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Faculté de biologie et de médecine

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The out-of-hours care system in Switzerland and in nine European countries, a comparative analysis

Etudiante: Marie-Laure Flammer

Tuteurs: Dr. Philippe Staeger, Dr. Christophe Monney, Dr. Fabrice Dami

Expert: Prof. Nicolas Senn

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1. Abstract

Background: the OOHC organization is in evolution in most of the western countries. The traditional model (the GP taking care of his own patients 24/7) tends to evolve towards bigger-scale organizations. Switzerland undergoes the same evolution. The OOHC system is different in each of the twenty-six Swiss cantons, and no comprehensive comparative review was ever published. In this context of change, it could be useful for decision makers to have this information, and in addition, to know which innovating OOHC models have been implemented in Europe so far.

Aims: 1) To describe in detail the Swiss out-of-hours care (OOHC) system based on internet information and a survey sent to key informants. 2) To compare the organization of the OOHC system of nine Europeans countries.

Methodology: 1) information was gathered on the internet using OOHC related key-words. We designed a survey and filled it according to this information, and then sent it to the key informants of each twenty-six cantons. 2) An extensive literature review was made about nine European countries that we chose based on their geographical proximity to Switzerland, and to which countries we thought could have been implementing innovating models in the field of OOHC.

Results: 1) Finding information about OOHC on the internet was easily feasible in 100% of the cantons. The answer rate to the survey was 50%. In 25/26 cantons, the medical cantonal society was responsible for organizing the OOHC, in 1/26 it was shared with the State. Inter-cantonal collaboration was active in 10/26 cantons. To take part in the OOHC was mandatory in 100% of the cantons. Duties were remunerated in 46% of the cantons that answered. Innovating models implemented in Switzerland were: a unique cantonal number (20/26 cantons, 17/20 using a non-surtaxed number), a telephonic regulation (17/26 cantons), the use of nurses for the latter (15/17 cantons), GP-cooperatives (16/26 cantons, 15/16 integrated to the hospitals), Baden's model (hospital-integrated GP-cooperatives (H-GPs) managed alternatively by general practioners (GPs) and hospital's doctors, 10/16 of the H-GPs), Lyss Model (at night, the hospital answer the calls, the on-call GP being called only if needed; 5/26 cantons), the use of private societies to do part of the home visits (12/26 cantons). 2) The main innovating models across Europe were the implementation of GP-cooperatives (Netherlands, Denmark, Sweden, UK), the increasing role of telenurses (nurses used for telephonic triage), the creation of new specific OOHC professions (UK). The UK has a special system of integrated care. During the literature review, several interesting points stood out: emergency department's overcrowding is a global OOHC critical issue (that GP-Cs seem to have an efficacy in reducing); too much innovation and creation of new professions leads to explosion of the costs (UK); specific populations tend to be left out of the new OOHC model (older people, disabled); patient's education about the new OOHC system is crucial for an efficient use and patients' satisfaction.

Limitations: 1) the 50% answer rate to the survey obligated us to rely a lot on the information found on the internet; 1) and 2) the accuracy and correctness of the latter is not guaranteed.

Conclusion: the Swiss OOHC system varies amongst the cantons. The same main innovating models were implemented as in some European countries: telephone triage (done by nurses) and GP-cooperatives. The latter have produced numerous studies that can be taken into account while redesigning the OOHC system.

2. Introduction

2.1. Western countries' out-of-hours care: reasons for a system's change

Most of developed countries have an out-of-hours care (OOHC) system, which refers to the organization of the primary care system out of general practitioners' practices' (GPPs) opening hours. These OOHC systems are evolving (1) along with deep changes in the traditional model whereby the general practioner (GP) is responsible, alone, for the care of his patients 24/7. This model is evolving to larger-scale organizations that help GPs to relieve the burden of out-of-hours care.
What are the reasons for this evolution that affects the OOHC systems? According to several studies, the main reasons are the increasing workload of doctors due to the increase in non-urgent demands, the complexity of health problems, and the shortage of GPs (2), as well as the wish among physicians, to better separate work and private life (1). An American study reported negative aspects for GPs taking part to an OOHC system and showed that being on-call has an important impact on quality of life: "Newly graduated physicians view being on call as a major detraction and impediment to socialization and family life" (3). Another study supports the idea that current and future GPs are more inclined to separate work from private life, and link this observation to a generational evolution: they characterize generations X and Y by a greater focus on technology, mobility and also in finding well-balanced life. The generation Z (born from 1991 to 2006) could follow in the footsteps of Generation Y in terms of behavior (4) A British study on GPs reported that being on call could also have a significant impact on perceived mental health: indeed, it showed that there is a correlation between the prevalence of anxiety and depression, and the number of out-of-hours shifts the GPs had to do (5). Finally, nocturnal home visits are considered as a significant stressor (5).

Patient's needs and demands have also evolved: "European countries face high demands for medical care due to population growth, ageing, migration, and to the changing patient behavior within a 24/7 culture"(6) The attitude of the patients towards the health care system may have indeed become more exigent : "The public expects the highest quality of care to be delivered 24 hours per day, seven days per week, at the lowest possible cost, and with the highest degree of safety to ensure the best possible outcomes."(3)

A Dutch report (7) made a list of the issues faced by GPs regarding their on-call duty:

Table 1: *Issues reported by GP in OOHC (Netherlands), taken from: "Quality of out-of-hours primary care in the Netherlands" by P. Giesen, 2007 (7)*

- Heavy workload
- Long on call time of about 19 hours/week, plus about 50 hours of regular work
- Lack of separation between work and private life
- Lack of private life
- Poor salary (full-time GPs received €4538 a year for on-call time of 19 hours a week)
- Shortage of GPs, especially in rural areas
- Inappropriate patient contacts
- Demanding and aggressive patient behaviour
- Patient self-referral to ambulance and hospital care
- Lack of material and personal support

Another critical issue faced by the OOHC system is the global emergency departments' overcrowding,

partly because of a high proportion of patients presenting with non-critical problems, that could be dealt with in primary care settings: Indeed, in most industrialized countries, the number of patients seeking non-urgent care at emergency departments (EDs) seems to increase immensely (8). This is preoccupant for many reasons: "The patient is at risk of poor outcome, prolonged pain, suffering long waits, dissatisfaction; ambulances are diverted in some cities; physicians' productivity decreases; and frustration among medical staff and violence increases"(9). ED's overcrowding has also been associated with increased patient's mortality in some studies (10). Patients self-referring to the EDs or call ambulances are generally generating greater costs than the ones that first make contact with a GP (11). Regarding the specific case of a non-urgent out-of-hours consultation, ED overcrowding represents a risk for "flee": excessive waiting times can make some patients leave the ED, without having being seen by medical professionals at all (12),(13).

Switzerland could also have to face the problem of the shortage of GPs in the future : according to a Swiss article (14), in 2010, 39.5% of all physicians were GPs, most of them being more than fifty years old and struggling to find young GPs willing to resume operating their practice, especially in rural area. According to surveys of medical students in Lausanne and Geneva, only 16% considered a career as a GP (14).

2.2. The Swiss OOHC background

In Switzerland, there is no unique OOHC system, but as many OOCH systems as the number of cantons (twenty-six), each one of them being individually responsible for building its own OOHC system, without any uniform federal model nor frame. In addition to that, the organization on the OOHC system can even vary within the canton itself: often, they are divided in different sectors, which do not necessarily follow the same scheme.

The use of the organized OOHC system is not mandatory in Switzerland: patients have a free-choice access to the whole health care system, without any restriction or gate-keeping barriers. They can go to "either their own GP, a GP-C (General Practitioner Cooperative) providing out-of-hours emergency services, sporadic urban walk-in emergency centers, or a hospital ED"(8). Mandatory health insurance covers all costs (except for basic annual deductibles of CHF 300.- to 2500.- and patient payment of 10% of all costs, with an annual maximum of CHF 700.-), whatever service is used (8). This unlimited model contributes to an increasing use and engorgement of the ED (15), partly due to self-referred patients with non-urgent problems, elderly patients or migrants patients. (16). In 2006, 84% of the ED with a rate of >20'000 visits/y reported being overcrowded (17).

