

The Sustainable Child Development Index (SCDI)

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Abstract

The ultimate goal of sustainable development (SD) is to protect inter-generational equity for ensuring that future generations are able to live with their own needs. The goal acknowledges that future generations, inter-generational equity, and SD mutually support each other. Future generations, namely children, inherit and shape societies towards SD. However, children are not widely addressed in existing sustainability assessments. The disregard of children in sustainability assessments can lead to incomplete and biased evaluation in terms of SD.

Although several development indices are available for assessing multifaceted topics of child development (CD), the topics which connect CD to SD are lacking in these indices. Current CD studies focus mainly on social and economic topics and have not yet considered topics regarding SD with the triple-bottom-line thinking (e.g. environmental aspects). Environmental aspects, such as resource accessibility, need to be addressed for protecting inter-generational equity, i.e. ensuring future generations to live with accessible and abundant resources.

Therefore, to enhance existing sustainability assessments, this dissertation establishes a new index – the Sustainable Child Development Index (SCDI) – by considering children as an essential stakeholder group and by addressing children related topics with regard to SD, for measuring the status of sustainable child development for countries. Sustainable child development refers to a development that supports children to meet their needs in the present living state and protects children in order for them to have ability for shaping their future prospects. The SCDI was built step by step based on the construction of the SCDI framework considering topics associated with sustainable child development, the selection of indicators for measuring the identified topics, and the provision of calculation methods for determining the SCDI for countries. Application options of the SCDI, i.e. using the SCDI similarly to existing development indices to assess the status of sustainable development on different geographic levels and between population groups and integrating the SCDI framework into social sustainability assessment approaches and databases, were suggested as well. The results are presented in the four peer-reviewed journal publications which this dissertation consists of.

On the basis of a literature review, 626 topics (including overlaps of topics) associated with sustainable child development were identified and then hierarchically categorized to define the SCDI framework: seven themes (i.e. health, education, safety, economic status, relationship, participation and environmental aspects), 50 subthemes and 109 criteria. Each theme is specified by subthemes, which are further described by criteria. The criteria are then assessed by indicators. 154 indicators were then collected for measuring the criteria. An initial indicator set of 66 indicators was selected from the collected

indicators based on data availability on country level. For assuring the practicality of the SCDI, the initial indicator set was further finetuned with regard to the association (i.e. similarity) between indicators, the coverage of countries and child population addressed in the SCDI across all five geographic regions, namely Africa, Americas, Asia, Europe, and Oceania. Accordingly, 25 indicators were chosen as a final indicator set, which at present addresses five themes (health, education, safety, economic status and environmental aspects), 19 subthemes and 22 criteria in the SCDI and covers 138 countries (accounting for 86% of global child population).

Then, the final indicator set was normalized into 0-1 scores by the reference points derived from the quantified targets defined in the SDGs. By means of defining reference points with regard to the targets of the SDGs, the SCDI scores can reflect the status of sustainable child development. The normalized scores of the indicators for the 138 countries were then aggregated by arithmetically averaging accordingly on criterion, subtheme and theme level. Based on the SCDI scores, countries were also ranked and classified into four groups representing different levels of sustainable child development (very high, high, medium and low).

According to the results of country ranking and classification, the SCDI shows the strength in assessing the status of sustainable child development for countries and monitoring the status over time. Iceland, Bhutan, Norway, Sweden and Finland are the five highest ranked countries based on the SCDI scores for the year 2015. A significant regional inequality on the status of sustainable child development was found. European countries generally have a more advanced sustainable child development. On the contrary, 90% of African and 76% of Asian countries are assessed as countries with medium and low sustainable child development. In addition, the trend of the SCDI scores from 2006 to 2015 indicated that several developing countries (e.g. Cambodia and Ethiopia) show their improvement due to their enhanced performance for the themes health and economic status. On the other hand, some developed countries, such as Cyprus, Greece and Spain are the countries with the largest declines in SCDI scores due to a lower performance for the themes health and economic status in the years from 2006 to 2015.

By analyzing the association between the SCDI, Human Development Index (HDI) and Child development Index (CDI), it is found that the SCDI can be applied as an assessment that complements existing development indices to provide a more comprehensive evaluation of SD. Also, the comparison of the trend of country ranking assessed by the SCDI and the HDI from 2006 to 2015 points out that countries have enhancing development progress with a focus on whole population can have declining progress of sustainable child development. The dissimilar trends of development progress assessed by the SCDI and the HDI further acknowledge the importance to take children

into account in development policies and assessments to avoid a biased evaluation of development progress of countries.

Application options were suggested to foster the implementation of the SCDI. The SCDI is proposed to evaluate performance of sustainable child development on different geographic levels (e.g. a city or district) and between population groups (e.g. ethnics or education levels) with corresponding data, and to be extended by adding additional topics of sustainable child development for different assessment purposes. The other option is to consider the SCDI in existing social sustainability assessment approaches (e.g. Social Life Cycle Assessment, SLCA, and Social Organizational Life Cycle Assessment, SOLCA) and databases (e.g. Social Hotspot Database, SHDB) to tackle the neglect of children as a stakeholder group for realizing SD and to address the lack of quantitative description of the relation between socio-economic topics. For instance, the SCDI framework can be used to complement the existing framework of SLCA and SOLCA by proposing a stakeholder group, impact categories, subcategories and indicators connected to sustainable child development, and serve as basis to initiate the establishment of quantitative social impact pathways. An exemplary social impact pathway was built to quantitatively describe the strength of the relation between the SCDI criterion completion of tertiary education and the selected SCDI criteria. In addition, the SCDI can be considered in the SHDB to screen social conditions and to describe the degree of sustainable child development for countries.

In conclusion, the SCDI addresses the interwoven relationship between children, inter-generational equity and SD, and adopts the SDGs as target values to determine and monitor the status of sustainable child development for countries. The SCDI complements existing development indices to provide a comprehensive evaluation of SD by considering children as an essential stakeholder group and addressing topics with regard to SD. It can also be used as a basis to foster the establishment of indices that evaluate sustainable child development for different policy purposes and consider all the three dimensions of sustainability. In addition, the SCDI framework can be integrated into existing social sustainability assessment approaches and databases to evaluate social conditions with a focus on children and to improve social impact assessment.

Keywords: child development; inter-generational equity; resource accessibility; sustainability assessment; sustainable development; Sustainable Child Development Index (SCDI); Sustainable Development Goals (SDGs)

List of publications

Publication I: Chang, Y.-J.; Schneider, L.; Finkbeiner, M. Assessing Child Development: A Critical Review and the Sustainable Child Development Index (SCDI). *Sustainability* **2015**, *7*, 4973–4996, doi:[10.3390/su7054973](https://doi.org/10.3390/su7054973). [1]

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Publication III: Chang, Y.-J.; Lehmann, A.; Winter, L.; Finkbeiner, M. The Sustainable Child Development Index (SCDI) for countries. *Sustainability* **2018**, *10*, 1563, doi:[10.3390/su10051563](https://doi.org/10.3390/su10051563). [3]

Publication IV: Chang, Y.-J.; Lehmann, A.; Winter, L.; Finkbeiner, M. Application options of the Sustainable Child Development Index (SCDI) - Assessing the status of sustainable development and establishing social impact pathways. *Int. J. Environ. Res. Public Health* **2018**, *15*, 1391, doi:[10.3390/ijerph15071391](https://doi.org/10.3390/ijerph15071391). [4]

List of abbreviations

CD	-	Child development
CDI	-	Child Development Index
HDI	-	Human Development Index
IMF	-	International Monetary Fund
ISO	-	International Organization for Standardization
ITU	-	International Telecommunication Union
MPI	-	Multidimensional Poverty Index
MODA	-	Multiple Overlapping Deprivation Analysis
OECD	-	Organization for Economic Co-Operation and Development
SCDI	-	Sustainable Child Development Index
SD	-	Sustainable development
SDGs	-	Sustainable Development Goals
SHDB	-	Social Hotspot Database
SHI	-	Social Hotspot Index
SLCA	-	Social Life Cycle Assessment
SOLCA	-	Social Organizational Life Cycle Assessment
UN	-	United Nations
UNDP	-	United Nations Development Programme
UNEP	-	United Nations Children's Fund
UNESCO	-	United Nations Educational, Scientific and Cultural-Organization
UNICEF	-	United Nations Children's Fund
UNODC	-	United Nations Office on Drugs and Crime
WB	-	World Bank
WHO	-	World Health Organization

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1. Introduction

Children, inter-generational equity, and sustainable development (SD) are closely connected. However, children have not yet been widely considered as key stakeholder in sustainability assessments. This dissertation aims at constructing a new index to improve existing sustainability assessments by considering children as a key stakeholder and by addressing children related topics with regard to SD.

This chapter introduces sustainable development and the role of children (section 1.1), summarizes the state-of-the-art regarding sustainability assessments for children and outlines the research motivation (section 1.2). The goal of the dissertation and the research questions are presented in section 1.3. Research objectives and the connection of publications are explained in section 1.4, and the structure of the dissertation is shown in section 1.5.

1.1. Sustainable development and role of children

SD has become the conclusive goal for governments and societies to pursue. According to the Brundtland Report [5], SD was defined as a development that meets the needs of the present without compromising the ability of future generations to meet their own needs. This definition emphasizes intra- and inter-generational equity, implying that every adult and child has the right to own the opportunity to develop in freedom and in a stabilized society by satisfying basic needs and protecting the environment. Children (defined as aged under 18 according to the UN [6]) connect current and future generations. In other words, they are the key stakeholders inheriting and forming future societies towards SD. Additionally, the International Union for Conservation of Nature and Natural Resource [7] claimed that "we have not inherited the Earth from our parents, we have borrowed it from our children". This statement further stresses the role of children in inter-generational equity and SD and urges that the present generations shall ponder the effects of its decisions and behavior on the living of future generations.

Several international organizations emphasized the significance of children in achieving SD, and highlighted topics which could deteriorate children development (referring to the change or growth that occurs in a child during the life span from birth to adolescence [8]) and thus SD in initiatives and reports. One example is the 2030 Agen-

data for Sustainable Development [9], which consists of 17 Sustainable Development Goals (SDGs) with 169 targets covering a comprehensive range of SD topics: 13 of the goals (e.g. achieving gender equality and empowering all women and girls) and 95 of the targets (e.g. eliminating all harmful practices, such as child, early and forced marriage and female genital mutilation) are either directly or indirectly connected to children [10]. This large share of goals and targets addressing children shows an inseparable relation between children and SD. Moreover, the report of the United Nations Children's Fund [11] stated that "sustainable development starts with safe, healthy and well-educated children; and safe and sustainable societies are in turn essential for children". These reports emphasize that children are the basis of achieving SD and underlined the fact that children and SD mutually support to each other.

1.2. State-of-the-art sustainability assessments for children and research motivation

Despite the relevance of children for supporting SD, children are usually neglected as an essential stakeholder group in existing sustainability assessments. Children are more vulnerable than adults to diseases, environmental pollution, violence and poverty. In the early stage of life, such negative living conditions can significantly bring about suffering in a short term and further hinder CD in long-term perspective. Since the needs of children and their vulnerability to external living context are dissimilar to those of adults, schemes and indices for assessing SD by taking children as a key stakeholder group, namely sustainable child development, need to be independently established from whole-population-oriented assessments, such as the Human Development Index (HDI), Multidimensional Poverty Index (MPI), Social Life Cycle Assessment (SLCA) and Social Organizational Life Cycle Assessment (SOLCA).

The HDI was established in an attempt to describe the development status of a country by aggregating indicators for the three dimensions long and healthy life, knowledge, and standard of living according to national average data with regard to whole population [12]. It has been widely applied for decades, but the neglect of future generations in its scheme persists. The MPI consists of ten indicators corresponding to the three dimensions of the HDI, describing a set of direct deprivations that affect individuals and household [13]. Only two out of the ten considered indicators in the MPI particu-

larly involve children (i.e. school attendance and child mortality). SLCA aims at evaluating the positive and negative social and socio-economic impacts associated with products for five stakeholder groups workers, consumers, local communities, value chain actors and the society [14]. Future generations are only suggested as an optional considered stakeholder while performing SLCA studies [14]. In addition, the conceptual framework of SOLCA [15] was developed to foster the implementation of SLCA from a complementary, organizational perspective as most social impacts addressed in SLCA are related to organization's behavior and national conditions (e.g. fair salary) rather than to a product itself. Although having the strength in addressing social impacts from an organizational perspective, SOLCA inherits the missing consideration of children as a stakeholder group from SLCA. The disregard of future generations in sustainability assessments could bring about incomplete evaluation in terms of SD. Children's interests and influence on SD should be considered in sustainability assessments for underlining the strong connection between children and SD.

Some development indices have been proposed with a focus on children but have not yet comprehensively addressed topics related to SD (e.g. environmental aspects). Recently, one of the key movements of CD related studies is the establishment of indices for including multidimensional topics [16,17]. This movement considers the multifaceted nature of CD. For instance, the Child Development Index (CDI) [18] was proposed to evaluate the development of children considering the topics health (i.e. under-five mortality), education (i.e. primary school enrolment) and nutrition (i.e. underweight), by mirroring the HDI. Other indices include additional topics, such as relationships with family, school and community. For example, Land et al. [19] constructed the Child and Youth Well-Being Index to track the trends in child well-being on country level across 28 indicators and seven different topics, namely material well-being, health, social relationships, safety/behavior concerns, productivity/educational attainment, place in community, and emotional/spiritual well-being. Breaking down from country to district level, the New KIDS COUNT Index was proposed to measure and compare the performance of child well-being across states of the United States [20]. The index consists of 16 indicators categorized to four topics, i.e. economic well-being, education, health, and family and community.

Though these indices are already available for assessing multifaceted topics that influence CD, they focus mainly on social and economic topics and have not yet considered other topics regarding SD, such as environmental aspects. Environmental aspects, for example resource accessibility, need to be addressed to consider SD with the triple-bottom-line thinking (tackling environmental, economic and social dimensions [21]) and to protect inter-generational equity. Children are the ones passively inheriting the resources from current generations. To protect inter-generational equity, resource condition such as availability of freshwater and preservation of fossil fuels are of high importance to reflect resource scarcity and shall be considered into development indices and sustainability assessments.

In addition, a common classification scheme for topics and indicators addressing CD is lacking [22,23]. First, the selection of topics and indicators is often subjective [24,25]. And second, one indicator can be classified into different topics. For example, school enrolment indicators were categorized to measure education in some indices [20,26,27], but were assigned to describe participation in other indices [28,29]. Moreover, some studies did not clarify the data availability of underlining indicators, or did not even specify the indicators needed for measuring the topics [24]. Consequently, as data for indicators are not available or the indicators are not specified, such indices may not be applied in practice.

According to the state-of-the-art sustainability assessments for children, a widely-accepted, clearly-stated and comprehensive index to assess SD by taking children as key stakeholder is missing. Amongst other, especially the lack of including environmental aspects is identified as a gap.

1.3. Goal of dissertation and research questions

The goal of this dissertation is to develop a new index - the Sustainable Child Development Index (SCDI) - in an attempt to enhance existing sustainability assessments by considering children as key stakeholder and by addressing children related topics in the context of SD.

This index is designed to be an aggregated score that presents countries' status of sustainable child development by considering topics and indicators encompassing environmental, economic and social dimensions. The SCDI intends to compare the status of sustainable child development for countries and monitor the trends on improvements and declines of the status for countries by continuously updating the indicators over time. Sustainable child development refers to a development that supports children to meet their needs in the present living state and protects children in order for them to have ability for shaping their future prospects. Compared to sustainable development defined by Brundtland Report, sustainable child development takes children as a core and particularly stresses that the children should be supported and protected to satisfy their needs and to be capable to develop themselves on both current and future stages. The SCDI intends to consider topics and indicators not only for evaluating the current development status (e.g. eliminating risk behavior and reducing mortality) but also the restrictions that limit future development of children (e.g. concerning scarcity of nature resources). Therefore, the SCDI can support decision makers to formulate or adjust strategies on child as well as SD policies, and, alike HDI, can be a communication tool to policy makers, communities, academies, public and private organizations.

The overall goal, i.e. developing the SCDI, is specified in more detail by introducing the following four research questions, which are further illustrated by research objectives in section 1.4.

(1) What are the topics relevant to sustainable child development?

As described in section 1.2, children are usually neglected as a stakeholder group in sustainability assessments. Though development indices that assess multifaceted topics of CD are available, they mainly focus on social and economic topics without considering environmental aspects. Thus, the topics relevant to sustainable child development with the triple-bottom-line thinking need

to be comprehensively identified for being considered in the SCDI (for more details see section 2.1).

(2) Which indicators can measure the relevant topics of sustainable child development and support comparative assessment of sustainable child development on country level?

Having identified the relevant topics, how to measure the topics is the next essential question which shall be solved. As described in section 1.2, some studies of CD did not clarify the data availability of underlining indicators or did not even specify the indicators needed for measuring the topics. The practicality of such indices can be low, as data for indicators are not available or the indicators are not specified. To ensure the practicality of the SCDI, the indicators that can measure the identified topics of sustainable child development are collected and evaluated regarding data availability on country level. To support comparative assessment of sustainable child development for countries, a diverse coverage of countries assessable by the SCDI is another key consideration to select the indicators for the SCDI (for more details see sections 2.2 and 2.3).

(3) What is the status of sustainable child development for countries?

To assess sustainable child development on country level, the status of sustainable child development for countries needs to first be determined by combining the indicators into an index. Reference points derived from quantified international agreed targets for SD (e.g. the SDGs) are essential to be considered in index calculation to map the status of sustainable child development for countries. It is also important to examine if the SCDI can assess SD differently than other existing indices, for providing a more comprehensive evaluation of SD (for more details see section 2.3).

(4) How can the SCDI be implemented into sustainability assessments?

While having the SCDI established, how to put the SCDI into practice and how to use the SCDI to improve sustainability assessments are of importance to investigate. Thus, application options of the SCDI need to be suggested and demonstrated by examples (for more details see section 2.4).

1.4. Research objectives and connection of publications

Four research objectives are defined in order to answer the four research questions and thus to achieve the goal of the dissertation. Each research objective responds to one corresponding research question. The four research objectives are provided in the following together with their corresponding research steps:

(1) Construction of the SCDI framework considering topics associated with sustainable child development

Research steps:

- a. To review topics and gaps of assessing sustainable child development based on child rights, development and well-being studies
- b. To categorize the identified topics into a hierarchical framework considering themes, subthemes and criteria
- c. To address some of the identified gaps in the proposed framework

(2) Selection of indicators for measuring the identified topics of the SCDI framework

Research steps:

- a. To collect indicators for the identified topics of the framework
- b. To analyze the collected indicators regarding data availability on country level
- c. To select indicators regarding data availability and association between indicators

(3) Provision of calculation methods for establishing and determining the SCDI for countries

Research steps:

- a. To normalize the indicators regarding the defined reference points derived from quantified international agreed targets for SD
- b. To aggregate the normalized indicators into an index
- c. To classify countries into different sustainable child development levels based on the SCDI results
- d. To compare the SCDI with other existing development indices

(4) Suggestion of application options of the SCDI

Research steps:

- a. To propose application options of the SCDI based on the practices of existing sustainability development indices
- b. To suggest options on how to integrate the SCDI into existing social sustainability assessment approaches and databases

The research objectives 1-3 aim at establishing the SCDI and the research objective 4 focuses on putting the SCDI into practice.

This dissertation consists of four peer-reviewed journal publications (see List of publications). Each of the four research objectives has been addressed in at least one publication. Table 1 shows the connection between the four research questions, the four research objectives (including the research steps) and the four publications.

Table 1. Connection between the research questions, objectives and the publications

Research question	Research objective	Research step	Publication			
			I	II	III	IV
Research question 1 What are the topics relevant to sustainable child development?	Research objective 1 Construction of the SCDI framework considering topics associated with sustainable child development	1.a	x			
		1.b	x			
		1.c	x			
Research question 2 Which indicators can measure the relevant topics of sustainable child development and support comparative assessment of sustainable child development on country level?	Research objective 2 Selection of indicators for measuring the identified topics of the SCDI framework	2.a		x		
		2.b		x		
		2.c		x	x	
Research question 3 What is the status of sustainable child development for countries?	Research objective 3 Provision of calculation methods for establishing and determining the SCDI for countries	3.a			x	
		3.b			x	
		3.c			x	
		3.d			x	
Research question 4 How can the SCDI be implemented into sustainability assessments?	Research objective 4 Suggestion of application options of the SCDI	4.a				x
		4.b				x

Publication I conducted a literature review of studies related to child rights, CD and child well-being from an academic, organizational and governmental background to identify relevant topics and gaps for assessing sustainable child development (contributing to the research step 1.a). The identified relevant topics already addressed in existing studies were then classified into a hierarchical framework, consisting of themes, subthemes and criteria. Each theme is specified by subthemes, which are further described by criteria (responding to the research step 1.b). To tackle some of the gaps identified for assessing sustainable child development, the framework further goes beyond current practices by e.g. considering environmental aspects and underlining interdependence between the topics of sustainable child development (corresponding to the research step 1.c). The term “topic” used in this dissertation describes the subjects relevant to CD or SD studies and also used as a general term to refer to the clustered themes, subthemes and criteria in the SCDI framework.

Publication II collected indicators for measuring the themes, subthemes and criteria of the SCDI framework and analyzed the indicators regarding data availability on country level. Indicators for the criteria of the SCDI framework were collected from peer-reviewed publications, reports and international open-source databases specialized in CD research (responding to the research step 2.a). Statistical data on country level listed in international open-source databases and reports were then collected for the indicators. Afterwards, the indicators were screened with regard to data availability and assigned into different data availability levels for recommending an initial indicator set of the SCDI and highlighting the need of indicator and database development for specific topics and indicators before being considered in the SCDI (responding to the research step 2.b). A scheme to describe the data availability of indicators was established by taking the number (N) of countries considered in the UNICEF database (195) as a reference: if one indicator had statistical data for all 195 countries, the indicator was classified into the top data availability level. In total, seven data availability levels were defined: top (195), very high ($195 > N \geq 175$), high ($175 > N \geq 150$), medium ($150 > N \geq 100$), low ($100 > N \geq 50$), very low ($50 > N > 0$) and no available statistical data on country level. Medium data availability level was considered as an appropriate yardstick to select indicators for the initial indicator set because the data for indicators in this

level were available for 100 countries, representing 50% of the countries listed in the UNICEF database (responding to the research step 2.c).

Publication III refined the initial indicator set in attempt to assure practicality of the SCDI. Considering such a large number of indicators in one index may pose challenges for data collection as well as for indicator aggregation to an index, and thus impede the practicality of the SCDI. To reduce the number of indicators, correlation analysis was conducted to examine if the indicators assess topics in a similar way within an individual theme and then to select representative indicators from the initial indicator set (addressing the research step 2.c). If a strong association (the benchmark was defined as Spearman correlation coefficient of ± 0.8) was found between two indicators, one of the two indicators would be sufficient to describe the performance of specific topic. In this case, the indicator which had statistical data for a higher number of countries was selected as the representative indicator. If a correlation analysis did not show a strong association between the two indicators, both indicators were kept because one indicator cannot represent the other.

Moreover, the number of the topics and assessable countries in the SCDI was investigated and then considered to choose the representative indicators to form the final indicator set (contributing to the research step 2.c). Statistical data for the indicators are not available for the same countries. The more indicators are considered, the fewer countries can be addressed because of missing data. Thus, three principles were defined to reduce the number of the representative indicators and to determine the final indicator set: the final indicator set shall (1) address at least 50% of the themes, sub-themes and criteria covered by the selected representative indicators, (2) consider at least 70% of the 195 countries listed in the UNICEF database to ensure a diversity of covered countries across all five geographic regions i.e. Africa, Americas, Asia, Europe, and Oceania, and (3) address at least 70% of child population (of the 195 countries) to consider a large share of children. The initial SCDI framework was further finetuned according to the final indicator set.

Furthermore, for combining the final indicator set into an index, the indicator values were normalized by applying defined reference points derived from the targets of the SDGs (contributing to the research step 3.a), and then summed up into a SCDI score by

arithmetically averaging the normalized scores from the indicator, criterion, subtheme, theme to index level in Publication III (responding to the research step 3.b). Countries were ranked based on their SCDI scores, and then classified into four sustainable child development levels (very high, high, medium and low) in accordance with the country classification approach applied in the HDI, to summarize and communicate the status of sustainable child development for countries (contributing to the research step 3.c). Moreover, to examine the ability of the SCDI to complement existing development indices, the association between the country rankings assessed by the SCDI, the HDI and the CDI were investigated by a correlation analysis, and the trend of country rankings assessed by the SCDI and the HDI from 2006 to 2015 for six selected OECD countries (i.e. Australia, Canada, Mexico, Austria, Greece and Republic of Korea representing countries across different regions) was compared (responding to the research step 3.d).

Publication IV recommended application options of the SCDI. First, current use of the HDI were taken as references to suggest application options of the SCDI (contributing to the research step 4.a). Second, some social sustainability assessment approaches (e.g. SLCA and SOLCA) and databases (e.g. the Social Hotspots Database, SHDB) were selected and then reviewed to propose application options of the SCDI (contributing to the research step 4.b).

1.5. Structure of dissertation

This dissertation comprises four chapters. Figure 1 presents the structure of this dissertation. This chapter (Introduction) introduces the research background and motivation and defines the goal and research objectives of this dissertation. The linkage between the research objectives and the four publications is outlined in this chapter as well. These four publications are presented in chapter 2 (Results). Furthermore, key findings and challenges of the SCDI and ongoing methodological development trend for addressing children in sustainability assessments are discussed in chapter 3 (Discussion). Added value of the SCDI and suggestions of future research and practice are given in chapter 4 (Conclusions and outlook).

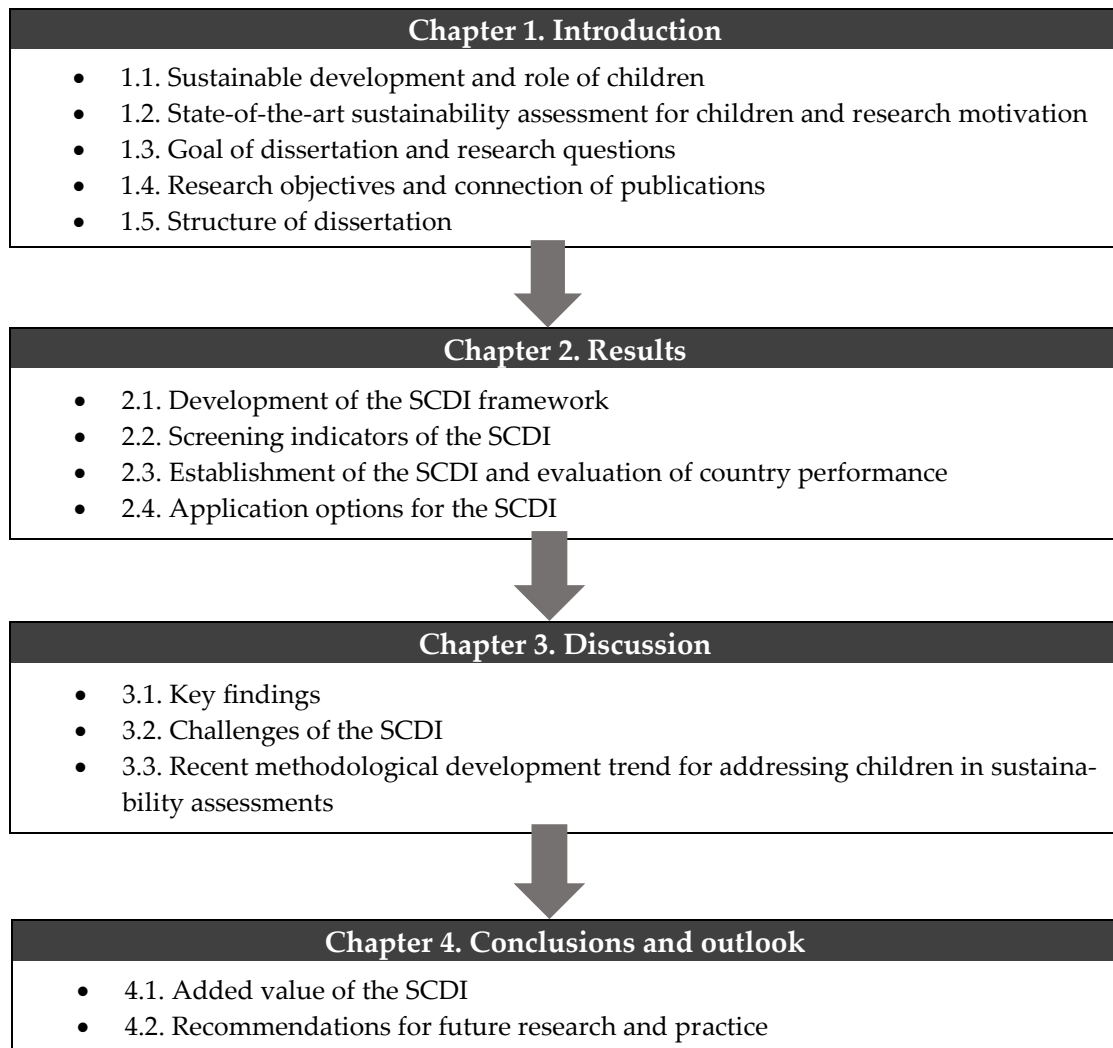


Figure 1. Structure of the dissertation

2. Results

This chapter provides the results based on the four publications which the dissertation consists of. In each section, the findings of each publication are first summarized, and the specified publication is then attached.

2.1. Development of framework of the SCDI

This section presents the results of Publication I [1]: ‘Chang, Y.-J.; Schneider, L.; Finkbeiner, M. Assessing Child Development: A Critical Review and the Sustainable Child Development Index (SCDI). *Sustainability* **2015**, *7*, 4973–4996, doi:[10.3390/su7054973](https://doi.org/10.3390/su7054973).’ which addresses the research objective 1.

Publication I suggested an index for assessing sustainable development with a focus on children and proposed the initial framework of the SCDI. 626 topics (including overlaps of topics) and six gaps of assessing sustainable child development were identified by the literature review. The gaps include inconsistent definitions of the age of children considered, heterogeneous classification of topics, interdependency between topics, regional and societal bias in addressing topics, limited consideration of topics and a lack of including environmental aspects.

The SCDI framework comprehensively considers topics of sustainable child development and goes beyond current practices by including environmental aspects and underlining the interdependencies between topics. The identified topics were classified into a hierarchical scheme, consisting of themes, subthemes and criteria. Seven themes were clustered: health, education, safety, economic status, relationships, participation and additionally environmental aspects. 50 subthemes and 109 criteria were grouped correspondingly. The subthemes and criteria were also assigned to two different levels: outcome and context level. This was done to distinguish the topics presenting outcomes of sustainable child development (e.g. child mortality) and the topics describing contexts of sustainable child development (e.g. immunization coverage) which potentially influence the outcomes. The SCDI framework was further finetuned with consideration of the results of indicator selection from Publications II and III. The finetuned framework is presented in Publication III.

*Article***Assessing Child Development: A Critical Review and the Sustainable Child Development Index (SCDI)****Ya-Ju Chang ***, Laura Schneider and Matthias Finkbeiner

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Abstract: Children are an important stakeholder group for sustainable development, as they represent the interface between current and future generations. A comprehensive assessment of child development (CD) in the context of sustainable development is still missing. In this paper, as a first step, a literature review is conducted to identify relevant aspects and gaps related to the assessment of CD. The main issues of CD are categorized into seven themes: health, education, safety, economic status, relationships, participation, and newly proposed environmental aspects. The corresponding subthemes and criteria are classified accordingly (e.g., nutrition, child mortality, immunization, *etc.*, are assigned to the theme health). However, gaps in current studies, such as the heterogeneous classification of relevant aspects, regional and societal bias in addressing certain aspects, the limited number of subthemes, and criteria and the missing inclusion of environmental aspects impede the assessment of sustainable child development. To address the existing gaps, a comprehensive framework, the Sustainable Child Development Index (SCDI), is proposed. The SCDI is based on sustainable development as the core value, considers relevant aspects of CD with regard to newly-proposed environmental aspects and includes 26 aspects on an outcome and 37 indicators on a context level to tackle the heterogeneous classifications and interdependencies of relevant aspects. The proposed index intends to strengthen the stakeholder perspective of children in sustainability assessment.

Keywords: child development; Sustainable Child Development Index (SCDI); sustainability assessment; sustainable development

1. Introduction

Sustainable development (SD) has become an ultimate goal for societies globally. SD was defined as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” by the Brundtland Commission [1]. This definition not only refers to intra- and inter-generational equity, but also to the right for every human being, whether adult or child, to be granted the opportunity to develop in freedom and in a well-balanced society by satisfying basic needs and protecting the environment [2–4]. Correspondingly, based on the definition stated by the United Nations, sustainability refers to use of the biosphere by present generations while maintaining its potential yield for future generations and/or non-declining trends of economic growth and development that might be impaired by natural resource depletion and environmental degradation [5]. In this context, the term environment refers to “the totality of all the external conditions affecting the life, development and survival of an organism [6]”. With regard to SD and sustainability, the definition of environment is specified, considering its carrying capacity [7,8]: “the use of renewable resources should not exceed regeneration rates and the rate of non-renewable resource use should not exceed the development of renewable substitutes...[7,8]”. The International Union for Conservation of Nature Resource et al. [9] stated that “we have not inherited the Earth from our parents, we have borrowed it from our children”. This statement highlights the significant relationship between inter-generational equity, children and SD.

Children (here defined as aged under 18 [10,11]) are the stakeholders inheriting and shaping the society. Child development (CD) is affected by external circumstances, and children are more vulnerable than adults [12]. For example, children are more susceptible to diseases, environmental pollution, violence and abuse. Furthermore, children’s basic rights to express opinions and to have access to education can be deprived by adults [12,13]. Disregard and violation of these basic rights and the principles of well-being can lead to irreversible and severe impacts on child development and, consequently, future societies.

There are several approaches for the assessment of sustainability. Recently, the life cycle sustainability assessment (LCSA) method has received increasing attention. LCSA combines life cycle assessment (LCA), social LCA (SLCA) and life cycle costing (LCC) to comprehensively

cover environmental, social and economic aspects [14,15]. To investigate social issues from a whole-population perspective, the United Nations Environment Programme (UNEP) [16] proposes five stakeholder groups for SLCA: workers, consumers, local communities, value chain actors and societies. Despite the fact that children form future societies and their relevance in the context of SD, children are neglected as a relevant stakeholder group. However, any sustainability assessment method neglecting children’s interests and their influence on SD is insufficient. Consequently, the stakeholder group children should be added to LCSA or, for a simplified assessment, even replaces the current five stakeholder groups, acknowledging children’s relevance for the achievement of inter-generational equity.

As the needs of children and their susceptibility to external factors are different from those of adults, schemes and indexes for evaluating SD from a child perspective, that is sustainable child development (SCD), need to be developed independent of whole-population-oriented assessments, such as the Human Development Index (HDI). The HDI was introduced by the United Nations Development Programme (UNDP) in the 1990s to measure the state of a country to enable people to have long, healthy, and creative lives by combining indicators of life expectancy, educational attainment, and income into a composite index based on national average data of the whole population [17]. Although HDI has been widely adopted to measure the degree of development of a country, relevant drawbacks remain. For example, environmental and resource consumption aspects are neglected, criteria related to income and gender equity are missing and impacts on future generations are ignored [18–20]. The NGO, Save the Children, proposed a Child Development Index (CDI) in 2008 [21,22] by applying an integrated index to evaluate the development of children with regard to health, education and basic needs. The CDI was designed as a mirror of the HDI, and both indexes address health and education themes. However, an indicator related to nutrition was taken up in the CDI to describe the basic need of children instead of using the indicator ‘income’ as proposed by in the HDI (the indicators are shown in Table 1). Similar to the HDI, the CDI still has several drawbacks and does not allow a comprehensive assessment of environmental and resource-consumption aspects in the context of SD.

Table 1. The themes and indicators of HDI and CDI, adopted from the save the children Fund [21].

Theme	Human Development Index (HDI)	Children Development Index (CDI)
Health	Life expectancy at birth	Under five mortality rate
Education	Mean years of schooling for adults aged 25 years; expected years of schooling for children of school entering age	Percentage of primary age children not in school
Basic needs	Gross national income per capita	Under-weight prevalence among children under five

A comprehensive assessment of issues that affect the well-being of children is needed to acknowledge and give consideration to children’s vulnerability and the strong connection of CD and SD [13]. In recent years, according to the Handbook of Child Well-Being [23], studies related to CD and well-being have undergone five relevant movements: shifting from assessing single aspects, like health, to including multi-dimensional topics, such as child rights and well-being, including positive aspects instead of only negative ones, considering new themes (e.g., participation), reflecting what a child feels and needs from a child’s perspective and developing a composite index [24,25]. Several NGOs proposed child well-being indexes to include additional aspects, such as relationships with family, schooling and community, emotional well-being, safety, or social engagement [26–28]. These themes and associated subthemes can broaden and improve the CDI. However, other relevant themes (e.g., environmental aspects, such as resource vulnerability) are not yet considered in the Handbook of

Child Well-Being and other current studies [23]. There is still no widely-accepted, clearly-stated and comprehensive index system to evaluate CD in the context of SD.

The objective of this study is to review literature related to the assessment of CD and to systematically identify the different aspects addressed in existing studies, including their frequency of being mentioned. Based on these results, existing gaps are identified from a top-down SD perspective.

On this basis, the Sustainable Child Development Index (SCDI) is proposed as a holistic concept covering existing priority areas of CD and addressing existing gaps by considering regional conditions and including environmental aspects. The SCDI intends to take a SD perspective in defining relevant themes, subthemes and criteria that affect CD. The SCDI framework will provide an innovative perspective to evaluate SD and highlights the fact that children and SD are mutually supporting [12].

In the following sections, current themes, subthemes and criteria related to CD, as well as existing gaps are identified and classified as a basis for the development of the SCDI.

2. Review of Themes Related to Sustainable Development of Children

In this section, a literature review related to child rights, CD and child well-being is presented as a basis for identifying relevant themes, subthemes, criteria and existing gaps. The evaluation is used as a basis to propose the structure of the SCDI. The themes, subthemes and criteria used in the SCDI need to have a clear link to the principles of CD and address relevant aspects of SD.

The rights of children have to be considered, since every child needs to be protected to live with their basic rights. Relevant principles related to CD need to be identified and considered for SD. Thus, as a first step, the basic rights of children and underlying themes regarding SD are identified and combined as a foundation for SCD. The right to survival, to development, to protection, and to participation are identified as the four basic child rights [10,11,29,30]. The Millennium Development Goals (MDGs) [31] serve as a reference for ensuring that the rights and themes comply with SD goals. As a next step, after defining the frame for SCD, relevant themes, subthemes and criteria are identified based on existing studies of CD and child well-being. The results represent current best practice regarding the assessment of SCD. In the following, the rights of children, the MDGs and the relevant themes, subthemes and criteria are analyzed and classified to provide a systematic overview of SCD.

2.1. Basic Rights of Children and Millennium Development Goals

Children are born with basic rights [29] (see the previous section). The protection of these basic rights needs to be considered as the core principles of SCD.

In 1989, the Convention on the Rights of the Child (CRC) of the United Nations defined basic rights of children, including the best interests of children, non-discrimination, participation, survival and development [10,11]. The CRC assigns children a relevant role in SD and provides a normative concept for understanding child well-being and CD [25,32,33]. Due to the broad spectrum of aspects covered, the rights defined by the CRC are often used as fundamental principles for the assessment of CD and well-being [25]. The NGO Child Right and You [29] further defined these rights by pointing out relevant themes: the right to survival (to life, health, nutrition, name and nationality), the right to development (to education, care, leisure and recreation), the right to protection (from exploitation, abuse and neglect), and the right to participation (to expression, information, thought and religion). In Table 2, a comprehensive overview of identified rights and corresponding themes is presented, based on data published by different NGO reports [10,11,29,30].

Table 2. The basic rights of children and corresponding themes.

Right	Theme
Right to survival	Physical and mental health
	Nutrition
	Clean drinking water and sanitation
	Unpolluted environment
Right to development	Education
	Leisure
	Family relations
	Eliminate child labor
	Alternative care
	Free to choose religion
Right to protection	Free from violence and crime
	Free from exploitation
	Free from abuse
	Free from armed conflict
	Registration with nationality
Right to participation	Express concern
	Active participation in media

Four basic rights are identified based on the literature review. Children should have these four rights no matter their gender, race, wealth and health conditions [11,33]. The right to survival for children includes four themes: health, enough food with sufficient nutrition, access to clean drinking water and sanitation and living in an unpolluted environment. The right to development refers to basic elements of child care and the children's capability for working and exploring their daily life. The associated themes focus on parental and alternative care, education, leisure and religion. Next, protection and safe living conditions form another basic right. Children are very vulnerable, and negative external conditions can threaten their safety. In this regard, relevant themes to be considered encompass birth registration with nationality, violence and crime, exploitation, abuse and armed conflict. Finally, the right to participation refers to the right of children to be heard, to express their concerns on child-related issues and to have access to media [10,11,29,30]. All of these rights need to be considered as the foundation of SCD.

As a next step, the MDGs are analyzed, to check if the identified rights and themes reflect general SD goals. The MDGs are the most broadly supported development goals the world has ever agreed upon. The MDGs aim at holistically addressing development needs, globally and locally, to eliminate poverty

towards SD. The UNDP stated eight MDGs [34] based on the United Nations Millennium Declaration in 2000 [31]:

- Eradicating extreme poverty and hunger;
- Achieving universal primary education;
- Promoting gender equality and empowering women;
- Reducing child mortality;
- Improving maternal health;
- Combating HIV/AIDS, malaria and other diseases;
- Ensuring environmental sustainability;
- Developing a global partnership for development.

Verifying that the rights and themes identified earlier are compliant with the MDGs strengthens the fundamental structure of the assessment of CD and ensures the compliance of SCD with basic sustainable development goals. There are direct links between MDGs and the identified rights. For example, eradicating extreme poverty and hunger, reducing child mortality and combating HIV/AIDS, malaria and other diseases can directly link to the physical and mental health of the rights to survival. Besides, improving maternal health can also influence children's health, since maternal conditions can affect the mortality rate of newborn babies and the health situation of children in early years. Furthermore, ensuring environmental sustainability means that children could live without the danger of environmental degradation, and the unpolluted environment is identified as a relevant theme for securing the rights to survival. Achieving universal primary education connects to the rights to children's development in education. Through basic education, children can gain their capability for further development as human capital in society. Promoting gender equality and empowering women are relevant for decreasing gender discrimination, which link to the fundamental background in CRCs. Only one goal, developing a global partnership for development, is not pointed out in CRCs. However, the MDGs only represent selected urgent aspects for persuading countries to take actions towards SD, and the goals are limited to survival, education and discrimination issues. To make SCDI more comprehensive, additional aspects that may influence children's well-being and development have to be considered.

Furthermore, in 2013, a publication of the United Nations Children's Fund (UNICEF) highlighted the importance to invest in the development and well-being of children as an integral instrument for achieving SD and reconfirms the rights and themes with basic sustainable development goals [12]:

- SD starts with safe, healthy and well-educated children;
- Safe and sustainable societies are, in turn, essential for children; and
- Children's voice, choice and participation are critical for the future that we want them to have.

Those aspects highlight that children are the foundation of SD and strongly support the rights and principles claimed in CRC and MDGs: health, safety, education and participation. Based on the rights and principles, the themes, subthemes and criteria related to SCD are identified and classified correspondingly through a literature review in the following section.

2.2. Identification of Themes, Subthemes and Criteria Relevant for Child Well-Being and Development

The basic question followed up in this section is: Which aspects of SD are of special relevance for children? This question needs to be answered by identifying relevant themes, subthemes and criteria

based on a review of existing literature concerned with CD and well-being under consideration of the principles defined by the CRC and MDGs. Additional aspects relevant to SCD, which have not been covered in CRC or MDGs yet, are also identified.

To comprehensively address aspects related to CD and well-being, this article focuses on studies that refer to overall aspects of child development and well-being rather than ones with only specific emphasis on single areas, like physical health or education. The literature review includes ten academic publications [35–44], eight works completed by the NGOs specializing in child development and well-being research [21,26–28,45–48], as well as five reports provided by government-supported institutions [49–53]. In total, 23 studies are selected as references to identify relevant themes, subthemes and criteria. By including studies from an academic, organizational and governmental background, a more comprehensive set of themes can be identified. Based on the discussed rights and principles, a set of relevant themes related to SCD can be determined: health, safety, education and participation. Furthermore, by reviewing selected studies on CD and well-being, two additional themes are identified: relationships and economic status. Moreover, subthemes and according criteria associated with the themes are categorized as well. A comprehensive overview of all themes and subthemes and related criteria is displayed in Tables 3–6. The numbers given in brackets of Tables 3–6 refer to the frequency of their occurrence in the literature analyzed. Despite the limitations of this purely quantitative indicator, it is still used here as a proxy indicator for their relevance. The categorization presented in Tables 3–6 is reflected in the development of the SCDI by the introduction of two levels: an outcome level and a context level. The SCDI framework differentiates between subthemes that relate to the outcome of child development (outcome level, e.g., school attainment) and subthemes that relate to contexts that affect those outcomes (context level, e.g., parents' educational qualifications) [41,54]. In the following, relevant themes, subthemes and criteria are discussed in more detail.

2.2.1. Health

According to the literature review, health is a theme of high importance for CD. Without securing their health, children have difficulties surviving and obtaining skills, and this negatively affects future human capital. In Table 3, the subthemes and criteria related to health are presented. Risk behavior, nutrition, child mortality, immunization coverage, eating and physical activity and subjective health are identified as the six most relevant subthemes.

- Behavior of children that puts their health at risk needs to be evaluated. Tobacco and alcohol use are two criteria that are identified as relevant for determining the exposure to health hazards, especially for children of school age. In addition, adolescent fertility is also recognized as relevant, as it could damage the immature reproductive system and also increase the risk of venereal disease.
- Sufficient nutrition is a basic need for children and their physical development. Low birth weight, being overweight and obesity, breastfeeding and being underweight are identified as relevant criteria for the subtheme nutrition.
- Reducing child mortality was already suggested in the MDGs and is frequently mentioned in the literature. To determine child mortality, infant mortality and under-five mortality are two commonly suggested criteria.
- Sufficient vaccination programs are representative of the quality of health services (to avoid particular harmful communicable diseases in children). Full immunization, vaccinations for diphtheria tetanus tox-

oid and pertussis (DTP3) and vaccinations for measles (measles containing vaccine, MCV) are three criteria identified as relevant for evaluating the state of immunization of children.

- Both physical activity and healthy diets help children to strengthen their physiological function. For example, healthy eating behaviors, like having breakfast and eating fruits, are two commonly recommended criteria in the literature.
- Apart from judging health from an objective perspective, the subjective perspective is also relevant. Criteria such as satisfaction and perceived quality of life relate to the subjective health of children.
- Other subthemes, such as oral health, injury, mental health, maternal health, health financing, water and sanitation, child disability, chronic disease and hazardous pollutants, are mentioned, but not frequently addressed in the reviewed literature. HIV and malaria are rarely considered in the reviewed literature, even though they can also affect health and are directly linked to the MDGs.

2.2.2. Education

Education is another theme of high relevance for SCD. Obtaining benefits from education, for example learning values, behavior, knowledge, skills and competencies required for a sustainable future, is a key pathway of SD [55]. This theme refers to the attainment of knowledge and skills, which is important for children to develop their capability to work and to elaborate life. By means of the literature review, several subthemes could be identified. As displayed in Table 4, school attainment, attendance of basic education, early childhood education and advanced education (high schools and colleges) are the subthemes with high priority for evaluating the educational background of children.

- The subtheme school attainment can be evaluated by means of the criteria mathematical and reading literacy. Higher literacies indicate that children may have better performance and knowledge obtainment.
- Several criteria are available for evaluating the level of basic education. This links to the MDG ‘achieving universal primary education’. During the literature review, enrollment in primary school is identified as the criteria most often used to assess whether children obtain basic and fundamental knowledge. However, gender equality is assessed only by one study in the literature. Unequal rights in basic education can seriously damage further skill development and also lead to the vicious circle of the situation of females.
- Early childhood education and advanced education are two other subthemes essential to children. Early childhood education is important to attain day-to-day knowledge and to acquire social capability in the initial phases of life. The criteria ‘enrollment in kindergarten’ is identified as the most relevant to reflect the level of early childhood education. Advanced education refers to the attainment of higher levels of knowledge for further development of skills, which plays a key role to strengthen the position of children in the employment market.
- Other subthemes mentioned as relevant for assessing the theme education are transition to employment, parents’ education qualification, other participation (like extra-curricular subjects) and public expenditure on education.

2.2.3. Safety

Children are fragile in the early life stage and need parents and adults to care for and support them. Without appropriate care arrangements, children can easily be exposed to dangers and engage in delinquent behavior. Violence and crime, child care arrangements and child abuse and punishment are identified as the three major subthemes of safety (see Table 5).

- Violence in school and juvenile delinquency are identified as the two main criteria for evaluating safety in the literature review. Criteria presumed as relevant, like child trafficking, child prostitution and child pornography, are not evaluated in the currently reviewed literature. These situations occur especially in countries with insufficient laws [10,12].
- Child abuse can cause physical and mental damage and, consequently, has a negative effect on CD.
- Child care arrangement is relevant for ensuring the safety of children. The identified criteria are formal care and adult supervision after school.
- Governmental efforts to ensure child safety, like birth registration, child labor, child marriage, and female genital mutilation (FGM).

2.2.4. Relationships

Relationships with family, peers and community are identified as common subthemes in the literature for the evaluation of child development, as shown in Table 6. Effective relationships are important for children with regard to their long-term emotional and psychological development [28]. Family relationships provide the basis for children's personality and behavior; peers and community relationships also shape CD as external factors. Communication between parents and children, as well as family structure (such as single-parent or step families) are the two main criteria reflecting the family relationship. They are typically based on subjective evaluations. However, these criteria are mainly included in studies from industrialized countries [26-28,35,36,38,40,48-50,52,53,56].

2.2.5. Economic Status

Economic status is another theme identified as relevant for the assessment of CD. The main subthemes are relative household income poverty, household without job, material deprivation, risk housing, hunger and food shortage, crowded household and macroeconomic situation (see Table 6). Those subthemes influence children from a material perspective and can affect their daily life. If the resources of income, material and housing are not sufficient, CD can be restricted, possibly triggering the early leave from school and possible crimes.

2.2.6. Participation

Participation is not widely discussed in most of the reviewed literature. However, based on the importance for children to learn how to express their opinions on public issues, participation is identified as a relevant theme. Participation in public affairs via voting, joining civic activities and engaging in media can motivate children to defend their rights and become responsible and active citizens. The voting right is a key for children to express their choices in politics and public affairs.

However, there are several potential subthemes that have not been addressed in the reviewed literature, but that might be of high importance for SCD. In the next section, gaps of current SCD, such as inconsistent definitions of the age of children, heterogeneous classification of subthemes and criteria, potential bias in addressing certain aspects, the limited number of subthemes and criteria and the missing consideration of environmental aspects, are discussed. Furthermore, based on these gaps, additional subthemes are identified for the development of the SCDI.

Table 3. Subthemes and related criteria of the theme health in current child development (CD) studies.

Health (23)		
Risk behavior (21)	Nutrition (19)	Child mortality (18)
• Tobacco use (14) • Alcohol use (14) • Adolescent fertility (12) • Illicit drug use (10) • Contraceptive prevalence (8) • Cannabis use (7) • Prevalence of sexual activity in youth (6)	• Low birth weight (15) • Overweight and obesity (13) • Breastfeeding (7) • Underweight (3) • Iodized salt consumption (2) • Vitamin A deficiency (2) • Stunted (1) • Wasted (1)	• Infant mortality (15) • Under-five mortality (5) • Mortality, aged 1–14 (1); 1–19 (5); 15–24 (1); under 20 (1) • Neonatal mortality (3) • Foetal mortality (1) • Perinatal mortality (1)
Immunization coverage (15)	Eating and physical activity (12)	Oral health (9)
• Measles containing vaccine (MCV) immunization (6) • Fully immunization (5) • Diphtheria tetanus toxoid and pertussis (DTP3) immunization (3) • Polio (Pol3) immunization (3) • Hepatitis B (HepB3) immunization (2) • Bacillus Calmette-Guérin (BCG) immunization (2) • MCV + DTP3 + Polio3 (2) • Haemophilus influenzae type B (Hib3) immunization (1) • Neonates protected at birth against neonatal tetanus (1)	• Exercise and leisure (10) • Fruit consumption (5) • Breakfast consumption (4) • Soft drink consumption (2) • Three meals per day (1)	• Untreated dental caries (6) • Daily teeth brushing (2) • Dental visit (1)
	Subjective health (12)	Injury (8)
	• Self-rated health (11) • Esteem (4) • Quality of life (3) • Satisfaction of body figure (1)	• Medically attended injuries (6) • Numbers of injured cases (3) • Transportation injury (2) • Burn injury (1) • Poison injury (1) • Fracture injury (1)

The numbers in brackets display the times considered in the literature.

Table 3. Cont.

Health (23)		
Mental health (8)	Maternal health (7)	Health financing (6)
• Depression (4) • Suicide (4) • Emotional and behavior difficulty (4) • Religious attendance (3) • Report religion is very important (2) • Mental health complaints (1)	• Antenatal care (5) • Maternal smoking (3) • Skilled attendant at birth (2) • Maternal mortality (2) • Congenital malformation (2) • Teenagers abortion (1) • Preterm birth (1)	• Children health insurance coverage (4) • Public expenditure as a percentage of GDP on health (2)
		Child disability (5)
		Chronic disease (5)
		Accessibility of health service (3)
Hazardous pollutant (4)	Water and sanitation (3)	HIV (3)
• Families smoking (3) • Outdoor air pollution (3) • Lead pollution (2) • Hazardous noise (1)	• Improved sanitation facilities coverage (2) • Improved drinking water coverage (2) • Drinking water quality (1)	• HIV prevalence (3) • Pregnant women living with HIV, receive medicine for preventing transmission (2) • Knowledge of HIV (2) • Sterile injecting equipment usage (1)
Malaria (2)	School absence due to health issues (2)	Activity limitation (2)
• Children under five sleeping under nets (2) • Children under five fever with treatment (2) • Households with at least 1 net (2) • Pregnant women sleeping under nets (1) • Pregnant women fever with treatment (1)	Child cancer (2)	Diabetes (1)
	Diarrhea (2)	Hearing (1)
	Asthma (2)	Chlamydia infection (1)
	Pneumonia (2)	

The numbers in brackets display the times considered in the literature.

Table 4. Subthemes and related criteria of the theme education in current child development (CD) studies.

Education (23)		
School attainment (18)	Early childhood education (12)	Attendance of advanced education (11)
• Mathematical literacy (10) • Reading literacy (10) • Overall literacy (5) • Science literacy (4) • Learning difficulty (3) • Language learning (2)	• Enrollment of kindergarten (12) • Parents reading to young children (3)	• High school completion (7) • Youth (15–19) remain in education (3) • College enrollment (2) • Bachelor completion (2) • High school student not graduated on time (2)
Attendance of basic education (10)	Subjective evaluation (9)	Parent's educational qualification (5)
• Enrollment in primary school (5) • Enrollment in secondary school (4) • Truancy (3) • Primary school completion (2) • Secondary school completion (2) • Gender equality in enrolment of primary school (1); of secondary school (1) • Compulsory education completion (1)	• Satisfaction of school (8) • Pressure from school work (3)	• Parent's formal educational level (4) • Mother's educational level (1)
	Transition to employment (7)	Other participation (4)
	• Idle youth (15–19) not in education, training or employment (7) • Finding low-skilled work (2)	• Reading pleasure (2) • Extra-curricular subjects (2)
		Public expenditure on education (2)

The numbers in brackets display the times considered in the literature.

Table 5. Subthemes and related criteria of the theme safety in current child development (CD) studies.

Safety (19)		
Violence and crime (14)	Child care arrangement (8)	Child abuse (6)
• Bully in school (9) • Juvenile delinquency and cases proved in courts (8) • Fighting (4) • Criminal/assault victimization (4) • Rating the safety of living community (3) • Witness of family violence (2) • Fear of crime (1) • Police apprehension (1) • Rating the safety of school (1)	• Formal care (4) • Adult supervision after school (5) • Primary child care arrangement by employed mothers (2)	• Birth registration (2) • Child labor (2) • Child marriage (2)
	Physical punishment (4)	Female genital mutilation (2)
	• Punishment occurred in school (2) • Punishment occurred in family (1)	

The numbers in brackets display the times considered in the literature.

Table 6. Subthemes and related criteria of the theme economic status, relationship and participation in current child development (CD) studies.

Economic status (19)		
Relative household income poverty (16)	Household without job (9)	Macroeconomic situation (3)
Material deprivation (8)	Risk housing (8)	• Unemployment rate (2)
• Fewer than ten books (5)	Food shortage (5)	• Income equality at societal level (1)
• Few educational resource (4)	Crowded household (4)	• Annual inflation rate (1)
• Low family affluence (3)	Debt and financial difficulties (2)	• National debts (1)
• Lack of needed items (1)	Worry about family financial situation (2)	
Relationship (17)		
Family relationship (17)	Peer relationship (8)	Community relationship (8)
• Single, unmarried or foreign parent or step families (10)	• Kind and helpful peers (7)	• Feeling discriminated and isolated (5)
• Communication and relation of parents and children (9)	• Electronic media contact with friends (1)	• Immigration (4)
• Satisfaction of family (1)		• Engaging in community/group activities (4)
		• Social capital in the community (4)
		• Satisfaction with the living community (2)
Participation (6)		
Participation in civic activity (4)	Social connection (3)	Voting in presidential elections (3)
	• Telephone access in home (2)	
	• Internet access in home (2)	
	• Use of mass media among adolescents (1)	

The numbers in brackets display the times considered in the literature.

2.3. Gaps and Challenges of Assessing CD

As an additional contribution of the literature review, several gaps were identified with regard to the current analysis of CD. The inconsistent definitions of the age of children considered, the heterogeneous classification of subthemes and criteria, interdependency, regional and societal bias in addressing certain aspects, the limited subthemes and criteria and the lack of including environmental aspects currently impede the implementation of SCD.

2.3.1. Inconsistent Definitions of the Age of Children

This study follows the definition of the United Nations', stating that children are people under 18 years old [10]. However, this definition is not uniformly applied throughout studies. For example, the Ontario Agency for Health Protection and Promotion states that the definition of "children" encompasses only people from age two to less than 12, and refers to "teenager" from age 12–20 [57]. In addition, other studies consider the criterion "risk behavior" of children at different ages, for instance surveying the tobacco use at age 16 or 18 [27,28,36,49,52,57]. This may bring about inconsistencies in the data used for further evaluation.

2.3.2. Heterogeneous Classification of Relevant Aspects

The clustering of subthemes and criteria is not a straightforward task. The literature review revealed that the classification of criteria and subthemes is rather heterogeneous and that there is currently no generally accepted classification scheme [32,38,58,59]. There are discrepancies in the literature with regard to the identification of relevant themes, subthemes and criteria. The choice of themes, subthemes and criteria is subjective and depends also on the availability of related data [38,41]. Furthermore, different approaches for addressing certain themes are used. For example, the theme education can be approached by evaluating the subtheme school attainment or the subtheme attendance of basic education [59]. Thus, this paper proposes a consistent classification scheme based on existing literature (see Tables 3–6).

2.3.3. Interdependencies

So far, an assessment of the dependencies between different subthemes and criteria is missing [54]. Even though the SCDI framework is a first step towards a standardized and explicit classification scheme, the interdependencies between the criteria and subthemes needs to be further investigated in future studies. Furthermore, the attribution of criteria to the different subthemes is often ambiguous. The criterion low birth weight currently attributed to the subtheme nutrition could also be used as a criterion for analyzing maternal health.

2.3.4. Regional and Societal Bias

Current studies often lack a truly global perspective and, thus, underrepresent aspects of high relevance for CD in certain regions. The identification of subthemes and criteria is often based on the concerns of industrialized countries. In addition, some criteria are based on particular societal preferences in evaluating CD. Both effects introduce bias to CD assessment:

- Only two studies cover the situation in developing countries [46,47]. So far, not enough attention is put on issues of particular relevance for developing countries, such as hunger, access to water, sanitation, malaria,

diarrhea, etc. As a consequence, the criterion “overweight and obesity” is associated with higher attention in the current literature than the criterion “underweight”. Furthermore, access to water is generally assured, and sanitation systems are available in industrialized countries, leading to the negligence of those criteria in many studies. In addition, malaria and diarrheal disease, which are very critical to young children, receive little attention in the reviewed literature [47], as they mainly occur in Sub-Saharan Africa and South Asia.

- FGM for non-medical reasons violates the human rights of girls and causes severe damage to health. However, as FGM occurs mainly in Africa and the Middle East, insufficient attention is paid to it in current literature [46,47].
- Societal preferences lead to criteria like the proportion of children living in single-parent families and stepfamilies, which is often used to negatively judge family relationship. However, children in single-parent and stepfamilies can still grow up well [28]. Similarly, regarding child labor, usually negative impacts, like increasing health risks and deteriorating school performance, are mentioned and observed; however, some positive effects, like the development of discipline, responsibility and self-confidence, may also occur [60]. It is very complicated to establish straightforward cause and effect relations with regard to CD due to the multi-faceted character of social issues.

For a holistic assessment of CD, subthemes and criteria need to also acknowledge such regional and societal circumstances. The evaluation framework needs to be designed in a way that allows customization and expansion for different regional and societal preferences.

2.3.5. Limited Subthemes and Criteria

There are still some general issues that may affect CD, but lack proper consideration in the scientific literature. Examples include vocational education, equality in education, demographic structure, youth unemployment or availability of media for children. Those missing issues highlight that current CD studies are still confined to limited sets of themes, subthemes and criteria.

2.3.6. Lack of Including Environmental Aspects

Current CD studies focus mainly on social and economic issues. Environmental aspects are not addressed yet. However, environmental aspects need to be addressed as an additional theme to link CD to SD with triple-bottom-line thinking (considering environmental, economic and social aspects) [7] and protecting inter-generational equity. Some studies related to human or society development already pointed out the relevance of environmental aspect for SD [2,8,18,19]. In existing studies, there are only two proposals to consider greenhouse gas emission, and only two studies indicated the potential relevance of other environmental issues, such as the use of renewable energy and water resources, etc. [2,8,18,19]. The effects of greenhouse gas emissions occur on a global level. For assessing CD regional effects, it would be of higher interest to assess the difference between countries. Regional issues related to the exhaustion and scarcity of resource, like water vulnerability and the use of renewable energy, should be considered in SCD. In the next section, the SCDI framework is outlined to address the identified gaps and to support a more comprehensive approach for the assessment of SCD.

3. The Sustainable Child Development Index

Based on the literature review and the identified themes, subthemes and criteria, a new concept is proposed: The Sustainable Child Development Index (SCDI). The SCDI aims to provide a consistent and comprehensive assessment of CD from a sustainability perspective and to address existing gaps by identifying subthemes and criteria according to their relevance, distinguishing between an outcome and context level, considering regional conditions and including environmental aspects.

An integration of sustainability aspects, especially environmental aspects, is needed to acknowledge the connection between present and future generations [8]. Among various concepts of sustainability, the triple-bottom-line theory is widely adopted, especially in politics, as it considers environmental, economic and social aspects as outlined in LCSA [14]. This triple-bottom-line theory is also adopted in the SCDI framework to demonstrate the relationship of CD and sustainability thinking. The three dimensions are partially overlapping and correlate with each other. In Figure 1, the themes identified in the SCDI are assigned to the corresponding dimension of sustainability to highlight the consideration of all three dimensions of sustainability.

The SCDI is proposed as a two-level scheme, including an outcome and a context level. Both levels rely on the six earlier identified themes: health, education, safety, economic status, relationships and participation as a foundation and include the additional theme environment on the context level to live up to the requirements of sustainability. The outcome level refers to the development status of children, like child mortality and school attainment, including subthemes identified in the literature review. The context level considers aspects, such as relative family income, that can affect the outcomes of CD. This context level also includes aspects that have not been addressed in current literature (e.g., demography), but that are considered as relevant for achieving a comprehensive assessment of SCD.

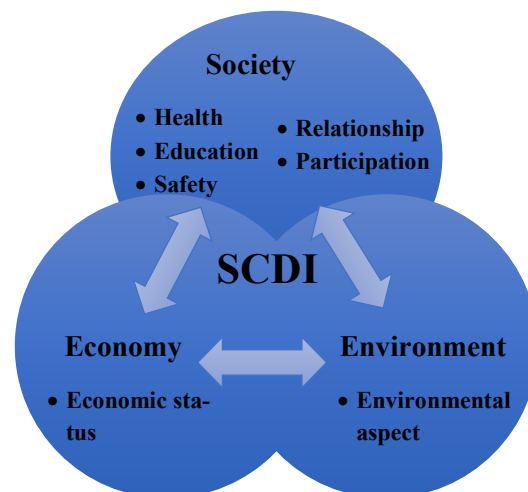


Figure 1. Overview of the Sustainable Child Development Index (SCDI) structure based on the triple-bottom-line theory.

As there is no generic agreement with regard to approaches and themes to be considered in CD studies, a framework is needed to broadly distinguish the subthemes and criteria in two parts: outcomes of CD and contexts that have the potential to influence the outcomes [32,41,54,61]. The contextual subthemes and criteria can affect CD, but this causal relation-ship is not binding. For instance, growing up in a single-parent family may, but does not necessarily have to increase the likelihood of having negative effects on CD. This implies that the contextual sub-themes and criteria are associated with the outcome of CD, but should not be considered as direct measures of the outcome [54]. In this sense, on the outcome level, the subthemes showing children's status and capability are selected based on the results of Tables 3–6. For example, the subthemes nutrition, child mortality, injury, subjective health, oral health, mental health, chronic disease and disability are listed on the outcome level of the theme health in line with the literature review.

Furthermore, the additional theme environmental aspect is added on the context level to bridge current CD to SD and to highlight the relevance of the triple-bottom-line thinking. Based on the definitions of environment, resource accessibility is identified as relevant and needs to be considered in the development of the SCDI framework. A similar concept was also introduced in a proposal for the Sustainability Adjusted HDI (SHDI) [8]. The SHDI proposes to include, for instance, fresh water withdrawals, land use for permanent crops, biodiversity lost and greenhouse gas emissions into the evaluation of human development. For assessing SCD, freshwater vulnerability is proposed as a subtheme of the theme environmental aspects due to the close relation to everyday needs of children, the regional and local circumstances and the relevance to maintaining freshwater access for the achievement of inter-generational equity. The criterion hazardous pollutants is not considered under the theme environment aspects, as it is included under the theme health, in line with current literature.

On the context level, subthemes that have the potential to influence the outcome of CD are selected. In addition, new subthemes are proposed based on the gap analysis to strengthen the comprehensiveness of the evaluation. These subthemes include provision of vocational school, equality in education, youth unemployment, availability of media for children, fossil fuel energy consumption and demographic structure. An overview of the outcome and context level proposed in this work is provided in Figure 2. The new subthemes are written in italics in Figure 2 and are described as follows.

- Vocational education (may include technical schools, workshop schools, development agencies, *etc.* [55]) is designed to prepare individuals for a vocation or a specialized occupation and is directly linked with a nation's productivity, competitiveness and equality in education. It can increase further career development opportunities and professional status [62]. Quality of life of children and personal development, attitudes and motivation can also be affected by vocational education.
- Equality in education is essential for all children. Gender equality in education plays a core role in protecting children's basic right to education. If gender equality is low, this leads to a vicious circle in the further personal development of girls, human capital and gender conflicts in society.
- The global youth unemployment rate in 2013 was 12.6%, close to a crisis critical peak [63]. Although children are defined as aged 0–18 earlier, youth (aged 15–24) unemployment can reflect the prosperity of job opportunities and can influence children's plans for further education, career and development of skills. The economic and social costs of unemployment and widespread low quality jobs for young people continue to rise and undermine the potential of economies to grow [63].

- Media (newspapers, periodicals, books, broadcasts, websites, television shows and news, *etc.*) designed for children is important for children to attain knowledge and to participate in public affairs by expressing their opinions. Furthermore, well-designed media can provide information without harmful content, such as violence and pornography.
- Fossil fuel is a non-renewable energy source. High fossil fuel energy consumption speeds up the depletion of fossil fuel resources and damages the rights of future generation to access these resources. Each country should reduce the consumption of fossil fuel and should implement measurements to promote renewable energy.
- Demographic structure (especially the sex ratio at birth, estimated as the number of boys born per 100 girls) can reflect the attitude towards gender equality in society. High sex ratios at birth may be attributed to sex-selective abortion, infanticide and underreporting of female births due to a strong preference for sons [64,65]. Exposure to pesticides and other environmental contaminants may be a significant contributing factor, as well.

Furthermore, a comprehensive assessment of SCD needs to enable the inclusion of additional subthemes into the assessment that might be only of regional relevance. The necessity of adapting to the circumstances in, for example, developing countries can be considered on both levels by including subthemes related to societal value and prerequisites in the SCDI, which can be adapted according to country-specific situations. These subthemes can refer to FGM, armed conflicts or critical diseases, for example HIV or malaria (see also the previous section).

By proposing a set of themes and subthemes and by differentiating the assessment into an outcome and context level, the SCDI can enable a comprehensive evaluation of SCD. Though the arrangement of the subthemes into the two different levels can be debated with regard to different approaches developed among CD-related studies and there are still potential missing issues not addressed in the index, the SCDI is a first step towards a common and consistent assessment of CD in the context of sustainable development.

To further develop the SCDI, as a next step, relevant criteria need to be identified that properly represent the identified subthemes, and the quantification of these criteria for the calculation of the numerical SCDI needs to be defined. The goal is to provide quantitative values to compare the performance of countries and to reflect their potential toward SD. The SCDI can then be used to support decision making in policy and societal development and bridge SCD to current sustainability studies.

In addition to its application on the country level, the SCDI framework intends to complement SLCA methodologies as part of LCSA. SCDI could be used to fill the current gap of SLCA and to introduce children as an additional stakeholder group in SLCA, respectively LCSA. As SLCA is struggling with lacking data, children could even replace the current stakeholder groups for a high-level assessment, and SCDI could provide the basis for an indicator framework.

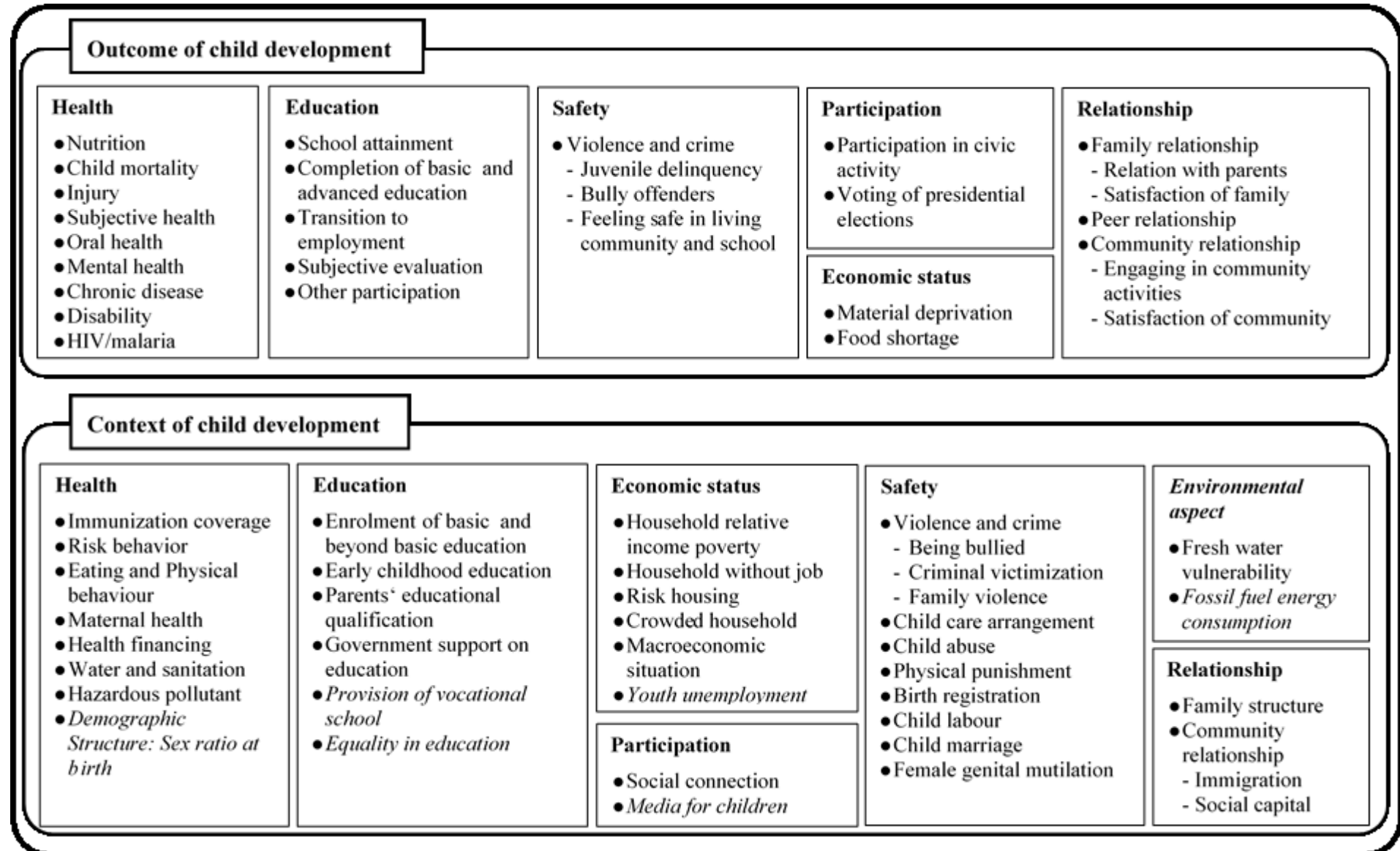


Figure 2. The structure of the Sustainable Child Development Index.

4. Conclusions and Discussion

The study provides a new approach by treating children as the critical stakeholder group for SD, since they represent the link between current and future generations. In a comprehensive literature review, six relevant themes were identified, which need to be considered for assessing SD of children: health, education, safety, economic status, relationships and participation. Several relevant subthemes were identified and clustered correspondingly. Nevertheless, there are still critical gaps in current studies on CD, such as the lacking environmental aspect, biased perspectives in identifying critical issues and the correlation between themes. Based on these findings, the two-level Sustainable Children Development Index (SCDI) framework is proposed to comprehensively consider relevant themes and subthemes of sustainable child development in an outcome and a context level, but beyond current practices by including additional aspects. By including environmental aspects and enabling the integration of additional aspects with regional relevance, the SCDI enables the evaluation of the potential towards SD at a country level. The SCDI can be applied to support decision making in policy and be used to support decision making in policy and societal development.

However, several shortcomings remain. The relevant themes, subthemes and criteria considered in this paper depend on the reviewed literature. Thus, the proposed scheme will have to be revised when additional literature and information with regard to CD become available. Furthermore, the interdependencies between the different subthemes and criteria need to be discussed in more detail in future studies, as these interdependencies could influence the categorization of the criteria. Since CD aspects are often multi-faceted with complex and indirect cause-and-effect relations, interpretation is not always straightforward. This will be addressed in more detail in the future, and the SCDI will be tested in exemplary case studies. This study adopts triple-bottom-line thinking to construct the framework of SCDI; however, the definitions of sustainability are diverse and can influence the understanding of the integrated SCDI framework. This needs to be considered for interpretation and further developments of the SCDI.

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Author Contributions

Ya-Ju Chang is the leading composer of the manuscript. The research, including literature analysis and new method development, was completed and proposed by Ya-Ju Chang. Laura Schneider and Matthias Finkbeiner both provided substantial contributions to the design of the study. All authors proofread and approved the final manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

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2.2. Screening indicators of the SCDI

This section provides the findings of Publication II [2] ‘Chang, Y.-J.; Lehmann, A.; Finkbeiner, M. Screening indicators for the Sustainable Child Development Index (SCDI). *Sustainability* **2017**, *9*, 518, doi:[10.3390/su9040518](https://doi.org/10.3390/su9040518).’, contributing to the research objective 2 ‘Selection of indicators for measuring the topics of the SCDI framework’.

In Publication II, 154 indicators were collected for the themes, subthemes and criteria of the SCDI framework. 66 of the 154 indicators which were classified to at least medium data availability level (i.e. the data for indicators are available more than 100 countries) were recommended for an initial indicator set for the SCDI.

Through the indicator collection and the analysis of data availability for the indicators, it was found that the share and the data availability of indicators differ among the themes. Most indicators are available for the themes health and education for the collected 154 indicators (57%) and initial indicator set (69%). Moreover, health and education are the themes that have most indicators with better data availability. On the other hand, data for most of the indicators for the themes relationship and participation can be found for less than 100 countries. The analysis also pointed out that 21 subthemes and 50 criteria were described by indicators with data available less than 100 countries. These subthemes and criteria were underlined to call on indicator and database development (e.g. data collection and methodological improvement for indicators) before being considered in the SCDI.

Article

Screening Indicators for the Sustainable Child Development Index (SCDI)

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Abstract: Since children are the key stakeholders supporting and being affected by sustainable development, the framework for the Sustainable Child Development Index (SCDI) was proposed. It addresses social, economic and environmental dimensions of sustainable development by considering seven relevant themes of child development, i.e., health, education, safety, economic status, relationship, environmental aspects and participation. However, an indicator set for initiating the SCDI is still missing. In this study, indicators for the themes, sub-themes and criteria of SCDI are identified from literature and then analyzed regarding data availability. Sixty-six indicators with statistical data covering at least 100 countries are selected as the indicator set for the SCDI. The results indicate that data availability is best for indicators describing the themes of health and education, and worst for indicators addressing the themes of relationship and participation. Furthermore, 21 subthemes and 50 criteria described by indicators with limited data availability are identified for future indicator and data development. By providing an initial indicator set and screening the indicators with regard to data availability, the practicality of the SCDI framework is expected. Furthermore, the indicator set can serve as a potential indicator pool for other child and sustainable development related studies.

Keywords: sustainable development; sustainability assessment; Sustainable Child Development Index (SCDI); child development; indicator set; Sustainable Development Goals (SDGs)

1. Introduction

Children are the stakeholders inheriting and shaping future society. The International Union for Conservation of Nature and Natural Resource [1] claimed that “we have not inherited the Earth from our parents, we have borrowed it from our children”. This claim emphasizes the important relationship between inter-generational equity, children and sustainable development (SD). Child development (CD) is affected by external circumstances, and children are more vulnerable to violence, diseases and environmental pollution than adults [2]. Furthermore, children’s basic rights such as to express their own opinions and to have access to education can be impeded by adults [2,3]. Disregarding and violating these basic rights can lead to irreversible and severe effects on CD and consequently on future society.

Many studies on CD are available and many schemes and indexes for assessing CD have been developed. The Handbook of Child Well-Being [4] indicates that the studies related to CD and well-being have undergone some relevant movements: multi-dimensional topics (for example, child rights) are increasingly addressed and new themes (for example, participation) are included. Accordingly, several indexes for CD were developed [5,6]. One famous example, the Child Development Index (CDI) [7,8], was proposed to evaluate countries’ performance on CD considering health, education and nutrition. It was designed to mirror the Human Develop-

ment Index (HDI) [9] with particular focus on children. Other government-supported institutions and NGOs proposed alternative indexes focusing more on well-being by considering additional topics, such as relationships with family, school and community, safety, or social engagement [10–14]. However, though these indexes are advanced compared to former ones focusing on single topics only, some limitations still remain. For instance, they do not address topics related to environmental aspects, such as water availability or resource consumption. Generally, a consistent classification of topics as well as a description of interdependencies between different topics is still a challenge.

1.1. The SCDI Framework and Potential Application

To address some of those gaps, for example, lack of considering environmental aspects, inconsistent classification scheme, and missing description of interdependencies between topics, Chang et al. [15] proposed the Sustainable Child Development Index (SCDI) framework in the context of SD. This index is designed to be an aggregated score that presents countries' performance with regard to SD by considering relevant topics and indicators addressing environmental, economic and social dimensions. The performance can be treated as the potential towards SD by emphasizing intergenerational equality and the completed picture of SD. In addition, the SCDI can compare the performance for countries on CD and monitor the trends on improvements and declines of the performance for countries as well as specific topics by continuously updating the indicators over a defined time frame (e.g., on a four-year basis, such as done for CDI [7,8]). Therefore, the SCDI can support decision makers to formulate or adjust strategies on child as well as sustainable development policies, and, similar to HDI, is a communication tool in order to inform the condition on CD to policy makers, communities, academics, public and private organizations. As all indexes, the SCDI aims at summarizing a large amount of information from the included indicators to a manageable, meaningful message [16,17].

The SCDI framework considers seven themes, which, based on a literature review, were identified as relevant for CD: health, education, safety, economic status, relationship, and participation plus environmental aspects. Each theme is specified by subthemes and criteria. Figure 1 displays the overall structure of the SCDI. For example, the theme health includes 17 subthemes like child mortality, nutrition and risk behavior. Subthemes are further described by criteria, which are measured by indicators. The subtheme child mortality contains three criteria, such as neonatal-, infant-, and under-five mortality. The criterion under-five mortality is assessed by the indicator under-five mortality rate. As an index for SD, the SCDI also reflects the Sustainable Development Goals (SDGs). SDGs were adopted in 2015 by 193 countries and target at holistically tackling development needs, eradicating poverty in all its forms, improving human rights and gender equality, and considering SD in environmental, social and economic dimensions [18,19]. There are some links between SDGs and the identified relevant topics in the SCDI framework [15,18]. For example, the goal "ensure healthy lives and promote well-being for all" is associated with the subthemes child mortality, mental health, maternal mortality, immunization, etc.; the goal "ensure access to affordable, reliable, sustainable and modern energy for all" links to the subtheme renewable energy consumption; and the goal "ensure inclusive and quality education for all and promote lifelong learning" relates to the subthemes gender equality, access to all levels of education, and provision for vocational training.

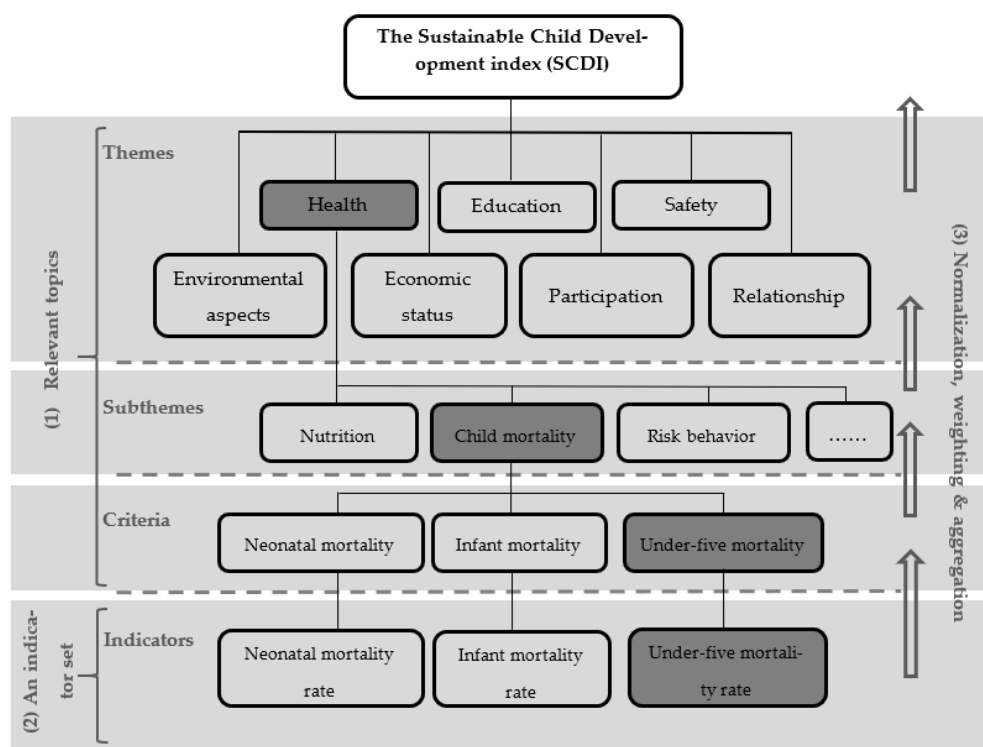


Figure 1. The structure of the SCDI (exemplary criteria and indicator are presented for the subtheme child mortality, adapted from Chang et al. [15]).

The SCDI framework provides a consistent classification scheme for topics relevant for CD and includes environmental aspects, which was not yet considered in previous studies on CD but relevant in SDGs. Furthermore, the subthemes and criteria are allocated to the outcome and the contextual level. The outcome level considers topics reflecting the status of CD, such as the subtheme school attainment. The contextual level considers topics, such as the subtheme parents' educational qualification, which can potentially affect the outcomes. For instance, growing up in a relatively low parents' educational qualification family may, but does not inevitably, lead to negative effects on children's school attainment. This indicates the topics on contextual level are connected with the topics on outcome level, but should not be considered as direct measures of the outcome. Thus, this two-level differentiation reveals the interdependency between subthemes and criteria. This is crucial to avoid overstressing or neglecting the outcomes and the influences of contexts on CD [15].

This SCDI framework was the first step for developing a SCDI (illustrated in the first three blocks in Figure 1) and was discussed in detail in Chang et al. [15]. The second step—the main task of this paper—is to provide an indicator set for constructing the SCDI to measure CD on country level and to screen the data availability for indicators for the identified topics. It is illustrated in the fourth block in Figure 1 and further explained in Section 1.2. The development of normalization and aggregation approaches needed for determining the SCDI is a topic for the future research (see also discussion). The SCDI is planned to be designed as the arithmetic average of normalized indicators for each of the relevant themes. By normalization, indicator scores measured on different scales are adjusted to a common scale, i.e., the units of indicators are removed. Therefore, an aggregation of different indicators to their corresponding subthemes and thus themes is possible. Finally, arithmetic average scores of the themes are calculated for summarizing the relative CD performance of countries.

