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Emergency and urgent care systems in Australia, Denmark, England, France, Germany and the Netherlands – Analyzing organization, payment and reforms☆

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ABSTRACT

Introduction: Increasing numbers of hospital emergency department (ED) visits pose a challenge to health systems in many countries. This paper aims to examine emergency and urgent care systems, in six countries and to identify reform trends in response to current challenges.
Methods: Based on a literature review, six countries – Australia, Denmark, England, France, Germany and the Netherlands – were selected for analysis. Information was collected using a standardized questionnaire that was completed by national experts. These experts reviewed relevant policy documents and provided information on (1) the organization and planning of emergency and urgent care, (2) payment systems for EDs and urgent primary care providers, and (3) reform initiatives.
Results: In the six countries four main reform approaches could be identified: (a) extending the availability of urgent primary care, (b) concentrating and centralizing the provision of urgent primary care, (c) improving coordination between urgent primary care and emergency care, and (d) concentrating emergency care provision at fewer institutions. The design of payment systems for urgent primary care and for emergency care is often aligned to support these reforms.
Conclusion: Better guidance of patients and a reconfiguration of emergency and urgent care are the most important measures taken to address the current challenges. Nationwide planning of all emergency care providers, closely coordinated reforms and informing patients can support future reforms.
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1. Introduction

In theory, emergency care is medical care for conditions that are life-threatening, while urgent care is care for other (non-life threatening) conditions that require prompt attention [1]. However, in practice, emergency care systems developed from regional or local initiatives in the middle ages [2], which explains that many developed countries still struggle with a patchwork of various – often uncoordinated – emergency and urgent care providers. In addition, emergency medicine has changed significantly in recent years: New treatment options for critical conditions (e.g. stroke and acute myocardial infarction (AMI)), require more rapid specialized intervention, and the availability of new medical technologies has increased the ability to directly manage patients in the emergency and urgent care system [3,4].

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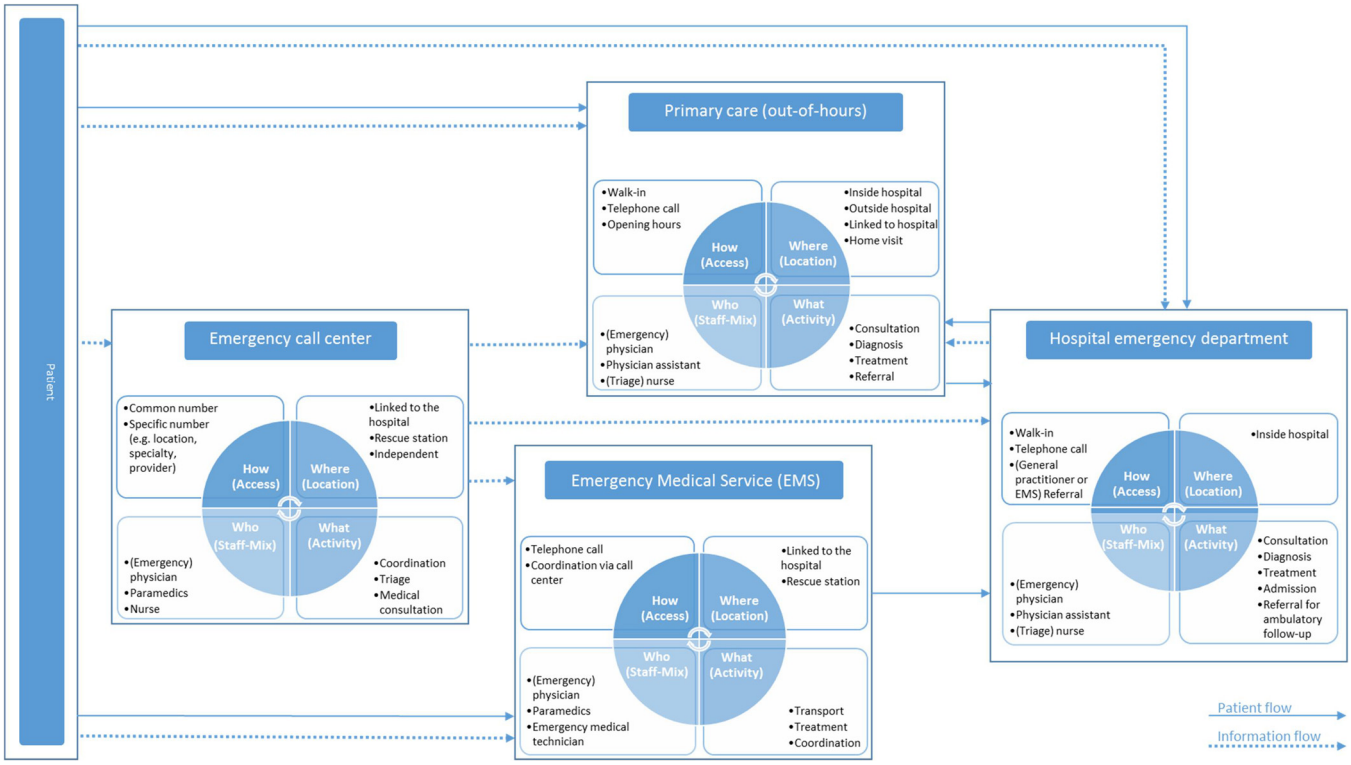


Fig. 1. Framework for analyzing different emergency service providers and the flow of patient.

Several developed countries are currently in the process of reforming their emergency and urgent care systems [5–7] as they struggle with major challenges. These challenges include ED (over-) crowding, long waiting times and, in general, increasing numbers of ED visits, with annual growth rates of up to 10% in New Zealand, 8.5% in England and 5% in Belgium [8]. An important driver for increasing growth rates are non-urgent visits [9], i.e. visits of patients with conditions that do not require urgent attention or complex interventions and that could safely be treated by urgent primary care providers.

These visits have been described with different terms, such as "inappropriate ED visits" or "avoidable ED visits", and various definitions exist, ranging from assigned triage category to self-perceived urgency, which makes it difficult to compare estimates of these visits [8,10,11]. However, available data for the proportion of non-urgent ED visits range from 20% in the United States to 56% in Belgium [8,10,11]. A high prevalence of non-urgent ED visits contributes to crowded EDs, long waiting times and adverse outcomes for patients, as well as financial losses for providers [12].

In addition, structured coordination between the different emergency providers is lacking in several countries. This is particularly problematic for life-threatening and conditions, such as stroke and AMI, which require well-coordinated emergency medical services and timely treatment by hospitals with the necessary staff and equipment as well as a defined pathway. Several studies have shown that e.g. stroke patients benefit from thrombolysis and treatment in specialized stroke units. However due to missing pathways a large percentage of patients is still treated in non-specialized facilities resulting in worse health outcomes and costs [13–15].

Although, the mentioned challenges affect mostly the ED, these challenges need to be considered in the national emergency and urgent care system context. In most countries, the system includes urgent primary (out-of-hours) services, different call centers, and emergency medical services, which influence whether patients will or will not use the ED as their central contact point. In addition, payment systems may provide (unintended) incentives for increased use of EDs. Several studies have examined the effect of different payment systems in the ED [16–19]. The different incentives of fee-for-service, bundled payments and a mixture of fixed and variable payments have been extensively discussed, often combined with the observation that fee-for-service payment of EDs may contribute to increasing numbers of ED visits. However, these studies did not consider the interaction between payment systems for urgent and emergency care providers.

