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Help-seeking behaviour outside office hours in Denmark, the Netherlands, and Switzerland: a cross-sectional observational study

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ABSTRACT

Objectives: We aim to study the preferred behaviour among individuals from different age groups in three countries when acute health problems occur outside office hours and thereby to explore variations in help-seeking behaviour.

Design: A cross-sectional observational study using questionnaires with six predefined cases describing situations with a potential need for seeking medical care and questions on background characteristics.

Setting: General population in Denmark, the Netherlands, and Switzerland.

Population: Danish, Dutch, and Swiss individuals from three age groups (0-4, 30-39, 50-59 years).

Main outcome measures: Distribution of help-seeking preferences per case per age group, compared between countries. Differences in percentage of help-seeking outside office hours per age group and country, crude and adjusted for background characteristics.

Results: Danish and Dutch parents of children aged 0-4 years differed in help-seeking behaviour for five out of six cases (abdominal pain, red eyes, rash, relapse fever, chicken pox); Danish parents significantly more often chose to contact OOH care than Dutch parents. For adults aged 30-39 years, no significant difference between the three countries was found for contacting OOH care. Swiss adults aged 50-59 years had the highest percentage of OOH contacts (38.3%), followed by the Danish (33.4%) and the Dutch (32.5%).

Conclusion: Some differences in help-seeking behaviour outside office hours exist between Danish, Dutch, and Swiss individuals, particularly for parents of young children. The question remains whether these differences result from individual preferences, cultural disparities, and/or health services variations. Future research should focus on identifying explanations for these differences to reduce undesirable use of out-of-hours care and lower the workload.

ARTICLE SUMMARY

Strengths and limitations of this study:

- Inclusion of representative samples of three countries
- An extensive procedure was followed to ensure high quality of the case development
- Using invented cases to measure intended help-seeking behaviour could have introduced social desirability bias, and the responses may thus not represent actual behaviour
- The choice of cases could have affected the results

Keywords: after-hours care, primary health care, emergency medical services, help-seeking behavior

INTRODUCTION

Many European countries face high demands in out-of-hours (OOH) care, e.g. primary care, emergency departments (EDs), and emergency medical services (EMS).[1-3] This can lead to high workload, excessive use of resources, and increased costs.[4-6] High workload may lead to longer waiting times, work pressure, and risk of safety incidents. At the same time, the service delivery by general practitioners (GPs) to OOH primary care is challenged due to fewer available GPs, low work satisfaction, and need for off-duty time.[7]

The help-seeking behaviour among individuals varies between European countries, with differing numbers of ED visits and GP consultations.[8-10] The number of GP consultations per patient ranges from 2.9 to 11.8 per year in European countries,[9] whereas the proportion of patients who visited the ED in the past year varied between 18% and 40%.[8] Similar differences also seem apparent in OOH primary care. In a previous study, we found differences in help-seeking behaviour between Danish and Dutch individuals; the Danes contacted OOH primary care about twice as often as the Dutch.[11]

Differences between countries may be related to the organisation of healthcare systems and OOH care (such as fees, accessibility, and availability), the composition of populations,[12] culture, and/or public expectations to healthcare services. Exploring differences in help-seeking behaviour could be a first step to identify factors with a potential for intervention, to optimising help-seeking behaviour and demands. Thus, we aim to study how individuals from different age groups in three countries (i.e. Denmark, The Netherlands, and Switzerland) react to acute health problems occurring outside office hours.

METHODS

Design and population

We performed a cross-sectional observational study by sending questionnaires with paper case scenarios to Danish, Dutch, and Swiss individuals in December 2015 and January 2016. This study formed part of a

project of the European research network for out-of-hours primary health care (EurOOHnet).[13] We included a random selection of individuals from three age groups (i.e. parents of children aged 0-4 years, adults aged 30-39 years, and adults aged 50-59 years). Pre-defined age groups were preferred to ensure construction of explicit cases and to obtain sufficient power for identifying differences for each separate age group. Age groups were based on a previous study, which found the largest differences in the use of OOH care to be between Danish and Dutch individuals for both age groups 0-4 years and 20-35 years.[11] In this study, we added the age group 50-59 years to examine the robustness of our results.

We used the Danish Civil Registration System to randomly select representative individuals among the five Danish regions. We excluded individuals living in institutions and individuals with address protection. The Dutch and Swiss samples were selected using consumer panels (The Netherlands: TNS Nipo; Switzerland: Respondi and Bilendi).[14,15] The Dutch sample represented the population on age, gender, and region (0-4 years), and age, gender, region, education, and ethnicity (both adult age groups). For Switzerland, it was only possible to include adults selected on age by using two panels to reach 600 respondents.

Settings

In Denmark, 99% of citizens are listed with a GP. Through the GP, they have access to the entire public (tax-funded) healthcare system, which is free of charge for the patients.[16] Outside office hours, patients can contact OOH primary care or the prehospital Emergency Medical Services (EMS), depending on the severity and urgency of the health problem. Referral from either primary care or EMS is generally a prerequisite for an emergency department (ED) visit, specialist care, or hospital admission, although self-referral to the ED exists. For most OOH primary care services, GPs perform the telephone triage and are remunerated on a fee-for-service basis. The Netherlands has a similar system, with the GP serving as a gatekeeper.[17] Citizens must have private health insurance, which gives free access to primary care throughout and outside office hours. Nurses and practice assistants answer the telephone in the Dutch OOH primary care services and

perform the triage under supervision by GPs. All professionals working in OOH primary care get paid per hour. A referral is usually a prerequisite for access to the ED and hospital visits, although self-referral to the ED exists. In Switzerland, OOH care is organised locally, and organizational models vary between regions. The most widespread models include rotation systems, which are most often combined with EMS telephone triage, walk-in centres (e.g. group practices offering OOH care), and general practices integrated in the ED. No gate-keeping system exists, and referral from a GP is thus not needed for access to the ED and specialist care. OOH care is covered by the mandatory health insurance plan, except for an annual deductible rate ranging between CHF 300 to 2,500 (EUR 275 to 2300) and a 10% co-payment.

Development of questionnaires

We developed questionnaires containing predefined cases that described situations with a potential acute need for medical care outside office hours; all cases varied in urgency levels. The questionnaires for children and adults mainly differed on presented cases. The questionnaires also included questions on background characteristics (i.e. age, sex, social support, living status, education level, employment, and ethnicity) and on factors related to help-seeking based on Andersen's behavioural model.[12] The questions on factors related to help-seeking were part of a larger study and will be described in further detail in another scientific article.

Cases

The development of cases followed several steps: collecting and selecting relevant and representative cases, assessing urgency levels (performed by an expert panel), and making the final selection using Rasch analysis. We collected cases from previous studies.[18-20] We also added new cases to include frequent reasons for encounter (based on an analysis of data from Danish and Dutch OOH primary care) and to ensure that we included cases from all urgency levels (based on the telephone guideline from the Dutch Association of GPs to categorise the cases).[21] We selected different health problems for the cases for each

age group separately to ensure that the urgency levels were not immediately obvious. For cases regarding children, we defined a specific age for the child as even small age differences in this group can change the help-seeking behaviour considerably for the same illness. For the adults, no specific age was presented as the individuals were intended to see themselves in the described situation. All cases included a specific weekday and time. The list of potentially relevant cases were discussed at several internal meetings with researchers and GPs (to ensure representativeness of cases) and in two feedback rounds by email involving eight individuals and five academic GPs (to check for recognisability and clarity). We selected 20 cases involving children and 32 cases involving adults to be presented for the expert panel. In this process, we used cases written in English.

We sent the cases to a convenience sample of 29 GPs using the following inclusion criteria: ≥2 years GP experience, ≥6 OOH shifts per year, varying regions within the countries, and good knowledge of English. This expert panel had to assess the most appropriate type of care needed per case.

After the expert round, we ranked the cases on type of care needed as we aimed to select cases that represented different levels of care with only a few cases per urgency level. We excluded cases that appeared to be unclear. We selected 11 cases for children and 13 cases for adults; these numbers were estimated to be sufficient for selection of cases to be included in the final questionnaire after additional analysis.

The cases were then translated from English into Danish. To ensure high quality of the translation, we followed the standard translation procedure in healthcare: backward-forward translation with a subsequent consensus meeting before creating the final document.[22] The cases were randomly ranked, and questions on background characteristics were added to the questionnaires. Individuals were asked about their expected choice of action per case, and each question had the following multiple choice answering

categories: 'Wait and see (no contact with a health care provider)', 'Self-care (for example a pain killer)', 'Ask my partner, a relative, or others for advice', 'Check a guidebook, the internet or an app', 'Contact my own GP the next working day', 'Contact OOH primary care', 'Contact the ED', 'Contact 112/144 ambulance care', and 'Other'. Questionnaires were sent to 150 Danish individuals per age group (with one reminder). A total of 18 parents and 30 adults responded: 11 aged 30-39 years and 19 aged 50-59 years. Item selection was done using Rasch analysis to ensure that all the items included in the test were sufficiently unidimensional and to maximize the test information across the interested continuum of the latent constructs. This resulted in the selection of six cases for children and six for adults.

Pilot testing

We tested the readability and feasibility of the Danish questionnaires by performing cognitive interviews and pilot testing. After interviewing eight patients at a GP practice, we sent the questionnaire to 50 Danish individuals per age groups (with one reminder). The response rate was 38% for 0-4 years, 28% for 30-39 years, and 50% for 50-59 years. The pilot testing resulted in minor adjustments of layout. The final Danish questionnaire was translated into Dutch and German using the usual translation procedure.[22]

Power calculation

A power calculation showed that we needed 600 returned questionnaires per age group to be able to find an 8% difference between countries. Expecting an average response rate of 40%, we chose to send 1,200 questionnaires per age group in the Danish population. The Dutch panel expected higher response rate and aimed to collect 600 returned questionnaires per age group within one week of data collection. The Swiss panel invited all members in the adult groups and stopped the data collection when 600 respondents had been reached.