2.3. New models emerging amongst western countries

An interesting study conducted in 2007 (1) analyzed and compared the OOHC system in 25 western countries, and identified nine different models (reported here as it will provide you with a useful reading tool for the following of this work. See appendix 1 for detailed descriptions):

Table 2: models of OOHC in western countries	
Small GP-based models	**Individual family practices**: GP in charge for his patients 24/7

	Rota groups: several GPs in close areas cooperate to be on-call one after the others, covering all GPs' patients.
Bigger-scale GP-based models	**GP-cooperatives**: large-scale structures where GP are on-call in turn, to cover all the patients from the GPs who take part in.
	Primary care centers: structures that patients can come to without appointment for minor injury or illness; the center is supervised by a GP.
	Minor injury centers or **walk-in centers**: structures that patients can come to without appointment for minor injury or illness. Patients are seen by formed nurses.
	Deputizing services: private societies that hire GPs to do duties of other GPs.
Hospital-based and **national models**	**Telephone regulation service**: telephonic triage and consultations. Can be done by different types of professionals (doctors / nurses / others).
	Emergencies departments of the hospital (ED)
	Primary OOHC structures integrated to the hospital: for example, GP-cooperative in the hospital and that collaborate with the ED.

2.4. Hypothesis and objectives

Our starting hypothesis is that the twenty-six counties of Switzerland have a different OOHC system. It can be supposed that the different cantons don't know much about the OOHC systems of the others, as a review of all their respective models have never been comprehensively published. In the current context of shuffling and innovation in the different OOHC systems, suppliers and relevant stakeholders could benefit from such information. Effective models in other western countries could also inspire innovation, as many of these countries have reformed their OOHC system over the past two decades. So, the question is: how are the different cantonal OOCH systems organized, and those of the neighbor European countries? Our objective in this review is to describe in details the 26 Swiss OOCH systems, as well as the OOCH systems of nine European countries. We identified two additional secondary objectives while gathering information on the internet:

1) To evaluate the visibility and clarity of the OOHC system on the Internet (which could be the main source of information on the system for many patients)
2) To evaluate whether the information found on the Internet is consistent with the existing system.

3. Methodology

We designed a questionnaire addressing different aspects of the organization of the out-of-hours care system (see appendix 2): demographic information, existence and organization of a telephonic triage service, organization of OOHC consultations for patients who can move, organization of home visits, obligation for doctors to participate in the OOHC system, remuneration, length of duties and number of penalties per year, average number of interventions performed while being on call, and finally, the existence or not of a collaboration with the hospital.

The information is based on the internet source (other sources that can be used by patients to know how to contact the OOHC system, such as calling their GP's telephone answering machine or looking into newspapers, were left aside). On the basis of information available on the Internet (information addressed to patients, websites of the cantonal OOHC organizational societies, newspaper articles, review articles), we completed the questionnaire for the 26 cantons. For searching the information, the following key words were used:

Table 3 : internet research key-words	
French	[Garde médicale / Médecin de garde / Urgence / Maison de garde] AND [name of the canton]
German	[Notfallarzt / Notfalldienst / Dienstarzt / Notfall] AND [name of the canton]
Italian	[Guardi Medica / Emergenza] AND [name of the canton]

After this information gathering step, we sent the completed questionnaire to each of the twenty-six cantons, asking them to check if the information was up-to-date and correct, and to add any eventual comments. We sent the survey to the medical societies that were responsible to organize the OOHC system in each canton (except for Lausanne where the State is now entitled to organize it, we hence sent it to a personal contact). We compiled the results in a global comparative table.

Concerning the foreign OOHC models, we selected nine European countries based on their geographical proximity to Switzerland or based on what we thought could be countries having done interesting innovations in the field of OOHC. We selected Germany, Austria, France, Italy and the UK, the Netherlands, Denmark, Sweden and Norway. Based on an in-depth literature review, we analyzed their OOHC system, focusing on the conceptual and structural organization, and the innovative models they implemented. Although the United States, Canada and Australia are also reviewing their OOHC system, we chose not to not include them because their health system is very different from the Swiss health system.

4. Results and discussion

4.1 THE SWISS OOHC system: a comparative review

4.1.1 Results from the survey

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Table 4: comparative table of OOHC system in the twenty-six Swiss cantons

	Uniform organi-sation	Telephonic regulation, UCN, actors of TT	OOH consultations for patients who can move	House calls	Legal obligation and age limit	Re-mune-ration	Innovating models
AG	No, but UCN	**Yes, UCN, nurses / PS**	GPPs, 1 H-GP-C (BM), ED	GPs , PS	**Yes** (age limit:?)	**No**	UCN, TT, TN, H-GP-C, BM, HV by PS
AI	Yes	**Yes, UCN, nurses**	GPPs, ED	GPs	**Yes** (age limit: ?)	*?*	UCN, TT, TN
AR	No, but UCN	**Yes, UCN**, nurses	GPPs, 1 H-GP-C, ED	GPs	**Yes** (age limit:?)	*?*	UCN, TT, TN, H-GP-C
BE	No, but UCN	**Yes, UCN, nurses**	GPPs, 4 H-GP-C, Walk-in centers, ED	GPs, PS	**Yes** (age limit: ?)	*?*	UCN, TT, TN, H-GP-C, BM, HV by PS
BL	No, but UCN	**Yes, UCN, nurses**	GPPs, 2 H-GP-C, ED	GPs , PS	**Yes** (until 55 yo)	**No**	UCN, TT, TN, H-GP-C, HV by PS
BS	Yes	**Yes, UCN, nurses**	GPPs, 1 H-GP-C, ED	GPs , PS	**Yes** (until 55 yo)	**Yes**	UCN, TT, TN, H-GP-C, HV by PS
FR	Yes, but no UCN	**Yes, no UCN, nurses/doctors**	GPPs, ED	GPs, PS	**Yes** (60 yo)	*?*	TT, TN, HV by PS, LM
GE	No	**Yes, no UCN, 3 PS**	GPPs, WIC, ED	GPs, 3 PS	**Yes** (age limit :?)	*?*	TT , TT done by paramedical professional, HV by PS
GL	Yes	**Yes (1 sector), no UCN, nurses**	GPPs , ED	GPs	**Yes** (age limit:?)	*?*	TT, TN
GR	Yes	**Yes, no UCN,** nurses / on-call GP	GPPs, ED	GPs	Yes (age limit:?)	*?*	UCN, TT, TN
JU	Yes	**No,** UCN, redirected to o GP/hospital doctor	GPPs, ED	GP	Yes (age limit :?)	*?*	UCN
LU	No, but UCN	**Yes ,** UCN, Nurses	GPs, 3 H-GP-C	GPs, PS	**Yes** (60 yo)	**No**	UCN, TT, TN, H-GP-C, HV by PS
NE	Yes	**Yes,** UCN, Nurses	GPPs, 3 H-GP-C, ED	GPs ,	**Yes** (60/65y)	**Yes**	UCN, TT, TN