Regarding the organization of care, previous studies have analyzed specific emergency care providers in various countries [20–22] and the drivers of ED crowding [8,9,23]. However, no study so far has examined the full range of providers and their interactions within national emergency and urgent care systems. Similarly, systematic comparative information on payment systems for emergency and urgent care providers remains unavailable.

The two main aims of this paper were: (1) to compare emergency and urgent care systems with regard to the set-up, roles and interactions of different providers; and (2) to analyze the payment systems of the two main categories of providers, i.e. EDs and urgent primary (out-of-hours) care providers. Furthermore, we aimed to identify recent reform trends across countries that may provide inspiration for reforms in other countries.

2. Methods

A comprehensive review was performed to identify countries with provision models that are characterized by innovative approaches regarding the coordination between and concentration of different providers, payment models for the emergency department that comprises e.g. co-payments or special payment groups and recent reforms in the area of emergency and urgent primary care. In a first step, Health Systems in Transition (HiT) reviews were screened to obtain an overview of the organization and payment for emergency care in different countries. This resulted in a long list of 13 countries. In a second step, a rapid review using the scientific database PubMed and Scopus was conducted to extend and specify

Table 1
Availability of emergency departments.

Countries	Number of acute care hospitals with EDs	EDs*/100 000 population	Total number of acute care hospitals in the country**	Acute care hospitals/100 000 population	Proportion of acute care hospitals with ED	Population***
Australia (2013-14)	289[a]	1.25 [a]	728[b]	3.15	39.7%	23 125 868
Denmark (2013)	22	0.39	49	0.87	44.9%	5 614 932
England (2013)	180[c]	0.33	419	0.78	43.0%	53 865 800
France (2013)	655[d]	0.99	1592	2.41	41.1%	65 925 498
Germany (2014)	1250	1.54	1619	2.0	77.2%	80 982 500
Netherlands (2014)	91[e]	0.54	131	0,78	69.5%	16 804 432

Notes: *Sources: [24–29]** Sources: [26,28,30–33]; for the Netherlands, the number of 131 hospitals refers to the number of sites but several sites may belong to the same hospital organization; *** Sources [34,35]; [a] There are also 23 EDs at private hospitals but they are excluded because do not play an important role [36] and because utilization data is not available for these EDs, [b] Number refers to acute public hospitals ; [c] Excludes 28 single specialty EDs (e.g. for ophthalmology or dentistry) because these do not provide general emergency care and might be co-located with other EDs; [d] hospitals with multiple EDs are counted only once; [e] In addition, four hospitals have an ED, which is not open 24/7.

the aspects regarding the organization and payment of emergency care and to examine major structural reforms. Subsequently, six countries – Australia, Denmark, England, France, Germany and the Netherlands – were included in a short list. A table showing the long and short list as well reasons for inclusion and exclusion can be found in the online appendix.

Subsequently, a framework was developed to enable systematic cross-country comparisons of urgent and emergency care providers and the flow of patients and information through national care systems (see Fig. 1). The figure shows that patients in need of urgent and/or emergency care can contact different providers, which depending on the country specific organization may include different call centers (e.g. one for urgent and one for emergency care), urgent primary care (out-of-hours) providers, emergency medical services or hospital EDs. The characteristics of each provider can be described by four main dimensions which may differ depending on national/regional or local arrangements: Access (How can patients contact the provider?), Location (Where is the provider located?), Activity (What kind of services are performed?) and Staff-mix (Who is providing the service/treatment?).

Information on emergency and urgent care systems is often fragmented and current reforms are rarely described in the available literature. Therefore, a standardized questionnaire was developed to obtain comprehensive and detailed information for the selected countries from national experts (co-authors of this paper). The questionnaire was based on the framework presented in Fig. 1, and structured in four sections: (1) background information, (2) organization of emergency care, (3) payment systems in emergency care and (4) challenges and reforms (see online Appendix).

National experts were initially contacted in July 2015. They reviewed national policies and documents, and provided first answer by the end of August 2015. After screening their responses, additional questions and ambiguities were iteratively clarified through further correspondence. Completed questionnaires were available in November 2015. All experts were contacted again in September 2017 to review the content presented in this paper and to update the information if necessary.

3. Results

3.1. Indicators of emergency care availability and utilization

Table 1 summarizes data about the availability of EDs in six countries. As national definitions of emergency cases and emergency departments differ across countries (see results section), EDs were defined as facilities that are hospital based, open 24/7, have continuous access to medical staff and provide general emergency care. The number of EDs per 100,000 population varies considerably from 0.33 in England to 1,54 in Germany. Partially, differences in the availability of EDs reflect differences in the general availability of acute care hospitals in these countries. Consequently, the proportion of hospitals with EDs out of all acute care hospitals is relatively similar in Australia, Denmark, France, and England, i.e. between 37% and 45%. In the Netherlands, where the number of acute hospitals is relatively low (0.78 per 100,000), almost 70% of all acute care hospitals have an ED. In Germany, where official data on the number of EDs is unavailable the number of around 1250 EDs is based on all hospitals billing emergency services [24]. All numbers need to be interpreted in view of the national context, e.g. with Australia being a sparsely populated country; and caution should be applied because of discrepancies in the organization of care.

Table 2 summarizes indicators of ED utilization in the six included countries. There is considerable variation across countries in the number of ED visits per 1000 population, ranging from 124 in the Netherlands to 311 in Australia. However, Australian statistics include also patients who visit the ED for planned follow-up and pre-arranged visits. The proportion of admitted patients out of all ED visits is similar to that in other countries, i.e. 33% in Australia versus 27 to 32% in England, Denmark, and the Netherlands. In Germany, the proportion is considerably higher (with 49%).

3.2. Organization of urgent and emergency care services across countries

3.2.1. Urgent primary care provision

Table 3 provides an overview of urgent primary care provision across countries, which includes in all countries (1) centers for out-of-hours care and (2) a home visit service. In Denmark, Germany, and the Netherlands, the same institution coordinates both services, while they are operated independently in the other countries.

In Denmark, 46 service centers provide urgent primary care, including home visits from general practitioners (GPs) based at the centers. The centers are increasingly located at local hospitals but organizationally independent. Traditionally, local GPs organized the out-of-hours service within the service centers on a rotation basis. However, increasingly the five regions are taking over the organization of urgent primary care with the aim of improving coordination between urgent primary and emergency care. A similar trend is observable in the Netherlands, where primary care centers (PCC) (almost) exclusively organize out-of-hours services and home visits. PCCs gradually emerged since the year 2000 because of the high workload for local GPs who traditionally used to organize out-of-hours care by mutual stand-in agreements. PCCs work on a larger scale, which reduces the number of evening and night shifts for the associated GPs. Similar to in Denmark a better coordination between emergency and urgent care is promoted through co-location of PCCs at hospitals with EDs. In 2014, 71 of the 122 PCCs were located at one of the 91 EDs in the country.

Table 2
Indicators of emergency department utilization.