Data collection

The Danish individuals received an invitation letter with a personal internet link to a web-based survey and a paper questionnaire in January 2016. One reminder was sent three weeks later. Dutch individuals received an e-mail invitation to the online questionnaire in December 2015. One reminder was sent for age groups 0-4 and 30-39 years to achieve 600 respondents per group, whereas no reminder was needed for age group 50-59 years. The data collection ended after one week. Swiss individuals received their invitation via e-mail in December 2015, and the data collection ended when 600 respondents had been included per age group.

Analysis

We performed descriptive analyses of the Danish respondents and non-respondents and identified the main characteristics for each age group as the Danish selection was random. We also performed descriptive analyses to compare respondents with the general population in the Netherlands and Switzerland as we used consumer panels that might not be entirely representative. Next, we calculated the distribution of the individual help-seeking behaviour per case and stratified for age group and country. We dichotomised the intended help-seeking behaviour into 'no OOH contact' ('Wait and see', 'Self-care', 'Ask my partner, a relative, or others for advice', 'Check a guidebook, the internet or an app', 'Contact my own GP the next working day') and 'OOH contact' ('Contact OOH primary care', 'Contact ED', 'Contact 112/144 ambulance care'). For each respondent, we calculated a score between 0 and 6 for the number of cases for which 'OOH contact' had been chosen. After calculating the percentage of individuals contacting OOH care, we studied differences between Danish, Dutch, and Swiss individuals per case and age groups by using chi-square and ANOVA tests. Finally, we performed three linear regression analyses for each age group to see if there were any differences between the Danish, Dutch, and Swiss individuals regarding their choice to contact OOH care. We adjusted for background characteristics (i.e. age, gender, education, ethnicity, employment, and living status). Differences with a p-value of <0.05 were considered significant.

RESULTS

Study population

Table 1 describes the final respondents of our study after data cleaning. In Denmark, we included 572 respondents for children (response rate: 47.7%), 429 for 30-39 years (response rate: 35.8%), and 652 for 50-59 years (response rate: 54.4%). In the Netherlands, we included 621 respondents for children (response rate: 65.4%), 592 for 30-39 years (response rate: 62.3%), and 633 for 50-59 years (response rate: 66.5%). The Swiss panel included 589 final respondents for age group 30-39 years and 595 for age group 50-59 years. However, due to the data collection strategy, we obtained no information on response rate. When comparing respondents in different age groups between countries, we found some significant (although small) differences for gender, age, and ethnicity for respondents of age group 0-4 years (Table 1). For both adult age groups, we found significant differences for gender (Dutch respondents were more often female), education (Dutch aged 50-59 years more often had low education level), and ethnicity (Swiss respondents were more often immigrants).

(Table 1)

We compared the Danish respondents and non-respondents. For the age groups 30-39 years and 50-60 years, we found that respondents were more often female (Appendix, Table 1).

The Dutch respondents were compared with the general population. Adult respondents were slightly more often highly educated and native Dutch compared to the general population (Appendix, Table 2).

The Swiss respondents were also compared with the general population. Swiss respondents were more often female, had middle-level education, and were native Swiss (Appendix, Table 3).

Help-seeking at case level - children

Figure 1 shows help-seeking behaviour per age group, per case, and per country. Danish and Dutch parents differed in their help-seeking in most of the presented cases. The Dutch parents chose 'wait and see' more often than the Danish parents, who more often answered that they would contact their own GP or OOH primary care. Overall, the Danish parents chose to contact OOH acute care more often than Dutch parents, with significant differences for the five following cases. For 'red eyes', 18.7% of the Danish parents chose to contact OOH acute care, compared to 12.4% among Dutch parents. For 'rash', 23.4% of Danish and 16.4% of Dutch parents would contact OOH acute care. For 'chicken pox', 31.8% of Danish and 15.8% of Dutch parents would contact OOH acute care. For 'relapse fever', 59.5% of Danish and 41.6% of Dutch parents would contact OOH acute care. For 'abdominal pain', 84.4% of Danish and 79.1% of Dutch parents would contact OOH acute care.

(Figure 1)

Help-seeking at case level - adults

We also found some differences in help-seeking behaviour among adults from different countries (Figure 1). In the age group 30-39 years, the Swiss more often chose to contact the ED than Danish and Dutch adults. Overall, the choices for different types of care varied per case. Additionally, adults aged 30-39 years differed in the frequency of contacting OOH acute care, with varying differences per case. For 'sore throat' (Danes: 7.5%, Dutch: 3.6%, Swiss: 10.9%), 'acute back pain' (Danish: 14.1%, Dutch: 10.8%, Swiss: 28.4%), and 'ankle distortion' (Danes: 40.3%, Dutch: 43.1%, Swiss: 44.3%), the Swiss adults significantly more often chose to contact OOH care than the Danish and Dutch, although with relatively small differences. For 'wounded foot' (Danes: 26.1%, Dutch: 34.0%, Swiss: 30.8%) and 'acute stomach pain' (Danes: 42.0%, Dutch: 54.4%, Swiss: 41.6%), Dutch adults significantly more often chose to contact OOH care.

In the age group 50-59 years, the Swiss also more often contacted the ED compared to the Danish and Dutch adults in this group. No clear pattern was seen for the other types of care. The Swiss adults more often chose to contact OOH care for two cases: 'sore throat' (Danish: 5.7%, Dutch: 2.7%, Swiss: 14.1%) and 'acute back pain' (Danish: 12.1%, Dutch: 8.1%, Swiss: 32.5%). For 'wounded foot', the Dutch and Swiss adults significantly more often chose to contact OOH care than the Danes (Danes: 26.1%, Dutch: 34.0%, Swiss: 30.8%). The Dutch significantly more often chose OOH care for 'acute stomach pain' (Danes: 42.0%, Dutch: 54.4%, Swiss: 41.6%).

Adjusted differences in help-seeking

Table 2 shows that the Dutch parents significantly less often chose to contact OOH care than Danish parents (mean: 2.25 versus 2.91 out of 6 cases). For adults aged 30-39 years, no significant differences were found between the three countries when correcting for age, gender, education, ethnicity, employment, and living status. Swiss adults aged 50-59 years more often contacted OOH care than the Danish (mean: 2.58 versus 2.34 out of 6 cases).

(Table 2)

DISCUSSION

Main findings

Danish and Dutch parents of children aged 0-4 years differed in help-seeking behaviour for five out of six cases (i.e. abdominal pain, red eyes, rash, relapse fever, chicken pox); the Dutch more often chose 'wait and see' than the Danish. For these cases, Danish parents significantly more often chose to contact OOH care than Dutch parents (difference varying from 1.1% to 17.9%). Also a regression analysis showed that Dutch parents significantly less often chose to contact OOH care than Danish parents. For adult citizens, we

found varying choices of responses for many of the presented cases. A regression analysis showed that the Swiss adults aged 50-59 years more often chose OOH care than the Danish and Dutch.

Comparison with existing literature

We found a difference in help-seeking behaviour between Denmark, the Netherlands, and Switzerland; this difference was varying for different age groups. In a previous study, we found that the Danes had higher consumption of OOH primary care than the Dutch, particularly for young children.[11] This difference between parents of young children was also apparent in our study. The question is what the underlying explanations could be for this consistent difference. A difference in employment exists between Danish and Dutch parents as Danish women more frequently are working full-time.[23] Danish women thus have fewer opportunities to visit the GP during daytime. Furthermore, the role of the Danish GP in childcare is different from that of the Dutch GP. Danish GPs have an active role as they see also young children for preventive issues, which could make parents more prone to contact primary care. In contrast, Dutch GPs do not play a role in preventive care for young children. Perhaps other cultural differences may be important factors. For example, there is a strong focus on work-life balance in Denmark (including extensive maternity leave). Differences between the Danish and the Dutch healthcare systems may play a smaller role as we did not find any differences in the help-seeking between adults. Besides, the two healthcare systems seem quite similar. Yet, the direct telephone access to a GP (who answers the telephone) in the OOH primary services in Denmark may encourage parents to seek advice or help at the OOH primary care service. Additionally, problems with the accessibility and availability of one's own GP are also issues that are discussed in both countries.

We did not find a significant difference in help-seeking between Danish and Dutch adults, while a previous study showed a small difference between Danish and Dutch adults.[11] Our study may have lacked power to identify such small difference, or there may not have been a difference. Swiss adults aged 50-59 years more

often chose to contact OOH care. On the one hand, they more often answered 'wait and see'. On the other hand, they also more often answered 'ED'. The organisation of the Swiss healthcare system without the gate-keeping role of the GP may make citizens contact the ED more often, in particular for injury-related health problems, which were described in three of the six cases targeting adults.[24] In Denmark and the Netherlands, patients are strongly encouraged to contact primary care in case of an acute problem in order to assess the necessity of a subsequent referral to ED or secondary care. In the Netherlands, contacting the ED without a referral results in a fee for the citizen (own risk) as these ED visits are not covered by the health insurance. For Danish citizens, an ED visit is free, but citizens are strongly encouraged to first contact primary care, where triage is done.

Help-seeking behaviour is related to many factors, as also found by Andersen.[12] We focused on differences between countries and corrected for main variations between the populations (i.e. age, gender, education, ethnicity, employment, and living status). Several studies have shown an effect of these characteristics on help-seeking behaviour.[25] Yet, several other influential factors have also been identified, such as psychological characteristics and usual behaviour.[12] It could be that population differences relating to other factors may cause the variation between countries concerning help-seeking behaviour.

Strengths and limitations

We were able to include citizens from three countries for our study by using a consumer panel in two countries. Our Danish sample was representative for the general population, and our Dutch and Swiss panels were also able to select quite representative samples for a range of background characteristics. We followed an extensive procedure to ensure high quality of the case development, which is a strength of this study. However, the varying relatively low response rates and the data collection method through consumer panels (ending the collection when about 600 respondents had been included) introduced a risk of selection bias. Additionally, our non-response analyses showed that adult respondents more often were

female than non-respondents. Respondents also seemed to be higher educated and were more often native citizens than the general population. Therefore, we adjusted for these background factors in our final analyses.