				hospital, PS			H-GP-C, BM, HV done by PS
NW	Yes	**No, UCN,** on-call GP / hospital doctor	GPPs, ED	GPs	**Yes** (age limit: ?)	**Yes**	UCN, LM
OW	Yes	**No**, UCN, on-call GP or H-GP-C	GPPs, 1 H-GP-C, ED	GPs	**Yes** (no age limit)	**No**	UCN, H-GP-C, BM
SG	No	**No, no UCN, on-call GP / hospital doctors**	GPPs, 2 H-GP-C (BM), ED	GPs	**Yes** (age limit :?)	*?*	H-GP-C, BM, LM
SH	No, but UCN	**No, UCN, GP-C / on-call GP**	GPPs, 1 H-GP-C (BM), ED	GPs	**Yes** (no age limit)	**Yes**	UCN, H-GP-C, BM, LM
SO	No, but UCN	**Yes,** UCN, Doctors	GPPs, 2 H-GP-C (BM), ED	GPs, PS	**Yes** (no age limit)	**Yes**	UCN, H-GP-C, BM, HV by PS
SZ	No	**No, no UCN,** On-call GP / GP-C	GPPs, 1 H-GP-C (BM), ED	GPs	**Yes** (age limit?)	**No**	H-GP-C, BM
TI	Yes	**Yes,** UCN	GPPs, ED	GPs , PS	**Yes** (60 yo)	*?*	UCN, HV done by PS
TG	No	**Yes** (2 sectors), Nurses / on-call GP	GPPs, 2 H-GP-C (BM), ED	GPs	**Yes** (no age limit)	Yes	TT, TN, H-GP-C, BM
UR	Yes	**No, UCN.** **on-call GP / hospital doctor**	GPPs, ED	GPs	**Yes** (until 65 yo)	No	UCN, LM
VD	No, but UCN	**Yes, UCN**, Nurses	GPPs, WIC, ED	GPs, 2 PS	**Yes** (60yo)	No	UCN, TT, TN, H-GP-C HV done by PS
VS	No	**Yes, UCN,** Telephone doctors	GPPs, 1 H-GP-C (BM), ED	GPs	**Yes** (age limit :?)	*?*	UCN, TT, H-GP-C, BM
ZG	No	**Yes ,UCN ,** Nurses	GPPs, 1 H-GP-C, WIC, ED	GPs	**Yes** (age limit:?)	*?*	UCN, TT, TN, H-GP-C
ZH	No	**Yes, UCN**, Nurses	GPs, 2 H-GP-C, WIC, ED	GPs, PS	**Yes** (60 yo)	*?*	UCN, TT, TN, H-GP-C, HV done by PS

Table 3 : abbreviations

- GP : general practionner
- GPP : general practioner's practice
- UCN : unique cantonal number
- TT : telephone triage
- TN : telenurses
- GP-C : GP-cooperatives (« Maisons de garde » or « Notfallpraxen »)
- H-GP-C : integrated- hospital GP-cooperatives
- BM: Baden's model
- LM: Lyss Model
- HV: Home visits
- PS: private socieities, DS: deputizing services
- yo: years old, y: year
- w-e: week-end, bh: bank holiday
- ED: Emergency departments (of the hospital)

A more detailed comparative overview of the Swiss cantons' systems is available under appendix 3. For the completely detailed organization of each canton, the complete tables are available under appendices 4 – 29.

In 100% of the cantons, information about how to contact the OOHC system was easily accessible on the internet. Solicitation for revising and completing the questionnaire received a response rate of 50% (13 cantons). For the cantons that returned the survey, the information they gave is globally congruent to the one found in the websites in 100% of the cases. Information that is not visible on the internet is the remuneration for OOHC duties, the number of duties per year and the mean number of interventions during an on-call duty.

Table 4: general information about the OOHC	
Responsibility for organizing the OOHC	Medical society in 25 cantons
	State and Medical society in 1 canton (VD)
Inter-cantonal collaboration	10 cantons : AG, BS, BL, VD, NE, FR, NW, OW, GL, ZU
Obligation to take part to OOHC	100% of the cantons
	Age limit: 55, 60, 65 or none (until cessation of activity)
Remuneration	In 46% of cantons that answered.
	Between 100 and 200 CHF per on-call duty*
Duration and number of duties	Extremely variable
Mean number of interventions per duty	Extremely variable. 30% of the responding cantons answered it wasn't statistically collected.

** for on-call duty done in the GP-cooperatives, duties are remunerated differently (salary depending on the GP-cooperative).*

Based on the analysis of the OOHC systems of the twenty-six cantons, we drew a few "trends" of innovations recently or currently set up across Switzerland:

Table 5: emerging OOHC model in Switzerland	
Unique cantonal phone number *for OOH non-vital emergencies*	**20/26** cantons, **17/20** using a **non-surtaxed** number
Telephonic regulation	**17/26** cantons. 9 cantons don't have a proper telephonic triage system yet.
	16/17 with a triage service linked to the unique cantonal number (and eventually private societies having a parallel telephonic regulation function).
	1/17 with no unique cantonal number but triage done only by **private societies.**
	15/17 using **nurses**, **1/17** using **doctors**, **1/17** using **paramedical or non-medical professionals** for the triage.
Phone centers doing the triage	*MNZ* (*Medizinische Notrufzentrale*): **3/17** (AG, BL, BS)
	ARTZEFON: **4/17** (AI, AR, GL, ZU)
	MEDPHONE: **3/17** (LU, ZG, BE)
	CTMG: **3/17** (VD, NE, FR*)

	144 phone center: **1/17** (GR)
GP-cooperatives	In **16/26** cantons
	15/16 integrated to hospitals**, **1/16 apart** (VD).
Baden's model	Hospital-integrated GP-cooperatives that are managed conjunctively by on-call GPs (usually in the evenings after GPs practice's closure) and hospital doctors (at night, and eventually during the day before GPs arrive) in collaboration
	10/16 H-GP-C. Others H-GP-C are not managed by hospital doctors (they are closed at night).
Lyss' model	At night, the existing OOHC telephone number is redirected to hospital's doctors. The on-call GP is available as a piquet and called only if its presence is necessary.
	5/26 cantons.
Private societies used for home visits	**12/26** cantons.
	SOS Aertze in 1/12 (ZU)
	Mobile Aertze in 7/12 (AG, BE, BL, BS, LU, SO, ZU)
	MedSarl and *Médecins du Léman* in 1/12 (VD)
	Médecins du Jura in 1/12 (NE)
	LuganoCare in 1/12 (TI)
	SOS Médecins in 1/12 (GE)
	MEDHOME in 1/12 (FR)
Home visiting service done (at least partly) by GPs	**100%** of the cantons.
	12/26 cantons: **GPs and PS co-exist for this task.**

*the CTMG is doing the telephonic regulation only for a small part of Fribourg.
** These ***hospital-integrated GP-cooperatives*** "share infrastructures with the ED" (e.g. administrative staff, X-ray, laboratory) (18)

4.1.2. OOHC new models in Switzerland, some outcomes

4.1.2.1. Telephonic triage

A Swiss report describes several aspects of telephonic regulation: the type of number, type of triage, type of phone center and how it is financed. According to this report, an optimal model would be a non-surtaxed phone number, uniform at least for the whole canton, with an at least minimal triage (to decrease the GPs' workload), with specifically formed professionals for the telephonic triage, and financed the least possible by the GPs (for instance, MEDPHONE in Bern is 75% financed by affiliated doctors; Artzefon in Zurich only 25%, 75% of the costs being sponged by the city of Zurich and its associated cantons). The CMTG (Vaud) and the MNZ (Basel) are corresponding to these criterions. Efficiently and economically speaking, cantons are encouraged to collaborate in using a single phone center for several cantons. At term, a unique standardized phone number for the whole country could be considered (19).

Concerning the Lyss model (the hospital taking care of the phone calls at night, the on-call GP standing as a "piquet" and called only if needed), a survey in Aarberg's hospital (Thurgovie) showed that this model

decreased the GP's night-time workload of 90% compared to before the introduction of the Lyss model , with a better quality of life, and without new costs generated (20).

4.1.2.2. Integrated ED GP-cooperatives

A few studies focus on the idea of integrating GP-cooperatives ("Maisons de Garde", "Notfallpraxen") in the hospitals.

One study's conclusion is that it is "an efficient way to manage walk-in patients with regard to process time and utilization of additional diagnostic resources […] should be considered as a promising model to overcome the inappropriate use of resources in EDs for walk-in patients who can be treated by ambulatory care" (18). Another study explored the patient's population at Waid's hospital Notfallpraxis (Zurich): "overall, 95% of HGP *(NDLR: Hospital-integrated General Practice)* patients were self-referred, Swiss nationals (65%) and with a personal GP (82%) they attended regularly (69%). The most common reason for presenting at the emergency Centre was not being able to reach the GP (60%). […] The HGP does not represent competition to the GP out-of-hours care service, since the main reason for presenting at the hospital was not lacking a relationship but the GPs' inaccessibility."(21).