Countries	Hospital ED visits/1000 population	Ambulatory ED visits/1000 population	Emergency admissions/1000 population	Emergency admissions/ ED visits
Australia (2013-14)[a]	311	219	103	33.1%
Denmark (2013)[b]	156	111	45	28.7%
England (2013-14)[c]	264	200	70	26.7%
France (2013)[d]	279	218	61	21.7%
Germany (2014)[e]	205	105	100	48.8 %
Netherlands (2012)[f]	124	84	40	32.0%

Notes: Sources: a: [25, 36], the number of ambulatory ED visits and the number of emergency inpatient admissions do not equal the number of hospital ED visits because emergency inpatient admissions may occur also at hospitals that do not have a formal ED; b: [26, 37]; c: [38]; d: [39] ;e: Diagnosis-related groups (DRG) statistic and Central Research Institute of Ambulatory Health Care; f: own calculations based on [8] and [40]. Note: Numbers are different from those reported in Berchet (2015) [8] for Australia, England, France and Germany because of various reasons: Australia: the number reported here is more recent (2013 instead of 2012); the number reported for England is lower because it does not include visits to minor injury units or walk-in centres, which are intended to provide primary-care like services and are not comparable with EDs in other countries; the number for France is more recent (2013 instead of 2011); for Germany ambulatory patients visiting the ED were considered rather than emergency visits that lead to hospital admissions; Denmark and was not included in Berchet (2015) [8]; the number for the Netherlands is identical. The German numbers should be considered with caution as various data sources have been used.

Table 3
Provider of urgent primary care.

Country	Urgent Primary Care	
	Centers	Home Visit
Australia	Establishment of **GP-type 24 hrs clinics** *How:* Walk-in *Where:* Linked to the hospital	**GP home visit** *How:* Call (various numbers of home-visit service providers) *Where:* Patients home, visits by chosen service provider
Denmark	Provider: **Service centers** providing out-of-hours care and home visits service 46 locations *How:* Call the primary care call center *Where:* Increasingly located at the hospital, increasingly regional organization of primary care out-of-hours service	
England	**Urgent care centers, Minor injuries centers, Walk-in center** *How:* Walk-in, Urgent care centers – by ambulance *Where*: Increasingly located at the hospital	**Home visits service** *How:* Call (GP or non-emergency telephone number(111)) *Where*: Patient's home
France	**Out of hours health centers** (Maisons Médicales de Garde) 369 locations *How:* Walk-in or referred by emergency call center *Where:* mostly in (peri-)urban areas, increasingly linked to the hospital	**Home visits** (SOS Médecins and network of GPs) *How:* Call (SOS medicine, local council number or emergency call center) *Where:* SOS medecins - mostly in urban and suburban areas, networks of GPs – mostly in rural areas
Germany	**Out-of-hours services** provided by regional association of statutory health insurance-accredited physicians (out-of-hour services and home visits) *How*: Walk-in or call center *Where*: depending on the region in the regular physician's office, or a service center that may be linked to the hospital Ongoing establishment of so called **"Portalpraxen"** How: Walk-in *Where*: exclusively located at or in the hospital	
Netherlands	**Primary care centers (PCC)** providing out-of-hours service and home visits 122 locations *How:* Walk-in or telephone call (strongly advised) *Where:* Increasingly nearby hospital (80% of PCCs), independently or within the hospital (in this case coordinated activities as triage)	

The ongoing establishment of out-of-hours primary care centers (Portalpraxen) in Germany since 2016 at hospitals also aims at improving coordination between emergency and urgent care and improving availability of urgent primary care. However, as regional associations of statutory health insurance physicians are responsible for the organization of out-of-hours services, including home visits and service centers, regional approaches to out-of-hours care provision differ across Germany.

In Australia, England and France, out-of-hours services and home visit services are organized separately. However, similar trends are observable. In Australia, GP-type 24 hs clinics, located adjacent to hospitals but organizationally independent, have been established to divert low-severity patients to these facilities. Home visit services are provided by various – often commercial – providers. In England, the availability of urgent primary care services has been strongly expanded by introducing several new types of providers since the late 1990s. These include minor injury units, walk-in centers and urgent care centers, which are increasingly located at hospitals. In addition home visit services are available from local GPs. In France, there has been a rapid growth of out-of-hours health centers (Maisons Médicales de Garde) which are increasingly linked to hospitals. Home visit services in France are provided by different networks of physicians. In urban and suburban areas these networks are called SOS Médecins, in rural areas local councils have organized similar services.

3.2.2. *Call centers and emergency medical services*

Table 4 shows that France is the only country, where a single number for urgent and emergency care call centers has been established in most regions (in 70 of 95 départements). When calling this number, patients reach a call handler based at the ED who has in most regions a digital real time resource monitoring system with information on the local availability of resources (Répertoire Opérationnel des Ressources) including out-of-hours

Table 4
Call centers.

	Primary care call center	Emergency call center
Australia	Number: 1800 022 222 *Where:* Regional Call center *Who*: Nurses, sometimes GPs What: General health advice, information about home visit services, connect to emergency call center	Number: 000 or 112 *Where:* Call center *Who*: Operator *What*: Triage for police, fire, ambulance
Denmark	Number: 1813 in capital region, various numbers in other regions Where: at out-of-hours service centers *Who:* GPs, nurses What: Medical advice, arrange out-of-hours/home visit service	Number: 112 Where: at out-of-hours service centers or at hospitals (depending on the region) *Who*: Nurses, GPs, paramedics *What*: Coordination of rescue activities, pre-triage
England	Number: 111 *Where*: n.s. *Who*: Non-clinical call handlers, supported by nurses and paramedics *What:* Triage, transfer call to a GP, arrange a GP to visit the patient at home or a call back by an out-of-hours GP, book appointments at urgent primary care providers	Number: 999 *Where*: n.s. *Who*: Ambulance paramedics *What*: Triage
France	Number: 15 or 112 In 70 of 95 départements, about 3-4 per department Where: within the ED *Who:* Call handlers (medical secretary qualification), emergency physicians *What:* Medical advice and triage, coordination of emergency care service (home visit service, ambulance – software indicates which GP is on call and which beds are available in local hospitals)	
Germany	Number for out-of-hours services: 116,117 Where: Regional call center Who: Call handler What: Medical advice, connect to or arrange out-of-hours/ home visits services	Number: 112 Where: share facilities with fire and police call Who: Emergency medical dispatcher What: Triage, in some regions cooperation with out-of-hours services
Netherlands	Various numbers of local PCCs Where: PCC Who: Nurses, GP What: Medical advice, arrange out-of-hours/ home visits services, on-site consultations (on appointment)	Number: 112 Where: share facilities with fire and police call centers, 21 locations *Who*: Nurses (at almost all call centers), call handlers *What*: Coordination of rescue activities, triage

primary care providers, ambulances and hospital capacities. Based on the overview of the available resources in the area and the exact patient need, the call handler may provide the advice to visit the GP the next day, transfers the call to the home visit service, send the patient to the ED, or send an ambulance.

In all other countries, there are at least two types of call centers, one for urgent primary care and one for emergency care, and numbers for urgent primary care may differ across regions. In Australia, the main purpose of the primary care call centers is to provide health advice and information about home visit services. It does not arrange out-of-hours care or home visits. In England, the primary care call center coordinates out-of-hours services and may link patients to a local GP home visit service. In Denmark, England, Germany, and the Netherlands, call centers coordinate all out-of-hours services, and may advise patients to visit an out-of-hours service center or arrange a home visit. In Denmark GPs or nurses at the urgent care hotline can book an appointment for the patient at the nearest ED if necessary. Information about waiting times is available through the IT system, and the patient can wait at home until the appointment. In addition, Danish regions have introduced an app that guides patients to out-of-hours service centers and provides information about current waiting times in EDs. In some countries, call centers are staffed with nurses or GPs that give medical advice to patients (see Table 4).