We used six cases per age group, and the selected cases represented varying health problems with different levels of severity and appropriate healthcare actions. The choice of cases could have affected the differences found. Other health problems may thus have given different results, for example due to differences in culture, traditional treatment, or the healthcare system. However, for the age group 0-4 years, the results for the individual cases all showed the same trend, which suggests that case selection is a minor problem. For adults, the direction of differences varied per case. For the three cases on acute injuries, the organisation of healthcare may have played a role. Furthermore, using invented cases to measure intended help-seeking behaviour could have introduced social desirability bias, and the responses may thus not represent actual behaviour.

Implications for research and/or practice

We compared help-seeking behaviour between countries and found some differences. Further investigation of possible explanations for these differences is highly relevant, in particular concerning parents of young children. The differences were distinct in this group, and the use of OOH primary care is known to be high in this age group.[11] Identifying explanations for the differences found may help us reduce the use of OOH care in this group of patients.

Future research should also focus on other factors related to a high likelihood of contacting OOH care as this insight could be used to investigate whether interventions could be made to reduce the workload at OOH care while still addressing the highly relevant contacts. It could be interesting to see if differences in

preferred actions also exist between healthcare professionals from different countries as this could imply differences in the approach to healthcare provision and cultural variations.

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COMPETING INTEREST

The authors have declared no competing interests.

ETHICAL APPROVAL

The project was approved by the Danish Data Protection Agency (J.no. 2013-41-2104). According to Danish law, approval from the Committee on Health Research Ethics of the Central Denmark Region was not needed as the study did not include biomedical intervention. The research ethics committee of the Radboud university medical center (CMO Arnhem-Nijmegen) was consulted and concluded that the study did not fall within the remit of the Medical Research Involving Human Subjects Act (WMO) (file number: 2013/379). According to current Swiss law on human research, anonymously collected data require no approval by a regional ethics committee.[26]

DATA SHARING STATEMENT

The dataset will be available on request.

AUTHORS' CONTRIBUTION

LH designed the study, performed the data collection, interpreted the data and drafted the manuscript. EK participated in designing the study and interpretation of the data, and critically revised the manuscript. AHC performed statistical analyses and critically revised the manuscript. GM and MS participated in the interpretation of the data and critically revised the manuscript. OS performed the data collection and critically revised the manuscript. MBC designed the study and critically revised the manuscript. All authors read and approved the final manuscript.

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TABLES AND FIGURES

Table 1. Description of the study population per age group and country (mean, %)

Age group	**0-4 years**		**30-39 years**			**50-59 years**		
Country	**DK** N=572	**NL** N=621	**DK** N=429	**NL** N=592	**CH** N=589	**DK** N=652	**NL** N=633	**CH** N=595
Age respondent (mean)	34.4 (34.0-34.8)	35.4 (34.9-35.8)	34.8 (34.6-35.1)	34.8 (34.6-35.0)	34.9 (34.7-35.2)	54.4 (54.1-54.6)	54.6 (54.4-54.8)	54.5 (54.2-54.7)
Gender respondent (%)								
- Male	14.4 (11.7-17.5)	37.7 (33.9-41.6)	37.7 (33.2-42.4)	50.2 (46.1-54.2)	42.3 (38.3-46.3)	44.9 (41.1-48.8)	52.9 (49.0-56.8)	48.1 (44.1-52.1)
- Female	85.6 (82.5-88.3)	62.3 (58.4-66.1)	62.4 (57.6-66.8)	49.8 (45.8-53-9)	57.7 (53.7-61.7)	55.1 (51-2-58.9)	47.1 (43.2-51.0)	51.9 (47.9-55.9)
Education level[1] (%)								
- Low: ≤ 10 years	4.4 (3.0-6.4)	7.0 (5.2-9.3)	6.4 (4.4-9.1)	9.3 (7.2-11.9)	4.6 (3.2-6.6)	13.5 (11.0-16.3)	25.4 (22.2-29.0)	9.7 (7.6-12.4)
- Middle: >10 & ≤ 15 years	33.5 (29.7-37.4)	30.1 (26.6-33.9)	41.0 (36.4-45.8)	43.4 (39.5-47.4)	59.4 (55.3-63.3)	55.0 (51.1-58.8)	43.9 (40.1-47.8)	66.1 (62.1-69.7)

- High: > 15 years	62.1 (58.1-66.1)	62.9 (59.0-66.6)	52.6 (47.8-57.3)	47.3 (43.3-51.3)	36.1 (32.3-40.0)	31.6 (28.1-35.3)	30.6 (27.2-34.4)	24.2 (20.9-27.8)
Ethnicity (%)								
- Native	85.5 (82.3-88.2)	81.8 (78.5-84.6)	84.8 (81.0-87.9)	76.1 (72.5-79.4)	64.3 (60.4-68.1)	92.0 (89.6-93.9)	87.1 (84.2-89.5)	70.3 (66.4-73.8)
- Western immigrant	10.2 (8.0-13.0)	7.4 (5.6-9.8)	9.0 (6.6-12.2)	10.2 (8.0-13.0)	31.6 (27.9-35.5)	6.4 (4.8-8.6)	9.1 (7.1-11.6)	27.9 (24.4-31.6)
- Non-western immigrant	4.3 (2.9-6.3)	10.8 (8.6-13.5)	6.2 (4.2-8.9)	13.7 (11.1-16.7)	4.1 (2.8-6.0)	1.6 (0.8-2.9)	3.8 (2.6-5.6)	1.8 (1.0-3.3)

DK: Denmark, NL: Netherlands, CH: Switzerland

[1] This categorisation was made following the ISCED guidelines[27]

Table 2. Association between country and out-of-hours help-seeking per age group (crude and adjusted for background characteristics) (B, mean, 95% CI)

	0-4 years		**30-39 years**		**50-59 years**	
	Crude **N=1,186**	**Adjusted[1]** **N=1,161**	**Crude** **N=1,602**	**Adjusted[1]** **N=1,585**	**Crude** **N=1,864**	**Adjusted[1]** **N=1,844**
Denmark (ref) (mean (95%CI))	2.31 (2.20;2.42)	2.91 (2.53;3.30)	1.75 (1.61;1.89)	2.15 (1.78;2.51)	2.00 (1.89;2.12)	2.34 (1.90;2.77)
Netherlands (B, mean (95%CI))	-0.54* 1.78 (1.66;1.87)	-0.66* 2.25 (1.87;2.63)	0.16 1.91 (1.79;2.02)	0.11 2.26 (1.90;2.61)	-0.04 1.96 (1.84;2.07)	-0.10 2.24 (1.81;2.66)
Switzerland (B, mean (95%CI))	*Not available*	*Not available*	0.22* 1.97 (1.85;2.09)	0.16 2.31 (1.94;2.68)	0.29* 2.30 (2.18;2.41)	0.24* 2.58 (2.14;3.02)

**Significant difference (p<.005) compared with reference group; [1]Adjusted for age, gender, education, ethnicity, employment, and living status.*

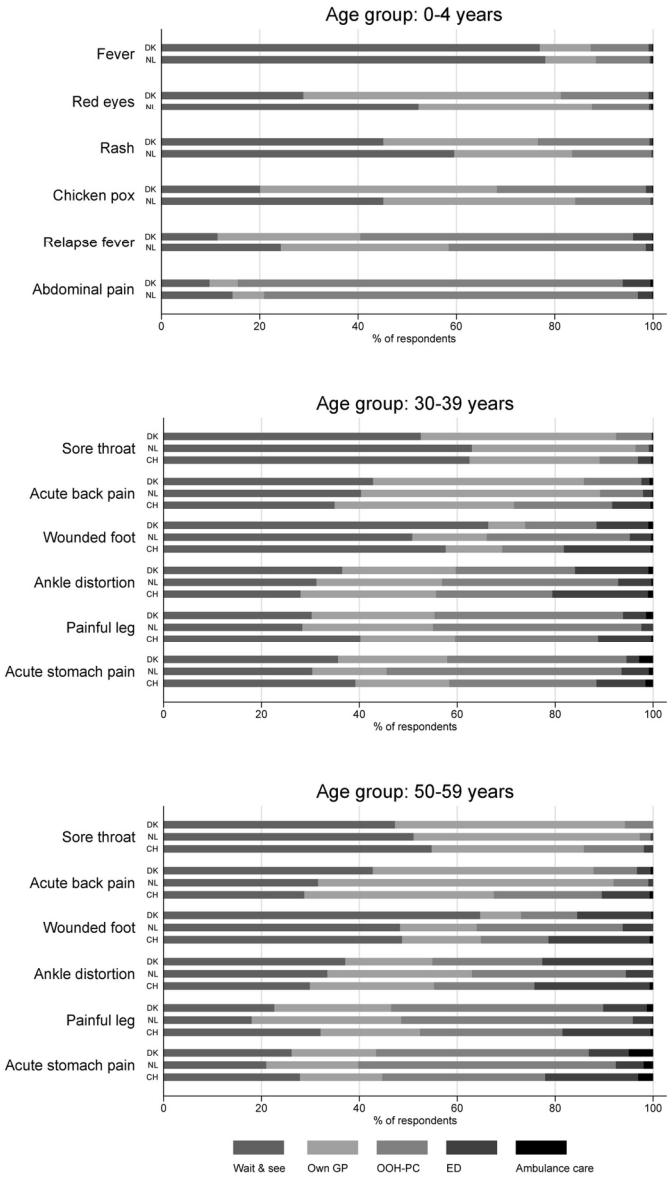

Figure 1. Description of individuals' help-seeking behaviour per case, stratified for age group and country (distribution of choices)

114x187mm (300 x 300 DPI)

Appendix

Box 1. Cases for children

Box 1. Cases for children
Case 1 "Abdominal pain"
Time: Saturday at 3 PM. *Situation:* Your 4-year-old child has had abdominal pain for two days, and the pain is increasing in severity. He has a fever (39.6°C). He has vomited twice today and has not eaten anything for the entire day. He will not drink much. He has a little bit of diarrhoea. You cannot comfort him by reading a book, and he does not want to play by himself.
Case 2 "Red eyes"
Time: Sunday evening at 4 PM. *Situation:* Your 3-year-old child has a cold and has had red eyes with discharge for two days. He is also sniffing. The eye discharge is yellow, and the eye lids stick together slightly. He has no problems with the vision and no wounds or other skin rashes. He is watching television.
Case 3 "Fever“
Time: Saturday at 3 PM. *Situation:* Your 15-month-old child has woken after his nap with a temperature of 39.8°C. He already seemed listless before his nap today. He has not vomited, has no diarrhoea and no skin rash. He wants to sit with you and watch television. He does not want to eat anything, but drinks small amounts of cold water.
Case 4 "Rash"
Time: Saturday at 3 PM. *Situation:* Your 2-year-old child wakes up after his nap with red rash across arms, legs, chest and face. The rash is itching. He is alert, is playing as usual and has no other complaints and no fever.