1.2. Research Objective

Currently, many indicators related to CD are available in the literature and considered in existing indexes. However, according to Fernandes et al. [20], who reviewed the leading research on the measurement of CD and well-being through indexes, common classification of indicators used in the indexes is lacking. One indicator can be classified into different topics. For instance, the school enrolment indicators were assigned to address education in many indexes [13,14,21], but were allocated to participation in some other indexes [22,23]. Consequently, allocating an indicator to a specific topic is not always straightforward. That indicates a robust classification system needs to be developed. Moreover, some studies did not clarify the data availability of indicators, or did not specify the indicators needed for measuring the topics [10,24–28]. Consequently, such indexes may not be applied in practice, as data for one or more indicators are simply not available on country level. To foster the implementation of the SCDI, developing an indicator set based on sufficiently available data is necessary.

Hence, the objective of this study is to transparently provide an initial indicator set for developing the SCDI and to screen the indicators for the identified topics of the SCDI framework with regard to data availability. Such an analysis of the indicators is needed because the SCDI is designed to assess countries' performance on CD in the context of SD and the assessment can be only implemented if data are available. Indicators that already have available data are proposed as an initial indicator set to put the SCDI in practice. The indicator set is the basis for further development of the SCDI, facilitating a quantitative assessment of the relevant topics of sustainable child development and thus the implementation of the SCDI. In addition, according to the analysis of the indicators, the topics described by indicators with limited data are underlined for future indicator and data development. Moreover, the indicator set can serve as a basic indicator pool to support decision makers and researchers for formulating or adjusting development indexes related to child as well as sustainable development policies and studies.

The succeeding sections present the research materials and methods (Section 2), results, including the provision of the indicator set and the analysis of the indicators for the topics with regard to data availability (Section 3), followed by research discussion (Section 4) and conclusion (Section 5).

2. Materials and Methods

For identifying an initial indicator set for the SCDI framework, a review and analysis of indicators were conducted. The approach started with collecting indicators that reflected the identified subthemes and criteria of the SCDI framework. It was checked if statistical data were available on country level. Then, the data availability for the indicator was classified in different data availability levels—depending on the number of countries for which data were provided. Through this indicator analysis, indicators with sufficient data availability (at least medium data availability, further explained in the following paragraphs) were selected as an initial indicator set. The subthemes and criteria described by indicators with limited data availability on country level are identified. The result was an initial indicator set, which now allows assessing CD in the context of SD on country level. An overview of the research approach is shown in Figure 2. A detailed description is provided in the following.

Indicators for the defined subthemes and criteria of the SCDI framework were collected from seven peer-reviewed publications [13,28–33], three book sections [22–24], five studies from Non-Governmental Organizations (NGOs) specialized in CD research [8,10,14,27,34], as well as 14 reports from government-supported institutes [11,12,21,26,35–44] and 11 international databases established by government-supported institutions [45–55]. For example, the reports and database of United Nations Office on Drugs and Crime (UNODC) [50] and the United Nations Children's Fund (UNICEF) [45] were used as the key references of the theme safety. By considering studies and databases from an academic, organizational and governmental background, a comprehensive set of indicators can be provided.

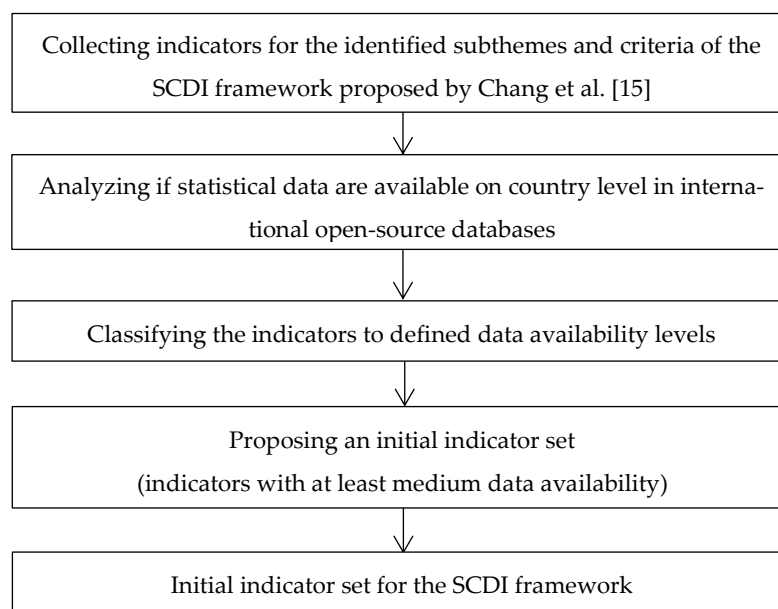


Figure 2. Research approach of the study.

After completing the indicator collection, it was checked if statistical data were available for the indicators on country level in the international, accessible databases or studies that are highly involved in development research, such as United Nations Children’s Fund (UNICEF), World Health Organization (WHO) and World Bank. In this study, these international databases and reports are considered as the fundamental data sources because they frequently update statistics and clearly provide the data sources and calculation methods. As the statistical data were taken from these renowned references, a high data quality is assumed and thus the data are suitable for investigating data availability further. We established a scheme to describe different data availability levels and to define a level considered as sufficient for initiating the SCDI. For the scheme, the number of countries considered in the UNICEF database (195) was taken as a reference: if one indicator had statistical data for all 195 countries, the indicator was classified into the top data availability level. In total, seven data availability levels were defined: top, very high, high, medium, low, very low and no available statistical data (on country level). The defined data availability levels are listed in Table 1. For example, an indicator with statistical data covering 160 countries was not classified to the top and very high data availability level, but included in the high data availability level. If an indicator has no available statistical data at country level (e.g., on regional level) from international databases, then the indicator is assigned to the no available statistical data level.

Table 1. Scheme of data availability levels of indicators.

	Data Availability Level						No Available Statistical Data
	Top	Very High	High	Medium	Low	Very Low	
Numbers of covered country	195	$195 > N \geq 175$	$175 > N \geq 150$	$150 > N \geq 100$	$100 > N \geq 50$	$50 > N \geq 1$	0

The data availability level scheme provided an overview on the data availability of the indicators identified for the subthemes and criteria of the SCDI framework, and indicated which subthemes and criteria could currently be assessed in all countries or in just a few. These results were used for proposing an initial indicator set for the SCDI framework. In concrete terms, we proposed to consider those indicators, which were allocated to at least the medium data availability level (from top to medium data availability levels). It implied that data for the indicators are available at least in 100 countries, representing more than 50% of the countries listed in the

UNICEF database. The subthemes and criteria described by indicators with low and very low data availability, and no available statistical data (hereafter defined as limited data availability) are concerned as the topics that need more development of indicator and data (e.g., data collection and methodological improvement for indicators) before being considered in the SCDI.

3. Results

In total, 154 indicators were collected for the subthemes and criteria of the SCDI. For 139 indicators, statistical data were found on country level in international open-source databases. For the other 15 indicators, statistical data were not found on country level (e.g., regional level) or were not accessible in international open-source databases. A detailed list of all the 139 indicators identified for the topics as well as all the corresponding data coverage (and data sources) are provided in the Supplementary Materials, Table S1. The following sections provide the results of the analysis of the data availability of these 154 indicators. Based on the results, an initial indicator set for the SCDI and the topics concerned with limited data availability are stated. An initial indicator set is proposed (in Section 3.1). A detailed description of the findings of the data availability analysis is given in Section 3.2.

3.1. Selection of the Initial Indicator Set

According to the results of the indicator collection, Table 2 summarizes the accumulative numbers of indicators, criteria, subthemes, and themes structured in different data availability levels. The accumulative numbers of indicators and topics for a specific data availability level cover the indicators and topics considered in the better data availability level(s). For example, the at least high data availability level includes the indicators from top, very high, to high data availability level. Table 2 shows that only a few (seven) indicators have top data availability; that is, the data are available for 195 countries. It also shows that only a few topics are covered by these seven indicators with top data availability. A trade-off between the data availability for the indicators for the SCDI framework and its comprehensiveness (regarding the considered topics) is revealed in Table 2. If all themes and subthemes identified in the SCDI framework should be considered in developing a future SCDI, the data availability would be low, meaning that data of many indicators measured in a SCDI would only be available for few countries. On the other hand, if good data availability would be a criterion for selecting indicators considered in the SCDI, only few indicators would be used and thus only few subthemes and themes would be addressed. For example, if the criterion for including an indicator in a SCDI is, that data should be available in all countries (the top data availability level), the SCDI would only consider two themes (health and safety), three subthemes, child mortality, immunization coverage, and violence and crime, and the respective seven criteria (neonatal mortality, infant mortality, under-five mortality, Measles containing vaccine (MCV) immunization, Diphtheria tetanus toxoid and pertussis (DTP3) immunization, Polio (Pol3) immunization, and criminal victimization).

To develop an initial indicator set for the SCDI framework, a compromise between data availability and coverage of topics is needed. It is proposed to consider indicators with at least medium data availability for the proposed indicator set; that is, data cover at least 100 countries. In addition, it means that more than 50% of all subthemes and criteria identified in the SCDI framework are included. For example, 29 out of 50 subthemes, and 59 out of 109 criteria are taken into account. Furthermore, all seven themes are considered. As a result, 66 indicators are proposed for the initial indicator set of SCDI. This indicator set is presented in Table 3.

Moreover, the identified relevant topics in the SCDI are associated with some SDGs. The corresponding SDGs and SDG targets for the initial SCDI indicator set are listed in the Supplementary Materials, Table S2. Moreover, the overlap between the initial SCDI indicator set and the SDG indicator set is checked and presented in Table S2 as well. The results show that 39 out of the 66 SCDI indicators (59%) are also considered as SDG indicators. That indicates the SCDI indicator set has compatibility with the SDG indicator set. Nonetheless, the results do not imply

that the indicators of the initial SCDI indicator set which are not suggested as SDG indicators have low relevance of SD. These SCDI indicators respond to SDGs and SDG targets. Besides, the SDG indicators are classified into three tiers with regard to data availability and the level of methodological development [56]. This classification can also serve as a reference to support the data availability we analyzed for the initial SCDI indicator set. In the SDG framework, Tier I considers the indicators that have clear established methodologies, and data regularly produced by countries. Tier II includes the indicators that have clear established methodologies, but data are not regularly produced by countries. Tier III addresses the indicators that have no firmly established methodologies. Among the 39 indicators (both considered in the initial SCDI indicator set and the SDG indicator set), 30 (77%) are assigned to Tier I, and the other nine are categorized to Tier II. None of the indicators of the initial indicator set are classified as Tier III indicators. That shows the indicator set provides indicators that have both good data availability and sound methodological development. As revealed in the SDG indicator classification, further research for indicator and data improvement is needed for those indicators without regularly updated data at country level and firmly established methodologies. Few collected SCDI indicators (e.g., Number of people covered by health insurance or a public health system per 1,000 population) were found as Tier III indicators due to the lack of statistical data at country level. This outcome points out that the ongoing SDG indicator development with regard to Tier III indicators could also be beneficial for the future SCDI indicator development.

Table 2. Accumulative numbers of covered indicators and topics in different data availability levels.

Data Availability Level	Covered Indicators	Covered Topics
Top data availability	7	2 themes, 3 subthemes, 7 criteria
At least very high data availability	34	5 themes, 19 subthemes, 29 criteria
At least high data availability	44	5 themes, 22 subthemes, 41 criteria
At least medium data availability	66	7 themes, 29 subthemes, 59 criteria
At least low data availability	84	7 themes, 33 subthemes, 70 criteria
At least very low data availability	139	7 themes, 46 subthemes, 98 criteria
No statistical data at country level	154	7 themes, 50 subthemes, 109 criteria

Table 3. Initial indicator set based on at least medium data availability.

Theme	Subtheme	Criteria	Indicator	Data Availability		Source
				Covered Countries	Level	
Health	Nutrition	Low birth weight	Percentage of infants born with low birth weight (<2,500 g)	187	Very high	UNICEF Childinfo [45]
		Overweight and obesity	Overweight (including obesity, %)	146	Medium	
		Breast feeding	Exclusive breastfeeding < six months (%)	167	High	
		Underweight	Underweight (moderate and severe, %)	148	Medium	
		Wasting	Children under five below minus two standard deviations from median weight-for-height (%)	147	Medium	
		Stunting	Children under five below minus two standard deviations from median height-for-age (%)	147	Medium	
	Child mortality	Infant mortality	Infant mortality rate (probability of dying between birth and age one per 1000 live births)	195	Top	
		Under-five mortality	Under-five mortality rate (probability of dying by age five per 1,000 live births)	195	Top	
		Neonatal mortality	Neonatal mortality rate (during the first 28 completed days, per 1,000 live births)	195	Top	
	Oral health	Dental treatments	DMFT (decayed, missing or filled teeth) among 12-year-olds	180	Very high	Malmö University Oral Health Database [46]
	Mental health	Suicide	Suicide rate, 15–29 year-olds, per 100,000	171	Very high	WHO [40]
	Hazardous pollutant	Household and ambient air pollution	Mortality rate attributed to household and ambient air pollution (per 100,000 population)	172	High	WHO [47]
		PM _{2.5} air pollution	PM _{2.5} air pollution, population exposed to levels exceeding WHO guideline value (% of total)	187	Very high	
	Immunization coverage	Measles containing vaccine (MCV) immunization	Measles (MCV) immunization coverage among one-year-olds (%)	195	Top	UNICEF [45]
		Diphtheria tetanus toxoid and pertussis (DTP3) immunization	Diphtheria tetanus toxoid and pertussis (DTP3) immunization coverage among one-year-olds (%)	195	Top	
		Polio (Pol3) immunization	Polio (Pol3) immunization coverage among one-year-olds (%)	195	Top	
		Hepatitis B (HepB3) immunization	Hepatitis B (HepB3) immunization coverage among one-year-olds (%)	185	Very high	
		Bacillus Calmette-Guérin (BCG) immunization	BacilleCalmette-Guérin (vaccine against tuberculosis) immunization coverage among one-year-olds (%)	164	High	

Table 3. Cont.

Theme	Subtheme	Criteria	Indicator	Data Availability		Source
				Covered Countries	Level	
Health	Risk behavior	Alcohol use	Percentage of 15–19 years old heavy episodic drinkers	189	Very high	WHO; World Bank [47,52]
		Adolescent fertility	Adolescent fertility rate (per 1,000 girls aged 15–19 years)	184	Very high	
	Physical behavior	Physical activity	Comparable estimates of prevalence of insufficient physical activity (adolescents 11–17 years)	120	Medium	WHO [42]
	Maternal health	Antenatal care	Percentage of women aged 15–49 years attended at least once during pregnancy by skilled health personnel (doctor, nurse or midwife)	149	Medium	UNICEF Childinfo [45]
		Maternal mortality	Maternal mortality ratio (MMR, maternal deaths per 100,000 live births)	183	Very high	
		Skilled attendant at birth	Percentage of births attended by skilled health personnel (doctor, nurse or midwife)	168	High	
	Health expenditure	Public health expenditure	Public health expenditure as % of total health expenditure	190	Very high	WHO; World Bank [47,52]
	Water and sanitation	Access to improved sanitation facilities	Improved sanitation facilities (% of population with access)	191	Very high	UNICEF; WHO; World Bank [45,47,52]
		Access to improved drinking-water sources	Population using improved drinking-water sources (%)	193	Very high	
	HIV	HIV prevalence among youth	Estimated percentage of young men and women (aged 15–24) living with HIV	128	Medium	UNICEF [57,58]
Education	School attainment	Overall literacy	Youth literacy rate, population 1–24 years, both sexes (%)	151	High	UNESCO [48]
		Repetition	Repetition rate in primary education (all grades), both sexes (%)	165	High	
	Completion of education	Primary school completion	Gross graduation ratio from primary education, both sexes	107	Medium	
		Secondary school completion	Gross graduation ratio from lower secondary education, both sexes (%)	114	Medium	
		Tertiary school completion	Gross graduation ratio from first degree programmes (ISCED 6 and 7) in tertiary education, both sexes (%)	120	Medium	
	Attendance of education	Enrolment in primary school	Gross enrolment ratio, primary, both sexes (%)	191	Very high	
		Enrolment in secondary school	Gross enrolment ratio, secondary, both sexes (%)	188	Very high	
		Enrolment in tertiary school	Gross enrolment ratio, tertiary, both sexes (%)	175	Very high	
	Early childhood education	Enrolment of kindergarten	Gross enrolment ratio, pre-primary, both sexes (%)	187	Very high	

Table 3. Cont.

Theme	Subtheme	Criteria	Indicator	Data Availability		Source
				Covered Countries	Level	
Education	Government support on education	Public expenditure on education	Government expenditure on education as % of GDP	179	Very high	UNESCO [48]
	Gender equality	Gender equality in enrolment	Gross enrolment ratio, pre-primary, gender parity index (GPI)	176	Very high	
			Gross enrolment ratio, primary, gender parity index (GPI)	190	Very high	
			Gross enrolment ratio, secondary, gender parity index (GPI)	187	Very high	
			Gross enrolment ratio, tertiary, gender parity index (GPI)	177	Very high	
		Gender equality in graduation	Gross graduation ratio from primary education, gender parity index (GPI)	134	Medium	
			Gross graduation ratio from lower secondary education, gender parity index (GPI)	134	Medium	
			Gross graduation ratio from first degree programmes (ISCED 6 and 7) in tertiary education, gender parity index (GPI)	137	Medium	
		Gender equality in youth literacy	Youth literacy rate, population 1–24 years, gender parity index (GPI)	152	High	
Safety	Violence and crime	Juvenile delinquency	Juveniles held in prisons, penal institutions or correctional institutions	108	Medium	UNODC [50]
			Juveniles brought into formal contact with the police and/or criminal justice system, all crimes	108	Medium	
		Criminal victimization	Intentional homicide count and rate per 100,000 population	195	Top	
			Assault and major assault rates in different countries (police recorded assaults/100,000 population)	128	Medium	
			Total sexual offences against children at the national level, police-recorded offences, rate per 100,000 children aged 17 or under	102	Medium	
	Birth registration	Registration of new-borns	Birth registration rate	166	High	UNICEF [45]
	Child labor	Children involved in child labor	Percentage of children five-14 years old involved in child labor	112	Medium	
	Child marriage	Children married or in union	Percentage of women aged 20 to 24 years who were first married or in union before ages 18	123	Medium	
	Demographic structure	Sex ratio	Sex ratio at birth	191	Very high	CIA [53]

Table 3. Cont.

Theme	Subtheme	Criteria	Indicator	Data Availability		Source
				Covered Countries	Level	
Economic status	Housing quality	Electricity coverage	Access to electricity (% of population)	191	Very high	World Bank [52]
	Macroeco-nomic situa-tion	Overall unemployment	Unemployment, total (% of total labor force) (modeled ILO estimate)	170	High	
		Youth unemployment	Youth unemployment rate (% of total labor force ages 15–24)	170	High	
	Macroeco-nomic situa-tion	Income equality at societal level	Income Gini coefficient	156	High	UNDP [55]
		National income	GNI per capita, Purchasing power parity (current international \$)	183	Very high	World Bank [52]
		National debts	Public debt as percentage of GDP	179	Very high	CIA [53]
Relationship	Community relationship	Social capital	Social Capital Ranking	140	Medium	Legatum Institute [44]
Participation	Social media connection	Internet access in home	Proportion of households with internet access at home	138	Medium	ITU [54]
		Access to public media	Proportion of households with computer	126	Medium	
Environmental aspects	Freshwater vulnerability	Risk of depleting fresh-water resources	Water depletion index (WDI)	192	Very high	Berger et al. [33]
	Renewable energy consumption	Consumption of renewable energy	Renewable energy consumption (% of total final energy consumption)	180	Very high	World Bank [52]

3.2. Analysis of Indicators for the SCDI

The key messages gained from the analysis of indicators for the SCDI are summarized in the following bullet points, and are then explained in detail.

- The data availability of indicators differs among the different topics, for example data availability for the theme health is high, but for the theme relationship is low.
- The share of indicators differs for the different topics of the SCDI framework, for instance most indicators are available for the theme health.

It is shown that data availability varies significantly for the topics of the SCDI framework. Figure 3 shows the results of the analysis of data availability for the 154 indicators collected for the seven themes of the SCDI framework, such as health, safety, relationship. It is displayed that only for six indicators in the theme health and one indicator in the theme safety, data are available for all countries, that is, on top data availability level. In general, health and education are the themes that have most indicators with better data availability. For example, Figure 3 displays that for the themes health and education, there are large shares of the indicators from top to medium data availability levels. On the other hand, the indicators for the themes relationship and participation are mainly considered in the medium, low, very low data availability levels. This finding indicates that the indicators of the themes relationship and participation have a worse data availability to evaluate CD. Thus, the development of data collection of theme relationship and participation shall be noticed and further improved. Besides, some indicators of the theme health, economic status and relationship show worse data availability because their associated data source are especially limited to certain countries, for example Organization for Economic Co-operation and Development (OCED) and European countries [12,38,41,49,51]. The themes health, education, relationship include many indicators that have no statistical data at country level. For example, the indicators that assess chronic diseases, disability and illicit drug use have statistical data only on regional level from international databases. In addition, some indicators were conceptually proposed for the SCDI framework for addressing subjective-evaluated topics, e.g., reading pleasure and satisfaction to family, without collecting data in practice. A detailed list of numbers of indicators for different themes in different data availability levels is shown in the Supplementary Materials, Table S3.

It is also shown that most indicators are available for the theme health. The theme health covers over one third of the collected indicators (37%). The key reason may be that health was the main theme in early CD related studies, having more indicators developed than other themes. That indicates the indicators are concentrated on the theme health. While measuring CD, it shall be noticed not to overuse the indicators of the theme health. Education is another theme of large share of the indicators (20%). The themes economic status (12%), relationship (11%) and participation (5%) obtain minor share of indicators. This reveals a need for further indicator development of the three themes. Besides, currently, only two indicators are selected for the theme environment aspects. As the theme was newly proposed in Chang et al. [15] for assessing CD in the context of SD, more indicators associated to resource accessibility are needed for a more comprehensive coverage of environmental aspects in the SCDI framework.

Besides, the theme health holds the largest share of the initial indicator set (43%) followed by the theme education (26%). Other themes, for example relationship, participation, and environmental aspects, individually represent 1–3% of the indicator set. It indicates that though the identified seven themes are covered in an initial indicator set, the portion of themes relationship, participation, and environmental aspects is relatively small. The minor share of these themes shall be considered when implementing and interpreting the SCDI. Besides, the result also responds to the fact that health and education are the themes that have the most indicators with sufficient data availability; that is, at least medium data availability (also shown in Figure 3).

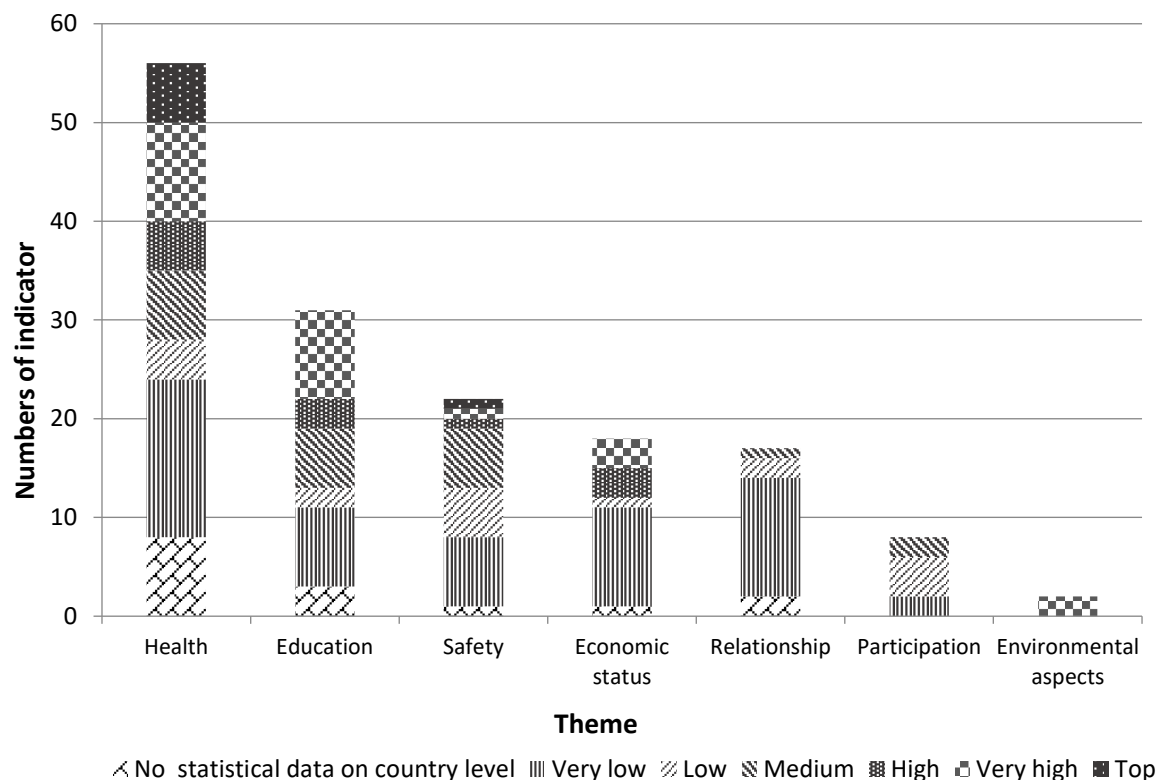


Figure 3. Numbers of the indicators in different data availability levels, by themes of the SCDI framework

As described in Section 2, the indicators for the SCDI topics were screened with regard to data availability. An overview of the themes and subthemes of the SCDI framework including their data availability is provided in Figure 4. In Figure 4, bold wording and bullet correspondingly indicate the themes and subthemes. Superscripts note the highest data availability level that indicators have in each subtheme. T, VH, H, M, L, VL, and N corresponding to top, very high, high, medium, low, very low data availability level, and no statistical data on country level, respectively. The detailed lists of corresponding criteria of the subthemes are provided in the Supplementary Materials, Table S4. The subthemes and criteria which are described by indicators with limited data availability are identified and recommended to conduct further indicator and data development, e.g., data collection and methodological improvement of indicators. Four subthemes and 11 criteria were recognized as the topics described by indicators lacking statistical data available on country level from international databases. The four subthemes are chronic diseases, disability, other participation in education, as well as debt and financial difficulty. The 11 criteria are depression, emotional and behavior difficulty, maternal smoking, health insurance coverage, family smoking, illicit drug use, parents reading to children, reading pleasure, extracurricular subjects, satisfaction of family, and satisfaction of community. Additionally, 17 subthemes and 39 criteria only have indicators assigned to low and very low data availability levels. These subthemes and criteria are also provided in Table S1. In total, 21 subthemes (marked with superscripts L, VL, and N in Figure 4) and 50 criteria described by indicators with limited data availability are considered in the SCDI framework, but for now are not included in the initial indicator set in order to facilitate implementation of the SCDI. The challenge of data availability shall be noticed and addressed by indicator and data development measures, such as methodology development and data collection.

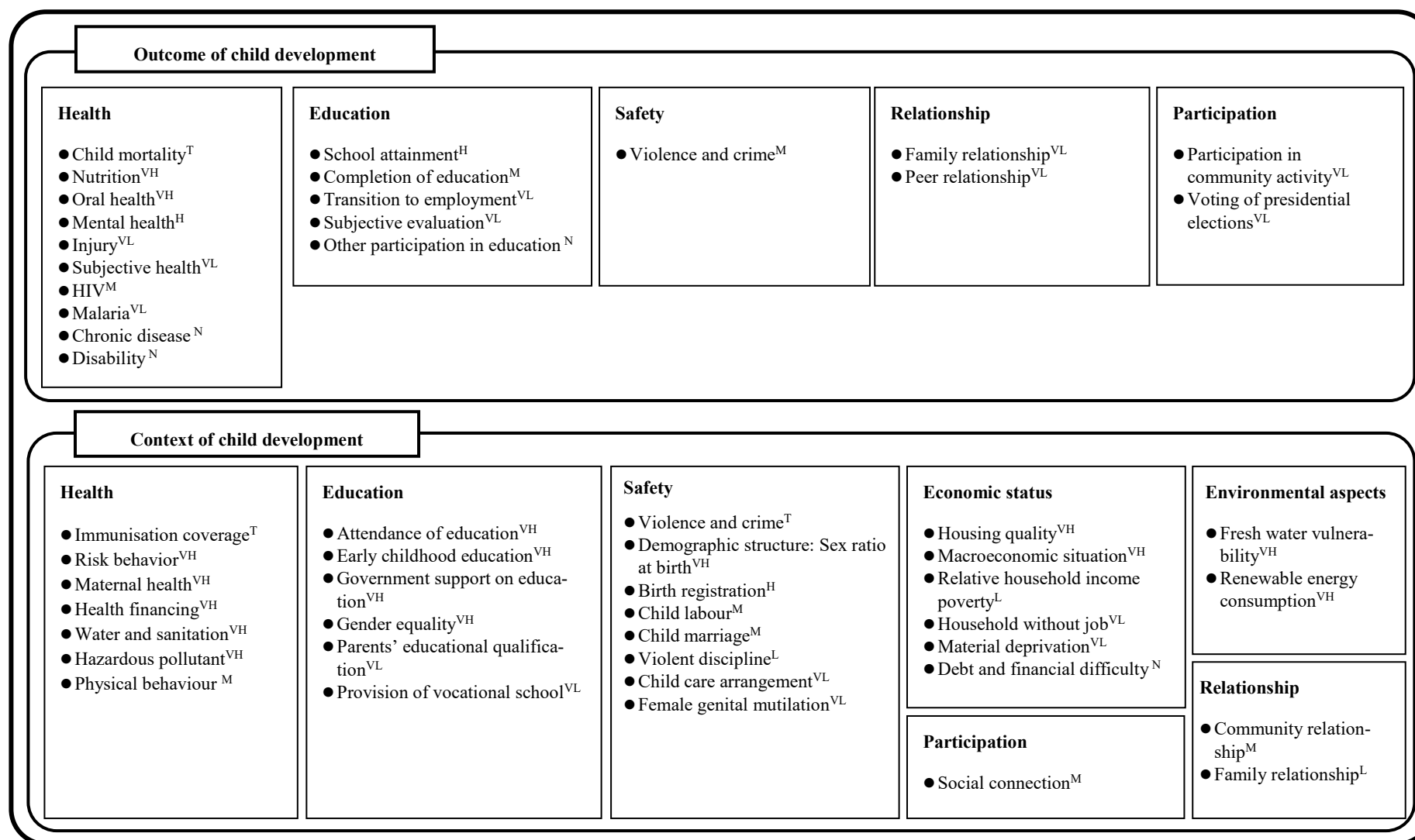


Figure 4. The overall framework of Sustainable Child Development Index (adapted from Chang et al. [15]).

To be noticed, addressing economic status as a purely contextual theme is a modification of the SCDI framework proposed by Chang et al. [15]. The indicators for the theme economic status refer to the background of economy in which children grow up and live with. For instance, housing quality, macroeconomic situation, and household income poverty are the factors to influence development of children, but not the direct performance acted by children. Thus, the theme economic status shall be allocated only on contextual level. The subthemes and criteria of the theme economic status separated on the two levels in the original SCDI framework are put together on contextual level. To sum up, the SCDI framework contains seven themes, 50 subthemes, and 109 criteria. It includes five themes (health, educational, safety, relationship, and participation) addressing the outcome level and seven themes (the previous five themes, economic status, and environment aspects) addressing the contextual level (see Figure 4).

4. Discussion

This study provides an initial indicator set for the SCDI and identifies the SCDI topics described by indicators with limited data availability. This contribution can serve as the basis for further developing the SCDI in the context of SD to allow a comparison of countries in terms of their relative performance, and for fostering indicator and data development for the topics with limited data availability.

Nevertheless, some research challenges remain, such as the limited consideration of indicators in specific themes, such as environmental aspects and participation, and inconsistent reference years of statistical data for the indicators. For instance, among all 154 identified indicators, there are only eight for the theme participation, and two for the theme environmental aspects. The limited inclusion of indicators may lead to insufficient and biased evaluation of sustainable child development. Since participation is a relatively new topic in evaluation of sustainable child development, existing indicators with available data are few. The theme environment aspects was newly proposed in Chang et al. [15] for assessing CD in the context of SD. Freshwater vulnerability and renewable energy consumption were selected as the two relevant subthemes for the theme environmental aspects in the SCDI framework; nevertheless, other potential topics (such as soil quality and erosion) that are specifically related to resource accessibility and intergenerational equality usually have limited statistical data on country level. The databases need to be developed and more indicators addressing resource accessibility need to be considered in the SCDI framework for a more comprehensive coverage in order to emphasize intergenerational equality.

Besides, reference years of statistical data for the indicators are not identical. Statistical data of indicators for most of the subthemes (e.g., child mortality and attendance of education) are updated annually. On the other hand, indicators for few subthemes (e.g., renewable energy consumption and mental health) are updated on a four-year basis. Considering the indicators with lower update frequency, the SCDI is thus suggested being updated on a four-year basis (i.e., over a longer period than one year). This suggested updating period is also in line with the CDI. As the SCDI is designed for assessing and monitoring the improvements or declines of CD for countries, this arrangement for updating frequency could be also reasonable as longer time frames may be needed to make the trend of the country's performance regarding sustainable child development visible.

Currently, there are no commonly used or widely suggested methods to normalize and aggregate multi-dimensional indicators for computing one index. In order to construct a SCDI, defining proper normalization and aggregation methods as well as weighting choices is the next step for this research (also see Figure 1). Sensitivity analysis will also be conducted to test the robustness of a SCDI.

Moreover, the indicators were collected based on the identified relevant subthemes and criteria summarized in Chang et al. [15]. Thus, the SCDI framework and indicators will have to be continuously revised and updated when additional literature and statistical data with regard to sustainable child development become available. In accordance with the indicator analysis

considering data availability, the subthemes (e.g., family relationship and parents' educational qualification) that have indicators only with limited data availability (see Figure 4) have priority in indicator and data development. The ongoing SDG indicator development is also beneficial and can be taken as reference for supporting SCDI indicator development.

In addition, the SCDI and the proposed initial indicator set will be tested in exemplary case studies to investigate the validity and potential to be integrated into existing sustainability assessment approaches. Since the indicator set is proposed considering good data availability and reliable data, it can serve as a supplementary indicator pool to support researchers for developing or adjusting development indicators and indexes related to child as well as sustainable development policies and studies (e.g., the HDI families and CDI).

5. Conclusions

In total, 154 indicators are identified for the topics of the Sustainable Child Development Index (SCDI) framework with statistical data on country level and then analyzed regarding data availability. Among the collected indicators, 66 indicators with statistical data covering at least 100 countries are proposed as an initial indicator set. The indicator analysis also shows that the theme health has the largest share of collected indicators and obtains many indicators with good data availability. On the other hand, most of the indicators of the themes relationship and participation have limited data availability. Moreover, 21 subthemes and 50 criteria described by indicators with limited data availability at this point of time are underlined to call on indicator and data development.

The contribution of this paper is the provision of an indicator set for initiating the SCDI that can clearly measure the relevant topics of sustainable child development and has available statistical data to support a quantitative assessment. Therefore, the practicality of the SCDI framework is expected. Such a detailed analysis is required to transparently describe the development of the SCDI. In addition, the individual indicators of the set can also serve as a basic indicator pool for being applied and adapted in other CD and SD related studies. It is expected to support decision makers to draw up strategies on child as well as sustainable development policies, and serve as a communication tool to stakeholders. The next steps will focus on the development of calculation methods such as normalization and aggregation for the SCDI.

Supplementary Materials: The following are available online at www.mdpi.com/2071-1050/9/4/518/s1, Table S1: 139 indicators collected for Sustainability Child Development Index, Table S2: The relation of the initial indicator set of the SCDI to the SDG indicator development, Table S3: Numbers of indicators of the themes in different data availability levels, Table S4: Subthemes and criteria of the SCDI framework.

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2.3. Establishment of the SCDI and evaluation of country performance

This section presents the findings of Publication III [3] ‘Chang, Y.-J.; Lehmann, A.; Winter, L.; Finkbeiner, M. The Sustainable Child Development Index (SCDI) for countries. *Sustainability* **2018**, *10*, 1563, doi:[10.3390/su10051563](https://doi.org/10.3390/su10051563).’. The findings address the research objectives 2 ‘Selection of indicators for measuring the topics of the SCDI framework’ and 3 ‘Provision of calculation methods for establishing and determining the SCDI for countries’.

Publication III finetuned the indicator set, established the SCDI, determined the SCDI for countries and demonstrated the ability of the SCDI to complement the HDI and the CDI. 50 representative indicators were chosen from the initially considered 66 indicators based on the results of correlation analysis. Complying with the three principles (see section 1.4 and Publication III) to balance the number of topics, the number of countries for which data for the indicators, and child population addressed in the SCDI, the number of the representative indicators was further reduced from 50 to 25. 138 countries (accounting for 86% of child population) are mutually covered with this final indicator set for the SCDI, and five themes (health, education, safety, economic status and environmental aspects), 19 subthemes, and 22 criteria are addressed. The final indicator set of 25 indicators was combined to an index and the SCDI scores were calculated for 138 countries.

138 countries were then ranked and classified into four sustainable child development levels based on their SCDI scores. The country classification points out a significant regional inequality on the status of sustainable child development. European countries generally have better status in sustainable child development. 90% of African and 76% of Asian countries were assigned to medium and low sustainable child development levels. The results highlighted the urgent need for improving the living conditions related to sustainable child development topics for most of African and Asian countries.

Moreover, a correlation analysis showed a moderate association between the country ranking assessed by the SCDI and the HDI, and the SCDI and the CDI. The outcome supported that the SCDI evaluates the status of SD for countries beyond the scope of the HDI and the CDI as a complementary assessment, by treating children as key stakeholder and by addressing children related topics in the context of SD (e.g. envi-

ronmental aspects and safety). In addition, a significant difference between the trends of the country ranking assessed by the SCDI and the HDI from 2006 to 2015 was found in the selected six OECD countries. The different trends of the SCDI and HDI showed that the countries can have improving progress on SD with regard to whole-population but deteriorating performance on SD with a focus on children. The results further supported that the SCDI can be applied as a complementary assessment of existing development indices.

Article

The Sustainable Child Development Index (SCDI) for Countries

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Abstract: Despite the relevance of children in inheriting and shaping society, an index assessing sustainable development with a focus on children is missing. To tackle this gap, this study established the Sustainable Child Development Index (SCDI) by considering child development topics in the context of inter-generational equity and applying indicators with available statistical data on country level. The SCDI at present addresses health, education, safety, economic status and environmental aspects described by 25 indicators. By taking reference points derived from the targets of the Sustainable Development Goals (SDGs), the SCDI scores for the year 2015 were calculated for 138 countries and then classified into four sustainable child development levels (very high, high, medium and low). The results showed great regional inequality on the status of sustainable child development. European countries generally have better status of sustainable child development. By contrast, 90% of African and 76% of Asian countries were classified as countries with medium and low levels. Moreover, the comparison of the SCDI, the Human Development Index (HDI) and the Child Development Index (CDI) based on correlation analysis and 10-year (2006–2015) country rankings demonstrated that the SCDI can complement existing development indices to provide a more comprehensive evaluation of sustainable development.

Keywords: Sustainable Child Development Index (SCDI); child development; inter-generational equity; sustainability assessment; sustainable development; Sustainable Development Goals (SDGs)

1. Introduction

Children (here defined as aged under 18 [1]) are an important stakeholder group for Sustainable Development (SD) as they connect current and future generations. The Brundtland Commission defined SD as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” [2]. The definition underlines the important relationship between children, inter-generational equity and SD.

As the needs of children and their susceptibility to external factors are different from those of adults, indices that evaluate SD by treating children as a key stakeholder group are needed for complementing whole-population-oriented assessments, such as the Human Development Index (HDI). The HDI was introduced by the United Nations Development Programme (UNDP) in the 1990s to measure the developmental state of a country by combining indicators of life expectancy, educational attainment, and income based on national average data of the whole population [3,4]. It has been widely applied for decades, but the missing consideration of future generations in its scheme persists.

Several indices for assessing child development have been proposed. Child development refers to change or growth that occurs in a child during the life span from birth to adolescence [5]. One relevant focus in child development-related studies is the development of indices [6,7]. An index aggregates a number of indicators addressing individual topics. Since child development is a multi-dimensional

issue involving a large number of topics, there is a need to systematically aggregate the information to a simpler layout by constructing indices. For example, the Child Development Index (CDI) [8,9] evaluates the development of children considering the topics health (i.e., under-five mortality), education (i.e., primary school enrolment) and nutrition (i.e., underweight status), mirroring the HDI. Other indices address additional topics, such as relationships with family, school and community and safety. For example, Bradshaw et al. [10] proposed an index of child well-being on European level. The index considers the child's rights and analyzes child well-being in eight topics (material situation, housing, health, education, relationships, civic participation, and risk and safety) with 51 indicators. Land et al. [11] constructed the Child and Youth Well-Being Index to track the trends in child well-being on a national level across 28 indicators and seven different topics. The seven topics were material well-being, health, social relationships, safety/behavior concerns, productivity/educational attainment, place in community, and emotional/spiritual well-being. Later on, the index was expanded to consider additional 16 indicators [12]. Breaking down from national to state level, the New KIDS COUNT Index was proposed for measuring and comparing the performance of child well-being across states of the United States [13]. The New KIDS COUNT Index classified 16 indicators to four topics, i.e., economic well-being, education, health, and family and community. Unlike the aforementioned indices, Moore et al. [14] used data of individual children obtained by National Survey of America's Families instead of national or regional aggregated data to construct the index for indicating risks that individual children experience. A key characteristic of this index is the distinction between topics which refer to the outcome or performance of children development (i.e., well-being) and topics which refer to the contextual level (i.e., background that may influence well-being). This framework was further improved to address four topics for well-being (physical health, psychological health, social health, education), and three topics for the contextual part (family, community, and socio-demography), covering 69 indicators in an index in total [15,16].

Although numerous indices for assessing child development are already available, some limitations remain. The limitations include: (1) the lack of a consistent classification of topics and indicators considered in the indices; (2) the disregard of data availability for selected indicators; and (3) the neglect of topics related to environmental aspects. In fact, a classification of topics and indicators is not straight-forward. According to a review on assessing child development conducted by Chang et al. [17], there is no generally accepted classification scheme. The same indicators can be classified into different topics. For example, school enrolment indicators were assigned to address the topic of education in many indices [10,13], but were allocated to the topic participation in some other indices [18,19]. Moreover, Chang et al. [20] pointed out that some studies did not clearly list the indicators needed for measuring the topics [21], or did not clarify the data availability of the selected indicators. Consequently, such indices may not be applied in practice, as data for one or more indicators are simply not available. Furthermore, current child development studies focus mainly on social and economic issues. Environmental aspects have not yet been addressed. However, environmental aspects need to be considered for connecting child development to SD with triple-bottom-line thinking (considering environmental, economic and social aspects [22]).

1.1. The Sustainable Child Development Index (SCDI) Framework and an Initial Indicator Set

To address those aforementioned three gaps, Chang et al. [17] proposed the Sustainable Child Development Index (SCDI) framework which considers children as a stakeholder group, includes environmental aspects such as resource accessibility, and applies an indicator set based on available statistical data. Sustainable child development refers to a development that supports children to meet their needs in the present living state and protects children in order for them to have the ability for shaping their future prospects. The SCDI allows for comparing countries in terms of their status regarding sustainable child development and monitoring the trends on the status for countries by continuously updating the indicators over time. The SCDI framework considers seven themes related to sustainable child development: health, education, safety, economic status, relationship, and participation plus the newly suggested theme environmental aspects addressing resource accessibility. Children are those inheriting the resources from current generations. To protect inter-generational equity,

resource condition such as accessibility to freshwater and the preservation of fossil fuels are of high concern. Therefore, the theme environmental aspects considers freshwater vulnerability and renewable energy consumption as starting points to address resource accessibility. Each of the seven SCDI themes is specified by 2–17 subthemes. Subthemes are further described by 1–7 criteria, which are measured by 1–4 indicators. For instance, the theme health specifies 17 subthemes (e.g., child mortality, risk behavior, mental health), described by 44 criteria (e.g., infant mortality, suicide, adolescent fertility), measured by 48 indicators (e.g., infant mortality rate, suicide rate and adolescent fertility rate). Details of topic and indicator collection and classification can be found in Chang et al. [17,20]. Figure 1 displays the overall structure of the SCDI framework. It provides a clear and consistent classification scheme for topics connected to child development including the theme environmental aspects. As an index for SD, the SCDI also closely reflects the Sustainable Development Goals (SDGs) [23,24]. For example, the SDG ‘ensure healthy lives and promote well-being for all’ is associated with the SCDI subthemes child mortality, maternal health, and hazardous pollutant, etc.; the SDG ‘ensure inclusive and equitable quality education and promote lifelong learning opportunities for all’ addresses the SCDI subthemes gender equality and attendance of education, etc.

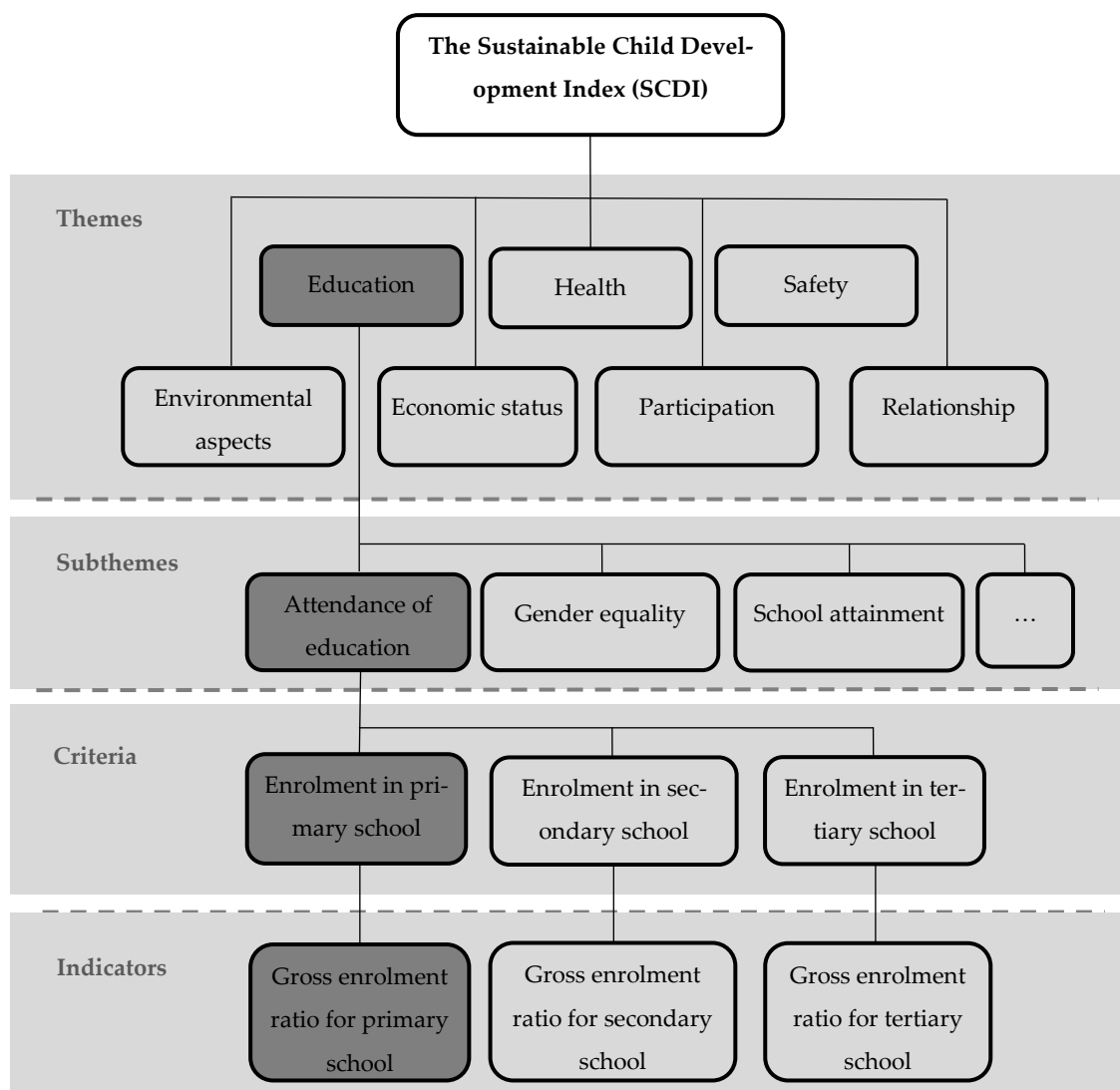


Figure 1. Structure of the Sustainable Child Development Index (SCDI) framework (exemplary criteria and indicator are presented for the subtheme attendance of education and highlighted in dark grey), adapted from Chang et al. [17,20].

In addition to the framework of the SCDI, an initial indicator set consisting of 66 indicators was proposed considering data availability [20]. Statistical data for each of the 66 indicators are available

for at least 100 countries. The 66 indicators can clearly measure the criteria of sustainable child development and allow for a quantitative assessment with available statistical data.

1.2. Research Objective

On the basis of previous work of the authors [17,20], this study aims at establishing the SCDI by fine-tuning the indicator set, calculating the SCDI for countries, and analyzing the similarity between the SCDI and existing development indices.

Although the initial indicator set of 66 indicators was previously selected by Chang et al. [20], considering such a large number of indicators in one index may pose challenges for data collection as well as for indicator aggregation to an index, and thus impede the practicality of the SCDI. Therefore, the first focus of this study is to reduce the number of indicators for enhancing the practicality of the SCDI. To reduce the number of indicators, two steps were taken: (1) considering association (i.e., similarity) between indicators, and (2) balancing of the number of addressed countries and topics with regard to data availability.

A deeper analysis of the 66 indicators indicated that some indicators have a high association with each other, i.e., evaluate the topics in a similar way. For example, the three indicators neonatal-, infant-, and under-five mortality rate describe child mortality in a very similar manner. Therefore, one of these three indicators can be selected to represent the other indicators to address child mortality. That indicator (under-five mortality rate) is chosen as it has the highest data availability among the three indicators. By doing so, practitioners can use a smaller number of indicators to sufficiently address the considered topics.

Statistical data of each of the 66 indicators can be found for at least 100 countries. The limiting point is that the statistical data of each of the 66 indicators are available for different countries. The more indicators that are considered, the fewer the countries that can be addressed because of missing data. For example, for only nine countries (addressing 2.3% of child population in 2015 of 195 countries listed in the UNICEF database [25,26]), statistical data can be found for all the 66 indicators. In this case, the SCDI is hardly able to support comparing countries in terms of their status regarding sustainable child development in practice. On the other hand, the more countries that are considered, the fewer the topics as well as indicators that are addressed. For instance, 195 countries are considered when only three subthemes and seven indicators are addressed in the SCDI. This very limited consideration of topics leads to insufficient and biased assessment of sustainable child development status. Hence, a balance of the number of covered countries (as well as child population) and topics is needed to further reduce the 66 indicators for enhancing the practicality of the SCDI.

The second focus of this study is to construct the SCDI. Normalization and aggregation are used to combine the indicators into one index, thus to provide a summarized result [27,28]. Normalization is needed to transfer indicator values into a common scale (e.g., 0–1) by reference points [27,28]. By transferring indicator values into a common scale, the aggregation of different indicators into a dimensionless index is possible.

The third focus of this study is to compare the results of the SCDI with existing development indices (e.g., the HDI and the CDI) for clarifying their similarity. The comparison can examine if the SCDI evaluates the status of sustainable development for countries differently than existing development indices by considering children as key stakeholders and addressing topics in the context of SD. Therefore, the objective of this paper is to establish the SCDI for countries by:

- selecting a final indicator set for the SCDI;
- using normalization and aggregation methods to combine the final indicator set into one index, i.e., the SCDI; and
- comparing the results of the SCDI with existing development indices such as the HDI and the CDI.

The following sections present the research methodology (Section 2), results (Section 3), followed by discussion (Section 4).

2. Methods

In this section, the method for constructing the SCDI is presented. First, the method for selecting the final indicator set for the SCDI is introduced (Section 2.1). Methods for determining the SCDI scores for countries and country classification are then provided (Section 2.2). Afterwards, a way to compare the SCDI with other development indices is described in Section 2.3.

2.1. Selection of the Final Indicator Set to Be Used in the SCDI

A correlation analysis of the 66 indicators proposed by Chang et al. [20] was carried out to identify indicators that are strongly associated within individual themes (e.g., health or education). Correlation analysis can quantify the direction and strength of association between variables [29,30]. Spearman correlation was selected to perform the correlation analysis [29–31] since it is suitable to measure the association between two ranked variables (e.g., indicators). Spearman correlation does not require the making of any assumptions about the frequency distribution and the linear relationship between the two variables [29]. The value of the correlation coefficient varies between +1 and −1. A perfect Spearman correlation coefficient of ± 1 occurs when a variable is in a perfect association to the other, i.e., the values of both variables are moving with fixed proportion. A pair-wise comparison was conducted for indicators within individual themes. A Spearman correlation coefficient of ± 0.5 or ± 0.7 is often used as a benchmark to determine strong association between variables [29,30]. In this study, a stricter benchmark, i.e., a Spearman correlation coefficient of ± 0.8 , was presumed to examine a strong association between indicators. If the Spearman correlation coefficient is higher than +0.8 or lower than −0.8, a strong association is assumed, i.e., the two indicators are similar and can represent each other. Therefore, one of the two indicators would be sufficient to describe/predict the performance of a specific topic. In that case, we selected the indicator which has statistical data for more countries and consider that indicator as the representative indicator. If the correlation analysis does not show a strong association between the two indicators, both indicators are kept because one indicator cannot represent the other.

In a second step, the number of the identified representative indicators was further reduced to balance the number of topics covered by the representative indicators and the number of countries for which data for the representative indicators are available. The number of representative indicators (as well as topics) addressed in the SCDI and their mutually covered countries were analyzed. Based on the results, the number of representative indicators was further reduced according to three principles. First, the final indicator set used in the SCDI shall consider at least 50% of the topics (i.e., themes, sub-themes and criteria) addressed by the representative indicators selected based on the results of the correlation analysis. Second, the number of mutually covered countries for which the SCDI can be calculated shall represent at least 70% of all 195 countries (i.e., 137 countries) listed in the United Nations Children's Fund (UNICEF) database, to consider countries across the five geographic regions, (namely Africa, Americas, Asia, Europe, and Oceania [32]). Third, apart from the coverage of countries, child population covered in the SCDI is the other consideration for assuring the practicality of the SCDI. At least 70% of the child population (of all 195 countries) shall be addressed to consider a large share of children. These three principles are value choices but are considered as suitable to foster the practicality of the SCDI. The final indicator set is used to construct the SCDI and measure the SCDI scores.

2.2. Determination of the SCDI Scores for Countries and Classification of Countries

To combine the final indicator set into one index, normalization and aggregation of the indicator values are required. The method is presented in the following two subsections.

2.2.1. Normalization of the Indicators of the Final Indicator Set

Indicators are usually measured in different units and scales. Normalization aims at transferring indicator values into a common scale. By doing so, the aggregation of different indicators into one

index is possible. A scale of 0–1 was chosen, and linear scaling was used as the normalization method to transform the indicator values into 0–1 scale. Linear scaling transformation requires two reference points for each indicator. Thus, two reference points (i.e., minimum and maximum reference point) were defined for each indicator of the final indicator set. The first reference point represents the target value for the indicators of the final indicator set. As the second reference point can be a minimum or maximum reference point, the lowest or highest indicator value collected for the indicators of the final indicator set among the considered countries from 2006 to 2015 was chosen. This setting supports a comparative assessment of sustainable child development status for countries within the same year or across years. Since the SCDI intends to reflect SD, the SDGs were used as a guide to define the first reference point (representing the target value). For example, SDG 3.9 includes the target “substantially reducing the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination” [23]. In accordance with this target, the target value (here the minimum reference point) for the indicator ‘mortality rate attributed to household and ambient air pollution (per 100,000 populations)’ would be fixed to 0 which could represent the best case. Then, the other reference point is the maximum indicator value collected for the indicator among the addressed countries from 2006 to 2015, which is 300. If the definition of the target value for indicators cannot be guided directly from the SDGs, both reference points are defined based on maximum and minimum indicator values collected for the indicators of the final indicator set among the addressed countries from 2006 to 2015.

Having defined the reference points for the indicators of the final indicator set, the normalized indicator scores can be calculated. Depending on the type of indicator, the normalized indicator scores were calculated differently. In this study, three types of indicator, i.e., so-called positive indicators, negative indicators, and neutral indicators for sustainable child development, were distinguished. For positive indicators (e.g., ‘population using improved drinking-water sources’), a higher indicator value means a higher positive contribution to sustainable child development. For negative indicators (e.g., ‘under-five mortality rate’), a higher indicator value means a higher negative contribution to sustainable child development. The neutral indicators aim at reflecting equality topics (e.g., ‘sex ratio at birth’), namely expressing the relation between the indicator value and the equal state. In this sense, the closer the indicator value to the equal state of the topic (e.g., 1.05 for the topic sex ratio at birth [33,34], and 1.00 for the topic gender parity in school enrolment), the higher the positive contribution to sustainable child development results.

The normalized score (S_{i,I_p}) for a positive indicator I_p with data of a specific assessed country i is measured according to Equation (1).

$$S_{i,I_p} = \frac{V_{i,I_p} - R_{m,I_p}}{R_{M,I_p} - R_{m,I_p}}, \quad (1)$$

V_{i,I_p} denotes the value for a positive indicator I_p of a specific country i . R_{M,I_p} and R_{m,I_p} represent the maximum and minimum reference points for I_p , respectively.

The normalized score (S_{i,I_n}) for a negative indicator I_n with data of a specific assessed country i is measured according to Equation (2).

$$S_{i,I_n} = 1 - \frac{V_{i,I_n} - R_{m,I_n}}{R_{M,I_n} - R_{m,I_n}}, \quad (2)$$

V_{i,I_n} denotes the value for a negative indicator I_n of a specific country i . R_{M,I_n} and R_{m,I_n} represent the maximum and minimum reference points for I_n , respectively.

The normalized score (S_{i,I_u}) for a neutral indicator I_u with data of a specific assessed country i is measured according to Equation (3).

$$S_{i,I_u} = 1 - \frac{|V_{i,I_u} - e_{I_u}|}{R_{M,I_u} - R_{m,I_u}}, \quad (3)$$

V_{i,I_u} denotes the value for a neutral indicator I_u of a specific country i . R_{M,I_u} and R_{m,I_u} represent the maximum and minimum reference points for I_u , respectively. e_{I_u} denotes the equal state value for a neutral indicator I_u .

Equation (3) is not only used for normalizing the indicators of equality topics, but also for normalizing the indicators gross enrolment ratio in different education levels. The gross enrolment ratio presents the ratio of enrolled children of all ages to the total number of children in the official school age group. The ratio can exceed 100% when many children enter school late or repeat a grade. Repetition and postponement in education could imply negative conditions in education. In this context, 100% of the enrolment ratio was treated as the target value and also the equal state value in this study.

2.2.2. Aggregation of the Normalized Indicators into an Index—The SCDI and Country Classification

After normalizing the indicators of the final indicator set to the same scale, the indicators can be aggregated into the SCDI. Currently, no literature objectively provides information and the relative importance for the themes, subthemes and criteria of sustainable child development. Hence, equal weighting was presumed while conducting aggregation at indicator, criterion, sub-theme and themes level. That means all indicators, criteria, subthemes and themes were considered as being equally important. For instance, the criterion gender equality in enrolment and other criteria (e.g., gender equality in graduation) are presumed to have equal importance on the subtheme gender equality. The sub-theme gender equality and other subthemes such as government support on education are suggested to have the same importance on the theme education. Then, the theme education and the other four themes considered in the SCDI have equal importance for measuring sustainable child development (i.e., the SCDI scores). Arithmetic average method was used for aggregating the scores from the indicator, criterion, sub-theme, theme to index level. As the values for the considered indicators range between 0–1 (see Section 2.1.1), the SCDI scores also range between 0–1. It is assumed that the higher the SCDI score is, the better is the sustainable child development status.

For example, the arithmetic average of the normalized scores of three indicators ‘gross enrolment ratio for primary school’ (representing the criterion ‘enrolment in primary school’), ‘gross enrolment ratio for secondary school’ (representing the criterion ‘enrolment in secondary school’) and ‘gross enrolment ratio for tertiary school’ (representing the criterion ‘enrolment in tertiary school’) is the aggregated score of the subtheme attendance of education. Then, the arithmetic average of the aggregated scores of the subtheme attendance of education and the other subthemes (e.g., gender equality) (see Figure 1) addressing the theme education represents the aggregated score of the theme education. Finally, the SCDI score for a country is calculated by arithmetically averaging the aggregated scores of the themes considered (e.g., health and education) in the SCDI.

As a next step, the SCDI scores for countries were classified into four levels of sustainable child development. This was done in order to communicate results on the status of sustainable child development for countries. The four levels were set as very high, high, medium and low sustainable child development, in accordance with the country classification approach applied in the HDI [35]. To define the four levels, the quartiles of the aggregated scores for each theme (calculated based on the collected indicator values in 2015) were used to derive three cutoff points. The quartiles of the aggregated scores for each theme were first determined. Then the three cutoff points were calculated by arithmetically averaging the quartiles of the aggregated scores for themes, in line with the defined aggregation method. The three cutoff points were determined to identify the four levels of sustainable child development, regarding the performance on the addressed indicators and the target values derived from the SDGs. For example, countries classified into very high sustainable child development level indicate that their performance reaches the highest 25% of the progress towards sustainable child development according to the defined target values. Moreover, the countries were assigned to the five regions, namely Africa, Americas, Asia, Europe, and Oceania defined by the UN [32], to present the status not only on a country level but also from a regional perspective.

2.3. Comparing the SCDI with Other Development Indices

The comparison aims at examining if the SCDI evaluates sustainable development for countries differently than existing development indices by considering children as the key stakeholder group and addressing topics in the context of SD.

The comparison of the SCDI, the HDI and the CDI was firstly conducted by using correlation analysis to describe the degree of association between the country ranking assessed by the three indices. The country ranking assessed by the SCDI for the year 2015 was compared with the country ranking assessed by the HDI for the year 2015 and the CDI for the year 2012. The HDI and the CDI are selected since they consider similar topics and cover a wide coverage of countries, as does the SCDI. The HDI has been widely adopted to measure the degree of countries' development by considering a whole population-oriented perspective. The CDI applies a child-oriented perspective but does not allow a comprehensive assessment of child development in the context of SD. If the association between the SCDI, the HDI and the CDI is not strong, it is expected that the SCDI can assess the sustainable development status for countries in a different pattern than the HDI and the CDI by treating children as a key stakeholder group and addressing topics of child development in the context of inter-generational equity. That means the SCDI can complement existing development indices. In accordance with the correlation analysis conducted for selecting representative indicators (see Section 2.1), a correlation of indices is considered strong if the Spearman correlation coefficient is higher than +0.8. Moderate correlation between indices is recognized if the Spearman correlation coefficient ranges from +0.3 to +0.8 [29]. The country ranking of the HDI for the year 2015 and the CDI for the year 2012 can be found in the reports published by the UNDP [4] and the Save Children Fund [9] respectively.

In addition, the country rankings from 2006 to 2015 assessed by the SCDI and the HDI were compared in order to investigate their similarity. The comparison focused on the Organization for Economic Cooperation and Development (OECD) countries to examine if those highly economically developed countries have a similar status of sustainable child development and human development. Among the OECD countries, six countries: Australia, Canada, Austria, Greece, Mexico, and Republic of Korea, were selected to consider a diversity of countries across the five geographic regions.

Moreover, since the country classification for the SCDI was constructed based on the HDI approach, comparing the results of country classification assessed by the SCDI and the HDI for the year 2015 is another way to check their similarity. For example, if one country is classified at medium development level in the SCDI but very high development level in the HDI, a difference is recognized in the SCDI country classification and the HDI country classification. Based on the comparison, an overview of the similarity between the SCDI country classification and the HDI country classification is provided.

3. Results

The following sections provide the results: the final indicator set for the SCDI (Section 3.1), the SCDI scores for 138 countries including country ranking and classification (Section 3.2), and the results of the comparison of the SCDI with the HDI and the CDI (Section 3.3).

3.1. Final Indicator Set for the SCDI

First, based on the results obtained from the correlation analysis (described in Section 2.1), 50 representative indicators were chosen from the original 66 indicators proposed by Chang et al. [20]. Detailed information of the correlation analysis (e.g., Spearman correlation coefficients for the 66 indicators) is shown in Table S1; the 50 representative indicators are listed in Table S2.

After selecting the 50 representative indicators based on correlation analysis, a second indicator selection process was conducted. An overview of the number of topics described by the 50 representative indicators and the number of countries for which data for the representative indicators are available is provided in Figure 2. Naturally, when more indicators are considered in the SCDI, more topics are considered (see dotted lines in Figure 2) as well. At the same time, the number of countries mutually covered by the indicators decreases. Only nine countries can be assessed by the SCDI when all the 50 indicators (as well as their considered topics, i.e., seven themes, 29 subthemes, and 43 criteria) are included. Details of the topics addressed by the 50 indicators can be found in Table S2.

The second indicator selection process follows the three principles defined in Section 2.1 to balance the number of topics, countries and child population covered in the SCDI. Table 1 shows that 138 (70.7%) countries and five regions are covered when 25 representative indicators are used for con-

structing the SCDI (also see Figure 2). In this context, 85.9% of the child population can be addressed in the SCDI (as shown in Table 1). While using these 25 representative indicators, five themes (health, education, safety, economic status and environmental aspects), 19 subthemes (e.g., nutrition, risk behavior, gender equality, violence and crime, macroeconomic status and freshwater vulnerability) and 22 criteria (e.g., low birth weight, alcohol use, gender equality in enrolment, criminal victimization, youth unemployment and risk of depleting freshwater resources) would be addressed in the SCDI, including more than 50% of the topics considered by the 50 indicators. When 26 representative indicators would be considered for constructing the SCDI, the share of mutually covered countries would decrease from 70.7% to 66.2%, not fulfilling the principle (defined by the authors) that the covered countries should represent at least 70% of countries. Thus, the 25 representative indicators are used as the final indicator set for constructing the SCDI. This final indicator set including the covered topics and data sources is listed in Table 2.

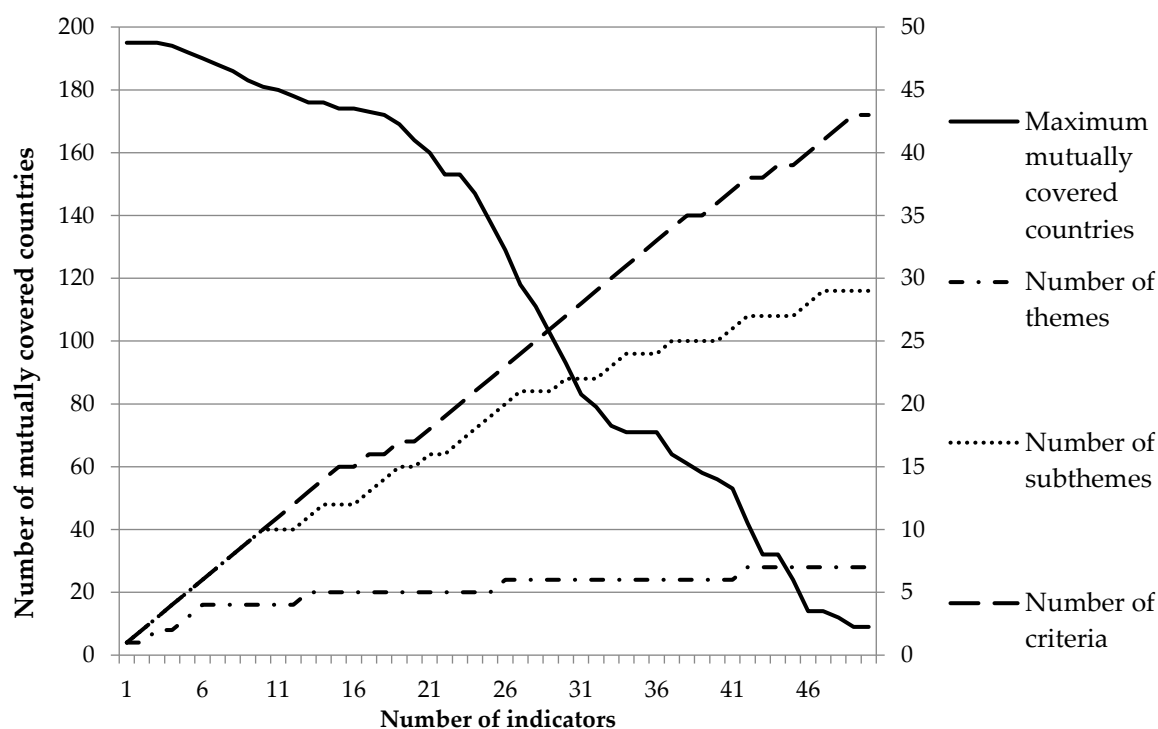


Figure 2. Relation between number of representative indicators and coverage of topics and countries.

Table 1. Relation between coverage of considered representative indicators, topics, countries and child population: an extract of a consideration from 24 to 29 representative indicators.

Number of Indicators	Share of Topics (Criteria)	Number of Countries	Share of Countries	Number of Considered Counties					Share of Child Population
				Africa	Asia	Americas	Europe	Oceania	
24	48.8%	147	75.4%	40	38	26	39	4	92.2%
25	51.2%	138	70.7%	39	34	25	37	3	85.9%
26	53.5%	129	66.2%	36	30	24	37	2	85.2%
27	55.8%	118	60.5%	35	21	24	36	2	71.2%
28	58.1%	111	56.9%	34	19	22	35	1	69.9%
29	60.5%	102	52.3%	33	19	21	29	0	67.0%

Table 2. The final indicator set considered in the SCDI, including the reference points and the addressed themes, sub-themes, criteria and data sources.

Theme	Sub-theme	Criterion	Indicator	Maximum Reference Point	Minimum Reference Point	Target of the SDGs	Data Source
Health	Nutrition	Low birth weight	Percentage of infants born with low birth weight (<2500 g)	0	40	Target 2.2	UNICEF [26]
	Child mortality	Under-five mortality	Under-five mortality rate (probability of dying by age five per 1000 live births)	0	210	Target 3.2	
	Mental health	Suicide	Suicide rate (per 100,000 aged 15–29 years)	0	50	Target 3.4	WHO [36]
	Hazardous pollutant	Household and ambient air pollution	Mortality rate attributed to household and ambient air pollution (per 100,000 population)	0	300	Target 3.9	WHO [37]
		PM2.5 air pollution	PM2.5 air pollution, population exposed to levels exceeding World Health Organization (WHO) guideline value (% of total)	0	100	Target 3.9	
	Immunization coverage	Diphtheria tetanus toxoid and pertussis (DTP3) immunization	Diphtheria tetanus toxoid and pertussis (DTP3) immunization coverage among one-year-olds (%)	20	100	Target 3.8	UNICEF [26]
	Risk behavior	Alcohol use	15–19 years old heavy episodic drinkers (population) (% by country)	0	55	Target 3.5	WHO [37]
		Adolescent fertility	Adolescent fertility rate (per 1000 girls aged 15–19 years)	0	220	Target 3.7	World Bank [38]
	Oral health	Dental treatments	DMFT (decayed, missing or filled teeth) among 12-year-olds	0	6	Target 3.4	Malmö University [39]
	Health expenditure	Public health expenditure	Health expenditure, public (% of total health expenditure)	5	100	Target 6.1	WHO [32]; World Bank [38]
Education	Attendance of education	Enrolment in primary school	Gross enrolment ratio, primary, both sexes (%)	25	160	-	United Nations Educational, Scientific and Cultural Organization (UNESCO) [40]
		Enrolment in secondary school	Gross enrolment ratio, secondary, both sexes (%)	5	170	-	
	Early childhood education	Enrolment of kindergarten	Gross enrolment ratio, pre-primary, both sexes (%)	0	160	Target 4.2	

Table 2. Cont.

Theme	Sub-theme	Criterion	Indicator	Maximum Reference Point	Minimum Reference Point	Target of the SDGs	Data Source
Education	Gender equality	Gender equality in enrolment	Gross enrolment ratio, pre-primary, gender parity index (GPI)	0.50	2	Target 4.5	United Nations Educational, Scientific and Cultural Organization (UNESCO) [40]
			Gross enrolment ratio, primary, gender parity index (GPI)	0.50	1.20	Target 4.5	
			Gross enrolment ratio, secondary, gender parity index (GPI)	0.30	2	Target 4.5	
			Gross enrolment ratio, tertiary, gender parity index (GPI)	0.05	6.50	Target 4.5	
	Government support on education	Public expenditure on education	Government expenditure on education (% of GDP)	0.50	20	-	
Safety	Violence and crime	Criminal victimization	Intentional homicide count and rate per 100,000 population	0	100	Target 16.1	United Nations Office on Drugs and Crime (UNODC) [41]
	Demographic structure	Sex ratio	Sex ratio at birth (ratio)	0.80	1.20	Target 5.1	Central Intelligence Agency (CIA) [42]; United Nations [43]
Economic status	Housing quality	Electricity coverage	Access to electricity (% of population)	0	100	Target 7.1	World Bank [38]
	Macroeconomic situation	Youth unemployment	Youth unemployment rate (% of total labor force ages 15–24)	0	65	Target 8.5	
		National debts	Public debt (% of GDP)	0	600	-	International Monetary Fund (IMF) [44]
Environmental aspects	Freshwater vulnerability	Risk of depleting freshwater resources	Water depletion index (WDI) (ratio)	0	1	Target 6.4	Berger et al. [45]
	Renewable energy consumption	Consumption of renewable energy	Renewable energy consumption (% of total final energy consumption)	0	100	Target 7.2	World Bank [38]

3.2. The SCDI Scores and Country Classification

Following the normalization and aggregation methods defined in Section 2.2, the SCDI scores for 138 countries for the year 2015 were determined. First, among the 25 indicators of the final indicator set (selected in Section 3.1), the reference points for 21 indicators were defined with regard to the targets of the SDGs. For the other four indicators, the reference points were defined based on the collected indicator values. These four indicators are ‘gross enrolment ratio in primary school’, ‘gross enrolment ratio in secondary school’, ‘government expenditure on education as percentage of GDP’ and ‘public debt as percentage of GDP’. The reference points used for normalizing the 25 indicators are listed in Table 2. Second, according to the defined reference points and Equations (1)–(3) (see Section 2.2.1), the values for the 25 indicators were transferred into scores between 0–1. Then, the normalized scores for the 25 indicators were aggregated into the SCDI scores for the 138 countries. The indicator values, normalized scores, the SCDI scores, as well as the country ranking for the 138 countries can be found in Table S3. Table 3 provides an overview of the results of the SCDI by showing an extract from the country ranking, namely the 20 highest and 20 lowest ranks. The result shows that Iceland, Bhutan, Norway, Sweden and Finland are the five highest-ranked countries based on the SCDI scores. By having a better performance in the subthemes freshwater vulnerability and renewable energy consumption considered for the theme environmental aspects, Bhutan, Uruguay and Paraguay have higher ranks than Denmark and Canada. Mauritania, Yemen, Lesotho, Namibia and Niger are the five lowest-ranked countries.

Furthermore, the SCDI scores and the according country ranking were determined for the year 2006 in order to observe the trend of sustainable development status for countries. Comparing the 2015 SCDI scores to the 2006 SCDI scores, 104 (75%) out of the 138 countries show an enhancement in sustainable child development status. In particular, nine countries (i.e., Armenia, Bhutan, Cambodia, Ethiopia, Lao People’s Democratic Republic, Lesotho, Liberia, Nepal and Niger) have the largest increase in SCDI scores during the 10-year period. The performance, especially for the themes health and economic status, has improved among these developing countries. By contrast, Cyprus, Greece, Mexico, Spain and Ukraine are the five countries with the largest declines of SCDI scores due to their decreasing performance for the themes health and economic status. The annual SCDI scores and country ranking from 2006 to 2015 are provided in Table S4.

Table 3. Country ranking based on the SCDI scores (2015): an extract showing the 20 highest and 20 lowest ranks.

Ranks: Highest 20	Country	SCDI Score	Ranks: Lowest 20	Country	SCDI Score
1	Iceland	0.894	119	Morocco	0.659
2	Bhutan	0.860	120	Angola	0.657
3	Norway	0.846	121	Senegal	0.655
4	Sweden	0.840	122	Saudi Arabia	0.655
5	Finland	0.820	123	Turkmenistan	0.654
6	Uruguay	0.820	124	Egypt	0.648
7	Paraguay	0.819	125	India	0.644
8	Austria	0.818	126	Eritrea	0.643
9	Estonia	0.817	127	Armenia	0.638
10	Denmark	0.815	128	Botswana	0.637
11	Canada	0.814	129	Gambia	0.637
12	Latvia	0.813	130	Syrian Arab Republic	0.635
13	Brunei Darussalam	0.813	131	South Africa	0.623
14	New Zealand	0.811	132	Sudan	0.621
15	Lao People’s Democratic Republic	0.810	133	Mali	0.610
16	Ghana	0.809	134	Niger	0.608
17	Costa Rica	0.806	135	Namibia	0.605
18	Thailand	0.804	136	Lesotho	0.603
19	Fiji	0.804	137	Yemen	0.576
20	Malaysia	0.801	138	Mauritania	0.548

According to the SCDI scores for the year 2015, the 138 countries were classified into four sustainable development levels. Table 4 presents the interval of the SCDI scores and the numbers of classified countries of the four levels of sustainable child development. The cutoff points to group the countries into the four levels are derived as 0.66, 0.75 and 0.81 according to the country classification approach defined in Section 2.2.2. Correspondingly, 15, 37, 65 and 21 countries were categorized as countries with very high, high, medium, and low sustainable child development levels, respectively. That is, the performance of 15 countries (11%) reach the highest 25% of the progress towards sustainable child development with regard to the defined target values. In addition, a majority (62%) of the covered countries were assessed as countries with medium and low sustainable child development. It indicates that many countries are indeed in critical conditions to reach the defined targets of sustainable child development. The country classification for the 138 countries is provided in Table S3.

Table 4. Four levels of sustainable child development and the number of classified countries.

Level of Sustainable Child Development	Interval of the SCDI Score	Number of Classified Country
Very high	0.81–0.89	15
High	0.75–0.80	37
Medium	0.66–0.74	65
Low	0.54–0.65	21

The country classification significantly points out the great regional inequality on sustainable child development. Figure 3 presents an overview of the status of sustainable child development for countries worldwide. In Figure 3, countries assessed with very high, high, medium and low sustainable child development are marked in light green, dark green, orange and red, respectively. The grey areas indicate the countries not covered in the SCDI at present. As shown in Figure 3, European countries generally have better sustainable child development while a large share of African and Asian countries has worse sustainable child development. Furthermore, Figure 4 shows that 70% of European countries are classified as countries with very high and high sustainable child development. In the Americas, 48% of countries are classified as those with very high and high sustainable child development. Several Central and South American countries e.g., Paraguay and Uruguay, show their good performance in sustainable child development (see Table 2). On the contrary, 90% of African and 76% of Asian countries are assigned to medium and low sustainable child development levels, as shown in Figure 4. These African and Asian countries (e.g., Niger, Yemen and Namibia) in general have lower performance in the themes economic status (e.g., access to electricity and youth unemployment), health (e.g., low birth weight) and environmental aspects (e.g., freshwater vulnerability). The results highlight the urgent need to improve the living conditions related to sustainable child development topics for most African and Asian countries. Children and youths dominate the populations of Africa. Children under the age of 15 accounted for 41% of the population, and youths aged 15–24 accounted for a further 19% in Africa in 2015 [46]. This result on the low level of sustainable child development is also in line with the statement claimed by UNICEF that nine out of 10 of the world's children surviving in extreme poverty (less than US\$1.90 a day) will live in sub-Saharan Africa in 2030 [25]. Note, some OECD countries, such as Australia, Netherlands, Japan, Israel, Italy and Turkey, were assigned to the medium sustainable child development level. One key reason is their weak performance in freshwater vulnerability and renewable energy consumption for the theme environmental aspects.

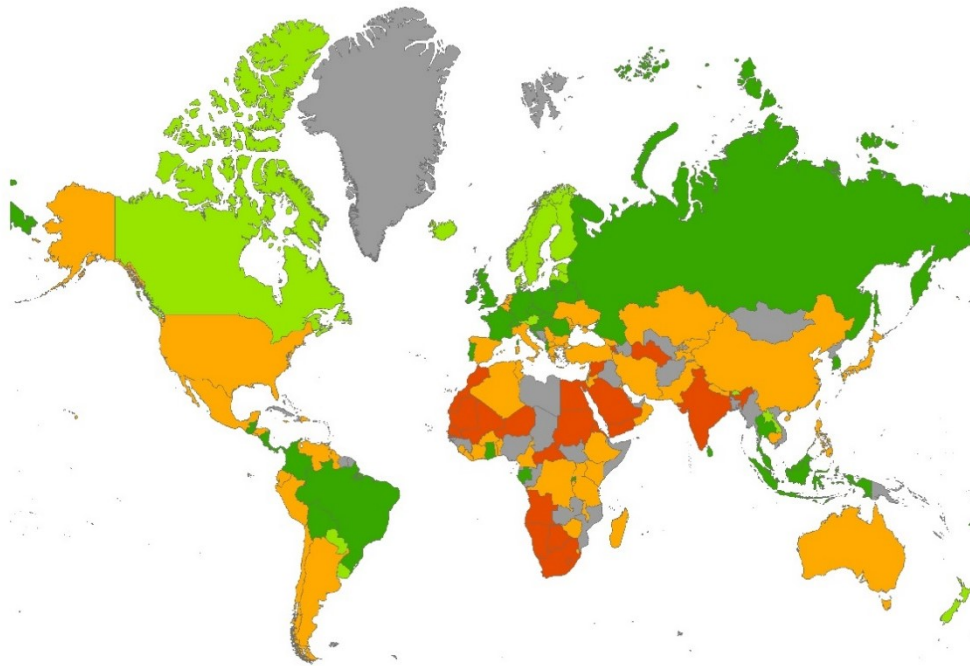


Figure 3. Overview of different levels of sustainable child development for countries.

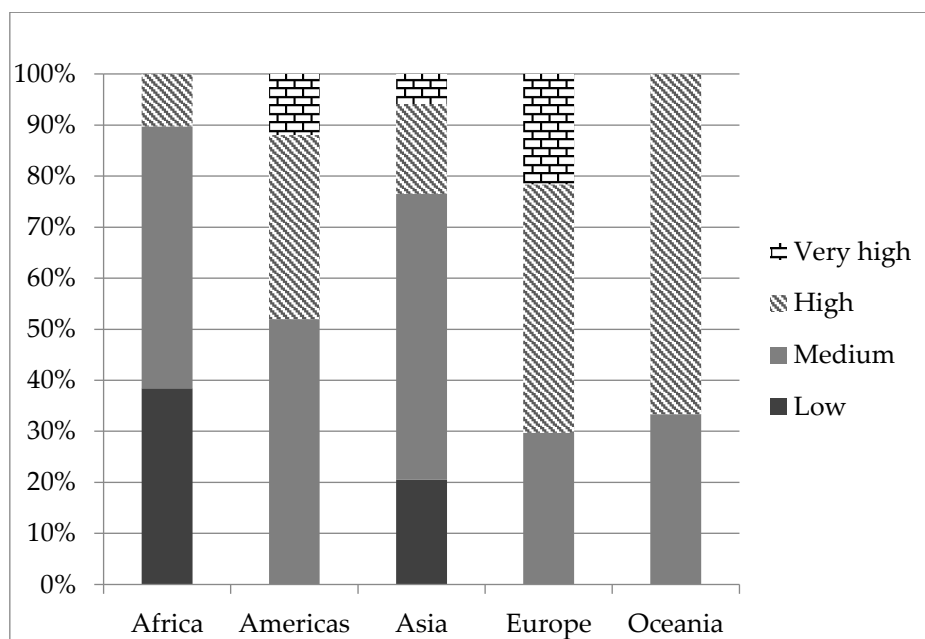


Figure 4. Share of sustainable child development levels in different regions.

3.3. The SCDI Compared to the Human Development Index (HDI) and Child Development Index (CDI)

To evaluate the similarity between the SCDI and the selected existing development indices (i.e. the HDI and the CDI), a correlation analysis was conducted. The correlation coefficient of the country ranking assessed by the SCDI and HDI for the year 2015, the country ranking assessed by the SCDI for the year 2015, and the CDI for the year 2012 is 0.476 and 0.489, respectively. Therefore, the analysis implies that the SCDI has a moderate association with the HDI and the CDI. The results point out that the SCDI can evaluate the sustainable development status for countries differently than the HDI and the CDI. The full country rankings of the SCDI, the HDI and the CDI can be found in Table S5.

Three out of five themes of the SCDI (health, education and economic status) consider similar topics as the HDI (i.e., long and healthy life, knowledge, and a decent standard of living). Among the four indicators applied in the HDI, one indicator is addressed in the SCDI. The indicator ‘gross national income per capita at purchasing power parity’ used in the HDI is addressed in the SCDI by its representative indicator ‘access to electricity (percentage of population)’ in the theme economic status. The two indicators ‘expected years of schooling’ and ‘mean years of schooling’ which describe the topic knowledge, and the indicator ‘life expectancy’ which measures the topic health in the HDI, are not considered in the SCDI. Although the two indices tackle similar topics and one identical indicator, their moderate correlation supports the fact that the SCDI can differently assess a country’s sustainable development status from a child’s point of view than a whole population-oriented concept. The SCDI contributes to development index studies by treating children as key stakeholders in sustainable assessments.

All of the three topics considered in the CDI (i.e., health, education and nutrition) are covered in the SCDI. Two out of three indicators used in the CDI are also addressed in the SCDI. The two indicators ‘under-five mortality rate’ and ‘primary school enrolment rate’ are used in the CDI and the SCDI. Nutrition is measured by two different indicators, ‘percentage of under-fives who are underweight’, and ‘percentage of infants born with low birth weight’, that are used in the CDI and SCDI, respectively. The moderate correlation of the SCDI to the CDI shows that although the SCDI and the CDI are both children-oriented indices, addressing environmental and additional topics (such as safety and economic status) in the SCDI could lead to different sustainable development status for countries than the CDI.