Emergency call centers in all countries perform a triage and coordinate rescue activities of the emergency medical services (EMS). After an initial triage, call handlers or emergency medical dispatchers will alert the ambulance station. They can be co-located with the fire service (Australia, Denmark, some German regions) or linked to the hospital (England, France, other German regions).

In all countries the EMS transports the patient to the hospital but sometimes care is also provided on the spot. The Australian EMS aims to transport the patient as fast as possible to the hospital trying to minimize care on spot. In all other countries the EMS provides care on the spot before transporting the patient to the hospital. Ambulances are mostly staffed by emergency physicians, paramedics, emergency medical technicians or emergency assistants depending on the severity of the emergency. In England and the Netherlands, there is an additional type of EMSs, the so-called rapid response vehicle. Those are staffed by health care professionals combining extended nursing and paramedic skills, who assesses and/or stabilize the patient at home. However, these rapid responders cannot transport patients. In England, this model substitutes the home visits of a GP who often has no time to conduct home visits and is cheaper than an ambulance, which is normally staffed with at least two team members.

3.2.3. *Emergency departments*

Definitions for EDs differ across countries. In Australia, EDs are defined by the Australasian College of Emergency Medicine (ACEM) as dedicated hospital based facilities specifically designed and staffed to provide 24 h emergency care [41]. These facilities must provide (as a minimum) continuous access to medical staff, have a dedicated resuscitation area, provide 24 h access to blood products, laboratory, radiology, and access to specialist medical and surgical services [42]. In France [43,44] and England, the definition of an ED is similar, but in other countries, the definition of EDs is less specific. For example, in the Netherlands, facilities that are open only during daytime may also be considered EDs; and in Denmark, some hospital based nurse-led outpatient-clinics are locally referred to as EDs. In Germany, a law passed in 2016 determined that hospital EDs will be classified into three levels (basic, specialized and maximum medical care) in relation to the availability of equipment, qualification of staff, capacity for intensive care patients and other criteria [45]. The same classification can be seen in the Netherlands.

Table 5
Payment of emergency care providers.

	Urgent Primary Care	Emergency Department
Australia (with focus on Victoria)	Consultation fee per case + additional fees for services	80% state budget (for fixed costs), 20 % based on proportion of ED visits out of all ED visits in the state Admitted Patients: two payment streams in most states, one payment stream in Victoria
Denmark	Consultation fee per case + additional fees for services	Mostly financed by global budget, some regions activity related payment (DAGS) Admitted Patients: one payment stream
England	Depends on contract with local CCGs	Payment per case (HRG), some have still block contracts Admitted Patients: two payment streams
France	Availability fee for GPs, basic out-of-hours fee and fees for additional services	Budget for emergency availability, payment per case and additional payments per service (e.g. lab tests) Admitted Patients: one payment stream
Germany	Consultation fee per case + additional fees for services and severity	Consultation fee per emergency case + additional fees for services and severity Surcharge for emergency care in DRG reimbursement Admitted Patients: one payment stream
Netherlands	Budget	Payment per case (DTC), for certain rural hospitals subsidies Admitted Patients: one payment stream

Also several other countries distinguish between different categories of EDs. Australian ED's are categorized in four different levels depending on the location - from remote or rural hospital to tertiary and major referral hospital. The four levels differ with regard to staffing requirements (from physicians on call to 24 h availability of emergency medicine specialists and various other sub-specialties) and the range of treatment and care provided (from basic emergency care to major trauma services) [6]. In France, categorizes EDs are categorized according to specialty into general EDs, geriatric EDs, pediatric EDs and psychiatric EDs. In England, Germany (currently) and the Netherlands, the main distinction is between general EDs and Major Trauma Centers, which function as hubs within a trauma network and coordinate regional trauma care. Also in France, trauma networks have been established in certain regions but the approach is less systematic than in England and the Netherlands.

Furthermore, several countries have concentrated emergency care provision at fewer hospitals over the past decades. Since the late 1990s, pathways have been introduced for trauma patients in the Netherlands, Germany and Denmark, and more recently in England (2012), where patients are directly taken by ambulances to facilities with the necessary staff (e.g. neurosurgeons) and equipment (CT, MRI) available 24/7, bypassing other closer facilities. Since 2010, similar pathways have also been introduced for stroke patients in some regions of Denmark, England, and the Netherlands, concentrating care for these patients at hospitals with stroke units and 24/7 thrombolysis and CT, and for AMI patients in England and in France to assure that patients are taken only to hospitals with catheterization laboratories.

However, the most radical reform has taken place in Denmark, where a large-scale structural reform has reduced the number of hospitals with 24/7 EDs from approximately 40 to 22 as part of an administrative reform since 2007. In this process, so-called Joint Acute Wards (JAWs) have been established, replacing smaller EDs of individual departments. JAWs have to assure 24-hour availability of specialists in internal medicine, general trauma surgery, anesthesiology, radiology (on-call within 30 min), CT and MRI scanners. To compensate for longer travelling times to EDs, regions have expanded pre-hospital emergency capacities by increasing the number of (physician-led) ambulances and helicopters. In addition, nurse-led clinics were established, where emergency departments had closed, to assure that patients can still receive treatment at the hospital.

Finally, all countries have started to establish mechanisms that aim to steer non-urgent patients away from the ED. The increasing co-location of urgent primary care centers at hospitals with EDs – in particular in the Netherlands, but also in Australia, England, and Germany – directs patients away from the EDs to the co-located urgent primary care center. In the Netherlands, this mechanism is further supported through financial incentives, as patients have to pay for visits to the ED up to their deductible (between €375 and €875 in 2015) but not for visiting the PCC. However, Denmark has taken the most radical approach to steering patients away from the ED. Since 2004, patients need a referral from the urgent care call center or from a GP to enter the ED. Patients without a referral are only accepted at hospitals in clear emergency situations. This reform was supported through a large information campaign in most regions, including a letter to every citizen, explaining the new emergency care system in the region.

3.3. Payment of emergency and urgent care providers

Table 5 provides an overview to the different payment systems for urgent primary (out-of-hours) care and EDs in the six countries. For Australia, where payment systems differ by state, the table shows the payment system for Victoria. Countries included in our survey can be clustered into three main groups. The first group comprises Denmark and Australia (Victoria), where EDs are mainly paid by a global budget, while activity of urgent primary care providers is incentivized through fee-for-service (FFS) payments. In Australia (Victoria), the ED budget is equal to 80% of the reported fixed costs of the ED for non-admitted care, including salaries and hotel goods/services. Only 20% of the ED budget depend on activity, measured in terms of cases treated. In Denmark, the global budget always covers the major share of costs, although activity related payments for emergency cases exist in some regions (up until 2018 after which payment will partly depend on performance indicators e.g. readmission rates). Payment for urgent primary care (out-of-hours) services in both countries strongly depends on activity of providers to encourage treatment of patients outside of EDs. In both countries, there is a mix of a basic consultation fee per case with additional FFS, such as diagnostic services.