Case 5 "Relapse fever"
Time: Thursday at 7 PM. *Situation:* Your 8-month-old child has a fever. Last week, he had a common cold with a fever. He was also coughing. He seemed to recover, but now the fever has returned (temperature: 39.1°C). He does not drink a lot, and he is still coughing. Your child wants to sit with you all the time, but you cannot comfort him.
Case 6 "Chicken pox"
Time: Sunday at 5 PM. *Situation:* For one day, your 2-year-old child has had red skin and fluid-filled blisters, mostly on the chest and belly. He is a bit warm (temperature: 38.1°C), complains of a sore throat and generally does not seem fit. He drinks and eats as usual and is as alert as usual.

Box 2. Cases for adults

Box 2. Cases for adults
Case 1 "Painful leg"
Time: Sunday at 3 PM. *Situation:* When you woke up this morning, your left leg was swollen and painful. The leg has a warm, red and painful area with a 10 cm diameter. You do not feel well. You are not sure whether you have a fever. You did not hit your leg.
Case 2 "Acute stomach pain"
Time: Monday at 8 PM. *Situation:* You have been suffering from a severe stomach ache that started suddenly two hours ago; something you have never had before. The pain seems to be localised in your upper stomach, radiating towards your shoulder blades. You have an urge to move around a lot, and you feel nauseous, but you do not vomit. You have had normal defecation patterns all day.
Case 3 "Acute back pain"
Time: Wednesday at 6 PM. *Situation:* This morning you suddenly got a severe back pain when lifting a bag with groceries. The pain is continuously present in your lower back. The pain does radiate to your left buttocks, and it limits your movements. You have taken paracetamol (Panadol), but this does not relieve the pain.
Case 4 "Sore throat"
Time: Thursday at 7 PM. *Situation:* You have been suffering from a severe sore throat for two days. You are also coughing slightly and feel feverish. You can take liquids, but swallowing is painful. You have to attend a wedding of a relative in two days.
Case 5 "Wounded foot"

Time: Wednesday at 7 PM. *Situation:* You accidently stepped on a piece of glass with your left foot 30 minutes ago. The piece of glass seems to have come out. The bleeding seems to have lessened, but you have quite some pain. The wound is about 3 cm long and is open 1-2 mm. Your tetanus vaccination is up to date.
Case 6 "Ankle distortion"
Time: Saturday at 4 PM. *Situation:* Your left foot was twisted yesterday when you were walking in the forest. Your left ankle was directly painful and swollen. Initially, you were able to walk on the injured foot, but now you are unable to even rest on it. Your left ankle is quite painful and seems swollen compared to the right one.

Table 1. Description of background characteristics of Danish population per age group, for respondents and non-respondents (%, 95% CI)

Age group	**0-4 years**		**30-39 years**		**50-59 years**	
	Respondents	**Non-respondents**	**Respondents**	**Non-respondents**	**Respondents**	**Non-respondents**
Age, citizen (mean)	2.0 (1.9-2.1)	2.1 (1.9-2.2)	34.7 (34.5-35.0)	34.8 (34.6-35.0)	54.2 (54.0-54.5)	54.3 (54.0-54.5)
Gender, citizen (%)						
- Male	50.3 (46.3-54.4)	51.8 (47.8-55.6)	38.0 (33.4-42.7)	55.2 (51.7-58.7)	45.0 (41.2-48.8)	54.6 (50.4-58.7)
- Female	49.7 (45.6-53.7)	48.2 (44.4-52.2)	62.0 (57.3-66.5)	44.8 (41.3-48.3)	55.1 (51.2-58.8)	45.4 (41.3-49.6)
Region, citizen						
- Capital	32.3 (28.6-36.3)	36.1 (32.5-40.0)	35.2 (30.8-39.8)	37.1 (33.8-40.6)	25.9 (22.7-29.4)	32.8 (29.0-36.8)
- Zealand	12.6 (10.1-15.6)	12.4 (10.1-15.2)	13.6 (10.6-17.5)	11.4 (9.4-13.9)	16.9 (14.2-20.0)	14.3 (11.6-17.5)
- South	20.3 (17.2-23.8)	20.2 (17.3-23.6)	18.2 (14.8-22.1)	20.3 (17.6-23.3)	22.9 (19.8-26.2)	21.6 (18.4-25.3)
- Central	23.6 (20.3-27.3)	23.1 (20.0-26.6)	24.9 (21.1-29.3)	20.9 (18.2-23.9)	23.5 (20.4-26.9)	20.7 (17.5-24.3)
- North	11.2 (8.9-14.0)	8.1 (6.2-10.5)	8.2 (5.9-11.2)	10.3 (8.3-12.6)	10.9 (8.7-13.5)	10.6 (8.3-13.5)

Information on education level, ethnicity, and living status was not available for non-respondents. We checked the general population and found that respondents are generally more often native and slightly higher educated.

Table 2. Description of background characteristics of Dutch population per age group, for respondents and general population (%, 95% CI)

Age group	**0-4 years**		**30-39 years**		**50-59 years**	
Characteristics	**Respondents**	**General population**	**Respondents**	**General population**	**Respondents**	**General population**
Age, citizen (mean)	1.7 (1.6-1.8)[1]	2.0[1]	34.8 (34.6-35.0)	34.5	54.6 (54.4-54.8)	54.4
Gender, citizen (%)	*Not available – only gender parent*					
- Male		51.2 (51.1-51.3)	50.2 (46.1-54.2)	50.1 (50.0-50.2)	52.9 (49.0-56.8)	50.2 (50.1-50.2)
- Female		48.8 (48.7-48.9)	49.8 (45.8-53.9)	49.9 (49.8-50.0)	47.1 (43.2-51.0)	49.8 (50.0-50.0)
Region , citizen						
- Groningen	3.1 (2.0-4.7)	3.1 (3.0-3.1)[1]	3.4 (2.2-5.2)	3.2 (3.2-3.3)	3.6 (2.4-5.4)	3.3 (3.3-3.3)
- Friesland	3.7 (2.5-5.5)	3.7 (3.6-3.7)	2.5 (1.5-4.2)	3.4 (3.4-3.5)	3.5 (2.3-5.2)	3.8 (3.8-3.8)
- Drenthe	2.4 (1.5-4.0)	2.6 (2.5-2.6)	2.2 (1.3-3.7)	2.5 (2.4-2.5)	3.3 (2.2-5.0)	3.1 (3.0-3.1)
- Overijssel	6.9 (5.2-9.2)	7.0 (6.9-7.0)	7.4 (5.6-9.8)	6.6 (6.5-6.6)	7.0 (5.2-9.2)	6.5 (6.5-6.6)
- Gelderland	11.9 (9.6.-14.7)	11.5 (11.5-11.6)	11.3 (9.0-14.1)	11.0 (11.0-11.0)	13.1 (10.7-16.0)	12.2 (12.2-12.3)
- Utrecht	9.0 (7.0-11.5)	8.4 (8.3-8.4)	9.6 (7.5-12.3)	8.1 (8.0-8.1)	6.5 (4.8-8.7)	7.1 (7.1-7.1)
- Noord-Holland	15.8 (13.1-18.9)	16.8 (16.7-16.9)	18.1 (15.2-21.4)	18.0 (18.0-18.1)	15.6 (13.0-18.7)	16.1 (16.0-16.1)
- Zuid-Holland	22.5 (19.4-26.0)	23.0 (22.9-23.1)	21.3 (18.2-24.8)	22.8 (22.7-22.8)	18.0 (15.2-21.2)	20.6 (20.5-20.6)
- Zeeland	1.9 (1.1-3.4)	2.1 (2.1-2.1)	1.9 (1.0-3.3)	2.0 (1.9-2.0)	2.5 (1.6-4.1)	2.3 (2.2-2.3)
- Flevoland	3.7 (2.5-5.5)	2.8 (2.8-2.9)	3.2 (2.1-5.0)	2.6 (2.6-2.6)	2.8 (1.8-4.5)	2.4 (2.4-2.5)
- Noord-Brabant	14.2 (11.6-17.1)	13.9 (13.8-14.0)	13.7 (11.1-16.7)	14.2 (14.2-14.3)	16.3 (13.6-19.4)	15.2 (15.1-15-2)
- Limburg	4.8 (3.4-6.8)	5.2 (5.1-5.2)	5.4 (3.8-7.5)	5.7 (5.7-5.7)	7.7 (5.9-10.1)	7.4 (7.4-7.4)

[1]*Information about child, whereas information about respondent is information on parent/caregiver.*

Table 3. Description of background characteristics of Swiss population per age group, for respondents and general population (%, 95% CI)