However, a 2017 Swiss study highlights that some caution is warranted with the ED-integrated model, especially regarding some specific patient's groups: "the clear demand for home visits indicates that new organizational models, such as hospital-based out-of-hours services performed by GPs, will probably not be an appropriate service for all patients. The danger is high that the needs of older or disabled patients will be unattended if the traditional out-of-hours service completely disappear."(22).

4.2 OOHC systems of nine EUROPEAN COUNTRIES

For an overall detailed comparison of the OOHC systems of the selected countries, see APPENDIX 30.

To read the following table, refer to table 5 for the used abbreviations, in addition to:

- NI: number of inhabitants
- MD: medical density (ambulatory physicians) (23)
- S: sectors

Table 6: A comparative table of European countries' OOHC system							
	Demographics	**Telephonic regulation**	**OOH consultations (patients able to move)**	**OOH house calls**	**Obligation**	**Remuneration**	**Collab the EI**
Switzer-land	NI: 8'656'311, MD: 4, S:26	Varying	GPPs, GP-Cs, WIC, ED	GPs, PS	**Yes**	**Varying**	Yes fo
Germany	NI: 82,293,457, MD: 4, S:14	Yes: formed employees under doctor supervision	GPPs (rota), GP-Cs, ED	GPs, PS	**Yes**	**No**	Yes fo
Austria	NI:8 754 413 MD: 5.15, S: 9	Yes: doctors	GPPs, ED	GPs, PS	**?**	**Yes**	?
France	NI: 67'795'000,MD: 3, S: 1616	Yes: doctors / private societies	GPPs, GP-Cs, ED	GPs, PS	**No**	**yes**	Yes fo
Italy	60'589'445 MD: 4, S: ?	No	GPPs, Guardia Medica practices, ED	"Physicians for continuity" , PS?	**No**	**yes**	No
UK	NI: 65'648'100, MD: 3, S:?	Yes: trained advisors	GPPs, PCC, MIC, WIC, ED	GPs, nurses, paramedics, DS	**No**	**Yes**	Yes
The Nether-lands	NI:17'108'799, MD: 3, S: ?	Yes: telenurses	GP-Cs, ED	GPs, PS?	**Yes**	**Yes**	Yes (n
Denmark	NI:5'887'565 MD: 3.65 S:5	Yes: telenurses	GP-C, ED	GPs, DS?	**No?**	**Yes**	No
Sweden	NI: 10' 171'524, MD: 4, S:?	Yes: telenurses	GP-C, ED	GPs, DS?	**Yes**	**Yes**	?
Norway	NI:5'295 619 , MD: 4.42, S: 262	Yes: telenurses	GPPs, GP-C, ED	GPs, DS?	**Yes**	**?**	No

4. 2.1. Germany's OOHC system

For a detailed table, see appendix 31.

As we can see, the German organization of out-of-hours care presents similarities with the Swiss system: the "in-town system" can be compared to our "Notfallpraxen" (the Baden's model).

4.2.1.1 How OOHC can be a factor of dissatisfaction for GPs

According to the literature, Germany seems to be in a difficult situation regarding out-of-hours care: they face the same problem of GPs shortage as the other western countries, but reforms are implemented slowly. Indeed, "significant demographic changes in age distribution in the German population along with the desire of Generation Y physicians (millennium generation, born between 1980 and 2000) for a balanced work-life situation and the high workloads of general practitioners (GP) are all factors influencing the shortage of GPs, especially in rural areas" (24). As developed later on, some western countries has been reforming the OOHC system (see: The Netherlands, UK) in the 2000, but in Germany in 2018, "these reform just began on a political level" (1).

In 2011, an international study showed that GPs in Germany have the highest workload and were the most unhappy with their professional situations, compared to GPs in other western countries (25). Another recent study shows some important issues regarding the out-of-hours care in Germany: The OOHC seems to play a key role in making the position of the GP in Germany unattractive (26). In a sample out of a rural area, 79% of the GPs' thought that less OOHC would improve job satisfaction (24); hours of work and income were source of dissatisfaction.

Another complaint is the high utilization of OOHC system by patients with non-urgent problems, which contributes to increase GP's workload. The study shows that there is a significant part of patients presenting "low urgency" problem, which could have wait easily for a consultation by their own GP the next morning. This shows that triage needs to be improved, maybe with the development of decision-making support guidelines, which doesn't exist in Germany yet (27).

4.2.1.2. Key message

Germany is currently making OOHC system reforms that some other western countries made about twenty years ago. This lack of new ways to manage OOHC led to a relatively high GPs dissatisfaction (with OOHC duty making the GP position unattractive), amongst other things because of a high workload. There's a high use of the OOHC system by patients with minor ailments, suggesting that triage could be improved (27).

4.2.2. Austria's OOHC system

For a detailed table, see appendix 32.

Austria has implemented a unique phone number, managed by regulator doctors for each sector. Otherwise, their OOHC system is based on GP's practices and the use of the ED. Regarding home visits, an on-call GP can have two functions: either "Funkarzt" (on-call GP doing house calls, driven by a paramedical driver), or "Selbstfahrender Arzt" (using his own vehicle to do house calls").

4.2.3. France's OOHC system

For a detailed table, see appendix 33.

4.2.3.1. The MMG's model

The "Maisons Médicale de Garde" (MMG) (literally, "out-of-hours medical houses") are GP-cooperatives. In theory, these MMGs are supposed to be multidisciplinary structures (regrouping doctors, nurses, medical secretaries, …) so that the GPs can fully dedicate themselves to what they are formed to do (28). These MMG allow "team working, a diminution of the feeling of insecurity for the doctors and of the waiting times". In reality, a review of 2003 analyzed the French MMG's system and results show that their organization is all but uniform. Some of them are multidisciplinary, some of them work in collaboration with the hospitals and dispose of technical diagnostic platform, but not all of them (29). Their role is still to be consolidated in the OOH care: "they are few, unequally frequented, sometimes badly financed and their articulation with the hospital is often imprecise."(30)

4.2.3.2. Ongoing issues

The national council published an overview in 2015, which highlights different issues faced by the OOH care. First, the sectorization France is trying to operate regarding the OOHC sectors is coming towards its limit. In addition, the volunteering for taking part to the OOHC is diminishing. The liberal workforce (GP available for consultations or home visits) at night keeps declining, therefore patients are sent to the ED, which contributes to its engorgement. The regulation (function of telephonic regulator doctor) workforce reaches a plateau. The design of new MMGs is slowing down: they only cover 27,5% of French territory and a "frequent absence of perennation discourages the promoting doctors" (31). They attribute the deterioration of the current OOHC system to several factors, for instance: structural problems (such as the GP shortage, more complex and heavy workloads and excessive administrative paperwork), and problems linked to professional dissatisfaction (out-of-hours sectors too broad or risky, and obligations outside their sector).

One of the suggested solutions for the future is the creation of an integrated system, with a fixed "clinician doctor" (consultations); a pharmacy nearby; a "moving" clinician for home visits; and a system of transport for the patients (taxi, "social vehicle") towards the fixed clinician. They also stress the importance of an information campaign targeting the patients and coordination with the emergency department. Some ideas for the future are professionalizing the function of the clinician, the advancement of telemedicine and better inter-professional collaboration (31).

4.2.3.3 Illustration of a global western countries issue: the ED engorgement

The saturation of the emergency departments, which is a global problem concerning the actual western countries OOHC systems, is particularly problematic in France, insomuch that it is becoming a public security problem in some areas (28). A French one-day observational study in every French A&E departments shows that 58% patients arrive there through self-referral and that 16,4% of these patients could have been effectively attended within the primary care system (32). The admission of these low level emergency patients contributes to the ED's overcrowding. This kind of patients is also more likely to go home before any consultation, because of the long waiting times. A consultation in the ED is more costly than one at a general practice, and some Australian studies have shown that the overcrowding of the ED is actually dangerous for patients as it is linked with increased mortality (33).