The trend of development status for Australia, Canada, Mexico, Austria, Greece and Republic of Korea assessed by the SCDI and the HDI were compared. Significant differences were found between the country rankings assessed by the SCDI and the HDI (see Figure 5). For example, Australia and Greece were both assessed as the 30 highest-ranked countries by the HDI from 2006 to 2015, but ranked between the 70th and 110th by the SCDI from 2006 to 2015. This indicates that the HDI and the SCDI indeed provide different assessment results of national development status by considering different stakeholder groups and addressing topics in the context of SD. The OECD countries are usually recognized as highly economically developed countries. Nevertheless, the comparison of country rankings assessed by the SCDI and the HDI from 2006 to 2015 points out that such highly economically developed countries may have decreasing progress on sustainable child development (e.g., Greece). Ideally the trends of the country rankings assessed by the SCDI and the HDI shall both improve over time. The dissimilar trends (e.g., for Austria and Republic of Korea) could imply an incomplete consideration of children in development policies. The results further support the fact that the SCDI can be a complementary assessment to the existing development indices to support decision making. The full country ranking of the SCDI and the HDI from 2006 to 2015 can be found in Table S4.

Furthermore, the comparison of the results of country classification between the SCDI and the HDI was conducted to investigate their similarities and differences. The country classifications of the SCDI and the HDI are listed in Table S6. Out of the 138 countries (66%) assessed in the SCDI, 91 are evaluated with a different development level in the HDI; 22 countries are determined with at least two development levels difference between the SCDI and the HDI. For instance, Argentina and Chile are assigned to a medium development level in the SCDI but to a very high development level in the HDI. This outcome is in line with the correlation analysis of the SCDI and HDI, supporting the fact that the SCDI can be applied as a complementary assessment to the existing whole population-oriented development indices to provide a more comprehensive assessment of a country’s sustainable development performance with a focus on children.

Moreover, it is shown that the HDI is strongly associated with the CDI (correlation coefficient of 0.925). The results of the HDI can be used to image the outcome of the CDI, and vice versa. One key reason could be that the topics (e.g., life expectancy and child mortality) considered in the HDI and the CDI have a strong association.

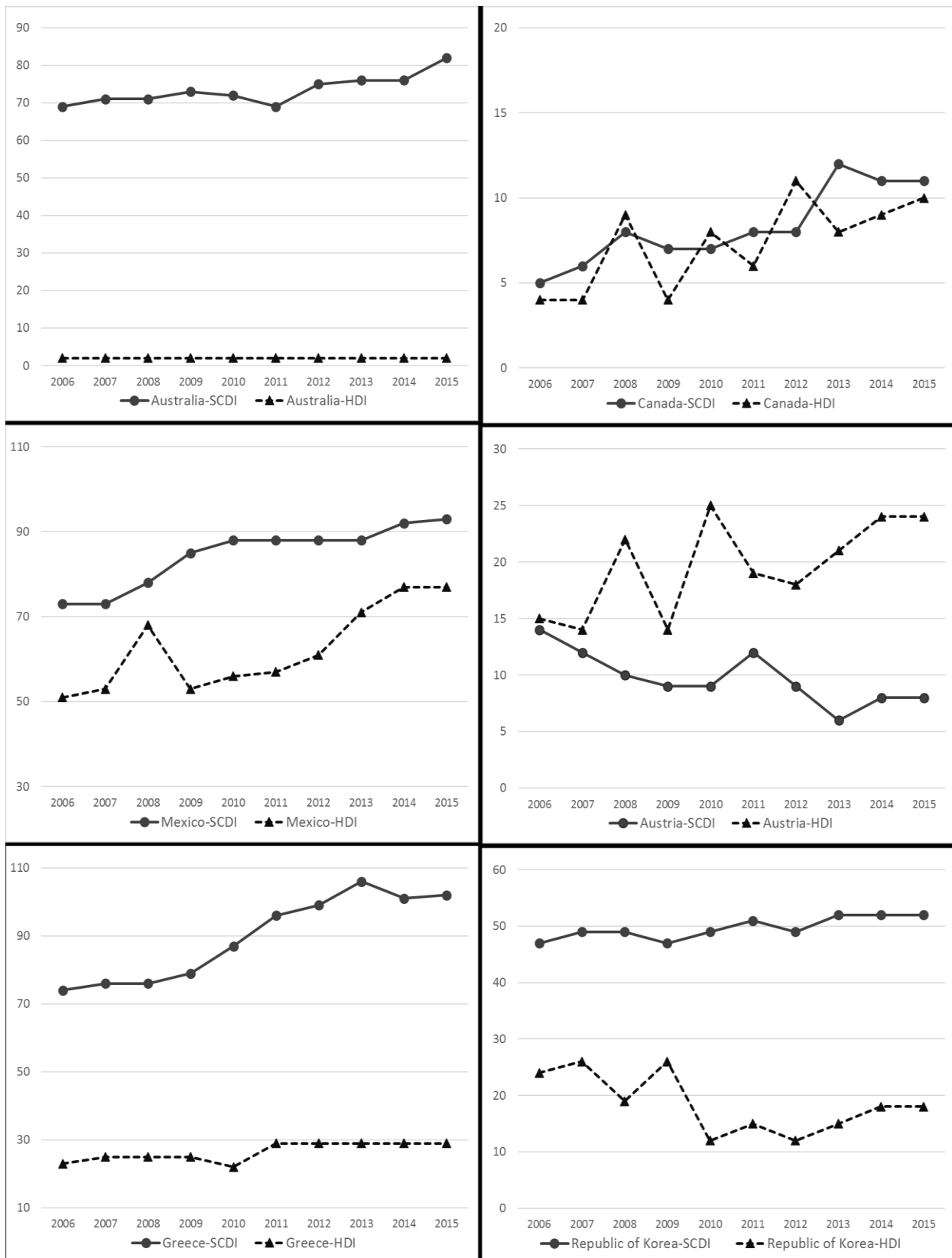


Figure 5. Country ranking assessed by the SCDI and the HDI from 2006 to 2015 for selected OECD countries.

4. Discussion

The following sections summarize the key findings and the contribution of the SCDI to sustainability assessment (Section 4.1) and present the limitations of the SCDI (Section 4.2) and an outlook for future research (Section 4.3).

4.1. Key Findings and Contribution of the SCDI to Sustainability Assessment

This study completes the establishment of a new index for assessing sustainable child development, namely the Sustainable Child Development Index (SCDI). The SCDI at present addresses five themes health, education, safety, economic status, and environmental aspects described by 25 indicators. The SCDI contributes to sustainability assessment as it addresses the inseparable relationship between children, inter-generational equity and sustainable development in an index. Furthermore, the SCDI is a development index that uniquely takes children as the core stakeholder group and addresses the topics with the triple-bottom-line thinking. As an index related to SD, the targets of the SDGs are employed to derive the reference points for determining the SCDI.

The SCDI allows comparing sustainable child development status for countries and supports monitoring the trend of the status of countries by continuously updating the indicators over time. Great regional inequality in sustainable child development exists among the assessed 138 countries and five regions; 90% of African and 67% of Asian countries are classified as countries with medium and low sustainable child development. The results reflect the urgent need for improving living conditions for most African and Asian countries. In addition, some OECD countries (e.g., Austria and Republic of Korea) have dissimilar trends on the status of sustainable child development and human development. This result implies that incomplete consideration of child development policies may exist in those highly economically developed countries. The study demonstrates that the SCDI can complement existing development indices (e.g., the HDI) by regarding children as a key stakeholder group and addressing topics (such as environmental aspects and safety) in terms of inter-generational equity for providing a more comprehensive evaluation of SD.

4.2. Limitations of the SCDI

Some research limitations regarding the SCDI remain. The limitations include: (1) a restricted number of indicators, topics and countries due to low data availability; (2) different reference years of statistical data for the indicators; and (3) value choices made for indicator selection and index calculation.

4.2.1. Limited Data Availability

Data availability is a key factor that leads to the need for balancing the number of considered topics (and indicators) and the countries covered in the SCDI. In order to balance the number of considered topics as well as indicators and countries covered, not all of the identified topics and indicators (e.g., for the themes relationship and participation) were considered in the SCDI. The limited inclusion of topics and indicators in the current SCDI may lead to incomplete and biased evaluation of the sustainable child development status for countries.

In addition, low data availability also results in limited consideration of indicators in specific themes (e.g., environmental aspects, relationship and participation). For instance, only two indicators were collected and then considered for the theme environmental aspects. Chang et al. [17] newly proposed the theme environment aspects in the SCDI framework for addressing triple-bottom-line thinking. Freshwater vulnerability and renewable energy consumption were selected as two subthemes as starting points for the theme environmental aspects. Other potential topics (such as soil quality) associated with resource accessibility usually have indicators with limited statistical data on country level. Databases need to be developed and more indicators addressing resource accessibility need to be considered in the SCDI framework for a more comprehensive coverage in order to protect inter-generational equity. It is notable that environmental pollution, e.g., air pollution, was classified under the theme health instead of the theme environmental aspects since environmental pollutants have

been treated as a direct health determinant in the literature (e.g., the SDGs). Furthermore, indicators for the themes relationship and participation are not addressed in the present SCDI framework. Since relationship and participation are relatively new topics in the evaluation of sustainable child development, existing indicators usually have data only available for a few countries (e.g., the OECD countries). These themes (e.g., environmental aspects, relationship and participation) that have indicators with limited data availability have priority in indicator and data development.

Moreover, the limited data availability also influences the number of countries that can be assessed in the SCDI. That means, currently, that the SCDI cannot yet be determined for all countries (see Section 3.2). For some countries such as Cuba, Singapore and the United Arab Emirates, the SCDI could not yet be determined since data are not available for the indicators of the final set (e.g., ‘government expenditure on education as percentage of GDP’ or ‘public debt as percentage of GDP’). This incomprehensive coverage of countries may bring about a restricted set of countries for comparing sustainable child development status.

4.2.2. Inconsistent Reference Year of Statistical Data

Additionally, reference years of statistical data for the indicators of the final indicator set are not identical [20]. Statistical data of indicators for most of the subthemes (e.g., child mortality, gender equality and attendance of education), are updated annually. By contrast, indicators for some subthemes (e.g., mental health) are not frequently updated. This inconsistency is noticeable when interpreting the SCDI results, especially while monitoring the trend of sustainable child development status for countries.

4.2.3. Value Choices for Indicator Selection and Index Calculation

There are no widely used normalization and aggregation methods for combining indicators into an index. In this study, reference points for normalizing the indicators were defined based on the SDGs and the lowest or highest indicator values collected for the indicators among the assessed countries from 2006 to 2015. A reference point may be defined according to an extreme low or high indicator value collected for an indicator. Nevertheless, this reference point is still suitable as a benchmark to perform the comparative assessment of sustainable child development status for countries because it describes a general picture of countries’ performance for a specific topic. For negative indicators (e.g., under-five mortality rate), the target values were all presumed as zero in order to achieve the ultimate goal to eliminate the negative contribution to sustainable child development. Additionally, the reference points would be updated over time when the newly collected indicator values go beyond the current applied reference points. For instance, in this study, the reference points for the indicator ‘percentage of infants born with low birth weight’ were defined as 0 and 40 regarding the SDGs and the highest indicator values collected from 2006 to 2015 among the considered countries. The reference point shall be updated over time once the indicator value is found to be higher than 40.

Moreover, weighting applied in the aggregation stage can largely influence the assessment results. Because no literature objectively provides information and the relative importance of the indicators and topics of sustainable child development, all indicators, criteria, subthemes and themes were considered as being equal in aggregation. If practitioners assign specific weighting to the considered indicators and topics in the SCDI, the SCDI scores can be altered and thus influence country ranking and classification.

4.3. Outlook for Future Research

In future, the framework, the indicators, as well as the SCDI scores for countries will have to be refined and updated when additional topics, indicators and data regarding sustainable child development become available. Ongoing work of the authors focuses on the potential integration of the SCDI into current social sustainability assessment approaches (e.g., Social Life Cycle Assessment (SLCA) [47] and Social Organizational Life Cycle Assessment (SOLCA) [48]) and databases (e.g., The Social Hotspots Database [49]). For example, the SCDI can be an index that describes in particular the

social conditions for the proposed stakeholder group, children, in SLCA and SOLCA studies. In addition, the current use of the HDI would be reviewed for recommending application options of the SCDI.

Supplementary Materials: The following are available online at www.mdpi.com/2071-1050/10/5/1563/s1, Table S1: Spearman correlation coefficients for the 66 indicators, Table S2: 50 representative indicators selected based on correlation analysis, Table S3: The indicator values, SCDI scores as well as country rankings and classification for the 138 countries, Table S4: Country ranking assessed by the SCDI and HDI from 2006 to 2015, Table S5: Country ranking assessed by the SCDI, the HDI and the CDI, Table S6: Country classification assessed by the SCDI and the HDI for the year 2015.

Author Contributions: Y.-J.C. composed this study and designed the research approach. Indicator selection and index calculation were completed by Y.-J.C. Furthermore, comparison of the SCDI and other development indices was performed by Y.-J.C. L.W. supported the statistical analysis for indicator selection. A.L. and M.F. provided substantial contributions and advice to the design of the research. All authors proofread and approved the final manuscript.

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2.4. Application options of the SCDI

This section provides the findings of Publication IV [4] ‘Chang, Y.-J.; Lehmann, A.; Winter, L.; Finkbeiner, M. Application options of the Sustainable Child Development Index (SCDI) - Assessing the status of sustainable development and establishing social impact pathways. *Int. J. Environ. Res. Public Health* **2018**, *15*, 1391, doi:[10.3390/ijerph15071391](https://doi.org/10.3390/ijerph15071391).’. Publication IV contributes to the research objective 4 ‘Suggestion of application options of the SCDI.’.

To put the SCDI into practice, two directions of application options were suggested in Publication IV.

First, the SCDI can be applied similarly to the current practice of the HDI, to compare and to trace the status of sustainable child development on different geographic levels and between population groups. The SCDI would complement existing development indices and can support decision making in CD as well as SD policies. Additionally, the SCDI can be adapted for different assessment purposes by considering additional topics (e.g. poverty) connected to SD.

Second, the SCDI can be integrated into social sustainability assessment approaches and databases, e.g. SLCA, SOLCA and the SHDB, for addressing the missing consideration of children as an essential stakeholder group and the lack of quantitative social impact pathways. The SCDI framework can be used to complement the current SLCA and SOLCA scheme by suggesting a new stakeholder group, i.e. children, and the corresponding subcategories and indicators. The SCDI can also be applied as a stakeholder-oriented index to reflect the social conditions specifically for the stakeholder group children. Additionally, the SCDI framework can be applied to support the development of quantitative social impact pathways in SLCA and SOLCA. An exemplary socio-economic relation model was built to examine the strength of the relation between the criterion completion of tertiary education and the other criteria selected from the SCDI framework. With regard to the SHDB, the SCDI can be adopted as an indicator to present the development status for countries involved in specific supply chains.



Article

Application Options of the Sustainable Child Development Index (SCDI) – Assessing the Status of Sustainable Development and Establishing Social Impact Pathways

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Abstract: The needs of children and their vulnerability to diseases, violence and poverty are different from those of adults. The Sustainable Child Development Index (SCDI) was thus developed in previous work to evaluate the status of sustainable development for countries with a focus on children and triple-bottom-line thinking. This study proposes application options to put the SCDI into practice. The SCDI can be performed similarly to existing development indices, for comparing and tracing the performance of sustainable development on different geographic levels and between population groups. In addition, the SCDI can be integrated into existing social sustainability assessment approaches (e.g., Social Life Cycle Assessment and Social Organizational Life Cycle Assessment) and databases (e.g., The Social Hotspots Database) to take children into account and enhance impact assessment of social sustainability assessment approaches. As an exemplification, this study demonstrates the application of the SCDI framework to support the development of social impact pathways. Due to the importance of tertiary education in reducing poverty, a preliminary social impact pathway addressing completion of tertiary education was established. By putting the SCDI into practice, the SCDI can support decision making in child as well as sustainable development policies.

Keywords: Sustainable Child Development Index (SCDI); sustainable assessment; sustainable development; child development; Social Life Cycle Assessment (SLCA); social impact pathways; tertiary education; poverty; Social Organizational Life Cycle Assessment (SOLCA); The Social Hotspots Database (SHDB)

1. Introduction

Children (defined as aged under 18 according to the United Nations [1]) are key stakeholder for achieving sustainable development because they inherit and shape societies. According to the Brundtland Report [2], sustainable development is defined as “a development that meets the needs of the present without compromising the ability of future generations to meet their own needs”. This definition stresses intra- and inter-generational equity and denotes that every adult and child have the right to own the opportunity to develop in freedom and in a stabilized society by satisfying basic needs and protecting the environment. In addition, children are more vulnerable than adults to diseases, environmental pollution, violence and poverty, and their specific needs are different from those of adults. Overlooking negative living conditions (e.g., poverty and violence) in childhood can

compromise life experience for children and impede their long-term development. Due to these reasons, an index for evaluating sustainable development with a focus on children is needed to complement existing whole-population-oriented assessments, such as the Human Development Index (HDI) [3]. For instance, the HDI was established to present the development status of a country by aggregating indicators for health, knowledge, and standard of living in accordance with national average data with regard to whole population. It has been widely applied for decades, but future generations, i.e., children, are not considered.

Some development indices have been proposed with a focus on children, but they address social and economic indicators and have not yet considered other indicators regarding sustainable development, such as environmental aspects. For example, the Child Development Index (CDI) was proposed to evaluate the development of children considering health (i.e., under-five mortality), education (i.e., primary school enrolment) and nutrition (i.e., underweight), without considering issues associated with environmental aspects [4]. Among the issues of environmental aspects, resource accessibility is of significance that ensures future generations to live with accessible and abundant resources. For example, availability of freshwater and preservation of fossil fuels are of high importance to reflect resource scarcity and shall be considered into development indices and sustainability assessments.

Therefore, the Sustainable Child Development Index (SCDI), which considers children as a core and addresses children related topics in the context of sustainable development, was established in previous work for supporting decision making in child development and sustainable development policies [5–7]. The SCDI allows for comparing countries in terms of their status regarding sustainable child development and for monitoring the performance of countries by updating the indicators over time. Sustainable child development refers to a development that supports children to meet their needs in the present living state and protects children to have ability for shaping their future prospects. Compared to sustainable development defined by Brundtland Report, sustainable child development takes children as a core and particularly stresses that the children should be supported and protected to satisfy their needs and to be capable to develop themselves during both current and future stages. Hence, the SCDI not only evaluates the current development status (e.g., eliminating risk behavior and reducing mortality) but also considers the restrictions that limit future development of children (e.g., scarcity of nature resources).

Previous work of the authors focused on the construction of the SCDI and the comparison of the SCDI and other existing development indices. First, topics, indicators and gaps associated with evaluating sustainable child development were identified to propose the framework of the SCDI [5,6]. As shown in Figure 1, the identified relevant topics were then classified into a hierarchical framework, consisting of themes, subthemes and criteria. Each theme (e.g., education) is specified by subthemes (e.g., attendance of education and government support on education), which are further described by criteria (e.g., enrolment in primary school and public expenditure on education), measured by indicators (e.g., gross enrolment rate of primary school and government expenditure on education as percentage of GDP) [5,6]. An indicator set was then selected regarding: (1) data availability, (2) association between indicators and (3) coverage of considered subthemes, criteria, countries and child population in the SCDI [6,7]. On the basis of the indicator set, the SCDI at present addresses five themes (health, education, safety, economic status and environmental aspects) described by 19 corresponding subthemes (e.g., child mortality, risk behavior, gender equality in education, macroeconomic situation and renewable energy consumption) measured by 25 indicators. The numbers in brackets in Figure 1 display the numbers of themes, subthemes, criteria and indicators considered in the indicator set. So far, the SCDI was calculated for 138 countries [7]. As being internationally agreed targets for sustainable development, the Sustainable Development Goals (SDGs) [8] were used to define the reference points for the indicators to evaluate countries' status of sustainable child development. The SCDI was designed as an aggregated score ranging between 0–1. The higher the SCDI score is, the better is the sustainable child development status for a country [7]. For example, the SCDI score for Sweden and Argentina is 0.840 and 0.710, respectively, indicating that Sweden has a better sustainable child development status than Argentina. Chang et al. [7] also demonstrated that

the SCDI complements existing development indices (e.g., the HDI and the CDI) to support a more comprehensive evaluation of sustainable development for countries. That is, the SCDI can evaluate the sustainable development status for countries differently than the HDI and the CDI by treating children as key stakeholders and by addressing environmental and additional topics (e.g., safety) connected to sustainable development.

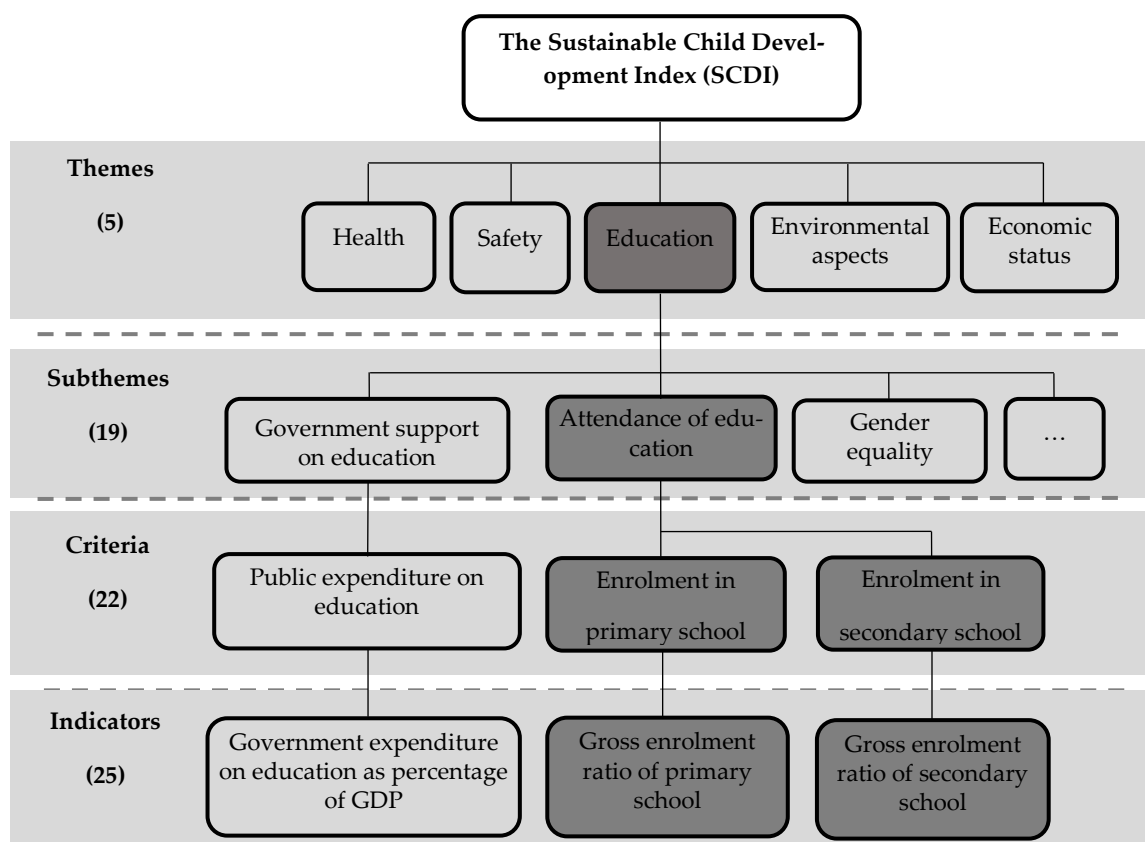


Figure 1. The SCDI framework (exemplary criteria and indicators are presented for the subtheme child mortality belonging to the theme health and highlighted in dark grey), adapted from Chang et al. [5–7]

Though the SCDI was established and its ability to complement existing sustainable development indices was demonstrated in previous work, it has not yet been applied in practice within sustainability assessments. Thus, the objective of this study is to propose application options of the SCDI. The application options are proposed by taking current practices of sustainability assessments (e.g., development indices and social sustainability assessment approaches and databases) into account. In this study, two potential ways to implement the SCDI for supporting decision making in development policies and enhancing existing sustainability assessments are proposed by the authors:

- Applying the SCDI similarly to the current practice of existing development indices (e.g., the HDI [3]) to assess the performance of sustainable development on different geographic levels and between population groups
- Integrating the SCDI framework into social sustainability assessment approaches (e.g., Social Life Cycle Assessment, SLCA [9] and Social Organizational Life Cycle Assessment, SOLCA [10]) and databases (e.g. Social Hotspots Database, SHDB [11]) to consider children as a stakeholder group and to enhance social impact assessment

The following sections present methodology (section 2), recommended application options of the SCDI – similar to existing development indices (section 3) and integrating the SCDI into existing social sustainability assessment approaches and databases (section 4) and discussion (section 5).

2. Methodology

This section presents, how application options of the SCDI were identified and selected. To identify potential application options, the current practice of existing development indices (Section 2.1) and social sustainability assessment approaches and databases (Section 2.2) were reviewed. Application options proposed by the authors and corresponding examples are provided in Sections 3 and 4 afterwards.

2.1. Reviewing the Current Practices of Existing Development Indices

Chang et al. [7] demonstrated that the SCDI complements the HDI. Therefore, current practices of the HDI were taken as references to suggest application options of the SCDI. The HDI was introduced by the United Nations Development Programme (UNDP) in the 1990s [12] and has been widely adopted in development studies and policy making to measure the development status of a country based on national average data of the whole population. Practices of the HDI in development studies and policy making were first reviewed by the authors. Based on this literature review, three types of practices of the HDI were identified: evaluating status of sustainable development: (1) on different geographic levels and (2) between population groups, and (3) for establishing other development indices.

2.2. Reviewing Existing Social Sustainability Assessment Approaches and Databases

As the SCDI addresses social and economic topics which are also assessed in existing child development as well as sustainable development research, the integration of the SCDI framework into current social sustainability assessment approaches and databases was considered as a potential application option. Social sustainability assessment approaches (Section 2.2.1) and databases (Section 2.2.2) were reviewed to investigate application options of the SCDI.

2.2.1. Social Sustainability Assessment Approaches

Building upon life-cycle based social sustainability assessment approaches [10,13–17], the authors proposed to apply the SCDI framework within Social Life Cycle Assessment (SLCA) and Social Organizational Life Cycle Assessment (SOLCA). In this Section, the background of SLCA and SOLCA is first introduced to facilitate understanding. Then, the approaches to demonstrate the integration of the SCDI framework into SLCA and SOLCA are explained.

SLCA was established in 2009 [9] and assesses social and socio-economic impacts of products from a life cycle perspective. According to The Guidelines for SLCA of products (hereafter referred to the Guidelines), social and socio-economic impacts can affect different stakeholder groups: workers, consumers, local communities, value chain actors and the society [9]. The SLCA framework defined in the Guidelines builds upon relevant socio-economic topics called subcategories which are measured by so-called inventory indicators. Subcategories can be aggregated to stakeholder groups and/or to impact categories. For example, for the stakeholder group workers, eight subcategories (e.g., freedom of association and collective bargaining, fair salary, and working hours) are suggested. The aggregation of subcategories into impact categories can help to integrate the results of the subcategories that have the same impacts [9]. The aggregated results could be further linked to areas of protection, e.g., human well-being. Abiding by the Guidelines, the ‘Methodological Sheets for Subcategories in SLCA’ (hereafter referred to the Methodological Sheets) were published to provide a practical guidance on how to evaluate the subcategories by suggesting indicators for its measurements [18]. Subcategories and indicators considered in the Methodological Sheets are specified for different stakeholder groups.

SOLCA was developed in 2015 and adapts the SLCA framework to an organizational level for providing a more direct evaluation of social and socio-economic impacts resulted from organizational behavior and context [10]. As most social impacts addressed in SLCA are influenced by organization’s behavior and national conditions (e.g., fair salary) rather than a product, an organizational approach may be more straightforward than a product approach to address social aspects. The conceptual framework of SOLCA was built based on the Guidelines and the Guidance on Organization-

al Life Cycle Assessment (OLCA) [19]—Which adapts product LCA to the organizational perspective. SOLCA inherits the considered stakeholder groups, subcategories and impact categories from the SLCA framework. Impact assessment and interpretation of SOLCA are mostly mapped according to SLCA [10]. Table 1 summarizes the key differences between the SLCA and SOLCA framework, e.g., different goal and unit of analysis.

Table 1. Summary of key differences between the SLCA and SOLCA framework, adapted from [10].

Method Requirement	SLCA	SOLCA
Goal	Assess social conditions and the socio-economic performance of a product throughout its life cycle and for its stakeholders	Assess social conditions and the socio-economic performance of an organization and its value chain and for its stakeholders
Unit of analysis	A functional unit referring to the quantified performance of a product system (e.g., a car driven for 30,000 km)	An organization and its portfolio (e.g., an organization that produces a series of cars)
Data collection	- Specific data for the product assessed is expected, at least for the identified hotspots. Screening social hotspots based on generic data (country or sector level) is recommended. - Collection of site-specific data is mostly done on an organization (or facility) level but not on a product level	- Specific data should be used for direct activities, at least for the identified hotspots. The use of generic or extrapolated data may be used for indirect activities. - Specific data are more likely to be available on organization, than on product level
Relating data to unit of analysis	Qualitative and perhaps some quantifiable data may not be expressible per unit of process or per product	Data collected for social aspects can mostly relate to the organization management and behavior in a direct way

So far, the missing consideration of children as a stakeholder group and a low development of quantitative social impact assessment method have been two of the challenges of SLCA and SOLCA. Though children are relevant in supporting sustainable development, children have not yet been considered as a stakeholder group in SLCA and SOLCA. For example, the Guidelines name future generations as a stakeholder group which can be optionally considered in SLCA studies. The Methodological Sheets do not suggest a corresponding framework and indicators for taking future generations into assessment [9]. Child labor is the only children-related subcategory in the Guidelines. Such a low concern on children's interests and their influence on sustainable development may consequently lead to a biased interpretation of social sustainability.

Lacking quantitative social impact pathways that describe relation between socio-economic topics is another challenge of SLCA and SOLCA [10,13]. Impact assessment aims at relating indicators for socio-economic topics to real impacts. Most of the SLCA studies (e.g., Ekener-Petersen & Finnveden [20] and Martínez-Blanco et al. [16]) applied performance reference points to conduct impact assessment for qualitatively or semi-quantitatively indicating the levels of social performance or impacts. The interwoven connection between socio-economic topics and the common usage of qualitative indicators brings the difficulty to describe the relation of socio-economic topics in a quantitative way. This difficulty consequently hinders the implementation of SLCA and SOLCA, and lead to an incomplete consideration of potential social impacts in SLCA and SOLCA studies.

Since the SCDI considers children as a stakeholder group and its framework encompasses and classifies the relevant topics of sustainable child development, this study investigates how the SCDI framework could be used to address the two challenges of SLCA and SOLCA.

First, as the SCDI is a children-oriented assessment, the SCDI framework could be used to suggest impact categories, subcategories and indicators which shall be addressed for a newly proposed stakeholder group, i.e., children, in SLCA and SOLCA. Furthermore, the SCDI could be directly used as a stakeholder-oriented index to assess the social conditions specified for the proposed stakeholder group children and to initiate the development of other stakeholder-oriented indices for other stakeholder groups in SLCA and SOLCA.

Second, the SCDI framework could be a laying ground to initiate the development of social impact pathways. The SCDI framework provides qualitative description of the relation between the

themes, subthemes and criteria (see Figure 1). To have a closer investigation of the relation between the SCDI criteria, this study examined the relation between the selected SCDI criteria from different themes and provided quantitative description of the relation. When the interlinkages between the SCDI criteria across different themes are demonstrated, the results can in turn support the interwoven nature of socio-economic topics. For example, education can relate to health or safety topics. According to the examined relation between the selected SCDI criteria, a preliminary social impact pathway could be proposed.

Path analysis was applied to examine the validity of relation and to quantify the strength of relation between selected criteria. Path analysis is a statistical technique extending from linear regression that can examine if a given data set fits the hypothesized relations specified in the hypothesized relation model and can assess the strength of relation between the selected criteria along hypothesized pathways [21]. This technique was firstly proposed by Sewall Wright [22,23] and has been applied in phylogenetic, social and behavioral studies [24–29].

Path analysis consists of three steps. First, a relation model (hereafter referred to exemplary socio-economic relation model) was established to consider the hypothesized relations between criteria. Second, linear regression was performed to examine the validity of hypothesized relations. Path coefficients from linear regression present relative magnitude and the sign (positive or negative) of the relation between criteria. The value of the path coefficient varies between +1 and −1. Path coefficient of ± 1 occurs if a criterion could potentially contribute all the (positive or negative) attribution to another criterion. Therefore, this study uses path coefficients to compare the magnitude of the relation between criteria. Third, direct and indirect relation between criteria was investigated according to the results of linear regression. The strength of indirect relation between two criteria was estimated by multiplying the path coefficients along the pathways between the two criteria [21,25,27,28].

An exemplary socio-economic relation model was thus established for showing how to use the SCDI framework and path analysis to initiate the development of social impact pathways. Tertiary education (referring to both public and private universities, colleges, advanced vocational and professional education [30]) is significant in diminishing poverty and fostering growth. Verner [31] found that completed tertiary education reduces poverty more effectively than secondary education. Also, population who complete tertiary education are six times less likely to fall below the poverty line than those who complete primary education. The economic return for tertiary education graduates is estimated 17% enlargement in earnings as compared with 10% for primary and 7% for secondary education [32]. As tertiary education is a key to tackle poverty, the relation between the criterion completion of tertiary education and other criteria selected from the SCDI framework was analyzed in the exemplification.

The results of correlation analysis performed in Chang et al. [7] was used to choose the criteria associated with the criterion completion of tertiary education. Six criteria of the SCDI were chosen as their corresponding indicators were found to have association with the indicator for the criterion completion of tertiary education: enrolment in tertiary education, children involved in child labor, children married or in union, adolescent fertility, public expenditure on tertiary education, and household and ambient air pollution. Then, it is reasonable to further examine and quantify the relation between the six selected criteria and the criterion completion of tertiary education. The criteria completion of tertiary education, enrolment in tertiary education and public expenditure on tertiary education are classified into the theme education in the SCDI framework. The criteria children involved in child labor, and children married or in union are categorized into the theme safety; the criteria adolescent fertility and household and ambient air pollution are selected from the theme health. Spreadsheet S1 in the supplementary material provides the seven indicators and their latest statistical data used in the path analysis. The numbers of addressed countries and the reference year of the statistical data for the indicators are also presented in Spreadsheet S1. Spreadsheet S2 in the supplementary material provides the results of correlation analysis for the seven considered indicators. Hypotheses of the relations between the six selected criteria and the criterion completion of tertiary education were defined by the authors based on the correlation analysis and are described in Spreadsheet S3 in the supplementary material. The path analysis was then programmed by IBM

SPSS Statistics [33]. It should be noticed that the exemplary socio-economic relation model only considered some of the possible relations to demonstrate the quantification of relation between criteria.

The causality between the selected criteria is hard to examine and quantify due to the interconnection of socio-economic topics and the difficulty in determining the causality within temporal sequence. Therefore, this study focuses on a quantitative assessment of the relation of the selected criteria to get a step closer to the causality of socio-economic topics.

2.2.2. Social Sustainability Databases

Integrating the SCDI into a social sustainability database can support the generic assessment of social condition and development status for countries. According to the experience of using social sustainability databases [34], the authors selected and examined the Social Hotspots Database (SHDB). In current social sustainability studies, the SHDB is usually used a screening tool to provide a generic assessment by identifying the social hotspots for countries and sectors [11,35]. The SHDB has been developed by New Earth and provides social risk information on five categories, namely human rights, health and safety, labor rights and decent work, governance, and community infrastructure, described by 22 social themes including 89 issues characterized for risk for countries or country-specific-sectors and 133 indicators [11,35,36]. Practitioners can thus compare and analyze risks for individual social issues for countries or selected country-specific-sectors (e.g., German manufacturing sector) in a supply chain. The Social Hotspots Index (SHI), which considers topics and indicators selected from the SHDB, is available to summarize the large amount of social risk information for the country-specific-sectors in a supply chain [11,35]. The SHI considers 39 indicators for the five categories and 22 themes selected, and is determined by means of a weighted sum approach [37]. However, identical to the challenge identified in SLCA and SOLCA, there is a limited consideration of children in the SHDB. For example, only three out of the 133 indicators used in the SHDB address health, education and child labor issues connected to sustainable child development. Among the 39 indicators considered in the SHI, only two indicators (i.e., percentage of child labor and percentage of children out of primary education) are directly linked to children. Hence, using the SCDI to tackle this challenge was also taken into consideration to propose application options of the SCDI. A case study involving a bamboo bike supply chain [34] was conducted to compare the social condition assessed by the SCDI and the SHI.

3. Application of the SCDI Similar to Existing Development Indices

According to Chang et al. [7], the SCDI enables a complementary assessment to whole-population oriented indices, such as Human Development Index (HDI), by assessing sustainable development performance for countries or regions with a focus on children. Three applications for the SCDI based on the present use of the HDI are suggested as follows: (1) evaluating the achievement of sustainable child development on different geographic levels, (2) comparing the development condition between population groups, and (3) being as basis to establish further development indices.

First, the SCDI can be used to assess the status of sustainable child development on different geographic levels. Basically, the SCDI can be used to compare and monitor countries' achievement regarding sustainable child development. Like the HDI results presented in the annual human development reports published by the United Nations Development Programme [38], the trends on enhancements and declines of the performance for countries regarding sustainable child development can be continually updated. The SCDI results can thus provide information for both the sustainable child development status, and support policy making by showing hotspots of the considered topics of sustainable child development. Regarding the indicators with different update frequency, an updating frequency of the SCDI is suggested as 1–4 years. This proposed updating frequency could be reasonable and realistic since a longer time frame (than just one year) may be required to clearly reflect the trend of the country's performance [6,7].

Furthermore, breaking down from country level, the SCDI can analyze the inequality on the sustainable child development between regions and cities for supporting policy making. Some exist-

ing studies which applied the HDI on regional level can serve as basis to suggest applications of the SCDI. For example, Schrott et al. [39] modified the HDI to assess the development status across the provinces of Austria. The results showed substantial differences of the HDI results in life expectancy between the provinces. The study also found an inequality of income and educational level within and between provinces, emphasizing the needs of policies to lower the infrastructure weakness in rural regions. Antony and Visweswara Rao [40] used both the HDI and Human Poverty Index to analyze the variations in poverty, health, nutritional status and standard of living among Indian states, and concluded that demographic, socio-economic, health and dietary indicators determined the real standard of living for India.

Moreover, the SCDI can be performed similarly to the HDI to describe the development condition between population groups (e.g., different ethnic and income groups). For instance, Segura and Birson [41] adapted the HDI and found an inequality in human capital and social well-being between the ethnic groups within the United States. The findings revealed the needs for addressing the gaps in the unequal development status between the ethnic groups. Cooke et al. [42] applied the HDI to compare the development of indigenous people and the general populations in Australia, Canada, New Zealand and the United States. The assessed countries were evaluated as high human development countries, nevertheless, their resident indigenous people were only recognized in medium human development, calling for the efforts to improve the living condition of indigenous people. Especially, Australian society faced the increasing gap in human development between indigenous people and the general population. The results indicated that the Australian government shall address this development gap in the existing development policy in priority. Focusing on the socio-economic distribution, Harttgen and Klasen [43] and Grimm et al. [44] performed the HDI at the household level to capture the inequality of human development between income groups within and among countries. The studies proved that inequality was large for countries assessed as low human development countries, especially for African countries. The results could raise awareness to governments to take measures to tackle income inequality for lowering the gap in development progress within their countries. By following those applications, the SCDI allows for analyzing sustainable development achievement with a focus on children to explore the inequality on development achievement among population groups, such as different ethnics, income groups and education level, etc.

In addition, the SCDI can be used as basis for establishing further development indices. By including additional topics with regard to sustainable development e.g., poverty, the SCDI can be adapted and then applied for different specific assessment purposes. The indices derived from the HDI can be used as a reference to construct new indices based on the SCDI. For example, the HDI has been further adapted in many studies by considering specific topics associated to sustainable development such as inequality (e.g., Inequality-adjusted HDI [45]), deprivations level (e.g., Multi-dimensional Poverty Index [46]), and environment (Sustainability Adjusted HDI [47]). These indices derived from the HDI take the three dimensions of the HDI (i.e., long and healthy life, knowledge and a standard of living) as the core of schemes, and then the schemes are modified by considering additional topics. Via adding topics connected to sustainable development into the SCDI framework, these SCDI-derived indices can evaluate the status of sustainable child development for different purposes and can thus perform as tools to support decision-making in sustainable development policies with a focus on children.

4. Integration of the SCDI Framework into Existing Social Sustainability Assessment Approaches and Databases

In this section, the integration of the SCDI framework into Social Life Cycle Assessment (SLCA) and Social Life Cycle Assessment (SOLCA) (Section 4.1), and the Social Hotspots Database (SHDB) (Section 4.2) is presented.

4.1. Integration of the SCDI Framework into SLCA and SOLCA Scheme

Two options of how the SCDI framework could be integrated into both the SLCA and SOLCA scheme are suggested and described in the following two subsections:

- Proposing children as a new regularly considered stakeholder group and suggesting its corresponding indicators, subcategories and impact categories (section 4.1.1)
- Using the SCDI framework (e.g. criteria and indicators) for initiating the development of social impact pathways (section 4.1.2)

4.1.1. Proposal of Children as a New Stakeholder Group

The SCDI framework can complement the existing SLCA and SOLCA framework by laying a ground for establishing a new stakeholder group namely children and its according impact categories, subcategories and indicators. Children, inter-generational equity and sustainable development are inseparable from each other. In line with this concept, children shall thus be proposed as a regularly considered stakeholder group to ensure that sustainable development is considered in SLCA and SOLCA studies. The SCDI takes children as the core of assessment and consists of five themes (i.e., health, education, safety, economic status, and environmental aspects) relevant to sustainable child development. As shown in Figures 1 and 2, each theme of the SCDI is specified by subthemes, and these subthemes are further described by criteria measured by indicators [5–7].

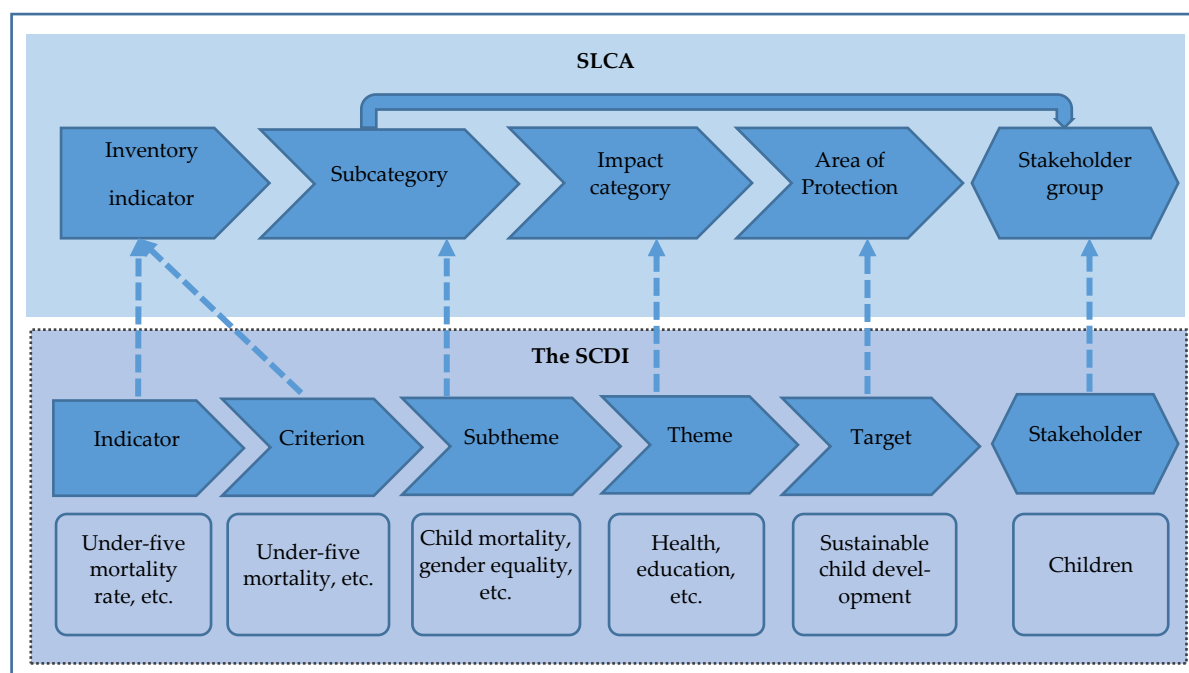


Figure 2. Scheme of SLCA and SOLCA (based on UNEP [9]) and an exemplary relation of the SCDI framework to SLCA and SOLCA.

This hierarchical structure is similar to the SLCA framework: The five themes of the SCDI can be treated as impact categories in SLCA and SOLCA, and the subthemes of the SCDI can be applied as the subcategories for the newly proposed stakeholder group, children (see dotted lines in Figure 2). The five themes of the SCDI can be used as impact categories to aggregate the results of subcategories on a higher level in SLCA and SOLCA scheme. The criteria of the SCDI can be used to specify

the associated subcategories in the SLCA and SOLCA framework and then assessed by the indicators. The impact categories, subcategories and indicators (adapted from the present SCDI framework [7]) proposed for the stakeholder group children are listed in Table 2. It shall be noticed that the assessment scope of the SCDI is not consistent with the assessment scope of SLCA and SOLCA. Compared to SLCA and SOLCA, the SCDI provides a broader assessment scope by further addressing environmental aspects.

Table 2. Impact categories, subcategories and indicators for the proposed stakeholder group children, adapted from the current SCDI framework [7].

Stakeholder Group	Impact Category	Subcategory	Indicator
Children	Health	Child mortality	Under-five mortality rate (probability of dying by age five per 1000 live births)
		Immunization coverage	Diphtheria tetanus toxoid and pertussis (DTP3) immunization coverage among one-year-olds (%)
		Nutrition	Percentage of infants born with low birth weight (<2500 g)
		Risk behavior	15–19 years old heavy episodic drinkers (% by country) Adolescent fertility rate (per 1000 girls aged 15–19 years)
		Mental health	Suicide rate (per 100,000 aged 15–29 years)
		Oral health	DMFT (decayed, missing or filled teeth) among 12-year-olds
		Health expenditure	Health expenditure, public (% of total health expenditure)
		Hazardous pollutant	Mortality rate attributed to household and ambient air pollution (per 100,000 population) PM2.5 air pollution, population exposed to levels exceeding WHO guideline value (% of total)
	Education	Early childhood education	Gross enrolment ratio, pre-primary, both sexes (%)
		Attendance of education	Gross enrolment ratio, primary, both sexes (%)
			Gross enrolment ratio, secondary, both sexes (%)
		Gender equality	Gross enrolment ratio, pre-primary, gender parity index
			Gross enrolment ratio, primary, gender parity index
			Gross enrolment ratio, secondary, gender parity index
			Gross enrolment ratio, tertiary, gender parity index
		Government support on education	Government expenditure on education (% of GDP)
	Safety	Violence and crime	Intentional homicide count and rate per 100,000 population
		Demographic structure	Sex ratio at birth (ratio)
	Economic status	Housing quality	Access to electricity (% of population)
		Macroeconomic situation	Youth unemployment rate (% of total labor force ages 15–24)
			Public debt (% of GDP)
	Environmental aspects	Freshwater vulnerability	Water depletion index (WDI) (ratio)
		Renewable energy consumption	Renewable energy consumption (% of total final energy consumption)

New methodological sheets that contain the suggested subcategories and corresponding indicators (in Table 2) for the newly proposed stakeholder group (i.e., children) shall then be developed and complement the existing ones for the other stakeholder groups. It shall be noticed that so far there are no available studies providing the subcategories and corresponding indicators for stakeholder groups for SOLCA. Since SOLCA inherits the structure consisting of stakeholder groups and subcategories from SLCA, the methodological sheets that address the subcategories and corresponding indicators for children is suitable to SOLCA as well.

Moreover, the SCDI can be used as a stakeholder-oriented index to evaluate the social conditions specified for the stakeholder group children and initiate the development of other stakeholder-oriented indices for other stakeholder groups in SLCA and SOLCA. Since the SCDI scores are determined by combining several topics and indicators of sustainable child development, the SCDI can be used as an index to describe the social conditions for the stakeholder group children for countries in SLCA and SOLCA studies. This SCDI application can be an illustration for initiating stakeholder-oriented indices for other stakeholder groups in SLCA and SOLCA. For example, a stakeholder-oriented index for workers can be established by considering the subcategories connected to workers (e.g., the subcategories freedom of association and collective bargaining, fair salary, hours of work, and health and safety) for providing an overall assessment of social impacts on workers. This stakeholder-oriented index establishment can facilitate stakeholder-oriented analysis of social conditions in SLCA and SOLCA studies. This application is not identical to the first proposed application option which uses the SCDI compares and traces the status of sustainable child development on different geographic levels and between population groups (see Section 3). This application specifies how to use the SCDI to support stakeholder-oriented assessment in SLCA and SOLCA studies. Organizational behavior can be directly, significantly influenced by social conditions in different countries. At present the SCDI can evaluate an overall status of sustainable development as well as social conditions on country level. Therefore, compared to using the SCDI to link the generic social conditions to a specific product assessed in SLCA, the SCDI can provide a closer investigation of social context for an organization in SOLCA studies.

4.1.2. Supporting the Development of Quantitative Social Impact Pathways

This section presents how to use the SCDI framework (e.g., themes, subthemes, criteria and indicators) as basis to initiate the development of social impact pathways for the impact assessment in SLCA and SOLCA. The results of path analysis showed the validity of the hypothesized relation between the selected criteria and provided quantitative information on the strength of the valid relation (Section 4.1.2.1). A preliminary social impact pathway was then established according to the results of path analysis (Section 4.1.2.2).

Results of Path Analysis

In line with the results of the path analysis, the validity and the strength of the relations considered in the exemplary socio-economic relation model are illustrated in Figure 3. Each straight arrow (in Figure 3) shows a valid relation between two criteria, heading from the potential factor to the condition. Dotted arrows in Figure 3 present the invalid relations according to the path analysis. Spreadsheet S4 in the supplementary material presents the detailed outcome of the path analysis.

The key messages gained from the path analysis (based on the exemplary socio-economic relation model) are summarized in the following bullet points and are then explained in detail.

- The criterion enrolment in tertiary education has a direct relation to the criterion completion of tertiary education.
- The criteria adolescent fertility, children involved in child labor, public expenditure on tertiary education, and children married or in union have an indirect relation to the criterion completion of tertiary education.
- The criterion enrolment in tertiary education presents the strongest relation to the criterion completion of tertiary education, followed by the criteria adolescent fertility, children involved in child labor, public expenditure on tertiary education and children married or in union.

The results of path analysis denote that the criterion completion of tertiary education is directly related to and can be predicted by the criterion enrolment in tertiary education (via P_{12} and H_{12}) in the socio-economic relation model. The criteria adolescent fertility (via P_3 and H_3), children involved in child labor (via P_4 and H_4) and public expenditure on tertiary education (via P_6 and H_6) have direct relation to the criterion enrolment in tertiary education and thus have indirect relation to the criteri-

on completion of tertiary education. In addition, the criterion children married or in union has indirect relation to both the criteria completion of tertiary education and enrolment in tertiary education by its direct relation to the criterion adolescent fertility (via P_1 and H_1). The results also show that the relation of the criterion household and ambient air pollution to the criteria enrolment in tertiary education and completion of tertiary education is not of statistical significance.

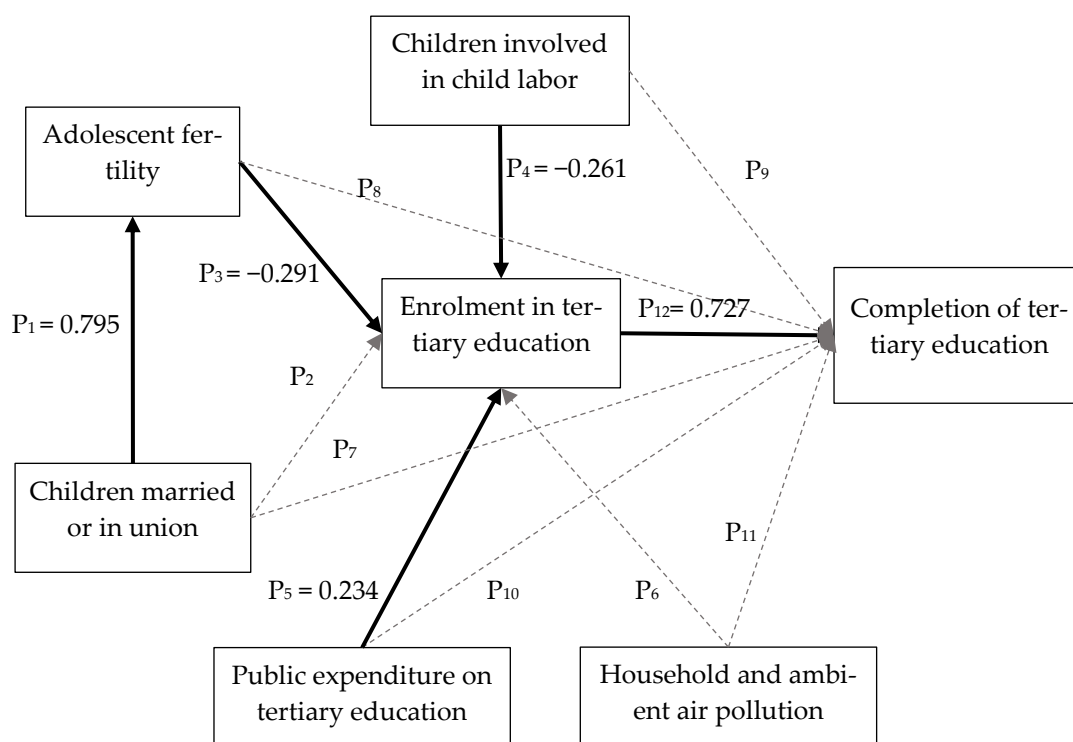


Figure 3. An exemplary socio-economic relation model including the presumed pathways between the six selected criteria and the criterion completion of tertiary education and the strength of the valid relation.

Moreover, the path analysis results indicated that the criterion enrolment in tertiary education has the strongest relation to the criterion completion of tertiary education among the selected criteria, followed by the criteria adolescent fertility, children involved in child labor, public expenditure on tertiary education and children married or in union. According to Figure 3, the criterion adolescent fertility has an indirect relation to the criterion completion of tertiary education through its direct relation to the criterion enrolment in tertiary education (via the pathways P_3 and P_{12}). The strength of the indirect relation of the criterion adolescent fertility to the criterion completion of tertiary education (path coefficient of -0.212) was derived by multiplying the path coefficients for P_3 and P_{12} . Following the same logic, the indirect relation of the criteria children involved in child labor (path coefficient of -0.190), public expenditure on tertiary education (path coefficient of 0.170) and children married or in union (path coefficient of -0.168) to the criterion completion of tertiary education were estimated. According to the magnitude of the derived path coefficients, the strength of the relation between the selected criteria and the criterion completion of tertiary education were thus compared.

Several studies provided a similar description to the key messages gained from the path analysis. For example, the criteria adolescent fertility, children involved in child labor and children married or in union were recognized as negative factors that relate to the attendance of secondary and higher levels of education (i.e., tertiary education). The criteria child marriage and adolescent fertility may limit opportunities for attending education and likely contribute to school dropout [48,49]. Delprato et al. [50] found that delaying early marriage by one year is associated with an increase of half a year of education in Sub-Saharan Africa and one third of a year of education in South West Asia. According to Presler-Marshall and Jones [51], 90% of adolescent fertility in the developing world are to girls who are married. In general, the majority (75%) of adolescent fertility are planned

and associated with child marriage. These studies support that the two selected criteria adolescent fertility and children married or in union may have direct relation to the criterion enrolment of tertiary education and indirect relation to the criterion completion of tertiary education. In addition, Putnick and Bornstein [52] found a significant negative relation between child labor and enrollment of school in 30 low- and middle-income developing countries. Guarcello et al. [53] pointed out the risk that engagement in employment increases the probability of being out of school among 25 developing countries. The two studies could support the identified direct relation between the criteria children involved in child labor and enrolment of tertiary education and the potential indirect relation between the criteria children involved in child labor and completion of tertiary education (due to the school dropout). Public expenditure was identified in literature as a positive factor that contribute to tertiary education attainment. Trostel [54] found that state funding for tertiary education has significant attribution to both college enrollment and degree attainment based on 22 years of U.S. interstate data (1985–2006). Haveman and Smeeding [55] pointed out that public expenditure on tertiary education is a key factor to foster the attendance of tertiary education for the students in poor and minority neighborhoods. These two studies support that the criterion public expenditure on tertiary education has direct relation to enrolment of tertiary education and thus indirect relation to completion of tertiary education.

The results of path analysis also showed that the SCDI criteria classified into different themes can be interlinked. In the exemplary socio-economic relation model, the seven selected SCDI criteria were not classified into the same themes in the SCDI framework. The criteria enrolment in tertiary education and completion of tertiary education are classified to the theme education. The criterion adolescent fertility is categorized in the theme health, and for the criteria children married or in union and children married or in union is the theme safety. The results of the path analysis demonstrated that education topics can relate to health or safety issues and supported the interwoven linkage between socio-economic topics.

Establishment of a Preliminary Social Impact Pathway

By using the results of the path analysis, a preliminary social impact pathway addressing completion of tertiary education can be illustrated based on the structure of impact pathways in environmental LCA. In environmental LCA, an impact pathway quantitatively describes the relation between inventory indicators (e.g., greenhouse gas emissions) and impacts classified into impact categories at the midpoint level (e.g., climate change) and impact categories at the endpoint level (e.g., damage to ecosystem diversity [56,57]). Impacts at the endpoint level are then linked to AoPs (e.g., ecosystem quality). The inventory results are firstly classified to a specific impact category (namely classification), and then multiplied by characterization factors which presents their relative contribution to the impact (namely characterization [56,57]). For example, the greenhouse gas emissions are classified into the midpoint impact category climate change. Per kilogram of the greenhouse gas emissions carbon dioxide, methane, and dinitrogen oxide are respectively characterized as 1, 34, and 298 kg carbon dioxide equivalent (kg CO₂eq.) to present their relative contribution to the impact category indicator global warming potential in kg CO₂eq. [58] for the midpoint impact category climate change.

Taking the structure of impact pathways used in LCA as reference, completion of tertiary education, is presumed as a mid-point impact category (as shown in Figure 4). Pathways between the five criteria (i.e., enrolment in tertiary education, adolescent fertility, children involved in child labor, public expenditure on tertiary education and children married or in union) and the criterion completion of tertiary education are presented in the preliminary impact pathway. Moreover, Figure 4 maps that the presumed midpoint impact category completion of tertiary education can link to the endpoint impact category knowledge (adapted from the SCDI theme education), which links to the newly suggested area of protection for children, namely child well-being (i.e., present living state) and well-becoming (i.e., future prospects). Child well-being and well-becoming indicates how children live with the current state and how the present living state shapes children's future prospects, connecting well-being of adults and thus societies [59]. This newly proposed area of protection closely

responds to the definition of sustainable child development stated in introduction. It shall be noticed that the relation between the impact categories at midpoint and endpoint level and the area of protection (illustrated as the dotted arrows in Figure 4) is not investigated in this study. It is worthy to note that path coefficients are not identical to the characterization factors used in LCA. For example, by investigating the magnitude of path coefficients, the strength of the relation of different criteria to the presumed midpoint impact category completion of tertiary education can be compared. It does not attempt to transform the relation between different criteria and the presumed midpoint impact category into an equivalent unit.

Figure 4 also showed that the SCDI criteria could be allocated to inventory or impact level in social impact pathways (based on the structure of impact pathways in environmental LCA). This outcome is not fully identical to the proposed integration of the SCDI framework into SLCA and SOLCA (see Figure 2). In Section 4.1.1, the SCDI criteria were suggested to be as inventory indicators describing subcategories for the new stakeholder group, namely children. While we projected the examined relation between the selected SCDI criteria into an impact pathway, potential contribution of one SCDI criterion to another was found. However, it is not necessary to consider that the results of the preliminary social impact pathway conflict with the proposed integration of the SCDI framework to SLCA and SOLCA. The key reason is that one criterion could be inventory or impact according to different hypotheses of relation or in different social impact pathways.

In brief, the exemplification demonstrates the initiative of social impact pathways based on a provision of the SCDI topics (e.g., criteria and themes) and indicators, and a quantitative evaluation of the strength of relation by path analysis. Academia specialized in social studies and development research can take the exemplification as reference to quantitatively measure the relation between socio-economic topics in general. The results of this exemplification can also be used to support governments and public bodies to design the policies regarding child development as well as sustainable development. The path analysis pointed out that enrolment of tertiary education is instrumental in fostering completion of tertiary education. Authorizations shall then consider the measures that support enrolment on tertiary education in policy making. Public expenditure is also identified as a factor that can positively contribute to enrolment of tertiary education and thus completion of tertiary education. Besides, since the criteria adolescent fertility, children married or in union, children involved in child labor were found negatively relating to the criterion completion of tertiary education, these three criteria need to be mitigated and concerned in child development or sustainable development policies for enhancing knowledge (gained from tertiary education) level of population in a country.

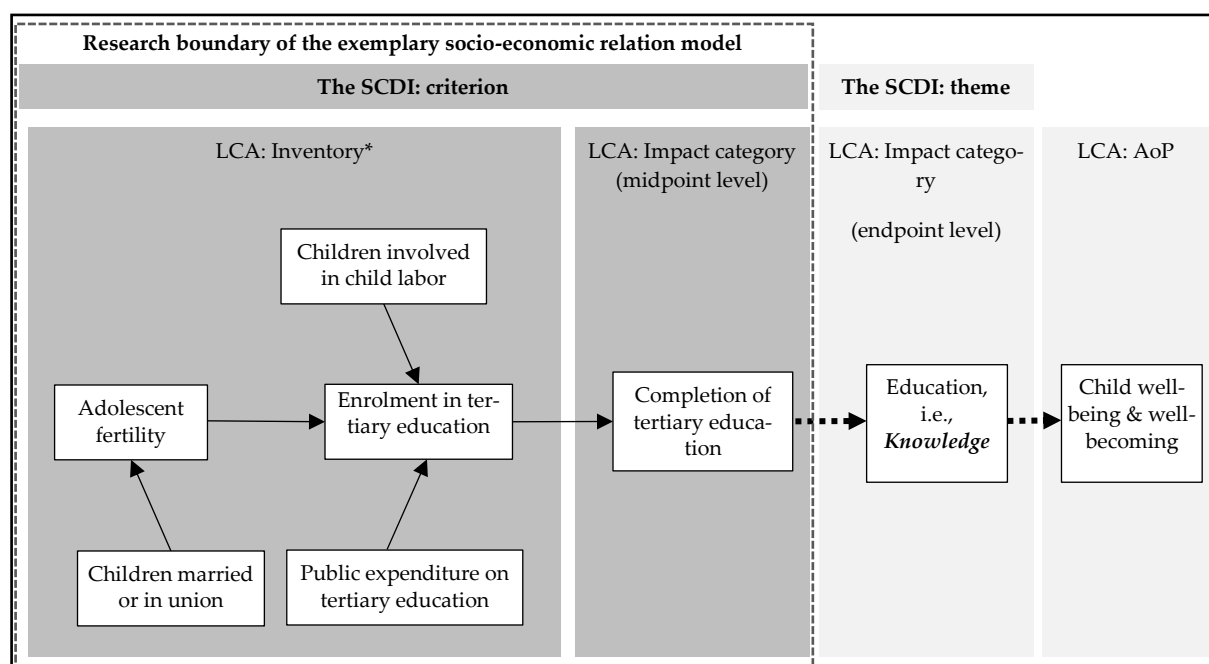


Figure 4. A preliminary social impact pathway addressing the criterion completion of tertiary education and its relation to the impact assessment of LCA and the SCDI framework. * Inventory denotes the selected criteria that may relate to the presumed midpoint impact category.

4.2. Inclusion of the SCDI into the SHDB

To overcome the missing consideration of children in the Social Hotspots Database (SHDB), the SCDI can be added as a new indicator in the SHDB to describe the degree of sustainable development for countries. For example, while using the SHDB to conduct a generic assessment, practitioners can apply the SCDI to evaluate and compare the status of sustainable child development for countries involving in a supply chain.

In addition, the SCDI can be used as a complementary assessment to the Social Hotspots Index (SHI). The SHI was designed for summarizing social risks for countries and country-specific-sectors from a whole-population-oriented perspective. For having a more complete interpretation of countries' social conditions, the SCDI is thus recommended to be applied together with the SHI in generic assessments. It shall be noticed that the SCDI at present only provide assessment at country level.

To compare the social risks of countries assessed by the SCDI and the SHI, a case study of the life cycle of a bamboo bike sold and used in Germany was conducted. Social risks evaluated for country-specific-sectors by the SHI can be used to interpret the status with regard to sustainable development for countries. According to Chang et al. [34], bamboos were assumed to be planted and processed in China; steel, aluminum, plastics and rubber components were presumed to be manufactured in Germany. Based on the German raw material situation report [60], raw material for manufacturing steel and aluminum components were mainly imported from Brazil and Ireland respectively. Hence, China, Brazil, Ireland and Germany were the four countries considered in the case study. Based on the data in SHDB, China has the highest SHI scores (210.91), followed by Brazil (112.79), Ireland (46.83) and Germany (22.08). The higher the SHI score is, the higher are social risks in a country-specific-sector. The result indicates that China and Brazil are the country assessed with the highest social risks, which could imply unfavorable status regarding sustainable development. The SCDI scores show that Brazil (0.794) has better sustainable child development status than Germany (0.793), Ireland (0.781), and China (0.724) [7]. The higher the SCDI score is, the better is the sustainable child development status for a country. To illustrate the results of the comparison, Figure 5 shows the country ranking regarding their social risks assessed by the SCDI and the SHI of the bamboo bike case study. Compared to the other considered countries, Brazil has a significant difference between the ranking assessed by the SCDI and the SHI. Different to the ranking evaluated by the SHI, Brazil shows the best ranking assessed by the SCDI among the four countries. This advantage results from having a better performance in the subthemes freshwater vulnerability and renewable energy consumption considered for the theme environmental aspects in the SCDI. Besides, only China has the same rank assessed by the SHI and the SCDI. This outcome points out that the SCDI leads to different social risks assessed for countries than the SHI by considering children as the key stakeholder group. By using the SCDI as a complementary assessment to SHI in the SHDB, organizations can screen the social risks of the countries which involve in a supply chain of a specific product to support supply chain management.

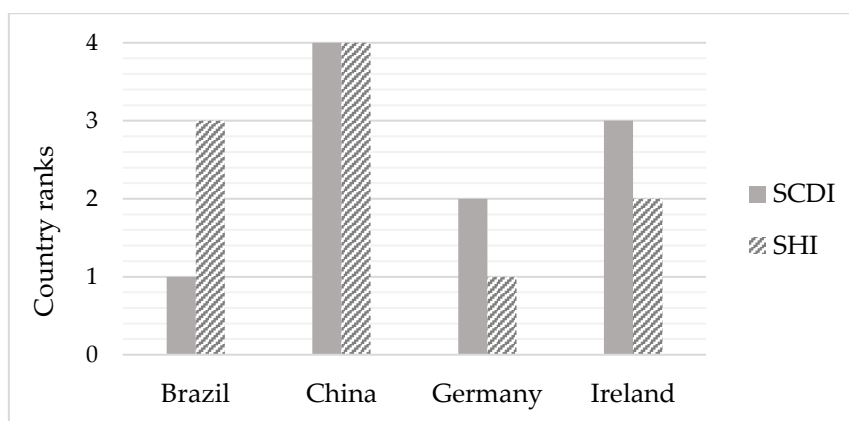


Figure 5. Ranking assessed by the SHI and the SCDI for the four countries involving the bamboo bike supply chain case study (1: Best, 4: Worst).

5. Discussion

This section presents the limitations with regard to the proposed application options of the SCDI. Research limitations are clustered into three groups: Limitations for applying the SCDI similarly to existing development indices (Section 5.1), for integrating the SCDI into SLCA, SOLCA and the SHDB as a complementary assessment (Section 5.2), and for initiating the development of quantitative social impact pathways (Section 5.3).

5.1. Limitations for Applying the SCDI Similarly to Existing Development Indices

First, alike the feature of all indices, the SCDI summarizes a large amount of information from the included indicators. Apart from the aggregated results, the practitioners shall also examine and show the results of individual indicators in a transparent way to avoid overlooking the potential gaps for achieving sustainable child development. Additionally, reference years of statistical data for the indicators used in the SCDI are not identical. Statistical data for most of indicators (e.g., for describing child mortality and attendance of education), are updated annually. On the other hand, some indicators (e.g., for describing mental health and renewable energy consumption) are not frequently updated. This inconsistency shall be noticed when interpreting the SCDI results, especially while monitoring the trend of sustainable child development achievement for countries.

5.2. Limitations for Integrating the SCDI into SLCA, SOLCA and the SHDB as a Complementary Assessment

Assessment scopes of the SCDI, SLCA, SOLCA and the SHDB are different. The SCDI evaluates the status of sustainable development for countries with regard to all the three pillars of sustainable development. Compared to SLCA, SOLCA and the SHDB, the SCDI provides a broader assessment scope by further addressing environmental aspects. Thus, different assessment scopes of the considered dimensions of sustainable development shall be noticed while applying the SCDI in SLCA and SOLCA case studies and comparing the results of the SCDI and the SHI. Additionally, it shall be noticed that the SCDI at present evaluates sustainable child development on country rather than sector/organization/product level. Results of the SCDI can be applied to reflect the generic social conditions for countries but should not be directly interpreted as social risks caused by country-specific-sectors, organizations or products.

5.3. Limitations for Initiating the Development of Quantitative Social Impact Pathways

The statistic technique of path analysis is based on linear regressions to examine the validity of hypotheses for the hypothesized relations. It follows the common assumptions of linear regression, e.g., data linearity, and unidirectional relation flow (e.g., no loop [21,25,61]). However, socio-economic topics are difficult to meet these presumptions of linear regression. Socio-economic topics

could relate to each other within a loop. For instance, completion of tertiary education and the selected SCDI criteria could be interdependent. This interdependence brings difficulty and uncertainty in quantifying and interpreting the relation.

Reference year of statistical data for the indicators applied in the exemplary socio-economic relation model are not identical. For instance, statistical data for the indicator “adolescent fertility rate (per 1000 girls aged 15–19 years)” are updated to the year 2015. For the indicator “gross enrolment ratio in tertiary education”, the latest data for countries vary from the year 2003 to 2015. This inconsistency in statistical data can lead to uncertainty of the results of the path analysis.

Moreover, path analysis examines if a given data set fits the hypothesized relation specified in the hypothesized relation model, but it can neither prove the existence of relation, nor test compatibility of the hypothesized relation model [21,27,61]. Additionally, the comprehensiveness of considered SCDI criteria and the completeness of the proposed pathways for the considered SCDI criteria can largely influence the robustness of the results. The selected SCDI criteria and the presumed relation were used to exemplify how to quantify comparative strength of the relation between socio-economic topics. Other topics of sustainable child development can be added to extend and refine this exemplary relation model. Besides, since the indirect relation between the selected SCDI criteria were estimated by multiplying the path coefficients along the pathways, the uncertainty and statistical errors could be expanded.

In addition, it is noteworthy to discuss that the identified relation between the selected SCDI criteria does not contradict to the developed SCDI framework. The classification of the relevant topics and indicators of the SCDI was made based on the literature review in existing development studies, and it does not necessarily indicate the criteria can only relate to the criteria within the same theme. As the results of the path analysis, an education topic can relate to health and safety issues. The identified relation reflects the complex nature and interwoven linkages between socio-economic topics.

6. Conclusions

The Sustainable Child Development Index (SCDI) was developed in previous work to evaluate countries’ status of sustainable development by considering children as the key stakeholder and addressing topics in the context of inter-generational equity (e.g., environmental aspects). This study suggests two directions of application options to put the SCDI into practice. Both directions deal with the fact that the SCDI addresses the missing consideration of children in these sustainability assessments and databases. By putting the SCDI into practice, the SCDI can contribute to supporting decision making in development policies and enhancing existing sustainability assessments.

First, the SCDI can be used similarly to the current practice of existing development indices for comparing and tracing the status of sustainable child development on different geographic levels and population groups. The SCDI can also be expanded for including additional topics for different purposes of sustainability assessments.

Second, the SCDI framework can be integrated into existing social sustainability assessment approaches and databases to tackle the missing consideration of children and to support the development of quantitative social impact pathways. The SCDI framework can be used to complement the existing SLCA and SOLCA scheme by proposing a new stakeholder group and corresponding impact categories, subcategories and indicators connected to sustainable child development. The SCDI can be used as a reference to initiate the establishment of stakeholder-oriented indices for existing stakeholder groups in SLCA and SOLCA. In addition, by the provision of the SCDI framework and the application of path analysis, this study demonstrates how to quantify the strength of the relation between the selected SCDI criteria and the criterion completion of tertiary education and thus establishes a preliminary social impact pathway addressing completion of tertiary education. According to the path analysis, the criterion enrolment in tertiary education presents the strongest relation to the criterion completion of tertiary education, followed by the criteria adolescent fertility, children involved in child labor, public expenditure on tertiary education and children married or in union. Scholars can take the exemplification as reference to quantitatively measure the relation between

socio-economic topics in general. Moreover, the SCDI can be considered in the SHDB in an effort to screen the degree of sustainable child development of countries.

The future research would focus on the implementation of the SCDI through case studies and the development of quantitative social impact pathways, and the continuous update of the SCDI framework and indicators when additional literature and statistical data regarding sustainable child development become available.

Supplementary Materials: The following are available online at www.mdpi.com/xxx/s1, Spreadsheet S1: Statistical data collected for the seven indicators considered in the linear regression models of the path analysis, Spreadsheet S2: Results of the correlation analysis of the seven indicators considered in the linear regression models of the path analysis, Spreadsheet S3: Hypotheses for potential relation between the six selected criteria and the criterion completion of tertiary education, Spreadsheet S4: Results of the three linear regression models of the path analysis.

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3. Discussion

This chapter presents the key findings (section 3.1) and the challenges of the SCDI (section 3.2). Moreover, recent methodological development trend that addresses children in sustainability assessments (section 3.3) is presented as well.

3.1. Key findings

This dissertation establishes a new index, the Sustainable Child Development Index (SCDI), to improve current sustainability assessments by considering children as the essential stakeholder and by addressing children related topics (e.g. safety and environmental aspects) in the context of SD. The SCDI acknowledges and addresses the interwoven relationship between children, inter-generational equity and SD in an index. It was demonstrated that SCDI can be applied as a complementary assessment to existing development indices and can thus support a more comprehensive evaluation of sustainable development.

The four research objectives were addressed based on the results of the four publications. In accordance with a literature review based on child rights, development and well-being studies, seven themes (i.e. health, education, safety, economic status, relationship, participation and environmental aspects), 50 subthemes and 109 criteria associated with sustainable child development were identified and then structured into a hierarchical framework (i.e. accomplishing the research objective 1). For measuring the identified topics of the SCDI framework, 154 indicators were collected for the identified topics. Based on an evaluation of data availability on country level and association between indicators, the final indicator set of 25 indicators was defined and applied in the SCDI at present to address five themes (health, education, safety, economic status and environmental aspects), 19 subthemes and 22 criteria (i.e. achieving the research objective 2). The 25 indicators were normalized based on the defined reference points derived from the targets of the SDGs, and then aggregated into an index. In this context, 138 countries as well as 86% of global child population are assessed by the SCDI as the statistical data can be found for the 25 indicators (i.e. accomplishing the research objective 3). Furthermore, applying the SCDI based on the current use of HDI and integrating the SCDI framework into SLCA, SOLCA and the SHDB to tackle the missing

consideration of children as a stakeholder group and the lack of quantitative social impact pathways, were proposed to put the SCDI into practice (i.e. fulfilling the objective 4).

The SCDI shows its strength in evaluating the status of sustainable child development for countries and monitoring the status over time. The determined SCDI scores (for the year 2015) and country classification for the 138 countries across five regions showed a significant regional inequality on the status of sustainable child development. European countries in general have an advanced progress of sustainable child development. On the contrary, 90% of African and 76% of Asian countries were assessed as countries with medium and low sustainable child development. The trend of the SCDI scores from the year 2006 to 2015 shows that several developing countries express their great potential in enhancing the status of sustainable child development due to their improved performance for the themes health and economic status. On the other hand, some developed countries, such as Cyprus, Greece and Spain are the countries having the largest declines of SCDI scores due to the deteriorate performance for the themes health and economic status.

In addition, the SCDI can be applied as an assessment that complements the existing development indices (e.g. the HDI and CDI) to provide a more comprehensive evaluation of SD. The SCDI can assess the status of SD for countries beyond the scope of the HDI and CDI, by treating children as a key stakeholder group and by addressing children related topics in the context of SD (e.g. environmental aspects and safety). The comparison of the trend of country ranking assessed by the SCDI and the HDI from 2006 to 2015 pointed out the fact that countries could have improving development status from whole-population perspective but a deteriorating status of sustainable child development. This gap between the development status assessed by the SCDI and the HDI further acknowledges the importance to take children into account in sustainability assessments and development policies.

Moreover, the SCDI was proposed to evaluate the status of sustainable child development on different geographic levels and between population groups with corresponding data, and to be expanded for including additional topics of sustainable child development for different purposes of assessments. Besides, the SCDI framework was used

to propose children as a stakeholder group regularly assessed in social sustainability assessment approaches and databases. The SCDI framework can also support describing the relation of socio-economic topics related to sustainable child development, and thus support the establishment of quantitative social impact pathways.

To sum up, the SCDI connects CD and SD with a consideration of all three sustainability dimensions, provides a structural framework with an inclusion of multifaceted topics of sustainable child development, and applies quantified internationally agreed targets of SD. The ability of the SCDI to complement existing development indices is demonstrated. The literature review and the indicator analysis regarding data availability provide an insight of the state-of-the-art child-oriented assessments and the research needs for indicator and database development. Regarding implementation, the SCDI can be adapted for different purposes of assessments for SD, can enhance existing social sustainability assessment approaches and databases, and can address a large amount of countries as well as child population worldwide.

3.2. Challenges of the SCDI

This section presents the challenges of the SCDI regarding methodological development (section 3.2.1) and application (section 3.2.2). The methodological development part presents the challenges involving index design, and the application part introduces the challenges that hinder the interpretation and implementation of the SCDI.

3.2.1. Methodological challenges of the SCDI

Four challenges with regard to the methodological development of the SCDI are:

- (1) value choices made for classifying topics, selecting indicators and calculating the index,
- (2) restricted inclusion of topics and indicators in the SCDI,
- (3) limited consideration of the linkages between topics, and
- (4) disregard of children's opinions to determine relevant topics of sustainable child development.

The four challenges are described in detail as below.

- (1) Value choices required for topics classification, indicator selection and index calculation

Selection and classification of topics and indicators and index calculation are necessary steps to establish an index. However, there are no common rules or methods for these steps. Value choices are thus needed for carrying out these steps.

In this dissertation, the topics and indicators of the SCDI were collected and classified with reference to the literature review. Value choices were necessary for topic and indicator classification as the classification is inconsistent in current studies. For example, as described in introduction, school enrolment indicators were categorized to measure education in some indices [20,26,27], but were assigned to describe participation in other indices [28,29]. In Publication I, topics were classified by considering the majority of topic categorization in the literature (e.g. assigning school enrolment to the theme education rather than the theme participation). Different arrangement for topic and indicator classification can change the structure of SCDI framework.

In addition, for increasing the practicality of the SCDI, the final indicator set of 25 indicators was selected with regard to data availability and similarity of indicators. A succession of value choices was made for the proposal of initial indicator set, the determination of similarity of indicators, and the definition of principles for balancing the numbers of considered topics and covered countries and child population in the SCDI. Altering the value choices can generate different indicator set used for the SCDI, and consequently change the framework and scores of SCDI, and coverage of countries in the SCDI. Relevance of sustainable child development could have been an alternative yardstick for selecting indicators. However, it is hardly to determine the relevance of sustainable child development for indicators with objective and scientific verification. The relevance is usually determined based on policy purposes and subjective preferences. Therefore, data availability and similarity of indicators were applied as key references in this dissertation to propose the final indicator set

Moreover, there are no universal normalization and aggregation methods for combining indicators to an index. Value choices were therefore applied to select reference points for normalizing indicators and equal weighting was assumed for the topics and indicators at aggregation stage. Normalization aims at transfer indicator values into a common scale, e.g. 0-1. In this dissertation, the targets of the SDGs were taken as a guide to define the target value for indicators, in order to measure the status of sustainable child development for countries. Other reference points could have been chosen, e.g. the indicator values of a specific country. For instance, selecting a developed country such as Germany as a reference country and use its performance as benchmark to assess sustainable child development for other countries. However, the selection of a reference country is arbitrary. For example, Germany has a great performance in low child mortality, but an unfavorable performance in adolescent alcohol use compared to other countries. In this case, using the performance of a selected country to define reference points could lead to bias in measuring sustainable child development.

Weighting applied in aggregation stage can largely influence the SCDI scores and country ranking. However, weighting of topics and indicators in an index is always challenging and not straightforward. As no literature objectively provides the relative importance for the topics and indicators of sustainable child development with scien-

tific verification, equal weighting was applied while conducting aggregation at indicator, criterion, subtheme and themes level. For example, four indicators namely gender parity index of gross enrolment ratio for pre-primary, primary, secondary, and tertiary education were assumed to have the same importance on the criterion gender equality in enrolment. The criterion gender equality in enrolment and other criteria (e.g. gender equality in graduation) were assumed to have equal importance in the subtheme gender equality. And the subtheme gender equality and other subthemes such as government support on education were suggested to have same importance on the theme education. Then, the theme education and the other four themes considered in the present SCDI framework have equal importance for measuring sustainable child development. Nevertheless, some studies encouraged to assign specific weighting to topics and indicators based on stakeholder surveys or interviews to better reflect the ‘real’ relevance of the topics and indicators [30]. In addition, another recommendation to address weighting (i.e. with regard to the outcome and context of sustainable child development) is proposed in section 4.2.

(2) Restricted inclusion of topics and indicators in the SCDI

Restricted consideration of topics and indicators in the SCDI is resulted from limited indicator development and data availability, and particular focus on the studies of industrialized countries in literature review.

Particular stress on topics and indicators for the themes health and education exists in the SCDI because these two themes have been emphasized and developed in CD and SD studies for decades. The development of indicators and databases (e.g. WHO [31] and UNESCO [32] databases) associated with the themes health and education is relatively mature. By contrast, other emerging themes, such as safety, relationship and participation, have less indicators and databases available. For example, children’s relationship regarding family, school, peers, community and society can significantly affect their development but the data associated with these relationships are limited to developed countries, such as European and OECD countries. Therefore, the topics and indicators for these emerging themes are less considered in the SCDI. This limited inclusion of these emerging themes could lead to incomplete description of the status of sustainable child development for countries. Indicator and database development for

emerging topics of sustainable child development is suggested to tackle this challenge. The suggestion is presented in more detail in section 4.2.

In addition, as the theme environment aspects was newly proposed in this dissertation (in Publication I) to evaluate sustainable child development with triple-bottom-line thinking, resource accessibility was identified as one relevant environmental aspect in the SCDI. Freshwater vulnerability and renewable energy consumption were selected as a starting point to address resource accessibility. Some indicators assess the damage on human health caused by water scarcity. For example, Motoshita et al. [33] established a cause-effect chain to quantify how freshwater consumption affects crop production loss by irrigation and consequently brings about damage on malnutrition. The malnutrition damage caused by freshwater consumption is a potential indicator to describe the impact of resource consumption on human health. However, this measurement suffers from a large uncertainty since damage of nutrition deficiency can be determined by other socio-economic factors (e.g. poverty and diseases) than agricultural water scarcity. As the SCDI at the moment addresses general resource accessibility for the theme environmental aspects, the measurements that intend to describe the damage on socio-economic topics caused by resource condition are not considered in the present SCDI framework.

Mineral resources are also important to be protected to support inter-generational equity. However, mineral resources are not naturally available in every country. The resource extraction and production are only located in some specific countries which have abundant mineral resources (e.g. China, Russia and Australia). The consumption of mineral resources involves countries worldwide but the linkage between the consumed products and the amount of consumption of mineral resources is hard to quantify on country level. Consequently, mineral resources have not yet been included to evaluate resource accessibility in the present SCDI framework. Other potential topics (such as soil quality and erosion, and biodiversity) that specify resource accessibility and ecosystem services to which human kind is intimately linked, usually have limited statistical data on country level, and thus have not yet been addressed in the SCDI as well.

Besides, a focus on industrialized countries in identifying relevant topics of sustainable child development (conducted in Publication I) limits the consideration of topics in the SCDI. Only two out of 23 studies cover the situation in developing or war-affected countries in the literature review. Accordingly, not enough attention is put on the topics of particular relevance for developing or war-affected countries, such as malaria and child soldiers. Furthermore, data availability for sensitive topics (e.g. child labor and child soldiers) could be restricted by governments and institutions, and consequently lead to the limited consideration of the topics and indicators in the SCDI.

(3) Limited consideration of the linkages between topics

In this dissertation, the statistical correlation between indicators was evaluated in order to select representative indicators, but the linkages between topics have not yet been fully addressed.

While proposing the initial SCDI framework, the topics describing the outcome of sustainable child development (e.g. the SCDI subtheme child mortality) and the topics describing the contexts which potentially affect the outcomes (e.g. the SCDI subthemes immunization coverage and risk behavior) were identified (see Publication I and Appendix 1), to underline the linkages between the topics and to support the development of social impact pathways for sustainable child development. However, the linkages between the topics describing the outcome and the context of sustainable child development were not considered when calculating the SCDI scores for countries. That could lead to an uncertainty of the results of the SCDI scores.

In fact, the consideration of the contextual topics can significantly affect the results of SCDI scores and thus the country ranking. In the present framework of SCDI, the themes economic status and environmental aspects consider the topics describing general economic conditions and resource accessibility on country level. These topics (e.g. the subthemes youth unemployment, national debts, freshwater vulnerability and renewable energy consumption) present the context which potentially affects the outcomes of sustainable child development. Spearman correlation analysis [34–36] was used to examine the association between the country rankings assessed by the current SCDI framework and the modified SCDI frameworks without considering the theme

economic status or/and environmental aspects. Spearman correlation coefficients represent the strength of association between the country rankings. The value of the correlation coefficient varies between +1 and -1. A perfect Spearman correlation coefficient of ± 1 occurs when a variable is in a perfect association to the other, i.e. the values of both variables are moving with fixed proportion. The Spearman correlation analysis indicates that the SCDI country ranking (for the year 2015) is largely influenced by the theme environmental aspects. As shown in Table 2, the correlation between the country rankings assessed by the current and the modified SCDI frameworks largely drops (e.g. Spearman correlation coefficients decreases to 0.504) when the theme environmental aspects is not considered. The change in the country rankings underlines the strong effect of the theme environmental aspects on the SCDI results and implies a relative independence of environmental topics (e.g. addressing resource accessibility) to the other two dimensions of SD, namely social and economic pillars.