Age group	**30-40 years**		**50-60 years**	
	Respondents[1,2]	**General population[3]**	**Respondents**	**General population[3]**
Age, respondent (mean)	34.9 (34.7-35.2)	34.5	54.5 (54.2-54.7)	54.2
Gender, respondent (%)				
- Male	42.3 (38.3-46.3)	50.3 (50.2-50.4)	48.1 (44.1-52.1)	50.4 (50.3-50.5)
- Female	57.7 (53.7-61.7)	49.7 (49.6-49.8)	51.9 (47.9-55.9)	49.6 (49.5-49.6)
Education level (%)		***(35-44 years)***		***(55-64 years)***
- Low	4.6 (3.2-6.6)	11.5	9.7 (7.6-12.4)	15.5
- Middle	59.4 (55.3-63.3)	42.5	66.1 (62.1-69.8)	52.4
- High	36.1 (32.3-40.0)	46.0	24.2 (20.9-27.8)	32.1
Ethnicity (%)				
- Native	64.0 (60.0-67.8)	62.8 (62.7-62.9)	70.3 (66.4-73.8)	80.0 (80.0-80.1)
- Immigrant	36.0 (32.2-40.0)	37.2 (37.1-37.3)	29.7 (26.2-33.6)	20.0 (19.9-20.0)

[1]Respondi panel company; [2]Bilendi panel company; [3]According to the Federal Statistical Office of Switzerland https://www.bfs.admin.ch/bfs/en/home/statistics/population.html

STROBE 2007 (v4) Statement—Checklist of items that should be included in reports of *cross-sectional studies*

Section/Topic	Item #	Recommendation	Reported on page #
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	2
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	4
Objectives	3	State specific objectives, including any prespecified hypotheses	4
Methods			
Study design	4	Present key elements of study design early in the paper	4,5
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	5,6,9
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	4,5
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	6
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	6
Bias	9	Describe any efforts to address potential sources of bias	*5*
Study size	10	Explain how the study size was arrived at	8
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	9
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	9
		(*b*) Describe any methods used to examine subgroups and interactions	n.a.
		(*c*) Explain how missing data were addressed	n.a.
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	n.a.
		(*e*) Describe any sensitivity analyses	n.a.
Results			

Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	10
		(b) Give reasons for non-participation at each stage	n.a.
		(c) Consider use of a flow diagram	n.a.
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	10
		(b) Indicate number of participants with missing data for each variable of interest	10
Outcome data	15*	Report numbers of outcome events or summary measures	11,12
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	n.a.
		(*b*) Report category boundaries when continuous variables were categorized	n.a.
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	n.a.
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	
Discussion			
Key results	18	Summarise key results with reference to study objectives	12,13
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	14,15
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	13,14
Generalisability	21	Discuss the generalisability (external validity) of the study results	13-15
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	16

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

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Help-seeking behaviour outside office hours in Denmark, the Netherlands, and Switzerland: a questionnaire study exploring responses to hypothetical cases

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Help-seeking behaviour outside office hours in Denmark, the Netherlands, and Switzerland: a questionnaire study exploring responses to hypothetical cases

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ABSTRACT

Objectives: We aim to study the preferred behaviour among individuals from different age groups in three countries when acute health problems occur outside office hours and thereby to explore variations in help-seeking behaviour.

Design: A questionnaire study exploring responses to six hypothetical cases describing situations with a potential need for seeking medical care and questions on background characteristics.

Setting: General population in Denmark, the Netherlands, and Switzerland.

Population: Danish, Dutch, and Swiss individuals from three age groups (0-4, 30-39, 50-59 years).

Main outcome measures: Distribution of intended help-seeking preferences per case per age group, compared between countries. Differences in percentage of help-seeking outside office hours per age group and country, crude and adjusted for background characteristics.

Results: Danish and Dutch parents of children aged 0-4 years differed in intended help-seeking behaviour for five out of six cases (abdominal pain, red eyes, rash, relapse fever, chicken pox); Danish parents significantly more often chose to contact OOH care than Dutch parents. For adults aged 30-39 years, no significant difference between the three countries was found for contacting OOH care. Swiss adults aged 50-59 years had the highest percentage of OOH contacts (38.3%), followed by the Danish (33.4%) and the Dutch (32.5%).

Conclusion: Some differences in help-seeking behaviour outside office hours exist between Danish, Dutch, and Swiss individuals, particularly for parents of young children. The question remains whether these differences result from individual preferences, cultural disparities, and/or health services variations. Future research should focus on identifying explanations for these differences to reduce undesirable use of out-of-hours care.

ARTICLE SUMMARY

Strengths and limitations of this study:

- The study is based on representative population samples from three countries
- An extensive procedure was followed to ensure high quality of the case development
- Using hypothetical cases to measure intended help-seeking behaviour could have introduced social desirability bias, and the responses may thus not represent actual behaviour
- The choice of cases could have affected the results

Keywords: after-hours care, primary health care, emergency medical services, help-seeking behaviour

INTRODUCTION

Many European countries face high demands in out-of-hours (OOH) care, e.g. primary care, emergency departments (EDs), and emergency medical services (EMS).[1-3] This can lead to high workload, excessive use of resources, and increased costs.[4-6] High workload may lead to longer waiting times, work pressure for OOH staff, and risk of safety incidents. At the same time, the service delivery by general practitioners (GPs) to OOH primary care is challenged due to fewer available GPs, low work satisfaction, and need for off-duty time.[7]

The help-seeking behaviour among individuals varies between European countries, with differing numbers of ED visits and GP consultations.[8-10] The number of GP consultations per patient ranges from 2.9 to 11.8 per year in European countries,[9] whereas the proportion of patients who visited the ED in the past year varied between 18% and 40%.[8] Similar differences also seem apparent in OOH primary care. In a previous study, we found differences in help-seeking behaviour between Danish and Dutch individuals; the Danes contacted OOH primary care about twice as often as the Dutch.[11]

Differences between countries may be related to the organisation of healthcare systems and OOH care (such as fees, accessibility, and availability), the composition of populations,[12] culture, and/or public expectations to healthcare services. Exploring differences in help-seeking behaviour could be a first step to identify factors with a potential for intervention to optimise help-seeking behaviour and requests. Thus, we aim to study how individuals from different age groups in three countries (i.e. Denmark, the Netherlands, and Switzerland) react to hypothetical scenarios about acute health problems occurring outside office hours.

METHODS

Design and population

We performed a questionnaire study exploring responses to hypothetical cases by sending questionnaires with hypothetical paper case scenarios to Danish, Dutch, and Swiss individuals in December 2015 and January 2016. This study was part of a project of the European research network for out-of-hours primary health care (EurOOHnet).[13] We included a random selection of individuals from three age groups (i.e. parents of children aged 0-4 years, adults aged 30-39 years, and adults aged 50-59 years). Pre-defined age groups were preferred to ensure construction of explicit cases and to obtain sufficient power for identifying differences for each separate age group. Age groups were based on a previous study, which found the largest differences in the use of OOH care to be between Danish and Dutch individuals for both age groups 0-4 years and 20-35 years.[11] We composed the age group of individuals aged 30-39 years as we expected more homogeneity in this group than in the group of individuals aged 25-35 years. In this study, we added the age group 50-59 years to examine the robustness of our results.

We used the Danish Civil Registration System to randomly select representative individuals among the five Danish regions. We excluded individuals living in institutions and individuals with address protection. The Dutch and Swiss samples were selected using consumer panels (the Netherlands: TNS Nipo; Switzerland: Respondi and Bilendi).[14-16] The Dutch sample represented the population on age, gender, and region (0-4 years), and age, gender, region, education, and ethnicity (both adult age groups). For Switzerland, it was only possible to include adults selected on age by using two panels to reach 600 respondents as information about children of panel members was not available.

Settings

In Denmark, 99% of citizens are listed with a GP. Through the GP, they have access to the entire public (tax-funded) healthcare system, which is free of charge for the patients.[17] Outside office hours, patients can contact OOH primary care or the prehospital Emergency Medical Services (EMS), depending on the severity and urgency of the health problem. Referral from either primary care or EMS is generally a prerequisite for

an emergency department (ED) visit, specialist care, or hospital admission, although self-referral to the ED exists. For most OOH primary care services, GPs perform the telephone triage and are remunerated on a fee-for-service basis. The Netherlands has a similar system, with the GP serving as a gatekeeper.[18] Citizens must have private health insurance, which gives free access to primary care throughout and outside office hours. Nurses and practice assistants answer the telephone in the Dutch OOH primary care services and perform the triage under supervision by GPs. All professionals working in OOH primary care get paid per hour. A referral is usually a prerequisite for access to the ED and hospital visits, although self-referral to the ED exists. In Switzerland, OOH care is organised locally, and organizational models vary between regions. The most widespread models include rotation systems, which are most often combined with EMS telephone triage, walk-in centres (e.g. group practices offering OOH care), and general practices integrated in the ED. No gate-keeping system exists, and referral from a GP is thus not needed for access to the ED and specialist care. OOH care is covered by the mandatory health insurance plan, except for an annual deductible rate ranging between CHF 300 to 2,500 (EUR 275 to 2300) and a 10% co-payment.

Development of questionnaires

We developed questionnaires containing hypothetical cases that described situations with a potential acute need for medical care outside office hours. As a measure of urgency, all cases varied in the type of care needed (Appendix). The questionnaires for children and adults mainly differed on presented cases. The questionnaires also included questions on background characteristics (i.e. age, sex, social support, living status, education level, employment, and ethnicity) and on factors related to help-seeking based on Andersen's behavioural model.[12] The questions on factors related to help-seeking were part of a larger study and will be described in further detail in another scientific article focusing on factors related to intended help-seeking outside office hours.