Implementing other OOHC structures (such as the French MMGs) could be a good option for low-level emergency patients and therefore relieve the EDs. In most of the academic EDs, this overcrowding phenomenon leads to a "redirection trend", that does not appear in any official guideline: 83% of the ED doctors surveyed were familiar with the reorientation exercise, 62% redirecting patients towards a MMG (34). A French study assessed this practice and the results showed that such a physician-led redirection procedure seems safe and is somewhat well accepted by the patients, but results in a low rate of real redirection. It is therefore unlikely to relieve the ED (35), However, this procedure could still be useful.

Another French study, focusing on the increasing use of the ED by the elderly, shows that this important use of the ED is in some way linked to a sub-optimal accessibility of the primary care system out-of-hours. This needs to be rethought, "at local level, including improving the accessibility and continuity of primary and social care services for older people" (36).

4.2.3.4. Key message

The principal French OOHC innovating model was the GP-cooperative, that they call "Maisons de la Garde". They were designed to be multidisciplinary structures, but as we could see, standardization efforts are needed. Overall, OOHC system seems to be about to reach its limit regarding resources (volunteering is diminishing, resectorization and building of GP-cooperatives are declining, the EDs are saturated), sometimes so bad that it represent a public health danger in some areas. Accessibility needs to be increased. For the future, the focus will be on creating integrated models, with specific OOHC roles.

4.2.4. Italy's OOHC system

For a detailed table, see appendix 33.

Italy has a special type of OOHC professionals, entirely dedicated to it, called the "Guardia Medica".

4.2.5. The United Kingdom's model: the integrated care

For a detailed table, see appendix 34.

4.2.5.1. A shift from the traditional "GP-based" OOHC model towards an integrated care system

The UK's model is an interesting one as it is very peculiar: the traditional model where the GP is taking care of his own patients has gradually been disappearing, through a shift from the model where the GP works as a OOHC system gatekeeper towards a large-scale organization model, and also because of the possibility (and even encouragement) for GPs to evade their OOHC duty. How so?

Until 2005, GPs were providing "traditional care", either in an individual GP practice (caring for their own patients 24/24), or as part of a GP-cooperative. One third were employing a commercially organized deputizing service (37). In 2000, a study compared patient's satisfaction towards 3 systems: practice-based arrangements, GP-cooperatives, deputizing service arrangements. The study showed that the overall satisfaction was not different between these different models, "although many concerns were expressed about the quality of service provision" (38), with the use of deputizing services being controversial and

rising concern among patients (39). The Carson report published in 2000 proposed new standards of care which would apply to GP-cooperatives, deputizing services and even individual GP's practices, in an integrated model, the NHS Direct, which later became the NHS 111 (37).

In 2005, NHS took the huge decision of completely relieving GPs from the out-of-hours care (40) and passed the responsibility to the PrimaryCare Trusts (which then were abolished; delivery of the NHS services being now taken care of by clinical commissioning groups) (41). GPs could still conserve their OOHC duties if they wanted to, but 90% decided to opt out (42). Then, "typically, out-of-hours services are run from primary care centres (PCCs) where up to half of the workload is managed by telephone rather than face-to-face consultation."(43)

This big change led to the bloom of new health care professions, such as the nurse-consultants, care givers that lead some of the walk-in centers or go to patient's home to provide basic health care (especially for patients suffering with chronic illnesses as diabetes or cardiac insufficiency); or emergency care practitioners (ECP), which are paramedics or nurses, dedicated to low-level emergency home visits and specifically trained to manage patients with minor ailments at their own home: "the ECP can autonomously assess a patient's needs, perform simple wound interventions, undertake suturing and other wound closure techniques, dispense drugs using patient group directions and refer directly to multiple community and secondary care acute services" (44).

An interesting fact is that, with GPs massively opting out of the on-call duty, the primary care organizations were challenged to assure continuous out-of-hours care, and many did so by re-employing individual GPs. A study conducted in rural areas of Scotland showed that out of all the practices that opted out, 40.6% participated in the OOH care. The study suggests that this decision of providing OOHC could be due to economic reasons, and that opting out actually "provided the GP the flexibility to raise additional income" (45).

4.2.5.2. The ongoing ED engorgement's issue

Introducing the NHS Direct system was also aiming to cope with this issue. An 2005 evaluation showed that "it had been effective in halting the previous rise in demand for out-of-hours general practice, but had not changed the volume of demand for emergency ambulances or hospital ED" (46). Five years later, studies even report an *increasing use* of the ED by non-urgent patients (47). Patients with non-vital emergencies are told to try to reach out first a general practitioner, but in UK, "access to GP appointments is variable" (48): accessibility to the OOH primary health care system is a key-point for efficiency.

4.2.5.3. Specific OOHC education, an example: the "Hospital at night"

Specific continuous education is crucial for doctors to provide a safe, qualitative out-of-hours care. For example, the UK made a point of providing a specific formation program, called "Hospital at night", which through e-learning and summits, "focuses on out of hours care in hospitals delivering high quality safe care at night" (49). The aim is an OOHC provided by a multidisciplinary team. "The central tenets include multispeciality handovers, extended nursing roles (including prescribing), bleep filtering through central co-ordination and ensuring routine work is not carried over into the out-of-hours period" (50) It was

implemented in hospitals across the UK and a 2009 study has shown "significant improvements in both patient and system outcomes […] with no adverse effects noted"(50).

4.2.5.4. A crucial issue: exploring the patient's point of view

The NHS system was vehemently criticized after its introduction (51). Indeed, transition from a traditional GP's practice's based-model towards large scale organizations is a very consistent change, which could stir reluctance to use from the patients, furthermore if they are not educated about how to understand and use this new system. A study explored older people's mindset, and concluded that, even if they are a key OOHC population (as they are likable to make high use of the out-of-hours system), they "appear reluctant to make use of out-of-hours services and are critical of the trend away from out-of-hours care being delivered by a familiar GP. […] Participants preferred contact with a familiar doctor and were distrustful of telephone advice, particularly from nurses."(52). These doubts about the NHS system could dissuade patients from using the purposed OOHC system, eventually making them go to the A&E instead, thus increasing the ED's burden: "The changes to the provision of out-of-hours primary care have been associated with an increase in patients with non-traumatic attendances presenting to our emergency department."(47).

So what are the actual issues perceived by the patients and what can be done? A British study explored patient's satisfaction about receiving a home visit by a GP from a GP-cooperative after the new GP contract. The conclusion was that "although the OOH services have received considerable criticism over the past 5 years, this study reveals that patients remain largely satisfied with the service and would have called 999 or gone directly to hospital if there had been no service" (51).

Another qualitative study specifically asked patients for their ideas to ameliorate the out-of-hours care system, asking open questions in a survey called "the Out-of-hours Patient Questionnaire". Amongst others, central themes subject to amelioration were primary care service accessibility, patient's perceived quality of care (lack of consideration, communication's issues), and exaggerated waiting times. Patients suggested "triaging patients more effectively and efficiently, addressing specific aspects of practitioners' communication with patients, reconsidering the size of areas covered by services and number of professionals required for the population covered, extending GP and pharmacy opening times and medication delivery services." (53).

The question of accessibility plays an important role in patient's satisfaction and needs improvement: "Centralization of urgent care services may reduce access for patients living further away from primary care centers. […] Telephone access and consultation can be used to overcome geographical barriers but do not necessarily make access geographically equitable"(43). Another study suggested "quicker response and triage, and keeping users informed of waiting times"(54) could improve access and satisfaction.

The question of patient's education about current OOHC service is also a recurring point: "Better information and education about services are needed if users are to derive the greatest benefit and satisfaction"(55). Another study showed the importance of ameliorating the cooperation of in-hours care and out-of-hours care: "GP surgeries need to give better information on how to access the out-of-hours services. Out-of-hours providers should improve their advice on how and when to access in-hours surgeries

and also improve the availability of medicines after out-of-hours consultations" (56). The NHS also worked hard on advising patients to use the local existent OOHC system, and not to go to the A&E for non-vital problems. They created a global campaign, "A&E won't kiss it better", which clearly enjoined patients to try to make the difference on which system to use (57).