Moreover, the comparison of the SCDI and the existing development indices (such as the HDI and the CDI) is also significantly affected by the consideration of the theme environmental aspects in the SCDI framework. Table 2 presents that correlation of the country rankings assessed by the SCDI, the HDI and the CDI increases (e.g. Spearman correlation coefficients increases from 0.476 to 0.880) when the theme environmental aspects is not included in the SCDI framework. The increased correlation of the country rankings indicates that the SCDI, the HDI and the CDI evaluate sustainable development for countries in a similar pattern. That means the additional information of the SCDI to the HDI and the CDI reduces if the theme environmental aspects is not considered in the SCDI. This result further supports the need to consider the topics of environmental aspects in the SCDI in order to provide a more comprehensive evaluation of SD based on the triple-bottom-line thinking. Appendix 19 lists the country rankings assessed by the current SCDI framework and the three modified SCDI frameworks.

Linkages between the topics considered in the SCDI have not yet been analyzed in the four publications since this dissertation aims at the construction of the SCDI to enhance existing sustainability assessments by treating children as the key stakeholder and considering children related topics in the context of SD. Investigating the dependences of

topics of SCDI could be one direction of the further research for evaluating sustainable child development, presented in section 4.2.

Table 2. Correlation analysis of the country rankings assessed by the current SCDI framework, the three modified SCDI frameworks (without considering the theme economic status or/and environmental aspects), the HDI and the CDI [3]

	SCDI (year 2015)	SCDI, without considering the themes economic status & envi- ronmental as- pects (year 2015)	SCDI, without considering the theme economic status (year 2015)	SCDI, without considering the theme environmental aspects (year 2015)	HDI (year 2015)	CDI (year 2012)
SCDI (year 2015)	1.000	0.504	0.893	0.559	0.476	0.489
SCDI, without considering the themes economic status & envi- ronmental aspects (year 2015)	0.504	1.000	0.297	0.937	0.860	0.800
SCDI, without considering the theme economic status (year 2015)	0.893	0.297	1.000	0.260	0.193	0.187
SCDI, without considering the theme environmental aspects (year 2015)	0.559	0.937	0.260	1.000	0.880	0.843
HDI (year 2015)	0.476	0.860	0.193	0.880	1.000	0.925
CDI (year 2012)	0.489	0.800	0.187	0.843	0.925	1.000

(4) Disregard of children's opinions to determine relevant topics of sustainable child development

Involving children's opinions to identify the relevant topics of sustainable child development can directly address what children expect and concern for their development. Though children are the key stakeholders in assessing sustainable child development, the topics and indicators addressed in the assessment are usually determined by policy makers and researchers based on literature or the policy purposes. The SCDI frame-

work was built based on a literature view in order to comprehensively collect the topics relevant to sustainable child development. Children's opinions are not taken into account to identify the relevant topics regarding their development. In this regard, children shall participate in determining relevant topics of sustainable child development, to better evaluate sustainable child development regarding children's opinion and thus enhance the relevance of the SCDI framework. To address this challenge, relevant topics suggested by children shall be taken into consideration while updating the framework of the SCDI in future research (elaborated in section 4.2).

3.2.2. Application challenges of the SCDI

After the elaboration of the methodological challenges of the SCDI, the application challenges that the SCDI faces are introduced in this section. Three challenges which may influence the implementation and interpretation of the SCDI are:

- (1) inconsistent reference year and age of statistical data,
- (2) different assessment scope of the SCDI, social sustainability assessment approaches and databases, and
- (3) disregard of taking children as primary data sources.

The three application challenges are described as below.

(1) Inconsistent reference year and age of statistical data

Reference years of statistical data for indicators are not identical (also discussed in Publications II and III). Statistical data of indicators for most of the subthemes (e.g. child mortality and attendance of education), are updated annually. On the other hand, indicators for some subthemes (e.g. child labor and renewable energy consumption) are not regularly updated. This inconsistency in statistical data can lead to uncertainty of the SCDI results.

According to the UN [6], children are defined as aged under 18 in this dissertation. However, statistical data for few indicators in the SCDI address the population at different ages, e.g. the indicators 'suicide rate (per 100,000 aged 15-29 years)' and '15-19 years old heavy episodic drinkers (percentage of aged 15-19 population)'. Suicide and alcohol use were reviewed as relevant topics of sustainable child development in Publication I, and the statistical data for the corresponding indicators were found in WHO

report [37] and database [31] respectively. This inconsistency may lead to uncertainty of the SCDI results. Though the assessed target groups cover different ages than the UN definition of children, the results can be used to illustrate children's health status and behavior.

(2) Inconsistent assessment scope of the SCDI, social sustainability assessment approaches and databases

It shall be noted that the SCDI evaluates sustainable child development on country rather than sector/organization/product level. The data for indicators listed in the Methodological Sheet for Subcategories in SLCA are specified for countries, sectors or could be associated with products. For SOLCA, organization-oriented data are collected, and data on country or industry level are used to represent the social-economic context of organizations. In addition, social risks can be analyzed for countries or selected country-specific-sectors in the SHDB. When the SCDI is integrated into social sustainability assessment approaches and databases (e.g. SLCA, SOLCA and the SHDB), results of the SCDI can be applied to reflect the generic social conditions for countries or country-specific-sectors but should not be directly interpreted as social risks caused by country-specific-sectors, organizations or products.

(3) Disregard of taking children as primary data sources

Using data linked to children may better capture their development status and living conditions. The SCDI uses country-based aggregated data to have a general picture of the status of sustainable child development for countries. However, the use of country-based aggregated data may hinder the observation of the development status and living condition for children because these aggregated data basically describe the share of children that live with a particular condition (e.g. suicide rate, per 100,000 aged 15-29 years), without detailed information of their development status (e.g. the levels of feeling depress). While collecting primary data directly from children, particular development status for children (e.g. different levels of satisfaction for personal life, family, peer or community) can be identified and investigated. Nevertheless, applying child-based data in the assessment may suffer from the difficulty in data collection and arrangement.

3.3. Recent methodological development trends for addressing children in sustainability assessments

The SCDI was established in line with some of the key movements for measuring CD and well-being, such as considering multidimensional topics and addressing topics beyond basic needs. While establishing the SCDI, several ongoing initiatives as well as methodology development of sustainability assessments have taken children into consideration. Intensive research on multidimensional child poverty and growing notice on life stage thinking in development studies are found as two of the movements for addressing children in sustainability assessments.

(1) Multidimensional child poverty research

One ongoing methodological development is to measure multidimensional aspects (e.g. financial strains to afford certain goods or services, and social exclusion such as discrimination and social activities) of child poverty on country and regional level. The SDGs underline the significance of children on the accomplishment of SD, and state topics which could impede CD and thus SD. In the SDGs, the target “by 2030, reduce at least by half the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions” emphasizes the consideration of children in poverty elimination and highlights the multidimensional nature of poverty [9]. Several studies thus responded to this target and addressed multidimensional child poverty. For instance, Milliano and Plavgo [38] estimated the number of multidimensionally poor children in 30 sub-Saharan African countries. They defined multidimensional child poverty and compared it with monetary poverty. Furthermore, on the basis of the assessment of the sub-Saharan African countries, the topics and indicators of child poverty were then adjusted to fit the local context for Mali, Malawi and Republic of Tanzania [39]. Similarly to the multidimensional child poverty assessments tailored for countries, Ferrone and Chzhen [40] investigated strategies to halve multidimensional poverty among children of Armenia, Bosnia and Herzegovina. From developing to developed countries, Stefánsson et al. [41] evaluated the effects of an economic fluctuation on multidimensional child poverty in Iceland. The results indicated that children were sheltered less than the general population in an economic fluctuation. In addition, it was found that the children from single parent households and the children

living in households receiving disability benefits were more affected by the economic fluctuation than the children from other types of households.

These studies followed the Multiple Overlapping Deprivation Analysis (MODA) approach [42], and adapted the approach to reflect national specific conditions of multidimensional child poverty. MODA builds on earlier multidimensional poverty studies (e.g. the MPI) and assesses child poverty from headcounts in individual dimensions (e.g. deprivation of nutrition) to multidimensional poverty indices (e.g. including deprivations of health care, protection and education) via multiple overlap analysis. The multiple overlap analysis indicates the deprivations that children concurrently experience.

The fundamental commonality of the SCDI and those multidimensional child poverty studies is encompassing the multifaceted nature of development. Both the SCDI and the multidimensional child poverty studies consider child rights and address the topics which may affect CD, e.g. gender equality and nutrition. Furthermore, the SCDI can provide an aggregated result for the status of sustainable child development for countries; by applying the MODA approach in the multidimensional child poverty studies, the amount and intensity of multidimensional child poverty for countries and regions can be identified and aggregated. Such aggregated results favor a comparison of the status of sustainable child development or multidimensional child poverty between countries. Due to the commonality, the results provided by the SCDI and those multidimensional child poverty studies (based on the MODA approach) could be used to cross check the social conditions of countries.

On the other hand, there are dissimilarities between the SCDI and multidimensional child poverty studies. First, the existing multidimensional child poverty studies have not yet considered environmental aspects and safety. The deprivation of (natural) resources and safety shall be taken into account as other types of poverty to affect inter-generational equity in multidimensional child poverty studies. Therefore, indicators identified for the themes environmental aspects and safety in the SCDI could be considered in multidimensional child poverty studies to provide a more comprehensive evaluation of child poverty. Second, the MODA approach used in current multidimensional child poverty studies shows its benefit on taking individual children rather than

households as the unit of analysis. Since children experience and perceive poverty differently from adults, the MODA approach uses data directly linked to children to describe the poverty status. This feature addresses one of the application challenges of the SCDI, namely disregard of taking children as primary data sources (see section 3.2.2). Besides, the MODA approach further discusses the overlaps between different deprivations that are simultaneously experienced by children, which partly addresses a methodological challenge of the SCDI, i.e. limited consideration of the linkages between topics (see section 3.2.1). Thus, the MODA approach could be used as a reference to strengthen the robustness and application of the SCDI in future research.

(2) Life stage thinking in development studies

A “life stage” or “life course” thinking has been increasingly proposed in development studies. In 2016, UNDP newly introduced the Life-course gender gap to indicate gender gaps and women’s empowerment over the three main stages of life course: childhood and youth, adulthood and older age [12]. The Life-course gender gap dashboard contains 14 indicators referring to health, education, labor market and work, leadership, seats in parliament and social protection [12]. For childhood and youth, sex ratio at birth, adolescent birth rate, female gross enrolment ratio at different levels of schools (pre-primary, primary and secondary) and youth unemployment rate are addressed [12]. For each indicator (except for sex ratio at birth), countries are classified into three groups, i.e. the top third, the middle third and the bottom third, depending on their performance [12].

The Life-course gender gap can be treated as a starting point to acknowledge that the concerns and needs for humans in specific development topics (e.g. gender equality) differ in individual life stages. In other words, researchers perceive the importance and necessity to tailor the assessment frameworks for addressing different needs, rights and interests for humans in different life stages.

This trend also supports the goal of this dissertation to establish an index that considers children as key stakeholder instead of evaluating SD from a whole-population oriented perspective. Additionally, the indicators used for childhood and youth in the

Life-course gender gap are all considered in the SCDI, showing the commonality of the topics in the two frameworks.

4. Conclusions and outlook

In this chapter, the added value of the SCDI is summarized (section 4.1), and the recommendations for future research and practice are provided (section 4.2).

4.1. Added value of the SCDI

Based on the results of the four publications, the SCDI provides its added value compared to other development indices. This section describes the added value of the SCDI from two perspectives: methodological development (section 4.1.1) and application (section 4.1.2). The methodological development part presents the added value resulting from index design, and the application part introduces the strength of the SCDI from an implementation perspective.

4.1.1. Added value of the SCDI from methodological perspective

The SCDI shows its added value in methodological development by providing a structural framework with an inclusion of multifaceted topics of sustainable child development, by connecting CD to SD with a consideration of all three sustainability dimensions, and by using quantified internationally agreed targets for SD for the SCDI.

(1) Provision of a structural framework including multifaceted topics of sustainable child development

The SCDI reflects the multifaceted characteristic of CD and SD. Based on the literature review, topics of sustainable child development were comprehensively identified and classified into a clear, structural framework: seven themes, 50 subthemes and 109 criteria. 154 indicators were also assigned to the responding criteria. The structural framework favors the comprehension of the relevant topics which affect sustainable child development and their available measurements. Additionally, these identified topics and indicators can serve as a topic and indicator pool to support developing or adjusting development indices related to CD as well as SD. At present, the SCDI addresses five themes: health, education, safety, economic status and environmental aspects, and corresponding 19 subthemes and 22 criteria. Compared to existing development indices (e.g. the HDI, the MPI and the CDI), the SCDI considers a more diverse set of topics such as safety. The consideration of more topics of sustainable child development also supports the SCDI as a complementary assessment of existing development indices.

(2) Connection of CD to SD by a consideration of all three sustainability dimensions

The SCDI acknowledges and addresses the inseparable relationship between children, inter-generational equity and SD in an index. The SCDI builds on social and economic characteristics from existing CD and well-being research and extends the framework by including environmental aspects. In other words, the SCDI is the index that firstly assesses SD with a focus on children and regards topics linked to environmental, social, and economic dimensions. It can be used as a starting point to foster the establishment of development indices that concerns all the three dimensions of sustainability. This feature of the SCDI goes beyond current development indices and thus provides a more comprehensive assessment of SD.

(3) Use of quantified internationally agreed targets for SD for the SCDI

Many development indices defined reference points without considering the SDGs or other targets addressed in international agreements. Although such indices can support comparative assessment of development status, they cannot really evaluate the status towards SD. To tackle this weakness, the SCDI addresses topics and indicators linked to the SDGs, and further applies quantified targets of the SDGs as reference points for the index calculation. By adopting the targets of the SDGs as target values, the SCDI can present countries' and regions' status of sustainable child development in the context of the 2030 Agenda for Sustainable Development.

4.1.2. Added value of the SCDI from application perspective

With a focus on application, the SCDI shows the added value compared to current development indices and support comparative assessment of the status of sustainable child development for countries across regions. Moreover, the SCDI can be adapted for different purposes of assessments for SD and enhance existing social sustainability assessment approaches and databases.

(1) Provision of the assessment scope beyond and enhancement of current development indices

The feature of the SCDI that complements and improves the existing development indices was demonstrated in this dissertation. For example, with a focus on children, the SCDI evaluates countries' status of SD differently than the whole-population oriented assessments (e.g. the HDI). Furthermore, the SCDI enhances available CD and well-being indices (e.g. the CDI) by addressing additional topics relevant to SD (e.g. safety and environmental aspects). By means of the SCDI, policy makers and researchers can avoid the missing consideration of future generations and the disregard of topics related to SD in development policies. Therefore, the SCDI can contribute to sustainability assessments as it supports a more comprehensive evaluation of SD.

(2) High practicality for comparative assessment of the status of sustainable child development on country level

Practicality (i.e. coverage of countries which can be assessed by the SCDI) was taken as an essential consideration in the establishment of the SCDI. As described in introduction, one of the gaps of existing CD and well-being indices is that the data availability of indicators is not clarified. This disregard of data availability impedes the practicality of indices since the statistical data for the indicators may be found for only a few or even no country at all. To tackle this gap, the SCDI at present evaluates the status of sustainable child development for 138 countries across five regions (representing 71% of countries and 86% of global child population, based on the child population of year 2015 [43]) by selecting indicators based on data availability (see Publication III). A wide coverage of countries worldwide ensures practicality of the SCDI in comparative assessment of sustainable child development on country level.

(3) High adaptability of the SCDI for different assessment purposes of SD

The structural SCDI framework favors an adjunction of additional topics related to SD (e.g. child soldiers) into the current SCDI to suit different assessment purposes. Because the SCDI framework structurally categorizes relevant topics of sustainable child development, policy makers and researchers can assign the topics of purposes into a corresponding theme or subtheme to adapt the SCDI for specific assessment targets. In addition, as data could be found for indicators for different geographic levels and population groups, the SCDI could be employed to support decision making and research for CD as well as SD for different assessment purposes.

(4) Improvement of existing social sustainability assessment approaches and databases

This dissertation suggests how to apply the SCDI to enhance existing social sustainability assessment approaches and databases. The SCDI can improve existing social sustainability assessment approaches and databases since it tackles the neglect of children in assessing social conditions for societies (e.g. countries or regions). For example, in the dissertation, the integration of the SCDI into the existing schemes of SLCA and SOLCA, and the SHDB was proposed. Apart from improving the current scheme of SLCA and SOLCA, the SCDI framework can enhance social impact assessment by supporting the development of quantitative social impact pathways. This contribution allows a better quantitative description of relation of social-economic topics.

4.2. Recommendations for future research and practice

To further strengthen the SCDI, six suggestions for future research and practice are provided based on the identified challenges and research needs (see section 3.2):

- (1) continuous update of topics and indicators,
- (2) indicator and database development for emerging topics of sustainable child development,
- (3) assignment of weighting to topics and indicators,
- (4) investigation of relation between the topics of sustainable child development,
- (5) establishment of social impact pathways for the stakeholder children and other stakeholder groups in SLCA and SOLCA, and
- (6) evaluation of the status of sustainable child development for countries in specific cultural, economic and political background.

The six suggestions are described in detail as below.

(1) Continuous update of topics and indicators

Since the SCDI framework was built based on literature review (of the year 2007-2014), the topics and indicators used in the SCDI will have to be continuously refined and updated when additional topics, indicators and data regarding sustainable child development become available. Moreover, children's opinions could be taken into account for determining the relevant topics of sustainable child development, to directly consider children's concerns and expectations for their development in the updating SCDI framework (for addressing the methodological development challenge "*Disregard of children's opinions to determine relevant topics of sustainable child development*", see section 3.2.1).

(2) Indicator and database development for emerging topics of sustainable child development

Developing indicators and databases is needed to enhance the coverage of topics of sustainable child development and countries in the SCDI. Publication II identified that 21 subthemes and 50 criteria are described by indicators with limited data availability. Consequently, topics for the themes relationship and participation are not addressed in

the SCDI at the moment due to the limited data availability for the indicators. For example, statistical data for the indicators describing peer and family relationship are available only for the OECD countries. Collecting data and providing the data via open-access databases or publications are the key to improve data availability for indicators (responding to the methodological development challenge “*Restricted inclusion of topics and indicators in the SCDI*”, see section 3.2.1). While data availability for indicators enhances, the number of topics and countries addressed in the SCDI can therefore increase.

Additionally, there are only few indicators available for resource accessibility (e.g. for freshwater vulnerability and renewable energy consumption) for the theme environmental aspects at the moment. More indicators are required to develop for assuring a more inclusive assessment of resource accessibility and other topics related to ecosystem services provided for generations (e.g. biodiversity) in the future work (responding to the methodological development challenge “*Restricted inclusion of topics and indicators in the SCDI*”, see section 3.2.1).

(3) Allocation of weighting to topics and indicators

The differentiation of the topics describing the outcome of sustainable child development (e.g. child mortality) and topics describing contexts that have potential to affect those outcomes (e.g. hazardous pollutants) could be a consideration to assign weighting to topics and indicators apart from applying stakeholder interview. The contextual topics may affect the outcome of sustainable child development, but the causal relationship is not binding. For instance, growing up in a step or single-parent family may, but does not necessarily have to increase the likelihood of having negative effects on sustainable child development. By taking this perspective, lower weighting could be assigned to contextual topics compared to outcome topics. Since different weighting for topics and indicators can significantly alter the SCDI results, researchers should always transparently provide the weighting determined for topics and indicators to increase robustness and reliability of assessment (for addressing the methodological development challenge “*Value choices for topics classification, indicator selection and index calculation*”, see section 3.2.1).

(4) Investigation of relation between the topics of sustainable child development

As pointed out in section 3.2.1, consideration of the linkages between topics is restricted in the SCDI. To address the limitation, two directions for future research are thus proposed: examining the relation between the contextual topics and the outcome topics and investigating the topics that have similar trends in improving or decreasing performance of sustainable child development.

By determining the relation of the contextual topics and those outcomes, the linkage of topics can be better analyzed, and the results of the identified relation can be used to develop quantitative social impact pathways, i.e. describing the strength of relation of topics. For example, the relation between gender equality (identified as a contextual topic, see Publication I and Appendix 1) to school attainment (identified as an outcome topic, see Publication I and Appendix 1) could be examined and the strength of the relation could be quantified. This work can closely support other two suggestions for future research “Allocation of weighting to topics and indicators” and “Establishment of social impact pathways for the stakeholder children and other stakeholder groups in SLCA and SOLCA”.

Furthermore, the concurrence of topics that have similar trends in improving or decreasing performance of sustainable child development can be investigated. For example, the performance of the themes health and economic status were found simultaneously fluctuated among the countries (e.g. Cyprus, Greece and Spain) assessed with decreasing sustainable child development from 2006 to 2015. The concurrence of hotspot topics of sustainable child development can be investigated to profile the linkages between the hotspot topics and the influenced countries (for addressing the methodological challenge “*Limited consideration of the linkages between topics*”, see section 3.2.1).

(5) Establishment of social impact pathways for the stakeholder children and other stakeholder groups in SLCA and SOLCA

Employing the SCDI framework and path analysis to quantitatively describe relation of socio-economic topics is a starting point to build up social impact pathways. The results of quantified relation between the contextual topics and the outcome topics, and

the identified concurrence of the topics that have similar trends in improving or decreasing performance of sustainable child development, can provide information to support the development of social impact pathways. Future work could focus on establishing social impact pathways that mainly cover the subthemes and criteria of the SCDI and using this approach to construct social impact pathways for addressing the socio-economic topics for other stakeholder groups (e.g. workers and local community) considered in SLCA and SOLCA.

(6) Evaluation of the status of sustainable child development for countries in specific cultural, economic and political background

In the dissertation, the status of sustainable child development of countries worldwide was evaluated and then analyzed regarding different regions. Apart from geographic conditions, the SCDI could be applied to evaluate and compare countries' status of sustainable child development with a focus on specific culture (e.g. different religion), economic development (e.g. developed or developing countries) and political background (e.g. for war-affected countries). Hence, the status of sustainable child development for countries can be better compared with identical or different socio-economic background.

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Glossary

Adolescent fertility	- Births given by women aged 15-19 [44]
Area of protection (AoP)	- Safeguard subjects with recognizable value to society to be protected [45]
Biodiversity	- Variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems [46]
Characterization factor	- Factor derived from a characterization model which is applied to convert an assigned life cycle inventory analysis result to the common unit of the category indicator [47]
Child development	- Change or growth that occurs in a child during the life span from birth to adolescence [8]
Child labor	- Work that deprives children of their childhood, their potential and their dignity, and that is harmful to physical and mental development [48]
Child marriage	- Marriage before the age of 18 [49]
Child poverty	- Children living in poverty experience deprivation of the material, spiritual and emotional resources needed to survive, develop and thrive, leaving them unable to enjoy their rights, achieve their full potential or participate as full and equal members of society [50]
Child rights	- Protection that the best interests of the child, non-discrimination, participation and survival and development [6]
Child soldier	- Any person under 18 years of age who is part of any kind of regular or irregular armed force or armed group in any capacity, including but not limited to cooks, porters, messengers, and anyone accompanying such groups, other than family members [51]

Glossary

Child well-being	-	Dynamic process wherein a child's physical, mental, social and material situation is more commonly positive than negative, and as an outcome of intrapersonal, interpersonal, societal and cultural processes [52]
Ecosystem service	-	Activity or function of an ecosystem that provides benefit (or occasionally disbenefit) to humans [46]
Female genital mutilation (FGM)	-	Procedures involving partial or total removal of the female external genitalia or other injury to the female genital organs for non-medical reasons [49]
Freshwater	-	Water having a low concentration of dissolved solids [53]
Gender parity index (GPI)	-	Ratio that divides the female value of an indicator by the male value of the same indicator [32]
Gross enrolment ratio	-	Number of students enrolled in a given level of education, regardless of age, expressed as a percentage of the official school-age population corresponding to the same level of education [32]
Low birth weight	-	Weight at birth less than 2500 grams, irrespective of the gestational age [54]
Life cycle impact assessment	-	Phase of environmental/social Life Cycle Assessment that aims at understanding and evaluating the magnitude and significance of the potential environmental/social impacts for a product system throughout the life cycle of the product [14,47]
Life cycle inventory analysis		Phase of life cycle assessment involving the compilation and quantification of inputs and outputs for a product throughout its life cycle [47]
Impact pathway	-	Sequence of cause-and-effect chain linking inventory data through consecutive environmental impacts to the damage that they cause on the AoPs [55]
Inter-generational equity	-	Notion that each generation has the right to inherit the same diversity in natural and cultural resources enjoyed by previous generations and to equitable access to the

	use and benefits of these resources [56]
Pre-primary education	Education that supports children's early cognitive, physical, social and emotional development, introduces - young children to organized instruction outside of the family context and prepares children for entry into primary education [57]
Primary education	Education (typically taking six years) that provides students with fundamental skills in reading, writing and mathematics (i.e. literacy and numeracy), and lasts until age 10 to 12 [57] -
Public health expenditure	Expenditure on health care funded by recurrent and capital spending from government (central and local) budgets, external borrowings and grants (including donations from international agencies and nongovernmental organizations), and social (or compulsory) health insurance funds [31] -
Renewable energy	Energy derived from natural processes (e.g. sunlight, wind, geothermal, hydro, and some forms of biomass) that are replenished at a faster rate than they are consumed [58] -
Secondary education	Education designed in preparation for tertiary education or provide skills relevant to employment, or both, usually referring to junior and senior high schools [57] -
Sustainable development	Development that meets the needs of the present without compromising the ability of future generations to meet their own needs [5] -
Tertiary education	Education that provides learning activities in specialized fields of education, including academic education, advanced vocational or professional education [57] -
Water depletion index (WDI)	Indicator expressing the vulnerability to freshwater depletion in a basin determined based on blue water scarcity [59] -

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Appendix 1. Themes, subthemes and criteria collected for the SCDI

Subthemes and criteria of theme health

Theme: Health		
Risk behavior ²	Nutrition ^{1,2}	Child mortality ¹
• Tobacco use² • Alcohol use² • Adolescent fertility² • Contraceptive prevalence² • Cannabis use² • Prevalence of sexual activity in youth² • Illicit drug use²	• Low birth weight¹ • Overweight and obesity¹ • Breastfeeding² • Underweight¹ • Stunting¹ • Wasting¹	• Infant mortality¹ • Under-five mortality¹ • Neonatal mortality¹
Immunization coverage ²	Eating and physical activity ²	Water and sanitation ²
• Measles containing vaccine (MCV) immunization² • Diphtheria tetanus toxoid and pertussis (DTP3) immunization² • Polio (Pol3) immunization² • Hepatitis B (HepB3) immunization² • Bacillus Calmette-Guérin (BCG) immunization²	• Physical activity² • Eating behavior²	• Access to improved sanitation facilities coverage² • Access to improved drinking water coverage²
	Subjective health ¹	Injury ¹
	• Self-rated health¹	• Medically attended injuries¹
	Mental health ¹	Health expenditure ²
	• Suicide¹ • Depression¹ • Emotional and behavior difficulty¹	• Public expenditure on health² • Health insurance coverage²
Hazardous pollutant ²	Maternal health ²	Oral health ¹
• Household and ambient air pollution² • PM2.5 exposure² • Family smoking²	• Antenatal care² • Skilled attendant at birth² • Maternal mortality² • Maternal smoking²	• Untreated dental caries¹
HIV ¹	Malaria ¹	Chronic disease ¹
• HIV prevalence among youth¹ • Pregnant women living with HIV, receive medicine for preventing transmission¹	• Children under five sleeping under nets¹ • Children under five fever with treatment¹	Disability ¹

1, 2 respectively indicates outcome, contextual level.

Subthemes and criteria of theme education and safety

Theme: Education		
School attainment ¹	Attendance of education ²	Completion of education ¹
- Mathematical literacy¹ - Reading literacy¹ - Overall literacy¹ - Repetition¹	- Enrollment in primary school² - Enrollment in secondary school² - Enrollment in tertiary school²	- Primary school completion¹ - Secondary school completion¹ - Tertiary school completion¹
Early childhood education ²	Subjective evaluation ¹	Parent's educational qualification ²
- Enrollment of kindergarten² - Parents reading to young children²	- Satisfaction of school¹ - Pressure from school work¹	Parent's formal educational level²
Gender equality ²	Transition to employment ¹	Government support on education ²
- Gender equality in enrolment² - Gender equality in graduation² - Gender equality in youth literacy²	Idle youth (15–19) not in education, training or employment¹	Public expenditure on education²
	Other participation¹ - Reading pleasure¹ - Extra-curricular subjects¹	Provision of vocational school² Attendance of vocational education²
Theme: Safety		
Violence and crime ^{1,2}	Child care arrangement ²	Violent discipline ²
- Bully in school^{1,2} - Juvenile delinquency¹ - Fighting¹ - Criminal victimisation² - Family violence² - Sexual violence against children²	Formal care²	Psychological aggression and/or punishment²
	Demographic structure² Sex ratio at birth²	Birth registration² Registration of newborns²
Child labor ²	Child marriage ²	Female genital mutilation ²
Children involved in child labor²	Children married or in union²	Girls received genital mutilation²

1, 2 respectively indicates outcome, contextual level.

**Subthemes and criteria of theme economic status, relationship, participation
and environmental aspects**

Theme: Economic status		
Material deprivation²	Housing quality²	Macroeconomic situation²
• Fewer than ten books² • Few educational resource² • Low family affluence² • Deprivation rate²	• Electricity coverage² • Crowded household² • Hygiene quality²	• General Unemployment² • Youth unemployment² • Income equality at societal level² • National debts² • National income²
Relative household income poverty²	Household without job²	
• Children living in households with income $\leq$ national median²	• Children living in jobless families²	Debt and financial difficulty²
Theme: Relationship		
Family relationship^{1,2}	Peer relationship²	Community relationship²
• Family structure² • Relation of parents and children¹ • Family engagement² • Satisfaction of family¹	• Kind and helpful peers² • Peer engagement²	• Social capital² • Satisfaction of community¹
Theme: Participation		
Participation in civic activity¹	Social connection²	Voting in presidential elections¹
• Participation in community activities¹	• Telephone/mobile access² • Internet access in home² • Access to mass media²	• Youth voting engagement²
Theme: Environmental aspects		
Freshwater vulnerability²	Renewable energy consumption²	
• Risk of depleting freshwater resources²	• Consumption of renewable energy²	

1, 2 respectively indicates outcome, contextual level.

Appendix 2. Numbers of the collected indicators of the themes in different data availability levels

Data availability	Theme						
	Health	Education	Safety	Economic status	Relationship	Participation	Environmental aspects
Top	6	0	1	0	0	0	0
Very high	10	9	1	3	0	0	2
High	5	3	1	3	0	0	0
Medium	7	6	6	0	1	2	0
Low	4	2	5	1	2	4	0
Very low	16	8	7	10	12	2	0
No statistical data on country level	8	3	1	1	2	0	0

Appendix 3. The collected indicators with the assigned data availability levels and data sources

Theme	Subtheme	Criteria	Indicator	Data availability		Source
				Covered country	Level	
Health	Nutrition	Low birth weight	Percentage of infants born with low birth weight (< 2,500 g)	187	Very high	UNICEF [49]
		Overweight and obesity	Overweight (including obesity, %)	146	Medium	
			Percentage of 11, 13, 15-year-olds who report that they are overweight or obese according to BMI	32	Very low	WHO Regional Office for Europe [60]
		Breastfeeding	Exclusive breast feeding < 6 months (%)	167	High	UNICEF [49]
		Underweight	Underweight (moderate and severe, %)	148	Medium	
		Stunting	Stunting (moderate and severe, %)	147	Medium	
		Wasting	Wasting (moderate and severe, %)	147	Medium	
	Child mortality	Infant mortality	Infant mortality rate (probability of dying between birth and age 1 per 1,000 live births)	195	Top	
		Under-five mortality	Under-five mortality rate (probability of dying by age 5 per 1,000 live births)	195	Top	
		Neonatal mortality	Neonatal mortality rate (during the first 28 completed days, per 1,000 live births)	195	Top	
	Injury	Medically attended injuries	Percentage of 11, 13, 15-year-olds who report at least one medically attended injury in the last 12 months	32	Very low	WHO Regional Office for Europe [60]
	Subjective health	Self-rated health	Percentage of 11, 13, 15-year-olds who rate their own health no more than 'fair' or 'poor'	32	Very low	
			Percentage of 11, 13, 15-year-olds who report multiple health complaints more than once a week (in past six months)	32	Very low	
	Oral health	Dental treatments	DMFT (decayed, missing or filled teeth) among 12-year-olds	180	Very	Malmö Uni-

Appendix

Theme	Subtheme	Criteria	Indicator	Data availability		Source
				Covered country	Level	
					high	iversity [61]
	Mental health	Suicide	Suicide rate, 15-29 year-olds, per 100,000	171	High	WHO [37]
	Hazardous pollutant	Household and ambient air pollution	Mortality rate attributed to household and ambient air pollution (per 100,000 population)	172	High	WHO [31]
		PM2.5 exposure	PM2.5 air pollution, population exposed to levels exceeding WHO guideline value (% of total)	187	Very high	
	HIV	HIV prevalence among youth	Estimated percentage of young men and women (aged 15-24) living with HIV	128	Medium	UNICEF [43,62]
		Mother-to child transmission preventing	Estimated percentage of pregnant women living with HIV delivering who received ARVs for PMTCT	83	Low	UNICEF [49]
	Malaria	Children under five sleeping under nets	Children under 5 sleeping under an insecticide treated net (ITN)	60	Low	
		Children under five fever with treatment	Children aged <5 years with fever who received treatment with any antimalarial	64	Low	
	Immunization coverage	Measles containing vaccine (MCV) immunization	Measles (MCV) immunization coverage among 1-year-olds (%)	195	Top	UNICEF [49]
		Diphtheria tetanus toxoid and pertussis (DTP3) immunization	Diphtheria tetanus toxoid and pertussis (DTP3) immunization coverage among 1-year-olds (%)	195	Top	
		Polio (Pol3) immunization	Polio (Pol3) immunization coverage among 1-year-olds (%)	195	Top	
		Hepatitis B	Hepatitis B (HepB3) immunization coverage among 1-year-olds (%)	185	Very	

Appendix

Theme	Subtheme	Criteria	Indicator	Data availability		Source
				Covered country	Level	
		(HepB3) immunization			high	
		Bacillus Calmette-Guérin (BCG) immunization	Bacille Calmette-Guérin (vaccine against tuberculosis) immunization coverage among 1-year-olds (%)	164	High	
	Risk behavior	Tobacco use	Percentage of 11, 13, 15-year-olds who smoke at least once a week	32	Very low	WHO Regional Office for Europe [60]
			Percentage of 15-year-olds who report first smoking at age or younger	32	Very low	
		Alcohol use	Percentage of 15-19 years old heavy episodic drinkers	189	Very high	WHO [31]
			Percentage of 15-year-olds who report first drunkenness at age 13 or younger	32	Very low	WHO Regional Office for Europe [60]
			Percentage of 11, 13, 15-year-olds who have been drunk at least twice	32	Very low	
		Adolescent fertility	Adolescent fertility rate (per 1,000 girls aged 15-19 years)	184	Very high	WHO [31]
		Cannabis use	Percentage of 15-year-olds who have used cannabis in the last 30 days	32	Very low	WHO Regional Office for Europe [60]
			Percentage of 15-year-olds who have ever used cannabis	32	Very low	
		Contraceptive prevalence	Contraceptive prevalence among girls aged 15-19	87	Low	WHO [31]
			Proportion of 15-year-olds having had sexual intercourse that reported using a condom during their last intercourse	32	Very low	WHO Regional Office for Europe [60]
			Percentage of 15-year-olds who used the contraceptive pill at last sexual intercourse	32	Very low	
		Prevalence of sexual activity in youth	Percentage of 15-year-olds who have had sexual intercourse	32	Very low	
	Eating and physical behavior	Eating behavior	Percentage of 11, 13, 15-year-olds who eat breakfast every school day	32	Very low	
			Percentage who eat fruit daily	32	Very low	
		Physical activity	Percentage of 11, 13, 15-year-olds who report at least one hour of moderate-to-vigorous physical activity daily	32	Very low	
			Comparable estimates of prevalence of insufficient physical activity (adolescents)	120	Medium	WHO [63]

Appendix

Theme	Subtheme	Criteria	Indicator	Data availability		Source
				Covered country	Level	
	Maternal health	Antenatal care	Percentage of women aged 15-49 years attended at least four during pregnancy by skilled health personnel (doctor, nurse or midwife)	149	Medium	UNICEF [49]
		Maternal mortality	Maternal mortality ratio (MMR, maternal deaths per 100,000 live births)	183	Very high	
		Skilled attendant at birth	Percentage of births attended by skilled health personnel (doctor, nurse or midwife)	168	High	
	Health expenditure	Public health expenditure	Public health expenditure as % of total health expenditure	190	Very high	WHO [31], WB [44]
	Water and sanitation	Access to improved sanitation facilities coverage	Improved sanitation facilities (% of population with access)	191	Very high	WB [44]
		Access to improved drinking water coverage	Population using improved drinking-water sources (%)	193	Very high	UNICEF [49], WHO [31],
Education	School attainment	Mathematical literacy	Average achievement in mathematical literacy	59	Low	OECD [64]
		Reading literacy	Average achievement in reading literacy	59	Low	
		Overall literacy	Youth literacy rate, population 15-24 years, both sexes (%)	151	High	UNESCO [32]
		Repetition	Repetition rate in primary education (all grades), both sexes (%)	165	High	
	Transition to employment	Idle youth	Proportion of 15-29 year olds not in employment, education or training (NEET)	42	Very low	OECD [65]
	Subjective evaluation	Satisfaction of school	Percentage of young people 'liking school a lot'	32	Very low	WHO Regional Office for Europe [60]
			Percentage of 11, 13, 15-year-olds who report good or very good perceived school performance	32	Very low	
		Pressure from school work	Percentage of 11, 13, 15-year-olds who feel pressured by schoolwork	32	Very low	

Appendix

Theme	Subtheme	Criteria	Indicator	Data availability		Source
				Covered country	Level	
	Completion of education	Primary school completion	Gross graduation ratio from primary education, both sexes	107	Medium	UNESCO [32]
		Secondary school completion	Gross graduation ratio from lower secondary education, both sexes (%)	140	Medium	
		Tertiary school completion	Gross graduation ratio from first degree programmes (ISCED 6 and 7) in tertiary education, both sexes (%)	120	Medium	
	Attendance of education	Enrolment in primary school	Gross enrolment ratio, primary, both sexes (%)	191	Very high	UNESCO [32]
		Enrolment in secondary school	Gross enrolment ratio, secondary, both sexes (%)	188	Very high	
		Enrolment in tertiary school	Gross enrolment ratio, tertiary, both sexes (%)	175	Very high	
	Early childhood education	Enrolment of kindergarten	Gross enrolment ratio, pre-primary, both sexes (%)	187	Very high	
	Parents' educational qualification	Parent's formal educational level	Percentage of children in households in which household head has a secondary education	41	Very low	Child Trends [66]
	Government support on education	Public expenditure on education	Government expenditure on education as % of GDP	179	Very high	UNESCO [32]
	Provision of vocational school	Attendance of vocational education	Young VET graduates in further education and training (%)	33	Very low	European Centre for the Development of Vocational Training [67]
			Initial-education-and-training students as a % of all upper-secondary students	33	Very low	
			Adults in lifelong learning (%)	33	Very low	
	Gender equality	Gender equality in enrolment	Gross enrolment ratio, pre-primary, gender parity index (GPI)	176	Very high	UNESCO [32]
			Gross enrolment ratio, primary, gender parity index (GPI)	190	Very high	

Appendix

Theme	Subtheme	Criteria	Indicator	Data availability		Source
				Covered country	Level	
			Gross enrolment ratio, secondary, gender parity index (GPI)	187	Very high	
			Gross enrolment ratio, tertiary, gender parity index (GPI)	177	Very high	
			Gross graduation ratio from primary education, gender parity index (GPI)	134	Medium	
		Gender equality in graduation	Gross graduation ratio from lower secondary education, gender parity index (GPI)	134	Medium	
			Gross graduation ratio from first degree programmes (ISCED 6 and 7) in tertiary education, gender parity index (GPI)	137	Medium	
		Gender equality in youth literacy	Youth literacy rate, population 15-24 years, gender parity index (GPI)	152	High	
		Juvenile delinquency	Juveniles held in prisons, penal institutions or correctional institutions	108	Medium	UNODC [68]
			Persons prosecuted, % of juvenile	80	Low	
			Persons convicted, % of juvenile	80	Low	
			Juveniles brought into formal contact with the police and/or criminal justice system, all crimes	108	Medium	
			Juveniles convicted, all crimes	92	Low	
Safety	Violence and crime	Bully in school	Percentage of 11, 13, 15-year-olds who have bullied others at school at least twice in the past couple of months	32	Very low	WHO Regional Office for Europe [60]
		Fighting	Percentage of 11, 13, 15-year olds who have been involved in a physical fight at least three times in the last months	32	Very low	
		Being bullied	Percentage of 11, 13, 15-year-olds who have been bullied at school at least twice in the past couple of months	32	Very low	
	Violence and crime	Criminal victimization	Intentional homicide count and rate per 100,000 population	195	Top	UNODC [68]
			Assault and major assault rates in different countries (police recorded assaults/100,000 population)	128	Medium	
		Family violence	Percentage of boys and men 15-49 years old who consider a husband to be justified in hitting or beating his wife for at least one of the specified reasons, i.e., if his	62	Low	UNICEF [49]

Appendix

Theme	Subtheme	Criteria	Indicator	Data availability		Source
				Covered country	Level	
			wife burns the food, argues with him, goes out without telling him, neglects the children or refuses sexual relations			
		Sexual violence against children	Total sexual offences against children at the national level, police-recorded offences, rate per 100,000 children aged 17 or under	102	Medium	UNODC [68]
			Sexual violence prevalence among girls and boys aged 15 to 19 years	40	Very low	UNICEF [49]
	Child care arrangement	Formal care	Formal childcare by age group and duration - % over the population of each age group (0-3, 30 hours per week or over)	31	Very low	European Commission [69]
			Formal childcare by age group and duration - % over the population of each age group (3-minimum school age, 30 hours per week or over)	31	Very low	
	Violent discipline	Psychological aggression and/or punishment	Percentage of children 2-14 years old who experience any violent discipline (psychological aggression and/or physical punishment)	61	Low	UNICEF [49]
	Birth registration	Registration of newborns	Birth registration rate	166	High	
	Child labor	Children involved in child labor	Percentage of children 5-14 years old involved in child labor	112	Medium	
	Child marriage	Children married or in union	Percentage of women aged 20 to 24 years who were first married or in union before age 18	123	Medium	
	Female genital mutilation	Girls received genital mutilation	Percentage of girls aged 0 to 14 years who have undergone FGM/C (as reported by their mothers)	19	Very low	
Economic status	Demographic structure	Sex ratio	Sex ratio at birth	191	Very high	CIA [70], UN [71]
	Relative household income poverty	Children living in households with income under national median	Percentage of children living in households with equivalent income lower than 50% of national median	39	Very low	OECD [65]
			Poverty gap at national poverty lines (%)	82	Low	WB [44]
	Household without job	Children living in jobless families	Proportion of children living in jobless families	31	Very low	OECD [65]

Appendix

Theme	Subtheme	Criteria	Indicator	Data availability		Source
				Covered country	Level	
	Material deprivation	Fewer than ten books	Percentage of children age 15 reporting less than 10 books in the home	28	Very low	UNICEF [72]
		Few educational resource	Percentage of children age 15 reporting less than six educational possessions	28	Very low	
	Material deprivation	Low family affluence	Percentage of children age 11, 13 and 15 reporting low family affluence	28	Very low	
		Lack of needed items	Material Deprivation rate, 0-18 years old	34	Very low	
	Housing quality	Electricity coverage	Access to electricity (% of population)	191	Very high	WB [44]
		Hygiene quality	Share of total population living in a dwelling with a leaking roof, damp walls, floors or foundation, or rot in window frames of floor	34	Very low	European Commission [69]
			Share of total population having neither a bath, nor a shower in their dwelling	34	Very low	
			Share of total population not having indoor flushing toilet for the sole use of their household	34	Very low	
		Crowded household	Overcrowding rate, 0-18 years old	33	Very low	
	Macroeconomic situation	Overall unemployment	Unemployment, total (% of total labor force) (modeled ILO estimate)	170	High	WB [44]
		Youth unemployment	Youth unemployment rate (% of total labor force ages 15-24)	170	High	
		Income equality at societal level	Income Gini coefficient	156	High	UNDP [73]
		National income	GNI per capita, Purchasing power parity (current international \$)	183	Very high	WB [44]
		National debts	Public debt as percentage of GDP	179	Very high	IMF [74]

Appendix

Theme	Subtheme	Criteria	Indicator	Data availability		Source
				Covered country	Level	
Relationship	Family relationship	Relation with parents	Percentage of children who report eating the main meal of the day with parents more than once a week	29	Very low	OECD [64], UNICEF [72]
			Percentage of children who report that parents spend time ‘just talking’ to them	29	Very low	
	Family relationship	Relation with parents	Percentage of 11, 13, 15-year-olds who find it easy to talk to their mothers	32	Very low	WHO Regional Office for Europe [60]
			Percentage of 11, 13, 15-year-olds who find it easy to talk to their fathers	32	Very low	
		Family engagement	Getting together with relatives every week, 16-19 years old	28	Very low	European Commission [69]
			Percentage of children living in single-parent family	61	Low	WHO Regional Office for Europe [60], Child Trends [66]
		Family structure	Percentage of children living in stepfamily	34	Very low	UNICEF [72]
			Percentage of Children Living with Probable Extended Family (Adults in Addition to Parents)	41	Very low	Child Trends [66]
			Percentage of children living in both-parents family	61	Low	WHO Regional Office for Europe [60], Child Trends [66]
	Community relationship	Social capital	Social Capital Ranking	140	Medium	Legatum Institute Foundation [75]
	Peer relationship	Kind and helpful peer	Percentage of 11, 13 and 15 year-olds who report finding their peers ‘kind and helpful’	32	Very low	WHO Regional Office for

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Theme	Subtheme	Criteria	Indicator	Data availability		Source
				Covered country	Level	
		Peer engagement	Percentage of 11, 13, 15-year-olds who have three or more close friends of the same gender	32	Very low	Europe [60]
			Percentage of 11, 13, 15-year-olds who spend four or more evenings per week out with friends	32	Very low	
			Percentage of 11, 13, 15-year-olds who have daily EMC with friends	32	Very low	
			Getting together with friends every week, 16-19 years old	28	Very low	European Commission [69]
Participation	Engagement of community activities	Participation of community activities	Participation of young people in informal voluntary activities, 16-19 years old	27	Very low	
	Voting of presidential elections	Youth voting engagement	Voter turnout in latest parliamentary election	29	Very low	OECD [65]
	Social media connection	Telephone access in home	Proportion of households with mobile phone	64	Low	ITU [76]
			Proportion of households with fixed line phone	65	Low	
		Internet access in home	Proportion of households with internet access at home	138	Medium	
		Access to public media	Proportion of households with computer	126	Medium	
			Proportion of households with radio	55	Low	
			Proportion of households with TV	66	Low	
Environmental aspects	Fresh water vulnerability	Risk of depleting freshwater re-	Water depletion index (WDI)	192	Very high	Berger et al. [59]

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Theme	Subtheme	Criteria	Indicator	Data availability		Source
				Covered country	Level	
		sources				
	Renewable energy consumption	Consumption of renewable energy	Renewable energy consumption (% of total final energy consumption)	180	Very high	WB [44]

Appendix 4. The relation of the initial indicator set of the SCDI to the SDG indicator development

SCDI theme	SCDI subtheme	SDG	SCDI criteria	SDG target	SCDI indicator	Data availability		Tier for SDG Indicator	Source
						Covered country	Level		
Health	Immunization coverage	3	Measles containing vaccine (MCV) immunization	3.8	Measles (MCV) immunization coverage among one-year-olds (%)	195	Top	-	UNICEF [49]
			Diphtheria tetanus toxoid and pertussis (DTP3) immunization		Diphtheria tetanus toxoid and pertussis (DTP3) immunization coverage among one-year-olds (%)	195	Top	-	
			Polio (Pol3) immunization		Polio (Pol3) immunization coverage among one-year-olds (%)	195	Top	-	
			Hepatitis B (HepB3) immunization		Hepatitis B (HepB3) immunization coverage among one-year-olds (%)	186	Very high	-	
			Bacillus Calmette-Guérin (BCG) immunization		Bacille Calmette-Guérin (vaccine against tuberculosis) immunization coverage among one-year-olds (%)	163	High	-	
	Risk behavior	3	Alcohol use	3.5	Percentage of 15-19 years old heavy episodic drinkers	189	Very high	I	WHO [31]
			Adolescent fertility	3.7	Adolescent fertility rate (per 1000 girls aged 15-19 years)	184	Very high	II	
	Physical behavior	3	Physical activity	3.4	Comparable estimates of prevalence of insufficient physical activity (adolescents 11-17 years)	120	Medium	-	WHO [63]
	Maternal health	3	Antenatal care	3.1	Percentage of women aged 15-49 years attended at least once during pregnancy by skilled health person-	166	High	-	UNICEF

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SCDI theme	SCDI subtheme	SDG	SCDI criteria	SDG target	SCDI indicator	Data availability		Tier for SDG Indicator	Source
						Covered country	Level		
					nel (doctor, nurse or midwife)				[49]
			Maternal mortality		Maternal mortality ratio (MMR, maternal deaths per 100 000 live births)	183	Very high	II	
			Skilled attendant at birth		Percentage of births attended by skilled health personnel (doctor, nurse or midwife)	180	Very high	I	
	Health expenditure	1	Public health expenditure	1.a	Public health expenditure as % of total health expenditure	190	Very high	II	WHO [31], WB [44]
	Water and sanitation	6	Access to improved sanitation facilities	6.2	Improved sanitation facilities (% of population with access)	191	Very high	I	WB [44]
			Access to improved drinking-water sources	6.1	Population using improved drinking-water sources (%)	193	Very high	I	UNICEF [49], WHO [31],
Health	HIV	3	HIV prevalence among youth	3.3	Estimated percentage of young men and women (aged 15-24) living with HIV	128	Medium	II	UNICEF [43,62]
Education	School attainment	4	Overall literacy	4.6	Youth literacy rate, population 15-24 years, both sexes (%)	151	High	II	UNESCO [32]
			Repetition	4.1	Repetition rate in primary education (all grades), both sexes (%)	152	High	-	
	Completion of education	4	School completion	4.1	Gross graduation ratio from primary education, both sexes	107	Medium	-	
				4.1	Gross graduation ratio from lower secondary education, both sexes (%)	114	Medium	-	
				-	Gross graduation ratio from first degree programmes (ISCED 6 and 7) in tertiary education, both sexes (%)	120	Medium	-	
	Attendance of	4	Enrolment in primary school	-	Gross enrolment ratio, primary, both sexes (%)	191	Very high	-	

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SCDI theme	SCDI subtheme	SDG	SCDI criteria	SDG target	SCDI indicator	Data availability		Tier for	Source	
						Covered country	Level	SDG Indicator		
	education		Enrolment in secondary school	-	Gross enrolment ratio, secondary, both sexes (%)	188	Very high	-		
			Enrolment in tertiary school	4.3	Gross enrolment ratio, tertiary, both sexes (%)	175	Very high	-		
			Early childhood education	4	Enrolment of kindergarten	4.2	Gross enrolment ratio, pre-primary, both sexes (%)	179		Very high
	Government support on education	1	Public expenditure on education	1.a	Government expenditure on education as % of GDP	178	Very high	II		
	Gender equality	4	Gender equality in enrolment	4.5	Gross enrolment ratio, pre-primary, gender parity index (GPI)	176	Very high	I		
					Gross enrolment ratio, primary, gender parity index (GPI)	190	Very high	I		
					Gross enrolment ratio, secondary, gender parity index (GPI)	187	Very high	I		
					Gross enrolment ratio, tertiary, gender parity index (GPI)	171	High	I		
			Gender equality in graduation		Gross graduation ratio from primary education, gender parity index (GPI)	118	Medium	I		
					Gross graduation ratio from lower secondary education, gender parity index (GPI)	107	Medium	I		
	Gender equality	4	Gender equality in graduation	4.5	Gross graduation ratio from first degree programmes (ISCED 6 and 7) in tertiary education, gender parity index (GPI)	127	Medium	I		
			Gender equality in youth literacy		Youth literacy rate, population 15-24 years, gender parity index (GPI)	152	High	I		
	Safety	Violence and crime	16	Juvenile delinquency	16.1	Juveniles held in prisons, penal institutions or correctional institutions	108	Medium		-
Juveniles brought into formal contact with the police						108	Medium	-		

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SCDI theme	SCDI subtheme	SDG	SCDI criteria	SDG target	SCDI indicator	Data availability		Tier for	Source
						Covered country	Level	SDG Indicator	
					and/or criminal justice system, all crimes				
			Criminal victimization	16.1	Intentional homicide count and rate per 100,000 population	195	Top	I	
					Assault and major assault rates in different countries (police recorded assaults/100,000 population)	128	Medium	-	
			Sexual violence against children	16.2	Total sexual offences against children at the national level, police-recorded offences, rate per 100,000 children aged 17 or under	102	Medium	II	
	Birth registration	16	Registration of newborns	16.9	Birth registration rate	162	High	I	UNICEF [49]
	Child labor	8	Children involved in child labor	8.7	Percentage of children five-14 years old involved in child labor	112	Medium	I	
	Child marriage	5	Children married or in union	5.3	Percentage of women aged 20 to 24 years who were first married or in union before ages 18	123	Medium	II	
	Demographic structure	5	Sex ratio	5.1	Sex ratio at birth	191	Very high	-	CIA [70], UN [71]
Economic status	Housing quality	7	Electricity coverage	7.1	Access to electricity (% of population)	191	Very high	I	WB [44]
	Macroeconomic situation	8	Overall unemployment	8.5	Unemployment, total (% of total labor force) (modeled ILO estimate)	171	High	I	
			Youth unemployment		Youth unemployment rate (% of total labor force ages 15-24)	170	High	I	
		10	Income equality at societal level	10.1	Income Gini coefficient	138	Medium	-	UNDP [73][44]
		8	National income	-	GNI per capita, Purchasing power parity (current international \$)	183	Very high	-	WB [44]
		8	National debts	-	Public debt as percentage of GDP	179	Very high	-	IMF [74]

Appendix

SCDI theme	SCDI subtheme	SDG	SCDI criteria	SDG target	SCDI indicator	Data availability		Tier for SDG Indicator	Source
						Covered country	Level		
Relationship	Community relationship	11	Social capital	11.3	Social Capital Ranking	140	Medium	-	Legatum Institute Foundation [75]
Participation	Social media connection	9	Internet access in home	9.c	Proportion of households with internet access at home	135	Medium	I	ITU [76]
			Access to public media		Proportion of households with computer	116	Medium	I	
Environmental aspects	Freshwater vulnerability	6	Risk of depleting freshwater resources	6.4	Water depletion index (WDI)	192	Very high	-	Berger et al. [59]
	Renewable energy consumption	7	Consumption of renewable energy	7.2	Renewable energy consumption (% of total final energy consumption)	180	Very high	I	WB [44]

Appendix 5. Correlation coefficients for the 66 indicators – Part I

		Under-5 mortality rate (per 1,000 live births)	Infant mortality rate (per 1,000 live births)	Neonatal mortality rate (per 1,000 live births)	Percentage of infants born with low birth weight (<2500g.)	Under- weight (moderate and severe, %)	Over- weight (including obesity, %)	Wasting (moder- ate and severe, %)	Stunting (moder- ate and severe, %)	Exclusive breast- feeding <6 months (%)	DMFT (decayed, missing or filled teeth) among 12-year- olds (number)	Suicide rate, 15-29 year- olds, per 100000	Mortality rate at- tributed to household and ambi- ent air pollution (per 100 000 population)	PM2.5 air pollution, population exposed to levels exceeding WHO guideline value (% of total)	Estimated percentage of young men and women (aged 15– 24) living with HIV as of 2013	Diphtheria tetanus toxoid and pertussis (DTP3) immuniza- tion cover- age among 1-year-olds (%)	Measles (MCV) immun- ization coverage among 1- year-olds (%)	Polio (Pol3) immun- ization cover- age among 1-year- olds (%)	Hepatitis B (HepB3) immuniza- tion cover- age among 1-year-olds (%)	Bacillus Calmette- Guérin (BCG) immun- ization	Comparable estimates of prevalence of insuffi- cient physi- cal activity (adolescents 11-17 years)	15-19 years old heavy episodic drinkers (popula- tion), % by country	Adoles- cent fertility rate (per 1000 girls aged 15- 19 years)
Under-5 mortality rate (per 1,000 live births)	Correlation Coefficient	1.00	0.998**	0.985**	0.645**	0.756**	-0.427**	0.513**	0.798**	0.367**	-0.174*	0.07	0.500**	0.11	0.563**	-0.537**	-0.491**	-0.521**	-0.452**	-0.330**	0.269**	-0.629**	0.791**
	Sig. (2- tailed)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.35	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	N	195.00	195.00	195.00	186.00	148.00	146.00	147.00	147.00	167.00	180.00	171.00	192.00	187.00	128.00	195.00	195.00	195.00	186.00	164.00	120.00	189.00	184.00
Infant mortality rate (per 1,000 live births)	Correlation Coefficient	0.998**	1.00	0.986**	0.645**	0.751**	-0.415**	0.517**	0.793**	0.357**	-0.173*	0.07	0.498**	0.11	0.554**	-0.536**	-0.491**	-0.519**	-0.450**	-0.325**	0.267**	-0.624**	0.781**
	Sig. (2- tailed)	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.38	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	N	195.00	195.00	195.00	186.00	148.00	146.00	147.00	147.00	167.00	180.00	171.00	192.00	187.00	128.00	195.00	195.00	195.00	186.00	164.00	120.00	189.00	184.00
Neonatal mortali- ty rate (per 1,000 live births)	Correlation Coefficient	0.985**	0.986**	1.00	0.647**	0.743**	-0.442**	0.523**	0.762**	0.335**	-0.159*	0.07	0.492**	0.13	0.521**	-0.533**	-0.481**	-0.527**	-0.453**	-0.309**	0.241**	-0.611**	0.763**
	Sig. (2- tailed)	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.34	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
	N	195.00	195.00	195.00	186.00	148.00	146.00	147.00	147.00	167.00	180.00	171.00	192.00	187.00	128.00	195.00	195.00	195.00	186.00	164.00	120.00	189.00	184.00
Percentage of infants born with low birth weight (<2500g.)	Correlation Coefficient	0.645**	0.645**	0.647**	1.00	0.677**	-0.498**	0.577**	0.562**	0.164*	-0.232**	-0.13	0.13	0.10	0.302**	-0.434**	-0.427**	-0.414**	-0.380**	-0.269**	0.205*	-0.556**	0.595**
	Sig. (2- tailed)	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.04	0.00	0.10	0.07	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00
	N	186.00	186.00	186.00	186.00	143.00	141.00	142.00	142.00	163.00	174.00	167.00	184.00	180.00	125.00	186.00	186.00	186.00	177.00	156.00	116.00	182.00	178.00
Underweight (moderate and severe, %)	Correlation Coefficient	0.756**	0.751**	0.743**	0.677**	1.00	-0.536**	0.811**	0.888**	0.324**	-0.310**	0.11	0.356**	0.11	0.235*	-0.408**	-0.429**	-0.392**	-0.378**	-0.427**	0.17	-0.556**	0.481**
	Sig. (2- tailed)	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.21	0.00	0.17	0.01	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.00
	N	148.00	148.00	148.00	143.00	148.00	145.00	147.00	147.00	138.00	138.00	138.00	148.00	146.00	116.00	148.00	148.00	148.00	147.00	140.00	81.00	146.00	146.00
Overweight (including obesi- ty, %)	Correlation Coefficient	-0.427**	-0.415**	-0.442**	-0.498**	-0.536**	1.00	-0.319**	-0.360**	-0.271**	0.264**	-0.181*	-0.14	-0.07	-0.200*	0.172*	0.173*	0.165*	0.189*	0.248**	-0.257*	0.234**	-0.329**
	Sig. (2- tailed)	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.03	0.10	0.42	0.03	0.04	0.04	0.05	0.02	0.00	0.02	0.00	0.00
	N	146.00	146.00	146.00	141.00	145.00	146.00	144.00	144.00	136.00	136.00	136.00	146.00	144.00	114.00	146.00	146.00	146.00	145.00	137.00	82.00	144.00	144.00
Wasting (moder- ate and severe, %)	Correlation Coefficient	0.513**	0.517**	0.523**	0.577**	0.811**	-0.319**	1.00	0.610**	0.06	-0.186*	-0.10	0.296**	0.185*	0.04	-0.261**	-0.362**	-0.289**	-0.247**	-0.318**	0.11	-0.525**	0.239**
	Sig. (2- tailed)	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.47	0.03	0.24	0.00	0.03	0.66	0.00	0.00	0.00	0.00	0.00	0.31	0.00	0.00

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		Under-5 mortality rate (per 1,000 live births)	Infant mortality rate (per 1,000 live births)	Neonatal mortality rate (per 1,000 live births)	Percentage of infants born with low birth weight (<2500g.)	Under-weight (moderate and severe, %)	Over-weight (including obesity, %)	Wasting (moderate and severe, %)	Stunting (moderate and severe, %)	Exclusive breast-feeding <6 months (%)	DMFT (decayed, missing or filled teeth) among 12-year-olds (number)	Suicide rate, 15-29 year-olds, per 100000	Mortality rate attributed to household and ambient air pollution (per 100 000 population)	PM2.5 air pollution, population exposed to levels exceeding WHO guideline value (% of total)	Estimated percentage of young men and women (aged 15–24) living with HIV as of 2013	Diphtheria tetanus toxoid and pertussis (DTP3) immunization coverage among 1-year-olds (%)	Measles (MCV) immunization coverage among 1-year-olds (%)	Polio (Pol3) immunization coverage among 1-year-olds (%)	Hepatitis B (HepB3) immunization coverage among 1-year-olds (%)	Bacillus Calmette-Guérin (BCG) immunization	Comparable estimates of prevalence of insufficient physical activity (adolescents 11-17 years)	15-19 years old heavy episodic drinkers (population), % by country	Adolescent fertility rate (per 1000 girls aged 15-19 years)
	N	147.00	147.00	147.00	142.00	147.00	144.00	147.00	147.00	137.00	137.00	138.00	147.00	145.00	116.00	147.00	147.00	147.00	146.00	139.00	80.00	145.00	145.00
Stunting (moderate and severe, %)	Correlation Coefficient	0.798**	0.793**	0.762**	0.562**	0.888**	-0.360**	0.610**	1.00	0.398**	-0.251**	0.16	0.400**	0.08	0.292**	-0.474**	-0.448**	-0.438**	-0.429**	-0.466**	0.20	-0.476**	0.534**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.05	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00
	N	147.00	147.00	147.00	142.00	147.00	144.00	147.00	147.00	137.00	137.00	138.00	147.00	145.00	116.00	147.00	147.00	147.00	146.00	139.00	80.00	145.00	145.00
Exclusive breast-feeding <6 months (%)	Correlation Coefficient	0.367**	0.357**	0.335**	0.164*	0.324**	-0.271**	0.06	0.398**	1.00	-0.10	0.159*	0.219**	-0.07	0.12	-0.08	-0.06	-0.04	0.01	0.06	0.342**	-0.322**	0.276**
	Sig. (2-tailed)	0.00	0.00	0.00	0.04	0.00	0.00	0.47	0.00		0.23	0.05	0.00	0.36	0.17	0.33	0.45	0.57	0.86	0.51	0.00	0.00	0.00
	N	167.00	167.00	167.00	163.00	138.00	136.00	137.00	137.00	167.00	155.00	155.00	166.00	164.00	123.00	167.00	167.00	167.00	160.00	144.00	98.00	163.00	163.00
DMFT (decayed, missing or filled teeth) among 12-year-olds (number)	Correlation Coefficient	-0.174*	-0.173*	-0.159*	-0.232**	-0.310**	0.264**	-0.186*	-0.251**	-0.10	1.00	0.07	0.12	0.11	-0.329**	-0.07	0.06	-0.04	-0.03	0.04	-0.06	0.14	-0.05
	Sig. (2-tailed)	0.02	0.02	0.03	0.00	0.00	0.00	0.03	0.00	0.23		0.36	0.10	0.16	0.00	0.37	0.46	0.62	0.71	0.59	0.50	0.07	0.52
	N	180.00	180.00	180.00	174.00	138.00	136.00	137.00	137.00	155.00	180.00	163.00	178.00	176.00	121.00	180.00	180.00	180.00	171.00	151.00	118.00	178.00	175.00
Suicide rate, 15-29 year-olds, per 100000	Correlation Coefficient	0.07	0.07	0.07	-0.13	0.11	-0.181*	-0.10	0.16	0.159*	0.07	1.00	0.177*	-0.15	0.191*	-0.03	0.03	-0.04	-0.06	-0.12	-0.07	0.171*	0.10
	Sig. (2-tailed)	0.35	0.38	0.34	0.10	0.21	0.03	0.24	0.05	0.05	0.36		0.02	0.05	0.03	0.70	0.66	0.63	0.45	0.16	0.49	0.03	0.21
	N	171.00	171.00	171.00	167.00	138.00	136.00	138.00	138.00	155.00	163.00	171.00	171.00	171.00	127.00	171.00	171.00	171.00	162.00	145.00	104.00	169.00	171.00
Mortality rate attributed to household and ambient air pollution (per 100 000 population)	Correlation Coefficient	0.500**	0.498**	0.492**	0.13	0.356**	-0.14	0.296**	0.400**	0.219**	0.12	0.177*	1.00	0.318**	0.15	-0.328**	-0.339**	-0.319**	-0.281**	-0.245**	-0.06	-0.178*	0.323**
	Sig. (2-tailed)	0.00	0.00	0.00	0.07	0.00	0.10	0.00	0.00	0.00	0.10	0.02		0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.53	0.01	0.00
	N	192.00	192.00	192.00	184.00	148.00	146.00	147.00	147.00	166.00	178.00	171.00	192.00	187.00	128.00	192.00	192.00	192.00	183.00	162.00	119.00	188.00	184.00
PM2.5 air pollution, population exposed to levels exceeding WHO guideline value (% of total)	Correlation Coefficient	0.11	0.11	0.13	0.10	0.11	-0.07	0.185*	0.08	-0.07	0.11	-0.15	0.318**	1.00	0.03	0.06	0.06	0.06	0.13	0.11	-0.06	-0.256**	0.03
	Sig. (2-tailed)	0.12	0.12	0.07	0.16	0.17	0.42	0.03	0.34	0.36	0.16	0.05	0.00		0.71	0.42	0.42	0.39	0.08	0.17	0.56	0.00	0.66
	N	187.00	187.00	187.00	180.00	146.00	144.00	145.00	145.00	164.00	176.00	171.00	187.00	187.00	128.00	187.00	187.00	187.00	178.00	158.00	115.00	184.00	183.00
Estimated percentage of young men and women (aged 15–24) living with HIV	Correlation Coefficient	0.563**	0.554**	0.521**	0.302**	0.235*	-0.200*	0.04	0.292**	0.12	-0.329**	0.191*	0.15	0.03	1.00	-0.384**	-0.359**	-0.386**	-0.337**	-0.17	0.08	-0.194*	0.563**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.01	0.03	0.66	0.00	0.17	0.00	0.03	0.08	0.71		0.00	0.00	0.00	0.00	0.06	0.53	0.03	0.00

Appendix

		Under-5 mortality rate (per 1,000 live births)	Infant mortality rate (per 1,000 live births)	Neonatal mortality rate (per 1,000 live births)	Percentage of infants born with low birth weight (<2500g.)	Under-weight (moderate and severe, %)	Over-weight (including obesity, %)	Wasting (moderate and severe, %)	Stunting (moderate and severe, %)	Exclusive breast-feeding <6 months (%)	DMFT (decayed, missing or filled teeth) among 12-year-olds (number)	Suicide rate, 15-29 year-olds, per 100000	Mortality rate attributed to household and ambient air pollution (per 100 000 population)	PM2.5 air pollution, population exposed to levels exceeding WHO guideline value (% of total)	Estimated percentage of young men and women (aged 15–24) living with HIV as of 2013	Diphtheria tetanus toxoid and pertussis (DTP3) immunization coverage among 1-year-olds (%)	Measles (MCV) immunization coverage among 1-year-olds (%)	Polio (Pol3) immunization coverage among 1-year-olds (%)	Hepatitis B (HepB3) immunization coverage among 1-year-olds (%)	Bacillus Calmette-Guérin (BCG) immunization	Comparable estimates of prevalence of insufficient physical activity (adolescents 11-17 years)	15-19 years old heavy episodic drinkers (population), % by country	Adolescent fertility rate (per 1000 girls aged 15-19 years)
as of 2013	N	128.00	128.00	128.00	125.00	116.00	114.00	116.00	116.00	123.00	121.00	127.00	128.00	128.00	128.00	128.00	128.00	128.00	124.00	117.00	70.00	126.00	128.00
Diphtheria tetanus toxoid and pertussis (DTP3) immunization coverage among 1-year-olds (%)	Correlation Coefficient	-0.537**	-0.536**	-0.533**	-0.434**	-0.408**	0.172*	-0.261**	-0.474**	-0.08	-0.07	-0.03	-0.328**	0.06	-0.384**	1.00	0.855**	0.948**	0.945**	0.708**	-0.11	0.296**	-0.522**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.33	0.37	0.70	0.00	0.42	0.00		0.00	0.00	0.00	0.00	0.23	0.00	0.00
	N	195.00	195.00	195.00	186.00	148.00	146.00	147.00	147.00	167.00	180.00	171.00	192.00	187.00	128.00	195.00	195.00	195.00	186.00	164.00	120.00	189.00	184.00
Measles (MCV) immunization coverage among 1-year-olds (%)	Correlation Coefficient	-0.491**	-0.491**	-0.481**	-0.427**	-0.429**	0.173*	-0.362**	-0.448**	-0.06	0.06	0.03	-0.339**	0.06	-0.359**	0.855**	1.00	0.854**	0.827**	0.672**	-0.11	0.268**	-0.438**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.45	0.46	0.66	0.00	0.42	0.00	0.00		0.00	0.00	0.00	0.22	0.00	0.00
	N	195.00	195.00	195.00	186.00	148.00	146.00	147.00	147.00	167.00	180.00	171.00	192.00	187.00	128.00	195.00	195.00	195.00	186.00	164.00	120.00	189.00	184.00
Polio (Pol3) immunization coverage among 1-year-olds (%)	Correlation Coefficient	-0.521**	-0.519**	-0.527**	-0.414**	-0.392**	0.165*	-0.289**	-0.438**	-0.04	-0.04	-0.04	-0.319**	0.06	-0.386**	0.948**	0.854**	1.00	0.921**	0.693**	-0.05	0.278**	-0.513**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.57	0.62	0.63	0.00	0.39	0.00	0.00	0.00		0.00	0.00	0.62	0.00	0.00
	N	195.00	195.00	195.00	186.00	148.00	146.00	147.00	147.00	167.00	180.00	171.00	192.00	187.00	128.00	195.00	195.00	195.00	186.00	164.00	120.00	189.00	184.00
Hepatitis B (HepB3) immunization coverage among 1-year-olds (%)	Correlation Coefficient	-0.452**	-0.450**	-0.453**	-0.380**	-0.378**	0.189*	-0.247**	-0.429**	0.01	-0.03	-0.06	-0.281**	0.13	-0.337**	0.945**	0.827**	0.921**	1.00	0.752**	-0.10	0.188*	-0.443**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.86	0.71	0.45	0.00	0.08	0.00	0.00	0.00	0.00		0.00	0.28	0.01	0.00
	N	186.00	186.00	186.00	177.00	147.00	145.00	146.00	146.00	160.00	171.00	162.00	183.00	178.00	124.00	186.00	186.00	186.00	186.00	160.00	112.00	180.00	175.00
Bacillus Calmette-Guérin (BCG) immunization	Correlation Coefficient	-0.330**	-0.325**	-0.309**	-0.269**	-0.427**	0.248**	-0.318**	-0.466**	0.06	0.04	-0.12	-0.245**	0.11	-0.17	0.708**	0.672**	0.693**	0.752**	1.00	-0.08	0.12	-0.274**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.51	0.59	0.16	0.00	0.17	0.06	0.00	0.00	0.00	0.00		0.47	0.12	0.00
	N	164.00	164.00	164.00	156.00	140.00	137.00	139.00	139.00	144.00	151.00	145.00	162.00	158.00	117.00	164.00	164.00	164.00	160.00	164.00	93.00	159.00	156.00
Comparable estimates of prevalence of insufficient physical activity (adolescents 11-17 years)	Correlation Coefficient	0.269**	0.267**	0.241**	0.205*	0.17	-0.257*	0.11	0.20	0.342**	-0.06	-0.07	-0.06	-0.06	0.08	-0.11	-0.11	-0.05	-0.10	-0.08	1.00	-0.254**	0.193*
	Sig. (2-tailed)	0.00	0.00	0.01	0.03	0.12	0.02	0.31	0.07	0.00	0.50	0.49	0.53	0.56	0.53	0.23	0.22	0.62	0.28	0.47		0.01	0.04
	N	120.00	120.00	120.00	116.00	81.00	82.00	80.00	80.00	98.00	118.00	104.00	119.00	115.00	70.00	120.00	120.00	120.00	112.00	93.00	120.00	120.00	114.00
15-19 years old heavy episodic drinkers (population), % by	Correlation Coefficient	-0.629**	-0.624**	-0.611**	-0.556**	-0.556**	0.234**	-0.525**	-0.476**	-0.322**	0.14	0.171*	-0.178*	-0.256**	-0.194*	0.296**	0.268**	0.278**	0.188*	0.12	-0.254**	1.00	-0.420**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.03	0.01	0.00	0.03	0.00	0.00	0.00	0.01	0.12	0.01		0.00

Appendix

		Under-5 mortality rate (per 1,000 live births)	Infant mortality rate (per 1,000 live births)	Neonatal mortality rate (per 1,000 live births)	Percentage of infants born with low birth weight (<2500g.)	Under-weight (moderate and severe, %)	Over-weight (including obesity, %)	Wasting (moderate and severe, %)	Stunting (moderate and severe, %)	Exclusive breast-feeding <6 months (%)	DMFT (decayed, missing or filled teeth) among 12-year-olds (number)	Suicide rate, 15-29 year-olds, per 100000	Mortality rate attributed to household and ambient air pollution (per 100 000 population)	PM2.5 air pollution, population exposed to levels exceeding WHO guideline value (% of total)	Estimated percentage of young men and women (aged 15–24) living with HIV as of 2013	Diphtheria tetanus toxoid and pertussis (DTP3) immunization coverage among 1-year-olds (%)	Measles (MCV) immunization coverage among 1-year-olds (%)	Polio (Pol3) immunization coverage among 1-year-olds (%)	Hepatitis B (HepB3) immunization coverage among 1-year-olds (%)	Bacillus Calmette-Guérin (BCG) immunization	Comparable estimates of prevalence of insufficient physical activity (adolescents 11-17 years)	15-19 years old heavy episodic drinkers (population), % by country	Adolescent fertility rate (per 1000 girls aged 15-19 years)
country	N	189.00	189.00	189.00	182.00	146.00	144.00	145.00	145.00	163.00	178.00	169.00	188.00	184.00	126.00	189.00	189.00	189.00	180.00	159.00	120.00	189.00	182.00
Adolescent fertility rate (per 1000 girls aged 15-19 years)	Correlation Coefficient	0.791**	0.781**	0.763**	0.595**	0.481**	-0.329**	0.239**	0.534**	0.276**	-0.05	0.10	0.323**	0.03	0.563**	-0.522**	-0.438**	-0.513**	0-.443**	-0.274**	0.193*	-0.420**	1.00
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.52	0.21	0.00	0.66	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	
	N	184.00	184.00	184.00	178.00	146.00	144.00	145.00	145.00	163.00	175.00	171.00	184.00	183.00	128.00	184.00	184.00	184.00	175.00	156.00	114.00	182.00	184.00
Percentage of births attended by skilled health personnel (doctor, nurse or midwife)	Correlation Coefficient	-0.829**	-0.823**	-0.808**	-0.651**	-0.762**	0.527**	-0.497**	-0.782**	-0.297**	0.286**	-0.11	-0.317**	-0.02	-0.343**	0.596**	0.607**	0.564**	0.561**	0.450**	-0.309**	0.506**	-0.685**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	N	168.00	168.00	168.00	161.00	142.00	140.00	141.00	141.00	150.00	155.00	148.00	166.00	162.00	120.00	168.00	168.00	168.00	166.00	156.00	98.00	164.00	160.00
Percentage of women aged 15–49 years attended at least 4 times during pregnancy by skilled health personnel (doctor, nurse or midwife)	Correlation Coefficient	-0.772**	-0.773**	-0.770**	-0.573**	-0.707**	0.361**	-0.586**	-0.763**	-0.179*	0.226**	-0.07	-0.322**	-0.12	-0.280**	0.556**	0.570**	0.525**	0.475**	0.462**	-0.267*	0.504**	-0.542**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.01	0.40	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00
	N	149.00	149.00	149.00	145.00	137.00	135.00	136.00	136.00	137.00	136.00	135.00	148.00	145.00	115.00	149.00	149.00	149.00	149.00	136.00	81.00	145.00	144.00
Maternal mortality ratio (MMR, maternal deaths per 100 000 live births)	Correlation Coefficient	0.937**	0.932**	0.920**	0.661**	0.736**	0-.480**	0.475**	0.760**	0.394**	-0.173*	0.10	0.449**	0.08	0.602**	-0.558**	-0.528**	-0.550**	-0.469**	-0.359**	0.265**	-0.609**	0.819**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.18	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	N	183.00	183.00	183.00	178.00	145.00	143.00	144.00	144.00	164.00	173.00	171.00	182.00	182.00	128.00	183.00	183.00	183.00	174.00	156.00	112.00	180.00	181.00
Health expenditure, public (% of total health expenditure)	Correlation Coefficient	-0.467**	-0.467**	-0.475**	-0.387**	-0.361**	0.177*	-0.301**	-0.381**	-0.14	0.03	0.00	-0.428**	-0.266**	-0.08	0.307**	0.230**	0.289**	0.246**	0.244**	-0.08	0.275**	-0.459**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.08	0.65	0.99	0.00	0.00	0.37	0.00	0.00	0.00	0.00	0.00	0.40	0.00	0.00
	N	190.00	190.00	190.00	185.00	146.00	144.00	145.00	145.00	164.00	176.00	170.00	188.00	184.00	127.00	190.00	190.00	190.00	181.00	159.00	118.00	185.00	181.00
Improved sanitation facilities (% of population with access)	Correlation Coefficient	-0.862**	-0.853**	-.841**	-.589**	-.709**	0.424**	-0.412**	-0.764**	-0.454**	0.12	-0.13	-0.555**	-0.06	-0.560**	0.587**	0.539**	0.574**	0.506**	0.367**	-0.17	0.528**	-0.756**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.10	0.00	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00
	N	191.00	191.00	191.00	183.00	146.00	144.00	145.00	145.00	166.00	176.00	168.00	189.00	184.00	127.00	191.00	191.00	191.00	182.00	162.00	119.00	186.00	181.00
Population using improved drinking-water sources (%)	Correlation Coefficient	-0.849**	-0.845**	-0.831**	-0.532**	-0.645**	0.346**	-0.430**	-0.710**	-0.350**	0.12	-0.09	-0.458**	-0.12	-0.391**	0.500**	0.472**	0.494**	0.419**	0.309**	-0.236**	0.557**	-0.670**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.26	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00

Appendix

		Under-5 mortality rate (per 1,000 live births)	Infant mortality rate (per 1,000 live births)	Neonatal mortality rate (per 1,000 live births)	Percentage of infants born with low birth weight (<2500g.)	Under-weight (moderate and severe, %)	Over-weight (including obesity, %)	Wasting (moderate and severe, %)	Stunting (moderate and severe, %)	Exclusive breast-feeding <6 months (%)	DMFT (decayed, missing or filled teeth) among 12-year-olds (number)	Suicide rate, 15-29 year-olds, per 100000	Mortality rate attributed to household and ambient air pollution (per 100 000 population)	PM2.5 air pollution, population exposed to levels exceeding WHO guideline value (% of total)	Estimated percentage of young men and women (aged 15–24) living with HIV as of 2013	Diphtheria tetanus toxoid and pertussis (DTP3) immunization coverage among 1-year-olds (%)	Measles (MCV) immunization coverage among 1-year-olds (%)	Polio (Pol3) immunization coverage among 1-year-olds (%)	Hepatitis B (HepB3) immunization coverage among 1-year-olds (%)	Bacillus Calmette-Guérin (BCG) immunization	Comparable estimates of prevalence of insufficient physical activity (adolescents 11-17 years)	15-19 years old heavy episodic drinkers (population), % by country	Adolescent fertility rate (per 1000 girls aged 15-19 years)
	N	193.00	193.00	193.00	184.00	147.00	145.00	146.00	146.00	167.00	178.00	170.00	191.00	186.00	128.00	193.00	193.00	193.00	184.00	163.00	119.00	188.00	183.00
Youth literacy rate, population 15-24 years, both sexes (%)	Correlation Coefficient	-0.809**	-.0798**	-0.790**	-0.676**	-0.699**	0.487**	-0.478**	-0.710**	-0.261**	0.316**	-0.07	-0.229**	-0.02	-0.444**	0.546**	0.547**	0.543**	0.521**	0.420**	-0.270*	0.504**	-0.762**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.38	0.00	0.83	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
	N	151.00	151.00	151.00	146.00	133.00	130.00	133.00	133.00	139.00	140.00	143.00	150.00	149.00	117.00	151.00	151.00	151.00	149.00	141.00	85.00	148.00	149.00
Repetition rate in primary education (all grades), both sexes (%)	Correlation Coefficient	0.642**	0.632**	0.609**	0.575**	0.555**	-0.300**	0.348**	0.597**	0.225**	-0.167*	0.04	0.05	-0.02	0.517**	-0.450**	-0.440**	-0.432**	-0.417**	-0.354**	0.07	-0.450**	0.635**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.04	0.66	0.55	0.82	0.00	0.00	0.00	0.00	0.00	0.00	0.45	0.00	0.00
	N	165.00	165.00	165.00	163.00	131.00	129.00	131.00	131.00	144.00	153.00	150.00	163.00	160.00	116.00	165.00	165.00	165.00	160.00	144.00	103.00	162.00	158.00
Gross graduation ratio from primary education, both sexes (%)	Correlation Coefficient	-0.615**	-0.606**	-0.602**	-0.459**	-0.501**	0.383**	-0.331**	-0.535**	-0.03	0.16	-0.17	-0.266**	-0.229**	-0.472**	0.524**	0.523**	0.504**	0.494**	0.442**	-0.08	0.309**	-0.560**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.77	0.08	0.06	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00
	N	135.00	135.00	135.00	132.00	116.00	114.00	116.00	116.00	122.00	126.00	123.00	133.00	132.00	104.00	135.00	135.00	135.00	132.00	122.00	82.00	132.00	130.00
Gross graduation ratio from lower secondary education, both sexes (%)	Correlation Coefficient	-0.737**	-0.735**	-0.719**	-0.636**	-0.600**	0.421**	-0.417**	-0.653**	-0.13	0.15	0.03	-0.176*	-0.11	-0.447**	0.565**	0.575**	0.562**	0.516**	0.403**	-0.19	0.549**	-0.652**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.09	0.70	0.04	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00
	N	140.00	140.00	140.00	137.00	116.00	115.00	116.00	116.00	125.00	131.00	125.00	138.00	136.00	101.00	140.00	140.00	140.00	135.00	126.00	86.00	137.00	134.00
Gross graduation ratio from first degree programmes (ISCED 6 and 7) in tertiary education, both sexes (%)	Correlation Coefficient	-0.591**	-0.593**	-0.586**	-0.570**	-0.539**	0.284**	-0.373**	-0.450**	-0.256**	0.14	0.10	-0.193*	-0.180*	-0.367**	0.195*	0.220**	0.216**	0.13	0.07	-0.19	0.490**	-0.498**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.23	0.02	0.03	0.00	0.02	0.01	0.01	0.12	0.42	0.07	0.00	0.00
	N	145.00	145.00	145.00	142.00	109.00	108.00	109.00	109.00	127.00	138.00	137.00	144.00	142.00	100.00	145.00	145.00	145.00	136.00	119.00	96.00	143.00	143.00
Gross enrolment ratio, pre-primary, both sexes (%)	Correlation Coefficient	-0.648**	-0.650**	-0.626**	-0.430**	-0.470**	0.14	-0.413**	-0.509**	-0.182*	0.02	0.07	-0.428**	-0.222**	-0.279**	0.377**	0.376**	0.360**	0.306**	0.237**	-0.09	0.538**	-0.472**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.02	0.74	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36	0.00	0.00
	N	188.00	188.00	188.00	181.00	143.00	141.00	142.00	142.00	163.00	175.00	166.00	185.00	181.00	124.00	188.00	188.00	188.00	179.00	158.00	118.00	183.00	179.00
Gross enrolment ratio, primary, both sexes (%)	Correlation Coefficient	0.14	0.14	0.12	0.04	0.07	0.01	-0.08	0.12	0.304**	-0.04	0.01	-0.07	-0.12	0.04	0.00	0.02	0.04	0.00	0.01	0.18	-0.09	0.149*
	Sig. (2-tailed)	0.05	0.06	0.09	0.56	0.41	0.91	0.34	0.14	0.00	0.61	0.86	0.37	0.11	0.63	0.98	0.83	0.58	0.95	0.89	0.05	0.21	0.05