Cases

The development of cases followed several steps: collecting and selecting relevant and representative cases, assessing the type of care needed (performed by an expert panel), and making the final selection using Rasch analysis. We collected cases from previous studies.[19-21] We also added new cases to include frequent reasons for encounter (based on an analysis of data from Danish and Dutch OOH primary care) and to ensure that we included cases from all urgency levels (based on the telephone guideline from the Dutch Association of GPs to categorise the cases).[22] We selected different health problems for the cases for each age group separately to ensure that the urgency levels were not immediately obvious. For cases regarding children, we defined a specific age for the child as even small age differences in this group can change the help-seeking behaviour considerably for the same illness. For the adults, no specific age was presented as the individuals were intended to see themselves in the described situation. All cases included a specific weekday and time. The list of potentially relevant cases was discussed at several internal meetings with researchers and GPs (to ensure representativeness of cases) and in two feedback rounds by email involving eight lay persons and five academic GPs (to check for recognisability and clarity). We selected 20 cases involving children and 32 cases involving adults to be presented for the expert panel. The relevance of the health problems described was checked and found relevant for the Swiss healthcare system. In this process, we used cases written in English.

We sent the cases to a convenience sample of 29 GPs using the following inclusion criteria: ≥2 years GP experience, ≥6 OOH shifts per year, varying regions within the countries, and good knowledge of English. This expert panel assessed the most appropriate type of care needed per case to enable us to include cases of different levels of urgency.

After the expert round, we ranked the cases on type of care needed as we aimed to select cases that represented different levels of care with only a few cases per urgency level. We excluded cases that appeared to be unclear. We selected 11 cases for children and 13 cases for adults; these numbers were

estimated to be sufficient for selection of cases to be included in the final questionnaire after additional analysis.

The cases were then translated from English into Danish. To ensure high quality of the translation, we followed the standard translation procedure in healthcare: backward-forward translation with a subsequent consensus meeting before creating the final document.[23] The cases were randomly ranked, and questions on background characteristics were added to the questionnaires. Individuals were asked about their expected choice of action per case, and each question had the following multiple choice answering categories: 'Wait and see (no contact with a health care provider)', 'Self-care (for example a pain killer)', 'Ask my partner, a relative, or others for advice', 'Check a guidebook, the internet or an app', 'Contact my own GP the next working day', 'Contact OOH primary care', 'Contact the ED', 'Contact 112/144 ambulance care', and 'Other'. Questionnaires were sent to 150 Danish individuals per age group (with one reminder). A total of 18 parents and 30 adults responded: 11 aged 30-39 years and 19 aged 50-59 years. The cases were treated as items in a Rasch analysis. This was done to eliminate redundant cases with respect to estimating the latent variable for intention to seek help. Cases were reduced, and we selected six cases for children and six for adults.

Pilot testing

We tested the readability and feasibility of the Danish questionnaires by performing cognitive interviews and pilot testing. Due to pragmatic considerations, we performed only one pilot test in Denmark. After interviewing eight patients at a GP practice, we sent the questionnaire to 50 Danish individuals per age groups (with one reminder). The response rate was 38% for 0-4 years, 28% for 30-39 years, and 50% for 50-59 years. The pilot testing resulted in minor adjustments of layout. The final Danish questionnaire was translated into Dutch and German using the usual translation procedure.[23]

Power calculation

A power calculation showed that we needed 600 returned questionnaires per age group to be able to find an 8% difference between countries, which we considered a clinically relevant difference. Expecting an average response rate of 40%, we chose to send 1,200 questionnaires per age group in the Danish population. The Dutch panel expected higher response rate and aimed to collect 600 returned questionnaires per age group within one week of data collection. The Swiss panel invited all members in the adult groups and stopped the data collection when 600 respondents had been reached.

Data collection

The Danish individuals received an invitation letter with a personal internet link to a web-based survey and a paper questionnaire in January 2016. One reminder was sent three weeks later. Dutch individuals received an e-mail invitation to the online questionnaire in December 2015. One reminder was sent for age groups 0-4 and 30-39 years to achieve 600 respondents per group, whereas no reminder was needed for age group 50-59 years. The data collection ended after one week. Swiss individuals received their invitation via e-mail in December 2015, and the data collection ended when 600 respondents had been included per age group.

Analysis

We performed descriptive analyses of the Danish respondents and non-respondents and identified the main characteristics for each age group as the Danish selection was random. We also performed descriptive analyses to compare respondents with the general population in the Netherlands and Switzerland. This was done because we wanted to check the representativeness of the consumer panels that we used in these two countries. Next, we calculated the distribution of the individual help-seeking behaviour per case and stratified for age group and country to investigate intended help-seeking behaviour.

We dichotomised the intended help-seeking behaviour into 'no OOH contact' ('Wait and see', 'Self-care', 'Ask my partner, a relative, or others for advice', 'Check a guidebook, the internet or an app', 'Contact my own GP the next working day') and 'OOH contact' ('Contact OOH primary care', 'Contact ED', 'Contact 112/144 ambulance care'). After calculating the percentage of individuals contacting OOH care, we studied differences between Danish, Dutch, and Swiss individuals per case and age groups by using chi-square and ANOVA tests. For each respondent, we calculated a score between 0 and 6 for the cases in which 'OOH contact' had been chosen. Finally, we performed three linear regression analyses for each age group to see if there were any differences between the Danish, Dutch, and Swiss individuals regarding their choice to contact OOH care using the mean score (range 0-6). We adjusted for background characteristics (i.e. age, gender, education, ethnicity, employment, and living status). Differences with a p-value of <0.05 were considered significant.

Patient involvement

The study was conducted using a random selection of citizens, who were all potential users of the healthcare system (patients). We asked eight lay persons to check the cases for recognisability and clarity. A selection of citizens got a questionnaire as part of our pilot study. We have no fixed plans to disseminate our study results to citizens, although we hope that the results will be used for interventions to influence use of out-of-hours care, for example to inform patients. If possible, dissemination of results in lay press will be done.

RESULTS

Study population

Table 1 describes the final respondents of our study after data cleaning. In Denmark, we included 572 respondents for children (response rate: 47.7%), 429 for 30-39 years (response rate: 35.8%), and 652 for 50-59 years (response rate: 54.4%). In the Netherlands, we included 621 respondents for children

(response rate: 65.4%), 592 for 30-39 years (response rate: 62.3%), and 633 for 50-59 years (response rate: 66.5%). The Swiss panel included 589 final respondents for age group 30-39 years and 595 for age group 50-59 years. However, due to the data collection strategy, we obtained no information on response rate for the Swiss panel. When comparing respondents in different age groups between countries, we found some significant (although small) differences for gender, age, and ethnicity for respondents of age group 0-4 years (Table 1). For both adult age groups, we found significant differences for gender (Dutch respondents were more often female), education (Dutch aged 50-59 years more often had low education level), and ethnicity (Swiss respondents were more often immigrants).

Table 1. Description of the study population per age group and country

Age group	**0-4 years**[2]		**30-39 years**			**50-59 years**		
Country	**DK** N=572	**NL** N=621	**DK** N=429	**NL** N=592	**CH** N=589	**DK** N=652	**NL** N=633	**CH** N=595
Age respondent (mean, (95% CI))	34.4 (34.0-34.8)	35.4 (34.9-35.8)	34.8 (34.6-35.1)	34.8 (34.6-35.0)	34.9 (34.7-35.2)	54.4 (54.1-54.6)	54.6 (54.4-54.8)	54.5 (54.2-54.7)
Gender respondent (%, (95% CI))								
- Male	14.4 (11.7-17.5)	37.7 (33.9-41.6)	37.7 (33.2-42.4)	50.2 (46.1-54.2)	42.3 (38.3-46.3)	44.9 (41.1-48.8)	52.9 (49.0-56.8)	48.1 (44.1-52.1)
- Female	85.6 (82.5-88.3)	62.3 (58.4-66.1)	62.4 (57.6-66.8)	49.8 (45.8-53-9)	57.7 (53.7-61.7)	55.1 (51-2-58.9)	47.1 (43.2-51.0)	51.9 (47.9-55.9)
Education level[1] (%, (95% CI))								
- Low: ≤ 10 years	4.4 (3.0-6.4)	7.0 (5.2-9.3)	6.4 (4.4-9.1)	9.3 (7.2-11.9)	4.6 (3.2-6.6)	13.5 (11.0-16.3)	25.4 (22.2-29.0)	9.7 (7.6-12.4)
- Middle: >10 & ≤ 15 years	33.5 (29.7-37.4)	30.1 (26.6-33.9)	41.0 (36.4-45.8)	43.4 (39.5-47.4)	59.4 (55.3-63.3)	55.0 (51.1-58.8)	43.9 (40.1-47.8)	66.1 (62.1-69.7)

- High: > 15 years	62.1 (58.1-66.1)	62.9 (59.0-66.6)	52.6 (47.8-57.3)	47.3 (43.3-51.3)	36.1 (32.3-40.0)	31.6 (28.1-35.3)	30.6 (27.2-34.4)	24.2 (20.9-27.8)
Ethnicity (%, (95% CI))								
- Native	85.5 (82.3-88.2)	81.8 (78.5-84.6)	84.8 (81.0-87.9)	76.1 (72.5-79.4)	64.3 (60.4-68.1)	92.0 (89.6-93.9)	87.1 (84.2-89.5)	70.3 (66.4-73.8)
- Western immigrant	10.2 (8.0-13.0)	7.4 (5.6-9.8)	9.0 (6.6-12.2)	10.2 (8.0-13.0)	31.6 (27.9-35.5)	6.4 (4.8-8.6)	9.1 (7.1-11.6)	27.9 (24.4-31.6)
- Non-western immigrant	4.3 (2.9-6.3)	10.8 (8.6-13.5)	6.2 (4.2-8.9)	13.7 (11.1-16.7)	4.1 (2.8-6.0)	1.6 (0.8-2.9)	3.8 (2.6-5.6)	1.8 (1.0-3.3)

DK: Denmark, NL: Netherlands, CH: Switzerland

[1] This categorisation was made according to the ISCED guidelines[24]; [2]Switzerland had no age group 0-4 years, due to restrictions of the consumer panels.

We compared the Danish respondents and non-respondents. For the age groups 30-39 years and 50-60 years, we found that respondents were more often female (Appendix, Table 1). The Dutch respondents were compared with the general population. Adult respondents were slightly more often highly educated and native Dutch compared to the general population (Appendix, Table 2). The Swiss respondents were also compared with the general population. Swiss respondents were more often female, had middle-level education, and were native Swiss (Appendix, Table 3).