4.2.5.5. Too much choice: too much costs

Another interesting and frequent topic across this literature review about UK's OOHC system is the issue of patients actually having now too many options when in need for OOHC. "Choice of location, choice of mode of contact, choice of health professional may sound good. But such choice is expensive to provide, and although perhaps desirable, may lead to confusion for users at a vulnerable time. […]. In came the days of unfettered access, a free-for-all, come-when-you-like policy which has resulted in a burgeoning of services: NHS Direct, walk-in centers, GP-led health centers, independent and NHS-based out-of-hours providers, accident and emergency (A&E) departments, and 24-hour pharmacies […] we can't afford the present situation "(58).

4.2.5.6. Key messages

UK's OOHC system has undergone a huge transition, aiming in a nationwide integrated model. GPs massively opted out their OOHC duty. New OOHC professions blossomed, and the use of deputizing services is high.

Despite this big reform, the ED's overcrowding is an ongoing issue, with even an *increased use* reported since the change. This can be linked, amongst other things, to patient's dissatisfaction with the OOHC system. According to patients, quality of care, accessibility and waiting times are fields needing improvement. Patient's education and clear, visible information are needed to improve accessibility and an efficient use of the OOHC system.

This boom in OOHC amenities (new structures, new jobs) led a very interesting problematic of a too wide choice for patients in need for OOHC. This generates excessive costs.

4.2.6. The Netherland's model: large-scale GP-cooperatives and nurse telephonic triage

For a detailed table, see appendix 35.

4.2.6.1. The GP-cooperative, an inspiring model with many positive outcomes

Around the year 2000, the Netherlands reformed its OOHC system and nationally switched from small GP's rota groups (several GPs that join together and alternate to be on-call) to large-scale structures, the GP-cooperatives. This model shows many positive aspects, for the GPs as for the patients.

The GP's reported a high satisfaction, with a diminished workload and a higher job satisfaction (59). Indeed, they report OOH workload going from 19h to only about 4 hours per week and "others factors, such as lack of separation of work and private life, have also improved" (7). A questionnaire showed that the most

burdensome aspect of working in a cooperative was the high charge of patients during peak-hour, and that to keep the GPs motivated to take part in the OOHC system, it is "important to set limits on their workload" (60).

Regarding the ED overcrowding, the GP-cooperative model seems to show some efficacy in reducing it, a capital factor seems to be the instauration of collaboration between the GP-cooperatives and the hospitals: "More than half of the PCP cooperatives in the Netherlands have integrated with hospital emergency departments, forming "emergency care access points." This collaboration has decreased emergency department use by 13% to 22%, and treatment of self-referrals by PCP cooperatives in emergency care access points is safe and cost-effective […] At the newly established emergency care access points, PCPs treat about 75% of the self-referred patients who otherwise would have gone to the emergency department"(61). A study compared GP's satisfaction between GP-cooperatives integrated to the hospital or separated, with a better satisfaction with the separated system (possibly due to a lower perceived workload), but the integrated system allowed a close cooperation between GPs and specialist (62).

Regarding the patient's opinion, a reliable survey was designed to evaluate patient's satisfaction, which was "high, showing highest levels for home visit and lowest levels for telephone advice"(63). Regarding the safety of such a system, a study " identified patient-safety incidents in 2.4% of all contacts, of which most did not result in harm to patients." (64).

4.2.6.2. Giving a key-role to nurses

The Dutch increasingly implicate nurses in the OOHC system: they are the key actors of the telephonic triage, and OOHC teams are more and more composed of nurse practitioners (NP) working along GPs, for a better task-sharing and a diminishment of GP's workload.

Many studies have focused on the efficiency and safety of the nurses-led telephonic triage. It is a promising model regarding the efficiency: "Telephone triage by nurses has positive effects on care efficiency by increasing the proportion of telephone consultations and decreasing the proportion of clinic consultations and home visits" (65). A study reports that it diminishes the GP's global workload from 50% (66).

Several studies tried to assess safety of this triage, the conclusions being than it is efficient but "possibly not safe, with potentially severe consequences for the patients" (67) because of occurring underestimation of the level of emergency by the nurses. Another study hypothesized that maybe underestimation could be due to nurses failing to ask essential questions during the history-taking: the nurses assessed were asking less than half of the guidelines recommended questions, but this was not correlated to underestimation. The study suggested that they were "recognition patterns" to recognize an emergency, which is efficient but necessitates good clinical knowledge, do "all triage nurses are sufficiently trained to have such knowledge"? (68). A specific education to use guidelines decreases the risk of underestimation and a supervision of the calls by a GP is desirable (67). Also, it has been suggested that the use of a computer-based assistance could increase the triage's safety (and in addition, could make the system more standardized, for a better quality of care and communication between different providers). The computer-based assistance tool "NTS" was assessed in a study which concluded than "the NTS as single triage system for physical and telephone triage seems feasible" (69).

Regarding the implementation of NPs in the OOHC, a study suggests that possibly "NP care result in lower resource use and cost savings than GP care" (70). Therefore, replacing some GPs by NPs in OOHC teams working, for example, in GP-cooperative, could have an interest. The optimal ratio of NPs and GPs in a team still needs to be investigated, with a study showing that a ratio up to 2 NPs and 2 GPs "provided sufficient capacity to provide care to all patients during weekend cover" (71). Also, a better communication about knowing each other's skills is needed (72), for a better collaboration.

Currently the effects of house calls managed by formed nurses are assessed (61).

4.2.6.3. There's still room for improvement

Patients reported that "telephone consultations, patient education, and distance to a pharmacy" could be improved (63). Another detailed review on quality of the Netherland's OOHC system (7) established this list:

***Table 7: Eventual failings of the GP-cooperative model**, taken from: "Quality of out-of-hours primary care in the Netherlands" by P. Giesen, 2007 (7)*

Patient and care characteristics
- Inefficient care caused by non urgent demands that need only self-care or daytime GP care
- Inefficient care due to patient self-referral to ambulance and hospital accident and emergency (A&E) care

Quality of care delivered by professionals
- Nurse telephone triage, which may lead to 'keeping from care' behaviour and possibly unsafe care
- Poor quality of care because of medical mistakes and lack of continuity of care
- Long distances, long waiting times, and therefore possibly unsafe care in urgent cases

Patient experience and behaviour
- Patient-unfriendly care because of the impersonal character of the care and problems with accessibility. These factors perhaps provoke rude and aggressive patient behaviour

Another Dutch study corroborated that accessibility and availability, also during day-time, is a key factor in an efficient use of the OOHC system (73).

Another problem is a high use of the GP-cooperatives, with a big proportion of non-urgent patients, leading to increasing costs (74).

A survey of Dutch GPs highlights ways to reduce this high OOHC use, for example "co-payment for patients, stricter triage, a larger role for the telephone consultation doctor" (74). Another way that could intensify the triage is a mobile application of auto-triage called "Should I see a doctor?" This app was evaluated and showed promising results, with 81% participants whose application results being congruent to the phone triage outcome (75).

4.2.6.1. Key message

The innovating models used in the Netherlands are 1) the GP-cooperative and 2) telenurses. The OOHC system shifted from the traditional model towards large-scale GP-cooperatives, this model having many advantages, such as increased GP's satisfaction, diminished workload, better separation between work and

private life. Efforts are made to integrate these GP-CS in hospital, with a decreased use of the EDs. With this system, patient's satisfaction is high.

Nurses are given a key-role. First, they increasingly do the telephonic triage, which has shown to decrease GP's workload. It is efficient but possibly not always safe. Special formation for nurses and the use of a computer-based assistance could improve safety.

4.2.7. Denmark's model

For a detailed table, see appendix 36.

4.2.7.1. A strong role for the GP as a gate-keeper

The system was reformed in 1992, mainly due to dissatisfaction throughout GPs because of the high workload. Before the reform, OOHC was organized mainly according to three models: GPs caring for their own patients h24, GPs' rotas, and deputizing service making telephonic advise and home visits (76). The reform introduced county-based service, with a coordination center for each county and a GP answering all the calls (77). As we can see, the GP has a key-role in this new system.

First, concerning the ED overcrowding problem: Danish patients can still directly self-refer to the ED (as in Switzerland for example) but more and more, it will require a referral by a GP or a member of the OOHC service staff, which obviously limit access to the ED by giving the out-of-hours primary care actors a strong gatekeeping role (78).