Appendix

		Under-5 mortality rate (per 1,000 live births)	Infant mortality rate (per 1,000 live births)	Neonatal mortality rate (per 1,000 live births)	Percentage of infants born with low birth weight (<2500g.)	Under-weight (moderate and severe, %)	Over-weight (including obesity, %)	Wasting (moderate and severe, %)	Stunting (moderate and severe, %)	Exclusive breast-feeding <6 months (%)	DMFT (decayed, missing or filled teeth) among 12-year-olds (number)	Suicide rate, 15-29 year-olds, per 100000	Mortality rate attributed to household and ambient air pollution (per 100 000 population)	PM2.5 air pollution, population exposed to levels exceeding WHO guideline value (% of total)	Estimated percentage of young men and women (aged 15–24) living with HIV as of 2013	Diphtheria tetanus toxoid and pertussis (DTP3) immunization coverage among 1-year-olds (%)	Measles (MCV) immunization coverage among 1-year-olds (%)	Polio (Pol3) immunization coverage among 1-year-olds (%)	Hepatitis B (HepB3) immunization coverage among 1-year-olds (%)	Bacillus Calmette-Guérin (BCG) immunization	Comparable estimates of prevalence of insufficient physical activity (adolescents 11-17 years)	15-19 years old heavy episodic drinkers (population), % by country	Adolescent fertility rate (per 1000 girls aged 15-19 years)
	N	191.00	191.00	191.00	183.00	146.00	144.00	145.00	145.00	166.00	178.00	169.00	188.00	184.00	127.00	191.00	191.00	191.00	182.00	161.00	119.00	186.00	182.00
Gross enrolment ratio, secondary, both sexes (%)	Correlation Coefficient	-0.830**	-0.826**	-0.814**	-0.651**	-0.709**	0.462**	-0.486**	-0.741**	-0.346**	0.160*	-0.03	-0.444**	-0.181*	-0.495**	0.559**	0.570**	0.544**	0.482**	0.346**	-0.196*	0.608**	-0.711**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.74	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00
	N	189.00	189.00	189.00	181.00	144.00	142.00	143.00	143.00	164.00	176.00	167.00	186.00	182.00	125.00	189.00	189.00	189.00	180.00	159.00	117.00	184.00	180.00
Gross enrolment ratio, tertiary, both sexes (%)	Correlation Coefficient	-0.832**	-0.829**	-0.803**	-0.605**	-0.704**	0.410**	-0.494**	-0.703**	-0.396**	0.225**	-0.02	-0.340**	-0.162*	-0.540**	0.413**	0.423**	0.418**	0.338**	0.245**	-0.267**	0.612**	-0.658**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.75	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	N	181.00	181.00	181.00	176.00	140.00	138.00	140.00	140.00	160.00	170.00	165.00	178.00	176.00	125.00	181.00	181.00	181.00	172.00	152.00	111.00	177.00	176.00
Government expenditure on education as % of GDP (%)	Correlation Coefficient	-0.168*	-0.162*	-0.165*	-0.194*	-0.245**	0.13	-0.258**	0.171*	-0.11	-0.199*	-0.02	-0.319**	-0.245**	0.02	0.09	0.06	0.11	0.05	0.00	-0.07	0.174*	-0.218**
	Sig. (2-tailed)	0.02	0.03	0.03	0.01	0.00	0.15	0.00	0.05	0.17	0.01	0.78	0.00	0.00	0.84	0.25	0.42	0.14	0.48	0.97	0.43	0.02	0.00
	N	179.00	179.00	179.00	172.00	134.00	132.00	133.00	133.00	152.00	166.00	159.00	176.00	173.00	120.00	179.00	179.00	179.00	170.00	149.00	113.00	173.00	171.00
Gross enrolment ratio, pre-primary, gender parity index (GPI)	Correlation Coefficient	0.252**	0.246**	0.230**	0.253**	0.190*	-0.214*	0.06	0.16	0.13	-0.11	-0.05	-0.05	-0.01	0.12	-0.07	-0.05	-0.05	-0.04	0.04	0.07	-0.159*	0.340**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.02	0.01	0.45	0.07	0.10	0.14	0.52	0.46	0.85	0.20	0.33	0.51	0.47	0.64	0.65	0.48	0.03	0.00
	N	187.00	187.00	187.00	180.00	142.00	140.00	142.00	142.00	162.00	174.00	166.00	184.00	180.00	124.00	187.00	187.00	187.00	178.00	157.00	117.00	182.00	178.00
Gross enrolment ratio, primary, gender parity index (GPI)	Correlation Coefficient	0.392**	-0.393**	-0.384**	-0.279**	-0.272**	0.08	-0.234**	-0.305**	0.08	0.02	0.08	-0.14	-0.10	-0.252**	0.303**	0.277**	0.279**	.269**	.217**	-0.07	.218**	-0.391**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.34	0.00	0.00	0.32	0.77	0.32	0.06	0.18	0.00	0.00	0.00	0.00	0.00	0.01	0.43	0.00	0.00
	N	191.00	191.00	191.00	183.00	146.00	144.00	145.00	145.00	166.00	178.00	169.00	188.00	184.00	127.00	191.00	191.00	191.00	182.00	161.00	119.00	186.00	182.00
Gross enrolment ratio, secondary, gender parity index (GPI)	Correlation Coefficient	-0.375**	-0.371**	-0.369**	-0.254**	-0.394**	0.286**	-0.329**	-0.428**	0.01	0.07	-0.15	-0.418**	-0.278**	-0.241**	0.313**	0.310**	0.307**	0.295**	0.385**	-0.01	0.161*	-0.315**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.93	0.37	0.05	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.95	0.03	0.00
	N	189.00	189.00	189.00	181.00	144.00	142.00	143.00	143.00	164.00	176.00	167.00	186.00	182.00	125.00	189.00	189.00	189.00	180.00	159.00	117.00	184.00	180.00
Gross enrolment ratio, tertiary, gender parity index (GPI)	Correlation Coefficient	-0.630**	-0.627**	-0.622**	-0.418**	-0.569**	0.428**	-0.376**	-0.639**	-0.291**	0.175*	-0.14	-0.457**	-0.151*	-0.247**	0.406**	0.430**	0.371**	0.391**	0.411**	-0.211*	0.346**	-0.412**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.08	0.00	0.05	0.01	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00

Appendix

		Under-5 mortality rate (per 1,000 live births)	Infant mortality rate (per 1,000 live births)	Neonatal mortality rate (per 1,000 live births)	Percentage of infants born with low birth weight (<2500g.)	Under-weight (moderate and severe, %)	Over-weight (including obesity, %)	Wasting (moderate and severe, %)	Stunting (moderate and severe, %)	Exclusive breast-feeding <6 months (%)	DMFT (decayed, missing or filled teeth) among 12-year-olds (number)	Suicide rate, 15-29 year-olds, per 100000	Mortality rate attributed to household and ambient air pollution (per 100 000 population)	PM2.5 air pollution, population exposed to levels exceeding WHO guideline value (% of total)	Estimated percentage of young men and women (aged 15–24) living with HIV as of 2013	Diphtheria tetanus toxoid and pertussis (DTP3) immunization coverage among 1-year-olds (%)	Measles (MCV) immunization coverage among 1-year-olds (%)	Polio (Pol3) immunization coverage among 1-year-olds (%)	Hepatitis B (HepB3) immunization coverage among 1-year-olds (%)	Bacillus Calmette-Guérin (BCG) immunization	Comparable estimates of prevalence of insufficient physical activity (adolescents 11-17 years)	15-19 years old heavy episodic drinkers (population), % by country	Adolescent fertility rate (per 1000 girls aged 15-19 years)
	N	179.00	179.00	179.00	174.00	139.00	137.00	139.00	139.00	158.00	168.00	164.00	176.00	174.00	124.00	179.00	179.00	179.00	170.00	150.00	111.00	175.00	174.00
Gross graduation ratio from primary education, gender parity index (GPI)	Correlation Coefficient	-0.323**	-0.318**	-0.338**	-0.192*	-0.318**	0.204*	-0.300**	-0.283**	0.07	0.06	0.02	-0.203*	-0.231**	-0.17	0.210*	0.190*	0.245**	0.210*	0.268**	0.05	0.282**	-0.230**
	Sig. (2-tailed)	0.00	0.00	0.00	0.03	0.00	0.03	0.00	0.00	0.46	0.50	0.80	0.02	0.01	0.09	0.02	0.03	0.00	0.02	0.00	0.64	0.00	0.01
	N	134.00	134.00	134.00	131.00	115.00	113.00	115.00	115.00	121.00	126.00	121.00	132.00	131.00	103.00	134.00	134.00	134.00	131.00	121.00	81.00	131.00	129.00
Gross graduation ratio from lower secondary education, gender parity index (GPI)	Correlation Coefficient	-0.298**	-0.294**	-0.290**	-0.180*	-0.375**	0.246**	-0.279**	-0.413**	-0.01	0.185*	-0.11	-0.370**	-0.213*	-0.209*	0.190*	0.219*	0.188*	0.180*	0.328**	0.04	0.176*	-0.174*
	Sig. (2-tailed)	0.00	0.00	0.00	0.04	0.00	0.01	0.00	0.00	0.88	0.04	0.24	0.00	0.01	0.04	0.03	0.01	0.03	0.04	0.00	0.72	0.04	0.05
	N	134.00	134.00	134.00	131.00	111.00	110.00	111.00	111.00	119.00	126.00	120.00	132.00	130.00	97.00	134.00	134.00	134.00	129.00	120.00	83.00	131.00	128.00
Gross graduation ratio from first degree programmes (ISCED 6 and 7) in tertiary education, gender parity index (GPI)	Correlation Coefficient	-0.554**	-0.555**	0-.557**	-0.456**	-0.532**	0.374**	-0.353**	-0.589**	-0.383**	0.200*	-0.13	-0.370**	-0.04	-0.303**	0.420**	0.426**	0.353**	0.364**	0.338**	-0.218*	0.339**	-0.394**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.15	0.00	0.61	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00
	N	137.00	137.00	137.00	134.00	101.00	100.00	101.00	101.00	119.00	130.00	130.00	136.00	134.00	93.00	137.00	137.00	137.00	128.00	111.00	89.00	135.00	135.00
Youth literacy rate, population 15-24 years, gender parity index (GPI)	Correlation Coefficient	-0.309**	-0.305**	-0.310**	-.0247**	-0.352**	0.306**	-0.348**	-0.337**	-0.03	0.07	0.05	-0.297**	-0.259**	0.05	0.202*	0.230**	0.214**	0.215**	0.227**	0.06	0.305**	-0.184*
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.69	0.40	0.58	0.00	0.00	0.61	0.01	0.00	0.01	0.01	0.01	0.57	0.00	0.02
	N	152.00	152.00	152.00	147.00	134.00	131.00	134.00	134.00	140.00	141.00	144.00	151.00	150.00	117.00	152.00	152.00	152.00	150.00	142.00	86.00	149.00	150.00
Juveniles Held in Prisons, Penal Institutions or Correctional Institutions, rate per 100,000 juveniles aged 17 or under	Correlation Coefficient	-0.02	-0.03	0.00	0.09	-0.277*	0.22	-0.254*	-0.300*	0.01	0.14	-0.09	-0.09	0.04	0.17	0.12	0.200*	0.06	0.14	0.283**	-0.02	0.00	0.06
	Sig. (2-tailed)	0.82	0.79	0.98	0.38	0.02	0.07	0.03	0.01	0.93	0.17	0.36	0.35	0.72	0.17	0.23	0.04	0.54	0.16	0.01	0.87	0.96	0.56
	N	108.00	108.00	108.00	105.00	71.00	71.00	71.00	71.00	91.00	103.00	102.00	106.00	105.00	70.00	108.00	108.00	108.00	99.00	83.00	72.00	105.00	104.00
Juveniles Brought into Formal Contact with the police and/or criminal justice system, All Crimes, rate per 100,000 juveniles aged 17 or under	Correlation Coefficient	-0.694**	-0.698**	-0.680**	-0.505**	-0.617**	0.273*	-0.452**	-0.652**	-0.340**	-0.08	0.05	-0.362**	-0.197*	-0.08	0.262**	0.12	0.256**	0.18	0.04	-0.22	0.575**	-0.536**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.40	0.59	0.00	0.04	0.52	0.01	0.23	0.01	0.07	0.73	0.05	0.00	0.00
	N	108.00	108.00	108.00	106.00	70.00	69.00	70.00	70.00	92.00	104.00	103.00	106.00	105.00	68.00	108.00	108.00	108.00	99.00	81.00	77.00	105.00	104.00
Intentional homicide, rates	Correlation Coefficient	0.552**	0.549**	0.550**	0.347**	0.14	-0.13	-0.03	0.172*	0.15	0.05	0.07	0.162*	0.08	0.502**	-0.337**	-0.199**	-0.336**	-0.258**	-0.12	0.12	-0.270**	0.630**

Appendix

		Under-5 mortality rate (per 1,000 live births)	Infant mortality rate (per 1,000 live births)	Neonatal mortality rate (per 1,000 live births)	Percentage of infants born with low birth weight (<2500g.)	Under-weight (moderate and severe, %)	Over-weight (including obesity, %)	Wasting (moderate and severe, %)	Stunting (moderate and severe, %)	Exclusive breast-feeding <6 months (%)	DMFT (decayed, missing or filled teeth) among 12-year-olds (number)	Suicide rate, 15-29 year-olds, per 100000	Mortality rate attributed to household and ambient air pollution (per 100 000 population)	PM2.5 air pollution, population exposed to levels exceeding WHO guideline value (% of total)	Estimated percentage of young men and women (aged 15–24) living with HIV as of 2013	Diphtheria tetanus toxoid and pertussis (DTP3) immunization coverage among 1-year-olds (%)	Measles (MCV) immunization coverage among 1-year-olds (%)	Polio (Pol3) immunization coverage among 1-year-olds (%)	Hepatitis B (HepB3) immunization coverage among 1-year-olds (%)	Bacillus Calmette-Guérin (BCG) immunization	Comparable estimates of prevalence of insufficient physical activity (adolescents 11-17 years)	15-19 years old heavy episodic drinkers (population), % by country	Adolescent fertility rate (per 1000 girls aged 15-19 years)
per 100,000 population	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.10	0.12	0.74	0.04	0.05	0.50	0.38	0.03	0.26	0.00	0.00	0.01	0.00	0.00	0.14	0.19	0.00	0.00
	N	195.00	195.00	195.00	186.00	148.00	146.00	147.00	147.00	167.00	180.00	171.00	192.00	187.00	128.00	195.00	195.00	195.00	186.00	164.00	120.00	189.00	184.00
Assault at the national level, number of police-recorded offences	Correlation Coefficient	-0.199*	-0.200*	-0.214*	-0.02	-0.233*	-0.03	-0.316**	-0.258*	-0.07	-0.16	-0.06	-0.437**	-0.189*	0.12	0.201*	0.255**	0.253**	0.17	0.10	-0.02	0.12	-0.09
	Sig. (2-tailed)	0.02	0.02	0.02	0.83	0.03	0.77	0.00	0.01	0.50	0.07	0.53	0.00	0.03	0.29	0.02	0.00	0.00	0.07	0.31	0.87	0.19	0.30
	N	128.00	128.00	128.00	126.00	89.00	88.00	89.00	89.00	111.00	122.00	121.00	126.00	125.00	84.00	128.00	128.00	128.00	119.00	101.00	88.00	125.00	124.00
Total Sexual Offences against Children at the national level, police-recorded offences, rate per 100,000 children aged 17 or under	Correlation Coefficient	-0.430**	-0.437**	-0.408**	-0.200*	-0.20	-0.17	-0.294*	-0.340**	-0.10	-0.12	0.16	-0.540**	-0.253*	0.16	0.247*	0.15	0.198*	0.16	0.10	-0.05	0.354**	-0.265**
	Sig. (2-tailed)	0.00	0.00	0.00	0.05	0.11	0.16	0.02	0.00	0.35	0.25	0.12	0.00	0.01	0.21	0.01	0.13	0.05	0.13	0.38	0.68	0.00	0.01
	N	102.00	102.00	102.00	100.00	67.00	67.00	67.00	67.00	88.00	97.00	96.00	100.00	100.00	66.00	102.00	102.00	102.00	94.00	80.00	70.00	101.00	99.00
Birth registration rate	Correlation Coefficient	-0.886**	-0.884**	-0.872**	-0.643**	-0.684**	0.490**	-0.490**	-0.721**	-0.413**	0.203*	-0.06	-0.392**	-0.13	-0.544**	0.570**	0.529**	0.567**	0.458**	0.305**	-0.422**	0.647**	-0.782**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.49	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	N	166.00	166.00	166.00	161.00	130.00	128.00	129.00	129.00	152.00	152.00	152.00	164.00	161.00	121.00	166.00	166.00	166.00	157.00	140.00	97.00	160.00	159.00
Percentage of women aged 20 to 24 years who were first married or in union before ages 18	Correlation Coefficient	0.639**	0.617**	0.619**	0.552**	0.605**	-0.587**	0.343**	0.603**	0.14	-0.198*	0.247**	0.15	-0.09	0.266**	-0.422**	-0.331**	-0.407**	-0.425**	-0.354**	0.14	-0.279**	0.801**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.04	0.01	0.11	0.31	0.01	0.00	0.00	0.00	0.00	0.00	0.30	0.00	0.00
	N	123.00	123.00	123.00	119.00	121.00	118.00	120.00	120.00	121.00	111.00	113.00	122.00	120.00	103.00	123.00	123.00	123.00	123.00	119.00	60.00	119.00	119.00
Percentage of children aged 5-14 engaged in child labor	Correlation Coefficient	0.716**	0.695**	0.664**	0.268**	0.501**	-0.455**	0.235*	0.577**	0.304**	-0.14	0.230*	0.380**	0.03	0.401**	-0.350**	-0.354**	-0.361**	-0.339**	-0.315**	0.280*	-0.237*	0.620**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.17	0.02	0.00	0.78	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.01	0.00
	N	112.00	112.00	112.00	109.00	110.00	109.00	110.00	110.00	109.00	103.00	108.00	111.00	111.00	99.00	112.00	112.00	112.00	112.00	107.00	55.00	110.00	111.00
Sex ratio at birth	Correlation Coefficient	-0.480**	-0.470**	-0.445**	-0.290**	-0.306**	0.218**	-0.166*	-0.341**	-0.168*	0.188*	-0.14	-0.03	-0.152*	-0.594**	0.14	0.13	0.158*	0.07	0.06	-0.06	0.402**	-0.507**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.01	0.04	0.00	0.03	0.01	0.07	0.68	0.04	0.00	0.06	0.08	0.03	0.32	0.44	0.55	0.00	0.00
	N	194.00	194.00	194.00	186.00	148.00	146.00	147.00	147.00	167.00	179.00	171.00	191.00	186.00	128.00	194.00	194.00	194.00	185.00	163.00	119.00	188.00	184.00
Access to electricity (% of population)	Correlation Coefficient	-0.858**	-0.849**	-0.830**	-0.589**	-0.731**	0.474**	-0.429**	-0.779**	-0.470**	0.222**	-0.13	-0.397**	-0.02	-0.594**	0.581**	0.514**	0.553**	0.502**	0.402**	-0.288**	0.582**	-0.748**

Appendix

		Under-5 mortality rate (per 1,000 live births)	Infant mortality rate (per 1,000 live births)	Neonatal mortality rate (per 1,000 live births)	Percentage of infants born with low birth weight (<2500g.)	Under- weight (moderate and severe, %)	Over- weight (including obesity, %)	Wasting (moder- ate and severe, %)	Stunting (moder- ate and severe, %)	Exclusive breast- feeding <6 months (%)	DMFT (decayed, missing or filled teeth) among 12-year- olds (number)	Suicide rate, 15-29 year- olds, per 100000	Mortality rate at- tributed to household and ambi- ent air pollution (per 100 000 population)	PM2.5 air pollution, population exposed to levels exceeding WHO guideline value (% of total)	Estimated percentage of young men and women (aged 15– 24) living with HIV as of 2013	Diphtheria tetanus toxoid and pertussis (DTP3) immuniza- tion cover- age among 1-year-olds (%)	Measles (MCV) immun- ization coverage among 1- year-olds (%)	Polio (Pol3) immun- ization cover- age among 1-year- olds (%)	Hepatitis B (HepB3) immuniza- tion cover- age among 1-year-olds (%)	Bacillus Calmette- Guérin (BCG) immun- ization	Comparable estimates of prevalence of insuffi- cient physi- cal activity (adolescents 11-17 years)	15-19 years old heavy episodic drinkers (popula- tion), % by country	Adoles- cent fertility rate (per 1000 girls aged 15- 19 years)
tion)	Sig. (2- tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	N	192.00	192.00	192.00	186.00	148.00	146.00	147.00	147.00	166.00	178.00	171.00	190.00	186.00	128.00	192.00	192.00	192.00	183.00	161.00	118.00	187.00	183.00
Unemployment, total (% of total labor force) (modeled ILO estimate)	Correlation Coefficient	-0.09	-0.07	-0.07	-0.02	-0.200*	0.334**	0.01	-0.13	-0.214**	0.14	-0.235**	0.00	0.11	-0.01	-0.03	-0.06	-0.03	-0.02	0.02	-0.08	0.10	-0.07
	Sig. (2- tailed)	0.26	0.34	0.36	0.76	0.02	0.00	0.89	0.12	0.01	0.08	0.00	1.00	0.15	0.90	0.69	0.47	0.72	0.81	0.78	0.40	0.21	0.37
	N	170.00	170.00	170.00	167.00	137.00	135.00	137.00	137.00	154.00	163.00	169.00	170.00	170.00	125.00	170.00	170.00	170.00	161.00	144.00	103.00	169.00	170.00
Youth unem- ployment rate (% of total labor force ages 15-24)	Correlation Coefficient	-0.271**	-0.257**	-0.256**	-0.10	-0.312**	0.427**	-0.03	-0.288**	-0.246**	0.177*	-0.288**	-0.12	0.06	-0.11	0.10	0.05	0.09	0.10	0.14	-0.12	0.12	-0.254**
	Sig. (2- tailed)	0.00	0.00	0.00	0.19	0.00	0.00	0.71	0.00	0.00	0.02	0.00	0.11	0.42	0.23	0.21	0.54	0.23	0.21	0.10	0.24	0.12	0.00
	N	170.00	170.00	170.00	167.00	137.00	135.00	137.00	137.00	154.00	163.00	169.00	170.00	170.00	125.00	170.00	170.00	170.00	161.00	144.00	103.00	169.00	170.00
Income Gini coefficient	Correlation Coefficient	0.417**	0.409**	0.388**	0.337**	0.02	-0.09	-0.17	0.08	0.195*	-0.09	-0.08	-0.12	-0.07	0.544**	-0.260**	-0.162*	-0.228**	-0.13	-0.01	0.239*	-0.338**	0.504**
	Sig. (2- tailed)	0.00	0.00	0.00	0.00	0.86	0.32	0.06	0.39	0.02	0.27	0.33	0.13	0.36	0.00	0.00	0.04	0.00	0.13	0.90	0.02	0.00	0.00
	N	156.00	156.00	156.00	152.00	125.00	125.00	124.00	124.00	146.00	147.00	147.00	155.00	154.00	116.00	156.00	156.00	156.00	147.00	137.00	94.00	153.00	154.00
Public debt as percentage of GDP	Correlation Coefficient	-0.233**	-0.234**	-0.205**	0.04	-0.05	-0.13	0.06	-0.14	-0.05	-0.11	-0.08	-0.163*	0.11	-0.04	0.184*	0.12	0.157*	0.11	0.05	-0.16	0.09	-0.162*
	Sig. (2- tailed)	0.00	0.00	0.01	0.62	0.55	0.13	0.45	0.10	0.56	0.16	0.30	0.03	0.13	0.69	0.01	0.11	0.03	0.16	0.51	0.09	0.22	0.03
	N	181.00	181.00	181.00	178.00	140.00	139.00	139.00	139.00	159.00	171.00	165.00	179.00	177.00	124.00	181.00	181.00	181.00	172.00	152.00	113.00	177.00	175.00
GNI per capita, PPP (current international \$)	Correlation Coefficient	-0.866**	-0.863**	-0.851**	-0.525**	-0.682**	0.407**	-0.451**	-0.743**	-0.546**	0.10	-0.08	-0.588**	-0.10	-0.422**	0.523**	0.494**	0.507**	0.432**	0.342**	-0.185*	0.551**	-0.728**
	Sig. (2- tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.29	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00
	N	185.00	185.00	185.00	181.00	144.00	142.00	143.00	143.00	162.00	173.00	168.00	184.00	181.00	125.00	185.00	185.00	185.00	176.00	156.00	116.00	182.00	179.00
Social Capital Ranking	Correlation Coefficient	0.458**	0.456**	0.457**	0.237**	0.16	-0.01	0.18	0.281**	0.16	0.213*	0.02	0.607**	0.415**	0.03	-0.304**	-0.259**	-0.291**	-0.224**	-0.190*	0.09	-0.320**	0.343**
	Sig. (2- tailed)	0.00	0.00	0.00	0.00	0.09	0.91	0.06	0.00	0.06	0.01	0.82	0.00	0.00	0.73	0.00	0.00	0.00	0.01	0.03	0.39	0.00	0.00
	N	148.00	148.00	148.00	146.00	116.00	117.00	116.00	116.00	134.00	143.00	148.00	148.00	148.00	110.00	148.00	148.00	148.00	139.00	124.00	96.00	147.00	148.00
Proportion of households with	Correlation Coefficient	-0.844**	-0.840**	-0.834**	-.0580**	-0.676**	0.443**	-0.415**	-0.724**	-0.469**	0.00	-0.04	-0.502**	-0.221**	-0.488**	0.435**	0.395**	0.447**	0.343**	0.15	-0.13	0.571**	-0.790**

Appendix

		Under-5 mortality rate (per 1,000 live births)	Infant mortality rate (per 1,000 live births)	Neonatal mortality rate (per 1,000 live births)	Percentage of infants born with low birth weight (<2500g.)	Under- weight (moderate and severe, %)	Over- weight (including obesity, %)	Wasting (moder- ate and severe, %)	Stunting (moder- ate and severe, %)	Exclusive breast- feeding <6 months (%)	DMFT (decayed, missing or filled teeth) among 12-year- olds (number)	Suicide rate, 15-29 year- olds, per 100000	Mortality rate at- tributed to household and ambi- ent air pollution (per 100 000 population)	PM2.5 air pollution, population exposed to levels exceeding WHO guideline value (% of total)	Estimated percentage of young men and women (aged 15– 24) living with HIV as of 2013	Diphtheria tetanus toxoid and pertussis (DTP3) immuniza- tion cover- age among 1-year-olds (%)	Measles (MCV) immun- ization coverage among 1- year-olds (%)	Polio (Pol3) immun- ization cover- age among 1-year- olds (%)	Hepatitis B (HepB3) immuniza- tion cover- age among 1-year-olds (%)	Bacillus Calmette- Guérin (BCG) immun- ization	Comparable estimates of prevalence of insuffi- cient physi- cal activity (adolescents 11-17 years)	15-19 years old heavy episodic drinkers (popula- tion), % by country	Adoles- cent fertility rate (per 1000 girls aged 15- 19 years)
internet at home (%)	Sig. (2- tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.97	0.64	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.11	0.22	0.00	0.00
	N	138.00	138.00	138.00	135.00	102.00	101.00	102.00	102.00	118.00	133.00	132.00	137.00	136.00	95.00	138.00	138.00	138.00	129.00	112.00	95.00	137.00	136.00
Proportion of households with computer (%)	Correlation Coefficient	-0.895**	-0.891**	-.0883**	-0.580**	-0.686**	0.398**	-0.419**	-0.769**	-0.518**	0.04	-0.07	-0.529**	-0.197*	-0.530**	0.459**	0.394**	0.460**	0.363**	0.18	-0.219*	0.620**	-0.796**
	Sig. (2- tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.65	0.44	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.07	0.04	0.00	0.00
	N	126.00	126.00	126.00	125.00	93.00	92.00	93.00	93.00	110.00	124.00	123.00	125.00	125.00	89.00	126.00	126.00	126.00	117.00	103.00	86.00	125.00	125.00
Water depletion index	Correlation Coefficient	-0.04	-0.03	-0.03	-0.02	0.00	0.07	0.199*	-0.05	-0.198*	-0.05	-0.326**	0.07	0.239**	-0.257**	0.10	0.04	0.11	0.10	-0.03	0.00	-0.216**	-0.157*
	Sig. (2- tailed)	0.59	0.66	0.64	0.74	0.98	0.42	0.02	0.55	0.01	0.49	0.00	0.37	0.00	0.00	0.16	0.58	0.12	0.17	0.70	0.98	0.00	0.03
	N	192.00	192.00	192.00	185.00	146.00	144.00	145.00	145.00	164.00	179.00	169.00	190.00	185.00	126.00	192.00	192.00	192.00	183.00	161.00	119.00	188.00	182.00
Renewable energy consump- tion (% of total final energy consumption)	Correlation Coefficient	0.513**	0.504**	0.489**	0.283**	0.564**	-0.424**	0.266**	0.626**	0.283**	-0.208**	0.285**	0.458**	-0.03	0.473**	-0.418**	-0.415**	-0.383**	-0.404**	-0.364**	0.13	-0.159*	0.537**
	Sig. (2- tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.64	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.03	0.00
	N	188.00	188.00	188.00	182.00	147.00	145.00	146.00	146.00	165.00	176.00	171.00	187.00	186.00	128.00	188.00	188.00	188.00	179.00	159.00	116.00	185.00	183.00

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Correlation is significant at the 0.01 level (2-tailed); *. Correlation is significant at the 0.05 level (2-tailed).

Appendix 6. Correlation coefficients for the 66 indicators – Part II

		Percentage of births attended by skilled health personnel (doctor, nurse or midwife)	Percentage of women aged 15–49 years attended at least 4 times during pregnancy by skilled health personnel (doctor, nurse or midwife)	Maternal mortality ratio (MMR, maternal deaths per 100 000 live births)	Health expenditure, public (% of total health expenditure)	Improved sanitation facilities (% of population with access)	Population using improved drinking-water sources (%)	Youth literacy rate, population 15–24 years, both sexes (%)	Repetition rate in primary education (all grades), both sexes (%)	Gross graduation ratio from primary education, both sexes (%)	Gross graduation ratio from lower secondary education, both sexes (%)	Gross graduation ratio from first degree programmes (ISCED 6 and 7) in tertiary education, both sexes (%)	Gross enrolment ratio, pre-primary, both sexes (%)	Gross enrolment ratio, primary, both sexes (%)	Gross enrolment ratio, secondary, both sexes (%)	Gross enrolment ratio, tertiary, both sexes (%)	Govern-ment expenditure on education as % of GDP (%)	Gross enrolment ratio, pre-primary, gender parity index (GPI)	Gross enrolment ratio, primary, gender parity index (GPI)	Gross enrolment ratio, secondary, gender parity index (GPI)	Gross enrolment ratio, tertiary, gender parity index (GPI)	Gross graduation ratio from primary education, gender parity index (GPI)	Gross graduation ratio from lower secondary education, gender parity index (GPI)
Under-5 mortality rate (per 1,000 live births)	Correlation Coefficient	-0.829**	-0.772**	0.937**	-0.467**	-0.862**	-0.849**	-.0809**	0.642**	-0.615**	-0.737**	-0.591**	-0.648**	0.14	-0.830**	-0.832**	-0.168*	0.252**	-0.392**	-0.375**	-0.630**	-0.323**	-0.298**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00
	N	168.00	149.00	183.00	190.00	191.00	193.00	151.00	165.00	135.00	140.00	145.00	188.00	191.00	189.00	181.00	179.00	187.00	191.00	189.00	179.00	134.00	134.00
Infant mortality rate (per 1,000 live births)	Correlation Coefficient	-0.823**	-0.773**	0.932**	-0.467**	-0.853**	-0.845**	-0.798**	0.632**	-0.606**	-0.735**	-0.593**	-0.650**	0.14	-0.826**	-0.829**	-0.162*	0.246**	-0.393**	-0.371**	-0.627**	-0.318**	-0.294**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
	N	168.00	149.00	183.00	190.00	191.00	193.00	151.00	165.00	135.00	140.00	145.00	188.00	191.00	189.00	181.00	179.00	187.00	191.00	189.00	179.00	134.00	134.00
Neonatal mortality rate (per 1,000 live births)	Correlation Coefficient	-0.808**	-0.770**	0.920**	-0.475**	-0.841**	-0.831**	-0.790**	0.609**	-0.602**	-0.719**	-0.586**	-0.626**	0.12	-0.814**	-0.803**	-0.165*	0.230**	-0.384**	-0.369**	-0.622**	-0.338**	-0.290**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
	N	168.00	149.00	183.00	190.00	191.00	193.00	151.00	165.00	135.00	140.00	145.00	188.00	191.00	189.00	181.00	179.00	187.00	191.00	189.00	179.00	134.00	134.00
Percentage of infants born with low birth weight (<2500g.)	Correlation Coefficient	-0.651**	-0.573**	0.661**	-0.387**	-0.589**	-0.532**	-0.676**	0.575**	-0.459**	-0.636**	-0.570**	-0.430**	0.04	-0.651**	-0.605**	-0.194*	0.253**	-0.279**	-0.254**	-0.418**	-0.192*	-0.180*
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.03	0.04
	N	161.00	145.00	178.00	185.00	183.00	184.00	146.00	163.00	132.00	137.00	142.00	181.00	183.00	181.00	176.00	172.00	180.00	183.00	181.00	174.00	131.00	131.00
Underweight (moderate and severe, %)	Correlation Coefficient	-0.762**	-0.707**	0.736**	-0.361**	-0.709**	-0.645**	-0.699**	0.555**	-0.501**	-0.600**	-0.539**	-0.470**	0.07	-0.709**	-0.704**	-0.245**	0.190*	-0.272**	-0.394**	-0.569**	-0.318**	-0.375**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.41	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00
	N	142.00	137.00	145.00	146.00	146.00	147.00	133.00	131.00	116.00	116.00	109.00	143.00	146.00	144.00	140.00	134.00	142.00	146.00	144.00	139.00	115.00	111.00
Overweight (including obesity, %)	Correlation Coefficient	.527**	0.361**	-0.480**	0.177*	0.424**	0.346**	0.487**	-0.300**	0.383**	0.421**	0.284**	0.14	0.01	0.462**	0.410**	0.13	-0.214*	0.08	0.286**	0.428**	0.204*	0.246**
	Sig. (2-tailed)	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.91	0.00	0.00	0.15	0.01	0.34	0.00	0.00	0.03	0.01
	N	140.00	135.00	143.00	144.00	144.00	145.00	130.00	129.00	114.00	115.00	108.00	141.00	144.00	142.00	138.00	132.00	140.00	144.00	142.00	137.00	113.00	110.00
Wasting (moderate and	Correlation	-0.497**	-0.586**	0.475**	-0.301**	-0.412**	-0.430**	-0.478**	0.348**	-0.331**	-0.417**	-0.373**	-0.413**	-0.08	-0.486**	-0.494**	-0.258**	0.06	-0.234**	-0.329**	-0.376**	-0.300**	-0.279**

Appendix

		Percentage of births attended by skilled health personnel (doctor, nurse or midwife)	Percentage of women aged 15–49 years attended at least 4 times during pregnancy by skilled health personnel (doctor, nurse or midwife)	Maternal mortality ratio (MMR, maternal deaths per 100 000 live births)	Health expenditure, public (% of total health expenditure)	Improved sanitation facilities (% of population with access)	Population using improved drinking-water sources (%)	Youth literacy rate, population 15–24 years, both sexes (%)	Repetition rate in primary education (all grades), both sexes (%)	Gross graduation ratio from primary education, both sexes (%)	Gross graduation ratio from lower secondary education, both sexes (%)	Gross graduation ratio from first degree programmes (ISCED 6 and 7) in tertiary education, both sexes (%)	Gross enrolment ratio, pre-primary, both sexes (%)	Gross enrolment ratio, primary, both sexes (%)	Gross enrolment ratio, secondary, both sexes (%)	Gross enrolment ratio, tertiary, both sexes (%)	Government expenditure on education as % of GDP (%)	Gross enrolment ratio, pre-primary, gender parity index (GPI)	Gross enrolment ratio, primary, gender parity index (GPI)	Gross enrolment ratio, secondary, gender parity index (GPI)	Gross enrolment ratio, tertiary, gender parity index (GPI)	Gross graduation ratio from primary education, gender parity index (GPI)	Gross graduation ratio from lower secondary education, gender parity index (GPI)
severe, %)	Coefficient																						
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34	0.00	0.00	0.00	0.45	0.00	0.00	0.00	0.00	0.00
	N	141.00	136.00	144.00	145.00	145.00	146.00	133.00	131.00	116.00	116.00	109.00	142.00	145.00	143.00	140.00	133.00	142.00	145.00	143.00	139.00	115.00	111.00
Stunting (moderate and severe, %)	Correlation Coefficient	-0.782**	-0.763**	0.760**	-0.381**	-0.764**	-0.710**	-0.710**	0.597**	-0.535**	-0.653**	-0.450**	-0.509**	0.12	-0.741**	-0.703**	-0.171*	0.16	-0.305**	-0.428**	-0.639**	-0.283**	-0.413**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.00	0.00	0.05	0.07	0.00	0.00	0.00	0.00	0.00
	N	141.00	136.00	144.00	145.00	145.00	146.00	133.00	131.00	116.00	116.00	109.00	142.00	145.00	143.00	140.00	133.00	142.00	145.00	143.00	139.00	115.00	111.00
Exclusive breastfeeding <6 months (%)	Correlation Coefficient	-0.297**	-0.179*	0.394**	-0.14	-0.454**	-0.350**	-0.261**	0.225**	-0.03	-0.13	-0.256**	-0.182*	0.304**	-0.346**	-0.396**	-0.11	0.13	0.08	0.01	-0.291**	0.07	-0.01
	Sig. (2-tailed)	0.00	0.04	0.00	0.08	0.00	0.00	0.00	0.01	0.77	0.14	0.00	0.02	0.00	0.00	0.00	0.17	0.10	0.32	0.93	0.00	0.46	0.88
	N	150.00	137.00	164.00	164.00	166.00	167.00	139.00	144.00	122.00	125.00	127.00	163.00	166.00	164.00	160.00	152.00	162.00	166.00	164.00	158.00	121.00	119.00
DMFT (decayed, missing or filled teeth) among 12-year-olds (number)	Correlation Coefficient	0.286**	0.226**	-0.173*	0.03	0.12	0.12	0.316**	-0.167*	0.16	0.15	0.14	0.02	-0.04	0.160*	0.225**	-0.199*	-0.11	0.02	0.07	0.175*	0.06	0.185*
	Sig. (2-tailed)	0.00	0.01	0.02	0.65	0.10	0.13	0.00	0.04	0.08	0.09	0.11	0.74	0.61	0.03	0.00	0.01	0.14	0.77	0.37	0.02	0.50	0.04
	N	155.00	136.00	173.00	176.00	176.00	178.00	140.00	153.00	126.00	131.00	138.00	175.00	178.00	176.00	170.00	166.00	174.00	178.00	176.00	168.00	126.00	126.00
Suicide rate, 15-29 year-olds, per 100000	Correlation Coefficient	-0.11	-0.07	0.10	0.00	-0.13	-0.09	-0.07	0.04	-0.17	0.03	0.10	0.07	0.01	-0.03	-0.02	-0.02	-0.05	0.08	-0.15	-0.14	0.02	-0.11
	Sig. (2-tailed)	0.17	0.40	0.18	0.99	0.10	0.26	0.38	0.66	0.06	0.70	0.23	0.35	0.86	0.74	0.75	0.78	0.52	0.32	0.05	0.08	0.80	0.24
	N	148.00	135.00	171.00	170.00	168.00	170.00	143.00	150.00	123.00	125.00	137.00	166.00	169.00	167.00	165.00	159.00	166.00	169.00	167.00	164.00	121.00	120.00
Mortality rate attributed to household and ambient air pollution (per 100 000 population)	Correlation Coefficient	-0.317**	-0.322**	0.449**	-0.428**	-0.555**	-0.458**	-0.229**	0.05	-0.266**	-0.176*	-0.193*	-0.428**	-0.07	-0.444**	-0.340**	-0.319**	-0.05	-0.14	-0.418**	-0.457**	-0.203*	-0.370**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.55	0.00	0.04	0.02	0.00	0.37	0.00	0.00	0.00	0.46	0.06	0.00	0.00	0.02	0.00
	N	166.00	148.00	182.00	188.00	189.00	191.00	150.00	163.00	133.00	138.00	144.00	185.00	188.00	186.00	178.00	176.00	184.00	188.00	186.00	176.00	132.00	132.00
PM2.5 air pollution, population exposed to levels exceed-	Correlation Coefficient	-0.02	-0.12	0.08	-0.266**	-0.06	-0.12	-0.02	-0.02	-0.229**	-0.11	-0.180*	-0.222**	-0.12	-0.181*	-0.162*	-0.245**	-0.01	-0.10	-0.278**	-0.151*	-0.231**	-0.213*
	Sig. (2-tailed)	0.83	0.16	0.31	0.00	0.45	0.11	0.83	0.82	0.01	0.19	0.03	0.00	0.11	0.01	0.03	0.00	0.85	0.18	0.00	0.05	0.01	0.01

Appendix

		Percentage of births attended by skilled health personnel (doctor, nurse or midwife)	Percentage of women aged 15–49 years attended at least 4 times during pregnancy by skilled health personnel (doctor, nurse or midwife)	Maternal mortality ratio (MMR, maternal deaths per 100 000 live births)	Health expenditure, public (% of total health expenditure)	Improved sanitation facilities (% of population with access)	Population using improved drinking-water sources (%)	Youth literacy rate, population 15–24 years, both sexes (%)	Repetition rate in primary education (all grades), both sexes (%)	Gross graduation ratio from primary education, both sexes (%)	Gross graduation ratio from lower secondary education, both sexes (%)	Gross graduation ratio from first degree programmes (ISCED 6 and 7) in tertiary education, both sexes (%)	Gross enrolment ratio, pre-primary, both sexes (%)	Gross enrolment ratio, primary, both sexes (%)	Gross enrolment ratio, secondary, both sexes (%)	Gross enrolment ratio, tertiary, both sexes (%)	Government expenditure on education as % of GDP (%)	Gross enrolment ratio, pre-primary, gender parity index (GPI)	Gross enrolment ratio, primary, gender parity index (GPI)	Gross enrolment ratio, secondary, gender parity index (GPI)	Gross enrolment ratio, tertiary, gender parity index (GPI)	Gross graduation ratio from primary education, gender parity index (GPI)	Gross graduation ratio from lower secondary education, gender parity index (GPI)
ing WHO guideline value (% of total)	N	162.00	145.00	182.00	184.00	184.00	186.00	149.00	160.00	132.00	136.00	142.00	181.00	184.00	182.00	176.00	173.00	180.00	184.00	182.00	174.00	131.00	130.00
Estimated percentage of young men and women (aged 15–24) living with HIV as of 2013	Correlation Coefficient	-0.343**	-0.280**	0.602**	-0.08	-0.560**	-0.391**	-0.444**	0.517**	-0.472**	-0.447**	-0.367**	-0.279**	0.04	-0.495**	-0.540**	0.02	0.12	-0.252**	-0.241**	-0.247**	-0.17	-0.209*
	Sig. (2-tailed)	0.00	0.00	0.00	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	0.00	0.00	0.84	0.20	0.00	0.01	0.01	0.09	0.04
	N	120.00	115.00	128.00	127.00	127.00	128.00	117.00	116.00	104.00	101.00	100.00	124.00	127.00	125.00	125.00	120.00	124.00	127.00	125.00	124.00	103.00	97.00
Diphtheria tetanus toxoid and pertussis (DTP3) immunization coverage among 1-year-olds (%)	Correlation Coefficient	0.596**	0.556**	-0.558**	0.307**	0.587**	0.500**	0.546**	-0.450**	0.524**	0.565**	0.195*	0.377**	0.00	0.559**	0.413**	0.09	-0.07	0.303**	0.313**	0.406**	0.210*	0.190*
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.98	0.00	0.00	0.25	0.33	0.00	0.00	0.00	0.02	0.03
	N	168.00	149.00	183.00	190.00	191.00	193.00	151.00	165.00	135.00	140.00	145.00	188.00	191.00	189.00	181.00	179.00	187.00	191.00	189.00	179.00	134.00	134.00
Measles (MCV) immunization coverage among 1-year-olds (%)	Correlation Coefficient	0.607**	0.570**	-0.528**	0.230**	0.539**	00.472**	.547**	-0.440**	0.523**	0.575**	0.220**	0.376**	0.02	0.570**	0.423**	0.06	-0.05	0.277**	0.310**	0.430**	0.190*	0.219*
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.83	0.00	0.00	0.42	0.51	0.00	0.00	0.00	0.03	0.01
	N	168.00	149.00	183.00	190.00	191.00	193.00	151.00	165.00	135.00	140.00	145.00	188.00	191.00	189.00	181.00	179.00	187.00	191.00	189.00	179.00	134.00	134.00
Polio (Pol3) immunization coverage among 1-year-olds (%)	Correlation Coefficient	0.564**	0.525**	-0.550**	0.289**	0.574**	0.494**	0.543**	-0.432**	0.504**	0.562**	0.216**	0.360**	0.04	0.544**	0.418**	0.11	-0.05	0.279**	0.307**	0.371**	0.245**	0.188*
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.58	0.00	0.00	0.14	0.47	0.00	0.00	0.00	0.00	0.03
	N	168.00	149.00	183.00	190.00	191.00	193.00	151.00	165.00	135.00	140.00	145.00	188.00	191.00	189.00	181.00	179.00	187.00	191.00	189.00	179.00	134.00	134.00
Hepatitis B (HepB3) immunization coverage among 1-year-olds (%)	Correlation Coefficient	0.561**	0.475**	-0.469**	0.246**	0.506**	0.419**	0.521**	-0.417**	0.494**	0.516**	0.13	0.306**	0.00	0.482**	0.338**	0.05	-0.04	0.269**	0.295**	0.391**	0.210*	0.180*
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.95	0.00	0.00	0.48	0.64	0.00	0.00	0.00	0.02	0.04
	N	166.00	149.00	174.00	181.00	182.00	184.00	149.00	160.00	132.00	135.00	136.00	179.00	182.00	180.00	172.00	170.00	178.00	182.00	180.00	170.00	131.00	129.00
Bacillus Calmette-Guérin (BCG) immunization	Correlation Coefficient	0.450**	0.462**	-0.359**	0.244**	0.367**	0.309**	0.420**	-0.354**	0.442**	.0403**	0.07	0.237**	0.01	0.346**	0.245**	0.00	0.04	0.217**	0.385**	0.411**	0.268**	0.328**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.42	0.00	0.89	0.00	0.00	0.97	0.65	0.01	0.00	0.00	0.00	0.00
	N	156.00	136.00	156.00	159.00	162.00	163.00	141.00	144.00	122.00	126.00	119.00	158.00	161.00	159.00	152.00	149.00	157.00	161.00	159.00	150.00	121.00	120.00

Appendix

		Percentage of births attended by skilled health personnel (doctor, nurse or midwife)	Percentage of women aged 15–49 years attended at least 4 times during pregnancy by skilled health personnel (doctor, nurse or midwife)	Maternal mortality ratio (MMR, maternal deaths per 100 000 live births)	Health expenditure, public (% of total health expenditure)	Improved sanitation facilities (% of population with access)	Population using improved drinking-water sources (%)	Youth literacy rate, population 15–24 years, both sexes (%)	Repetition rate in primary education (all grades), both sexes (%)	Gross graduation ratio from primary education, both sexes (%)	Gross graduation ratio from lower secondary education, both sexes (%)	Gross graduation ratio from first degree programmes (ISCED 6 and 7) in tertiary education, both sexes (%)	Gross enrolment ratio, pre-primary, both sexes (%)	Gross enrolment ratio, primary, both sexes (%)	Gross enrolment ratio, secondary, both sexes (%)	Gross enrolment ratio, tertiary, both sexes (%)	Government expenditure on education as % of GDP (%)	Gross enrolment ratio, pre-primary, gender parity index (GPI)	Gross enrolment ratio, primary, gender parity index (GPI)	Gross enrolment ratio, secondary, gender parity index (GPI)	Gross enrolment ratio, tertiary, gender parity index (GPI)	Gross graduation ratio from primary education, gender parity index (GPI)	Gross graduation ratio from lower secondary education, gender parity index (GPI)
Comparable estimates of prevalence of insufficient physical activity (adolescents 11-17 years)	Correlation Coefficient	-0.309**	-0.267*	0.265**	-0.08	-0.17	-0.236**	-0.270*	0.07	-0.08	-0.19	-0.19	-0.09	0.18	-0.196*	-0.267**	-0.07	0.07	-0.07	-0.01	-0.211*	0.05	0.04
	Sig. (2-tailed)	0.00	0.02	0.00	0.40	0.07	0.01	0.01	0.45	0.50	0.08	0.07	0.36	0.05	0.03	0.00	0.43	0.48	0.43	0.95	0.03	0.64	0.72
	N	98.00	81.00	112.00	118.00	119.00	119.00	85.00	103.00	82.00	86.00	96.00	118.00	119.00	117.00	111.00	113.00	117.00	119.00	117.00	111.00	81.00	83.00
15-19 years old heavy episodic drinkers (population), % by country	Correlation Coefficient	0.506**	0.504**	-0.609**	0.275**	0.528**	0.557**	0.504**	-0.450**	0.309**	0.549**	0.490**	0.538**	-0.09	0.608**	0.612**	0.174*	-0.159*	0.218**	0.161*	0.346**	0.282**	0.176*
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.00	0.00	0.02	0.03	0.00	0.03	0.00	0.00	0.04
	N	164.00	145.00	180.00	185.00	186.00	188.00	148.00	162.00	132.00	137.00	143.00	183.00	186.00	184.00	177.00	173.00	182.00	186.00	184.00	175.00	131.00	131.00
Adolescent fertility rate (per 1000 girls aged 15-19 years)	Correlation Coefficient	-0.685**	-0.542**	0.819**	-0.459**	-0.756**	-0.670**	-0.762**	0.635**	-0.560**	-0.652**	-0.498**	-0.472**	0.149*	-0.711**	-0.658**	-0.218**	0.340**	-0.391**	-0.315**	-0.412**	-0.230**	-0.174*
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.05
	N	160.00	144.00	181.00	181.00	181.00	183.00	149.00	158.00	130.00	134.00	143.00	179.00	182.00	180.00	176.00	171.00	178.00	182.00	180.00	174.00	129.00	128.00
Percentage of births attended by skilled health personnel (doctor, nurse or midwife)	Correlation Coefficient	1.00	0.788**	-0.847**	0.417**	0.803**	0.717**	0.837**	-0.644**	0.599**	0.739**	.0484**	0.520**	-0.10	0.799**	0.709**	0.08	-0.199*	0.298**	0.443**	0.677**	0.274**	0.265**
	Sig. (2-tailed)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.00	0.00	0.33	0.01	0.00	0.00	0.00	0.00	0.00
	N	168.00	144.00	160.00	163.00	166.00	167.00	144.00	148.00	129.00	130.00	122.00	164.00	167.00	165.00	157.00	152.00	163.00	167.00	165.00	155.00	128.00	124.00
Percentage of women aged 15–49 years attended at least 4 times during pregnancy by skilled health personnel (doctor, nurse or midwife)	Correlation Coefficient	0.788**	1.00	-0.741**	0.356**	0.685**	0.661**	0.718**	-0.552**	0.666**	0.698**	0.358**	0.518**	-0.12	0.746**	0.695**	0.10	-0.14	0.327**	0.436**	0.613**	0.298**	0.379**
	Sig. (2-tailed)	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.00	0.25	0.11	0.00	0.00	0.00	0.00	0.00
	N	144.00	149.00	144.00	146.00	147.00	148.00	128.00	134.00	116.00	119.00	110.00	145.00	148.00	146.00	140.00	135.00	144.00	148.00	146.00	139.00	116.00	115.00
Maternal mortality ratio (MMR, maternal deaths per 100 000 live births)	Correlation Coefficient	-0.847**	-0.741**	1.00	-0.489**	-0.893**	-0.807**	-0.842**	0.716**	-0.630**	-0.779**	-0.617**	-0.589**	0.13	-0.859**	-0.845**	-0.195*	0.305**	-0.390**	-0.358**	-0.580**	-0.263**	-0.302**
	Sig. (2-tailed)	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
	N	160.00	144.00	183.00	180.00	180.00	182.00	149.00	159.00	130.00	134.00	141.00	178.00	181.00	179.00	174.00	170.00	177.00	181.00	179.00	172.00	129.00	128.00

Appendix

		Percentage of births attended by skilled health personnel (doctor, nurse or midwife)	Percentage of women aged 15–49 years attended at least 4 times during pregnancy by skilled health personnel (doctor, nurse or midwife)	Maternal mortality ratio (MMR, maternal deaths per 100 000 live births)	Health expenditure, public (% of total health expenditure)	Improved sanitation facilities (% of population with access)	Population using improved drinking-water sources (%)	Youth literacy rate, population 15-24 years, both sexes (%)	Repetition rate in primary education (all grades), both sexes (%)	Gross graduation ratio from primary education, both sexes (%)	Gross graduation ratio from lower secondary education, both sexes (%)	Gross graduation ratio from first degree programmes (ISCED 6 and 7) in tertiary education, both sexes (%)	Gross enrolment ratio, pre-primary, both sexes (%)	Gross enrolment ratio, primary, both sexes (%)	Gross enrolment ratio, secondary, both sexes (%)	Gross enrolment ratio, tertiary, both sexes (%)	Government expenditure on education as % of GDP (%)	Gross enrolment ratio, pre-primary, gender parity index (GPI)	Gross enrolment ratio, primary, gender parity index (GPI)	Gross enrolment ratio, secondary, gender parity index (GPI)	Gross enrolment ratio, tertiary, gender parity index (GPI)	Gross graduation ratio from primary education, gender parity index (GPI)	Gross graduation ratio from lower secondary education, gender parity index (GPI)
Health expenditure, public (% of total health expenditure)	Correlation Coefficient	0.417**	0.356**	-0.489**	1.00	0.426**	0.441**	0.362**	-0.195*	0.344**	0.358**	0.240**	0.433**	-0.02	0.431**	0.302**	0.362**	-0.08	0.197**	0.341**	0.362**	0.15	0.238**
	Sig. (2-tailed)	0.00	0.00	0.00		0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.76	0.00	0.00	0.00	0.26	0.01	0.00	0.00	0.09	0.01
	N	163.00	146.00	180.00	190.00	187.00	188.00	149.00	164.00	134.00	139.00	143.00	184.00	186.00	184.00	178.00	177.00	183.00	186.00	184.00	176.00	133.00	133.00
Improved sanitation facilities (% of population with access)	Correlation Coefficient	0.803**	0.685**	-0.893**	0.426**	1.00	0.777**	0.824**	-0.635**	0.583**	0.724**	0.508**	0.528**	-0.13	0.803**	0.742**	0.161*	-0.224**	0.293**	0.363**	0.590**	0.228**	0.281**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.01	0.00
	N	166.00	147.00	180.00	187.00	191.00	191.00	150.00	164.00	134.00	139.00	143.00	185.00	187.00	185.00	178.00	176.00	184.00	187.00	185.00	176.00	133.00	133.00
Population using improved drinking-water sources (%)	Correlation Coefficient	0.717**	0.661**	-0.807**	0.441**	0.777**	1.00	0.642**	-0.529**	0.542**	0.618**	0.490**	0.563**	-0.12	.749**	0.702**	0.212**	-0.183*	0.362**	0.398**	0.586**	0.389**	0.288**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
	N	167.00	148.00	182.00	188.00	191.00	193.00	150.00	164.00	134.00	139.00	144.00	186.00	189.00	187.00	179.00	177.00	185.00	189.00	187.00	177.00	133.00	133.00
Youth literacy rate, population 15-24 years, both sexes (%)	Correlation Coefficient	0.837**	0.718**	-0.842**	0.362**	0.824**	0.642**	1.00	-0.744**	0.646**	0.758**	0.562**	0.498**	-0.16	0.825**	0.719**	0.13	-0.243**	0.339**	0.418**	0.598**	0.307**	0.384**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00
	N	144.00	128.00	149.00	149.00	150.00	150.00	151.00	140.00	116.00	116.00	117.00	147.00	149.00	147.00	148.00	139.00	147.00	149.00	147.00	147.00	115.00	111.00
Repetition rate in primary education (all grades), both sexes (%)	Correlation Coefficient	-0.644**	-0.552**	0.716**	-0.195*	-0.635**	-0.529**	-0.744**	1.00	-0.509**	-0.700**	-0.513**	-0.380**	0.336**	-0.628**	-0.644**	-0.04	0.268**	-0.414**	-0.229**	-0.430**	-0.14	-0.09
	Sig. (2-tailed)	0.00	0.00	0.00	0.01	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.61	0.00	0.00	0.00	0.00	0.13	0.34
	N	148.00	134.00	159.00	164.00	164.00	164.00	140.00	165.00	124.00	130.00	129.00	160.00	162.00	160.00	157.00	156.00	160.00	162.00	160.00	156.00	124.00	126.00
Gross graduation ratio from primary education, both sexes (%)	Correlation Coefficient	0.599**	0.666**	-0.630**	0.344**	0.583**	0.542**	0.646**	-0.509**	1.00	0.716**	0.234*	0.479**	0.15	0.729**	0.584**	0.09	-0.05	0.308**	0.420**	0.556**	.275**	0.308**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.02	0.00	0.08	0.00	0.00	0.33	0.54	0.00	0.00	0.00	0.00	0.00
	N	129.00	116.00	130.00	134.00	134.00	134.00	116.00	124.00	135.00	121.00	103.00	133.00	135.00	133.00	131.00	128.00	133.00	135.00	133.00	130.00	131.00	116.00
Gross graduation ratio from	Correlation Coefficient	0.739**	0.698**	-0.779**	0.358**	0.724**	0.618**	0.758**	-0.700**	.716**	1.00	00.490**	0.546**	-0.07	.796**	00.675**	-0.01	-0.15	0.394**	0.250**	0.489**	0.16	0.14

Appendix

		Percentage of births attended by skilled health personnel (doctor, nurse or midwife)	Percentage of women aged 15–49 years attended at least 4 times during pregnancy by skilled health personnel (doctor, nurse or midwife)	Maternal mortality ratio (MMR, maternal deaths per 100 000 live births)	Health expenditure, public (% of total health expenditure)	Improved sanitation facilities (% of population with access)	Population using improved drinking-water sources (%)	Youth literacy rate, population 15–24 years, both sexes (%)	Repetition rate in primary education (all grades), both sexes (%)	Gross graduation ratio from primary education, both sexes (%)	Gross graduation ratio from lower secondary education, both sexes (%)	Gross graduation ratio from first degree programmes (ISCED 6 and 7) in tertiary education, both sexes (%)	Gross enrolment ratio, pre-primary, both sexes (%)	Gross enrolment ratio, primary, both sexes (%)	Gross enrolment ratio, secondary, both sexes (%)	Gross enrolment ratio, tertiary, both sexes (%)	Government expenditure on education as % of GDP (%)	Gross enrolment ratio, pre-primary, gender parity index (GPI)	Gross enrolment ratio, primary, gender parity index (GPI)	Gross enrolment ratio, secondary, gender parity index (GPI)	Gross enrolment ratio, tertiary, gender parity index (GPI)	Gross graduation ratio from primary education, gender parity index (GPI)	Gross graduation ratio from lower secondary education, gender parity index (GPI)
lower secondary education, both sexes (%)	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.41	0.00	0.00	0.95	0.09	0.00	0.00	0.00	0.09	0.11
	N	130.00	119.00	134.00	139.00	139.00	139.00	116.00	130.00	121.00	140.00	111.00	138.00	140.00	138.00	136.00	133.00	138.00	140.00	138.00	135.00	121.00	134.00
Gross graduation ratio from first degree programmes (ISCED 6 and 7) in tertiary education, both sexes (%)	Correlation Coefficient	0.484**	0.358**	-0.617**	0.240**	0.508**	0.490**	0.562**	-0.513**	0.234*	0.490**	1.00	0.485**	-0.13	0.592**	0.667**	0.246**	-0.190*	0.267**	0.14	0.273**	0.14	0.15
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00		0.00	0.13	0.00	0.00	0.00	0.02	0.00	0.09	0.00	0.17	0.12
	N	122.00	110.00	141.00	143.00	143.00	144.00	117.00	129.00	103.00	111.00	145.00	143.00	145.00	143.00	145.00	140.00	143.00	145.00	143.00	145.00	101.00	106.00
Gross enrolment ratio, pre-primary, both sexes (%)	Correlation Coefficient	0.520**	0.518**	-0.589**	0.433**	0.528**	0.563**	0.498**	-0.380**	0.479**	0.546**	0.485**	1.00	-0.04	0.594**	0.568**	0.253**	-0.13	0.191**	0.259**	.502**	00.224**	0.309**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.55	0.00	0.00	0.00	0.08	0.01	0.00	0.00	0.01	0.00
	N	164.00	145.00	178.00	184.00	185.00	186.00	147.00	160.00	133.00	138.00	143.00	188.00	188.00	187.00	179.00	174.00	187.00	188.00	187.00	177.00	132.00	132.00
Gross enrolment ratio, primary, both sexes (%)	Correlation Coefficient	-0.10	-0.12	0.13	-0.02	-0.13	-0.12	-0.16	0.336**	0.15	-0.07	-0.13	-0.04	1.00	-0.01	-0.14	0.04	0.271**	0.05	0.176*	-0.04	0.16	0.14
	Sig. (2-tailed)	0.21	0.15	0.08	0.76	0.08	0.11	0.06	0.00	0.08	0.41	0.13	0.55		0.89	0.06	0.60	0.00	0.47	0.02	0.62	0.06	0.11
	N	167.00	148.00	181.00	186.00	187.00	189.00	149.00	162.00	135.00	140.00	145.00	188.00	191.00	189.00	181.00	176.00	187.00	191.00	189.00	179.00	134.00	134.00
Gross enrolment ratio, secondary, both sexes (%)	Correlation Coefficient	0.799**	0.746**	-0.859**	00.431**	.803**	0.749**	0.825**	-0.628**	0.729**	0.796**	0.592**	0.594**	-0.01	1.00	0.844**	0.265**	-0.210**	0.355**	0.366**	0.578**	0.276**	0.294**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.89		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	N	165.00	146.00	179.00	184.00	185.00	187.00	147.00	160.00	133.00	138.00	143.00	187.00	189.00	189.00	179.00	174.00	186.00	189.00	189.00	177.00	132.00	132.00
Gross enrolment ratio, tertiary, both sexes (%)	Correlation Coefficient	0.709**	0.695**	-0.845**	0.302**	0.742**	0.702**	0.719**	-0.644**	0.584**	0.675**	0.667**	0.568**	-0.14	0.844**	1.00	0.244**	-.307**	0.266**	0.279**	00.540**	0.286**	0.304**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
	N	157.00	140.00	174.00	178.00	178.00	179.00	148.00	157.00	131.00	136.00	145.00	179.00	181.00	179.00	181.00	170.00	179.00	181.00	179.00	179.00	130.00	130.00
Government expenditure on education as % of GDP (%)	Correlation Coefficient	0.08	0.10	-0.195*	0.362**	0.161*	0.212**	0.13	-0.04	0.09	-0.01	0.246**	0.253**	0.04	0.265**	0.244**	1.00	0.05	0.12	0.248**	0.159*	0.288**	0.08
	Sig. (2-tailed)	0.33	0.25	0.01	0.00	0.03	0.00	0.12	0.61	0.33	0.95	0.00	0.00	0.60	0.00	0.00		0.47	0.11	0.00	0.04	0.00	0.35

Appendix

		Percentage of births attended by skilled health personnel (doctor, nurse or midwife)	Percentage of women aged 15–49 years attended at least 4 times during pregnancy by skilled health personnel (doctor, nurse or midwife)	Maternal mortality ratio (MMR, maternal deaths per 100 000 live births)	Health expenditure, public (% of total health expenditure)	Improved sanitation facilities (% of population with access)	Population using improved drinking-water sources (%)	Youth literacy rate, population 15–24 years, both sexes (%)	Repetition rate in primary education (all grades), both sexes (%)	Gross graduation ratio from primary education, both sexes (%)	Gross graduation ratio from lower secondary education, both sexes (%)	Gross graduation ratio from first degree programmes (ISCED 6 and 7) in tertiary education, both sexes (%)	Gross enrolment ratio, pre-primary, both sexes (%)	Gross enrolment ratio, primary, both sexes (%)	Gross enrolment ratio, secondary, both sexes (%)	Gross enrolment ratio, tertiary, both sexes (%)	Government expenditure on education as % of GDP (%)	Gross enrolment ratio, pre-primary, gender parity index (GPI)	Gross enrolment ratio, primary, gender parity index (GPI)	Gross enrolment ratio, secondary, gender parity index (GPI)	Gross enrolment ratio, tertiary, gender parity index (GPI)	Gross graduation ratio from primary education, gender parity index (GPI)	Gross graduation ratio from lower secondary education, gender parity index (GPI)
	N	152.00	135.00	170.00	177.00	176.00	177.00	139.00	156.00	128.00	133.00	140.00	174.00	176.00	174.00	170.00	179.00	173.00	176.00	174.00	168.00	126.00	127.00
Gross enrolment ratio, pre-primary, gender parity index (GPI)	Correlation Coefficient	-0.199*	-0.14	0.305**	-0.08	-0.224**	-0.183*	-0.243**	0.268**	-0.05	-0.15	-0.190*	-0.13	0.271**	-0.210**	-0.307**	0.05	1.00	0.02	0.156*	-0.04	0.15	0.05
	Sig. (2-tailed)	0.01	0.11	0.00	0.26	0.00	0.01	0.00	0.00	0.54	0.09	0.02	0.08	0.00	0.00	0.00	0.47		0.80	0.03	0.55	0.09	0.58
	N	163.00	144.00	177.00	183.00	184.00	185.00	147.00	160.00	133.00	138.00	143.00	187.00	187.00	186.00	179.00	173.00	187.00	187.00	186.00	177.00	132.00	132.00
Gross enrolment ratio, primary, gender parity index (GPI)	Correlation Coefficient	0.298**	0.327**	-0.390**	00.197**	0.293**	0.362**	.339**	-0.414**	0.308**	0.394**	0.267**	.191**	0.05	0.355**	0.266**	0.12	0.02	1.00	0.299**	0.164*	0.473**	0.239**
	Sig. (2-tailed)	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.47	0.00	0.00	0.11	0.80		0.00	0.03	0.00	0.01
	N	167.00	148.00	181.00	186.00	187.00	189.00	149.00	162.00	135.00	140.00	145.00	188.00	191.00	189.00	181.00	176.00	187.00	191.00	189.00	179.00	134.00	134.00
Gross enrolment ratio, secondary, gender parity index (GPI)	Correlation Coefficient	0.443**	0.436**	-0.358**	0.341**	0.363**	0.398**	0.418**	-0.229**	0.420**	0.250**	0.14	0.259**	0.176*	0.366**	0.279**	0.248**	0.156*	0.299**	1.00	0.620**	0.646**	0.672**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.02	0.00	0.00	0.00	0.03	0.00		0.00	0.00	0.00
	N	165.00	146.00	179.00	184.00	185.00	187.00	147.00	160.00	133.00	138.00	143.00	187.00	189.00	189.00	179.00	174.00	186.00	189.00	189.00	177.00	132.00	132.00
Gross enrolment ratio, tertiary,gender parity index (GPI)	Correlation Coefficient	0.677**	0.613**	-0.580**	0.362**	0.590**	0.586**	0.598**	-0.430**	0.556**	0.489**	0.273**	0.502**	-0.04	00.578**	.540**	0.159*	-0.04	0.164*	0.620**	1.00	0.329**	0.446**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.62	0.00	0.00	0.04	0.55	0.03	0.00		0.00	0.00
	N	155.00	139.00	172.00	176.00	176.00	177.00	147.00	156.00	130.00	135.00	145.00	177.00	179.00	177.00	179.00	168.00	177.00	179.00	177.00	179.00	129.00	130.00
Gross graduation ratio from primary education, gender parity index (GPI)	Correlation Coefficient	0.274**	0.298**	-0.263**	0.15	0.228**	0.389**	0.307**	-0.14	0.275**	0.16	0.14	0.224**	0.16	0.276**	0.286**	0.288**	0.15	0.473**	0.646**	0.329**	1.00	0.427**
	Sig. (2-tailed)	0.00	0.00	0.00	0.09	0.01	0.00	0.00	0.13	0.00	0.09	0.17	0.01	0.06	0.00	0.00	0.00	0.09	0.00	0.00	0.00		0.00
	N	128.00	116.00	129.00	133.00	133.00	133.00	115.00	124.00	131.00	121.00	101.00	132.00	134.00	132.00	130.00	126.00	132.00	134.00	132.00	129.00	134.00	119.00
Gross graduation ratio from lower secondary education, gender parity index (GPI)	Correlation Coefficient	0.265**	0.379**	-0.302**	0.238**	0.281**	0.288**	0.384**	-0.09	0.308**	0.14	0.15	0.309**	0.14	0.294**	0.304**	0.08	0.05	0.239**	0.672**	0.446**	0.427**	1.00
	Sig. (2-tailed)	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.34	0.00	0.11	0.12	0.00	0.11	0.00	0.00	0.35	0.58	0.01	0.00	0.00	0.00	
	N	124.00	115.00	128.00	133.00	133.00	133.00	111.00	126.00	116.00	134.00	106.00	132.00	134.00	132.00	130.00	127.00	132.00	134.00	132.00	130.00	119.00	134.00
Gross graduation ratio from	Correlation	0.689**	0.635**	-0.557**	0.415**	0.521**	0.551**	0.610**	-0.455**	0.546**	0.481**	0.321**	0.439**	-0.08	0.560**	0.496**	0.16	-0.03	0.16	0.493**	0.883**	.212*	00.239*

Appendix

		Percentage of births attended by skilled health personnel (doctor, nurse or midwife)	Percentage of women aged 15–49 years attended at least 4 times during pregnancy by skilled health personnel (doctor, nurse or midwife)	Maternal mortality ratio (MMR, maternal deaths per 100 000 live births)	Health expenditure, public (% of total health expenditure)	Improved sanitation facilities (% of population with access)	Population using improved drinking-water sources (%)	Youth literacy rate, population 15–24 years, both sexes (%)	Repetition rate in primary education (all grades), both sexes (%)	Gross graduation ratio from primary education, both sexes (%)	Gross graduation ratio from lower secondary education, both sexes (%)	Gross graduation ratio from first degree programmes (ISCED 6 and 7) in tertiary education, both sexes (%)	Gross enrolment ratio, pre-primary, both sexes (%)	Gross enrolment ratio, primary, both sexes (%)	Gross enrolment ratio, secondary, both sexes (%)	Gross enrolment ratio, tertiary, both sexes (%)	Government expenditure on education as % of GDP (%)	Gross enrolment ratio, pre-primary, gender parity index (GPI)	Gross enrolment ratio, primary, gender parity index (GPI)	Gross enrolment ratio, secondary, gender parity index (GPI)	Gross enrolment ratio, tertiary, gender parity index (GPI)	Gross graduation ratio from primary education, gender parity index (GPI)	Gross graduation ratio from lower secondary education, gender parity index (GPI)
first degree programmes (ISCED 6 and 7) in tertiary education, gender parity index (GPI)	Coefficient																						
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.07	0.72	0.06	0.00	0.00	0.04	0.02
	N	114.00	103.00	133.00	135.00	135.00	136.00	110.00	122.00	96.00	104.00	136.00	136.00	137.00	136.00	137.00	131.00	136.00	137.00	136.00	137.00	96.00	101.00
Youth literacy rate, population 15-24 years, gender parity index (GPI)	Correlation Coefficient	0.354**	0.355**	-0.267**	0.263**	0.315**	0.281**	0.323**	-0.10	0.332**	0.220*	0.05	0.331**	0.165*	0.297**	0.196*	0.255**	0.08	0.169*	0.557**	0.417**	00.531**	0.435**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24	0.00	0.02	0.60	0.00	0.04	0.00	0.02	0.00	0.32	0.04	0.00	0.00	0.00	0.00
	N	145.00	129.00	150.00	150.00	151.00	151.00	151.00	141.00	116.00	116.00	117.00	148.00	150.00	148.00	148.00	140.00	148.00	150.00	148.00	147.00	115.00	111.00
Juveniles Held in Prisons, Penal Institutions or Correctional Institutions, rate per 100,000 juveniles aged 17 or under	Correlation Coefficient	0.19	0.277*	0.00	-0.04	0.07	0.12	0.16	0.05	0.17	0.05	-0.07	0.15	0.00	0.06	0.13	0.04	-0.197*	-0.11	0.14	0.271**	0.01	0.13
	Sig. (2-tailed)	0.09	0.02	0.98	0.69	0.50	0.21	0.16	0.66	0.15	0.64	0.49	0.12	0.97	0.51	0.18	0.71	0.04	0.28	0.14	0.01	0.92	0.27
	N	84.00	72.00	104.00	107.00	106.00	107.00	82.00	93.00	75.00	80.00	90.00	104.00	105.00	105.00	104.00	104.00	104.00	105.00	105.00	104.00	75.00	78.00
Juveniles Brought into Formal Contact with the police and/or criminal justice system, All Crimes, rate per 100,000 juveniles aged 17 or under	Correlation Coefficient	0.529**	0.501**	-0.649**	0.552**	0.550**	0.602**	0.355**	-0.12	0.19	0.331**	0.442**	0.583**	-0.18	0.547**	0.672**	0.330**	-0.16	0.10	0.01	0.211*	0.12	0.04
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.11	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.11	0.29	0.92	0.03	0.31	0.73
	N	83.00	73.00	105.00	107.00	106.00	107.00	80.00	95.00	74.00	78.00	93.00	104.00	105.00	105.00	104.00	104.00	104.00	105.00	105.00	104.00	73.00	77.00
Intentional homicide, rates per 100,000 population	Correlation Coefficient	-0.298**	-0.16	0.569**	-0.322**	-0.526**	-0.475**	-0.423**	0.403**	-0.265**	-0.383**	-0.343**	-0.336**	0.07	-0.403**	-0.385**	-0.02	.147*	-0.312**	-0.04	-0.14	-0.07	0.04
	Sig. (2-tailed)	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.00	0.00	0.77	0.04	0.00	0.58	0.06	0.46	0.63
	N	168.00	149.00	183.00	190.00	191.00	193.00	151.00	165.00	135.00	140.00	145.00	188.00	191.00	189.00	181.00	179.00	187.00	191.00	189.00	179.00	134.00	134.00
Assault at the national level, number of police-recorded offences	Correlation Coefficient	0.06	0.303**	-0.11	0.321**	0.16	0.16	-0.06	0.18	0.302**	0.17	-0.03	0.291**	0.09	0.278**	0.196*	0.243**	-0.02	-0.07	0.188*	0.235**	0.00	0.20
	Sig. (2-tailed)	0.54	0.00	0.21	0.00	0.07	0.07	0.59	0.06	0.00	0.10	0.79	0.00	0.31	0.00	0.03	0.01	0.86	0.46	0.04	0.01	0.97	0.06
	N	103.00	91.00	125.00	127.00	126.00	127.00	98.00	113.00	89.00	95.00	105.00	124.00	125.00	125.00	122.00	123.00	124.00	125.00	125.00	122.00	88.00	92.00

Appendix

		Percentage of births attended by skilled health personnel (doctor, nurse or midwife)	Percentage of women aged 15–49 years attended at least 4 times during pregnancy by skilled health personnel (doctor, nurse or midwife)	Maternal mortality ratio (MMR, maternal deaths per 100 000 live births)	Health expenditure, public (% of total health expenditure)	Improved sanitation facilities (% of population with access)	Population using improved drinking-water sources (%)	Youth literacy rate, population 15–24 years, both sexes (%)	Repetition rate in primary education (all grades), both sexes (%)	Gross graduation ratio from primary education, both sexes (%)	Gross graduation ratio from lower secondary education, both sexes (%)	Gross graduation ratio from first degree programmes (ISCED 6 and 7) in tertiary education, both sexes (%)	Gross enrolment ratio, pre-primary, both sexes (%)	Gross enrolment ratio, primary, both sexes (%)	Gross enrolment ratio, secondary, both sexes (%)	Gross enrolment ratio, tertiary, both sexes (%)	Government expenditure on education as % of GDP (%)	Gross enrolment ratio, pre-primary, gender parity index (GPI)	Gross enrolment ratio, primary, gender parity index (GPI)	Gross enrolment ratio, secondary, gender parity index (GPI)	Gross enrolment ratio, tertiary, gender parity index (GPI)	Gross graduation ratio from primary education, gender parity index (GPI)	Gross graduation ratio from lower secondary education, gender parity index (GPI)
Total Sexual Offences against Children at the national level, police-recorded offences, rate per 100,000 children aged 17 or under	Correlation Coefficient	0.301**	0.374**	-0.308**	0.457**	0.307**	0.395**	0.18	0.17	0.19	0.22	0.238*	0.527**	0.08	0.419**	0.311**	0.385**	0.05	0.213*	0.295**	0.334**	0.281*	0.21
	Sig. (2-tailed)	0.01	0.00	0.00	0.00	0.00	0.00	0.12	0.10	0.12	0.05	0.03	0.00	0.44	0.00	0.00	0.00	0.61	0.03	0.00	0.00	0.02	0.07
	N	81.00	72.00	100.00	101.00	101.00	102.00	78.00	92.00	71.00	77.00	84.00	100.00	100.00	100.00	98.00	98.00	100.00	100.00	100.00	98.00	70.00	76.00
Birth registration rate	Correlation Coefficient	0.851**	0.758**	-0.900**	0.483**	0.829**	0.803**	0.768**	-0.588**	0.584**	0.730**	0.586**	0.592**	-0.14	0.849**	0.826**	0.228**	-0.257**	0.346**	0.302**	0.566**	0.210*	0.223*
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02
	N	142.00	134.00	160.00	163.00	163.00	165.00	134.00	143.00	115.00	120.00	128.00	160.00	163.00	161.00	158.00	152.00	159.00	163.00	161.00	157.00	115.00	116.00
Percentage of women aged 20 to 24 years who were first married or in union before ages 18	Correlation Coefficient	-0.706**	-0.521**	0.681**	-0.298**	-0.679**	-0.500**	-0.717**	0.486**	-0.468**	-0.523**	-0.341**	-0.351**	0.02	-0.628**	-0.480**	-0.205*	0.181*	-.242**	-.00415**	-0.548**	-0.225*	-0.272**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.84	0.00	0.00	0.03	0.05	0.01	0.00	0.00	0.02	0.01
	N	123.00	122.00	120.00	121.00	122.00	123.00	114.00	112.00	100.00	98.00	87.00	119.00	122.00	120.00	116.00	111.00	118.00	122.00	120.00	115.00	100.00	94.00
Percentage of children aged 5-14 engaged in child labor	Correlation Coefficient	-0.643**	-0.475**	0.721**	-0.316**	-0.714**	-0.612**	-0.626**	0.441**	-0.477**	-0.445**	-0.440**	-0.368**	0.03	-0.660**	-0.630**	-0.15	0.15	-0.203*	-0.504**	-0.595**	-0.336**	-0.471**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.76	0.00	0.00	0.14	0.11	0.03	0.00	0.00	0.00	0.00
	N	112.00	110.00	112.00	110.00	111.00	112.00	108.00	106.00	96.00	94.00	88.00	108.00	111.00	109.00	110.00	104.00	108.00	111.00	109.00	109.00	94.00	91.00
Sex ratio at birth	Correlation Coefficient	0.311**	0.253**	-0.510**	0.194**	0.383**	0.372**	0.510**	-0.542**	0.352**	0.446**	0.413**	0.369**	-0.04	0.412**	0.455**	0.06	-0.281**	0.196**	.144*	0.197**	0.09	0.14
	Sig. (2-tailed)	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.00	0.00	0.42	0.00	0.01	0.05	0.01	0.31	0.11
	N	167.00	149.00	183.00	190.00	190.00	192.00	151.00	165.00	135.00	140.00	145.00	187.00	190.00	188.00	181.00	179.00	186.00	190.00	188.00	179.00	134.00	134.00
Access to electricity (% of population)	Correlation Coefficient	0.803**	0.697**	-0.876**	0.386**	0.851**	0.783**	0.831**	-0.704**	0.633**	0.758**	0.558**	0.534**	-0.152*	0.816**	0.780**	0.11	-0.240**	0.339**	0.343**	0.596**	0.248**	0.277**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.00
	N	165.00	148.00	182.00	190.00	188.00	190.00	150.00	164.00	134.00	139.00	143.00	185.00	188.00	186.00	179.00	177.00	184.00	188.00	186.00	177.00	133.00	133.00
Unemployment, total (%)	Correlation	0.176*	0.02	-0.11	0.06	0.168*	0.10	0.171*	-0.06	0.04	0.01	0.05	-0.08	-0.13	0.14	0.15	0.08	-0.13	-0.07	0.05	0.12	0.01	0.03

Appendix

		Percentage of births attended by skilled health personnel (doctor, nurse or midwife)	Percentage of women aged 15–49 years attended at least 4 times during pregnancy by skilled health personnel (doctor, nurse or midwife)	Maternal mortality ratio (MMR, maternal deaths per 100 000 live births)	Health expenditure, public (% of total health expenditure)	Improved sanitation facilities (% of population with access)	Population using improved drinking-water sources (%)	Youth literacy rate, population 15–24 years, both sexes (%)	Repetition rate in primary education (all grades), both sexes (%)	Gross graduation ratio from primary education, both sexes (%)	Gross graduation ratio from lower secondary education, both sexes (%)	Gross graduation ratio from first degree programmes (ISCED 6 and 7) in tertiary education, both sexes (%)	Gross enrolment ratio, pre-primary, both sexes (%)	Gross enrolment ratio, primary, both sexes (%)	Gross enrolment ratio, secondary, both sexes (%)	Gross enrolment ratio, tertiary, both sexes (%)	Government expenditure on education as % of GDP (%)	Gross enrolment ratio, pre-primary, gender parity index (GPI)	Gross enrolment ratio, primary, gender parity index (GPI)	Gross enrolment ratio, secondary, gender parity index (GPI)	Gross enrolment ratio, tertiary, gender parity index (GPI)	Gross graduation ratio from primary education, gender parity index (GPI)	Gross graduation ratio from lower secondary education, gender parity index (GPI)
of total labor force) (modeled ILO estimate)	Coefficient																						
	Sig. (2-tailed)	0.03	0.81	0.15	0.47	0.03	0.20	0.04	0.44	0.65	0.87	0.60	0.29	0.10	0.07	0.05	0.33	0.08	0.34	0.51	0.13	0.88	0.78
	N	147.00	134.00	170.00	168.00	167.00	169.00	143.00	149.00	122.00	124.00	136.00	165.00	168.00	166.00	165.00	157.00	165.00	168.00	166.00	164.00	120.00	119.00
Youth unemployment rate (% of total labor force ages 15-24)	Correlation Coefficient	0.347**	0.183*	-0.297**	0.160*	0.330**	0.274**	0.341**	-0.184*	0.209*	0.13	0.13	0.04	-0.10	0.306**	0.295**	0.08	-0.175*	0.03	0.212**	0.295**	0.11	0.194*
	Sig. (2-tailed)	0.00	0.03	0.00	0.04	0.00	0.00	0.00	0.02	0.02	0.15	0.15	0.61	0.20	0.00	0.00	0.30	0.02	0.67	0.01	0.00	0.25	0.03
	N	147.00	134.00	170.00	168.00	167.00	169.00	143.00	149.00	122.00	124.00	136.00	165.00	168.00	166.00	165.00	157.00	165.00	168.00	166.00	164.00	120.00	119.00
Income Gini coefficient	Correlation Coefficient	-0.248**	-0.10	0.496**	-0.15	-0.419**	-0.347**	-0.279**	0.470**	-0.10	-0.363**	-0.422**	-0.224**	0.231**	-0.389**	-0.420**	0.02	0.278**	-0.240**	0.11	-0.04	0.03	0.07
	Sig. (2-tailed)	0.00	0.28	0.00	0.07	0.00	0.00	0.00	0.00	0.32	0.00	0.00	0.01	0.00	0.00	0.00	0.81	0.00	0.00	0.19	0.65	0.74	0.43
	N	136.00	126.00	154.00	155.00	156.00	156.00	130.00	137.00	112.00	121.00	124.00	153.00	155.00	153.00	151.00	147.00	152.00	155.00	153.00	149.00	111.00	115.00
Public debt as percentage of GDP	Correlation Coefficient	0.04	0.11	-0.174*	0.02	0.221**	0.297**	0.00	-0.06	0.04	0.00	0.10	0.218**	-0.10	0.14	.171*	0.09	-0.05	0.03	0.01	0.10	-0.12	0.08
	Sig. (2-tailed)	0.62	0.21	0.02	0.78	0.00	0.00	1.00	0.49	0.64	0.97	0.27	0.00	0.17	0.07	0.03	0.24	0.54	0.72	0.86	0.19	0.19	0.35
	N	156.00	140.00	174.00	181.00	178.00	179.00	142.00	156.00	130.00	134.00	138.00	177.00	179.00	177.00	171.00	168.00	176.00	179.00	177.00	169.00	129.00	128.00
GNI per capita, PPP (current international \$)	Correlation Coefficient	0.786**	0.698**	-0.870**	0.484**	0.853**	0.782**	0.757**	-0.538**	0.622**	0.712**	00.484**	.588**	-0.14	0.804**	0.757**	0.153*	-0.183*	.319**	00.335**	0.621**	0.213*	0.322**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.05	0.01	0.00	0.00	0.00	0.01	0.00
	N	161.00	144.00	178.00	185.00	183.00	184.00	148.00	160.00	132.00	137.00	141.00	181.00	183.00	181.00	175.00	172.00	180.00	183.00	181.00	173.00	131.00	131.00
Social Capital Ranking	Correlation Coefficient	-0.249**	-0.428**	0.425**	-0.409**	-0.469**	-0.429**	-0.254**	0.180*	-0.338**	-0.278**	-0.192*	-0.436**	0.02	-0.453**	-0.340**	-0.286**	-0.02	-0.242**	-0.407**	-0.435**	-0.248*	-0.403**
	Sig. (2-tailed)	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.03	0.00	0.83	0.00	0.00	0.00	0.85	0.00	0.00	0.00	0.01	0.00
	N	125.00	112.00	148.00	148.00	147.00	148.00	125.00	133.00	108.00	112.00	126.00	145.00	147.00	145.00	147.00	143.00	145.00	147.00	145.00	147.00	105.00	107.00
Proportion of households with internet at home (%)	Correlation Coefficient	0.726**	0.673**	-0.877**	0.518**	0.813**	0.752**	0.773**	-0.594**	0.440**	0.656**	0.500**	0.560**	-0.199*	0.774**	0.712**	0.13	-0.296**	0.393**	0.15	0.376**	0.13	0.314**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.14	0.00	0.00	0.09	0.00	0.20	0.00

Appendix

		Percentage of births attended by skilled health personnel (doctor, nurse or midwife)	Percentage of women aged 15–49 years attended at least 4 times during pregnancy by skilled health personnel (doctor, nurse or midwife)	Maternal mortality ratio (MMR, maternal deaths per 100 000 live births)	Health expenditure, public (% of total health expenditure)	Improved sanitation facilities (% of population with access)	Population using improved drinking-water sources (%)	Youth literacy rate, population 15–24 years, both sexes (%)	Repetition rate in primary education (all grades), both sexes (%)	Gross graduation ratio from primary education, both sexes (%)	Gross graduation ratio from lower secondary education, both sexes (%)	Gross graduation ratio from first degree programmes (ISCED 6 and 7) in tertiary education, both sexes (%)	Gross enrolment ratio, pre-primary, both sexes (%)	Gross enrolment ratio, primary, both sexes (%)	Gross enrolment ratio, secondary, both sexes (%)	Gross enrolment ratio, tertiary, both sexes (%)	Government expenditure on education as % of GDP (%)	Gross enrolment ratio, pre-primary, gender parity index (GPI)	Gross enrolment ratio, primary, gender parity index (GPI)	Gross enrolment ratio, secondary, gender parity index (GPI)	Gross enrolment ratio, tertiary, gender parity index (GPI)	Gross graduation ratio from primary education, gender parity index (GPI)	Gross graduation ratio from lower secondary education, gender parity index (GPI)
	N	113.00	99.00	133.00	137.00	136.00	137.00	109.00	122.00	100.00	108.00	117.00	134.00	136.00	134.00	136.00	134.00	134.00	136.00	134.00	136.00	98.00	103.00
Proportion of households with computer (%)	Correlation Coefficient	0.810**	0.698**	-0.893**	0.520**	0.824**	0.808**	0.778**	-0.571**	0.476**	0.711**	0.533**	0.620**	-0.261**	.777**	00.729**	0.08	-0.363**	.325**	0.12	00.414**	0.06	0.226*
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39	0.00	0.00	0.18	0.00	0.55	0.03
	N	102.00	90.00	124.00	126.00	125.00	126.00	102.00	112.00	90.00	100.00	106.00	123.00	125.00	123.00	125.00	120.00	123.00	125.00	123.00	125.00	90.00	96.00
Water depletion index	Correlation Coefficient	-0.04	-0.07	-0.13	-0.13	0.165*	-0.02	0.15	-0.256**	0.00	0.01	0.03	-0.14	-0.244**	0.07	0.10	0.01	-0.182*	-0.01	-0.11	-0.08	-0.17	-0.191*
	Sig. (2-tailed)	0.63	0.42	0.08	0.08	0.02	0.80	0.06	0.00	0.97	0.91	0.72	0.05	0.00	0.36	0.20	0.87	0.01	0.89	0.13	0.27	0.05	0.03
	N	165.00	146.00	180.00	188.00	188.00	190.00	148.00	163.00	133.00	138.00	144.00	185.00	188.00	186.00	179.00	176.00	184.00	188.00	186.00	177.00	132.00	132.00
Renewable energy consumption (% of total final energy consumption)	Correlation Coefficient	-0.659**	-0.518**	0.575**	-0.312**	-0.609**	-0.417**	-0.655**	0.486**	-0.468**	-0.541**	-0.314**	-0.326**	0.13	-0.513**	-0.458**	-0.04	.147*	-00.228**	-0.368**	-0.452**	-0.11	-0.328**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.59	0.05	0.00	0.00	0.00	0.19	0.00
	N	163.00	146.00	182.00	186.00	185.00	187.00	149.00	161.00	133.00	137.00	142.00	182.00	185.00	183.00	177.00	174.00	181.00	185.00	183.00	175.00	132.00	131.00

** . Correlation is significant at the 0.01 level (2-tailed); * . Correlation is significant at the 0.05 level (2-tailed).