The second group comprises England and the Netherlands, where ED payment is strongly related to the activity as measured by the number and types of patients treated, while urgent primary care (PCC) is mostly paid on the basis of global budgets. In England, EDs receive a payment per case that is determined by the national case-mix system called Healthcare Resource Groups (HRGs). The system, distinguishes between 11 different accident and emergency (A&E) HRGs that are defined on the basis of combinations of broad categories of diagnostics (e.g. X-Ray, CT, MRI, biochemistry, hematology) and treatments (e.g. defibrillation, wound closure, burns review). However, not all EDs are paid by the system as some still receive a global budget. In the Netherlands, hospital payment is based on a case-mix system called Diagnosis Treatment Combinations (DTCs) classifying patients into groups depending on the

diagnosis, treatments, care setting and other variables. There are no distinct products/tariffs for emergency care. In contrast, PCCs in the Netherlands are paid by budget which is based on a fee per inhabitant of the service area and reimbursement of costs of housing, administration etc. The budget is a result of negotiations between health insurers and the PCC organization and has to be approved by the national health authority. Primary care out-of-hours services, ambulance services, and the telephone services (999 and 111) in England are commissioned by local Clinical Commissioning Groups (CCGs). The reimbursement depends on the contract with the local CCG and shows considerable variability (e.g. block grant and HRG-based payment).

France and Germany fall into the third group, where payment systems are similar for urgent primary care providers and EDs. In France, urgent primary care providers and the ED are both reimbursed by a mixed payment model based on FFS and budget for availability, payment per case and additional payments per service. In Germany, the payment system is the same for urgent primary care physicians and for non-admitted care at EDs. It consists of a basic fee per case with additional FFS payments for particular services (e.g. wound care, sonographic examination). University hospitals have the possibility to bill a different fee per case, i.e. the university hospital outpatient fee ('Hochschulambulanzpauschale'). Since April 2017, two additional fees have been introduced which are paid for more complex patients, e.g. patients with pneumonia or Alzheimer's. Simultaneously, a reduced fee was introduced – covering only a rapid assessment at the ED – for patients who should be treated by urgent primary care providers. Furthermore, availability costs of EDs are somewhat compensated by DRG-based payments, which are reduced by €50 per case for hospitals without emergency service provision. Finally, it is planned that EDs will receive an extra fee depending on the level of emergency care provided (described in the section emergency departments) [46].

Another important difference across countries is that some countries have separate payment streams for (1) the reimbursement of treatment in the ED and (2) the reimbursement of inpatient treatment, while others do not. The national payment model in Australia separates payment streams for the ED and the inpatient treatment as the hospital receives one payment for the initial treatment in the ED and a second payment if the patient is subsequently admitted for inpatient treatment. England has a similar approach where patients that have been admitted via the emergency department generate two payments – one for the ED and one for the inpatient treatment. In addition, there are two tariffs for each HRG, a lower tariff for elective patients and a higher tariff for non-elective patients. By contrast, in Denmark, France, Germany, and the Netherlands, emergency patients admitted as inpatients are generally paid for on the basis of the usual inpatient payment system, and there is no separate payment for services provided in the ED.

4. Discussion

Many developed countries struggle with three major challenges: (1) an increasing number of non-urgent visits at EDs, (2) insufficient coordination of emergency and urgent care providers, and (3) assuring that severely ill patients are treated by the most appropriate providers, i.e. those with specialized staff, equipment and 24/7 availability [5–7]. Our review of emergency and urgent care systems across countries shows that all countries have implemented a range of reforms that have attempted to address some of these problems. Considering the framework presented in Fig. 1, the undertaken reforms concentrate on the access to urgent primary care, emergency departments and emergency call centers as well as the activity of emergency call centers and the location of urgent primary care.

4.1. Expanding the availability of urgent primary care services

Several countries have increased the availability of urgent primary care in the form of service centers (e.g. "Portalpraxen" in Germany), home visits services (e.g. SOS Médecins in France) or primary care call centers (e.g. NHS health advice line). However, England is the country that most strongly invested in expanding the availability of urgent primary care services. Several new types of providers have been introduced since the late 1990′s. This includes minor injury units, walk-in centers and urgent care centers. The aim was to improve access to primary and urgent care and to avoid inappropriate use of the hospital accident and emergency departments [47,48]. Studies have shown that the new providers improved convenience and accessibility of care [48,49]. However, the effect on ED visits is not clear. Following Whittaker et al. [50] and Arain et al. [51] the opening of a walk-in center or extending opening hours in primary care reduced ED visits. Tan and Mays [48] and Ismail et al. [49] conclude that the effect on the ED remains unclear due to missing rigorous evaluations [48,49]. Besides, the introduction of new providers in England is sometimes viewed as problematic because it has led to an increasingly complex urgent care system, where patients have difficulties identifying the appropriate provider at the time of need [5].

4.2. Concentration/centralization of urgent primary care

While urgent primary care used to be organized and provided mostly by local GPs collaborating in a rotation system, this has increasingly changed in most countries towards a system of urgent primary care provided at a central location (Australia - 24 h bulk-billing, Denmark - Out-Of-Hours Service Centers, France - Maisons Médicales de Garde, the Netherlands - PCCs). The shift towards large-scale organizations for a larger geographical area has several advantages: patients have a central point of contact, GPs benefit from fewer shifts, urgent primary care centers are usually supported by call handlers, often with dedicated IT infrastructure and triage models, as well as nurses, and drivers, which allows a more systematic and professional response [20]. Those systems have been evaluated in different countries. Hansen and Munck [52] have demonstrated for Denmark that more centralized urgent primary care models result in more patients receiving telephone advice and lower number of home visits. However, the establishment of these centers does not necessarily translate into lower numbers of patients at EDs as Munro et al. [53] could show in England. A location within the ED and therefore a better cooperation between urgent and emergency care might however lead to fewer self-referrals [54].

4.3. Coordination of urgent primary care and emergency care

Countries included in the survey have taken various steps to promote the coordination between primary care out-of-office and the emergency care. One goal of the improved coordination is to guide patients to the most appropriate provider for their needs. Guidance is needed as several studies reported that patients have limited knowledge about all providers offering urgent and emergency care [55,56]. Therefore, France established one number for urgent and emergency care in nearly three-quarters of the French departments that release the patient from the decision which provider is most appropriate for their need. All countries have expanded the cooperation on the spot by co-locating urgent primary care providers at the hospital with first attempts of a shared entrance and joint triage for patients [57,58]. Several studies were able to show that a closer

collaboration reduces the number of ED patients and that most self-referred patients could be treated by the urgent care center [59,60]. Van Gils-van Rooij et al. [58] evaluated the concept of a joint triage with similar results. An extension of the clear guidance by telephone hotlines or cooperation on spot represents the restriction for patient to enter the ED without referral in Denmark which has been accompanied by a large information campaign composed of letters to every Danish citizen, apps that explain how to use the new system and media campaigns. First results show that the number of contacts at the EDs was reduced considerably after the introduction of the systematic referral – 27% in Central Denmark Region, 25% in the Region Zealand and 10% in Southern Denmark. Furthermore it could be shown that due to the new system (referral process and cooperation of primary care out-of-hours and ED) the number of GP contacts increased by 11% in the Central Denmark Region [26].

4.4. Concentration of emergency care

Denmark implemented a large scale structural reform of the health care system in 2007 which among others centralized the provision of emergency services in EDs in fewer hospitals [61]. This was possible as the National Board of Health (NBH), which is responsible for national regulation and standards, defines hospitals on a national level that are allowed to provide specific specialized services, including emergency services. In June 2014, the Ministry of Health, the Danish Regions and the NBH carried out a technical review of the implementation of the 21 different JAWs. The review did not perform an assessment following rigorous scientific standards. However, it evaluated specific areas and established that: waiting times had reduced (still varying widely across the country), all JAWs fulfilled the recommendations concerning the availability of specialties at the hospital (only six hospitals had them available 24 h a day), and JAWs were a good environment for education and training [26].