Secondly, in Denmark, only licensed GPs are allowed to undertake telephonic triage. A study showed that "only 12% of all face-to-face consultations in the study are assessed as irrelevant by GP colleagues, suggesting that GP triage is efficient"(79). A study done five years after the reform showed that telephonic consultations almost doubled, and that home visits reduced to 18%, considerably reducing the GP's workload (76). This can partly be explained by the fact that Danish GPs are directly encouraged to privilege telephonic rather than face-to-face contact as they get a higher fee if they manage the patient by telephone contact, rather than referring it for a live consultation.

4.2.7.2. The price of an efficient reform: patient's satisfaction

A 1998 study concluded that this "service had a major cost-effectiveness benefit, but there was a price to pay in patient satisfaction" (80). The patient's satisfaction had significantly declined, even though overall it was still high. A study of 2018 showed a high patient's satisfaction towards the OOHC, more patients being dissatisfied with phone consultations rather than face-to-face contact (81). Also, calling the Medical Helpline can lead to long waiting time before getting to an interlocutor, leading to dissatisfaction and the temptation, if the condition is perceived as severe, to call the EMDC-112 (the phone number made for life-threatening emergencies) (82). An interesting idea is introducing an "emergency access button, enabling patients to bypass the normal telephone waiting line in OOHC if they perceive their condition to be critical", to increase satisfaction and perceived safety (82).

4.2.7.3. The GP-cooperatives model: the Netherland vs Denmark

The OOHC systems of these two countries is, as we can see, quite alike, but a national statistics showed the Danish population have a use of this OOHC system that is about twice higher than the Dutch's one, which was confirmed by a regional study (telephone contacts being especially higher). The study suggests many hypotheses, some due to "cultural" factors (Danish women were more likely to have full-time jobs, GP is more included in extreme ages and pregnancy care (78)), but also that the it could be due to the higher fee that GPs are getting for giving telephonic advice instead of real-life consultations (83). Also, direct access to a licensed GP (rather than a nurse) could encourage patients to make more phone calls (83). A study focused on patient's motives for calling concluded that one fourth of these were "medically inappropriate", medicine request being the main motive. For a better forthcoming use of the OOHC, they suggest focusing efforts on particular types of situations, such as "medication requests, long-lasting symptoms, and exacerbations" (84).

4.2.7.2. Key message

Denmark also use this GP-cooperative model as main OOHC model. GPs are getting a key-gatekeeping role as, increasingly, a referral by GP is necessary to get access to the ED.

In Denmark, telephonic triage isn't done by nurses but by GPs. They get a higher fee if they provide a telephone consultation rather than face-to-face interaction, which led to an increase of telephone consultations and a decrease of GPs' workload. This system is efficient and cost-effective, but some caution is warranted with patient's satisfaction: they tend to be more dissatisfied getting telephone consultations, and waiting times are high when contacting the unique national number of the Medical Helpline.

Interestingly, use of the OOHC system is twice higher in Denmark than in The Netherlands (especially higher for telephonic advice), for a model that is quite similar. There are several hypotheses to explain this difference, for example that direct access to a licensed GP could encourage a higher use of the OOHC system.

4.2.8. Sweden's model

For a detailed table, see appendix 37.

4.2.8.1. "Telenurses": an opportunity for prevention

As we can see in this literature review, telephone nursing service are "expanding globally" (85).

Regarding their role, telenurses surveyed in a study mentioned, amongst other things, that strengthening and teaching callers, as well as facilitating their learning, was also part of their job (86). This shows that telephonic triage also has a "potential for health promotion, provided that the caller receives self-care advice, one of the most common measures of health promotion" (87). Another interesting study suggested the existence of a gender-bias regarding receiving self-care advice from telenurses: Swedish mothers "were

more likely to receive self-care advice" (88) comparing to Swedish fathers (regardless of the child's problem or its gender). A qualitative study asking the medical helpline managers about their goals revealed that most of them don't speak about importance of health promotion. That could "indicate a need for SHD to clarify its goals as the organization is part of the Swedish healthcare system, where health promotion should always permeate work."(87)

Another interesting study explored the actual nurses' point of view, which is important as their role is to increase in OOHC. Answers suggested that "the role of the 1177 service has not been properly implemented and accepted within the healthcare system […] and that managers must provide them (nurses) with resources, for example, support, education and opportunities for recovery during shifts" (89).

4.2.8.2. Older people's use of OOHC

Older people are important to considerate closely, as, in one hand, their proportion in society is likely going to increase ("population ageing") and that they are more likely to bear higher morbidity than younger people, and therefore, make a significant use of the OOHC system.

A study highlighted that the knowledge of the telephone helpline was varying greatly among the different regions, and throughout all age groups, the elderly being the less aware of this service (90). Another study focused on the use of telephonic advice by the older people and found that it was, surprisingly, high, with the first motive to call being drug-related inquiries. This "gives the telephone advice service a unique ability to function as a gatekeeper to further healthcare" (91).

4.2.8.3. High use of the ED is linked with low continuity of care

A Swedish study showed that continuity of care (CoC) was negatively linked with the use of the A&E departments. The study suggests that "patients with the lowest CoC had twice as many ES visits compared to patients with the highest CoC."(92).

4.2.8.4. Key message

Sweden's main OOHC models are GP-cooperatives and the use of telenurses for telephonic triage. An interesting study highlighted that beside a simple redirecting function, telephonic triage also represents an opportunity for health promotion and prevention (as patients are getting self-advice). Another interesting study showed the existence of a gender bias in getting self-advice.

Another interesting aspect was the low use of telephonic OOHC service by older people. More efforts are needed to include this vulnerable population in this evolving system.

4.2.9. Norway's model

For a detailed table, see appendix 38.

4.2.9.1. The Norwegian system

The Norwegian system shows a big variability throughout the territory: the general term "casualty clinics" can actually relate to very different structures, regarding the diagnostic tools: "availability of diagnostic and therapeutic equipment varies between clinics. While most have access to ancillary testing such as basic blood tests and electrocardiogram (ECG), only the minority have the possibility to do radiologic imaging (23%) (93). "Another challenge the Norwegian system faces is the fact that a big part of regions are rural, with a high distance to the local casualty clinic. A Norwegian study established a link between greater distance to the OOHC service and its lower use, "even for the most acute cases", which can represent a potential threat for patient's safety (94).

As in other Scandinavian countries, telenurses play a key role (95), with a good quality and safety: a study evaluated that "correct classification of acute and non-urgent cases among nurses was quite high" (96).

Another interesting study raised the point of, in such a new OOHC context with new roles, new professions, what was to be the current mission of the GPs? It focused on rural GPs and concluded that "the GPs felt that their role had changed from being the only provider of emergency care to being one of many. In particular, the emergency medical technician teams (EMT) have evolved and often manage well without a physician […]. Although their role may have changed, GPs argue that they still play a part in emergency medicine. The GPs claim that by participating in call outs, they maintain their skills and improve patient care, but further research is needed to help policy makers and clinicians decide when the presence of a GP really counts." (97)

4.2.9.2. Key message

The Norwegian OOHC system is composed of casualty clinics, structures showing a great variability. Accessibility needs to be improved, particularly in rural area.

4.2.10. A global international collaboration for a better future OOHC

A very interesting study, already mentioned, that described and compared many of western countries' OOHC systems, drew this useful summarizing table ,assessing strengths and weaknesses of different models, according to OOHC key informants (1):

Table 8: « Perceived strengthts and weaknesses of different models », *taken from : Huibers L, Giesen P, Wensing M, Grol R. Out-of-hours care in western countries: assessment of different organizational models.*

	Small family doctor based models		Large family doctor based models			Hospital based and national models		
	Individual general family practice (N = 3)	Rota group (N = 21)	GP coopera-tive (N = 9)	Primary care center (N = 5)	Deputizing service (N = 3)	A&E department (N = 7)	Telephone triage and advice (N = 3)	Integrated care (N = 1)
Continuity of care	-	0	0	-	-	-	-	+
Efficiency	0	0	+	-	-	-	0	+
Accessibility	+	+	+	+	0	-	+	0
Coordination of care	0	0	+	-	-	-	0	+
Satisfaction physicians	0	-	+	-	0	0	-	0
Satisfaction other professionals	0	0	+	0	+	0	-	0
Satisfaction patients	0	+	+	0	0	+	+	-
Safety of triage	0	+	+	0	0	0	0	+

Legend + = potential strength, no or few problems (median < 2); 0 = neutral, some problems (median = 3); - = potential weakness, many to major problems (median > 2). Changes after the second mailing led to some missings; therefore, the number of most used models is lower.