Help-seeking at case level - children

Figure 1 shows help-seeking behaviour per age group, per case, and per country. Danish and Dutch parents differed in their intended help-seeking in most of the presented cases. The Dutch parents chose 'wait and see' more often than the Danish parents, who more often answered that they would contact their own GP or OOH primary care. Overall, the Danish parents chose to contact OOH acute care more often than Dutch parents, with significant differences for the five following cases. For 'red eyes', 18.7% of the Danish parents chose to contact OOH acute care, compared to 12.4% among Dutch parents. For 'rash', 23.4% of Danish and 16.4% of Dutch parents would contact OOH acute care. For 'chicken pox', 31.8% of Danish and 15.8% of Dutch parents would contact OOH acute care. For 'relapse fever', 59.5% of Danish and 41.6% of Dutch parents would contact OOH acute care. For 'abdominal pain', 84.4% of Danish and 79.1% of Dutch parents would contact OOH acute care.

Figure 1. Description of individuals help seeking per case, stratified for age group and country (distribution of choices)

(figure 1)

Help-seeking at case level - adults

We also found some differences in intended help-seeking behaviour among adults from different countries (Figure 1). In the age group 30-39 years, the Swiss more often chose to contact the ED than Danish and Dutch adults. Overall, the choices for different types of care varied per case. Additionally, adults aged 30-39 years differed in the frequency of contacting OOH acute care, with varying differences per case. For 'sore throat' (Danes: 7.5%, Dutch: 3.6%, Swiss: 10.9%), 'acute back pain' (Danish: 14.1%, Dutch: 10.8%, Swiss: 28.4%), and 'ankle distortion' (Danes: 40.3%, Dutch: 43.1%, Swiss: 44.3%), the Swiss adults significantly more often chose to contact OOH care than the Danish and Dutch, although with relatively small differences. For 'wounded foot' (Danes: 26.1%, Dutch: 34.0%, Swiss: 30.8%) and 'acute stomach pain' (Danes: 42.0%, Dutch: 54.4%, Swiss: 41.6%), Dutch adults significantly more often chose to contact OOH care.

In the age group 50-59 years, the Swiss also more often chose to contact the ED compared to the Danish and Dutch adults in this group. No clear pattern was seen for the other types of care. The Swiss adults more often chose to contact OOH care for two cases: 'sore throat' (Danish: 5.7%, Dutch: 2.7%, Swiss: 14.1%) and 'acute back pain' (Danish: 12.1%, Dutch: 8.1%, Swiss: 32.5%). For 'wounded foot', the Dutch and Swiss adults significantly more often chose to contact OOH care than the Danes (Danes: 26.1%, Dutch: 34.0%, Swiss: 30.8%). The Dutch significantly more often chose OOH care for 'acute stomach pain' (Danes: 42.0%, Dutch: 54.4%, Swiss: 41.6%).

Adjusted differences in help-seeking

Table 2 shows that the Dutch parents significantly less often chose to contact OOH care than Danish parents (mean: 2.25 versus 2.91 out of 6 cases). For adults aged 30-39 years, no significant differences were found between the three countries when correcting for age, gender, education, ethnicity, employment, and

living status. Swiss adults aged 50-59 years more often chose to contact OOH care than the Danish (mean: 2.58 versus 2.34 out of 6 cases).

Table 2. Association between country and out-of-hours help-seeking per age group

	0-4 years		**30-39 years**		**50-59 years**	
	Crude N=1,186	**Adjusted[1] N=1,161**	**Crude N=1,602**	**Adjusted[1] N=1,585**	**Crude N=1,864**	**Adjusted[1] N=1,844**
Denmark (ref) (mean (95%CI))	2.31 (2.20;2.42)	2.91 (2.53;3.30)	1.75 (1.61;1.89)	2.15 (1.78;2.51)	2.00 (1.89;2.12)	2.34 (1.90;2.77)
Netherlands (B, mean (95%CI))	-0.54* 1.78 (1.66;1.87)	-0.66* 2.25 (1.87;2.63)	0.16 1.91 (1.79;2.02)	0.11 2.26 (1.90;2.61)	-0.04 1.96 (1.84;2.07)	-0.10 2.24 (1.81;2.66)
Switzerland (B, mean (95%CI))	*Not available*	*Not available*	0.22* 1.97 (1.85;2.09)	0.16 2.31 (1.94;2.68)	0.29* 2.30 (2.18;2.41)	0.24* 2.58 (2.14;3.02)

**Significant difference (p<.005) compared with reference group; [1]Adjusted for age, gender, education, ethnicity, employment, and living status.*

DISCUSSION

Main findings

Danish and Dutch parents of children aged 0-4 years differed in help-seeking behaviour for five out of six cases (i.e. abdominal pain, red eyes, rash, relapse fever, chicken pox); the Dutch more often chose 'wait and see' than the Danish. For these cases, Danish parents significantly more often chose to contact OOH care than Dutch parents (difference varying from 1.1% to 17.9%). Also a regression analysis showed that Dutch parents significantly less often chose to contact OOH care than Danish parents. For adult citizens, we

found varying choices of responses for many of the presented cases. A regression analysis showed that the Swiss adults aged 50-59 years more often chose OOH care than the Danish and Dutch.

Comparison with existing literature

We found a difference in help-seeking behaviour between Denmark, the Netherlands, and Switzerland; this difference was varying for different age groups. In a previous study, we found that the Danes had higher consumption of OOH primary care than the Dutch, particularly for young children.[11] This difference between parents of young children was also apparent in our study. The question is what the underlying explanations could be for this consistent difference. A difference in employment exists between Danish and Dutch parents as Danish women more frequently are working full-time.[25] Danish women thus have fewer opportunities to visit the GP during daytime. Furthermore, the role of the Danish GP in childcare is different from that of the Dutch GP. Danish GPs have an active role as they see also young children for preventive issues, which could make parents more prone to contact primary care. In contrast, Dutch GPs do not play a role in preventive care for young children. Perhaps other cultural differences may be important factors. For example, there is a strong focus on work-life balance in Denmark (including extensive maternity leave). Differences between the Danish and the Dutch healthcare systems may play a smaller role as we did not find any differences in the help-seeking between adults. Besides, the two healthcare systems seem quite similar. Yet, the direct telephone access to a GP (who answers the telephone) in the OOH primary services in Denmark may encourage parents to seek advice or help at the OOH primary care service. Additionally, problems with the accessibility and availability of one's own GP are also issues that are discussed in both countries.

We did not find a significant difference in help-seeking between Danish and Dutch adults, while a previous study showed a small difference between Danish and Dutch adults.[11] Yet, we found a difference for Swiss adults aged 50-59 years who more often chose to contact OOH care than Danish and Dutch adults. Swiss adults more often answered 'wait and see', but they also more often chose 'ED'. The difference in

healthcare systems (with or without gate-keeping) seems to influence the intended help-seeking behaviour. The organisation of the Swiss healthcare system without the gate-keeping role of the GP may make citizens contact the ED more often, in particular for injury-related health problems, which were described in three of the six cases targeting adults.[26] In Denmark and the Netherlands, patients are strongly encouraged to contact primary care in case of an acute problem in order to assess the necessity of a subsequent referral to ED or secondary care. In the Netherlands, contacting the ED without a referral results in a fee for the citizen (own risk) as these ED visits are not covered by the health insurance. For Danish citizens, an ED visit is free, but citizens are strongly encouraged to first contact primary care, where triage is done. A healthcare system based on gate-keeping may thus lead to less (unnecessary) use of the ED, but not necessarily to lower use of OOH care in general.

Help-seeking behaviour is related to many factors, as also found by Andersen.[12] We focused on differences between countries and corrected for main variations between the populations (i.e. age, gender, education, ethnicity, employment, and living status). Several studies have shown an effect of these characteristics on help-seeking behaviour.[27] Yet, several other influential factors have also been identified, such as psychological characteristics and usual behaviour.[12] It could be that population differences relating to other factors may cause the variation between countries concerning help-seeking behaviour.

Strengths and limitations

The chosen design of using invented cases to measure intended help-seeking behaviour had several strengths and limitations. Strengths were that the respondents received the same cases, making comparisons more straightforward, and that persons who do not use OOH care or healthcare at all were also included. A limitation was the risk of introducing social desirability bias, with the response not representing actual behaviour. Additionally, the absence of emotional reactions that occur in real-life situations could have influenced the response. However, according to the theory of planned behaviour,

behaviour is mainly determined by behavioural intentions.[28] A review of literature on theory of planned behaviour concluded that behavioural intentions do predict behavior,[29] while Nagai found that help-seeking intentions are an important predictor of help-seeking behavior.[30] Several studies used hypothetical case scenarios in out-of-hours care and other settings.[10,31,32] Thus, we found that the chosen design was the most feasible and appropriate in relation to our aim.

OOH care is a complex issue, which currently faces challenges in many European countries. We were able to include citizens from three countries for our study by using a consumer panel in two countries. Our Danish sample was representative for the general population, and our Dutch and Swiss panels were also able to select quite representative samples for a range of background characteristics although some small statistically significant differences existed. We followed an extensive procedure to ensure high quality of the case development, which is a strength of this study. However, the varying relatively low response rates and the data collection method through consumer panels (ending the collection when about 600 respondents had been included) introduced a risk of selection bias. Additionally, our non-response analyses showed that adult respondents more often were female than non-respondents. Respondents also seemed to be higher educated and were more often native citizens than the general population. Therefore, we adjusted for these background factors in our final analyses. We found some differences in the intended help-seeking between the three countries after correcting for differences in several background variables. Yet, different recruitment methods may have introduced some bias, although the effect on differences between the countries and differences between populations and culture remains unclear.