In contrast, the Netherlands and England are still in the process of discussing reform plans. In the Netherlands, health insurers agreed to concentrate emergency departments as part of a movement to reduce hospital capacity nationwide. Hospital organizations campaigned against the initiative and also the competition authority disagreed. Nevertheless, three EDs have been closed since 2013 without affecting the national 45 min access target (time from initial contact with the call center until delivery of a patient at the ED). In England, some EDs were closed in the last years accompanied by heavy criticism from different stakeholders. Those closures were the result of local decision making as planning for emergency care providers is based on the regional level and is assured by Clinical Commissioning Groups. However, for complex and life-threatening conditions as stroke we do observe a centralization process for emergency care in the Netherlands and in England. In both countries this process was implemented at a regional level, in England e.g. in the metropolitan areas London and Manchester. Studies could show that the centralization of stroke care increases the probability that evidence based clinical interventions are provided, reduces mortality and length of stay [62–65].

4.5. Incentives through payment systems

Different payment systems provide different incentives and have the potential to support reform measures. Activities of urgent primary care providers can be promoted by payments on the basis of fee-for-service (as in Denmark, France, and Australia) or on the basis of a case-mix system (as in England). A global budget of the ED ensures the availability of facilities and staff. Additionally, it has been discussed whether emergency inpatient admission generates one or two payments for the hospitals (one for the ED and one for the inpatient department) [19]. Having one payment for inpatients admitted via the ED encourages an integrated pathway for the entire admission episode spanning treatment in the ED and during the inpatient stay. Two separate payments make sure that the ED has a distinct funding stream, which is independent of whether the patient is admitted or not. However, it may lead to unintended incentives at the interface, e.g. patients might be admitted unnecessarily to avoid costs in the ED or ED resources will be increasingly used [19].

Several countries are currently debating reforms of their payment systems for urgent and emergency care, although details are not yet available. In England, plans include a proposal for the development of one payment system for both urgent primary care and emergency care [66].This has the potential advantage that payment for a patient is independent of the provider, encouraging providers to organize care in the most efficient setting. However, given the fact that the bulk of ED costs is related to its availability function, while the availability costs for urgent primary care providers are rather low, good arguments exist also in favor of having different payment systems for EDs and urgent primary care providers. Furthermore, any reform of payment systems should be careful not to incentivize a shift from regular primary care to urgent primary (out-of-hours) care because even small shifts away from regular primary care would constitute a huge increase for the urgent primary (out-of-hours) care system. One interesting approach supporting the reorganization of care when introducing a new urgent primary care facility at the location of an ED is the use of a shared savings program. In the Netherlands, insurers have offered shared savings programs to hospitals, when PCCs were introduced at the site of the hospital to compensate hospitals for the loss of revenue.

4.6. Limitations and strengths

As this is an exploratory analysis based on a review of a wide range of documents (published literature, legal documents, policy reports) there are two limitations that need to be considered. Emergency and urgent care systems are very complex comprising different providers with different tasks, locations or access possibilities (see Fig. 1). Therefore, in order to compare different countries a certain degree of simplification is necessary. As a result, certain aspects of the emergency and urgent care system might have been ignored whereas others were highlighted based on individual perceptions of the experts. However, we attempted to standardize the process of data collection by using a questionnaire (see online appendix) and we cross-checked the provided information. Furthermore, the discussion of our results is based on the available empirical evidence about the different reforms. But as the empirical evidence is often relatively weak – as also described in other studies [9,12,49] – it would be inappropriate to draw conclusions about the superiority of reform approaches in one country in comparison to another. Nevertheless, similar to other studies [9,67] we observe reform trends, such as the strengthening of urgent care and the increasing coordination between urgent and emergency care, which allows us to draw conclusions about potentially interesting reform approaches.

Given the wide range of documents assessed by national experts, our study was able to identify emerging trends and recently implemented reform projects that have not yet been comprehensively evaluated. This is in contrast to several systematic reviews [9,12,49,67] that have been conducted on the topic of increasing ED utilization. Furthermore, the national experts could review documents that are often excluded from consideration because of language barriers. Finally, this is the first study that compares both organization and payment systems of urgent and emergency care systems between different countries. This allow us to examine potential interactions between the organization and the payment for urgent and emergency care.

5. Conclusion

Based on a standardized questionnaire completed by national expert and a literature review, we were able to show that several countries have implemented reforms to improve their emergency and urgent care systems. However, most rigorous evaluations of these reforms are available only from the Netherlands and England, while they are largely unavailable for the other countries. As major reforms are currently under way in many countries, governments and researchers should use the opportunity to evaluate the results of the changed models in the delivery of emergency care. Available evaluations show that goals of the reforms, such as a reduction of the ED visits could be reached in some cases. The most important measures to achieve these aims are:

(1) Better guidance of patients through the emergency and urgent care system

Patients in need of urgent care are confronted with different providers with different working hours at different locations. Several countries provide examples of reforms that have improved the guidance of patients through the system. On the one hand, emergency care for highly complex patients (e.g. AMI and stroke) has been reorganized in England and France to steer patients to fewer highly specialized providers, where the necessary personnel and infrastructure is available. Studies have shown that this increases survival. On the other hand, several reforms have aimed to improve the pathway of patients with urgent primary care needs. These include the introduction of a single phone number in France or - more radical - the requirement that patients call the urgent primary care number to book an appointment at the ED in Denmark. However, changing patient pathways should be accompanied with information campaigns for patients as only patients who are aware of new models of providers or pathways can use them as intended. Other reforms have improved guidance of patients through the system by co-locating urgent primary care providers at EDs.

(2) Reconfiguration of urgent and emergency care

Several reforms in the six countries have aimed to move care provision for patients with urgent primary care needs away from EDs and to urgent primary care providers, e.g. through the progressive establishment of PCCs located at hospitals in the Netherlands. Several studies have shown that this reduces the number of patients in the ED. Similar reforms have also been implemented in Denmark and England. However, reform approaches are often implemented on a regional level because this is the level where the planning of emergency and urgent care providers takes place. Yet, implementation of more radical structural reforms, which would be necessary to achieve more harmonized provision of emergency and urgent care provision, are likely to require nationwide planning similar to the large-scale hospital reform undertaken in Denmark over the past 11years [68].

Conflict of interest statement

The authors declare that they have no competing interest.

Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:https://doi.org/10.1016/j.healthpol.2018.11.001.