Appendix 7. Correlation coefficients for the 66 indicators – Part III

		Gross graduation ratio from first degree programmes (ISCED 6 and 7) in tertiary education, gender parity index (GPI)	Youth literacy rate, population 15-24 years, gender parity index (GPI)	Juveniles Held in Prisons, Penal Institutions or Correctional Institutions, rate per 100,000 juveniles aged 17 or under	Juveniles Brought into Formal Contact with the police and/or criminal justice system, All Crimes, rate per 100,000 juveniles aged 17 or under	Intentional homicide, rates per 100,000 population	Assault at the national level, number of police-recorded offences	Total Sexual Offences against Children at the national level, police-recorded offences, rate per 100,000 children aged 17 or under	Birth registration rate	Percent-age of women aged 20 to 24 years who were first married or in union before ages 18	Percent-age of children aged 5-14 engaged in child labor	Sex ratio at birth	Access to electricity (% of population)	Unemployment, total (% of total labor force) (modeled ILO estimate)	Youth unemployment rate (% of total labor force ages 15-24)	Income Gini coefficient	Public debt as percentage of GDP	GNI per capita, PPP (current international \$)	Social Capital Ranking	Proportion of households with internet at home (%)	Proportion of households with computer (%)	Water depletion index	Renewable energy consumption (% of total final energy consumption)
Under-5 mortality rate (per 1,000 live births)	Correlation Coefficient	-0.554**	-0.309**	-0.02	-0.694**	0.552**	-0.199*	-0.430**	-0.886**	0.639**	0.716**	-0.480**	-0.858**	-0.09	-0.271**	.0417**	-0.233**	-0.866**	0.458**	-0.844**	-0.895**	-0.04	0.513**
	Sig. (2-tailed)	0.00	0.00	0.82	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.59	0.00	
	N	137.00	152.00	108.00	108.00	195.00	128.00	102.00	166.00	123.00	112.00	194.00	192.00	170.00	170.00	156.00	181.00	185.00	148.00	138.00	126.00	192.00	188.00
Infant mortality rate (per 1,000 live births)	Correlation Coefficient	-0.555**	-0.305**	-0.03	-0.698**	0.549**	-0.200*	-0.437**	-0.884**	0.617**	0.695**	-0.470**	-0.849**	-0.07	-0.257**	0.409**	-0.234**	-0.863**	0.456**	-0.840**	-0.891**	-0.03	0.504**
	Sig. (2-tailed)	0.00	0.00	0.79	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.66	0.00	
	N	137.00	152.00	108.00	108.00	195.00	128.00	102.00	166.00	123.00	112.00	194.00	192.00	170.00	170.00	156.00	181.00	185.00	148.00	138.00	126.00	192.00	188.00
Neonatal mortality rate (per 1,000 live births)	Correlation Coefficient	-0.557**	-0.310**	0.00	-0.680**	0.550**	-0.214*	-0.408**	-0.872**	0.619**	0.664**	-0.445**	-0.830**	-0.07	-0.256**	0.388**	-0.205**	-0.851**	0.457**	-0.834**	-0.883**	-0.03	0.489**
	Sig. (2-tailed)	0.00	0.00	0.98	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.36	0.00	0.00	0.01	0.00	0.00	0.00	0.64	0.00	
	N	137.00	152.00	108.00	108.00	195.00	128.00	102.00	166.00	123.00	112.00	194.00	192.00	170.00	170.00	156.00	181.00	185.00	148.00	138.00	126.00	192.00	188.00
Percentage of infants born with low birth weight (<2500g.)	Correlation Coefficient	-0.456**	-0.247**	0.09	-0.505**	0.347**	-0.02	-0.200*	-0.643**	0.552**	0.268**	-0.290**	-0.589**	-0.02	-0.10	0.337**	0.04	-0.525**	0.237**	-0.580**	-0.580**	-0.02	0.283**
	Sig. (2-tailed)	0.00	0.00	0.38	0.00	0.00	0.83	0.05	0.00	0.00	0.00	0.00	0.00	0.76	0.19	0.00	0.62	0.00	0.00	0.00	0.74	0.00	
	N	134.00	147.00	105.00	106.00	186.00	126.00	100.00	161.00	119.00	109.00	186.00	186.00	167.00	167.00	152.00	178.00	181.00	146.00	135.00	125.00	185.00	182.00
Underweight (moderate and severe, %)	Correlation Coefficient	-0.532**	-0.352**	-0.277*	-0.617**	0.14	-0.233*	-0.20	-0.684**	0.605**	0.501**	-0.306**	-0.731**	-0.200*	-0.312**	0.02	-0.05	-0.682**	0.16	-0.676**	-0.686**	0.00	0.564**
	Sig. (2-tailed)	0.00	0.00	0.02	0.00	0.10	0.03	0.11	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.86	0.55	0.00	0.09	0.00	0.98	0.00	

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		Gross graduation ratio from first degree programmes (ISCED 6 and 7) in tertiary education, gender parity index (GPI)	Youth literacy rate, population 15-24 years, gender parity index (GPI)	Juveniles Held in Prisons, Penal Institutions or Correctional Institutions, rate per 100,000 juveniles aged 17 or under	Juveniles Brought into Formal Contact with the police and/or criminal justice system, All Crimes, rate per 100,000 juveniles aged 17 or under	Intentional homicide, rates per 100,000 population	Assault at the national level, number of police-recorded offences	Total Sexual Offences against Children at the national level, police-recorded offences, rate per 100,000 children aged 17 or under	Birth registration rate	Percentage of women aged 20 to 24 years who were first married or in union before ages 18	Percentage of children aged 5-14 engaged in child labor	Sex ratio at birth	Access to electricity (% of population)	Unemployment, total (% of total labor force) (modeled ILO estimate)	Youth unemployment rate (% of total labor force ages 15-24)	Income Gini coefficient	Public debt as percentage of GDP	GNI per capita, PPP (current international \$)	Social Capital Ranking	Proportion of households with internet at home (%)	Proportion of households with computer (%)	Water depletion index	Renewable energy consumption (% of total final energy consumption)
	N	101.00	134.00	71.00	70.00	148.00	89.00	67.00	130.00	121.00	110.00	148.00	148.00	137.00	137.00	125.00	140.00	144.00	116.00	102.00	93.00	146.00	147.00
Overweight (including obesity, %)	Correlation Coefficient	0.374**	0.306**	0.22	0.273*	-0.13	-0.03	-0.17	0.490**	-0.587**	-0.455**	0.218**	0.474**	0.334**	0.427**	-0.09	-0.13	0.407**	-0.01	0.443**	0.398**	0.07	-0.424**
	Sig. (2-tailed)	0.00	0.00	0.07	0.02	0.12	0.77	0.16	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.32	0.13	0.00	0.91	0.00	0.00	0.42	0.00
	N	100.00	131.00	71.00	69.00	146.00	88.00	67.00	128.00	118.00	109.00	146.00	146.00	135.00	135.00	125.00	139.00	142.00	117.00	101.00	92.00	144.00	145.00
Wasting (moderate and severe, %)	Correlation Coefficient	-0.353**	-0.348**	-0.254*	-0.452**	-0.03	-0.316**	-0.294*	-0.490**	0.343**	0.235*	-0.166*	-0.429**	0.01	-0.03	-0.17	0.06	-0.451**	0.18	-0.415**	-0.419**	0.199*	0.266**
	Sig. (2-tailed)	0.00	0.00	0.03	0.00	0.74	0.00	0.02	0.00	0.00	0.01	0.04	0.00	0.89	0.71	0.06	0.45	0.00	0.06	0.00	0.00	0.02	0.00
	N	101.00	134.00	71.00	70.00	147.00	89.00	67.00	129.00	120.00	110.00	147.00	147.00	137.00	137.00	124.00	139.00	143.00	116.00	102.00	93.00	145.00	146.00
Stunting (moderate and severe, %)	Correlation Coefficient	-0.589**	-0.337**	-0.300*	-0.652**	0.172*	-0.258*	-0.340**	-0.721**	0.603**	0.577**	-0.341**	-0.779**	-0.13	-0.288**	0.08	-0.14	-0.743**	0.281**	-0.724**	-0.769**	-0.05	0.626**
	Sig. (2-tailed)	0.00	0.00	0.01	0.00	0.04	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.39	0.10	0.00	0.00	0.00	0.00	0.55	0.00
	N	101.00	134.00	71.00	70.00	147.00	89.00	67.00	129.00	120.00	110.00	147.00	147.00	137.00	137.00	124.00	139.00	143.00	116.00	102.00	93.00	145.00	146.00
Exclusive breastfeeding <6 months (%)	Correlation Coefficient	-0.383**	-0.03	0.01	-0.340**	0.15	-0.07	-0.10	-0.413**	0.14	0.304**	-0.168*	-0.470**	-0.214**	-0.246**	0.195*	-0.05	-0.546**	0.16	-0.469**	-0.518**	-0.198*	0.283**
	Sig. (2-tailed)	0.00	0.69	0.93	0.00	0.05	0.50	0.35	0.00	0.11	0.00	0.03	0.00	0.01	0.00	0.02	0.56	0.00	0.06	0.00	0.00	0.01	0.00
	N	119.00	140.00	91.00	92.00	167.00	111.00	88.00	152.00	121.00	109.00	167.00	166.00	154.00	154.00	146.00	159.00	162.00	134.00	118.00	110.00	164.00	165.00
DMFT (decayed, missing or filled teeth) among 12-year-olds (number)	Correlation Coefficient	0.200*	0.07	0.14	-0.08	0.05	-0.16	-0.12	0.203*	-0.198*	-0.14	0.188*	0.222**	0.14	0.177*	-0.09	-0.11	0.10	0.213*	0.00	0.04	-0.05	-0.208**
	Sig. (2-tailed)	0.02	0.40	0.17	0.40	0.50	0.07	0.25	0.01	0.04	0.17	0.01	0.00	0.08	0.02	0.27	0.16	0.20	0.01	0.97	0.65	0.49	0.01

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		Gross graduation ratio from first degree programmes (ISCED 6 and 7) in tertiary education, gender parity index (GPI)	Youth literacy rate, population 15-24 years, gender parity index (GPI)	Juveniles Held in Prisons, Penal Institutions or Correctional Institutions, rate per 100,000 juveniles aged 17 or under	Juveniles Brought into Formal Contact with the police and/or criminal justice system, All Crimes, rate per 100,000 juveniles aged 17 or under	Intentional homicide, rates per 100,000 population	Assault at the national level, number of police-recorded offences	Total Sexual Offences against Children at the national level, police-recorded offences, rate per 100,000 children aged 17 or under	Birth registration rate	Percentage of women aged 20 to 24 years who were first married or in union before ages 18	Percentage of children aged 5-14 engaged in child labor	Sex ratio at birth	Access to electricity (% of population)	Unemployment, total (% of total labor force) (modeled ILO estimate)	Youth unemployment rate (% of total labor force ages 15-24)	Income Gini coefficient	Public debt as percentage of GDP	GNI per capita, PPP (current international \$)	Social Capital Ranking	Proportion of households with internet at home (%)	Proportion of households with computer (%)	Water depletion index	Renewable energy consumption (% of total final energy consumption)
	N	130.00	141.00	103.00	104.00	180.00	122.00	97.00	152.00	111.00	103.00	179.00	178.00	163.00	163.00	147.00	171.00	173.00	143.00	133.00	124.00	179.00	176.00
Suicide rate, 15-29 year-olds, per 100000	Correlation Coefficient	-0.13	0.05	-0.09	0.05	0.07	-0.06	0.16	-0.06	0.247**	0.230*	-0.14	-0.13	-0.235**	-0.288**	-0.08	-0.08	-0.08	0.02	-0.04	-0.07	-0.326**	0.285**
	Sig. (2-tailed)	0.15	0.58	0.36	0.59	0.38	0.53	0.12	0.49	0.01	0.02	0.07	0.09	0.00	0.00	0.33	0.30	0.29	0.82	0.64	0.44	0.00	0.00
	N	130.00	144.00	102.00	103.00	171.00	121.00	96.00	152.00	113.00	108.00	171.00	171.00	169.00	169.00	147.00	165.00	168.00	148.00	132.00	123.00	169.00	171.00
Mortality rate attributed to household and ambient air pollution (per 100 000 population)	Correlation Coefficient	-0.370**	-0.297**	-0.09	-0.362**	0.162*	-0.437**	-0.540**	-0.392**	0.15	0.380**	-0.03	-0.397**	0.00	-0.12	-0.12	-0.163*	-0.588**	0.607**	-0.502**	-0.529**	0.07	0.458**
	Sig. (2-tailed)	0.00	0.00	0.35	0.00	0.03	0.00	0.00	0.00	0.11	0.00	0.68	0.00	1.00	0.11	0.13	0.03	0.00	0.00	0.00	0.00	0.37	0.00
	N	136.00	151.00	106.00	106.00	192.00	126.00	100.00	164.00	122.00	111.00	191.00	190.00	170.00	170.00	155.00	179.00	184.00	148.00	137.00	125.00	190.00	187.00
PM2.5 air pollution, population exposed to levels exceeding WHO guideline value (% of total)	Correlation Coefficient	-0.04	-0.259**	0.04	-0.197*	0.08	-0.189*	-0.253*	-0.13	-0.09	0.03	-0.152*	-0.02	0.11	0.06	-0.07	0.11	-0.10	0.415**	-0.221**	-0.197*	0.239**	-0.03
	Sig. (2-tailed)	0.61	0.00	0.72	0.04	0.26	0.03	0.01	0.11	0.31	0.78	0.04	0.78	0.15	0.42	0.36	0.13	0.16	0.00	0.01	0.03	0.00	0.64
	N	134.00	150.00	105.00	105.00	187.00	125.00	100.00	161.00	120.00	111.00	186.00	186.00	170.00	170.00	154.00	177.00	181.00	148.00	136.00	125.00	185.00	186.00
Estimated percentage of young men and women (aged 15-24) living with HIV as of 2013	Correlation Coefficient	-0.303**	0.05	0.17	-0.08	0.502**	0.12	0.16	-0.544**	0.266**	0.401**	-0.594**	-0.594**	-0.01	-0.11	0.544**	-0.04	-0.422**	0.03	-0.488**	-0.530**	-0.257**	0.473**
	Sig. (2-tailed)	0.00	0.61	0.17	0.52	0.00	0.29	0.21	0.00	0.01	0.00	0.00	0.00	0.90	0.23	0.00	0.69	0.00	0.73	0.00	0.00	0.00	0.00
	N	93.00	117.00	70.00	68.00	128.00	84.00	66.00	121.00	103.00	99.00	128.00	128.00	125.00	125.00	116.00	124.00	125.00	110.00	95.00	89.00	126.00	128.00
Diphtheria tetanus toxoid and pertussis (DTP3) immunization coverage among 1-year-	Correlation Coefficient	0.420**	0.202*	0.12	0.262**	-0.337**	0.201*	0.247*	0.570**	-0.422**	-0.350**	0.14	0.581**	-0.03	0.10	-0.260**	0.184*	0.523**	-0.304**	0.435**	0.459**	0.10	-0.418**
	Sig. (2-tailed)	0.00	0.01	0.23	0.01	0.00	0.02	0.01	0.00	0.00	0.00	0.06	0.00	0.69	0.21	0.00	0.01	0.00	0.00	0.00	0.00	0.16	0.00

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		Gross graduation ratio from first degree programmes (ISCED 6 and 7) in tertiary education, gender parity index (GPI)	Youth literacy rate, population 15-24 years, gender parity index (GPI)	Juveniles Held in Prisons, Penal Institutions or Correctional Institutions, rate per 100,000 juveniles aged 17 or under	Juveniles Brought into Formal Contact with the police and/or criminal justice system, All Crimes, rate per 100,000 juveniles aged 17 or under	Intentional homicide, rates per 100,000 population	Assault at the national level, number of police-recorded offences	Total Sexual Offences against Children at the national level, police-recorded offences, rate per 100,000 children aged 17 or under	Birth registration rate	Percentage of women aged 20 to 24 years who were first married or in union before ages 18	Percentage of children aged 5-14 engaged in child labor	Sex ratio at birth	Access to electricity (% of population)	Unemployment, total (% of total labor force) (modeled ILO estimate)	Youth unemployment rate (% of total labor force ages 15-24)	Income Gini coefficient	Public debt as percentage of GDP	GNI per capita, PPP (current international \$)	Social Capital Ranking	Proportion of households with internet at home (%)	Proportion of households with computer (%)	Water depletion index	Renewable energy consumption (% of total final energy consumption)
olds (%)	N	137.00	152.00	108.00	108.00	195.00	128.00	102.00	166.00	123.00	112.00	194.00	192.00	170.00	170.00	156.00	181.00	185.00	148.00	138.00	126.00	192.00	188.00
Measles (MCV) immunization coverage among 1-year-olds (%)	Correlation Coefficient	0.426**	0.230**	0.200*	0.12	-0.199**	0.255**	0.15	0.529**	-0.331**	-0.354**	0.13	0.514**	-0.06	0.05	-0.162*	0.12	0.494**	-0.259**	0.395**	0.394**	0.04	-0.415**
	Sig. (2-tailed)	0.00	0.00	0.04	0.23	0.01	0.00	0.13	0.00	0.00	0.00	0.08	0.00	0.47	0.54	0.04	0.11	0.00	0.00	0.00	0.00	0.58	0.00
	N	137.00	152.00	108.00	108.00	195.00	128.00	102.00	166.00	123.00	112.00	194.00	192.00	170.00	170.00	156.00	181.00	185.00	148.00	138.00	126.00	192.00	188.00
Polio (Pol3) immunization coverage among 1-year-olds (%)	Correlation Coefficient	0.353**	0.214**	0.06	0.256**	-0.336**	0.253**	0.198*	0.567**	-0.407**	-0.361**	0.158*	0.553**	-0.03	0.09	-0.228**	0.157*	0.507**	-0.291**	0.447**	0.460**	0.11	-0.383**
	Sig. (2-tailed)	0.00	0.01	0.54	0.01	0.00	0.00	0.05	0.00	0.00	0.00	0.03	0.00	0.72	0.23	0.00	0.03	0.00	0.00	0.00	0.00	0.12	0.00
	N	137.00	152.00	108.00	108.00	195.00	128.00	102.00	166.00	123.00	112.00	194.00	192.00	170.00	170.00	156.00	181.00	185.00	148.00	138.00	126.00	192.00	188.00
Hepatitis B (HepB3) immunization coverage among 1-year-olds (%)	Correlation Coefficient	0.364**	0.215**	0.14	0.18	-0.258**	0.17	0.16	0.458**	-0.425**	-0.339**	0.07	0.502**	-0.02	0.10	-0.13	0.11	0.432**	-0.224**	0.343**	0.363**	0.10	-0.404**
	Sig. (2-tailed)	0.00	0.01	0.16	0.07	0.00	0.07	0.13	0.00	0.00	0.00	0.32	0.00	0.81	0.21	0.13	0.16	0.00	0.01	0.00	0.00	0.17	0.00
	N	128.00	150.00	99.00	99.00	186.00	119.00	94.00	157.00	123.00	112.00	185.00	183.00	161.00	161.00	147.00	172.00	176.00	139.00	129.00	117.00	183.00	179.00
Bacillus Calmette-Guérin (BCG) immunization	Correlation Coefficient	0.338**	0.227**	0.283**	0.04	-0.12	0.10	0.10	0.305**	-0.354**	-0.315**	0.06	0.402**	0.02	0.14	-0.01	0.05	0.342**	-0.190*	0.15	0.18	-0.03	-0.364**
	Sig. (2-tailed)	0.00	0.01	0.01	0.73	0.14	0.31	0.38	0.00	0.00	0.00	0.44	0.00	0.78	0.10	0.90	0.51	0.00	0.03	0.11	0.07	0.70	0.00
	N	111.00	142.00	83.00	81.00	164.00	101.00	80.00	140.00	119.00	107.00	163.00	161.00	144.00	144.00	137.00	152.00	156.00	124.00	112.00	103.00	161.00	159.00
Comparable estimates of prevalence of insufficient physical activity (adolescents 11-17	Correlation Coefficient	-0.218*	0.06	-0.02	-0.22	0.12	-0.02	-0.05	-0.422**	0.14	0.280*	-0.06	-0.288**	-0.08	-0.12	0.239*	-0.16	-0.185*	0.09	-0.13	-0.219*	0.00	0.13
	Sig. (2-tailed)	0.04	0.57	0.87	0.05	0.19	0.87	0.68	0.00	0.30	0.04	0.55	0.00	0.40	0.24	0.02	0.09	0.05	0.39	0.22	0.04	0.98	0.16

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		Gross graduation ratio from first degree programmes (ISCED 6 and 7) in tertiary education, gender parity index (GPI)	Youth literacy rate, population 15-24 years, gender parity index (GPI)	Juveniles Held in Prisons, Penal Institutions or Correctional Institutions, rate per 100,000 juveniles aged 17 or under	Juveniles Brought into Formal Contact with the police and/or criminal justice system, All Crimes, rate per 100,000 juveniles aged 17 or under	Intentional homicide, rates per 100,000 population	Assault at the national level, number of police-recorded offences	Total Sexual Offences against Children at the national level, police-recorded offences, rate per 100,000 children aged 17 or under	Birth registration rate	Percentage of women aged 20 to 24 years who were first married or in union before ages 18	Percentage of children aged 5-14 engaged in child labor	Sex ratio at birth	Access to electricity (% of population)	Unemployment, total (% of total labor force) (modeled ILO estimate)	Youth unemployment rate (% of total labor force ages 15-24)	Income Gini coefficient	Public debt as percentage of GDP	GNI per capita, PPP (current international \$)	Social Capital Ranking	Proportion of households with internet at home (%)	Proportion of households with computer (%)	Water depletion index	Renewable energy consumption (% of total final energy consumption)
years)	N	89.00	86.00	72.00	77.00	120.00	88.00	70.00	97.00	60.00	55.00	119.00	118.00	103.00	103.00	94.00	113.00	116.00	96.00	95.00	86.00	119.00	116.00
15-19 years old heavy episodic drinkers (population), % by country	Correlation Coefficient	0.339**	0.305**	0.00	0.575**	-0.270**	0.12	0.354**	0.647**	-0.279**	-0.237*	0.402**	0.582**	0.10	0.12	-0.338**	0.09	0.551**	-0.320**	0.571**	0.620**	-0.216**	-0.159*
	Sig. (2-tailed)	0.00	0.00	0.96	0.00	0.00	0.19	0.00	0.00	0.00	0.01	0.00	0.00	0.21	0.12	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.03
	N	135.00	149.00	105.00	105.00	189.00	125.00	101.00	160.00	119.00	110.00	188.00	187.00	169.00	169.00	153.00	177.00	182.00	147.00	137.00	125.00	188.00	185.00
Adolescent fertility rate (per 1000 girls aged 15-19 years)	Correlation Coefficient	-0.394**	-0.184*	0.06	-0.536**	0.630**	-0.09	-0.265**	-0.782**	0.801**	0.620**	-0.507**	-0.748**	-0.07	-0.254**	0.504**	-0.162*	-0.728**	0.343**	-0.790**	-0.796**	-0.157*	0.537**
	Sig. (2-tailed)	0.00	0.02	0.56	0.00	0.00	0.30	0.01	0.00	0.00	0.00	0.00	0.00	0.37	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.03	0.00
	N	135.00	150.00	104.00	104.00	184.00	124.00	99.00	159.00	119.00	111.00	184.00	183.00	170.00	170.00	154.00	175.00	179.00	148.00	136.00	125.00	182.00	183.00
Percentage of births attended by skilled health personnel (doctor, nurse or midwife)	Correlation Coefficient	0.689**	0.354**	0.19	0.529**	-0.298**	0.06	0.301**	0.851**	-0.706**	-0.643**	0.311**	0.803**	0.176*	0.347**	-.248**	0.04	0.786**	-0.249**	0.726**	0.810**	-0.04	-0.659**
	Sig. (2-tailed)	0.00	0.00	0.09	0.00	0.00	0.54	0.01	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.62	0.00	0.01	0.00	0.00	0.63	0.00
	N	114.00	145.00	84.00	83.00	168.00	103.00	81.00	142.00	123.00	112.00	167.00	165.00	147.00	147.00	136.00	156.00	161.00	125.00	113.00	102.00	165.00	163.00
Percentage of women aged 15-49 years attended at least 4 times during pregnancy by skilled health personnel (doctor, nurse or midwife)	Correlation Coefficient	0.635**	0.355**	0.277*	0.501**	-0.16	0.303**	0.374**	0.758**	-0.521**	-0.475**	0.253**	0.697**	0.02	0.183*	-0.10	0.11	0.698**	-0.428**	0.673**	0.698**	-0.07	-0.518**
	Sig. (2-tailed)	0.00	0.00	0.02	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.81	0.03	0.28	0.21	0.00	0.00	0.00	0.00	0.42	0.00
	N	103.00	129.00	72.00	73.00	149.00	91.00	72.00	134.00	122.00	110.00	149.00	148.00	134.00	134.00	126.00	140.00	144.00	112.00	99.00	90.00	146.00	146.00
Maternal mortality ratio (MMR, maternal deaths per 100 000 live births)	Correlation Coefficient	-0.557**	-0.267**	0.00	-0.649**	0.569**	-0.11	-0.308**	-0.900**	0.681**	0.721**	-0.510**	-0.876**	-0.11	-0.297**	0.496**	-0.174*	-0.870**	0.425**	-0.877**	-0.893**	-0.13	0.575**
	Sig. (2-	0.00	0.00	0.98	0.00	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.00	0.02	0.00	0.00	0.00	0.08	0.00	

Appendix

		Gross graduation ratio from first degree programmes (ISCED 6 and 7) in tertiary education, gender parity index (GPI)	Youth literacy rate, population 15-24 years, gender parity index (GPI)	Juveniles Held in Prisons, Penal Institutions or Correctional Institutions, rate per 100,000 juveniles aged 17 or under	Juveniles Brought into Formal Contact with the police and/or criminal justice system, All Crimes, rate per 100,000 juveniles aged 17 or under	Intentional homicide, rates per 100,000 population	Assault at the national level, number of police-recorded offences	Total Sexual Offences against Children at the national level, police-recorded offences, rate per 100,000 children aged 17 or under	Birth registration rate	Percent-age of women aged 20 to 24 years who were first married or in union before ages 18	Percent-age of children aged 5-14 engaged in child labor	Sex ratio at birth	Access to electricity (% of population)	Unemployment, total (% of total labor force) (modeled ILO estimate)	Youth unemployment rate (% of total labor force ages 15-24)	Income Gini coefficient	Public debt as percentage of GDP	GNI per capita, PPP (current international \$)	Social Capital Ranking	Proportion of households with internet at home (%)	Proportion of households with computer (%)	Water depletion index	Renewable energy consumption (% of total final energy consumption)
	tailed)																						
	N	133.00	150.00	104.00	105.00	183.00	125.00	100.00	160.00	120.00	112.00	183.00	182.00	170.00	170.00	154.00	174.00	178.00	148.00	133.00	124.00	180.00	182.00
Health expenditure, public (% of total health expenditure)	Correlation Coefficient	0.415**	0.263**	-0.04	0.552**	-0.322**	0.321**	0.457**	0.483**	-0.298**	-0.316**	0.194**	0.386**	0.06	0.160*	-0.15	0.02	0.484**	-0.409**	0.518**	0.520**	-0.13	-0.312**
	Sig. (2-tailed)	0.00	0.00	0.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.47	0.04	0.07	0.78	0.00	0.00	0.00	0.00	0.08	0.00
	N	135.00	150.00	107.00	107.00	190.00	127.00	101.00	163.00	121.00	110.00	190.00	190.00	168.00	168.00	155.00	181.00	185.00	148.00	137.00	126.00	188.00	186.00
Improved sanitation facilities (% of population with access)	Correlation Coefficient	0.521**	0.315**	0.07	0.550**	-0.526**	0.16	0.307**	0.829**	-0.679**	-0.714**	0.383**	0.851**	0.168*	0.330**	-0.419**	0.221**	0.853**	-0.469**	0.813**	0.824**	0.165*	-0.609**
	Sig. (2-tailed)	0.00	0.00	0.50	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00
	N	135.00	151.00	106.00	106.00	191.00	126.00	101.00	163.00	122.00	111.00	190.00	188.00	167.00	167.00	156.00	178.00	183.00	147.00	136.00	125.00	188.00	185.00
Population using improved drinking-water sources (%)	Correlation Coefficient	0.551**	0.281**	0.12	0.602**	-0.475**	0.16	0.395**	0.803**	-0.500**	-0.612**	0.372**	0.783**	0.10	0.274**	-0.347**	0.297**	0.782**	-0.429**	0.752**	0.808**	-0.02	-0.417**
	Sig. (2-tailed)	0.00	0.00	0.21	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.80	0.00	
	N	136.00	151.00	107.00	107.00	193.00	127.00	102.00	165.00	123.00	112.00	192.00	190.00	169.00	169.00	156.00	179.00	184.00	148.00	137.00	126.00	190.00	187.00
Youth literacy rate, population 15-24 years, both sexes (%)	Correlation Coefficient	0.610**	0.323**	0.16	0.355**	-0.423**	-0.06	0.18	0.768**	-0.717**	-0.626**	0.510**	0.831**	0.171*	0.341**	-0.279**	0.00	0.757**	-0.254**	0.773**	0.778**	0.15	-0.655**
	Sig. (2-tailed)	0.00	0.00	0.16	0.00	0.00	0.59	0.12	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	1.00	0.00	0.00	0.00	0.06	0.00	
	N	110.00	151.00	82.00	80.00	151.00	98.00	78.00	134.00	114.00	108.00	151.00	150.00	143.00	143.00	130.00	142.00	148.00	125.00	109.00	102.00	148.00	149.00
Repetition rate in primary education (all grades), both sexes (%)	Correlation Coefficient	-0.455**	-0.10	0.05	-0.12	0.403**	0.18	0.17	-0.588**	0.486**	0.441**	-0.542**	-0.704**	-0.06	-0.184*	0.470**	-0.06	-0.538**	0.180*	-0.594**	-0.571**	-0.256**	0.486**
	Sig. (2-	0.00	0.24	0.66	0.27	0.00	0.06	0.10	0.00	0.00	0.00	0.00	0.00	0.44	0.02	0.00	0.49	0.00	0.04	0.00	0.00	0.00	

Appendix

		Gross graduation ratio from first degree programmes (ISCED 6 and 7) in tertiary education, gender parity index (GPI)	Youth literacy rate, population 15-24 years, gender parity index (GPI)	Juveniles Held in Prisons, Penal Institutions or Correctional Institutions, rate per 100,000 juveniles aged 17 or under	Juveniles Brought into Formal Contact with the police and/or criminal justice system, All Crimes, rate per 100,000 juveniles aged 17 or under	Intentional homicide, rates per 100,000 population	Assault at the national level, number of police-recorded offences	Total Sexual Offences against Children at the national level, police-recorded offences, rate per 100,000 children aged 17 or under	Birth registration rate	Percentage of women aged 20 to 24 years who were first married or in union before ages 18	Percentage of children aged 5-14 engaged in child labor	Sex ratio at birth	Access to electricity (% of population)	Unemployment, total (% of total labor force) (modeled ILO estimate)	Youth unemployment rate (% of total labor force ages 15-24)	Income Gini coefficient	Public debt as percentage of GDP	GNI per capita, PPP (current international \$)	Social Capital Ranking	Proportion of households with internet at home (%)	Proportion of households with computer (%)	Water depletion index	Renewable energy consumption (% of total final energy consumption)
		tailed)																					
	N	122.00	141.00	93.00	95.00	165.00	113.00	92.00	143.00	112.00	106.00	165.00	164.00	149.00	149.00	137.00	156.00	160.00	133.00	122.00	112.00	163.00	161.00
Gross graduation ratio from primary education, both sexes (%)	Correlation Coefficient	0.546**	0.332**	0.17	0.19	-0.265**	0.302**	0.19	0.584**	-0.468**	-0.477**	0.352**	0.633**	0.04	0.209*	-0.10	0.04	0.622**	-0.338**	0.440**	0.476**	0.00	-0.468**
	Sig. (2-tailed)	0.00	0.00	0.15	0.11	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.65	0.02	0.32	0.64	0.00	0.00	0.00	0.00	0.97	0.00
	N	96.00	116.00	75.00	74.00	135.00	89.00	71.00	115.00	100.00	96.00	135.00	134.00	122.00	122.00	112.00	130.00	132.00	108.00	100.00	90.00	133.00	133.00
Gross graduation ratio from lower secondary education, both sexes (%)	Correlation Coefficient	0.481**	0.220*	0.05	0.331**	-0.383**	0.17	0.22	0.730**	-0.523**	-0.445**	0.446**	0.758**	0.01	0.13	-0.363**	0.00	0.712**	-0.278**	0.656**	0.711**	0.01	-0.541**
	Sig. (2-tailed)	0.00	0.02	0.64	0.00	0.00	0.10	0.05	0.00	0.00	0.00	0.00	0.00	0.87	0.15	0.00	0.97	0.00	0.00	0.00	0.00	0.91	0.00
	N	104.00	116.00	80.00	78.00	140.00	95.00	77.00	120.00	98.00	94.00	140.00	139.00	124.00	124.00	121.00	134.00	137.00	112.00	108.00	100.00	138.00	137.00
Gross graduation ratio from first degree programmes (ISCED 6 and 7) in tertiary education, both sexes (%)	Correlation Coefficient	0.321**	0.05	-0.07	0.442**	-0.343**	-0.03	0.238*	0.586**	-0.341**	-0.440**	0.413**	0.558**	0.05	0.13	-0.422**	0.10	0.484**	-0.192*	0.500**	0.533**	0.03	-0.314**
	Sig. (2-tailed)	0.00	0.60	0.49	0.00	0.00	0.79	0.03	0.00	0.00	0.00	0.00	0.00	0.60	0.15	0.00	0.27	0.00	0.03	0.00	0.00	0.72	0.00
	N	136.00	117.00	90.00	93.00	145.00	105.00	84.00	128.00	87.00	88.00	145.00	143.00	136.00	136.00	124.00	138.00	141.00	126.00	117.00	106.00	144.00	142.00
Gross enrolment ratio, pre-primary, both sexes (%)	Correlation Coefficient	0.439**	0.331**	0.15	0.583**	-0.336**	0.291**	0.527**	0.592**	-0.351**	-0.368**	0.369**	0.534**	-0.08	0.04	-0.224**	0.218**	0.588**	-0.436**	0.560**	0.620**	-0.14	-0.326**
	Sig. (2-tailed)	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29	0.61	0.01	0.00	0.00	0.00	0.00	0.00	0.05	0.00
	N	136.00	148.00	104.00	104.00	188.00	124.00	100.00	160.00	119.00	108.00	187.00	185.00	165.00	165.00	153.00	177.00	181.00	145.00	134.00	123.00	185.00	182.00
Gross enrolment ratio, primary, both sexes (%)	Correlation Coefficient	-0.08	0.165*	0.00	-0.18	0.07	0.09	0.08	-0.14	0.02	0.03	-0.04	-0.152*	-0.13	-0.10	0.231**	-0.10	-0.14	0.02	-0.199*	-0.261**	-0.244**	0.13
	Sig. (2-	0.33	0.04	0.97	0.07	0.31	0.31	0.44	0.07	0.84	0.76	0.57	0.04	0.10	0.20	0.00	0.17	0.05	0.83	0.02	0.00	0.00	0.09

Appendix

		Gross graduation ratio from first degree programmes (ISCED 6 and 7) in tertiary education, gender parity index (GPI)	Youth literacy rate, population 15-24 years, gender parity index (GPI)	Juveniles Held in Prisons, Penal Institutions or Correctional Institutions, rate per 100,000 juveniles aged 17 or under	Juveniles Brought into Formal Contact with the police and/or criminal justice system, All Crimes, rate per 100,000 juveniles aged 17 or under	Intentional homicide, rates per 100,000 population	Assault at the national level, number of police-recorded offences	Total Sexual Offences against Children at the national level, police-recorded offences, rate per 100,000 children aged 17 or under	Birth registration rate	Percent-age of women aged 20 to 24 years who were first married or in union before ages 18	Percent-age of children aged 5-14 engaged in child labor	Sex ratio at birth	Access to electricity (% of population)	Unemployment, total (% of total labor force) (modeled ILO estimate)	Youth unemployment rate (% of total labor force ages 15-24)	Income Gini coefficient	Public debt as percentage of GDP	GNI per capita, PPP (current international \$)	Social Capital Ranking	Proportion of households with internet at home (%)	Proportion of households with computer (%)	Water depletion index	Renewable energy consumption (% of total final energy consumption)
	tailed)																						
	N	137.00	150.00	105.00	105.00	191.00	125.00	100.00	163.00	122.00	111.00	190.00	188.00	168.00	168.00	155.00	179.00	183.00	147.00	136.00	125.00	188.00	185.00
Gross enrolment ratio, secondary, both sexes (%)	Correlation Coefficient	0.560**	0.297**	0.06	0.547**	-0.403**	0.278**	0.419**	0.849**	-0.628**	-0.660**	0.412**	0.816**	0.14	0.306**	-0.389**	0.14	0.804**	-0.453**	0.774**	0.777**	0.07	-0.513**
	Sig. (2-tailed)	0.00	0.00	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.36	0.00
	N	136.00	148.00	105.00	105.00	189.00	125.00	100.00	161.00	120.00	109.00	188.00	186.00	166.00	166.00	153.00	177.00	181.00	145.00	134.00	123.00	186.00	183.00
Gross enrolment ratio, tertiary, both sexes (%)	Correlation Coefficient	0.496**	0.196*	0.13	0.672**	-0.385**	0.196*	0.311**	0.826**	-0.480**	-0.630**	0.455**	0.780**	0.15	0.295**	-0.420**	0.171*	0.757**	-0.340**	0.712**	0.729**	0.10	-0.458**
	Sig. (2-tailed)	0.00	0.02	0.18	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.20	0.00
	N	137.00	148.00	104.00	104.00	181.00	122.00	98.00	158.00	116.00	110.00	181.00	179.00	165.00	165.00	151.00	171.00	175.00	147.00	136.00	125.00	179.00	177.00
Government expenditure on education as % of GDP (%)	Correlation Coefficient	0.16	0.255**	0.04	0.330**	-0.02	0.243**	0.385**	0.228**	-0.205*	-0.15	0.06	0.11	0.08	0.08	0.02	0.09	0.153*	-0.286**	0.13	0.08	0.01	-0.04
	Sig. (2-tailed)	0.07	0.00	0.71	0.00	0.77	0.01	0.00	0.00	0.03	0.14	0.42	0.13	0.33	0.30	0.81	0.24	0.05	0.00	0.14	0.39	0.87	0.59
	N	131.00	140.00	104.00	104.00	179.00	123.00	98.00	152.00	111.00	104.00	179.00	177.00	157.00	157.00	147.00	168.00	172.00	143.00	134.00	120.00	176.00	174.00
Gross enrolment ratio, pre-primary, gender parity index (GPI)	Correlation Coefficient	-0.03	0.08	-0.197*	-0.16	0.147*	-0.02	0.05	-0.257**	0.181*	0.15	-0.281**	-0.240**	-0.13	-0.175*	0.278**	-0.05	-0.183*	-0.02	-0.296**	-0.363**	-0.182*	0.147*
	Sig. (2-tailed)	0.72	0.32	0.04	0.11	0.04	0.86	0.61	0.00	0.05	0.11	0.00	0.00	0.08	0.02	0.00	0.54	0.01	0.85	0.00	0.00	0.01	0.05
	N	136.00	148.00	104.00	104.00	187.00	124.00	100.00	159.00	118.00	108.00	186.00	184.00	165.00	165.00	152.00	176.00	180.00	145.00	134.00	123.00	184.00	181.00
Gross enrolment ratio, primary, gender parity index (GPI)	Correlation Coefficient	0.16	0.169*	-0.11	0.10	-0.312**	-0.07	0.213*	0.346**	-0.242**	-0.203*	0.196**	0.339**	-0.07	0.03	-0.240**	0.03	0.319**	-0.242**	0.393**	0.325**	-0.01	-0.228**
	Sig. (2-	0.06	0.04	0.28	0.29	0.00	0.46	0.03	0.00	0.01	0.03	0.01	0.00	0.34	0.67	0.00	0.72	0.00	0.00	0.00	0.89	0.00	

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		Gross graduation ratio from first degree programmes (ISCED 6 and 7) in tertiary education, gender parity index (GPI)	Youth literacy rate, population 15-24 years, gender parity index (GPI)	Juveniles Held in Prisons, Penal Institutions or Correctional Institutions, rate per 100,000 juveniles aged 17 or under	Juveniles Brought into Formal Contact with the police and/or criminal justice system, All Crimes, rate per 100,000 juveniles aged 17 or under	Intentional homicide, rates per 100,000 population	Assault at the national level, number of police-recorded offences	Total Sexual Offences against Children at the national level, police-recorded offences, rate per 100,000 children aged 17 or under	Birth registration rate	Percentage of women aged 20 to 24 years who were first married or in union before ages 18	Percentage of children aged 5-14 engaged in child labor	Sex ratio at birth	Access to electricity (% of population)	Unemployment, total (% of total labor force) (modeled ILO estimate)	Youth unemployment rate (% of total labor force ages 15-24)	Income Gini coefficient	Public debt as percentage of GDP	GNI per capita, PPP (current international \$)	Social Capital Ranking	Proportion of households with internet at home (%)	Proportion of households with computer (%)	Water depletion index	Renewable energy consumption (% of total final energy consumption)
		tailed)																					
	N	137.00	150.00	105.00	105.00	191.00	125.00	100.00	163.00	122.00	111.00	190.00	188.00	168.00	168.00	155.00	179.00	183.00	147.00	136.00	125.00	188.00	185.00
Gross enrolment ratio, secondary, gender parity index (GPI)	Correlation Coefficient	0.493**	0.557**	0.14	0.01	-0.04	0.188*	0.295**	0.302**	-0.415**	-0.504**	0.144*	0.343**	0.05	0.212**	0.11	0.01	0.335**	-0.407**	0.15	0.12	-0.11	-0.368**
	Sig. (2-tailed)	0.00	0.00	0.14	0.92	0.58	0.04	0.00	0.00	0.00	0.00	0.05	0.00	0.51	0.01	0.19	0.86	0.00	0.00	0.09	0.18	0.13	0.00
	N	136.00	148.00	105.00	105.00	189.00	125.00	100.00	161.00	120.00	109.00	188.00	186.00	166.00	166.00	153.00	177.00	181.00	145.00	134.00	123.00	186.00	183.00
Gross enrolment ratio, tertiary, gender parity index (GPI)	Correlation Coefficient	0.883**	0.417**	0.271**	0.211*	-0.14	0.235**	0.334**	0.566**	-0.548**	-0.595**	0.197**	0.596**	0.12	0.295**	-0.04	0.10	0.621**	-0.435**	0.376**	0.414**	-0.08	-0.452**
	Sig. (2-tailed)	0.00	0.00	0.01	0.03	0.06	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.13	0.00	0.65	0.19	0.00	0.00	0.00	0.00	0.27	0.00
	N	137.00	147.00	104.00	104.00	179.00	122.00	98.00	157.00	115.00	109.00	179.00	177.00	164.00	164.00	149.00	169.00	173.00	147.00	136.00	125.00	177.00	175.00
Gross graduation ratio from primary education, gender parity index (GPI)	Correlation Coefficient	0.212*	0.531**	0.01	0.12	-0.07	0.00	0.281*	0.210*	-0.225*	-0.336**	0.09	0.248**	0.01	0.11	0.03	-0.12	0.213*	-0.248*	0.13	0.06	-0.17	-0.11
	Sig. (2-tailed)	0.04	0.00	0.92	0.31	0.46	0.97	0.02	0.02	0.02	0.00	0.31	0.00	0.88	0.25	0.74	0.19	0.01	0.01	0.20	0.55	0.05	0.19
	N	96.00	115.00	75.00	73.00	134.00	88.00	70.00	115.00	100.00	94.00	134.00	133.00	120.00	120.00	111.00	129.00	131.00	105.00	98.00	90.00	132.00	132.00
Gross graduation ratio from lower secondary education, gender parity index (GPI)	Correlation Coefficient	0.239*	0.435**	0.13	0.04	0.04	0.20	0.21	0.223*	-0.272**	-0.471**	0.14	0.277**	0.03	0.194*	0.07	0.08	0.322**	-0.403**	0.314**	0.226*	-0.191*	-0.328**
	Sig. (2-tailed)	0.02	0.00	0.27	0.73	0.63	0.06	0.07	0.02	0.01	0.00	0.11	0.00	0.78	0.03	0.43	0.35	0.00	0.00	0.00	0.03	0.03	0.00
	N	101.00	111.00	78.00	77.00	134.00	92.00	76.00	116.00	94.00	91.00	134.00	133.00	119.00	119.00	115.00	128.00	131.00	107.00	103.00	96.00	132.00	131.00
Gross graduation ratio from first degree programmes (ISCED 6 and 7) in tertiary education,	Correlation Coefficient	1.00	0.246**	0.219*	0.02	-0.10	0.12	0.17	0.572**	-0.446**	-0.562**	0.16	0.552**	0.14	0.265**	-0.12	0.01	0.595**	-0.296**	0.301**	0.375**	-0.12	-0.464**
	Sig. (2-		0.01	0.04	0.86	0.26	0.24	0.13	0.00	0.00	0.00	0.06	0.00	0.13	0.00	0.21	0.88	0.00	0.00	0.00	0.00	0.17	0.00

Appendix

		Gross graduation ratio from first degree programmes (ISCED 6 and 7) in tertiary education, gender parity index (GPI)	Youth literacy rate, population 15-24 years, gender parity index (GPI)	Juveniles Held in Prisons, Penal Institutions or Correctional Institutions, rate per 100,000 juveniles aged 17 or under	Juveniles Brought into Formal Contact with the police and/or criminal justice system, All Crimes, rate per 100,000 juveniles aged 17 or under	Intentional homicide, rates per 100,000 population	Assault at the national level, number of police-recorded offences	Total Sexual Offences against Children at the national level, police-recorded offences, rate per 100,000 children aged 17 or under	Birth registration rate	Percentage of women aged 20 to 24 years who were first married or in union before ages 18	Percentage of children aged 5-14 engaged in child labor	Sex ratio at birth	Access to electricity (% of population)	Unemployment, total (% of total labor force) (modeled ILO estimate)	Youth unemployment rate (% of total labor force ages 15-24)	Income Gini coefficient	Public debt as percentage of GDP	GNI per capita, PPP (current international \$)	Social Capital Ranking	Proportion of households with internet at home (%)	Proportion of households with computer (%)	Water depletion index	Renewable energy consumption (% of total final energy consumption)
gender parity index (GPI)	tailed)																						
	N	137.00	110.00	87.00	89.00	137.00	100.00	80.00	122.00	82.00	81.00	137.00	135.00	129.00	129.00	117.00	130.00	133.00	119.00	111.00	104.00	136.00	134.00
Youth literacy rate, population 15-24 years, gender parity index (GPI)	Correlation Coefficient	0.246**	1.00	-0.02	0.12	0.11	0.311**	0.415**	0.212*	-0.393**	-0.360**	-0.01	0.216**	0.08	0.15	0.198*	-0.06	0.308**	-0.330**	0.11	0.14	-0.15	-0.210*
	Sig. (2-tailed)	0.01		0.84	0.28	0.16	0.00	0.00	0.01	0.00	0.00	0.92	0.01	0.34	0.08	0.02	0.48	0.00	0.00	0.25	0.17	0.07	0.01
	N	110.00	152.00	82.00	80.00	152.00	99.00	78.00	134.00	115.00	108.00	152.00	151.00	144.00	144.00	131.00	143.00	149.00	125.00	109.00	102.00	149.00	150.00
Juveniles Held in Prisons, Penal Institutions or Correctional Institutions, rate per 100,000 juveniles aged 17 or under	Correlation Coefficient	0.219*	-0.02	1.00	-0.02	0.241*	0.19	0.14	0.05	-0.05	-0.23	-0.10	0.09	0.15	0.220*	0.332**	0.199*	0.03	-0.07	-0.04	-0.09	-0.17	-0.16
	Sig. (2-tailed)	0.04	0.84		0.82	0.01	0.05	0.21	0.66	0.69	0.08	0.28	0.38	0.13	0.03	0.00	0.04	0.76	0.53	0.69	0.39	0.09	0.11
	N	87.00	82.00	108.00	92.00	108.00	103.00	85.00	96.00	57.00	59.00	108.00	107.00	102.00	102.00	89.00	104.00	105.00	95.00	95.00	87.00	106.00	106.00
Juveniles Brought into Formal Contact with the police and/or criminal justice system, All Crimes, rate per 100,000 juveniles aged 17 or under	Correlation Coefficient	0.02	0.12	-0.02	1.00	-0.368**	0.450**	0.600**	0.727**	-0.381**	-0.297*	0.15	0.588**	0.12	0.13	-0.255*	0.201*	0.626**	-0.392**	0.653**	0.673**	-0.14	-0.10
	Sig. (2-tailed)	0.86	0.28	0.82		0.00	0.00	0.00	0.00	0.00	0.02	0.11	0.00	0.24	0.18	0.02	0.04	0.00	0.00	0.00	0.00	0.14	0.33
	N	89.00	80.00	92.00	108.00	108.00	106.00	91.00	97.00	56.00	58.00	108.00	107.00	103.00	103.00	88.00	103.00	104.00	94.00	93.00	87.00	106.00	106.00
Intentional homicide, rates per 100,000 population	Correlation Coefficient	-0.10	0.11	0.241*	-0.368**	1.00	0.08	-0.01	-0.524**	0.222*	0.08	-0.411**	-0.502**	0.07	-0.07	0.613**	-0.07	-0.438**	0.223**	-0.586**	-0.587**	-0.149*	0.226**
	Sig. (2-tailed)	0.26	0.16	0.01	0.00		0.37	0.95	0.00	0.01	0.39	0.00	0.00	0.38	0.38	0.00	0.33	0.00	0.01	0.00	0.00	0.04	0.00
	N	137.00	152.00	108.00	108.00	195.00	128.00	102.00	166.00	123.00	112.00	194.00	192.00	170.00	170.00	156.00	181.00	185.00	148.00	138.00	126.00	192.00	188.00
Assault at the national level, number of police-	Correlation Coefficient	0.12	0.311**	0.19	0.450**	0.08	1.00	0.515**	0.16	-0.09	-0.13	-0.192*	0.04	0.12	0.11	0.265**	0.15	0.226*	0-386**	0.261**	0.271**	-0.06	-0.12

Appendix

		Gross graduation ratio from first degree programmes (ISCED 6 and 7) in tertiary education, gender parity index (GPI)	Youth literacy rate, population 15-24 years, gender parity index (GPI)	Juveniles Held in Prisons, Penal Institutions or Correctional Institutions, rate per 100,000 juveniles aged 17 or under	Juveniles Brought into Formal Contact with the police and/or criminal justice system, All Crimes, rate per 100,000 juveniles aged 17 or under	Intentional homicide, rates per 100,000 population	Assault at the national level, number of police-recorded offences	Total Sexual Offences against Children at the national level, police-recorded offences, rate per 100,000 children aged 17 or under	Birth registration rate	Percentage of women aged 20 to 24 years who were first married or in union before ages 18	Percentage of children aged 5-14 engaged in child labor	Sex ratio at birth	Access to electricity (% of population)	Unemployment, total (% of total labor force) (modeled ILO estimate)	Youth unemployment rate (% of total labor force ages 15-24)	Income Gini coefficient	Public debt as percentage of GDP	GNI per capita, PPP (current international \$)	Social Capital Ranking	Proportion of households with internet at home (%)	Proportion of households with computer (%)	Water depletion index	Renewable energy consumption (% of total final energy consumption)
recorded offences	Sig. (2-tailed)	0.24	0.00	0.05	0.00	0.37		0.00	0.09	0.44	0.28	0.03	0.64	0.20	0.22	0.01	0.10	0.01	0.00	0.01	0.01	0.50	0.17
	N	100.00	99.00	103.00	106.00	128.00	128.00	100.00	112.00	71.00	72.00	128.00	127.00	121.00	121.00	105.00	123.00	124.00	110.00	107.00	101.00	126.00	126.00
Total Sexual Offences against Children at the national level, police-recorded offences, rate per 100,000 children aged 17 or under	Correlation Coefficient	0.17	0.415**	0.14	0.600**	-0.01	0.515**	1.00	0.402**	-0.02	-0.13	-0.12	0.266**	-0.06	-0.04	0.06	0.06	0.454**	-0.543**	0.409**	0.467**	-0.358**	-0.03
	Sig. (2-tailed)	0.13	0.00	0.21	0.00	0.95	0.00		0.00	0.87	0.31	0.22	0.01	0.57	0.73	0.58	0.57	0.00	0.00	0.00	0.00	0.00	0.75
	N	80.00	78.00	85.00	91.00	102.00	100.00	102.00	92.00	56.00	60.00	102.00	101.00	96.00	96.00	85.00	98.00	99.00	88.00	84.00	81.00	100.00	101.00
Birth registration rate	Correlation Coefficient	0.572**	0.212*	0.05	0.727**	-0.524**	0.16	0.402**	1.00	-0.592**	-0.677**	0.510**	0.864**	0.11	0.268**	-0.447**	0.200*	0.844**	-0.412**	0.853**	0.882**	0.10	-0.549**
	Sig. (2-tailed)	0.00	0.01	0.66	0.00	0.00	0.09	0.00		0.00	0.00	0.00	0.00	0.17	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.21	0.00
	N	122.00	134.00	96.00	97.00	166.00	112.00	92.00	166.00	119.00	110.00	166.00	165.00	151.00	151.00	145.00	156.00	158.00	135.00	119.00	113.00	163.00	162.00
Percentage of women aged 20 to 24 years who were first married or in union before ages 18	Correlation Coefficient	-0.446**	-0.393**	-0.05	-0.381**	0.222*	-0.09	-0.02	-0.592**	1.00	0.592**	-0.300**	-0.668**	-0.291**	-0.417**	0.18	-0.02	-0.587**	0.01	-0.622**	-0.621**	-0.14	0.599**
	Sig. (2-tailed)	0.00	0.00	0.69	0.00	0.01	0.44	0.87	0.00		0.00	0.00	0.00	0.00	0.00	0.07	0.81	0.00	0.92	0.00	0.00	0.12	0.00
	N	82.00	115.00	57.00	56.00	123.00	71.00	56.00	119.00	123.00	104.00	123.00	122.00	111.00	111.00	109.00	116.00	119.00	94.00	79.00	72.00	120.00	121.00
Percentage of children aged 5-14 engaged in child labor	Correlation Coefficient	-0.562**	-0.360**	-0.23	-0.297*	0.08	-0.13	-0.13	-0.677**	0.592**	1.00	-0.394**	-0.733**	-0.218*	-0.420**	0.19	-0.255**	-0.719**	0.14	-0.645**	-0.660**	-0.15	0.657**
	Sig. (2-tailed)	0.00	0.00	0.08	0.02	0.39	0.28	0.31	0.00	0.00		0.00	0.00	0.02	0.00	0.05	0.01	0.00	0.16	0.00	0.00	0.10	0.00
	N	81.00	108.00	59.00	58.00	112.00	72.00	60.00	110.00	104.00	112.00	112.00	111.00	107.00	107.00	102.00	107.00	108.00	97.00	79.00	72.00	111.00	111.00
Sex ratio at birth	Correlation Coeffi-	0.16	-0.01	-0.10	0.15	-0.411**	-0.192*	-0.12	0.510**	-0.300**	-0.394**	1.00	0.512**	0.05	0.14	-0.422**	0.00	0.326**	-0.06	0.400**	0.423**	0.08	-0.271**

Appendix

		Gross graduation ratio from first degree programmes (ISCED 6 and 7) in tertiary education, gender parity index (GPI)	Youth literacy rate, population 15-24 years, gender parity index (GPI)	Juveniles Held in Prisons, Penal Institutions or Correctional Institutions, rate per 100,000 juveniles aged 17 or under	Juveniles Brought into Formal Contact with the police and/or criminal justice system, All Crimes, rate per 100,000 juveniles aged 17 or under	Intentional homicide, rates per 100,000 population	Assault at the national level, number of police-recorded offences	Total Sexual Offences against Children at the national level, police-recorded offences, rate per 100,000 children aged 17 or under	Birth registration rate	Percent-age of women aged 20 to 24 years who were first married or in union before ages 18	Percent-age of children aged 5-14 engaged in child labor	Sex ratio at birth	Access to electricity (% of population)	Unemployment, total (% of total labor force) (modeled ILO estimate)	Youth unemployment rate (% of total labor force ages 15-24)	Income Gini coefficient	Public debt as percentage of GDP	GNI per capita, PPP (current international \$)	Social Capital Ranking	Proportion of households with internet at home (%)	Proportion of households with computer (%)	Water depletion index	Renewable energy consumption (% of total final energy consumption)
	cient																						
	Sig. (2-tailed)	0.06	0.92	0.28	0.11	0.00	0.03	0.22	0.00	0.00	0.00		0.00	0.52	0.07	0.00	1.00	0.00	0.45	0.00	0.00	0.29	0.00
	N	137.00	152.00	108.00	108.00	194.00	128.00	102.00	166.00	123.00	112.00	194.00	192.00	170.00	170.00	156.00	181.00	185.00	148.00	138.00	126.00	191.00	188.00
Access to electricity (% of population)	Correlation Coefficient	0.552**	0.216**	0.09	0.588**	-0.502**	0.04	0.266**	0.864**	0-.668**	0-.733**	0.512**	1.00	0.14	0.327**	-0.457**	0.14	0.846**	-0.306**	0.817**	0.841**	0.162*	-0.620**
	Sig. (2-tailed)	0.00	0.01	0.38	0.00	0.00	0.64	0.01	0.00	0.00	0.00	0.00		0.07	0.00	0.00	0.06	0.00	0.00	0.00	0.03	0.00	
	N	135.00	151.00	107.00	107.00	192.00	127.00	101.00	165.00	122.00	111.00	192.00	192.00	170.00	170.00	155.00	181.00	185.00	148.00	137.00	126.00	190.00	188.00
Unemployment, total (% of total labor force) (modeled ILO estimate)	Correlation Coefficient	0.14	0.08	0.15	0.12	0.07	0.12	-0.06	0.11	-0.291**	-0.218*	0.05	0.14	1.00	0.911**	-0.02	0.264**	0.07	0.13	0.02	0.06	0.221**	-0.14
	Sig. (2-tailed)	0.13	0.34	0.13	0.24	0.38	0.20	0.57	0.17	0.00	0.02	0.52	0.07		0.00	0.81	0.00	0.38	0.11	0.78	0.53	0.00	0.06
	N	129.00	144.00	102.00	103.00	170.00	121.00	96.00	151.00	111.00	107.00	170.00	170.00	170.00	170.00	145.00	163.00	167.00	147.00	132.00	123.00	169.00	170.00
Youth unemployment rate (% of total labor force ages 15-24)	Correlation Coefficient	0.265**	0.15	0.220*	0.13	-0.07	0.11	-0.04	0.268**	-0.417**	-0.420**	0.14	0.327**	0.911**	1.00	-0.06	0.249**	0.270**	-0.01	0.172*	0.179*	0.213**	-0.320**
	Sig. (2-tailed)	0.00	0.08	0.03	0.18	0.38	0.22	0.73	0.00	0.00	0.00	0.07	0.00	0.00		0.48	0.00	0.00	0.94	0.05	0.05	0.01	0.00
	N	129.00	144.00	102.00	103.00	170.00	121.00	96.00	151.00	111.00	107.00	170.00	170.00	170.00	170.00	145.00	163.00	167.00	147.00	132.00	123.00	169.00	170.00
Income Gini coefficient	Correlation Coefficient	-0.12	0.198*	0.332**	-0.255*	0.613**	0.265**	0.06	-0.447**	0.18	0.19	-0.422**	-0.457**	-0.02	-0.06	1.00	-0.197*	-0.334**	0.04	-0.505**	-0.536**	-0.262**	0.273**
	Sig. (2-tailed)	0.21	0.02	0.00	0.02	0.00	0.01	0.58	0.00	0.07	0.05	0.00	0.00	0.81	0.48		0.02	0.00	0.64	0.00	0.00	0.00	0.00
	N	117.00	131.00	89.00	88.00	156.00	105.00	85.00	145.00	109.00	102.00	156.00	155.00	145.00	145.00	156.00	151.00	153.00	133.00	117.00	111.00	153.00	154.00
Public debt as percentage of	Correlation Coeffi-	0.01	-0.06	0.199*	0.201*	-0.07	0.15	0.06	0.200*	-0.02	-0.255**	0.00	0.14	0.264**	0.249**	-0.197*	1.00	0.11	-0.07	0.04	0.15	0.02	-0.07

Appendix

		Gross graduation ratio from first degree programmes (ISCED 6 and 7) in tertiary education, gender parity index (GPI)	Youth literacy rate, population 15-24 years, gender parity index (GPI)	Juveniles Held in Prisons, Penal Institutions or Correctional Institutions, rate per 100,000 juveniles aged 17 or under	Juveniles Brought into Formal Contact with the police and/or criminal justice system, All Crimes, rate per 100,000 juveniles aged 17 or under	Intentional homicide, rates per 100,000 population	Assault at the national level, number of police-recorded offences	Total Sexual Offences against Children at the national level, police-recorded offences, rate per 100,000 children aged 17 or under	Birth registration rate	Percent-age of women aged 20 to 24 years who were first married or in union before ages 18	Percent-age of children aged 5-14 engaged in child labor	Sex ratio at birth	Access to electricity (% of population)	Unemployment, total (% of total labor force) (modeled ILO estimate)	Youth unemployment rate (% of total labor force ages 15-24)	Income Gini coefficient	Public debt as percentage of GDP	GNI per capita, PPP (current international \$)	Social Capital Ranking	Proportion of households with internet at home (%)	Proportion of households with computer (%)	Water depletion index	Renewable energy consumption (% of total final energy consumption)
GDP	cient																						
	Sig. (2-tailed)	0.88	0.48	0.04	0.04	0.33	0.10	0.57	0.01	0.81	0.01	1.00	0.06	0.00	0.00	0.02		0.15	0.37	0.62	0.10	0.75	0.36
	N	130.00	143.00	104.00	103.00	181.00	123.00	98.00	156.00	116.00	107.00	181.00	181.00	163.00	163.00	151.00	181.00	179.00	146.00	133.00	124.00	179.00	179.00
GNI per capita, PPP (current international \$)	Correlation Coefficient	0.595**	0.308**	0.03	0.626**	-0.438**	0.226*	0.454**	0.844**	-0.587**	-0.719**	0.326**	0.846**	0.07	0.270**	-0.334**	0.11	1.00	-0.549**	0.910**	0.921**	0.14	-0.622**
	Sig. (2-tailed)	0.00	0.00	0.76	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.38	0.00	0.00	0.15		0.00	0.00	0.00	0.06	0.00
	N	133.00	149.00	105.00	104.00	185.00	124.00	99.00	158.00	119.00	108.00	185.00	185.00	167.00	167.00	153.00	179.00	185.00	147.00	135.00	126.00	183.00	183.00
Social Capital Ranking	Correlation Coefficient	-0.296**	-0.330**	-0.07	-0.392**	0.223**	-0.386**	-0.543**	-0.412**	0.01	0.14	-0.06	-0.306**	0.13	-0.01	0.04	-0.07	-0.549**	1.00	-0.481**	-0.486**	0.04	0.16
	Sig. (2-tailed)	0.00	0.00	0.53	0.00	0.01	0.00	0.00	0.00	0.92	0.16	0.45	0.00	0.11	0.94	0.64	0.37	0.00		0.00	0.00	0.60	0.05
	N	119.00	125.00	95.00	94.00	148.00	110.00	88.00	135.00	94.00	97.00	148.00	148.00	147.00	147.00	133.00	146.00	147.00	148.00	123.00	117.00	148.00	148.00
Proportion of households with internet at home (%)	Correlation Coefficient	0.301**	0.11	-0.04	0.653**	-0.586**	0.261**	0.409**	0.853**	-0.622**	-0.645**	0.400**	0.817**	0.02	0.172*	-0.505**	0.04	0.910**	-0.481**	1.00	0.963**	0.13	-0.555**
	Sig. (2-tailed)	0.00	0.25	0.69	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.78	0.05	0.00	0.62	0.00	0.00		0.00	0.13	0.00
	N	111.00	109.00	95.00	93.00	138.00	107.00	84.00	119.00	79.00	79.00	138.00	137.00	132.00	132.00	117.00	133.00	135.00	123.00	138.00	120.00	137.00	137.00
Proportion of households with computer (%)	Correlation Coefficient	0.375**	0.14	-0.09	0.673**	-0.587**	0.271**	0.467**	0.882**	-0.621**	-0.660**	0.423**	0.841**	0.06	0.179*	-0.536**	0.15	0.921**	-0.486**	0.963**	1.00	0.10	-0.560**
	Sig. (2-tailed)	0.00	0.17	0.39	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.05	0.00	0.10	0.00	0.00	0.00		0.24	0.00
	N	104.00	102.00	87.00	87.00	126.00	101.00	81.00	113.00	72.00	72.00	126.00	126.00	123.00	123.00	111.00	124.00	126.00	117.00	120.00	126.00	125.00	126.00
Water depletion index	Correlation Coeffi-	-0.12	-0.15	-0.17	-0.14	-0.149*	-0.06	-0.358**	0.10	-0.14	-0.15	0.08	0.162*	0.221**	0.213**	-0.262**	0.02	0.14	0.04	0.13	0.10	1.00	-0.228**

		Gross graduation ratio from first degree programmes (ISCED 6 and 7) in tertiary education, gender parity index (GPI)	Youth literacy rate, population 15-24 years, gender parity index (GPI)	Juveniles Held in Prisons, Penal Institutions or Correctional Institutions, rate per 100,000 juveniles aged 17 or under	Juveniles Brought into Formal Contact with the police and/or criminal justice system, All Crimes, rate per 100,000 juveniles aged 17 or under	Intentional homicide, rates per 100,000 population	Assault at the national level, number of police-recorded offences	Total Sexual Offences against Children at the national level, police-recorded offences, rate per 100,000 children aged 17 or under	Birth registration rate	Percent-age of women aged 20 to 24 years who were first married or in union before ages 18	Percent-age of children aged 5-14 engaged in child labor	Sex ratio at birth	Access to electricity (% of population)	Unemploy-ment, total (% of total labor force) (mod-eled ILO estimate)	Youth unem-employment rate (% of total labor force ages 15-24)	Income Gini coeffi-cient	Public debt as percent-age of GDP	GNI per capita, PPP (current interna-tional \$)	Social Capital Rank-ing	Propor-tion of house-holds with internet at home (%)	Propor-tion of house-holds with computer (%)	Water deple-tion index	Renewable energy consumption (% of total final energy consump-tion)
	cient																						
	Sig. (2-tailed)	0.17	0.07	0.09	0.14	0.04	0.50	0.00	0.21	0.12	0.10	0.29	0.03	0.00	0.01	0.00	0.75	0.06	0.60	0.13	0.24		0.00
	N	136.00	149.00	106.00	106.00	192.00	126.00	100.00	163.00	120.00	111.00	191.00	190.00	169.00	169.00	153.00	179.00	183.00	148.00	137.00	125.00	192.00	186.00
Renewable energy consumption (% of total final energy consumption)	Correlation Coefficient	-0.464**	-0.210*	-0.16	-0.10	0.226**	-0.12	-0.03	-0.549**	0.599**	0.657**	-0.271**	-0.620**	-0.14	-0.320**	0.273**	-0.07	-0.622**	0.16	-0.555**	-0.560**	-0.228**	1.00
	Sig. (2-tailed)	0.00	0.01	0.11	0.33	0.00	0.17	0.75	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.36	0.00	0.05	0.00	0.00	0.00	
	N	134.00	150.00	106.00	106.00	188.00	126.00	101.00	162.00	121.00	111.00	188.00	188.00	170.00	170.00	154.00	179.00	183.00	148.00	137.00	126.00	186.00	188.00

** . Correlation is significant at the 0.01 level (2-tailed); * . Correlation is significant at the 0.05 level (2-tailed).

Appendix 8. 50 indicators selected in line with the correlation analysis

Theme	Subtheme	Criterion	Indicator	Covered countries	Reference
Health	Nutrition	Low birth weight	Percentage of infants born with low birth weight (< 2500 g)	187	UNICEF [49]
		Overweight and obesity	Overweight (including obesity, %)	146	
		Underweight	Underweight (moderate and severe, %)	148	
		Breast feeding	Exclusive breastfeeding < six months (%)	167	
	Child mortality	Under-five mortality	Under-five mortality rate (probability of dying by age five per 1000 live births)	195	
	Oral health	Dental treatments	DMFT (decayed, missing or filled teeth) among 12-year-olds	180	Malmö University [61]
	Hazardous pollutant	Household and ambient air pollution	Mortality rate attributed to household and ambient air pollution (per 100,000 population)	172	WHO [31]
		PM2.5 air pollution	PM2.5 air pollution, population exposed to levels exceeding WHO guideline value (% of total)	187	
	Immunization coverage	Diphtheria tetanus toxoid and pertussis (DTP3) immunization	Diphtheria tetanus toxoid and pertussis (DTP3) immunization coverage among one-year-olds (%)	195	UNICEF [49]
		Bacillus Calmette-Guérin (BCG) immunization	Bacille Calmette-Guérin (vaccine against tuberculosis) immunization coverage among one-year-olds (%)	164	
	Risk behavior	Alcohol use	15-19 years old heavy episodic drinkers (population), % by country	189	WHO [31]
	Eating and physical behavior	Adolescent fertility	Adolescent fertility rate (per 1,000 girls aged 15-19 years)	184	
	Eating and physical behavior	Physical activity	Comparable estimates of prevalence of insufficient physical activity (adolescents 11-17 years)	120	WHO [63]
	Maternal health	Antenatal care	Percentage of women aged 15-49 years attended at least once during pregnancy by skilled health personnel (doctor, nurse or midwife)	149	UNICEF [49]
	Mental health	Suicide	Suicide rate, 15-29 year olds, per 100000	171	WHO [37]
	Health expenditure	Public health expenditure	Health expenditure, public (% of total health expenditure)	190	WHO [31], WB [44]
	HIV	HIV prevalence among youth	Estimated percentage of young men and women (aged 15-24) living with HIV	128	UNICEF [43,62]

Appendix

Theme	Subtheme	Criterion	Indicator	Covered countries	Reference
Education	School attainment	Repetition	Repetition rate in primary education (all grades), both sexes (%)	152	UNESCO [32]
	Completion of education	Primary school completion	Gross graduation ratio from primary education, both sexes	107	
		Secondary school completion	Gross graduation ratio from lower secondary education, both sexes (%)	114	
		Tertiary school completion	Gross graduation ratio from first degree programmes (ISCED 6 and 7) in tertiary education, both sexes (%)	120	
	Attendance of education	Enrolment in primary school	Gross enrolment ratio, primary, both sexes (%)	191	
		Enrolment in secondary school	Gross enrolment ratio, secondary, both sexes (%)	188	
	Early childhood education	Enrolment of kindergarten	Gross enrolment ratio, pre-primary, both sexes (%)	187	
	Government support on education	Public expenditure on education	Government expenditure on education as % of GDP	179	
	Gender equality	Gender equality in enrolment	Gross enrolment ratio, pre-primary, gender parity index (GPI)	176	
			Gross enrolment ratio, primary, gender parity index (GPI)	190	
			Gross enrolment ratio, secondary, gender parity index (GPI)	187	
			Gross enrolment ratio, tertiary, gender parity index (GPI)	177	
		Gender equality in graduation	Gross graduation ratio from primary education, gender parity index (GPI)	134	
			Gross graduation ratio from lower secondary education, gender parity index (GPI)	134	
			Gross graduation ratio from first degree programmes (ISCED 6 and 7) in tertiary education, gender parity index (GPI)	137	
		Gender equality in youth literacy	Youth literacy rate, population 15-24 years, gender parity index (GPI)	152	
Safety	Violence and crime	Juvenile delinquency	Juveniles held in prisons, penal institutions or correctional institutions	108	UNODC [68]
			Juveniles brought into formal contact with the police and/or criminal justice system, all crimes	108	
		Criminal victimization	Intentional homicide count and rate per 100,000 population	195	
			Assault and major assault rates in different countries (police recorded assaults/100,000 population)	128	

Appendix

Theme	Subtheme	Criterion	Indicator	Covered countries	Reference
		Sexual violence against children	Total sexual offences against children at the national level, police-recorded offences, rate per 100,000 children aged 17 or under	102	
	Birth registration	Registration of newborns	Birth registration rate	166	UNICEF [49]
	Child labor	Children involved in child labor	Percentage of children five-14 years old involved in child labor	112	
	Child marriage	Children married or in union	Percentage of women aged 20 to 24 years who were first married or in union before ages 18	123	
	Demographic structure	Sex ratio	Sex ratio at birth	191	CIA [70], UN [71]
Economic status	Housing quality	Electricity coverage	Access to electricity (% of population)	191	WB [44]
	Macroeconomic situation	Youth unemployment	Youth unemployment rate (% of total labor force ages 15-24)	170	
		Income equality at societal level	Income Gini coefficient	156	UNDP [73]
		National debts	Public debt as percentage of GDP	179	IMF [74]
	Community relationship	Social capital	Social Capital Ranking	148	Legatum Institute Foundation [75]
	Social media connection	Internet access in home	Proportion of households with internet access at home	138	ITU [76]
Environmental aspects	Freshwater vulnerability	Risk of depleting freshwater resources	Water depletion index (WDI)	192	Berger et al. [59]
	Renewable energy consumption	Consumption of renewable energy	Renewable energy consumption (% of total final energy consumption)	180	WB [44]

Appendix 9. Reference points for indicator normalization

Theme	Subtheme	Criterion	Indicator	Minimum reference point	Maximum reference point	Reference
Health	Child mortality	Under-five mortality	Under-5 mortality rate (per 1,000 live births)	0	210	Minimum reference point: (SDG3.2) UN [77]; Maximum reference point: UNICEF [49]
	Immunization coverage	Diphtheria tetanus toxoid and pertussis (DTP3) immunization	Diphtheria tetanus toxoid and pertussis (DTP3) immunization coverage among 1-year-olds (%)	20	100	Minimum reference point: UNICEF [49]; Maximum reference point: (SDG3.8) UN [77]
	Nutrition	Low birth weight	Percentage of infants born with low birth weight (<2,500g.)	0	40	Minimum reference point: (SDG2.2) UN [77]; Maximum reference point: UNICEF [49]
	Risk behavior	Alcohol use	15-19 years old heavy episodic drinkers (population), % by country	0	55	Minimum reference point: (SDG3.5) UN [77]; Maximum reference point: WHO [31]
		Adolescent fertility	Adolescent fertility rate (per 1,000 girls aged 15-19 years)	0	220	Minimum reference point: (SDG3.7) UN [77]; Maximum reference point: WB [44]
	Mental health	Suicide	Suicide rate, 15-29 year-olds, per 100,000	0	50	Minimum reference point: (SDG3.4) UN [77]; Maximum reference point: WHO [37]
	Hazardous pollutant	Household and ambient air pollution	Mortality rate attributed to household and ambient air pollution (per 100,000 population)	0	300	Minimum reference point: (SDG3.9) UN [77]; Maximum reference point: WHO [31]
		PM2.5 exposure	PM2.5 air pollution, population exposed to levels exceeding WHO guideline value (% of total)	0	100	
	Health expenditure	Public expenditure on health	Health expenditure, public (% of total health expenditure)	5	100	Minimum reference point: WHO [31], WB [44]; Maximum reference point: (SDG6.1) UN[77]
Education	Oral health	Untreated dental carries	DMFT (decayed, missing or filled teeth) among 12-year-olds (number)	0	6	Minimum reference point: (SDG3.4) UN [77]; Maximum reference point: Malmö University [61]
	Early childhood education	Enrollment of kindergarten	Gross enrolment ratio, pre-primary, both sexes (%)	0	160	Minimum reference point: UNESCO [32]; Maximum reference point: (SDG4.2) UN [77]
	Attendance of education	Enrollment in primary school	Gross enrolment ratio, primary, both sexes (%)	25	160	Minimum reference point: UNESCO [32]; Maximum reference point: UNESCO [32]
		Enrollment in secondary school	Gross enrolment ratio, secondary, both sexes (%)	5	170	
	Gender equality	Gender equality in enrolment	Gross enrolment ratio, pre-primary, gender parity index (GPI)	0.5	2	Minimum reference point: (SDG4.5) UN [77]; Maximum reference point: UNESCO [32]
			Gross enrolment ratio, primary, gender parity index (GPI)	0.5	1.20	
			Gross enrolment ratio, secondary, gender parity index (GPI)	0.3	2	

Appendix

Theme	Subtheme	Criterion	Indicator	Minimum reference point	Maximum reference point	Reference
			Gross enrolment ratio, tertiary, gender parity index (GPI)	0.05	6.5	
	Government support on education	Public expenditure on education	Government expenditure on education as % of GDP	0.5	20	Minimum reference point: UNESCO [32]; Maximum reference point: UNESCO [32]
Safety	Violence and crime	Criminal victimization	Intentional homicide, rates per 100,000 population	0	100	Minimum reference point: (SDG16.1) UN [77]; Maximum reference point: UNODC [68]
	Demographic structure	Sex ratio	Sex ratio at birth	0.80	1.20	Minimum reference point: (SDG5.1) UN [77]; Maximum reference point: CIA [70], UN [71]
Economic status	Housing quality	Electricity coverage	Access to electricity (% of population)	0	100	Minimum reference point: WB [44]; Maximum reference point: (SDG7.1) UN [77]
	Macroeconomic situation	Youth unemployment	Youth unemployment rate (% of total labor force ages 15-24)	0	65	Minimum reference point: (SDG8.5) UN [77]; Maximum reference point: WB [44]
		National debts	Public debt as % of GDP	0	600	Minimum reference point: IMF [74]; Maximum reference point: IMF [74]
Environmental aspects	Freshwater vulnerability	Risk of depleting freshwater resources	Water depletion index	0	1	Minimum reference point: (SDG6.4) UN [77]; Maximum reference point: Berger et al. [59]
	Renewable energy consumption	Consumption of renewable energy	Renewable energy consumption (% of total final energy consumption)	0	100	Minimum reference point: WB [44]; Maximum reference point: (SDG7.2) UN [77]

Appendix 10. Indicator values collected for the 25 indicators for the 138 countries

Country	Health										Education								Safety		Economic status			Environmental aspect	
	Child mortality	Immunization coverage	Nutrition	Risk behavior		Hazardous pollutant		Mental health	Oral health	Health expenditure	Early childhood education	Attendance of education		Gender equality				Government support on education	Violence and crime	Demographic structure	Housing quality	Macroeconomic situation		Freshwater vulnerability	Renewable energy consumption
	Under-5 mortality rate (per 1,000 live births)	Diphtheria tetanus toxoid and pertussis (DTP3) immunization coverage among 1-year-olds (%)	Percentage of infants born with low birth weight (<2500g.)	15-19 years old heavy episodic drinkers (population), % by country	Adolescent fertility rate (per 1000 girls aged 15-19 years)	PM2.5 air pollution, population exposed to levels exceeding WHO guideline value (% of total)	Mortality rate attributed to household and ambient air pollution (per 100 000 population)	Suicide rate, 15-29 year-olds, per 100000	DMFT (decayed, missing or filled teeth) among 12-year-olds (number)	Health expenditure, public (% of total health expenditure)	Gross enrolment ratio, pre-primary, both sexes (%)	Gross enrolment ratio, primary, both sexes (%)	Gross enrolment ratio, secondary, both sexes (%)	Gross enrolment ratio, pre-primary, gender parity index (GPI)	Gross enrolment ratio, primary, gender parity index (GPI)	Gross enrolment ratio, secondary, gender parity index (GPI)	Gross enrolment ratio, tertiary, gender parity index (GPI)	Government expenditure on education as % of GDP (%)	Intentional homicide, rates per 100,000 population	Sex ratio at birth	Access to electricity (% of population)	Youth unemployment rate (% of total labor force ages 15-24)	Public debt as percentage of GDP	Water depletion index	Renewable energy consumption (% of total final energy consumption)
	Indicator value																								
Albania	14.000	98.000	3.600	21.500	21.835	100.000	171.000	5.300	3.700	49.912	88.558	113.700	95.765	0.974	0.967	0.936	1.399	3.539	4.000	1.078	100.000	29.200	73.682	0.270	38.689
Algeria	25.500	95.000	6.000	0.100	10.472	100.000	32.000	2.200	2.300	72.763	79.213	116.154	99.860	1.007	0.943	1.037	1.560	4.354	1.500	1.050	100.000	20.000	8.811	0.920	0.069
Angola	156.900	64.000	12.000	4.200	161.932	100.000	104.000	21.400	1.700	64.255	79.248	128.704	28.899	1.470	0.640	0.648	0.793	3.476	9.800	1.030	32.000	10.500	65.438	0.300	50.797
Argentina	12.500	94.000	7.200	15.100	63.789	97.330	26.000	13.800	5.344	55.427	71.662	110.566	106.323	1.014	0.990	1.076	1.609	5.325	7.600	1.040	100.000	21.300	52.034	0.380	10.773
Armenia	14.100	94.000	8.000	20.600	22.461	100.000	125.000	2.800	2.400	42.982	52.395	98.467	88.502	1.029	1.000	1.011	1.129	2.814	2.000	1.138	100.000	35.100	43.030	0.950	7.725
Australia	3.800	93.000	6.200	19.600	13.844	0.140	0.400	12.200	1.050	67.039	124.920	102.208	137.565	0.972	0.998	0.946	1.403	5.225	1.000	1.055	100.000	13.100	37.626	0.910	9.498
Austria	3.500	98.000	6.900	34.600	6.786	100.000	34.000	9.500	1.400	77.864	103.365	102.970	100.022	1.016	0.986	0.954	1.203	5.500	0.500	1.055	100.000	9.200	85.544	0.180	35.784
Bahrain	6.200	98.000	9.900	0.000	13.421	100.000	11.000	8.700	1.400	63.253	55.858	101.171	102.131	0.983	1.012	0.995	1.921	2.668	0.500	1.039	100.000	10.900	66.014	1.000	0.000
Barbados	13.000	97.000	11.500	19.200	39.440	100.000	18.000	2.200	0.860	63.522	84.206	93.627	109.248	1.035	1.011	1.026	2.246	6.573	8.800	1.036	100.000	26.800	106.668	0.460	3.168
Belarus	4.600	99.000	5.100	33.500	17.551	100.000	104.000	20.100	2.100	65.787	103.229	101.342	107.119	0.954	1.000	0.987	1.327	4.948	3.600	1.060	100.000	12.000	53.039	0.110	6.634
Belgium	4.100	99.000	7.000	45.400	8.057	100.000	30.000	9.500	0.900	77.869	116.403	104.193	166.808	0.995	1.000	1.136	1.314	6.585	1.800	1.050	100.000	23.600	105.761	0.860	9.038
Belize	16.500	94.000	11.100	7.000	65.135	100.000	19.000	1.600	0.600	67.018	49.676	113.139	80.792	1.026	0.953	1.025	1.606	6.426	34.400	1.030	92.451	22.000	82.567	0.010	36.544
Benin	99.500	79.000	15.000	3.200	81.775	100.000	92.000	5.500	0.800	49.000	23.901	128.983	56.812	1.022	0.922	0.701	0.374	4.360	6.300	1.041	34.100	1.700	42.425	0.550	48.601
Bhutan	32.900	99.000	9.900	0.200	20.179	99.830	60.000	15.700	0.800	73.189	25.799	102.132	84.198	1.077	1.014	1.069	0.736	7.362	2.700	1.040	100.000	10.000	94.350	0.010	86.661
Bolivia	38.400	99.000	6.000	8.700	70.431	100.000	52.000	20.600	4.700	72.068	70.732	97.138	86.405	1.004	0.972	0.984	0.836	7.285	12.400	1.050	90.039	5.200	40.647	0.220	16.818
Botswana	43.600	95.000	13.000	4.600	30.973	99.380	38.000	4.500	0.500	59.015	18.333	108.572	83.918	0.987	0.971	1.056	1.369	9.633	14.800	1.030	56.482	33.900	15.858	0.970	29.168
Brazil	16.400	96.000	8.500	21.700	66.743	55.800	21.000	6.700	2.800	46.039	92.177	115.341	99.651	0.986	0.975	1.051	1.398	5.994	24.600	1.050	99.650	15.200	72.515	0.080	41.811
Brunei Darus-salam	10.200	99.000	11.900	15.200	20.788	0.000	0.200	6.000	0.600	93.860	71.998	108.138	96.079	1.022	1.001	1.004	1.647	3.353	0.500	1.055	100.000	11.100	2.953	0.010	0.014
Bulgaria	10.400	91.000	8.800	26.900	36.837	100.000	175.000	8.000	3.100	54.574	82.912	97.218	99.016	0.983	0.989	0.969	1.268	4.062	1.600	1.061	100.000	25.900	25.645	0.560	16.967
Burkina Faso	88.600	91.000	14.100	3.700	107.151	100.000	96.000	4.800	0.700	52.295	4.142	87.993	33.667	0.997	0.958	0.919	0.492	4.062	0.700	1.046	19.200	5.000	32.521	0.520	76.481