According to the informants, “small family doctor based models perform well. Accessibility is strength, and satisfaction of patients and safety of triage are assessed as positive. On the other hand, satisfaction of physicians is weak, as well as continuity of care. Interestingly, large scale family doctor based models (GP cooperative, PCC and deputizing services) seemed to perform even better, especially the GP cooperative”(1). Indeed, according to informants who stated the GP-cooperative as main model in their country, this model showed “many strengths, concerning for example coordination of care, accessibility and efficiency of healthcare delivery. No weaknesses were mentioned by the informants.”(1). A global weakness seemed to be continuity of care (cited a weakness for each model except the integrated care system) and decreased job satisfaction was prevalent in many systems (1).

A systematic literature review also compared different systems, focusing among other things on the GP’s workload, and concluded that “the rapid growth in telephone triage and advice services appears to have the advantage of reducing immediate medical workload through the substitution of telephone consultations for in-person consultations, and this has the potential to reduce costs”(98), being aware that some studies report patient’s dissatisfaction in regard to getting telephonic consultations.

This telephonic triage also warrants some evaluation. A systematic literature review showed that in “average triage was safe in 97% (95% CI 96.5–97.4%) of all patients contacting out-of-hours care and in 89% (95% CI 86.7–90.2%) of patients with high urgency. Ten studies that used high-risk simulated patients showed that on average 46% (95% CI 42.7–49.8%) were safe.”(99). This highlights that even overall safety is good, it was lacking in the specific high-risk patient’s population.

Regarding the fact that European countries seem to face alike challenges concerning OOHC, some authors got together to create a new “European research network that aims to study out-of-hours (OOH) primary health care”(6), the EuOOHnet. “There are many unsolved questions regarding the organization and

provision of OOH primary care, including access, organizational model, triage, quality, and safety of care […] A European research network linking key institutions offers a unique opportunity for knowledge transfer"(6). Currently, 11 countries are active in this network: Belgium, Denmark, Germany, Italy, the Netherlands, Norway, Poland, Spain, Slovenia, Switzerland, and the UK.

This EuOOHnet published a review concerning the main issues in the organization of the OOHC (100). Most of the problems they evocate were already discussed previously, through the literature review of the nine European countries. What can be added is the fact that, as said before, continuity of care needs to be ameliorated: "The loss of patient-related information between different health care providers is a ubiquitous and transnational problem […] it is necessary to define how a modern system of information flow between different health care providers could be planned and implemented. With rapid technological advances (internet, mobile devices) applications could be implemented to allow an access to centralized electronic patient records (EPR). There is no doubt that centralized EPRs have the potential to increase patient safety and notably to reduce costs of health care"(100). They also stress the importance of collaboration, for instance trans-national definition of the "emergency levels" and provide a system of data transfer between countries.

5. Limitations

For the first part (survey sent to the twenty-six cantons OOHC's system's accountants), an obvious limitation is the rate of response. In the case of a non-answer, the results are based only on information found on the internet, with the risk of being out-of-date, or even slightly incorrect. Even if the main information (phone numbers, number of GP-cooperatives) was corresponding to the internet-sourced information in 100% of the cantons, some slight differences or out-of-date information were observed in few of them.

Regarding the second part (comparison of some OOHC European systems based on a literature review), the limitations are similar: is all the information up to date?

6. Conclusion

First, according to me, here are the 2 main innovating models to be retained:

Table 9: Take-home messages
1. Telephonic triage done by nurses
2. GP-cooperatives, integrated in the hospitals and working in collaboration with the EDs.

Through this thesis, we can see that the OOHC settings are undergoing a lot of changes, not only in Switzerland but in most of the western countries, and it will probably continue to be so : "Most of the countries had plans to change the out-of-hours care in the future, mainly changes toward large scaled organizations, integration of primary care with A&E departments and introduction of one national telephone number with centralization of out-of-hours calls and triage"(1). Based on what we could learn during this thesis, it is likely for Switzerland to evolve in the same direction.

First, regarding telephonic triage: the aim seems to be establishing unique, non-overtaxed cantonal numbers, in cooperation with the emergency call Centers. In the long term, the question of a single number at the national level is to be discussed (19). As the introduction a triage and telephone regulation reduces the workload of GPs, it seems desirable that each canton set up such a service. Who takes responsibility for this triage is also under consideration: doctors, nurses, paramedics, even non-medical professions (as in "SOS Médecins", a deputizing service widely used in Switzerland)? We have seen that "telenurses" are now a widespread concept in several European countries. We hence dispose of quite a broad amount of studies and data regarding efficiency, safety, satisfaction and other factors, all of them that could be used by Switzerland to consolidate its model: some Swiss cantons use this system; supposedly it could continue to spread. It has to be said that in many studies, getting a telephone rather than a face-to-face consultations was associated to patient's dissatisfaction, especially when they didn't obtain the type of consultations they thought to have (81). In addition, we should decide which roles we assign to telephonic triage: only redirection, prevention, personalized care tips? (86)

Secondly, the type of OOHC structures can probably continue to evolve: some Swiss cantons have set up GP-cooperatives ("Maisons de Garde" or "Notfallpraxen"), sometimes integrated to the hospital. Studies (taking as subject the Waid's hospital Notfallpraxis in Zürich) have concluded that it was an efficient model to deal with self-referred non-urgent patients presenting to the ED, and could contribute to decrease its overcrowding, which is a substantial current Swiss OOHC problem (17). The GP-cooperatives also represent a decreased workload for the GP (increasing their job satisfaction). Integrating these GP-cooperatives to the hospital represents a potential for an inter-professional collaboration and a better resources use, but caution is warranted regarding a sufficient cover of more rural areas (101), and also in considering the needs of all patients.

Regarding the house calls service, efforts are being done in Switzerland to decrease the GP's workload related to the home visiting duty, mainly through the existence of deputizing service (SOS Médecins, Mobile Aertze, …), that collaborate with the rest of the OOHC system.

Education is also a key-point. Teaching the patients about the features of this new OOHC system, educate them when it is appropriate to use it (rather than systematically going to the ED), is crucial. Obviously, introducing a new model warrants some time to gain patient's confidence, but a real effort should be made about making the information easily available and understandable to them. A particular population, the older people, has the potential to be excluded from this new OOHC generation (52), and as they carry a high healthcare burden, they are important to considerate, maybe by asking GPs to specifically explain to their older patients how to use the current OOHC system. A better education could also increase patient's satisfaction, for example in the case of patients receiving telephonic instead of face-to-face consultations: if the system is better explained, including the fact that telemedicine will gradually be able to take up more space in the OOHC system and that it is a very useful and overall safe model, maybe the dissatisfaction would decrease.

Another interesting idea, evocated in a Swiss report (101), is the existence of a current "on-line generation". Indeed, the younger adults in western countries are now mostly "connected" through their smartphones, and this high use of internet could also come to play a role in the OOHC system, a few example being the auto-triage application examined in The Netherlands (75), the Futuro project in

Switzerland (on-line GP practice with self-care advice) (101), the creation of an application “Doccall”, which inform patients about the local OOHC system options when their GP is unavailable (102).

Among all these innovations and new ways for providing OOHC, efficiency has to be kept in mind. We saw with the example of the United Kingdom, that if patients having too much choice between all these new OOHC providers also mean uncertainty about how to use the OOHC system, and a further increase of the costs, because of an inefficient use of all these resources (58). For the future of the OOHC, we must be careful, while creating offer, that the latter is adequate to patient’s needs.

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