References

[1] NHS England. About urgent and emergency care; 2018. Accessed 14 Aug 2018 https://www.england.nhs.uk/urgent-emergency-care/about-uec/.
[2] Bossaert LL. The complexity of comparing different EMS systems—A survey of EMS systems in Europea. Annals of Emergency Medicine 1993;22:99–102, http://dx.doi.org/10.1016/S0196-0644(05)80259-8.
[3] Al-Shaqsi S. Models of international emergency medical service (EMS) systems. Oman Medical Journal 2010;25:320–3, http://dx.doi.org/10.5001/omj.2010.92.
[4] Jayaprakash N, O'Sullivan R, Bey T, Ahmed SS, Lotfipour S. Crowding and delivery of healthcare in emergency departments: the European perspective. Western Journal of Emergency Medicine 2009;10:233–9.
[5] NHS England. Transforming urgent and emergency care services in England: urgent and Emergency Care Review: end of phase 1 report 2013. Accessed 10 Nov 2018 https://www.nhs.uk/NHSEngland/keogh-review/Documents/UECR.Ph1Report.Appendix%201.EvBase.FV.pdf.
[6] Foley C, Droog E, Healy O, McHugh S, Buckley C, Browne JP. Understanding perspectives on major system change: a comparative case study of public engagement and the implementation of urgent and emergency care system reconfiguration. Health Policy 2017;121:800–8, http://dx.doi.org/10.1016/j.healthpol.2017.05.009.
[7] van den Heede K, Quentin W, Dubois C, Devriese S, van de Voorde C. The 2016 proposal for the reorganisation of urgent care provision in Belgium: A political struggle to co-locate primary care providers and emergency departments. Health Policy 2017;121:339–45, http://dx.doi.org/10.1016/j.healthpol.2017.02.006.
[8] Berchet C. Emergency care services: trends, drivers and interventions to manage the demand. Paris; 2015.
[9] van den Heede K, van de Voorde C. Interventions to reduce emergency department utilisation: A review of reviews. Health Policy 2016;120:1337–49, http://dx.doi.org/10.1016/j.healthpol.2016.10.002.
[10] McHale P, Wood S, Hughes K, Bellis MA, Demnitz U, Wyke S. Who uses emergency departments inappropriately and when - a national cross-sectional study using a monitoring data system. BMC Medicine 2013;11(258), http://dx.doi.org/10.1186/1741-7015-11-258.
[11] Carret MLV, Fassa ACG, Domingues MR. Inappropriate use of emergency services: a systematic review of prevalence and associated factors. Cad. Saúde Pública 2009;25:7–28, http://dx.doi.org/10.1590/S0102-311X2009000100002.
[12] Hoot NR, Aronsky D. Systematic review of emergency department crowding: causes, effects, and solutions. Annals of Emergency Medicine 2008;52:126–36, http://dx.doi.org/10.1016/j.annemergmed.2008.03.014.
[13] Mansky T, Drogan D, Nimptsch U, Günster C. Eckdaten stationärer Versorgungsstrukturen für ausgewählte Krankheitsbilder in Deutschland. In: Dormann F, Klauber J, editors. Qualitätsmonitor 2017. Berlin: Medizinisch Wissenschaftliche Verlagsgesellschaft; 2017. p. 165–216.
[14] Saka O, Serra V, Samyshkin Y, McGuire A, Wolfe, Charles CDA. Cost-effectiveness of stroke unit care followed by early supported discharge. Stroke 2009;40:24–9, http://dx.doi.org/10.1161/STROKEAHA.108.518043.
[15] Stroke Unit Trialists Collaboration. How do stroke units improve patient outcomes? A collaborative systematic review of the randomized trials. Stroke 1997;28:2139–44.
[16] Harish NJ, Miller HD, Pines JM, Zane RD, Wiler JL. How alternative payment models in emergency medicine can benefit physicians, payers, and patients. American Journal of Emergency Medicine 2017;35:906–9, http://dx.doi.org/10.1016/j.ajem.2017.03.025.
[17] Pines JM, McStay F, George M, Wiler JL, McClellan M. Aligning payment reform and delivery innovation in emergency care. The American Journal of Managed Care 2016;22:515–8.
[18] Sharp AL, Song Z, Safran DG, Chernew ME, Mark Fendrick A. The effect of bundled payment on emergency department use: alternative quality contract effects after year one. Academic Emergency Medicine 2013;20:961–4, http://dx.doi.org/10.1111/acem.12205.
[19] Duckett SJ, Jackson T. Paying for hospital emergency care under a single-payer system. Annals of Emergency Medicine 2001;37:309–17, http://dx.doi.org/10.1067/mem.2001.111576.
[20] Grol R, Giesen P, van Uden C. After-hours care in the United Kingdom, Denmark, and the Netherlands: new models. Health Affairs (Millwood) 2006;25:1733–7, http://dx.doi.org/10.1377/hlthaff.25.6.1733.
[21] Huibers L, Giesen P, Wensing M, Grol R. Out-of-hours care in western countries: assessment of different organizational models. BMC Health Services Research 2009;9(105), http://dx.doi.org/10.1186/1472-6963-9-105.
[22] Leibowitz R, Day S, Dunt D. A systematic review of the effect of different models of after-hours primary medical care services on clinical outcome, medical workload, and patient and GP satisfaction. Family Practice 2003;20:311–7, http://dx.doi.org/10.1093/fampra/cmg313.
[23] Pines JM, Hilton JA, Weber EJ, Alkemade AJ, Al Shabanah H, et al. International perspectives on emergency department crowding. Academic Emergency Medicine 2011;18:1358–70, http://dx.doi.org/10.1111/j.1553-2712.2011.01235.x.
[24] Neubauer G, Minarzt C, Niedermeier C. Kritische Analyse des, Gutachtens zur ambulanten Notfallversorgung im Krankenhaus – Fallkostenkalkulation und Strukturanalyse "der MCK in Kooperation mit der DGINA vom 17.02.2015; 2016.