Country	Health										Education								Safety		Economic status			Environmental aspect	
	Child mortality	Immunization coverage	Nutrition	Risk behavior		Hazardous pollutant		Mental health	Oral health	Health expenditure	Early childhood education	Attendance of education		Gender equality				Government support on education	Violence and crime	Demographic structure	Housing quality	Macroeconomic situation		Freshwater vulnerability	Renewable energy consumption
	Under-5 mortality rate (per 1,000 live births)	Diphtheria tetanus toxoid and pertussis (DTP3) immunization coverage among 1-year-olds (%)	Percentage of infants born with low birth weight (<2500g.)	15-19 years old heavy episodic drinkers (population), % by country	Adolescent fertility rate (per 1000 girls aged 15-19 years)	PM2.5 air pollution, population exposed to levels exceeding WHO guideline value (% of total)	Mortality rate attributed to household and ambient air pollution (per 100 000 population)	Suicide rate, 15-29 year-olds, per 100000	DMFT (decayed, missing or filled teeth) among 12-year-olds (number)	Health expenditure, public (% of total health expenditure)	Gross enrolment ratio, pre-primary, both sexes (%)	Gross enrolment ratio, primary, both sexes (%)	Gross enrolment ratio, secondary, both sexes (%)	Gross enrolment ratio, pre-primary, gender parity index (GPI)	Gross enrolment ratio, primary, gender parity index (GPI)	Gross enrolment ratio, secondary, gender parity index (GPI)	Gross enrolment ratio, tertiary, gender parity index (GPI)	Government expenditure on education as % of GDP (%)	Intentional homicide, rates per 100,000 population	Sex ratio at birth	Access to electricity (% of population)	Youth unemployment rate (% of total labor force ages 15-24)	Public debt as percentage of GDP	Water depletion index	Renewable energy consumption (% of total final energy consumption)
	Indicator value																								
Burundi	81.700	94.000	12.900	4.000	27.855	100.000	106.000	27.300	1.000	52.733	12.630	123.782	42.480	1.020	1.012	0.911	0.314	5.416	4.000	1.030	7.000	10.700	46.005	0.010	90.047
Cambodia	28.700	89.000	11.300	9.900	52.172	100.000	71.000	13.000	5.500	22.042	17.944	116.657	45.051	1.067	0.993	0.855	0.821	1.902	1.800	1.049	56.100	0.900	32.537	0.030	67.953
Cameroon	87.900	84.000	11.000	4.400	102.360	100.000	90.000	7.900	1.500	22.873	37.833	117.134	58.078	1.013	0.897	0.856	0.774	3.030	2.700	1.030	56.800	6.700	27.122	0.390	77.388
Canada	4.900	91.000	6.100	33.200	9.458	0.010	5.400	10.000	1.000	70.930	73.638	100.572	109.932	0.992	1.011	1.002	1.340	5.281	1.400	1.056	100.000	13.400	91.550	0.071	22.576
Cape Verde	24.500	93.000	6.000	3.800	73.156	100.000	58.000	2.500	2.800	74.736	73.652	109.888	92.898	0.988	0.945	1.121	1.394	4.992	10.600	1.030	90.188	18.800	127.922	1.000	26.196
Central African Republic	130.100	47.000	13.700	3.200	90.659	100.000	96.000	13.100	4.100	48.972	5.590	93.456	17.378	1.017	0.743	0.513	0.360	1.224	13.200	1.030	12.330	11.900	48.498	0.010	77.192
Chile	8.100	96.000	5.900	27.300	47.503	99.940	22.000	16.500	1.900	49.465	87.003	101.644	100.646	0.976	0.968	1.013	1.137	4.923	3.600	1.040	100.000	16.400	17.373	0.688	26.415
China	10.700	99.000	2.380	12.000	7.261	100.000	163.000	4.200	0.500	55.787	83.617	104.125	94.299	1.007	1.003	1.026	1.186	1.887	0.800	1.160	100.000	10.500	42.606	0.577	17.099
Colombia	15.900	91.000	9.500	11.000	48.682	96.000	24.000	8.000	1.700	75.125	84.492	113.563	98.092	0.993	0.967	1.071	1.162	4.491	27.900	1.050	97.791	18.900	50.667	0.017	24.517
Costa Rica	9.700	92.000	7.300	9.400	56.026	99.860	19.000	7.900	2.500	72.667	52.372	109.818	123.086	0.991	0.994	1.040	1.307	7.176	10.000	1.050	99.359	19.200	40.830	0.013	37.869
Côte d'Ivoire	92.600	83.000	17.000	14.400	135.626	99.980	90.000	8.500	1.800	29.364	7.159	93.635	43.868	1.009	0.887	0.718	0.662	5.034	11.400	1.030	61.900	5.800	47.819	0.125	70.835
Croatia	4.300	94.000	4.950	28.200	9.170	100.000	90.000	8.000	4.800	81.867	62.726	97.964	98.216	0.962	1.002	1.049	1.357	4.582	0.800	1.059	100.000	45.900	86.744	0.171	33.647
Cyprus	2.700	97.000	11.500	29.600	4.892	100.000	20.000	5.900	1.300	45.225	80.275	99.300	99.778	0.986	1.000	0.993	1.358	6.138	0.100	1.070	100.000	35.700	107.533	0.749	9.389
Czech Republic	3.400	99.000	8.000	28.000	9.683	100.000	59.000	10.600	2.600	84.537	105.904	99.747	105.562	0.972	1.004	1.010	1.407	4.089	0.700	1.058	100.000	16.700	40.314	0.145	12.753
Democratic Republic of the Congo	98.300	81.000	9.500	13.700	122.277	100.000	116.000	14.900	0.750	36.929	4.174	106.973	43.505	1.074	0.909	0.622	0.455	2.245	12.500	1.030	13.500	11.900	18.807	0.010	92.871
Denmark	3.500	93.000	5.400	42.700	3.961	78.800	20.000	5.700	0.400	84.764	95.923	101.516	130.825	1.002	0.985	1.040	1.382	8.627	1.000	1.056	100.000	12.400	39.554	0.282	30.220
Dominican Republic	30.900	85.000	11.000	16.700	97.340	82.000	29.000	3.300	4.400	66.900	44.005	103.491	77.821	1.051	0.913	1.102	1.836	2.045	17.400	1.050	98.471	31.400	33.047	0.304	18.378
Ecuador	21.600	78.000	8.600	10.600	75.596	91.770	15.000	15.700	4.850	49.210	71.045	113.817	107.701	1.034	1.003	1.039	1.310	4.963	8.200	1.050	98.976	10.800	22.608	0.188	12.218
Egypt	24.000	93.000	13.000	0.000	51.331	100.000	52.000	1.900	0.400	38.202	30.322	103.930	86.102	0.981	0.997	0.995	0.964	3.759	3.200	1.050	99.800	42.000	88.458	1.000	6.413

Appendix

Country	Health										Education								Safety		Economic status			Environmental aspect	
	Child mortality	Immunization coverage	Nutrition	Risk behavior		Hazardous pollutant		Mental health	Oral health	Health expenditure	Early childhood education	Attendance of education		Gender equality				Government support on education	Violence and crime	Demographic structure	Housing quality	Macroeconomic situation		Freshwater vulnerability	Renewable energy consumption
	Under-5 mortality rate (per 1,000 live births)	Diphtheria tetanus toxoid and pertussis (DTP3) immunization coverage among 1-year-olds (%)	Percentage of infants born with low birth weight (<2500g.)	15-19 years old heavy episodic drinkers (population), % by country	Adolescent fertility rate (per 1000 girls aged 15-19 years)	PM2.5 air pollution, population exposed to levels exceeding WHO guideline value (% of total)	Mortality rate attributed to household and ambient air pollution (per 100 000 population)	Suicide rate, 15-29 year-olds, per 100000	DMFT (decayed, missing or filled teeth) among 12-year-olds (number)	Health expenditure, public (% of total health expenditure)	Gross enrolment ratio, pre-primary, both sexes (%)	Gross enrolment ratio, primary, both sexes (%)	Gross enrolment ratio, secondary, both sexes (%)	Gross enrolment ratio, pre-primary, gender parity index (GPI)	Gross enrolment ratio, primary, gender parity index (GPI)	Gross enrolment ratio, secondary, gender parity index (GPI)	Gross enrolment ratio, tertiary, gender parity index (GPI)	Government expenditure on education as % of GDP (%)	Intentional homicide, rates per 100,000 population	Sex ratio at birth	Access to electricity (% of population)	Youth unemployment rate (% of total labor force ages 15-24)	Public debt as percentage of GDP	Water depletion index	Renewable energy consumption (% of total final energy consumption)
	Indicator value																								
El Salvador	16.800	91.000	8.700	6.300	64.916	100.000	45.000	17.600	1.500	65.996	72.171	109.179	79.425	1.024	0.959	1.005	1.104	3.545	64.200	1.050	95.125	11.700	58.723	0.010	28.166
Eritrea	46.500	95.000	14.000	5.800	53.002	100.000	76.000	8.300	0.600	45.756	13.229	49.637	30.550	0.981	0.864	0.853	0.497	2.127	9.700	1.052	45.833	10.900	127.126	1.000	80.305
Estonia	2.900	93.000	4.600	36.900	12.436	15.250	54.000	13.300	2.700	78.824	88.374	98.411	115.178	0.973	1.002	0.993	1.531	5.482	3.100	1.061	100.000	17.000	10.052	0.015	25.249
Ethiopia	59.200	86.000	20.000	3.100	56.612	100.000	57.000	10.700	1.300	58.710	30.362	102.122	35.173	0.947	0.909	0.959	0.481	4.501	8.000	1.040	27.200	7.100	54.553	0.516	92.719
Fiji	22.400	99.000	10.200	20.700	45.195	0.000	77.000	3.800	1.500	65.810	17.871	105.545	88.668	1.075	0.991	1.108	1.194	3.883	3.000	1.060	100.000	18.600	48.361	0.010	37.568
Finland	2.300	98.000	4.200	31.800	6.377	0.100	6.000	18.800	0.700	75.309	79.293	101.534	149.456	0.996	0.998	1.095	1.207	7.168	1.600	1.044	100.000	19.200	63.663	0.195	41.191
France	4.300	98.000	6.600	48.500	8.815	92.130	17.000	7.600	1.200	78.205	108.807	105.358	110.644	0.998	0.993	1.011	1.226	5.493	1.200	1.052	100.000	23.900	96.164	0.217	13.133
Gabon	50.800	80.000	14.000	16.800	97.692	100.000	47.000	12.000	4.900	68.381	37.114	141.993	53.304	1.038	0.972	0.877	0.586	2.666	9.400	1.030	89.494	35.500	41.356	0.010	81.046
Gambia	68.900	97.000	10.200	0.100	112.463	100.000	71.000	5.400	2.300	68.738	37.954	91.556	57.452	1.049	1.066	0.950	0.681	2.768	9.400	1.030	47.211	10.600	110.211	0.950	48.058
Georgia	11.900	94.000	6.500	16.200	38.329	100.000	292.000	2.900	2.000	20.936	59.453	116.785	103.682	1.241	1.024	1.002	1.219	1.983	2.700	1.106	100.000	34.100	41.446	0.770	31.893
Germany	3.700	96.000	6.900	50.600	6.428	99.930	33.000	7.700	0.700	76.987	111.153	104.970	102.665	0.993	0.995	0.944	0.958	4.952	0.900	1.058	100.000	7.600	71.151	0.174	13.379
Ghana	61.600	88.000	10.700	3.300	66.126	100.000	81.000	3.400	0.400	59.846	120.789	109.925	61.413	1.027	1.000	0.949	0.692	6.179	1.700	1.053	78.300	3.300	71.500	0.011	45.218
Greece	4.600	99.000	9.800	24.500	7.235	100.000	45.000	3.000	1.350	61.663	76.201	98.601	108.198	0.985	0.987	0.960	1.001	3.969	0.100	1.065	100.000	53.900	179.354	0.690	16.086
Guatemala	29.100	74.000	11.400	5.900	80.088	100.000	43.000	12.800	5.200	37.643	44.659	101.791	65.627	1.007	0.961	0.933	1.168	2.956	31.200	1.050	85.494	5.400	24.196	0.010	59.903
Guyana	39.400	95.000	14.300	17.900	87.577	98.630	43.000	29.700	1.300	59.448	94.337	85.438	89.337	0.979	0.965	0.992	2.033	3.192	20.400	1.050	86.900	23.800	47.901	0.020	24.015
Honduras	20.400	85.000	9.900	7.100	64.268	100.000	53.000	7.300	3.700	50.648	45.957	110.714	70.776	1.039	0.990	1.189	1.354	5.868	74.600	1.050	88.654	6.900	46.173	0.010	54.041
Hungary	5.900	99.000	8.600	23.900	17.707	100.000	123.000	10.900	2.400	65.981	79.363	101.616	105.204	0.973	0.994	1.002	1.252	4.659	1.500	1.060	100.000	21.000	74.690	0.180	10.361
Iceland	2.000	92.000	4.200	46.200	5.653	0.000	6.400	8.200	1.400	81.043	97.475	98.667	111.170	0.983	1.004	0.993	1.724	7.806	0.300	1.054	100.000	10.900	68.050	0.010	76.423
India	47.700	87.000	28.000	1.600	23.292	99.990	130.000	35.500	1.600	30.037	12.207	108.601	73.969	0.937	1.119	1.012	0.990	3.842	3.200	1.108	79.169	10.400	69.551	0.742	36.536
Indonesia	27.200	81.000	9.000	0.000	49.249	88.910	84.000	3.600	0.900	37.780	58.156	105.853	85.842	1.033	0.973	1.004	1.124	3.592	0.500	1.050	97.010	21.800	26.871	0.167	38.066
Iran	15.500	98.000	7.700	0.000	26.342	100.000	35.000	7.800	1.900	41.201	50.782	108.916	89.167	0.977	1.051	0.994	0.891	2.929	4.800	1.050	99.442	29.400	42.409	0.949	0.938
Ireland	3.600	95.000	5.200	31.300	10.095	31.250	17.000	14.500	1.800	66.059	96.795	101.428	127.482	1.040	1.011	1.030	1.093	5.325	1.100	1.070	100.000	25.800	78.706	0.099	8.472
Israel	4.000	94.000	8.000	15.100	9.308	100.000	16.000	4.700	1.660	60.854	111.104	104.776	102.479	0.999	1.007	1.010	1.383	5.757	1.700	1.053	100.000	11.000	64.082	0.971	9.343

Appendix

Country	Health										Education								Safety		Economic status			Environmental aspect	
	Child mortality	Immunization coverage	Nutrition	Risk behavior		Hazardous pollutant		Mental health	Oral health	Health expenditure	Early childhood education	Attendance of education		Gender equality				Government support on education	Violence and crime	Demographic structure	Housing quality	Macroeconomic situation		Freshwater vulnerability	Renewable energy consumption
	Under-5 mortality rate (per 1,000 live births)	Diphtheria tetanus toxoid and pertussis (DTP3) immunization coverage among 1-year-olds (%)	Percentage of infants born with low birth weight (<2500g.)	15-19 years old heavy episodic drinkers (population), % by country	Adolescent fertility rate (per 1000 girls aged 15-19 years)	PM2.5 air pollution, population exposed to levels exceeding WHO guideline value (% of total)	Mortality rate attributed to household and ambient air pollution (per 100 000 population)	Suicide rate, 15-29 year-olds, per 100000	DMFT (decayed, missing or filled teeth) among 12-year-olds (number)	Health expenditure, public (% of total health expenditure)	Gross enrolment ratio, pre-primary, both sexes (%)	Gross enrolment ratio, primary, both sexes (%)	Gross enrolment ratio, secondary, both sexes (%)	Gross enrolment ratio, pre-primary, gender parity index (GPI)	Gross enrolment ratio, primary, gender parity index (GPI)	Gross enrolment ratio, secondary, gender parity index (GPI)	Gross enrolment ratio, tertiary, gender parity index (GPI)	Government expenditure on education as % of GDP (%)	Intentional homicide, rates per 100,000 population	Sex ratio at birth	Access to electricity (% of population)	Youth unemployment rate (% of total labor force ages 15-24)	Public debt as percentage of GDP	Water depletion index	Renewable energy consumption (% of total final energy consumption)
	Indicator value																								
Italy	3.500	93.000	7.300	20.300	5.935	100.000	35.000	3.400	1.200	75.613	98.661	101.037	102.902	0.975	0.992	0.977	1.357	4.080	0.800	1.063	100.000	44.100	132.042	0.639	17.090
Jamaica	15.700	91.000	11.300	6.900	58.785	100.000	43.000	1.200	1.100	52.384	99.467	97.245	82.107	1.066	1.003	1.074	1.726	5.462	36.100	1.050	97.097	30.500	120.205	0.387	15.988
Japan	2.700	96.000	9.600	16.800	3.971	98.420	24.000	18.400	1.400	83.589	89.927	101.575	101.920	1.019	0.998	1.004	0.926	3.592	0.300	1.056	100.000	6.500	237.968	0.480	5.527
Jordan	17.900	99.000	13.000	0.000	22.644	100.000	22.000	2.200	1.100	69.678	32.197	88.719	84.294	0.961	0.988	1.051	1.112	4.945	2.300	1.054	100.000	28.800	93.391	1.000	3.130
Kazakhstan	14.100	98.000	6.100	23.400	27.191	89.140	93.000	30.800	2.100	54.360	59.576	110.564	109.108	1.111	1.001	1.035	1.277	2.788	7.400	1.065	100.000	3.500	21.882	0.950	1.363
Kenya	49.400	89.000	8.000	3.300	90.219	98.930	57.000	16.200	0.600	61.253	76.224	108.974	67.640	0.985	0.995	0.930	0.703	5.274	5.900	1.030	36.000	17.400	52.422	0.710	75.518
Kuwait	8.600	99.000	8.300	0.000	9.446	100.000	14.000	1.400	2.600	85.934	80.987	102.684	94.973	0.986	1.007	1.165	1.619	3.760	1.800	1.042	100.000	19.400	11.174	1.000	0.000
Kyrgyzstan	21.300	97.000	6.300	18.300	39.197	98.930	100.000	11.600	3.100	56.132	27.588	107.359	92.050	1.004	0.990	1.015	1.306	5.527	3.700	1.058	99.800	14.700	64.894	1.000	28.250
Lao People's Democratic Republic	66.700	89.000	14.800	11.800	63.734	100.000	108.000	6.900	2.100	50.534	35.349	111.346	61.697	1.043	0.960	0.925	0.956	3.320	7.300	1.050	78.089	3.400	65.555	0.020	90.344
Latvia	7.900	95.000	4.600	13.400	13.287	100.000	115.000	13.800	3.400	63.177	88.193	99.665	119.492	0.989	0.991	0.994	1.428	5.285	3.900	1.053	100.000	19.300	34.837	0.020	40.236
Lebanon	8.300	81.000	11.500	0.600	12.185	100.000	30.000	0.600	3.400	47.608	77.596	92.414	61.206	0.942	0.914	0.992	1.157	2.571	4.300	1.050	100.000	20.700	138.425	0.670	3.204
Lesotho	90.200	93.000	10.700	3.500	93.174	100.000	75.000	8.300	0.400	76.120	33.952	105.520	53.772	1.038	0.973	1.358	1.453	11.361	38.000	1.030	27.800	33.000	49.548	0.960	51.816
Liberia	69.900	52.000	14.000	3.500	107.121	2.820	70.000	3.700	0.400	31.478	156.063	93.916	37.300	0.965	0.904	0.776	0.631	2.758	3.200	1.054	9.141	4.600	39.512	0.010	89.819
Lithuania	5.200	93.000	4.800	20.400	10.400	100.000	73.000	26.800	3.700	67.870	91.310	103.439	108.260	0.983	1.004	0.961	1.469	4.613	5.500	1.052	100.000	21.500	42.544	0.020	28.072
Luxembourg	1.900	99.000	7.100	29.300	5.728	100.000	20.000	6.100	3.000	83.928	93.485	96.544	102.416	1.004	1.006	1.026	1.135	4.084	0.700	1.046	100.000	16.000	22.091	0.250	6.966
Madagascar	49.600	69.000	16.000	3.100	114.820	98.740	84.000	10.600	3.100	48.446	18.061	148.894	38.435	1.076	1.000	0.981	0.937	2.082	0.600	1.030	16.819	5.200	35.533	0.040	73.564
Malawi	64.000	88.000	13.500	3.200	135.349	99.580	72.000	10.500	0.700	52.721	81.612	145.466	43.395	1.009	1.021	0.896	0.636	5.608	1.800	1.030	11.900	13.800	61.066	0.010	80.578
Malaysia	7.000	99.000	11.100	10.200	13.717	86.850	22.000	2.300	1.100	55.175	93.949	101.792	77.571	1.035	1.002	1.081	1.527	4.966	1.900	1.060	100.000	6.700	57.946	0.030	4.770
Mali	114.700	68.000	18.000	0.100	173.741	100.000	116.000	4.300	2.200	22.852	4.056	75.790	41.307	1.060	0.909	0.808	0.426	3.739	10.200	1.050	27.293	10.500	30.914	0.990	83.561
Malta	6.400	97.000	7.000	32.200	16.380	100.000	31.000	4.000	1.400	69.164	111.169	103.414	94.802	1.040	1.025	1.070	1.370	7.849	1.400	1.060	100.000	13.600	60.608	1.000	3.952

Country	Health										Education								Safety		Economic status			Environmental aspect	
	Child mortality	Immunization coverage	Nutrition	Risk behavior		Hazardous pollutant		Mental health	Oral health	Health expenditure	Early childhood education	Attendance of education		Gender equality				Government support on education	Violence and crime	Demographic structure	Housing quality	Macroeconomic situation		Freshwater vulnerability	Renewable energy consumption
	Under-5 mortality rate (per 1,000 live births)	Diphtheria tetanus toxoid and pertussis (DTP3) immunization coverage among 1-year-olds (%)	Percentage of infants born with low birth weight (<2500g.)	15-19 years old heavy episodic drinkers (population), % by country	Adolescent fertility rate (per 1000 girls aged 15-19 years)	PM2.5 air pollution, population exposed to levels exceeding WHO guideline value (% of total)	Mortality rate attributed to household and ambient air pollution (per 100 000 population)	Suicide rate, 15-29 year-olds, per 100000	DMFT (decayed, missing or filled teeth) among 12-year-olds (number)	Health expenditure, public (% of total health expenditure)	Gross enrolment ratio, pre-primary, both sexes (%)	Gross enrolment ratio, primary, both sexes (%)	Gross enrolment ratio, secondary, both sexes (%)	Gross enrolment ratio, pre-primary, gender parity index (GPI)	Gross enrolment ratio, primary, gender parity index (GPI)	Gross enrolment ratio, secondary, gender parity index (GPI)	Gross enrolment ratio, tertiary, gender parity index (GPI)	Government expenditure on education as % of GDP (%)	Intentional homicide, rates per 100,000 population	Sex ratio at birth	Access to electricity (% of population)	Youth unemployment rate (% of total labor force ages 15-24)	Public debt as percentage of GDP	Water depletion index	Renewable energy consumption (% of total final energy consumption)
	Indicator value																								
Mauritania	84.700	73.000	34.700	0.100	77.903	100.000	64.000	2.400	2.000	49.594	10.605	102.452	30.598	1.262	1.050	0.929	0.503	2.930	11.400	1.050	38.800	46.600	98.363	1.000	32.580
Mauritius	13.500	97.000	14.000	3.900	28.317	100.000	21.000	10.700	4.900	49.167	103.861	103.036	95.696	1.024	1.017	1.047	1.314	4.885	2.700	1.042	99.166	21.200	62.299	0.030	10.640
Mexico	13.200	87.000	9.150	12.000	62.204	99.960	24.000	6.000	1.100	51.768	68.958	103.389	90.550	1.023	0.996	1.065	1.006	5.313	15.700	1.050	99.173	9.900	53.729	0.776	9.799
Morocco	27.600	99.000	15.000	0.000	31.365	100.000	29.000	5.900	2.500	33.876	56.869	114.706	69.063	0.808	0.948	0.854	0.958	5.261	1.000	1.060	91.600	20.200	64.059	0.989	11.778
Namibia	45.400	92.000	16.000	4.400	76.213	96.430	48.000	2.600	1.200	59.999	21.439	111.428	64.843	1.036	0.967	1.157	1.276	8.350	16.900	1.030	49.564	38.700	39.942	0.995	27.617
Nepal	35.800	91.000	17.800	0.200	71.288	99.980	104.000	25.800	2.300	40.327	84.214	135.434	67.170	0.970	1.082	1.073	1.019	3.712	2.900	1.065	84.900	4.000	25.157	0.947	84.377
Netherlands	3.800	95.000	6.300	50.200	3.884	100.000	24.000	6.700	0.800	87.004	95.630	104.702	135.474	1.021	0.995	1.012	1.105	5.529	0.700	1.055	100.000	11.100	65.119	0.740	5.668
New Zealand	5.700	92.000	5.700	17.800	23.252	0.000	0.500	13.000	1.100	82.348	93.184	99.361	116.592	1.002	0.996	1.057	1.351	6.369	0.900	1.055	100.000	14.600	29.557	0.362	30.865
Nicaragua	22.100	98.000	7.600	24.900	88.055	100.000	62.000	13.400	1.500	56.369	58.322	123.259	74.188	1.031	0.992	1.128	1.111	4.485	11.500	1.050	81.853	7.600	29.359	0.010	51.842
Niger	95.500	65.000	27.000	0.200	201.163	100.000	110.000	2.600	1.300	55.220	7.366	72.499	20.750	1.062	0.856	0.711	0.344	6.709	4.500	1.050	14.310	7.100	41.303	1.000	78.132
Norway	2.600	95.000	5.200	21.400	5.855	100.000	13.000	10.200	1.700	85.492	97.492	100.421	112.989	1.005	0.998	0.968	1.458	7.373	0.600	1.058	100.000	8.400	33.203	0.234	57.089
Oman	11.600	99.000	10.000	0.000	7.547	100.000	13.000	1.300	1.300	89.766	55.554	109.281	104.233	1.028	1.035	1.068	1.368	4.960	1.100	1.050	100.000	18.800	15.265	1.000	0.000
Pakistan	81.100	72.000	32.000	0.000	38.322	100.000	89.000	9.100	1.380	35.151	72.320	92.710	44.526	0.873	0.855	0.793	0.872	2.647	7.800	1.087	97.535	8.600	63.568	0.968	47.206
Panama	17.000	73.000	8.300	22.600	73.732	90.610	25.000	5.800	3.600	73.244	71.493	105.326	75.499	1.015	0.971	1.063	1.492	3.188	17.400	1.050	91.597	11.000	38.771	0.010	19.771
Paraguay	20.500	93.000	6.300	19.500	56.855	99.970	57.000	6.300	2.800	45.874	37.715	105.986	76.573	1.004	0.969	1.066	1.416	4.955	8.800	1.050	99.001	9.300	23.987	0.010	63.117
Peru	16.900	90.000	6.900	13.000	48.448	99.990	33.000	4.900	3.700	60.638	88.704	101.695	95.745	1.012	1.000	1.001	1.101	3.979	6.700	1.050	92.920	9.200	24.036	0.733	25.636
Philippines	28.000	60.000	21.000	11.200	62.654	100.000	83.000	4.300	3.300	34.282	54.418	116.819	88.389	1.044	1.001	1.098	1.282	2.652	9.900	1.060	89.126	16.400	36.280	0.023	28.721
Poland	5.200	98.000	5.700	21.700	13.135	100.000	69.000	12.700	3.200	70.984	77.324	101.311	108.703	0.995	1.002	0.965	1.522	4.912	0.700	1.060	100.000	24.000	51.140	0.038	11.547
Portugal	3.600	98.000	8.500	29.200	9.450	24.220	17.000	3.800	1.480	64.816	93.702	107.370	119.135	0.984	0.962	0.969	1.132	5.126	0.900	1.060	100.000	36.800	128.988	0.546	30.499
Qatar	8.000	99.000	7.600	1.500	10.483	100.000	9.000	4.600	1.000	85.749	58.783	102.998	91.172	1.025	1.011	1.264	6.945	3.607	7.200	1.046	100.000	1.300	34.925	1.000	0.000
Republic of Korea	3.400	98.000	4.400	18.200	1.589	100.000	24.000	18.200	1.800	54.051	93.582	99.009	98.882	0.998	0.994	0.990	0.765	5.052	0.700	1.070	100.000	10.400	37.755	0.423	2.838

Appendix

Country	Health										Education								Safety		Economic status			Environmental aspect	
	Child mortality	Immunization coverage	Nutrition	Risk behavior		Hazardous pollutant		Mental health	Oral health	Health expenditure	Early childhood education	Attendance of education		Gender equality				Government support on education	Violence and crime	Demographic structure	Housing quality	Macroeconomic situation		Freshwater vulnerability	Renewable energy consumption
	Under-5 mortality rate (per 1,000 live births)	Diphtheria tetanus toxoid and pertussis (DTP3) immunization coverage among 1-year-olds (%)	Percentage of infants born with low birth weight (<2500g.)	15-19 years old heavy episodic drinkers (population), % by country	Adolescent fertility rate (per 1000 girls aged 15-19 years)	PM2.5 air pollution, population exposed to levels exceeding WHO guideline value (% of total)	Mortality rate attributed to household and ambient air pollution (per 100 000 population)	Suicide rate, 15-29 year-olds, per 100000	DMFT (decayed, missing or filled teeth) among 12-year-olds (number)	Health expenditure, public (% of total health expenditure)	Gross enrolment ratio, pre-primary, both sexes (%)	Gross enrolment ratio, primary, both sexes (%)	Gross enrolment ratio, secondary, both sexes (%)	Gross enrolment ratio, pre-primary, gender parity index (GPI)	Gross enrolment ratio, primary, gender parity index (GPI)	Gross enrolment ratio, secondary, gender parity index (GPI)	Gross enrolment ratio, tertiary, gender parity index (GPI)	Government expenditure on education as % of GDP (%)	Intentional homicide, rates per 100,000 population	Sex ratio at birth	Access to electricity (% of population)	Youth unemployment rate (% of total labor force ages 15-24)	Public debt as percentage of GDP	Water depletion index	Renewable energy consumption (% of total final energy consumption)
	Indicator value																								
Republic of Moldova	15.800	87.000	5.800	22.400	22.028	100.000	115.000	10.100	3.500	51.377	83.898	92.413	86.108	0.989	0.990	1.008	1.342	7.468	3.200	1.061	100.000	8.500	38.527	0.455	13.047
Romania	11.100	89.000	8.400	37.700	34.034	100.000	138.000	7.800	2.100	80.404	90.985	89.783	92.252	1.001	0.984	0.994	1.232	3.129	1.500	1.058	100.000	25.100	39.400	0.207	24.342
Russian Federation	9.600	97.000	6.100	29.800	22.733	89.660	110.000	27.300	2.500	52.202	86.968	100.521	104.483	0.982	1.008	0.980	1.212	3.861	9.500	1.060	100.000	12.900	15.944	0.082	3.456
Rwanda	41.700	98.000	7.100	4.100	25.625	100.000	68.000	11.100	0.300	38.098	17.983	132.550	36.687	1.039	1.013	1.086	0.776	3.797	4.900	1.017	19.800	0.700	33.423	0.010	88.447
Saudi Arabia	14.500	98.000	8.800	0.000	8.406	100.000	28.000	0.600	2.800	74.524	17.350	109.478	108.288	1.054	1.030	0.765	0.960	5.136	6.200	1.030	100.000	29.500	4.963	1.000	0.006
Senegal	47.200	89.000	18.600	0.100	76.877	100.000	43.000	4.300	0.600	51.832	14.904	82.172	49.647	1.124	1.119	0.978	0.605	7.396	7.900	1.036	61.000	13.000	56.916	0.928	43.297
Serbia	6.700	95.000	6.100	26.800	18.695	100.000	137.000	5.700	5.350	61.883	58.172	101.343	96.670	0.988	0.998	1.014	1.333	4.179	1.300	1.052	100.000	49.500	76.016	0.176	23.429
Sierra Leone	120.400	86.000	10.500	4.100	116.732	99.970	142.000	10.700	1.300	16.987	10.165	127.599	43.250	1.111	1.010	0.863	0.400	2.662	1.900	1.018	13.097	4.900	42.370	0.015	73.054
Slovakia	7.300	96.000	7.900	25.900	19.940	100.000	66.000	7.600	4.300	72.505	93.639	99.732	92.467	0.980	0.988	1.008	1.546	4.239	1.100	1.050	100.000	31.100	52.495	0.177	12.141
Slovenia	2.600	95.000	6.000	28.900	3.633	100.000	42.000	8.400	1.800	71.734	93.419	99.304	110.671	0.975	1.001	0.998	1.444	5.487	0.700	1.054	100.000	20.800	83.149	0.174	22.678
South Africa	40.500	69.000	15.100	4.900	44.440	99.870	44.000	2.800	1.050	48.235	76.170	64.140	93.809	1.021	0.952	1.217	1.485	6.030	33.000	1.030	86.000	52.600	49.778	0.834	16.587
Spain	4.100	97.000	8.200	28.400	8.311	28.110	15.000	3.000	1.100	70.876	96.660	101.677	129.810	0.996	1.011	0.997	1.178	4.271	0.700	1.064	100.000	57.900	99.772	0.720	17.352
Sri Lanka	9.800	99.000	17.000	0.200	14.153	100.000	119.000	23.700	0.900	56.059	93.040	101.270	99.725	0.991	0.979	1.046	1.539	2.179	2.900	1.043	92.191	19.100	76.036	0.454	57.585
Sudan	70.100	93.000	30.700	0.500	72.050	100.000	64.000	15.000	0.500	21.383	34.267	70.402	42.698	1.347	0.900	0.945	1.063	2.219	6.500	1.040	44.900	23.300	72.908	0.890	62.417
Swaziland	60.700	90.000	8.700	4.000	67.234	100.000	63.000	8.700	0.900	75.713	25.374	113.267	62.993	1.022	0.916	0.982	1.055	7.050	17.400	1.030	65.000	42.600	18.578	0.063	63.551
Sweden	3.000	98.000	4.500	25.100	5.695	0.000	0.400	11.900	0.800	84.030	93.937	123.019	140.459	0.999	1.042	1.135	1.525	7.675	0.900	1.060	100.000	22.800	42.926	0.154	49.537
Switzerland	3.900	97.000	6.700	29.400	2.840	100.000	18.000	7.600	0.900	66.000	104.645	103.915	101.214	0.986	0.997	0.970	1.029	5.096	0.500	1.052	100.000	8.700	45.802	0.356	23.452
Syrian Arab Republic	12.900	41.000	10.300	0.000	38.877	100.000	31.000	0.400	2.300	46.310	5.879	80.101	50.489	0.965	0.967	1.001	1.137	5.130	2.200	1.050	95.843	30.100	30.024	0.939	2.993

Appendix

Country	Health										Education								Safety		Economic status			Environmental aspect	
	Child mortality	Immunization coverage	Nutrition	Risk behavior		Hazardous pollutant		Mental health	Oral health	Health expenditure	Early childhood education	Attendance of education		Gender equality				Government support on education	Violence and crime	Demographic structure	Housing quality	Macroeconomic situation		Freshwater vulnerability	Renewable energy consumption
	Under-5 mortality rate (per 1,000 live births)	Diphtheria tetanus toxoid and pertussis (DTP3) immunization coverage among 1-year-olds (%)	Percentage of infants born with low birth weight (<2500g.)	15-19 years old heavy episodic drinkers (population), % by country	Adolescent fertility rate (per 1000 girls aged 15-19 years)	PM2.5 air pollution, population exposed to levels exceeding WHO guideline value (% of total)	Mortality rate attributed to household and ambient air pollution (per 100 000 population)	Suicide rate, 15-29 year-olds, per 100000	DMFT (decayed, missing or filled teeth) among 12-year-olds (number)	Health expenditure, public (% of total health expenditure)	Gross enrolment ratio, pre-primary, both sexes (%)	Gross enrolment ratio, primary, both sexes (%)	Gross enrolment ratio, secondary, both sexes (%)	Gross enrolment ratio, pre-primary, gender parity index (GPI)	Gross enrolment ratio, primary, gender parity index (GPI)	Gross enrolment ratio, secondary, gender parity index (GPI)	Gross enrolment ratio, tertiary, gender parity index (GPI)	Government expenditure on education as % of GDP (%)	Intentional homicide, rates per 100,000 population	Sex ratio at birth	Access to electricity (% of population)	Youth unemployment rate (% of total labor force ages 15-24)	Public debt as percentage of GDP	Water depletion index	Renewable energy consumption (% of total final energy consumption)
	Indicator value																								
Tajikistan	44.800	96.000	10.000	16.400	37.786	100.000	98.000	3.600	1.200	28.830	11.061	98.190	87.895	0.912	1.004	0.899	0.669	5.232	1.400	1.050	99.990	15.500	33.912	1.000	40.714
Thailand	12.300	99.000	11.300	0.200	44.605	100.000	65.000	8.700	1.300	77.834	69.112	102.729	129.002	0.871	0.935	0.945	1.414	4.129	3.900	1.062	100.000	3.900	42.691	0.050	23.586
The former Yugoslav Republic of Macedonia	5.500	91.000	5.500	20.200	17.264	100.000	129.000	2.100	3.500	63.329	36.352	93.219	79.294	0.995	0.992	0.974	1.248	3.295	1.600	1.054	100.000	50.800	38.161	0.170	18.302
Togo	78.400	88.000	11.100	3.200	92.065	100.000	81.000	6.100	0.300	38.448	17.537	121.800	54.709	1.028	0.947	0.529	0.427	5.218	9.200	1.018	45.700	10.700	75.551	0.010	72.825
Trinidad and Tobago	20.400	96.000	11.900	25.400	30.835	100.000	28.000	7.600	0.600	53.506	82.955	106.160	85.512	0.998	0.966	1.071	1.265	3.137	25.900	1.038	100.000	10.600	49.501	0.010	0.281
Tunisia	14.000	98.000	6.900	0.000	6.805	100.000	44.000	2.700	1.300	56.666	43.947	114.174	88.204	1.000	0.972	1.046	1.651	6.250	3.100	1.050	99.800	31.800	57.188	0.938	12.924
Turkey	13.500	96.000	11.000	17.800	26.811	100.000	51.000	12.400	1.900	77.448	28.926	102.490	102.489	0.944	0.993	0.969	0.874	4.766	4.300	1.050	100.000	17.700	27.573	0.715	11.578
Turkmenistan	51.400	99.000	4.800	18.200	16.048	100.000	73.000	25.700	2.600	65.229	62.854	89.367	85.341	0.971	0.984	0.963	0.636	3.056	4.300	1.046	100.000	20.200	19.362	1.000	0.041
Uganda	54.600	78.000	11.800	4.500	108.946	100.000	70.000	19.300	0.700	24.941	11.626	109.886	23.237	1.038	1.019	0.909	0.776	2.214	11.800	1.030	20.400	6.800	33.210	0.012	89.216
Ukraine	9.000	23.000	5.300	25.800	23.351	100.000	139.000	19.500	2.800	50.798	94.142	103.915	99.237	0.974	1.022	0.980	1.156	5.864	4.400	1.062	100.000	16.900	79.331	0.463	3.498
United Kingdom	4.200	96.000	7.000	40.500	13.950	89.840	26.000	5.900	0.600	83.143	91.147	108.240	127.811	0.997	0.997	1.040	1.307	5.684	0.900	1.051	100.000	16.700	88.960	0.281	7.294
United Republic of Tanzania	48.700	98.000	8.400	4.000	117.721	99.990	50.000	20.700	0.300	46.414	31.783	81.706	32.256	1.024	1.031	0.915	0.511	3.479	7.900	1.030	15.501	5.500	36.944	0.200	86.673
United States	6.500	95.000	8.100	19.800	21.154	8.640	12.000	12.700	1.190	48.297	70.839	100.147	97.565	0.981	0.998	1.018	1.368	5.381	3.900	1.049	100.000	14.000	105.607	0.550	8.913
Uruguay	10.100	95.000	8.100	15.100	55.780	85.940	23.000	12.100	2.500	71.217	64.376	109.726	94.063	1.010	0.974	1.128	1.726	4.357	7.800	1.050	99.657	19.100	64.300	0.010	55.431
Venezuela	14.900	87.000	8.600	24.000	79.052	99.970	21.000	3.200	2.100	29.349	75.316	100.000	89.664	1.007	0.973	1.076	1.690	6.877	62.000	1.050	99.108	17.100	32.078	0.390	12.298
Yemen	41.900	69.000	32.000	0.000	60.695	100.000	57.000	5.200	3.200	22.563	53.689	97.488	50.625	1.881	0.841	0.688	0.442	5.147	6.700	1.050	72.041	29.900	66.671	1.000	1.064
Zimbabwe	70.700	87.000	11.000	3.700	108.937	100.000	53.000	30.900	0.900	38.303	55.243	99.938	49.570	1.966	0.983	0.979	0.897	8.429	6.700	1.020	32.300	9.400	58.893	0.737	81.130

Appendix 11. The SCDI scores, ranking, country classification and regions for the 138 countries

Country	Health									Education								Safety		Economic status		Environmental aspects												
	Child mortality	Immunization coverage	Nutrition	Risk behavior		Hazardous pollutant		Mental health	Oral health	Health expenditure	Early childhood education	Attendance of education	Gender equality			Government support on education	Violence and crime	Demographic structure	Housing quality	Macroeconomic situation	Freshwater vulnerability	Renewable energy consumption												
	Under-5 mortality rate (per 1,000 live births)	Diphtheria tetanus toxoid and pertussis (DTP3) immunization coverage among 1-year-olds (%)	Percentage of infants born with low birth weight (<2500g.)	15-19 years old heavy episodic drinkers (population), % by country	Adolescent fertility rate (per 1000 girls aged 15-19 years)	PM2.5 air pollution, population exposed to levels exceeding WHO guideline value (% of total)	Mortality rate attributed to household and ambient air pollution (per 100 000 population)	Suicide rate, 15-29 year-olds, per 100000	DMFT (decayed, missing or filled teeth) among 12-year-olds (number)	Health expenditure, public (% of total health expenditure)	Gross enrolment ratio, pre-primary, both sexes (%)	Gross enrolment ratio, primary, both sexes (%)	Gross enrolment ratio, secondary, both sexes (%)	Gross enrolment ratio, pre-primary, gender parity index (GPI)	Gross enrolment ratio, primary, gender parity index (GPI)	Gross enrolment ratio, secondary, gender parity index (GPI)	Gross enrolment ratio, tertiary, gender parity index (GPI)	Government expenditure on education as % of GDP (%)	Intentional homicide, rates per 100,000 population	Sex ratio at birth	Access to electricity (% of population)	Youth unemployment rate (% of total labor force ages 15-24)	Public debt as percentage of GDP	Water depletion index	Renewable energy consumption (% of total final energy consumption)									
	Normalized score for indicators																							Aggregated score for themes										
Albania	0.933	0.980	0.910	0.609	0.901	0.000	0.430	0.894	0.383	0.473	0.928	0.899	0.974	0.983	0.953	0.962	0.938	0.156	0.960	0.930	1.000	0.551	0.877	0.730	0.387	0.693	0.745	0.945	0.857	0.558	0.760	45	High	Europe
Algeria	0.879	0.950	0.850	0.998	0.952	0.000	0.893	0.956	0.617	0.713	0.870	0.880	0.999	0.996	0.918	0.979	0.913	0.198	0.985	1.000	1.000	0.692	0.985	0.080	0.001	0.798	0.740	0.993	0.919	0.040	0.698	97	Medium	Africa
Angola	0.253	0.640	0.700	0.924	0.264	0.000	0.653	0.572	0.717	0.624	0.870	0.787	0.569	0.687	0.485	0.793	0.968	0.153	0.902	0.950	0.320	0.838	0.891	0.700	0.508	0.553	0.609	0.926	0.592	0.604	0.657	120	Low	Africa
Argentina	0.940	0.940	0.820	0.725	0.710	0.027	0.913	0.724	0.109	0.531	0.823	0.922	0.962	0.991	0.985	0.955	0.906	0.247	0.924	0.975	1.000	0.672	0.913	0.620	0.108	0.657	0.743	0.950	0.896	0.364	0.722	79	Medium	Americas
Armenia	0.933	0.940	0.800	0.625	0.898	0.000	0.583	0.944	0.600	0.400	0.702	0.989	0.930	0.980	1.000	0.994	0.980	0.119	0.980	0.780	1.000	0.460	0.928	0.050	0.077	0.709	0.692	0.880	0.847	0.064	0.638	127	Low	Asia
Australia	0.982	0.930	0.845	0.644	0.937	0.999	0.999	0.756	0.825	0.653	0.844	0.984	0.772	0.981	0.997	0.968	0.938	0.242	0.990	0.988	1.000	0.798	0.937	0.090	0.095	0.847	0.734	0.989	0.934	0.092	0.719	82	Medium	Oceania
Austria	0.983	0.980	0.828	0.371	0.969	0.000	0.887	0.810	0.767	0.767	0.979	0.978	1.000	0.989	0.980	0.973	0.968	0.256	0.995	0.988	1.000	0.858	0.857	0.820	0.358	0.781	0.801	0.991	0.929	0.589	0.818	8	Very high	Europe
Bahrain	0.970	0.980	0.753	1.000	0.939	0.000	0.963	0.826	0.767	0.613	0.724	0.991	0.987	0.989	0.982	0.997	0.857	0.111	0.995	0.973	1.000	0.832	0.890	0.000	0.000	0.795	0.695	0.984	0.931	0.000	0.681	109	Medium	Asia
Barbados	0.938	0.970	0.713	0.651	0.821	0.000	0.940	0.956	0.857	0.616	0.901	0.953	0.944	0.977	0.984	0.985	0.807	0.311	0.912	0.965	1.000	0.588	0.822	0.540	0.032	0.782	0.775	0.939	0.852	0.286	0.727	73	Medium	Americas
Belarus	0.978	0.990	0.873	0.391	0.920	0.000	0.653	0.598	0.650	0.640	0.980	0.990	0.957	0.969	0.999	0.992	0.949	0.228	0.964	0.975	1.000	0.815	0.912	0.890	0.066	0.714	0.790	0.970	0.932	0.478	0.777	34	High	Europe
Belgium	0.980	0.990	0.825	0.175	0.963	0.000	0.900	0.810	0.850	0.767	0.897	0.969	0.595	0.997	1.000	0.920	0.951	0.312	0.982	1.000	1.000	0.637	0.824	0.140	0.090	0.780	0.740	0.991	0.865	0.115	0.698	96	Medium	Europe
Belize	0.921	0.940	0.723	0.873	0.704	0.000	0.937	0.968	0.900	0.653	0.685	0.903	0.884	0.983	0.932	0.985	0.906	0.304	0.656	0.950	0.925	0.662	0.862	0.990	0.365	0.795	0.709	0.803	0.843	0.678	0.766	39	High	Americas
Benin	0.526	0.790	0.625	0.942	0.628	0.000	0.693	0.890	0.867	0.463	0.524	0.785	0.738	0.986	0.888	0.824	0.903	0.198	0.937	0.978	0.341	0.974	0.929	0.450	0.486	0.662	0.596	0.957	0.646	0.468	0.666	114	Medium	Africa
Bhutan	0.843	0.990	0.753	0.996	0.908	0.002	0.800	0.686	0.867	0.718	0.536	0.984	0.904	0.949	0.979	0.959	0.959	0.352	0.973	0.975	1.000	0.846	0.843	0.990	0.867	0.776	0.698	0.974	0.922	0.928	0.860	2	Very high	Asia
Bolivia	0.817	0.990	0.850	0.842	0.680	0.000	0.827	0.588	0.217	0.706	0.817	0.979	0.918	0.998	0.960	0.990	0.975	0.348	0.876	1.000	0.900	0.920	0.932	0.780	0.168	0.668	0.773	0.938	0.913	0.474	0.753	51	High	Americas
Botswana	0.792	0.950	0.675	0.916	0.859	0.006	0.873	0.910	0.917	0.569	0.490	0.937	0.903	0.991	0.959	0.967	0.943	0.468	0.852	0.950	0.565	0.478	0.974	0.030	0.292	0.768	0.711	0.901	0.645	0.161	0.637	128	Low	Africa
Brazil	0.922	0.960	0.788	0.605	0.697	0.442	0.930	0.866	0.533	0.432	0.951	0.886	0.998	0.991	0.964	0.970	0.938	0.282	0.754	1.000	0.997	0.766	0.879	0.920	0.418	0.730	0.785	0.877	0.910	0.669	0.794	21	High	Americas
Brunei Darus-	0.951	0.990	0.703	0.724	0.906	1.000	0.999	0.880	0.900	0.935	0.825	0.940	0.976	0.985	0.999	0.998	0.900	0.146	0.995	0.988	1.000	0.829	0.995	0.990	0.000	0.897	0.725	0.991	0.956	0.495	0.813	13	Very	Asia

Country	Health									Education								Safety		Economic status			Environmental aspects											
	Child mortality	Immunization coverage	Nutrition	Risk behavior		Hazardous pollutant		Mental health	Oral health	Health expenditure	Early childhood education	Attendance of education		Gender equality			Government support on education	Violence and crime	Demographic structure	Housing quality	Macroeconomic situation		Freshwater vulnerability	Renewable energy consumption										
	Under-5 mortality rate (per 1,000 live births)	Diphtheria tetanus toxoid and pertussis (DTP3) immunization coverage among 1-year-olds (%)	Percentage of infants born with low birth weight (<2500g.)	15-19 years old heavy episodic drinkers (population), % by country	Adolescent fertility rate (per 1000 girls aged 15-19 years)	PM2.5 air pollution, population exposed to levels exceeding WHO guideline value (% of total)	Mortality rate attributed to household and ambient air pollution (per 100 000 population)	Suicide rate, 15-29 year-olds, per 100000	DMFT (decayed, missing or filled teeth) among 12-year-olds (number)	Health expenditure, public (% of total health expenditure)	Gross enrolment ratio, pre-primary, both sexes (%)	Gross enrolment ratio, primary, both sexes (%)	Gross enrolment ratio, secondary, both sexes (%)	Gross enrolment ratio, pre-primary, gender parity index (GPI)	Gross enrolment ratio, primary, gender parity index (GPI)	Gross enrolment ratio, secondary, gender parity index (GPI)	Gross enrolment ratio, tertiary, gender parity index (GPI)	Government expenditure on education as % of GDP (%)	Intentional homicide, rates per 100,000 population	Sex ratio at birth	Access to electricity (% of population)	Youth unemployment rate (% of total labor force ages 15-24)	Public debt as percentage of GDP	Water depletion index										Renewable energy consumption (% of total final energy consumption)
	Normalized score for indicators																																	Aggregated score for themes
salam																																high		
Bulgaria	0.950	0.910	0.780	0.511	0.833	0.000	0.417	0.840	0.483	0.522	0.893	0.979	0.994	0.989	0.984	0.982	0.958	0.183	0.984	0.973	1.000	0.602	0.957	0.440	0.170	0.671	0.760	0.978	0.890	0.305	0.721	81	Medium	Europe
Burkina Faso	0.578	0.910	0.648	0.933	0.513	0.000	0.680	0.904	0.883	0.498	0.401	0.911	0.598	0.998	0.940	0.952	0.921	0.183	0.993	0.990	0.192	0.923	0.946	0.480	0.765	0.685	0.573	0.992	0.563	0.622	0.687	106	Medium	Africa
Burundi	0.611	0.940	0.678	0.927	0.873	0.000	0.647	0.454	0.833	0.502	0.454	0.824	0.651	0.987	0.983	0.947	0.894	0.252	0.960	0.950	0.070	0.835	0.923	0.990	0.900	0.655	0.599	0.955	0.475	0.945	0.726	74	Medium	Africa
Cambodia	0.863	0.890	0.718	0.820	0.763	0.000	0.763	0.740	0.083	0.179	0.487	0.877	0.667	0.956	0.990	0.914	0.972	0.072	0.982	0.998	0.561	0.986	0.946	0.970	0.680	0.581	0.572	0.990	0.763	0.825	0.746	56	Medium	Asia
Cameroon	0.581	0.840	0.725	0.920	0.535	0.000	0.700	0.842	0.750	0.188	0.611	0.873	0.746	0.992	0.852	0.915	0.965	0.130	0.973	0.950	0.568	0.897	0.955	0.610	0.774	0.625	0.620	0.962	0.747	0.692	0.729	71	Medium	Africa
Canada	0.977	0.910	0.848	0.396	0.957	1.000	0.982	0.800	0.833	0.694	0.835	0.996	0.940	0.995	0.985	0.999	0.947	0.245	0.986	0.985	1.000	0.794	0.847	0.929	0.226	0.841	0.757	0.986	0.910	0.577	0.814	11	Very high	Americas
Cape Verde	0.883	0.930	0.850	0.931	0.667	0.000	0.807	0.950	0.533	0.734	0.835	0.927	0.957	0.992	0.922	0.929	0.939	0.230	0.894	0.950	0.902	0.711	0.787	0.000	0.262	0.760	0.738	0.922	0.825	0.131	0.675	111	Medium	Africa
Central African Republic	0.380	0.470	0.658	0.942	0.588	0.000	0.680	0.738	0.317	0.463	0.410	0.952	0.499	0.988	0.633	0.713	0.901	0.037	0.868	0.950	0.123	0.817	0.919	0.990	0.772	0.516	0.495	0.909	0.496	0.881	0.659	118	Low	Africa
Chile	0.961	0.960	0.853	0.504	0.784	0.001	0.927	0.670	0.683	0.468	0.919	0.988	0.996	0.984	0.955	0.992	0.979	0.227	0.964	0.975	1.000	0.748	0.971	0.312	0.264	0.713	0.779	0.970	0.930	0.288	0.736	65	Medium	Americas
China	0.949	0.990	0.941	0.782	0.967	0.000	0.457	0.916	0.917	0.535	0.898	0.969	0.965	0.995	0.995	0.985	0.971	0.071	0.992	0.725	1.000	0.838	0.929	0.423	0.171	0.794	0.731	0.859	0.942	0.297	0.724	76	Medium	Asia
Colombia	0.924	0.910	0.763	0.800	0.779	0.040	0.920	0.840	0.717	0.738	0.903	0.900	0.988	0.995	0.953	0.958	0.975	0.205	0.721	1.000	0.978	0.709	0.916	0.983	0.245	0.770	0.755	0.861	0.895	0.614	0.779	31	High	Americas
Costa Rica	0.954	0.920	0.818	0.829	0.745	0.001	0.937	0.842	0.583	0.712	0.702	0.927	0.860	0.994	0.992	0.976	0.952	0.342	0.900	1.000	0.994	0.705	0.932	0.987	0.379	0.761	0.729	0.950	0.906	0.683	0.806	17	High	Americas
Côte d'Ivoire	0.559	0.830	0.575	0.738	0.384	0.000	0.700	0.830	0.700	0.256	0.420	0.953	0.660	0.994	0.839	0.834	0.948	0.233	0.886	0.950	0.619	0.911	0.920	0.875	0.708	0.583	0.591	0.918	0.767	0.792	0.730	69	Medium	Africa
Croatia	0.980	0.940	0.876	0.487	0.958	0.000	0.700	0.840	0.200	0.809	0.767	0.985	0.989	0.975	0.996	0.971	0.945	0.209	0.992	0.978	1.000	0.294	0.855	0.829	0.336	0.715	0.734	0.985	0.787	0.583	0.761	44	High	Europe
Cyprus	0.987	0.970	0.713	0.462	0.978	0.000	0.933	0.882	0.783	0.423	0.877	0.995	0.999	0.991	1.000	0.996	0.945	0.289	0.999	0.950	1.000	0.451	0.821	0.251	0.094	0.743	0.786	0.975	0.818	0.172	0.699	95	Medium	Asia
Czech	0.984	0.990	0.800	0.491	0.956	0.000	0.803	0.788	0.567	0.837	0.963	0.998	0.966	0.982	0.995	0.994	0.937	0.184	0.993	0.980	1.000	0.743	0.933	0.855	0.128	0.761	0.777	0.987	0.919	0.491	0.787	27	High	Europe

Country	Health									Education								Safety		Economic status			Environmental aspects											
	Child mortality	Immunization coverage	Nutrition	Risk behavior		Hazardous pollutant		Mental health	Oral health	Health expenditure	Early childhood education	Attendance of education		Gender equality			Government support on education	Violence and crime	Demographic structure	Housing quality	Macroeconomic situation		Freshwater vulnerability	Renewable energy consumption										
	Under-5 mortality rate (per 1,000 live births)	Diphtheria tetanus toxoid and pertussis (DTP3) immunization coverage among 1-14 year-olds (%)	Percentage of infants born with low birth weight (<2500g.)	15-19 years old heavy episodic drinkers (population), % by country	Adolescent fertility rate (per 1000 girls aged 15-19 years)	PM2.5 air pollution, population exposed to levels exceeding WHO guideline value (% of total)	Mortality rate attributed to household and ambient air pollution (per 100 000 population)	Suicide rate, 15-29 year-olds, per 100000	DMFT (decayed, missing or filled teeth) among 12-year-olds (number)	Health expenditure, public (% of total health expenditure)	Gross enrolment ratio, pre-primary, both sexes (%)	Gross enrolment ratio, primary, both sexes (%)	Gross enrolment ratio, secondary, both sexes (%)	Gross enrolment ratio, pre-primary, gender parity index (GPI)	Gross enrolment ratio, primary, gender parity index (GPI)	Gross enrolment ratio, secondary, gender parity index (GPI)	Gross enrolment ratio, tertiary, gender parity index (GPI)	Government expenditure on education as % of GDP (%)	Intentional homicide, rates per 100,000 population	Sex ratio at birth	Access to electricity (% of population)	Youth unemployment rate (% of total labor force ages 15-24)	Public debt as percentage of GDP	Water depletion index	Renewable energy consumption (% of total final energy consumption)									
	Normalized score for indicators																									Aggregated score for themes								
Republic																																		
Democratic Republic of the Congo	0.532	0.810	0.763	0.751	0.444	0.000	0.613	0.702	0.875	0.336	0.401	0.948	0.658	0.951	0.870	0.778	0.916	0.090	0.875	0.950	0.135	0.817	0.969	0.990	0.929	0.615	0.543	0.913	0.514	0.959	0.709	87	Medium	Africa
Denmark	0.983	0.930	0.865	0.224	0.982	0.212	0.933	0.886	0.933	0.840	0.975	0.989	0.813	0.999	0.978	0.977	0.941	0.417	0.990	0.985	1.000	0.809	0.934	0.718	0.302	0.827	0.816	0.988	0.936	0.510	0.815	10	Very high	Europe
Dominican Republic	0.853	0.850	0.725	0.696	0.558	0.180	0.903	0.934	0.267	0.652	0.650	0.974	0.866	0.966	0.876	0.940	0.870	0.079	0.826	1.000	0.985	0.517	0.945	0.696	0.184	0.681	0.641	0.913	0.858	0.440	0.706	90	Medium	Americas
Ecuador	0.897	0.780	0.785	0.807	0.656	0.082	0.950	0.686	0.192	0.465	0.819	0.898	0.953	0.978	0.996	0.977	0.952	0.229	0.918	1.000	0.990	0.834	0.962	0.812	0.122	0.632	0.737	0.959	0.944	0.467	0.748	55	Medium	Americas
Egypt	0.886	0.930	0.675	1.000	0.767	0.000	0.827	0.962	0.933	0.349	0.565	0.971	0.916	0.987	0.996	0.997	0.994	0.167	0.968	1.000	0.998	0.354	0.853	0.000	0.064	0.754	0.667	0.984	0.801	0.032	0.648	124	Low	Africa
El Salvador	0.920	0.910	0.783	0.885	0.705	0.000	0.850	0.648	0.750	0.642	0.826	0.932	0.875	0.984	0.941	0.997	0.984	0.156	0.358	1.000	0.951	0.820	0.902	0.990	0.282	0.734	0.716	0.679	0.906	0.636	0.734	66	Medium	Americas
Eritrea	0.779	0.950	0.650	0.895	0.759	0.000	0.747	0.834	0.900	0.429	0.458	0.627	0.579	0.988	0.805	0.914	0.922	0.083	0.903	0.995	0.458	0.832	0.788	0.000	0.803	0.718	0.513	0.949	0.634	0.402	0.643	126	Low	Africa
Estonia	0.986	0.930	0.885	0.329	0.943	0.848	0.820	0.734	0.550	0.777	0.927	0.988	0.908	0.982	0.996	0.996	0.918	0.255	0.969	0.973	1.000	0.738	0.983	0.985	0.252	0.792	0.776	0.971	0.930	0.619	0.817	9	Very high	Europe
Ethiopia	0.718	0.860	0.500	0.944	0.743	0.000	0.810	0.786	0.783	0.565	0.565	0.984	0.607	0.965	0.870	0.976	0.920	0.205	0.920	0.975	0.272	0.891	0.909	0.484	0.927	0.683	0.625	0.948	0.586	0.706	0.709	86	Medium	Africa
Fiji	0.893	0.990	0.745	0.624	0.795	1.000	0.743	0.924	0.750	0.640	0.487	0.959	0.931	0.950	0.987	0.936	0.970	0.173	0.970	0.975	1.000	0.714	0.919	0.990	0.376	0.815	0.642	0.973	0.908	0.683	0.804	19	High	Oceania
Finland	0.989	0.980	0.895	0.422	0.971	0.999	0.980	0.624	0.883	0.740	0.871	0.989	0.700	0.997	0.997	0.944	0.968	0.342	0.984	0.985	1.000	0.705	0.894	0.805	0.412	0.850	0.758	0.985	0.900	0.608	0.820	5	Very high	Europe
France	0.980	0.980	0.835	0.118	0.960	0.079	0.943	0.848	0.800	0.771	0.945	0.960	0.935	0.999	0.990	0.994	0.965	0.256	0.988	0.995	1.000	0.632	0.840	0.783	0.131	0.783	0.784	0.992	0.868	0.457	0.777	32	High	Europe
Gabon	0.758	0.800	0.650	0.695	0.556	0.000	0.843	0.760	0.183	0.667	0.607	0.689	0.717	0.975	0.959	0.928	0.936	0.111	0.906	0.950	0.895	0.454	0.931	0.990	0.810	0.608	0.593	0.928	0.794	0.900	0.765	40	High	Africa
Gambia	0.672	0.970	0.745	0.998	0.489	0.000	0.763	0.892	0.617	0.671	0.612	0.937	0.742	0.967	0.906	0.970	0.951	0.116	0.906	0.950	0.472	0.837	0.816	0.050	0.481	0.711	0.629	0.928	0.649	0.265	0.637	129	Low	Africa
Georgia	0.943	0.940	0.838	0.705	0.826	0.000	0.027	0.942	0.667	0.168	0.747	0.876	0.978	0.839	0.966	0.999	0.966	0.076	0.973	0.860	1.000	0.475	0.931	0.230	0.319	0.660	0.673	0.917	0.852	0.274	0.675	112	Medium	Asia

Country	Health									Education								Safety		Economic status			Environmental aspects											
	Child mortality	Immunization coverage	Nutrition	Risk behavior		Hazardous pollutant		Mental health	Oral health	Health expenditure	Early childhood education	Attendance of education	Gender equality				Government support on education	Violence and crime	Demographic structure	Housing quality	Macroeconomic situation	Freshwater vulnerability	Renewable energy consumption											
	Under-5 mortality rate (per 1,000 live births)	Diphtheria tetanus toxoid and pertussis (DTP3) immunization coverage among 1-year-olds (%)	Percentage of infants born with low birth weight (<2500g.)	15-19 years old heavy episodic drinkers (population), % by country	Adolescent fertility rate (per 1000 girls aged 15-19 years)	PM2.5 air pollution, population exposed to levels exceeding WHO guideline value (% of total)	Mortality rate attributed to household and ambient air pollution (per 100 000 population)	Suicide rate, 15-29 year-olds, per 100000	DMFT (decayed, missing or filled teeth) among 12-year-olds (number)	Health expenditure, public (% of total health expenditure)	Gross enrolment ratio, pre-primary, both sexes (%)	Gross enrolment ratio, primary, both sexes (%)	Gross enrolment ratio, secondary, both sexes (%)	Gross enrolment ratio, pre-primary, gender parity index (GPI)	Gross enrolment ratio, primary, gender parity index (GPI)	Gross enrolment ratio, secondary, gender parity index (GPI)	Gross enrolment ratio, tertiary, gender parity index (GPI)	Government expenditure on education as % of GDP (%)	Intentional homicide, rates per 100,000 population	Sex ratio at birth	Access to electricity (% of population)	Youth unemployment rate (% of total labor force ages 15-24)	Public debt as percentage of GDP	Water depletion index	Renewable energy consumption (% of total final energy consumption)									
	Normalized score for indicators																							Aggregated score for themes										
Germany	0.982	0.960	0.828	0.080	0.971	0.001	0.890	0.846	0.883	0.758	0.930	0.963	0.984	0.995	0.993	0.967	0.994	0.228	0.991	0.980	1.000	0.883	0.881	0.826	0.134	0.778	0.780	0.986	0.941	0.480	0.793	24	High	Europe
Ghana	0.707	0.880	0.733	0.940	0.699	0.000	0.730	0.932	0.933	0.577	0.870	0.926	0.766	0.982	1.000	0.970	0.952	0.291	0.983	0.993	0.783	0.949	0.881	0.989	0.452	0.743	0.746	0.988	0.849	0.721	0.809	16	High	Africa
Greece	0.978	0.990	0.755	0.555	0.967	0.000	0.850	0.940	0.775	0.596	0.851	0.990	0.950	0.990	0.981	0.976	1.000	0.178	0.999	0.963	1.000	0.171	0.701	0.310	0.161	0.778	0.746	0.981	0.718	0.235	0.692	102	Medium	Europe
Guatemala	0.861	0.740	0.715	0.893	0.636	0.000	0.857	0.744	0.133	0.344	0.654	0.987	0.792	0.995	0.945	0.961	0.974	0.126	0.688	1.000	0.855	0.917	0.960	0.990	0.599	0.591	0.659	0.844	0.897	0.795	0.757	47	High	Americas
Guyana	0.812	0.950	0.643	0.675	0.602	0.014	0.857	0.406	0.783	0.573	0.965	0.892	0.935	0.986	0.951	0.995	0.840	0.138	0.796	1.000	0.869	0.634	0.920	0.980	0.240	0.655	0.740	0.898	0.823	0.610	0.745	58	Medium	Americas
Honduras	0.903	0.850	0.753	0.871	0.708	0.000	0.823	0.854	0.383	0.481	0.662	0.921	0.823	0.974	0.985	0.889	0.945	0.275	0.254	1.000	0.887	0.894	0.923	0.990	0.540	0.678	0.689	0.627	0.897	0.765	0.731	68	Medium	Americas
Hungary	0.972	0.990	0.785	0.565	0.920	0.000	0.590	0.782	0.600	0.642	0.871	0.988	0.968	0.982	0.991	0.999	0.961	0.213	0.985	0.975	1.000	0.677	0.876	0.820	0.104	0.726	0.761	0.980	0.888	0.462	0.763	41	High	Europe
Iceland	0.990	0.920	0.895	0.160	0.974	1.000	0.979	0.836	0.767	0.800	0.984	0.990	0.932	0.989	0.994	0.996	0.888	0.375	0.997	0.990	1.000	0.832	0.887	0.990	0.764	0.846	0.822	0.994	0.930	0.877	0.894	1	Very high	Europe
India	0.773	0.870	0.300	0.971	0.894	0.000	0.567	0.290	0.733	0.264	0.451	0.936	0.842	0.958	0.830	0.993	0.998	0.171	0.968	0.855	0.792	0.840	0.884	0.258	0.365	0.556	0.614	0.912	0.827	0.312	0.644	125	Low	Asia
Indonesia	0.870	0.810	0.775	1.000	0.776	0.111	0.720	0.928	0.850	0.345	0.738	0.957	0.914	0.978	0.962	0.998	0.981	0.159	0.995	1.000	0.970	0.665	0.955	0.833	0.381	0.735	0.703	0.998	0.890	0.607	0.787	28	High	Asia
Iran	0.926	0.980	0.808	1.000	0.880	0.000	0.883	0.844	0.683	0.381	0.692	0.934	0.934	0.984	0.927	0.997	0.983	0.125	0.952	1.000	0.994	0.548	0.929	0.051	0.009	0.750	0.681	0.976	0.866	0.030	0.661	117	Medium	Asia
Ireland	0.983	0.950	0.870	0.431	0.954	0.688	0.943	0.710	0.700	0.643	0.980	0.989	0.833	0.974	0.985	0.982	0.986	0.247	0.989	0.950	1.000	0.603	0.869	0.901	0.085	0.795	0.780	0.970	0.868	0.493	0.781	29	High	Europe
Israel	0.981	0.940	0.800	0.725	0.958	0.000	0.947	0.906	0.723	0.588	0.931	0.965	0.985	0.999	0.991	0.994	0.941	0.270	0.983	0.993	1.000	0.831	0.893	0.029	0.093	0.782	0.789	0.988	0.931	0.061	0.710	85	Medium	Asia
Italy	0.983	0.930	0.818	0.631	0.973	0.000	0.883	0.932	0.800	0.743	0.992	0.992	0.982	0.984	0.989	0.987	0.945	0.184	0.992	0.968	1.000	0.322	0.780	0.361	0.171	0.806	0.785	0.980	0.775	0.266	0.722	78	Medium	Europe
Jamaica	0.925	0.910	0.718	0.875	0.733	0.000	0.857	0.976	0.817	0.499	0.997	0.980	0.892	0.956	0.995	0.956	0.887	0.254	0.639	1.000	0.971	0.531	0.800	0.613	0.160	0.760	0.784	0.820	0.818	0.387	0.714	83	Medium	Americas
Japan	0.987	0.960	0.760	0.695	0.982	0.016	0.920	0.632	0.767	0.827	0.937	0.988	0.988	0.987	0.998	0.998	0.989	0.159	0.997	0.985	1.000	0.900	0.603	0.520	0.055	0.780	0.769	0.991	0.876	0.288	0.741	62	Medium	Asia
Jordan	0.915	0.990	0.675	1.000	0.897	0.000	0.927	0.956	0.817	0.681	0.576	0.916	0.905	0.974	0.983	0.970	0.983	0.228	0.977	0.990	1.000	0.557	0.844	0.000	0.031	0.806	0.673	0.984	0.850	0.016	0.666	115	Medium	Asia
Kazakhstan	0.933	0.980	0.848	0.575	0.876	0.109	0.690	0.384	0.650	0.520	0.747	0.922	0.945	0.926	0.998	0.980	0.957	0.117	0.926	0.963	1.000	0.946	0.964	0.050	0.014	0.680	0.691	0.944	0.977	0.032	0.665	116	Medium	Asia
Kenya	0.765	0.890	0.800	0.940	0.590	0.011	0.810	0.676	0.900	0.592	0.851	0.934	0.804	0.990	0.992	0.959	0.954	0.245	0.941	0.950	0.360	0.732	0.913	0.290	0.755	0.725	0.735	0.946	0.591	0.523	0.704	92	Medium	Africa

Country	Health									Education								Safety		Economic status			Environmental aspects											
	Child mortality	Immunization coverage	Nutrition	Risk behavior		Hazardous pollutant		Mental health	Oral health	Health expenditure	Early childhood education	Attendance of education	Gender equality			Government support on education	Violence and crime	Demographic structure	Housing quality	Macroeconomic situation	Freshwater vulnerability	Renewable energy consumption												
	Under-5 mortality rate (per 1,000 live births)	Diphtheria tetanus toxoid and pertussis (DTP3) immunization coverage among 1-year-olds (%)	Percentage of infants born with low birth weight (<2500g.)	15-19 years old heavy episodic drinkers (population), % by country	Adolescent fertility rate (per 1000 girls aged 15-19 years)	PM2.5 air pollution, population exposed to levels exceeding WHO guideline value (% of total)	Mortality rate attributed to household and ambient air pollution (per 100 000 population)	Suicide rate, 15-29 year-olds, per 100000	DMFT (decayed, missing or filled teeth) among 12-year-olds (number)	Health expenditure, public (% of total health expenditure)	Gross enrolment ratio, pre-primary, both sexes (%)	Gross enrolment ratio, primary, both sexes (%)	Gross enrolment ratio, secondary, both sexes (%)	Gross enrolment ratio, pre-primary, gender parity index (GPI)	Gross enrolment ratio, primary, gender parity index (GPI)	Gross enrolment ratio, secondary, gender parity index (GPI)	Gross enrolment ratio, tertiary, gender parity index (GPI)	Government expenditure on education as % of GDP (%)	Intentional homicide, rates per 100,000 population	Sex ratio at birth	Access to electricity (% of population)	Youth unemployment rate (% of total labor force ages 15-24)	Public debt as percentage of GDP	Water depletion index	Renewable energy consumption (% of total final energy consumption)									
	Normalized score for indicators																							Aggregated score for themes										
Kuwait	0.959	0.990	0.793	1.000	0.957	0.000	0.953	0.972	0.567	0.852	0.881	0.980	0.970	0.991	0.991	0.903	0.904	0.167	0.982	0.980	1.000	0.702	0.981	0.000	0.000	0.823	0.743	0.981	0.921	0.000	0.694	101	Medium	Asia
Kyrgyzstan	0.899	0.970	0.843	0.667	0.822	0.011	0.667	0.768	0.483	0.538	0.547	0.945	0.952	0.998	0.985	0.991	0.953	0.258	0.963	0.980	0.998	0.774	0.892	0.000	0.283	0.698	0.684	0.972	0.915	0.141	0.682	108	Medium	Asia
Lao People's Democratic Republic	0.682	0.890	0.630	0.785	0.710	0.000	0.640	0.862	0.650	0.479	0.596	0.916	0.768	0.972	0.943	0.956	0.993	0.145	0.927	1.000	0.781	0.948	0.891	0.980	0.903	0.658	0.637	0.964	0.850	0.942	0.810	15	Very high	Asia
Latvia	0.962	0.950	0.885	0.756	0.940	0.000	0.617	0.724	0.433	0.612	0.926	0.998	0.882	0.992	0.987	0.996	0.934	0.245	0.961	0.993	1.000	0.703	0.942	0.980	0.402	0.715	0.772	0.977	0.911	0.691	0.813	12	Very high	Europe
Lebanon	0.960	0.810	0.713	0.989	0.945	0.000	0.900	0.988	0.433	0.449	0.860	0.944	0.765	0.961	0.878	0.995	0.976	0.106	0.957	1.000	1.000	0.682	0.769	0.330	0.032	0.721	0.693	0.979	0.863	0.181	0.687	104	Medium	Asia
Lesotho	0.570	0.930	0.733	0.936	0.576	0.000	0.750	0.834	0.933	0.749	0.587	0.959	0.720	0.975	0.961	0.789	0.930	0.557	0.620	0.950	0.278	0.492	0.917	0.040	0.518	0.735	0.724	0.785	0.491	0.279	0.603	136	Low	Africa
Liberia	0.667	0.520	0.650	0.936	0.513	0.972	0.767	0.926	0.933	0.279	0.650	0.955	0.620	0.976	0.863	0.868	0.943	0.116	0.968	0.990	0.091	0.929	0.934	0.990	0.898	0.696	0.616	0.979	0.512	0.944	0.749	54	Medium	Africa
Lithuania	0.975	0.930	0.880	0.629	0.953	0.000	0.757	0.464	0.383	0.662	0.946	0.975	0.950	0.989	0.994	0.977	0.927	0.211	0.945	0.995	1.000	0.669	0.929	0.980	0.281	0.683	0.773	0.970	0.900	0.630	0.791	26	High	Europe
Luxembourg	0.991	0.990	0.823	0.467	0.974	0.000	0.933	0.878	0.500	0.831	0.959	0.974	0.985	0.998	0.991	0.985	0.979	0.184	0.993	0.990	1.000	0.754	0.963	0.750	0.070	0.775	0.778	0.992	0.929	0.410	0.777	33	High	Europe
Madagascar	0.764	0.690	0.600	0.944	0.478	0.013	0.720	0.788	0.483	0.457	0.488	0.638	0.627	0.949	1.000	0.989	0.990	0.081	0.994	0.950	0.168	0.920	0.941	0.960	0.736	0.607	0.546	0.972	0.549	0.848	0.704	91	Medium	Africa
Malawi	0.695	0.880	0.663	0.942	0.385	0.004	0.760	0.790	0.883	0.502	0.885	0.663	0.657	0.994	0.970	0.939	0.944	0.262	0.982	0.950	0.119	0.788	0.898	0.990	0.806	0.682	0.692	0.966	0.481	0.898	0.744	59	Medium	Africa
Malaysia	0.967	0.990	0.723	0.815	0.938	0.132	0.927	0.954	0.817	0.528	0.962	0.987	0.864	0.977	0.998	0.952	0.918	0.229	0.981	0.975	1.000	0.897	0.903	0.970	0.048	0.798	0.769	0.978	0.950	0.509	0.801	20	High	Asia
Mali	0.454	0.680	0.550	0.998	0.210	0.000	0.613	0.914	0.633	0.188	0.400	0.821	0.644	0.960	0.870	0.887	0.911	0.166	0.898	1.000	0.273	0.838	0.948	0.010	0.836	0.541	0.552	0.949	0.583	0.423	0.610	133	Low	Africa
Malta	0.970	0.970	0.825	0.415	0.926	0.000	0.897	0.920	0.767	0.675	0.930	0.975	0.968	0.973	0.965	0.959	0.943	0.377	0.986	0.975	1.000	0.791	0.899	0.000	0.040	0.781	0.810	0.981	0.922	0.020	0.703	94	Medium	Europe
Mauritania	0.597	0.730	0.133	0.998	0.646	0.000	0.787	0.952	0.667	0.469	0.441	0.982	0.579	0.826	0.928	0.958	0.923	0.125	0.886	1.000	0.388	0.283	0.836	0.000	0.326	0.595	0.564	0.943	0.474	0.163	0.548	138	Low	Africa
Mauritius	0.936	0.970	0.650	0.929	0.871	0.000	0.930	0.786	0.183	0.465	0.976	0.978	0.974	0.984	0.975	0.973	0.951	0.225	0.973	0.980	0.992	0.674	0.896	0.970	0.106	0.669	0.787	0.977	0.888	0.538	0.772	36	High	Africa

Country	Health									Education								Safety		Economic status			Environmental aspects											
	Child mortality	Immunization coverage	Nutrition	Risk behavior		Hazardous pollutant		Mental health	Oral health	Health expenditure	Early childhood education	Attendance of education		Gender equality			Government support on education	Violence and crime	Demographic structure	Housing quality	Macroeconomic situation		Freshwater vulnerability	Renewable energy consumption										
	Under-5 mortality rate (per 1,000 live births)	Diphtheria tetanus toxoid and pertussis (DTP3) immunization coverage among 1-year-olds (%)	Percentage of infants born with low birth weight (<2500g.)	15-19 years old heavy episodic drinkers (population), % by country	Adolescent fertility rate (per 1000 girls aged 15-19 years)	PM2.5 air pollution, population exposed to levels exceeding WHO guideline value (% of total)	Mortality rate attributed to household and ambient air pollution (per 100 000 population)	Suicide rate, 15-29 year-olds, per 100000	DMFT (decayed, missing or filled teeth) among 12-year-olds (number)	Health expenditure, public (% of total health expenditure)	Gross enrolment ratio, pre-primary, both sexes (%)	Gross enrolment ratio, primary, both sexes (%)	Gross enrolment ratio, secondary, both sexes (%)	Gross enrolment ratio, pre-primary, gender parity index (GPI)	Gross enrolment ratio, primary, gender parity index (GPI)	Gross enrolment ratio, secondary, gender parity index (GPI)	Gross enrolment ratio, tertiary, gender parity index (GPI)	Government expenditure on education as % of GDP (%)	Intentional homicide, rates per 100,000 population	Sex ratio at birth	Access to electricity (% of population)	Youth unemployment rate (% of total labor force ages 15-24)	Public debt as percentage of GDP	Water depletion index	Renewable energy consumption (% of total final energy consumption)									
	Normalized score for indicators																								Aggregated score for themes									
Mexico	0.937	0.870	0.771	0.782	0.717	0.000	0.920	0.880	0.817	0.492	0.806	0.975	0.943	0.984	0.994	0.962	0.999	0.247	0.843	1.000	0.992	0.848	0.910	0.224	0.098	0.747	0.749	0.922	0.935	0.161	0.703	93	Medium	Americas
Morocco	0.869	0.990	0.625	1.000	0.857	0.000	0.903	0.882	0.583	0.304	0.730	0.891	0.813	0.872	0.925	0.914	0.993	0.244	0.990	0.975	0.916	0.689	0.893	0.011	0.118	0.704	0.688	0.983	0.854	0.065	0.659	119	Low	Africa
Namibia	0.784	0.920	0.600	0.920	0.654	0.036	0.840	0.948	0.800	0.579	0.509	0.915	0.787	0.976	0.952	0.907	0.957	0.403	0.831	0.950	0.496	0.405	0.933	0.005	0.276	0.732	0.678	0.891	0.582	0.140	0.605	135	Low	Africa
Nepal	0.830	0.910	0.555	0.996	0.676	0.000	0.653	0.484	0.617	0.372	0.901	0.738	0.801	0.980	0.883	0.957	0.997	0.165	0.971	0.963	0.849	0.938	0.958	0.053	0.844	0.616	0.697	0.967	0.899	0.448	0.725	75	Medium	Asia
Netherlands	0.982	0.950	0.843	0.087	0.982	0.000	0.920	0.866	0.867	0.863	0.973	0.965	0.785	0.986	0.992	0.993	0.984	0.258	0.993	0.988	1.000	0.829	0.891	0.260	0.057	0.796	0.774	0.990	0.930	0.158	0.730	70	Medium	Europe
New Zealand	0.973	0.920	0.858	0.676	0.894	1.000	0.998	0.740	0.817	0.814	0.957	0.995	0.899	0.999	0.994	0.966	0.946	0.301	0.991	0.988	1.000	0.775	0.951	0.638	0.309	0.863	0.795	0.989	0.932	0.474	0.811	14	Very high	Oceania
Nicaragua	0.895	0.980	0.810	0.547	0.600	0.000	0.793	0.732	0.750	0.541	0.740	0.828	0.844	0.979	0.988	0.925	0.983	0.204	0.885	1.000	0.819	0.883	0.951	0.990	0.518	0.710	0.687	0.943	0.868	0.754	0.792	25	High	Americas
Niger	0.545	0.650	0.325	0.996	0.086	0.000	0.633	0.948	0.783	0.529	0.421	0.796	0.520	0.959	0.795	0.830	0.898	0.318	0.955	1.000	0.143	0.891	0.931	0.000	0.781	0.580	0.567	0.978	0.527	0.391	0.608	134	Low	Africa
Norway	0.988	0.950	0.870	0.611	0.973	0.000	0.957	0.796	0.717	0.847	0.984	0.997	0.921	0.997	0.996	0.981	0.929	0.352	0.994	0.980	1.000	0.871	0.945	0.766	0.571	0.805	0.818	0.987	0.954	0.669	0.846	3	Very high	Europe
Oman	0.945	0.990	0.750	1.000	0.966	0.000	0.957	0.974	0.783	0.892	0.722	0.931	0.974	0.981	0.950	0.960	0.943	0.229	0.989	1.000	1.000	0.711	0.975	0.000	0.000	0.849	0.716	0.995	0.921	0.000	0.696	98	Medium	Asia
Pakistan	0.614	0.720	0.200	1.000	0.826	0.000	0.703	0.818	0.770	0.317	0.827	0.946	0.664	0.915	0.792	0.878	0.980	0.110	0.922	0.908	0.975	0.868	0.894	0.032	0.472	0.588	0.658	0.915	0.928	0.252	0.668	113	Medium	Asia
Panama	0.919	0.730	0.793	0.589	0.665	0.094	0.917	0.884	0.400	0.718	0.822	0.961	0.852	0.990	0.958	0.963	0.924	0.138	0.826	1.000	0.916	0.831	0.935	0.990	0.198	0.697	0.706	0.913	0.900	0.594	0.762	43	High	Americas
Paraguay	0.902	0.930	0.843	0.645	0.742	0.000	0.810	0.874	0.533	0.430	0.611	0.956	0.858	0.998	0.955	0.961	0.936	0.228	0.912	1.000	0.990	0.857	0.960	0.990	0.631	0.701	0.677	0.956	0.949	0.811	0.819	7	Very high	Americas
Peru	0.920	0.900	0.828	0.764	0.780	0.000	0.890	0.902	0.383	0.586	0.929	0.987	0.974	0.992	1.000	1.000	0.984	0.178	0.933	1.000	0.929	0.858	0.960	0.267	0.256	0.717	0.771	0.967	0.919	0.262	0.727	72	Medium	Americas
Philippines	0.867	0.600	0.475	0.796	0.715	0.000	0.723	0.914	0.450	0.308	0.715	0.875	0.930	0.971	0.999	0.942	0.956	0.110	0.901	0.975	0.891	0.748	0.940	0.977	0.287	0.591	0.674	0.938	0.867	0.632	0.741	63	Medium	Asia
Poland	0.975	0.980	0.858	0.605	0.940	0.000	0.770	0.746	0.467	0.695	0.858	0.990	0.947	0.996	0.997	0.979	0.919	0.226	0.993	0.975	1.000	0.631	0.915	0.962	0.115	0.735	0.757	0.984	0.886	0.539	0.780	30	High	Europe
Portugal	0.983	0.980	0.788	0.469	0.957	0.758	0.943	0.924	0.753	0.630	0.961	0.945	0.884	0.989	0.946	0.982	0.980	0.237	0.991	0.975	1.000	0.434	0.785	0.454	0.305	0.828	0.772	0.983	0.805	0.380	0.753	50	High	Europe

Country	Health									Education								Safety		Economic status			Environmental aspects											
	Child mortality	Immunization coverage	Nutrition	Risk behavior		Hazardous pollutant		Mental health	Oral health	Health expenditure	Early childhood education	Attendance of education		Gender equality			Government support on education	Violence and crime	Demographic structure	Housing quality	Macroeconomic situation		Freshwater vulnerability	Renewable energy consumption										
	Under-5 mortality rate (per 1,000 live births)	Diphtheria tetanus toxoid and pertussis (DTP3) immunization coverage among 1-year-olds (%)	Percentage of infants born with low birth weight (<2500g.)	15-19 years old heavy episodic drinkers (population), % by country	Adolescent fertility rate (per 1000 girls aged 15-19 years)	PM2.5 air pollution, population exposed to levels exceeding WHO guideline value (% of total)	Mortality rate attributed to household and ambient air pollution (per 100 000 population)	Suicide rate, 15-29 year-olds, per 100000	DMFT (decayed, missing or filled teeth) among 12-year-olds (number)	Health expenditure, public (% of total health expenditure)	Gross enrolment ratio, pre-primary, both sexes (%)	Gross enrolment ratio, primary, both sexes (%)	Gross enrolment ratio, secondary, both sexes (%)	Gross enrolment ratio, pre-primary, gender parity index (GPI)	Gross enrolment ratio, primary, gender parity index (GPI)	Gross enrolment ratio, secondary, gender parity index (GPI)	Gross enrolment ratio, tertiary, gender parity index (GPI)	Government expenditure on education as % of GDP (%)	Intentional homicide, rates per 100,000 population	Sex ratio at birth	Access to electricity (% of population)	Youth unemployment rate (% of total labor force ages 15-24)	Public debt as percentage of GDP	Water depletion index	Renewable energy consumption (% of total final energy consumption)									
	Normalized score for indicators																									Aggregated score for themes								
Qatar	0.962	0.990	0.810	0.973	0.952	0.000	0.970	0.908	0.833	0.850	0.742	0.978	0.946	0.983	0.984	0.845	0.078	0.159	0.928	0.990	1.000	0.980	0.942	0.000	0.000	0.850	0.647	0.959	0.980	0.000	0.687	105	Medium	Asia
Republic of Korea	0.984	0.980	0.890	0.669	0.993	0.000	0.920	0.636	0.700	0.516	0.960	0.993	0.993	0.999	0.991	0.994	0.964	0.233	0.993	0.950	1.000	0.840	0.937	0.577	0.028	0.750	0.793	0.972	0.944	0.303	0.752	52	High	Asia
Republic of Moldova	0.925	0.870	0.855	0.593	0.900	0.000	0.617	0.798	0.417	0.488	0.899	0.944	0.916	0.993	0.986	0.995	0.947	0.357	0.968	0.973	1.000	0.869	0.936	0.545	0.130	0.676	0.792	0.970	0.951	0.338	0.745	57	Medium	Europe
Romania	0.947	0.890	0.790	0.315	0.845	0.000	0.540	0.844	0.650	0.794	0.944	0.924	0.953	0.999	0.977	0.997	0.964	0.135	0.985	0.980	1.000	0.614	0.934	0.793	0.243	0.721	0.750	0.983	0.887	0.518	0.772	37	High	Europe
Russian Federation	0.954	0.970	0.848	0.458	0.897	0.103	0.633	0.454	0.583	0.497	0.919	0.996	0.973	0.988	0.989	0.988	0.967	0.172	0.905	0.975	1.000	0.802	0.973	0.918	0.035	0.669	0.765	0.940	0.944	0.476	0.759	46	High	Europe
Rwanda	0.801	0.980	0.823	0.925	0.884	0.000	0.773	0.778	0.950	0.348	0.487	0.759	0.616	0.974	0.982	0.950	0.965	0.169	0.951	0.918	0.198	0.989	0.944	0.990	0.884	0.746	0.578	0.934	0.582	0.937	0.756	48	High	Africa
Saudi Arabia	0.931	0.980	0.780	1.000	0.962	0.000	0.907	0.988	0.533	0.732	0.483	0.930	0.950	0.964	0.957	0.862	0.994	0.238	0.938	0.950	1.000	0.546	0.992	0.000	0.000	0.797	0.651	0.944	0.884	0.000	0.655	122	Low	Asia
Senegal	0.775	0.890	0.535	0.998	0.651	0.000	0.857	0.914	0.900	0.493	0.468	0.868	0.695	0.918	0.830	0.987	0.939	0.354	0.921	0.965	0.610	0.800	0.905	0.072	0.433	0.720	0.630	0.943	0.731	0.253	0.655	121	Low	Africa
Serbia	0.968	0.950	0.848	0.513	0.915	0.000	0.543	0.886	0.108	0.599	0.739	0.990	0.980	0.992	0.997	0.992	0.948	0.189	0.987	0.995	1.000	0.238	0.873	0.824	0.234	0.668	0.724	0.991	0.778	0.529	0.738	64	Medium	Europe
Sierra Leone	0.427	0.860	0.738	0.925	0.469	0.000	0.527	0.786	0.783	0.126	0.439	0.796	0.656	0.926	0.986	0.919	0.907	0.111	0.981	0.920	0.131	0.925	0.929	0.985	0.731	0.585	0.552	0.951	0.529	0.858	0.695	99	Medium	Africa
Slovakia	0.965	0.960	0.803	0.529	0.909	0.000	0.780	0.848	0.283	0.711	0.960	0.998	0.954	0.986	0.983	0.995	0.915	0.192	0.989	1.000	1.000	0.522	0.913	0.823	0.121	0.710	0.775	0.995	0.859	0.472	0.762	42	High	Europe
Slovenia	0.988	0.950	0.850	0.475	0.983	0.000	0.860	0.832	0.700	0.702	0.959	0.995	0.935	0.983	0.998	0.999	0.931	0.256	0.993	0.990	1.000	0.680	0.861	0.826	0.227	0.773	0.789	0.992	0.885	0.526	0.793	23	High	Europe
South Africa	0.807	0.690	0.623	0.911	0.798	0.001	0.853	0.944	0.825	0.455	0.851	0.734	0.962	0.986	0.932	0.872	0.925	0.284	0.670	0.950	0.860	0.191	0.917	0.166	0.166	0.703	0.728	0.810	0.707	0.166	0.623	131	Low	Africa
Spain	0.980	0.970	0.795	0.484	0.962	0.719	0.950	0.940	0.817	0.693	0.979	0.988	0.819	0.997	0.984	0.998	0.972	0.193	0.993	0.965	1.000	0.109	0.834	0.280	0.174	0.844	0.766	0.979	0.736	0.227	0.710	84	Medium	Europe
Sri Lanka	0.953	0.990	0.575	0.996	0.936	0.000	0.603	0.526	0.850	0.537	0.956	0.991	0.998	0.994	0.970	0.973	0.916	0.086	0.971	0.983	0.922	0.706	0.873	0.546	0.576	0.712	0.750	0.977	0.856	0.561	0.771	38	High	Asia
Sudan	0.666	0.930	0.233	0.991	0.673	0.000	0.787	0.700	0.917	0.172	0.589	0.781	0.653	0.769	0.857	0.968	0.990	0.088	0.935	0.975	0.449	0.642	0.878	0.110	0.624	0.605	0.572	0.955	0.605	0.367	0.621	132	Low	Africa

Country	Health									Education								Safety		Economic status			Environmental aspects											
	Child mortality	Immunization coverage	Nutrition	Risk behavior		Hazardous pollutant		Mental health	Oral health	Health expenditure	Early childhood education	Attendance of education		Gender equality				Government support on education	Violence and crime	Demographic structure	Housing quality	Macroeconomic situation		Freshwater vulnerability									Renewable energy consumption	
	Under-5 mortality rate (per 1,000 live births)	Diphtheria tetanus toxoid and pertussis (DTP3) immunization coverage among 1-year-olds (%)	Percentage of infants born with low birth weight (<2500g.)	15-19 years old heavy episodic drinkers (population), % by country	Adolescent fertility rate (per 1000 girls aged 15-19 years)	PM2.5 air pollution, population exposed to levels exceeding WHO guideline value (% of total)	Mortality rate attributed to household and ambient air pollution (per 100 000 population)	Suicide rate, 15-29 year-olds, per 100000	DMFT (decayed, missing or filled teeth) among 12-year-olds (number)	Health expenditure, public (% of total health expenditure)	Gross enrolment ratio, pre-primary, both sexes (%)	Gross enrolment ratio, primary, both sexes (%)	Gross enrolment ratio, secondary, both sexes (%)	Gross enrolment ratio, pre-primary, gender parity index (GPI)	Gross enrolment ratio, primary, gender parity index (GPI)	Gross enrolment ratio, secondary, gender parity index (GPI)	Gross enrolment ratio, tertiary, gender parity index (GPI)	Government expenditure on education as % of GDP (%)	Intentional homicide, rates per 100,000 population	Sex ratio at birth	Access to electricity (% of population)	Youth unemployment rate (% of total labor force ages 15-24)	Public debt as percentage of GDP	Water depletion index	Renewable energy consumption (% of total final energy consumption)									
	Normalized score for indicators																							Aggregated score for themes										
Swaziland	0.711	0.900	0.783	0.927	0.694	0.000	0.790	0.826	0.850	0.744	0.534	0.902	0.776	0.985	0.880	0.989	0.992	0.336	0.826	0.950	0.650	0.345	0.969	0.937	0.636	0.752	0.667	0.888	0.653	0.786	0.750	53	Medium	Africa
Sweden	0.986	0.980	0.888	0.544	0.974	1.000	0.999	0.762	0.867	0.832	0.962	0.829	0.755	1.000	0.941	0.921	0.919	0.368	0.991	0.975	1.000	0.649	0.928	0.846	0.495	0.884	0.767	0.983	0.894	0.670	0.840	4	Very high	Europe
Switzerland	0.981	0.970	0.833	0.465	0.987	0.000	0.940	0.848	0.850	0.642	0.971	0.971	0.993	0.991	0.996	0.982	0.996	0.236	0.995	0.995	1.000	0.866	0.924	0.644	0.235	0.790	0.795	0.995	0.947	0.439	0.793	22	High	Europe
Syrian Arab Republic	0.939	0.410	0.743	1.000	0.823	0.000	0.897	0.992	0.617	0.435	0.412	0.853	0.700	0.977	0.953	0.999	0.979	0.237	0.978	1.000	0.958	0.537	0.950	0.061	0.030	0.687	0.601	0.989	0.851	0.046	0.635	130	Low	Asia
Tajikistan	0.787	0.960	0.750	0.702	0.828	0.000	0.673	0.928	0.800	0.251	0.444	0.987	0.927	0.941	0.994	0.941	0.949	0.243	0.986	1.000	1.000	0.762	0.943	0.000	0.407	0.697	0.650	0.993	0.926	0.204	0.694	100	Medium	Asia
Thailand	0.941	0.990	0.718	0.996	0.797	0.000	0.783	0.826	0.783	0.767	0.807	0.980	0.824	0.914	0.907	0.968	0.936	0.186	0.961	0.970	1.000	0.940	0.929	0.950	0.236	0.789	0.707	0.966	0.967	0.593	0.804	18	High	Asia
The former Yugoslav Republic of Macedonia	0.974	0.910	0.863	0.633	0.922	0.000	0.570	0.958	0.417	0.614	0.602	0.950	0.875	0.997	0.989	0.985	0.962	0.143	0.984	0.990	1.000	0.218	0.936	0.830	0.183	0.725	0.660	0.987	0.789	0.507	0.733	67	Medium	Europe
Togo	0.627	0.880	0.723	0.942	0.582	0.000	0.730	0.878	0.950	0.352	0.485	0.839	0.726	0.981	0.925	0.723	0.911	0.242	0.908	0.920	0.457	0.835	0.874	0.990	0.728	0.692	0.598	0.914	0.656	0.859	0.744	60	Medium	Africa
Trinidad and Tobago	0.903	0.960	0.703	0.538	0.860	0.000	0.907	0.848	0.900	0.511	0.893	0.954	0.912	0.999	0.952	0.958	0.959	0.135	0.741	0.970	1.000	0.837	0.917	0.990	0.003	0.747	0.732	0.856	0.939	0.496	0.754	49	High	Americas
Tunisia	0.933	0.980	0.828	1.000	0.969	0.000	0.853	0.946	0.783	0.544	0.650	0.895	0.929	1.000	0.960	0.973	0.899	0.295	0.969	1.000	0.998	0.511	0.905	0.062	0.129	0.803	0.704	0.985	0.853	0.096	0.688	103	Medium	Africa
Turkey	0.936	0.960	0.725	0.676	0.878	0.000	0.830	0.752	0.683	0.763	0.556	0.982	0.985	0.963	0.991	0.982	0.980	0.219	0.957	1.000	1.000	0.728	0.954	0.285	0.116	0.751	0.684	0.979	0.920	0.200	0.707	88	Medium	Asia
Turkmenistan	0.755	0.990	0.880	0.669	0.927	0.000	0.757	0.486	0.567	0.634	0.768	0.921	0.911	0.981	0.977	0.978	0.944	0.131	0.957	0.990	1.000	0.689	0.968	0.000	0.000	0.686	0.696	0.974	0.914	0.000	0.654	123	Low	Asia
Uganda	0.740	0.780	0.705	0.918	0.505	0.000	0.767	0.614	0.883	0.210	0.448	0.927	0.535	0.975	0.973	0.947	0.965	0.088	0.882	0.950	0.204	0.895	0.945	0.988	0.892	0.628	0.558	0.916	0.562	0.940	0.721	80	Medium	Africa
Ukraine	0.957	0.230	0.868	0.531	0.894	0.000	0.537	0.610	0.533	0.482	0.963	0.971	0.995	0.983	0.969	0.988	0.976	0.275	0.956	0.970	1.000	0.740	0.868	0.537	0.035	0.583	0.800	0.963	0.902	0.286	0.707	89	Medium	Europe

Country	Health									Education								Safety		Economic status			Environmental aspects												
	Child mortality	Immunization coverage	Nutrition	Risk behavior		Hazardous pollutant		Mental health	Oral health	Health expenditure	Early childhood education	Attendance of education		Gender equality				Government support on education	Violence and crime	Demographic structure	Housing quality	Macroeconomic situation		Freshwater vulnerability	Renewable energy consumption										
	Under-5 mortality rate (per 1,000 live births)	Diphtheria tetanus toxoid and pertussis (DTP3) immunization coverage among 1-year-olds (%)	Percentage of infants born with low birth weight (<2500g.)	15-19 years old heavy episodic drinkers (population), % by country	Adolescent fertility rate (per 1000 girls aged 15-19 years)	PM2.5 air pollution, population exposed to levels exceeding WHO guideline value (% of total)	Mortality rate attributed to household and ambient air pollution (per 100 000 population)	Suicide rate, 15-29 year-olds, per 100000	DMFT (decayed, missing or filled teeth) among 12-year-olds (number)	Health expenditure, public (% of total health expenditure)	Gross enrolment ratio, pre-primary, both sexes (%)	Gross enrolment ratio, primary, both sexes (%)	Gross enrolment ratio, secondary, both sexes (%)	Gross enrolment ratio, pre-primary, gender parity index (GPI)	Gross enrolment ratio, primary, gender parity index (GPI)	Gross enrolment ratio, secondary, gender parity index (GPI)	Gross enrolment ratio, tertiary, gender parity index (GPI)	Government expenditure on education as % of GDP (%)	Intentional homicide, rates per 100,000 population	Sex ratio at birth	Access to electricity (% of population)	Youth unemployment rate (% of total labor force ages 15-24)	Public debt as percentage of GDP	Water depletion index	Renewable energy consumption (% of total final energy consumption)	Health	Education	Safety	Economic status	Environmental aspects		SCDI score	Ranking	Sustainable child development level	Region
	Normalized score for indicators																							Aggregated score for themes											
United Kingdom	0.980	0.960	0.825	0.264	0.937	0.102	0.913	0.882	0.900	0.823	0.945	0.939	0.831	0.998	0.996	0.976	0.952	0.266	0.991	0.998	1.000	0.743	0.852	0.719	0.073	0.810	0.769	0.994	0.899	0.396	0.774	35	High	Europe	
United Republic of Tanzania	0.768	0.980	0.790	0.927	0.465	0.000	0.833	0.586	0.950	0.436	0.574	0.864	0.589	0.984	0.956	0.950	0.924	0.153	0.921	0.950	0.155	0.915	0.938	0.800	0.867	0.703	0.602	0.936	0.541	0.833	0.723	77	Medium	Africa	
United States	0.969	0.950	0.798	0.640	0.904	0.914	0.960	0.746	0.802	0.456	0.818	0.999	0.985	0.987	0.997	0.989	0.943	0.250	0.961	0.998	1.000	0.785	0.824	0.450	0.089	0.804	0.760	0.979	0.902	0.270	0.743	61	Medium	Americas	
Uruguay	0.952	0.950	0.798	0.725	0.746	0.141	0.923	0.758	0.583	0.697	0.777	0.928	0.964	0.993	0.963	0.925	0.887	0.198	0.922	1.000	0.997	0.706	0.893	0.990	0.554	0.751	0.716	0.961	0.898	0.772	0.820	6	Very high	Americas	
Venezuela	0.929	0.870	0.785	0.564	0.641	0.000	0.930	0.936	0.650	0.256	0.846	1.000	0.937	0.995	0.962	0.956	0.893	0.327	0.380	1.000	0.991	0.737	0.947	0.610	0.123	0.687	0.773	0.690	0.916	0.366	0.687	107	Medium	Americas	
Yemen	0.800	0.690	0.200	1.000	0.724	0.000	0.810	0.896	0.467	0.185	0.711	0.981	0.701	0.413	0.772	0.817	0.913	0.238	0.933	1.000	0.720	0.540	0.889	0.000	0.011	0.563	0.630	0.967	0.717	0.005	0.576	137	Low	Asia	
Zimbabwe	0.663	0.870	0.725	0.933	0.505	0.000	0.823	0.382	0.850	0.351	0.720	1.000	0.694	0.356	0.975	0.988	0.984	0.407	0.933	0.925	0.323	0.855	0.902	0.263	0.811	0.621	0.700	0.929	0.601	0.537	0.678	110	Medium	Africa	

Appendix 12. Country ranking assessed by the SCDI and HDI, from 2006 to 2015

Country	SCDI										HDI									
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Albania	46	48	47	44	46	46	42	42	46	45	68	70	87	70	64	70	70	95	75	75
Algeria	106	112	108	96	96	98	100	95	97	97	102	104	91	104	84	96	93	93	84	83
Angola	112	108	102	109	109	117	117	116	120	120	147	143	139	143	146	148	148	149	150	150
Argentina	80	79	79	75	75	74	76	77	80	79	45	49	50	49	46	45	45	49	45	45
Armenia	131	132	129	131	131	130	131	129	130	127	83	84	76	84	76	86	87	87	85	84
Australia	69	71	71	73	72	69	75	76	76	82	2	2	2	2	2	2	2	2	2	2
Austria	14	12	10	9	9	12	9	6	8	8	15	14	22	14	25	19	18	21	24	24
Bahrain	103	106	106	107	106	106	109	110	107	109	36	39	39	39	39	42	48	44	46	47
Barbados	60	52	57	57	65	70	69	73	71	73	37	37	51	37	42	47	38	59	54	54
Belarus	27	29	31	32	27	28	28	29	31	34	67	68	57	68	61	65	50	53	51	52
Belgium	87	88	85	89	89	87	87	96	96	96	17	17	20	17	18	18	17	21	21	22
Belize	40	43	44	78	48	50	47	38	39	39	88	93	81	93	78	93	96	84	103	103
Benin	116	115	116	117	113	111	111	113	116	114	157	161	151	161	134	167	166	165	168	167
Bhutan	7	4	4	4	4	4	4	3	3	2	130	132	-	132	-	141	140	136	132	132
Bolivia	66	64	55	51	55	54	56	55	53	51	110	113	106	113	95	108	108	113	118	118
Botswana	126	129	130	129	130	127	129	128	127	128	123	125	102	125	98	118	119	109	107	108
Brazil	26	26	26	24	23	25	27	21	24	21	73	75	-	75	73	84	85	79	79	79

Appendix

Country	SCDI										HDI									
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Brunei Darussalam	12	14	13	10	12	13	12	14	12	13	28	30	30	30	37	33	30	30	30	30
Bulgaria	75	74	70	72	76	79	80	80	81	81	57	61	55	61	58	55	57	58	57	56
Burkina Faso	111	111	109	108	108	108	108	109	105	106	173	177	169	177	161	181	183	181	185	185
Burundi	85	85	82	68	67	66	73	74	79	74	172	174	168	174	166	185	178	180	184	184
Cambodia	82	83	87	74	83	73	70	68	58	56	134	137	124	137	124	139	138	136	143	143
Cameroon	77	80	80	80	74	71	72	69	70	71	148	153	142	153	131	150	150	152	154	153
Canada	5	6	8	7	7	8	8	12	11	11	4	4	9	4	8	6	11	8	9	10
Cape Verde	113	113	111	112	111	112	112	112	112	111	118	121	115	121	118	133	132	123	122	122
Central African Republic	118	121	118	120	119	118	118	121	119	118	175	179	171	179	159	179	180	185	188	188
Chile	65	66	66	61	62	62	62	65	68	65	41	44	41	44	45	44	40	41	38	38
China	84	87	86	87	84	80	78	79	75	76	97	92	95	92	89	101	101	91	91	90
Colombia	43	41	42	39	40	40	39	39	38	31	78	77	88	77	79	87	91	98	95	95
Costa Rica	4	5	6	5	5	6	6	16	18	17	51	54	64	54	62	69	62	68	66	66
Côte d'Ivoire	83	82	84	82	78	78	77	75	73	69	160	163	159	163	149	170	168	171	172	171
Croatia	36	36	34	33	37	38	44	46	45	44	43	45	43	45	51	46	47	68	46	45
Cyprus	76	77	73	77	79	84	90	93	95	95	30	32	29	32	35	31	31	32	34	33
Czech Repub-	25	23	23	25	24	24	25	27	27	27	33	36	27	36	28	27	28	28	28	28

Appendix

Country	SCDI										HDI									
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
lic																				
Democratic Republic of the Congo	101	91	91	94	95	90	85	87	86	87	174	176	174	176	168	187	186	186	178	176
Denmark	11	11	11	12	11	11	7	11	10	10	14	16	9	16	19	16	15	10	6	5
Dominican Republic	102	97	97	99	98	102	96	97	88	90	87	90	93	90	88	98	96	102	101	99
Ecuador	71	67	75	63	61	60	63	58	56	55	75	80	89	80	77	83	89	98	87	89
Egypt	117	117	115	119	121	122	124	124	124	124	119	123	98	123	101	113	112	110	111	111
El Salvador	55	57	48	76	68	75	53	48	66	66	104	106	107	-	90	105	107	115	115	117
Eritrea	128	125	126	127	127	126	126	125	125	126	162	165	-	165	-	177	181	182	181	179
Estonia	6	7	5	8	14	10	10	8	7	9	38	40	31	40	34	34	33	33	31	30
Ethiopia	109	105	103	104	105	101	95	91	89	86	168	171	163	171	157	174	173	173	174	174
Fiji	13	16	16	19	19	19	18	18	19	19	105	108	78	108	86	100	96	88	91	91
Finland	8	8	7	6	8	5	5	5	6	5	12	12	16	12	16	22	21	24	23	23
France	29	27	28	29	28	31	31	30	33	32	10	8	18	8	14	20	20	20	22	21
Gabon	49	42	43	41	39	42	41	41	43	40	101	103	103	-	93	106	106	112	109	109
Gambia	129	128	125	128	128	128	127	127	129	129	165	168	156	168	151	168	165	172	173	173
Georgia	100	102	110	110	107	110	113	111	111	112	89	89	70	89	74	75	72	79	71	70

Appendix

Country	SCDI										HDI									
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Germany	23	24	25	23	22	22	22	24	23	24	20	22	5	22	10	9	5	6	4	4
Ghana	17	15	17	16	17	16	17	17	14	16	151	152	127	152	130	135	135	138	140	139
Greece	74	76	76	79	87	96	99	106	101	102	23	25	25	25	22	29	29	29	29	29
Guatemala	50	54	50	48	42	39	34	37	42	47	120	122	118	122	116	131	133	125	126	125
Guyana	41	46	52	49	51	47	52	59	57	58	111	114	112	114	104	117	118	121	125	127
Honduras	57	60	67	71	80	89	92	82	65	68	108	112	117	112	106	121	120	129	130	130
Hungary	35	35	39	42	43	41	43	44	41	41	38	43	37	43	36	38	37	43	43	43
Iceland	1	1	1	1	1	1	1	1	1	1	3	3	13	3	17	14	13	13	9	9
India	127	126	127	126	126	131	125	126	126	125	131	134	125	134	119	134	136	135	131	131
Indonesia	42	38	32	31	35	32	26	28	28	28	108	111	103	111	108	124	121	108	113	113
Iran	107	109	112	114	117	116	119	119	117	117	85	88	80	88	70	88	76	75	68	69
Ireland	16	18	20	22	26	27	32	32	30	29	5	5	5	5	5	7	7	11	8	8
Israel	86	86	83	88	85	85	84	85	84	85	26	27	17	27	15	17	16	19	19	19
Italy	59	56	56	59	60	63	67	70	78	78	18	18	22	18	23	24	25	26	27	26
Jamaica	97	101	105	105	103	92	86	89	83	83	89	100	81	100	80	79	85	96	94	94
Japan	51	50	54	54	56	56	58	60	63	62	10	10	15	10	11	12	10	17	17	17
Jordan	114	114	114	113	112	114	116	117	113	115	91	96	63	96	82	95	100	77	85	86
Kazakhstan	115	118	117	115	115	115	114	114	115	116	78	82	64	82	66	68	69	10	56	56

Appendix

Country	SCDI										HDI									
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Kenya	104	104	104	106	110	105	102	102	94	92	143	147	134	147	128	143	145	147	147	146
Kuwait	88	90	89	92	93	104	103	103	100	101	29	31	44	31	47	63	54	46	50	51
Kyrgyzstan	108	110	113	111	118	109	110	108	108	108	117	120	113	120	109	126	125	125	120	120
Lao People's Democratic Republic	45	44	37	35	30	26	24	19	17	15	129	133	131	133	122	138	138	139	137	138
Latvia	9	9	9	18	20	17	14	9	13	12	48	48	38	48	48	43	44	48	44	44
Lebanon	94	93	98	100	104	103	101	100	102	104	78	83	62	83	-	71	72	65	74	76
Lesotho	137	136	135	135	135	135	135	134	136	136	153	156	150	156	141	160	158	162	161	160
Liberia	96	84	69	58	50	52	50	49	54	54	166	169	166	169	162	182	174	175	177	177
Lithuania	22	22	24	26	32	30	29	26	26	26	44	46	34	46	44	40	41	35	37	37
Luxembourg	31	32	35	34	34	33	33	34	32	33	8	11	14	11	24	25	26	21	20	20
Madagascar	79	81	88	83	86	86	89	90	91	91	141	145	140	145	135	151	151	155	157	158
Malawi	58	65	64	56	59	58	61	62	61	59	158	160	162	160	153	171	170	174	170	170
Malaysia	24	25	22	21	21	21	20	20	20	20	64	66	59	66	57	61	64	62	59	59
Mali	133	133	133	132	133	133	133	133	133	133	176	178	164	178	160	175	182	176	175	175
Malta	93	94	99	103	102	94	97	92	93	94	33	38	40	38	33	36	32	39	35	33
Mauritania	138	138	138	138	138	138	138	138	138	138	148	154	147	154	136	159	155	161	155	157
Mauritius	28	33	36	36	33	35	38	36	35	36	77	81	67	81	72	77	80	63	64	64

Appendix

Country	SCDI										HDI									
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Mexico	73	73	78	85	88	88	88	88	92	93	51	53	68	53	56	57	61	71	77	77
Morocco	119	120	120	118	120	120	120	118	118	119	127	130	122	130	114	130	130	129	123	123
Namibia	134	134	136	136	134	134	134	135	135	135	126	128	120	128	105	120	128	127	126	125
Nepal	105	103	95	93	91	81	83	81	72	75	140	144	137	144	138	157	157	145	144	144
Netherlands	64	63	63	60	66	64	66	67	69	70	6	6	7	6	7	3	4	4	6	7
New Zealand	10	10	12	13	10	14	16	13	15	14	19	20	8	20	3	5	6	7	13	13
Nicaragua	30	28	29	27	25	23	23	25	25	25	120	124	119	124	115	129	129	132	124	124
Niger	135	135	134	134	136	136	136	136	134	134	179	182	173	182	167	186	186	187	187	187
Norway	2	2	2	2	2	2	2	2	2	3	1	1	1	1	1	1	1	1	1	1
Oman	99	100	100	101	101	100	98	101	98	98	53	56	77	56	-	89	84	56	53	52
Pakistan	123	116	119	116	116	119	115	115	114	113	138	141	130	141	125	145	146	146	148	147
Panama	39	40	41	45	45	44	37	43	40	43	59	60	61	60	54	58	59	65	60	60
Paraguay	15	13	15	14	13	9	11	10	9	7	99	101	100	101	96	107	111	111	110	110
Peru	89	89	90	86	81	83	79	78	74	72	81	78	84	78	63	80	77	82	89	87
Philippines	54	51	51	50	54	53	48	54	60	63	103	105	107	-	97	112	114	117	114	116
Poland	33	30	27	28	29	29	30	31	29	30	40	41	36	41	41	39	39	35	36	36
Portugal	37	39	40	38	38	43	54	51	50	50	31	34	41	34	40	41	43	41	41	41
Qatar	95	99	94	97	97	99	106	104	106	105	32	33	28	33	38	37	36	31	33	33

Appendix

Country	SCDI										HDI									
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Republic of Korea	47	49	49	47	49	51	49	52	52	52	24	26	19	26	12	15	12	15	18	18
Republic of Moldova	67	68	62	62	63	59	57	57	55	57	114	117	105	117	99	111	113	114	105	107
Romania	34	31	30	30	31	36	35	33	34	37	61	63	48	63	50	50	56	54	51	50
Russian Federation	44	45	45	46	47	48	46	47	47	46	72	71	54	71	65	66	55	57	48	49
Rwanda	52	58	61	53	53	55	55	50	48	48	164	167	156	167	152	166	167	151	162	159
Saudi Arabia	122	119	121	122	122	121	121	122	121	122	56	59	45	59	55	56	57	34	38	38
Senegal	125	127	128	125	125	123	122	123	123	121	163	166	143	166	144	155	154	163	163	162
Serbia	61	61	53	52	57	61	65	64	64	64	65	67	66	67	60	59	64	77	66	66
Sierra Leone	110	107	101	102	100	97	94	98	99	99	177	180	170	180	158	180	177	183	176	179
Slovakia	38	37	38	40	44	45	45	45	44	42	42	42	35	42	31	35	35	37	40	40
Slovenia	18	20	19	17	16	18	19	23	22	23	27	29	21	29	29	21	21	25	25	25
South Africa	132	130	131	130	129	129	130	131	131	131	125	129	111	129	110	123	121	118	119	119
Spain-	56	55	60	65	70	76	82	84	85	84	15	15	26	15	20	23	23	27	26	27
Sri Lanka	48	47	46	43	41	37	40	35	37	38	100	102	73	102	91	97	92	73	72	73
Sudan	130	131	132	133	132	132	132	132	132	132	145	150	153	150	154	169	171	166	165	165
Swaziland	78	75	77	69	71	65	60	56	51	53	137	142	132	142	121	140	141	148	149	148

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Country	SCDI										HDI									
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Sweden	3	3	3	3	3	3	3	4	4	4	6	7	11	7	9	10	7	12	15	14
Switzerland	20	21	21	20	18	20	21	22	21	22	8	9	4	9	13	11	9	3	3	2
Syrian Arab Republic	120	123	122	121	123	125	128	130	128	130	107	107	101	-	111	119	116	118	145	149
Tajikistan	90	96	93	91	90	91	93	94	103	100	123	127	121	127	112	127	125	133	129	129
Thailand	19	19	18	15	15	15	13	15	16	18	84	87	86	87	92	103	103	89	88	87
The former Yugoslav Republic of Macedonia	68	70	72	67	64	67	68	66	67	67	70	72	74	72	71	78	78	84	83	82
Togo	72	72	74	84	77	68	64	63	62	60	156	159	153	159	139	162	159	166	167	166
Trinidad and Tobago	53	53	58	55	52	49	51	53	49	49	61	64	57	64	59	62	67	64	64	65
Tunisia	91	92	92	95	99	107	105	105	104	103	97	98	85	98	81	94	94	90	97	97
Turkey	98	98	96	98	94	93	91	86	90	88	76	79	81	79	83	92	90	69	72	71
Turkmenistan	124	122	124	124	124	124	123	120	122	123	106	109	-	109	87	102	102	103	111	111
Uganda	81	78	81	81	82	77	81	83	82	80	155	157	148	157	143	161	161	164	165	163
Ukraine	63	59	59	64	73	82	74	72	87	89	82	85	71	85	69	76	78	83	81	84
United Kingdom	32	34	33	37	36	34	36	40	36	35	20	21	12	21	26	28	26	14	16	16

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Country	SCDI										HDI									
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
United Re- public of Tanzania	70	69	68	70	69	72	71	71	77	77	148	151	152	151	148	152	152	159	152	151
United States	62	62	65	66	58	57	59	61	59	61	12	13	3	13	4	4	3	5	11	10
Uruguay	21	17	14	11	6	7	15	7	5	6	46	50	52	50	52	48	51	50	54	54
Venezuela	92	95	107	90	92	95	104	99	109	107	60	58	60	58	75	73	71	67	70	71
Yemen	136	137	137	137	137	137	137	137	137	137	138	140	145	140	133	154	160	154	159	168
Zimbabwe	121	124	123	123	114	113	107	107	110	110	-	-	160	-	169	173	172	156	158	154

Appendix 13. Country ranking assessed by the SCDI, the HDI and the CDI

Country	Country ranking			Country	Country ranking		
	SCDI, 138 countries (for the year 2015)	HDI, 186 countries (for the year 2015)	CDI, 140 countries (for the year 2012)		CDI, 138 countries (for the year 2015)	HDI, 186 countries (for the year 2015)	CDI, 140 countries (for the year 2012)
Afghanistan	-	169	-	Denmark	10	5	20
Albania	45	75	75	Djibouti	-	172	135
Algeria	97	83	50	Dominica	-	96	-
Andorra	-	32	-	Dominican Republic	90	99	76
Angola	120	150	119	Ecuador	55	89	40
Antigua and Barbuda	-	62	-	Egypt	124	111	53
Argentina	79	45	24	El Salvador	66	117	48
Armenia	127	84	68	Equatorial Guinea	-	135	127
Australia	82	2	16	Eritrea	126	179	132
Austria	8	24	15	Estonia	9	30	-
Azerbaijan	-	78	87	Ethiopia	86	174	126
Bahamas	-	58	-	Fiji	19	91	-
Bahrain	109	47	30	Finland	5	23	14
Bangladesh	-	139	107	France	32	21	5
Barbados	73	54	-	Gabon	40	109	88
Belarus	34	52	33	Gambia	129	173	117
Belgium	96	22	12	Georgia	112	70	43
Belize	39	103	31	Germany	24	4	3
Benin	114	167	105	Ghana	16	139	109
Bhutan	2	132	91	Greece	102	29	-
Bolivia	51	118	70	Grenada	-	79	-
Bosnia and Herzegovina	-	81	-	Guatemala	47	125	72
Botswana	128	108	89	Guinea	-	183	121
Brazil	21	79	36	Guinea-Bissau	-	178	122
Brunei Darussalam	13	30	-	Guyana	58	127	74
Bulgaria	81	56	-	Haiti	-	163	125
Burkina Faso	106	185	138	Honduras	68	130	63
Burundi	74	184	124	Hungary	41	43	-

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Country	Country ranking			Country	Country ranking		
	SCDI, 138 countries	HDI, 186 countries	CDI, 140 countries		CDI, 138 countries	HDI, 186 countries	CDI, 140 countries
	(for the year 2015)	(for the year 2015)	(for the year 2012)		(for the year 2015)	(for the year 2015)	(for the year 2012)
Cambodia	56	143	93	Iceland	1	9	11
Cameroon	71	153	104	India	125	131	112
Canada	11	10	6	Indonesia	28	113	82
Cape Verde	111	122	-	Iran	117	69	60
Central African Republic	118	188	136	Iraq	-	121	81
Chad	-	186	139	Ireland	29	8	18
Chile	65	38	22	Israel	85	19	-
China	76	90	29	Italy	78	26	4
Colombia	31	95	52	Jamaica	83	94	66
Comoros	-	160	100	Japan	62	17	1
Congo	-	135	111	Jordan	115	86	45
Costa Rica	17	66	25	Kazakhstan	116	56	51
Côte d'Ivoire	69	171	128	Kenya	92	146	102
Croatia	44	45	17	Kiribati	-	137	-
Cuba		68	21	Kuwait	101	51	44
Cyprus	95	33		Kyrgyzstan	108	120	69
Czech Republic	27	28	28	Lao People's Democratic Republic	15	138	106
Democratic Republic of the Congo	87	176	137	Latvia	12	44	-
Country	Country ranking			Country	Country ranking		
	SCDI, 138 countries	HDI, 186 countries	CDI, 140 countries		CDI, 138 countries	HDI, 186 countries	CDI, 140 countries
	(for the year 2015)	(for the year 2015)	(for the year 2012)		(for the year 2015)	(for the year 2015)	(for the year 2012)
Lebanon	104	76	61	Republic of Korea	52	18	-
Lesotho	136	160	114	Republic of Moldova	57	107	56
Liberia	54	177	131	Romania	37	50	34
Libya	-	102	-	Russian Federation	46	49	37
Lithuania	26	37	-	Rwanda	48	159	99
Luxembourg	33	20	13	Saint Kitts	-	74	-

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Country	Country ranking			Country	Country ranking		
	SCDI, 138 countries (for the year 2015)	HDI, 186 countries (for the year 2015)	CDI, 140 countries (for the year 2012)		CDI, 138 countries (for the year 2015)	HDI, 186 countries (for the year 2015)	CDI, 140 countries (for the year 2012)
				and Nevis			
Madagascar	91	158	103	Saint Lucia	-	92	-
Malawi	59	170	98	Saint Vincent and the Grenadines	-	99	-
Malaysia	20	59	42	Samoa	-	104	-
Maldives	-	105	71	Sao Tome and Principe	-	142	86
Mali	133	175	133	Saudi Arabia	122	38	64
Malta	94	33	-	Senegal	121	162	108
Mauritania	138	157	116				
Mauritius	36	64	65	Serbia	64	66	-
Mexico	93	77	35	Seychelles	-	63	-
Micronesia (Fed. States of)	-	127	-	Sierra Leone	99	179	134
Mongolia	-	92	59	Singapore	-	5	-
Montenegro	-	48	-	Slovakia	42	40	-
Morocco	119	123	77	Slovenia	23	25	-
Mozambique	-	181	115	Solomon Islands	-	156	-
Myanmar	-	145	94	Somalia	-	-	141
Namibia	135	125	90	South Africa	131	119	84
Nepal	75	144	113	South Sudan	-	181	-
Netherlands	70	7	10	Spain	84	27	2
New Zealand	14	13	-	Sri Lanka	38	73	73
Nicaragua	25	124	57	State of Palestine	-	114	-
Niger	134	187	140	Sudan	132	165	129
Nigeria	-	152	130	Suriname	-	97	67
Norway	3	1	8	Swaziland	53	148	95
Oman	98	52	83	Sweden	4	14	19
Pakistan	113	147	120	Switzerland	22	2	7
Palau	-	60	-	Syrian Arab Republic	130	149	54
Panama	43	60	41	Turkey	88	71	47

Appendix

Country	Country ranking			Country	Country ranking		
	SCDI, 138 countries (for the year 2015)	HDI, 186 countries (for the year 2015)	CDI, 140 countries (for the year 2012)		CDI, 138 countries (for the year 2015)	HDI, 186 countries (for the year 2015)	CDI, 140 countries (for the year 2012)
Papua New Guinea	-	154	-	Turkmenistan	123	111	-
Paraguay	7	110	58	Uganda	80	163	97
Peru	72	87	38	Ukraine	89	84	-
Philippines	63	116	80	United Arab Emirates	-	42	62
Poland	30	36	-	United Kingdom	35	16	9
Portugal	50	41	-	United Republic of Tanzania	77	151	92
Qatar	105	33	39	United States	61	10	23
Tajikistan	100	129	85	Uruguay	6	54	27
Thailand	18	87	49	Uzbekistan	-	105	-
The former Yugoslav Republic of Macedonia	67	82	32	Vanuatu	-	134	-
Timor Leste	-	133	118	Venezuela	107	71	46
Togo	60	166	110	Viet Nam	-	115	79
Tonga	-	101	-	Yemen	137	168	123
Trinidad and Tobago	49	65	55	Zambia	-	139	101
Tunisia	103	97	26	Zimbabwe	110	154	96
Turkey	88	71	47				

Appendix 14. Country classification assessed by the SCDI and the HDI for the year 2015

Country	Country classification		Country	Country classification		Country	Country classification	
	SCDI	HDI		SCDI	HDI		SCDI	HDI
Albania	Very high	High	Ghana	High	Medium	Portugal	High	Very high
Algeria	Medium	High	Greece	Medium	Very high	Qatar	Medium	Very high
Angola	Low	Low	Guatemala	High	Medium	Republic of Korea	High	Very high
Argentina	Medium	Very high	Guyana	Medium	Medium	Republic of Moldova	Medium	Medium
Armenia	Low	High	Honduras	Medium	Medium	Romania	High	Very high
Australia	Medium	Very high	Hungary	High	Very high	Russian Federation	High	Very high
Austria	Very high	Very high	Iceland	Very high	Very high	Rwanda	High	Low
Bahrain	Medium	Very high	India	Low	Medium	Saudi Arabia	Low	Very high
Barbados	Medium	High	Indonesia	High	Medium	Senegal	Low	Low
Belarus	High	High	Iran	Medium	High	Serbia	Medium	High
Belgium	Medium	Very high	Ireland	High	Very high	Sierra Leone	Medium	Low
Belize	High	High	Israel	Medium	Very high	Slovakia	High	Very high
Benin	Medium	Low	Italy	Medium	Very high	Slovenia	High	Very high
Bhutan	Very high	Medium	Jamaica	Medium	High	South Africa	Low	Medium
Bolivia	High	Medium	Japan	Medium	Very high	Spain	Medium	Very high
Botswana	Low	Medium	Jordan	Medium	High	Sri Lanka	High	High
Brazil	High	High	Kazakhstan	Medium	High	Sudan	Low	Low
Brunei Darussalam	Very high	Very high	Kenya	Medium	Medium	Swaziland	Medium	Low
Bulgaria	Medium	High	Kuwait	Medium	Very high	Sweden	Very high	Very high
Burkina Faso	Medium	Low	Kyrgyzstan	Medium	Medium	Switzerland	High	Very high
Burundi	Medium	Low	Lao People's Democratic Republic	Very high	Medium	Syrian Arab Republic	Low	Low
Cambodia	Medium	Medium	Latvia	Very high	Very high	Tajikistan	Medium	Medium
Cameroon	Medium	Low	Lebanon	Medium	High	Thailand	High	High

Country	Country classification		Country	Country classification		Country	Country classification	
	SCDI	HDI		SCDI	HDI		SCDI	HDI
Canada	Very high	Very high	Lesotho	Low	Low	The former Yugoslav Republic of Macedonia	Medium	High
Cape Verde	Medium	Medium	Liberia	Medium	Low	Togo	Medium	Low
Central African Republic	Low	Low	Lithuania	High	Very high	Trinidad and Tobago	High	High
Chile	Medium	Very high	Luxembourg	High	Very high	Tunisia	Medium	High
China	Medium	High	Madagascar	Medium	Low	Turkey	Medium	High
Colombia	High	High	Malawi	Medium	Low	Turkmenistan	Low	Medium
Costa Rica	High	High	Malaysia	High	High	Uganda	Medium	Low
Côte d'Ivoire	Medium	Low	Mali	Low	Low	Ukraine	Medium	High
Croatia	High	Very high	Malta	Medium	Very high	United Kingdom	High	Very high
Cyprus	Medium	Very high	Mauritania	Low	Low	United Republic of Tanzania	Medium	Low
Czech Republic	High	Very high	Mauritius	High	High	United States	Medium	Very high
Democratic Republic of the Congo	Medium	Low	Mexico	Medium	High	Uruguay	Very high	High
Denmark	Very high	Very high	Morocco	Low	Medium	Venezuela	Medium	High
Dominican Republic	Medium	High	Namibia	Low	Medium	Yemen	Low	Low
Ecuador	Medium	High	Nepal	Medium	Medium	Zimbabwe	Medium	Low
Egypt	Low	Medium	Netherlands	Medium	Very high			
El Salvador	Medium	Medium	New Zealand	Very high	Very high			
Eritrea	Low	Low	Nicaragua	High	Medium			
Estonia	Very high	Very high	Niger	Low	Low			
Ethiopia	Medium	Low	Norway	Very	Very high			

Country	Country classification		Country	Country classification		Country	Country classification	
	SCDI	HDI		SCDI	HDI		SCDI	HDI
				high				
Fiji	High	High	Oman	Medium	High			
Finland	Very high	Very high	Pakistan	Medium	Medium			
France	High	Very high	Panama	High	High			
Gabon	High	Medium	Paraguay	Very high	Medium			
Gambia	Low	Low	Peru	Medium	High			
Georgia	Medium	High	Philippines	Medium	Medium			
Germany	High	Very high	Poland	High	Very high			

Appendix 15. Statistical data collected for the six indicators considered in the path analysis

The SCDI criterion	Adolescent fertility	Children married or in union	Children involved in child labor	Household and ambient air pollution	Public expenditure on tertiary education	Enrolment in tertiary education	Completion of tertiary education
Indicator	Adolescent fertility rate (per 1000 girls aged 15-19 years)	Percentage of women aged 20 to 24 years who were first married or in union before ages 18	Percentage of children aged 5-14 engaged in child labor	Mortality rate attributed to household and ambient air pollution (per 100,000 population)	Government expenditure on tertiary education as a percentage of GDP (%)	Gross enrolment ratio, tertiary, both sexes (%)	Gross graduation ratio from first degree programmes (ISCED 6 and 7) in tertiary education, both sexes (%)
Reference year of data	Year 2015	Year 2003-2015	Year 2003-2015	Year 2012	Year 2003-2015	Year 2003-2015	Year 2003-2015
Data source	World Bank (2017)	United Nations Children's Funds (2017)		World Health Organization (2017)	United Nations Educational, Scientific and Cultural Organization (2017)		
Afghanistan	71.203	32.800	29.400	113.00	0.529	8.663	-
Albania	21.835	9.600	5.100	171.00	0.776	58.110	36.813
Algeria	10.472	2.500	5.000	32.00	1.174	36.922	32.176
Andorra	-	-	-	27.00	0.178	-	-
Angola	161.932	-	-	104.00	0.249	9.308	-
Antigua and Barbuda	43.865	-	-	22.00	0.188	23.486	2.015
Argentina	63.789	-	4.400	26.00	1.087	82.917	11.041
Armenia	22.461	7.200	3.900	125.00	0.357	44.310	37.485
Australia	13.844	-	-	0.40	1.387	90.307	72.550
Austria	6.786	-	-	34.00	1.788	81.541	34.858
Azerbaijan	60.994	11.000	6.500	68.00	0.356	25.483	17.675
Bahamas	28.699	-	-	20.00	-	-	-
Bahrain	13.421	-	-	11.00	-	43.263	8.966
Bangladesh	82.550	52.300	4.300	68.00	0.385	13.441	7.270
Barbados	39.440	10.700	1.900	18.00	2.582	65.432	29.923
Belarus	17.551	3.200	1.400	104.00	0.829	87.941	63.607

Appendix

The SCDI criterion	Adolescent fertility	Children married or in union	Children involved in child labor	Household and ambient air pollution	Public expenditure on tertiary education	Enrolment in tertiary education	Completion of tertiary education
Indicator	Adolescent fertility rate (per 1000 girls aged 15-19 years)	Percentage of women aged 20 to 24 years who were first married or in union before ages 18	Percentage of children aged 5-14 engaged in child labor	Mortality rate attributed to household and ambient air pollution (per 100,000 population)	Government expenditure on tertiary education as a percentage of GDP (%)	Gross enrolment ratio, tertiary, both sexes (%)	Gross graduation ratio from first degree programmes (ISCED 6 and 7) in tertiary education, both sexes (%)
Reference year of data	Year 2015	Year 2003-2015	Year 2003-2015	Year 2012	Year 2003-2015	Year 2003-2015	Year 2003-2015
Data source	World Bank (2017)	United Nations Children's Funds (2017)		World Health Organization (2017)	United Nations Educational, Scientific and Cultural Organization (2017)		
Belgium	8.057	-	-	30.00	1.452	75.037	44.433
Belize	65.135	25.900	3.200	19.00	0.835	23.290	6.779
Benin	81.775	31.900	15.300	92.00	0.966	15.363	-
Bhutan	20.179	25.800	2.900	60.00	0.612	10.927	-
Bolivia (Plurinational State of)	70.431	21.700	26.400	52.00	1.910	38.391	-
Bosnia and Herzegovina	8.169	3.500	5.300	224.00	-	--	-
Botswana	30.973	-	9.000	38.00	3.999	27.531	6.742
Brazil	66.743	35.600	8.100	21.00	1.089	50.605	27.121
Brunei Darussalam	20.788	-	-	0.20	1.070	30.845	12.936
Bulgaria	36.837	-	-	175.00	0.647	73.934	49.561
Burkina Faso	107.151	51.600	39.200	96.00	0.555	4.776	2.101
Burundi	27.855	20.400	26.300	106.00	1.313	4.966	4.084
Cambodia	52.172	18.500	19.300	71.00	0.123	13.088	4.215
Cameroon	102.360	38.400	47.000	90.00	0.309	17.478	-
Canada	9.458	-	-	5.40	1.642	-	39.562
Cape Verde	73.156	18.000	6.400	58.00	0.790	21.708	5.712
Central African Re-	90.659	67.900	28.500	96.00	0.334	2.774	-

Appendix

The SCDI criterion	Adolescent fertility	Children married or in union	Children involved in child labor	Household and ambient air pollution	Public expenditure on tertiary education	Enrolment in tertiary education	Completion of tertiary education
Indicator	Adolescent fertility rate (per 1000 girls aged 15-19 years)	Percentage of women aged 20 to 24 years who were first married or in union before ages 18	Percentage of children aged 5-14 engaged in child labor	Mortality rate attributed to household and ambient air pollution (per 100,000 population)	Government expenditure on tertiary education as a percentage of GDP (%)	Gross enrolment ratio, tertiary, both sexes (%)	Gross graduation ratio from first degree programmes (ISCED 6 and 7) in tertiary education, both sexes (%)
Reference year of data	Year 2015	Year 2003-2015	Year 2003-2015	Year 2012	Year 2003-2015	Year 2003-2015	Year 2003-2015
Data source	World Bank (2017)	United Nations Children's Funds (2017)		World Health Organization (2017)	United Nations Educational, Scientific and Cultural Organization (2017)		
public							
Chad	129.752	68.100	26.100	122.00	0.903	3.445	-
Chile	47.503	-	6.600	22.00	1.264	88.577	12.962
China	7.261	-	-	163.00	-	43.392	25.705
Colombia	48.682	23.000	9.700	24.00	0.960	55.657	21.111
Comoros	67.104	31.600	22.000	63.00	0.452	8.928	4.952
Congo	116.122	32.600	23.300	90.00	0.705	9.719	-
Cook Islands	119.000	-	-	10.00	0.346	44.606	-
Costa Rica	56.026	21.200	4.100	19.00	1.597	53.630	50.325
Côte d'Ivoire	135.626	33.200	26.400	90.00	1.080	9.155	-
Croatia	9.170	-	-	90.00	1.001	69.052	48.543
Cuba	45.110	26.000	-	51.00	2.981	36.280	36.618
Cyprus	4.892	-	-	20.00	1.078	60.101	26.633
Czech Republic	9.683	-	-	59.00	0.878	64.967	39.034
Democratic People's Republic of Korea	0.522	-	-	234.00	-	28.059	20.091
Democratic Republic of the Congo	122.277	37.300	38.400	116.00	0.493	6.641	-
Denmark	3.961	-	-	20.00	2.320	82.787	55.720

Appendix

The SCDI criterion	Adolescent fertility	Children married or in union	Children involved in child labor	Household and ambient air pollution	Public expenditure on tertiary education	Enrolment in tertiary education	Completion of tertiary education
Indicator	Adolescent fertility rate (per 1000 girls aged 15-19 years)	Percentage of women aged 20 to 24 years who were first married or in union before ages 18	Percentage of children aged 5-14 engaged in child labor	Mortality rate attributed to household and ambient air pollution (per 100,000 population)	Government expenditure on tertiary education as a percentage of GDP (%)	Gross enrolment ratio, tertiary, both sexes (%)	Gross graduation ratio from first degree programmes (ISCED 6 and 7) in tertiary education, both sexes (%)
Reference year of data	Year 2015	Year 2003-2015	Year 2003-2015	Year 2012	Year 2003-2015	Year 2003-2015	Year 2003-2015
Data source	World Bank (2017)	United Nations Children's Funds (2017)		World Health Organization (2017)	United Nations Educational, Scientific and Cultural Organization (2017)		
Djibouti	21.182	5.400	7.700	40.00	0.739	4.985	2.444
Dominica	-	-	-	28.00	-	-	-
Dominican Republic	97.340	36.500	12.800	29.00	0.297	50.116	22.305
Ecuador	75.596	22.200	3.000	15.00	2.160	40.481	22.490
Egypt	51.331	17.400	7.000	52.00	-	36.229	25.032
El Salvador	64.916	25.400	19.000	45.00	0.279	29.131	12.214
Equatorial Guinea	107.531	29.500	27.800	98.00	-	-	-
Eritrea	53.002	40.700	-	76.00	1.004	2.565	1.214
Estonia	12.436	-	-	54.00	1.438	69.550	43.525
Ethiopia	56.612	41.000	27.400	57.00	1.922	8.126	4.696
Fiji	45.195	-	-	77.00	0.876	16.137	8.719
Finland	6.377	-	-	6.00	2.001	87.290	53.001
France	8.815	-	-	17.00	1.240	64.390	47.023
Gabon	97.692	21.900	13.400	47.00	1.009	8.435	5.909
Gambia	112.463	30.400	19.200	71.00	0.297	3.104	0.112
Georgia	38.329	14.000	18.400	292.00	0.380	43.420	24.573
Germany	6.428	-	-	33.00	1.317	68.266	32.793
Ghana	66.126	20.700	21.800	81.00	1.129	16.231	9.211
Greece	7.235	-	-	45.00	1.433	113.872	27.417

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The SCDI criterion	Adolescent fertility	Children married or in union	Children involved in child labor	Household and ambient air pollution	Public expenditure on tertiary education	Enrolment in tertiary education	Completion of tertiary education
Indicator	Adolescent fertility rate (per 1000 girls aged 15-19 years)	Percentage of women aged 20 to 24 years who were first married or in union before ages 18	Percentage of children aged 5-14 engaged in child labor	Mortality rate attributed to household and ambient air pollution (per 100,000 population)	Government expenditure on tertiary education as a percentage of GDP (%)	Gross enrolment ratio, tertiary, both sexes (%)	Gross graduation ratio from first degree programmes (ISCED 6 and 7) in tertiary education, both sexes (%)
Reference year of data	Year 2015	Year 2003-2015	Year 2003-2015	Year 2012	Year 2003-2015	Year 2003-2015	Year 2003-2015
Data source	World Bank (2017)	United Nations Children's Funds (2017)		World Health Organization (2017)	United Nations Educational, Scientific and Cultural Organization (2017)		
Grenada	29.564	-	-	25.00	0.384	91.148	60.449
Guatemala	80.088	30.300	25.800	43.00	0.408	21.847	1.439
Guinea	139.572	51.700	28.300	88.00	1.256	10.849	8.503
Guinea-Bissau	87.529	22.000	38.000	105.00	0.085	2.501	-
Guyana	87.577	23.000	18.300	43.00	0.162	12.481	2.981
Haiti	38.880	17.500	24.400	113.00	-	-	-
Honduras	64.268	33.600	15.300	53.00	0.896	22.059	10.911
Hungary	17.707	-	-	123.00	0.766	50.862	34.099
Iceland	5.653	-	-	6.40	1.511	81.260	61.855
India	23.292	47.400	11.800	130.00	1.096	26.875	28.701
Indonesia	49.249	13.600	6.900	84.00	0.568	24.255	15.170
Iran (Islamic Republic of)	26.342	16.700	11.400	35.00	0.861	71.881	32.069
Iraq	84.850	24.300	4.700	32.00	-	16.057	10.847
Ireland	10.095	-	-	17.00	1.145	83.778	42.333
Israel	9.308	-	-	16.00	0.878	64.747	45.273
Italy	5.935	-	-	35.00	0.799	62.496	38.204
Jamaica	58.785	7.900	3.300	43.00	0.950	27.220	-
Japan	3.971	-	-	24.00	0.746	63.363	47.087

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The SCDI criterion	Adolescent fertility	Children married or in union	Children involved in child labor	Household and ambient air pollution	Public expenditure on tertiary education	Enrolment in tertiary education	Completion of tertiary education
Indicator	Adolescent fertility rate (per 1000 girls aged 15-19 years)	Percentage of women aged 20 to 24 years who were first married or in union before ages 18	Percentage of children aged 5-14 engaged in child labor	Mortality rate attributed to household and ambient air pollution (per 100,000 population)	Government expenditure on tertiary education as a percentage of GDP (%)	Gross enrolment ratio, tertiary, both sexes (%)	Gross graduation ratio from first degree programmes (ISCED 6 and 7) in tertiary education, both sexes (%)
Reference year of data	Year 2015	Year 2003-2015	Year 2003-2015	Year 2012	Year 2003-2015	Year 2003-2015	Year 2003-2015
Data source	World Bank (2017)	United Nations Children's Funds (2017)		World Health Organization (2017)	United Nations Educational, Scientific and Cultural Organization (2017)		
Jordan	22.644	8.400	1.600	22.00	-	44.870	44.331
Kazakhstan	27.191	6.100	2.200	93.00	0.425	46.040	67.192
Kenya	90.219	22.900	-	57.00	0.690	4.047	-
Kiribati	16.380	20.300	-	48.00	-	-	-
Kuwait	9.446	-	-	14.00	1.226	27.027	12.107
Kyrgyzstan	39.197	11.600	25.800	100.00	0.256	46.901	33.985
Lao People's Democratic Republic	63.734	35.400	10.100	108.00	0.459	16.906	12.883
Latvia	13.287	-	-	115.00	1.126	67.040	34.598
Lebanon	12.185	6.100	1.900	30.00	0.739	38.485	28.086
Lesotho	93.174	18.800	-	75.00	4.134	9.842	3.340
Liberia	107.121	35.900	20.800	70.00	0.870	11.639	-
Libya	6.158	-	-	33.00	-	61.137	-
Lithuania	10.400	-	-	73.00	1.327	68.531	57.476
Luxembourg	5.728	-	-	20.00	0.517	19.407	8.474
Madagascar	114.820	41.200	22.900	84.00	0.415	4.776	1.787
Malawi	135.349	46.300	39.300	72.00	1.358	0.798	0.494
Malaysia	13.717	-	-	22.00	1.354	26.074	15.179
Maldives	6.214	3.900	-	21.00	0.666	16.227	-

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The SCDI criterion	Adolescent fertility	Children married or in union	Children involved in child labor	Household and ambient air pollution	Public expenditure on tertiary education	Enrolment in tertiary education	Completion of tertiary education
Indicator	Adolescent fertility rate (per 1000 girls aged 15-19 years)	Percentage of women aged 20 to 24 years who were first married or in union before ages 18	Percentage of children aged 5-14 engaged in child labor	Mortality rate attributed to household and ambient air pollution (per 100,000 population)	Government expenditure on tertiary education as a percentage of GDP (%)	Gross enrolment ratio, tertiary, both sexes (%)	Gross graduation ratio from first degree programmes (ISCED 6 and 7) in tertiary education, both sexes (%)
Reference year of data	Year 2015	Year 2003-2015	Year 2003-2015	Year 2012	Year 2003-2015	Year 2003-2015	Year 2003-2015
Data source	World Bank (2017)	United Nations Children's Funds (2017)		World Health Organization (2017)	United Nations Educational, Scientific and Cultural Organization (2017)		
Mali	173.741	55.000	21.400	116.00	0.807	6.875	-
Malta	16.380	-	-	31.00	1.511	47.422	35.441
Marshall Islands	-	26.300	-	26.00	-	42.862	-
Mauritania	77.903	34.300	14.600	64.00	0.339	5.622	3.485
Mauritius	28.317	-	-	21.00	0.333	36.668	-
Mexico	62.204	22.900	4.200	24.00	1.133	29.941	20.279
Micronesia (Fed. States of)	14.264	-	-	41.00	-	-	-
Monaco	-	-	-	23.00	0.054	-	-
Mongolia	15.002	4.700	15.200	132.00	0.176	68.567	52.261
Montenegro	12.031	4.500	12.500	124.00		55.345	-
Morocco	31.365	15.900	8.300	29.00	1.062	28.144	4.772
Mozambique	136.928	48.200	22.200	65.00	0.888	6.391	0.233
Myanmar	16.247	-	-	127.00		13.528	13.098
Namibia	76.213	6.900	-	48.00	1.928	9.330	7.132
Nauru	-	26.800	-	2.90	-	-	-
Nepal	71.288	36.600	37.400	104.00	0.401	14.940	9.721
Netherlands	3.884	-	-	24.00	1.690	78.501	48.247
New Zealand	23.252	-	-	0.50	1.628	83.931	55.975

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The SCDI criterion	Adolescent fertility	Children married or in union	Children involved in child labor	Household and ambient air pollution	Public expenditure on tertiary education	Enrolment in tertiary education	Completion of tertiary education
Indicator	Adolescent fertility rate (per 1000 girls aged 15-19 years)	Percentage of women aged 20 to 24 years who were first married or in union before ages 18	Percentage of children aged 5-14 engaged in child labor	Mortality rate attributed to household and ambient air pollution (per 100,000 population)	Government expenditure on tertiary education as a percentage of GDP (%)	Gross enrolment ratio, tertiary, both sexes (%)	Gross graduation ratio from first degree programmes (ISCED 6 and 7) in tertiary education, both sexes (%)
Reference year of data	Year 2015	Year 2003-2015	Year 2003-2015	Year 2012	Year 2003-2015	Year 2003-2015	Year 2003-2015
Data source	World Bank (2017)	United Nations Children's Funds (2017)		World Health Organization (2017)	United Nations Educational, Scientific and Cultural Organization (2017)		
Nicaragua	88.055	40.600	14.500	62.00	1.168	-	-
Niger	201.163	76.300	30.500	110.00	0.934	1.715	0.962
Nigeria	109.304	42.800	24.700	90.00	-	10.071	-
Niue	-	-	-	5.70	-	-	-
Norway	5.855	-	-	13.00	1.913	76.783	47.512
Oman	7.547	-	-	13.00	1.126	-	-
Pakistan	38.322	21.000	-	89.00	0.603	9.927	-
Palau	-	-	-	0.90	-	61.864	-
Panama	73.732	26.400	5.600	25.00	0.705	38.739	24.127
Papua New Guinea	54.432	21.300	-	44.00	-	-	-
Paraguay	56.855	17.900	27.600	57.00	1.110	35.081	-
Peru	48.448	18.600	33.500	33.00	0.640	40.513	-
Philippines	62.654	15.000	11.100	83.00	0.317	35.753	19.637
Poland	13.135	-	-	69.00	1.185	68.114	47.603
Portugal	9.450	-	3.400	17.00	0.914	61.874	51.412
Qatar	10.483	4.200	-	9.00	-	14.518	3.580
Republic of Korea	1.589	-	-	24.00	1.049	93.179	46.856
Republic of Moldova	22.028	12.200	16.300	115.00	1.284	41.213	33.359
Romania	34.034	-	-	138.00	0.677	53.220	45.151

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The SCDI criterion	Adolescent fertility	Children married or in union	Children involved in child labor	Household and ambient air pollution	Public expenditure on tertiary education	Enrolment in tertiary education	Completion of tertiary education
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Reference year of data	Year 2015	Year 2003-2015	Year 2003-2015	Year 2012	Year 2003-2015	Year 2003-2015	Year 2003-2015
Data source	World Bank (2017)	United Nations Children's Funds (2017)		World Health Organization (2017)	United Nations Educational, Scientific and Cultural Organization (2017)		
Russian Federation	22.733	-	-	110.00	0.817	80.394	61.484
Rwanda	25.625	8.100	28.500	68.00	0.792	7.897	2.936
Saint Kitts and Nevis	-	-	-	-	0.428	79.565	-
Saint Lucia	53.425	7.500	3.900	26.00	0.215	16.766	3.276
Saint Vincent and the Grenadines	50.333	-	-	26.00	0.356	-	-
Samoa	24.290	10.800	-	32.00	-	-	-
San Marino	-	-	-	-	0.257	59.849	-
Sao Tome and Principe	83.456	34.400	26.000	70.00	0.361	13.406	-
Saudi Arabia	8.406	-	-	28.00	-	63.066	28.531
Senegal	76.877	32.300	14.500	43.00	2.133	10.387	-
Serbia	18.695	3.200	9.500	137.00	1.291	58.288	23.593
Seychelles	56.896	-	-	1.10	1.173	14.256	10.227
Sierra Leone	116.732	38.900	37.400	142.00	0.818	-	-
Singapore	3.796	-	-	21.00	1.029	-	-
Slovakia	19.940	-	-	66.00	0.975	52.924	40.295
Slovenia	3.633	-	-	42.00	1.127	82.926	60.724
Solomon Islands	47.379	22.400	-	53.00	-	-	-

Appendix

The SCDI criterion	Adolescent fertility	Children married or in union	Children involved in child labor	Household and ambient air pollution	Public expenditure on tertiary education	Enrolment in tertiary education	Completion of tertiary education
Indicator	Adolescent fertility rate (per 1000 girls aged 15-19 years)	Percentage of women aged 20 to 24 years who were first married or in union before ages 18	Percentage of children aged 5-14 engaged in child labor	Mortality rate attributed to household and ambient air pollution (per 100,000 population)	Government expenditure on tertiary education as a percentage of GDP (%)	Gross enrolment ratio, tertiary, both sexes (%)	Gross graduation ratio from first degree programmes (ISCED 6 and 7) in tertiary education, both sexes (%)
Reference year of data	Year 2015	Year 2003-2015	Year 2003-2015	Year 2012	Year 2003-2015	Year 2003-2015	Year 2003-2015
Data source	World Bank (2017)	United Nations Children's Funds (2017)		World Health Organization (2017)	United Nations Educational, Scientific and Cultural Organization (2017)		
Somalia	102.617	45.300	49.000	117.00	-	-	-
South Africa	44.440	5.600	-	44.00	0.735	19.375	7.987
South Sudan	63.429	51.500	-	95.00	0.425	-	-
Spain	8.311	-	-	15.00	0.961	89.670	51.224
Sri Lanka	14.153	11.800	2.500	119.00	0.422	19.797	11.076
State of Palestine	-	15.300	5.700	-	-	44.283	30.541
Sudan	72.050	32.900	24.900	64.00	-	16.321	10.100
Suriname	45.739	18.800	4.100	23.00	-	-	-
Swaziland	67.234	6.500	7.300	63.00	0.940	5.329	8.364
Sweden	5.695	-	-	0.40	1.940	62.301	33.467
Switzerland	2.840	-	-	18.00	1.344	57.672	51.332
Syrian Arab Republic	38.877	13.300	4.000	31.00	1.243	44.049	11.404
Tajikistan	37.786	11.600	10.000	98.00	0.520	26.375	10.714
Thailand	44.605	22.100	8.300	65.00	0.642	48.857	26.989
The former Yugoslav Republic of Macedonia	17.264	6.900	12.500	129.00	-	42.063	32.126
Timor Leste	45.482	18.900	-	90.00	0.320	18.150	25.464
Togo	92.065	21.800	27.900	81.00	0.904	10.626	-

Appendix

The SCDI criterion	Adolescent fertility	Children married or in union	Children involved in child labor	Household and ambient air pollution	Public expenditure on tertiary education	Enrolment in tertiary education	Completion of tertiary education
Indicator	Adolescent fertility rate (per 1000 girls aged 15-19 years)	Percentage of women aged 20 to 24 years who were first married or in union before ages 18	Percentage of children aged 5-14 engaged in child labor	Mortality rate attributed to household and ambient air pollution (per 100,000 population)	Government expenditure on tertiary education as a percentage of GDP (%)	Gross enrolment ratio, tertiary, both sexes (%)	Gross graduation ratio from first degree programmes (ISCED 6 and 7) in tertiary education, both sexes (%)
Reference year of data	Year 2015	Year 2003-2015	Year 2003-2015	Year 2012	Year 2003-2015	Year 2003-2015	Year 2003-2015
Data source	World Bank (2017)	United Nations Children's Funds (2017)		World Health Organization (2017)	United Nations Educational, Scientific and Cultural Organization (2017)		
Tonga	14.860	5.600	-	30.00	0.849	6.349	-
Trinidad and Tobago	30.835	8.100	0.700	28.00	-	11.951	5.092
Tunisia	6.805	1.600	2.100	44.00	1.585	34.607	24.407
Turkey	26.811	14.700	5.900	51.00	1.583	94.732	31.678
Turkmenistan	16.048	7.300	-	73.00	0.282	7.984	-
Tuvalu	-	9.900	-	18.00	-	-	-
Uganda	108.946	39.700	16.300	70.00	0.361	4.483	1.957
Ukraine	23.351	9.100	2.400	139.00	1.848	82.305	-
United Arab Emirates	30.068	-	-	7.50	-	-	-
United Kingdom	13.950	-	-	26.00	1.297	56.477	52.673
United Republic of Tanzania	117.721	36.900	28.800	50.00	0.745	3.647	0.445
United States	21.154	-	-	12.00	1.751	85.796	40.415
Uruguay	55.780	24.600	7.900	23.00	1.169	55.566	-
Uzbekistan	17.600	7.200	-	83.00	-	8.788	11.354
Vanuatu	42.746	21.400	15.200	54.00	0.339	4.744	-
Venezuela (Bolivarian Republic of)	79.052	-	-	21.00	1.554	76.980	18.263

Appendix

The SCDI criterion	Adolescent fertility	Children married or in union	Children involved in child labor	Household and ambient air pollution	Public expenditure on tertiary education	Enrolment in tertiary education	Completion of tertiary education
Indicator	Adolescent fertility rate (per 1000 girls aged 15-19 years)	Percentage of women aged 20 to 24 years who were first married or in union before ages 18	Percentage of children aged 5-14 engaged in child labor	Mortality rate attributed to household and ambient air pollution (per 100,000 population)	Government expenditure on tertiary education as a percentage of GDP (%)	Gross enrolment ratio, tertiary, both sexes (%)	Gross graduation ratio from first degree programmes (ISCED 6 and 7) in tertiary education, both sexes (%)
Reference year of data	Year 2015	Year 2003-2015	Year 2003-2015	Year 2012	Year 2003-2015	Year 2003-2015	Year 2003-2015
Data source	World Bank (2017)	United Nations Children's Funds (2017)		World Health Organization (2017)	United Nations Educational, Scientific and Cultural Organization (2017)		
Viet Nam	39.149	10.600	16.400	84.00	0.849	28.836	19.529
Yemen	60.695	31.900	22.700	57.00	-	9.975	-
Zambia	87.857	31.400	40.600	64.00	0.447	3.981	-
Zimbabwe	108.937	33.500	-	53.00	1.419	8.433	1.069

**Appendix 16. Results of the correlation analysis of the seven indicators considered
in the path analysis**

		Mortality rate attributed to household and ambient air pollution (per 100 000 population)	Adolescent fertility rate (per 1000 girls aged 15-19 years)	Gross graduation ratio from first degree programmes (ISCED 6 and 7) in tertiary education, both sexes (%)	Gross enrolment ratio, tertiary, both sexes (%)	Government expenditure on education as % of GDP (%)	Percentage of women aged 20 to 24 years who were first married or in union before ages 18	Percentage of children aged 5-14 engaged in child labor
Mortality rate attributed to household and ambient air pollution (per 100 000 population)	Correlation Coefficient	1.000	0.323**	-0.193*	-0.340**	-0.319**	0.147	0.380**
	Sig. (2-tailed)		0.000	0.021	0.000	0.000	0.106	0.000
	N	192	184	144	178	176	122	111
Adolescent fertility rate (per 1000 girls aged 15-19 years)	Correlation Coefficient	0.323**	1.000	-0.498**	-0.658**	-0.217**	0.801**	0.620**
	Sig. (2-tailed)	0.000		0.000	0.000	0.004	0.000	0.000
	N	184	184	143	176	171	119	111
Gross graduation ratio from first degree programmes (ISCED 6 and 7) in tertiary education, both sexes (%)	Correlation Coefficient	-0.193*	-0.498**	1.000	0.667**	0.281**	-0.341**	-0.440**
	Sig. (2-tailed)	0.021	0.000		0.000	0.001	0.001	0.000
	N	144	143	145	145	140	87	88
Gross enrolment ratio, tertiary, both sexes (%)	Correlation Coefficient	-0.340**	-0.658**	0.667**	1.000	0.254**	-0.480**	-0.630**
	Sig. (2-tailed)	0.000	0.000	0.000		0.001	0.000	0.000
	N	178	176	145	181	170	116	110
Government expenditure on education as % of GDP (%)	Correlation Coefficient	-0.319**	-0.217**	0.281**	0.254**	1.000	-0.187*	-0.154
	Sig. (2-tailed)	0.000	0.004	0.001	0.001		0.050	0.118
	N	176	171	140	170	179	111	104
Percentage of women aged 20 to 24 years who were first married or in union before ages 18	Correlation Coefficient	0.147	0.801**	-0.341**	-0.480**	-0.187*	1.000	0.592**
	Sig. (2-tailed)	0.106	0.000	0.001	0.000	0.050		0.000
	N	122	119	87	116	111	123	104
Percentage of children aged 5-14 engaged in child labor	Correlation Coefficient	0.380**	0.620**	-0.440**	-0.630**	-0.154	0.592**	1.000
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.118	0.000	
	N	111	111	88	110	104	104	112

** . Correlation is significant at the 0.01 level (2-tailed); * . Correlation is significant at the 0.05 level (2-tailed).

Appendix 17. Hypotheses for potential relation between the six selected criteria and the criterion completion of tertiary education

No. of Hypothesis	Hypothesis of relation	Pathway
H1	Children married or in union will have a positive relation to adolescent fertility, and will be a predictor of adolescent fertility	P1
H2	Children married or in union will have a negative relation to enrolment in tertiary education, and will be a predictor of enrolment in tertiary education	P2
H3	Adolescent fertility will have a negative relation to enrolment in tertiary education, and will be a predictor of enrolment in tertiary education	P3
H4	Children involved in child labor will have a negative relation to enrolment in tertiary education, and will be a predictor of enrolment in tertiary education	P4
H5	Public expenditure on tertiary education will have a positive relation to enrolment in tertiary education, and will be a predictor of enrolment in tertiary education	P5
H6	Household and ambient air pollution will have a negative relation to enrolment in tertiary education, and will be a predictor of enrolment in tertiary education	P6
H7	Children married or in union will have a negative relation to tertiary education completion, and will be a predictor of completion of tertiary education	P7
H8	Adolescent fertility will have a negative relation to tertiary education completion, and will be a predictor of completion of tertiary education	P8
H9	Children involved in child labor will have a negative relation to tertiary education completion, and will be a predictor of completion of tertiary education	P9
H10	Public expenditure on tertiary education will have a positive relation to tertiary education completion, and will be a predictor of completion of tertiary education	P10
H11	Household and ambient air pollution will have a negative relation to tertiary education completion, and will be a predictor of completion of tertiary education	P11
H12	Enrolment in tertiary education will have a negative relation to tertiary education completion, and will be a predictor of completion of tertiary education	P12

Appendix 18. Results of the three linear regression models of the path analysis

Linear regression model	Presumed condition	Presumed factor	Pathway	Path coefficient	Coefficient of determination
1	Adolescent fertility	Children married or in union	P ₁	0.795**	0.632
2	Enrolment in tertiary education	Children married or in union	P ₂	-0.153	0.464
		Adolescent fertility	P ₃	-0.291*	
		Children involved in child labor	P ₄	-0.261*	
		Public expenditure on tertiary education	P ₅	0.234**	
		Household and ambient air pollution	P ₆	0.12	
3	Completion of tertiary education	Children married or in union	P ₇	0.007	0.723
		Adolescent fertility	P ₈	-0.074	
		Children involved in child labor	P ₉	-0.113	
		Public expenditure on tertiary education	P ₁₀	-0.015	
		Household and ambient air pollution	P ₁₁	0.161	
		Enrolment in tertiary education	P ₁₂	0.727**	

*Confidence level = 0.95, **Confidence level= 0.99

Note:

The relations considered in the exemplary socio-economic model were arranged into three linear regression models. Three linear regression models were defined to examine the validity of hypotheses by checking the statistical significance of path coefficients. Path coefficients assessed with statistical significance indicate that the hypotheses are supported. Linear regression model 1 took the criterion adolescent fertility as the presumed condition and the criterion children married or in union as the presumed factor which may attribute to the condition. For linear regression model 2, the criterion enrolment in tertiary education was assumed as the condition and other five criteria children involved in child labor, children married or in union, adolescent fertility, public expenditure on tertiary education, and household and ambient air pollution were considered as the factor. Linear model 3 addressed the criterion completion of tertiary education as the condition and considered the other six criteria enrolment in tertiary education, child labor, children married or in union, adolescent fertility, public expenditure on tertiary education, and household and ambient air pollution as the factors which may attribute to the condition. According to the results shown in Spreadsheet S4, the hypotheses H1, H3, H4, H5 and H12 are supported since the path coefficients for P1, P3, P4, P5 and P12 are of statistical significance. On the other hand, according to the statistical insignificance of the path coefficients for P2, P6, P7, P8, P9, P10 and P11, hypotheses H2, H5, H6, H7, H8, H9, H10 and H11 were not valid.

72.3%, 46.4% and 63.2% of variation of statistical data for the criteria completion of tertiary education, enrolment in tertiary education and adolescent fertility was respectively explained by the corresponding linear regression model. According to Hair et al.*, a coefficient of determination of 0.75, 0.50, or 0.25 represents a substantial, moderate, or weak explanation of a linear regression model. In accordance with the definition, the linear regression models for describing the criteria completion of tertiary education and adolescent fertility have moderate explanation ability. For describing the criterion enrolment in tertiary education, the linear regression model has relatively weak explanation ability. The relatively weak explanation ability for describing the criterion enrolment in tertiary education implies that there could be some other criteria related to the criterion enrolment in tertiary education were not yet addressed in the hypothesized relation model.

*Hair, J. F.; Ringle, C. M.; Sarstedt, M. PLS-SEM: Indeed a Silver Bullet. J. Mark. Theory Pract. 2011, 19, 139–152, DOI: 10.2753/MTP1069-6679190202. Available online: <http://www.tandfonline.com/doi/abs/10.2753/MTP1069-6679190202> (accessed on 14 November 2017).

Appendix 19. Country rankings assessed by the current SCDI framework and the three modified SCDI frameworks

	Current SCDI framework	Modified SCDI framework: without the themes economic status and environmental aspects	Modified SCDI framework: without the theme economic status	Modified SCDI framework: without the theme environmental aspects
Albania	45	73	57	80
Algeria	97	30	107	23
Angola	120	133	92	130
Argentina	79	83	91	79
Armenia	127	99	135	92
Australia	82	16	97	8
Austria	8	13	12	9
Bahrain	109	41	122	33
Barbados	73	36	80	44
Belarus	34	42	54	32
Belgium	96	33	99	37
Belize	39	94	45	91
Benin	114	113	93	116
Bhutan	2	51	2	40
Bolivia (Plurinational State of)	51	75	68	65
Botswana	128	76	113	103
Brazil	21	70	28	62
Brunei Darussalam	13	5	22	3
Bulgaria	81	64	90	63
Burkina Faso	106	107	67	124
Burundi	74	114	16	129
Cambodia	56	122	50	112
Cameroon	71	115	63	107
Canada	11	9	13	11
Cape Verde	111	61	109	78
Central African Republic	118	138	77	138
Chile	65	47	85	34
China	76	72	94	57
Colombia	31	71	44	68
Costa Rica	17	52	19	46
Côte d'Ivoire	69	131	65	118
Croatia	44	56	39	83
Cyprus	95	35	95	58
Czech Republic	27	31	40	25
Democratic Republic of the Congo	87	135	35	136
Denmark	10	4	18	4
Dominican Republic	90	112	96	97
Ecuador	55	90	78	72
Egypt	124	66	128	86
El Salvador	66	125	82	101
Eritrea	126	118	104	123
Estonia	9	29	14	20
Ethiopia	86	105	52	121
Fiji	19	58	21	49
Finland	5	7	7	13

Appendix

	Current SCDI framework	Modified SCDI framework: without the themes economic status and environmental aspects	Modified SCDI framework: without the theme economic status	Modified SCDI framework: without the theme environmental aspects
France	32	20	41	29
Gabon	40	124	36	109
Gambia	129	102	114	110
Georgia	112	108	115	96
Germany	24	26	37	16
Ghana	16	39	10	52
Greece	102	34	86	82
Guatemala	47	130	64	105
Guyana	58	97	62	94
Honduras	68	137	83	113
Hungary	41	43	58	42
Iceland	1	1	1	1
India	125	134	131	111
Indonesia	28	55	32	53
Iran (Islamic Republic of)	117	65	127	70
Ireland	29	24	34	31
Israel	85	19	100	15
Italy	78	15	70	45
Jamaica	83	80	84	87
Japan	62	28	73	30
Jordan	115	45	121	61
Kazakhstan	116	92	134	66
Kenya	92	67	59	104
Kuwait	101	22	110	21
Kyrgyzstan	108	82	120	74
Lao People's Democratic Republic	15	104	8	95
Latvia	12	44	15	38
Lebanon	104	68	106	76
Lesotho	136	109	116	128
Liberia	54	98	6	125
Lithuania	26	60	29	55
Luxembourg	33	25	53	18
Madagascar	91	126	46	131
Malawi	59	85	5	122
Malaysia	20	23	30	10
Mali	133	136	123	134
Malta	94	14	102	12
Mauritania	138	129	137	137
Mauritius	36	57	48	59
Mexico	93	62	105	43
Morocco	119	77	126	81
Namibia	135	95	125	114
Nepal	75	100	87	88
Netherlands	70	18	88	14
New Zealand	14	2	20	2
Nicaragua	25	87	24	85
Niger	134	127	118	133
Norway	3	6	4	5
Oman	98	17	108	17

Appendix

	Current SCDI framework	Modified SCDI framework: without the themes economic status and environmental aspects	Modified SCDI framework: without the theme economic status	Modified SCDI framework: without the theme environmental aspects
Pakistan	113	119	129	98
Panama	43	91	61	84
Paraguay	7	89	17	67
Peru	72	49	89	39
Philippines	63	117	71	99
Poland	30	40	42	41
Portugal	50	10	51	36
Qatar	105	48	124	27
Republic of Korea	52	32	74	22
Republic of Moldova	57	54	81	35
Romania	37	50	47	48
Russian Federation	46	78	69	60
Rwanda	48	103	11	120
Saudi Arabia	122	69	132	69
Senegal	121	96	111	102
Serbia	64	74	60	89
Sierra Leone	99	132	56	135
Slovakia	42	38	55	50
Slovenia	23	21	25	26
South Africa	131	110	130	108
Spain	84	8	75	56
Sri Lanka	38	53	43	64
Sudan	132	123	119	127
Swaziland	53	93	23	106
Sweden	4	3	3	6
Switzerland	22	11	38	7
Syrian Arab Republic	130	101	136	93
Tajikistan	100	86	112	75
Thailand	18	46	31	28
The former Yugoslav Republic of Macedonia	67	79	66	90
Togo	60	116	27	117
Trinidad and Tobago	49	88	72	71
Tunisia	103	37	103	47
Turkey	88	63	101	51
Turkmenistan	123	81	133	73
Uganda	80	128	33	132
Ukraine	89	84	98	77
United Kingdom	35	12	49	19
United Republic of Tanzania	77	111	26	126
United States	61	27	76	24
Uruguay	6	59	9	54
Venezuela (Bolivarian Republic of)	107	121	117	100
Yemen	137	120	138	115
Zimbabwe	110	106	79	119