[25] AIHW. Australian hospital statistics 2013–14: Emergency department care. Canberra: Australian Institute of Health and Welfare; 2015.
[26] Danske Regioner, Sundhedsstyrelsen og Ministeriet for Sundhed og Forebyggelse. Faglig gennemgang af akutmodtagelserne. Kopenhagen; 2014.
[27] Krommer GJ, Gijsen R, Lemmens LC, Kooistra M, Deuning C. Beschikbaarheid, specialisatie en bereikbaarheid van Spoedeisende hulp in Nederland: Analyse gevoelige ziekenhuizen. Bilthoven; 2015.
[28] NHS England. Hospital Episode Statistic 2012-13. 2014. https://digital.nhs.uk/data-and-information/data-tools-and-services/data-services/hospital-episode-statistics. Accessed 14 Aug 2018.
[29] Ricroch L. Urgences hospitalières en 2013: des organisations différentes selon le niveau d'activité; 2015.
[30] AIHW. Australian hospital statistics: Hospital resources 2013-14. Canberra: Australian Institute of Health and Welfare; 2015.
[31] Geissler A, Quentin W, Busse R. Umgestaltung der Notfallversorgung: Internationale Erfahrungen und Potenziale für Deutschland. In: Klauber J, Geraedts M, Friedrich J, Wasem J, editors. Krankenhaus-Report. Schwerpunkt: Zukunft gestalten. Stuttgart: Schattauer; 2017. p. 41–60.
[32] Volksgezondheidenzorg.info. Locaties algemene en academische ziekenhuizen. 2014. https://www.volksgezondheidenzorg.info/onderwerp/ziekenhuiszorg/regionaal-internationaal/locaties#!node-algemene-en-academische-ziekenhuizen. Accessed 25 Apr 2017.
[33] WHO Regional Office for Europe. European health for all database; 2015. Accessed 25 Apr 2017 http://data.euro.who.int/hfadb/.
[34] World Bank. World development indicators; 2015. Accessed 25 Apr 2017 http://data.worldbank.org/data-catalog/world-development-indicators.
[35] Office of National Statistics. Annual mid year population estimates: 2013; 2013. Accessed 25 Apr 2017 https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/bulletins/annualmidyearpopulationestimates/2014-06-26.
[36] AIHW. Australian hospital statistics: Admitted patient care. Canberra: Australian Institute of Health and Welfare; 2015.
[37] Statistics Denmark. 2015. http://www.dst.dk/en. Accessed 14 Aug 2018.
[38] NHS England. Quarterly A&E Activity and Emergency Admissions statistics, NHS and independent sector organisations in England.; 2015. Accessed 25 Apr 2017 https://www.england.nhs.uk/statistics/wp-content/uploads/sites/2/2014/04/Quarterly-time-series-2004-05-onwards-with-Annual3.xls.
[39] Cour des comptes. La sécurité sociale - Rapport sur l'pplication des lois de financement de la sécurité sociale. Paris; 2014.
[40] Gaakeer MI, van den Brand, Crispijn L, Veugelers R, Patka P. Inventarisatie van SEH-bezoeken en zelfverwijzers. Ned Tijdschr Geneeskd 2014;158:A7128.
[41] ACEM. Policy on standard terminology. Melbourne; 2014.
[42] ACEM. Statement on the declinieation of emergency departements. Melbourne; 2012.
[43] Ministère de la Santé et des Solidarités. Décret n° 2006-577 du 22 mai 2006 relatif aux conditions techniques de fonctionnement applicables aux structures de médecine d'urgence et modifiant le code de la santé publique (dispositions réglementaires). Paris; 2006.
[44] Ministère de la Santé et des Solidarités. Décret n° 2006-576 du 22 mai 2006 relatif à la médecine d'urgence et modifiant le code de la santé publique (dispositions réglementaires). Paris; 2006.
[45] Metzinger B. Notfallstrukturen in Krankenhäusern: Lösungen für ein gestuftes System. Das Krankenhaus; 2016. p. 657–61.
[46] Gemeinsamer Bundesausschuss. Neue G-BA-Regelung zur stationären Notfallversorgung: Sicherer Erreichbarkeit, verbesserte Qualität und zielgenaue Finanzierung; 2018. Accessed 12 Jul 2018 https://www.g-ba.de/institution/presse/pressemitteilungen/744/.
[47] Cowling TE, Harris MJ, Majeed A. Evidence and rhetoric about access to UK primary care. BMJ 2015;350:h1513, http://dx.doi.org/10.1136/bmj.h1513.
[48] Tan S, Mays N. Impact of initiatives to improve access to, and choice of, primary and urgent care in the England: a systematic review. Health Policy 2014;118:304–15, http://dx.doi.org/10.1016/j.healthpol.2014.07.011.
[49] Ismail SA, Gibbons DC, Gnani S. Reducing inappropriate accident and emergency department attendances: a systematic review of primary care service interventions. British Journal of General Practice 2013;63:e813–20, http://dx.doi.org/10.3399/bjgp13X675395.
[50] Whittaker W, Anselmi L, Kristensen SR, Lau Y, Bailey S, Bower P, et al. Associations between extending access to primary care and emergency department visits: a difference-in-differences analysis. PLoS Med 2016;13:e1002113, http://dx.doi.org/10.1371/journal.pmed.1002113.
[51] Arain M, Campbell MJ, Nicholl JP. Impact of a GP-led walk-in centre on NHS emergency departments. Emergency Medicine Journal 2015;32:295–300, http://dx.doi.org/10.1136/emermed-2013-202410.
[52] Hansen BL, Munck A. Out-of-hours service in Denmark: the effect of a structural change. British Journal of General Practice 1998;48:1497–9.
[53] Munro J, Nicholl J, O'Cathain A, Knowles E. Impact of NHS direct on demand for immediate care: observational study. BMJ 2000;321:150–3.
[54] van Uden CJT, Winkens RAG, Wesseling G, Crebolder Harry FJM, Schayck van, et al. Use of out of hours services: A comparison between two organisations. Emergency Medicine Journal 2003;20:184–7, http://dx.doi.org/10.1136/emj.20.2.184.
[55] Ipsos MORI. GP patient survey - national summary report; 2015. Accessed 28 Feb 2017 http://gp-survey-production.s3.amazonaws.com/archive/2015/July/July%202015%20National%20Summary%20Report.pdf.
[56] Somasundaram R, Geissler A, Leidel BA, Wrede CE. Beweggründe für die Inanspruchnahme von Notaufnahmen - Ergebnisse einer Patientenbefragung. Gesundheitswesen 2018;80:621–7, http://dx.doi.org/10.1055/s-0042-112459.
[57] Gnani S, Ramzan F, Ladbrooke T, Millington H, Islam S, Car J, et al. Evaluation of a general practitioner-led urgent care centre in an urban setting: description of service model and plan of analysis. JRSM Short Reports 2013;4, http://dx.doi.org/10.1177/2042533313486263, 2042533313486263.
[58] van Gils-van Rooij, Elisabeth Sybilla Johanna, Yzermans CJ, Broekman SM, Meijboom BR, et al. Out-of-Hours care collaboration between general practitioners and hospital emergency departments in the Netherlands. Journal of the American Board of Family Medicine 2015;28:807–15, http://dx.doi.org/10.3122/jabfm.2015.06.140261.
[59] van Uden, Caro JT, Winkens RAG, Wesseling G, et al. The impact of a primary care physician cooperative on the caseload of an emergency department: the Maastricht integrated out-of-hours service. Journal of General Internal Medicine 2005;20:612–7, http://dx.doi.org/10.1111/j.1525-1497.2005.0091.x.
[60] Cowling TE, Ramzan F, Ladbrooke T, Millington H, Majeed A, Gnani S. Referral outcomes of attendances at general practitioner led urgent care centres in London, England: retrospective analysis of hospital administrative data. Emergency Medicine Journal 2016;33:200–7, http://dx.doi.org/10.1136/emermed-2014-204603.
[61] Christiansen T. Ten years of structural reforms in Danish healthcare. Health Policy 2012;106:114–9, http://dx.doi.org/10.1016/j.healthpol.2012.03.019.
[62] Hunter RM, Davie C, Rudd A, Thompson A, Walker H, Thomson N, et al. Impact on clinical and cost outcomes of a centralized approach to acute stroke care in London: a comparative effectiveness before and after model. PLoS One 2013;8:e70420, http://dx.doi.org/10.1371/journal.pone.0070420.
[63] Lahr MMH, Luijckx G, Vroomen, Patrick CAJ, van der Zee D, Buskens E. Proportion of patients treated with thrombolysis in a centralized versus a decentralized acute stroke care setting. Stroke 2012;43:1336–40, http://dx.doi.org/10.1161/STROKEAHA.111.641795.
[64] Morris S, Hunter RM, Ramsay AIG, Boaden R, McKevitt C, Perry C, et al. Impact of centralising acute stroke services in English metropolitan areas on mortality and length of hospital stay: difference-in-differences analysis. BMJ 2014;349:g4757, http://dx.doi.org/10.1136/bmj.g4757.
[65] Ramsay AIG, Morris S, Hoffman A, Hunter RM, Boaden R, McKevitt C, et al. Effects of centralizing acute stroke services on stroke care provision in two large metropolitan areas in England. Stroke 2015;46:2244–51, http://dx.doi.org/10.1161/STROKEAHA.115.009723.
[66] NHS England. Local payment examples. Urgent and emergency care: a potential new payment model; 2015. Accessed 2 Mar 2017 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/452925/UEC_LPE.pdf.
[67] Flores-Mateo G, Violan-Fors C, Carrillo-Santisteve P, Peiró S, Argimon J. Effectiveness of organizational interventions to reduce emergency department utilization: a systematic review. PLoS One 2012;7:e35903, http://dx.doi.org/10.1371/journal.pone.0035903.
[68] Christiansen T, Vrangbæk K. Hospital centralization and performance in Denmark-Ten years on. Health Policy 2018;122:321–8, http://dx.doi.org/10.1016/j.healthpol.2017.12.009.