We used six cases per age group, and the selected cases represented varying health problems with different levels of severity and appropriate healthcare actions. The choice of cases could have affected the differences found. Other health problems may thus have given different results, for example due to differences in culture, traditional treatment, or the healthcare system. However, for the age group 0-4

years, the results for the individual cases all showed the same trend, which suggests that case selection is a minor problem. For adults, the direction of differences varied per case. For the three cases on acute injuries, the organisation of healthcare may have played a role. The use of three age groups with varying results limited the generalisability of our results to the entire population of the included countries. The results could be rather different for other groups, such as the elderly. Finally, to obtain an eight percent difference between groups, we needed 600 respondents; this was not achieved for all age groups.

Implications for research and/or practice

We compared help-seeking behaviour between countries and found some differences. Further investigation of possible explanations for these differences is highly relevant, in particular concerning parents of young children. The differences were distinct in this group, and the use of OOH primary care is known to be high in this age group.[11] Identifying explanations for the differences found may help us reduce the use of OOH care in this group of patients.

Future research should also focus on other factors related to a high likelihood of contacting OOH care as this insight could be used to investigate whether interventions could be made to reduce the workload at OOH care while still addressing the highly relevant contacts. It could be interesting to see if differences in preferred actions also exist between healthcare professionals from different countries as this could imply differences in the approach to healthcare provision and cultural variations.

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COMPETING INTEREST

The authors have declared no competing interests.

ETHICAL APPROVAL

The project was approved by the Danish Data Protection Agency (J.no. 2013-41-2104). According to Danish law, approval from the Committee on Health Research Ethics of the Central Denmark Region was not needed as the study did not include biomedical intervention. The research ethics committee of the Radboud university medical center (CMO Arnhem-Nijmegen) was consulted and concluded that the study did not fall within the remit of the Medical Research Involving Human Subjects Act (WMO) (file number: 2013/379). According to current Swiss law on human research, anonymously collected data require no approval by a regional ethics committee.[33]

DATA SHARING STATEMENT

The dataset will be available on request.

AUTHORS' CONTRIBUTION

LH designed the study, performed the data collection, interpreted the data and drafted the manuscript. EK participated in designing the study and interpretation of the data, and critically revised the manuscript. AHC performed statistical analyses and critically revised the manuscript. GM and MS participated in the interpretation of the data and critically revised the manuscript. OS performed the data collection and

critically revised the manuscript. MBC designed the study and critically revised the manuscript. All authors read and approved the final manuscript.

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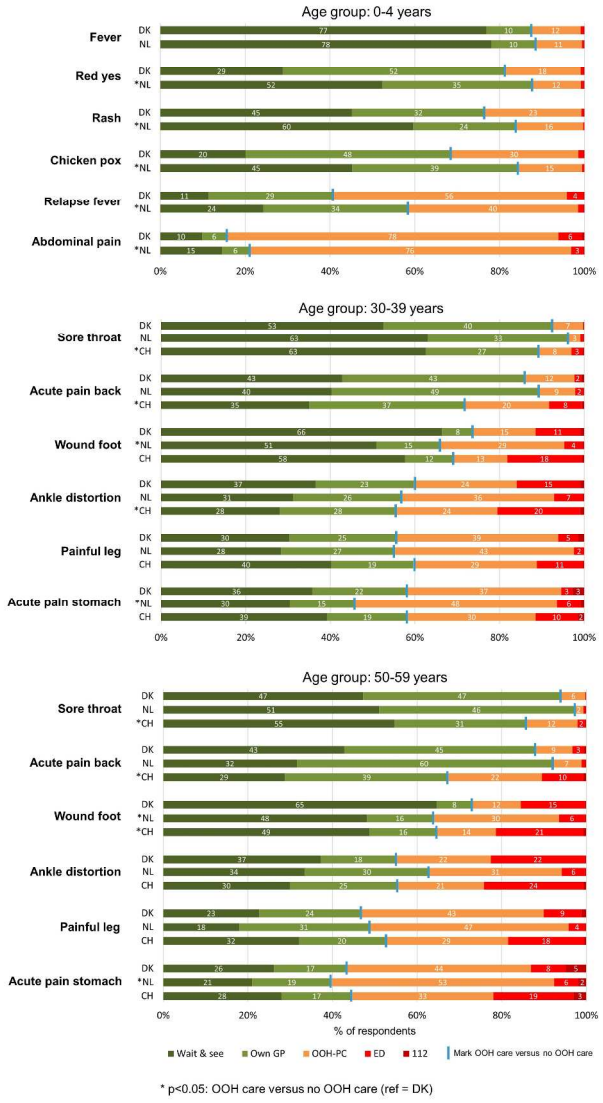

Description of individuals help seeking per case, stratified for age group and country (distribution of choices)

250x399mm (300 x 300 DPI)

APPENDIX

Questionnaire for children

In the English versions of the questionnaires, we write out-of-hours primary care, emergency department, and 112 ambulance care in the answering categories. The wording was culturally adapted in the language-specific questionnaires to match the available services.

SITUATION DESCRIPTIONS

We present six fictive situations. Each of the situations describes an invented case including a health problem affecting your **child's** health occurring outside the office hours of your own GP. Please answer what action(s) you would most likely take in this situation at this moment.

We would like to know what you would choose to do in the given situation (i.e. which actions you would most likely take). You do not have to consider what would be the "right" thing to answer or what other people think you should do.

In the cases we refer to a specific age. We ask you to pretend that your son/daughter is of the age stated in the case.

Case 1

Time: Saturday at 3 PM.

Situation: Your 4-year-old child has had abdominal pain for two days, and the pain is increasing in severity. He has a fever (39.6°C). He has vomited twice today and has not eaten anything for the entire day. He will not drink much. He has a little bit of diarrhoea. You cannot comfort him by reading a book, and he does not want to play by himself.

1. **What would you do, at this moment?** *(Please give one or more answers)*

o Wait and see (no contact with a doctor or similar)

o Self-care (for example a pain killer)

o Ask your partner, a relative, or others for advice

o Check a medical reference book, the internet or an app (for example "Patienthåndbogen"/"Moet ik naar de dokter?")

o Contact own general practitioner the next working day

o Contact the out-of-hours primary care outside opening hours own GP

o Contact the emergency department

o Call 112 ambulance care

o Do something else *Please describe:* _____

Case 2

Time: Sunday evening at 4 PM.

Situation: Your 3-year-old child has a cold and has had red eyes with discharge since two days. He is also sniffing. The eye discharge is yellow, and the eye lids stick together slightly. He is watching television.

2. **What would you do, at this moment?** *(Please give one or more answers)*

o Wait and see (no contact with a doctor or similar)

o Self-care (for example rinse with boiled water)

o Ask your partner, a relative, or others for advice

o Check a medical reference book, the internet or an app (for example "Patienthåndbogen"/"Moet ik naar de dokter?")

o Contact your child's own general practitioner the next working day

o Contact the out-of-hours primary care outside opening hours own GP

o Contact the emergency department

- o Call 112 ambulance care
- o Do something else *Please describe:* _____

Case 3

Time: Saturday at 3 PM.

Situation: Your 15-month-old child has woken after his nap with a temperature of 39.8°C. He already seemed listless before his nap today. He has not vomited, has no diarrhoea and no skin rash. He wants to sit with you and watch television. He does not want to eat anything, but drinks small amounts of cold water.

3. What would you do, at this moment? *(Please give one or more answers)*

- o Wait and see (no contact with a doctor or similar)
- o Self-care (for example a pain killer)
- o Ask your partner, a relative, or others for advice
- o Check a medical reference book, the internet or an app (for example "Patienthåndbogen"/"Moet ik naar de dokter?")
- o Contact your child's own general practitioner the next working day
- o Contact the out-of-hours primary care outside opening hours own GP
- o Contact the emergency department
- o Call 112 ambulance care
- o Do something else. *Please describe:* _____

Case 4

Time: Saturday at 3 PM.

Situation: Your 2-year-old child wakes up after his nap with red rash across arms, legs, chest and face. The rash is itching. He is alert, is playing as usual and has no other complaints and no fever.

4. What would you do, at this moment? *(Please give one or more answers)*

- o Wait and see (no contact with a doctor or similar)
- o Self-care
- o Ask your partner, a relative, or others for advice
- o Check a medical reference book, the internet or an app (for example "Patienthåndbogen"/"Moet ik naar de dokter?")
- o Contact your child's own general practitioner the next working day

- o Contact the out-of-hours primary care outside opening hours own GP
- o Contact the emergency department
- o Call 112 ambulance care
- o Do something else *Please describe:* _____

Case 5

Time: Thursday at 7 PM.

Situation: Your 8-month-old child has a fever. Last week, he had a common cold with a fever. He was also coughing. He seemed to recover, but now the fever has returned (temperature: 39.1°C). He does not drink a lot, and he is still coughing. Your child wants to sit with you all the time, but you cannot comfort him.

5. What would you do, at this moment? *(Please give one or more answers)*

- o Wait and see (no contact with a doctor or similar)
- o Self-care (for example a pain killer)
- o Ask your partner, a relative, or others for advice
- o Check a medical reference book, the internet or an app (for example "Patienthåndbogen"/"Moet ik naar de dokter?")
- o Contact your child's own general practitioner the next working day
- o Contact the out-of-hours primary care outside opening hours own GP
- o Contact the emergency department
- o Call 112 ambulance care
- o Do something else *Please describe:* _____

Case 6

Time: Sunday at 5 PM.

Situation: For one day, your 2-year-old child has had red skin and fluid-filled blisters, mostly on the chest and belly. He is a bit warm (temperature: 38.1°C), complains of a sore throat and generally does not seem fit. He drinks and eats as usual and is as alert as usual.

6. What would you do, at this moment? *(Please give one or more answers)*

- o Wait and see (no contact with a doctor or similar)
- o Self-care (for example a pain killer)
- o Ask your partner, a relative, or others for advice

o Check a medical reference book, the internet or an app (for example “Patienthåndbogen”/”Moet ik naar de dokter?”)

o Contact your child’s own general practitioner the next working day

o Contact the out-of-hours primary care outside opening hours own GP

o Contact the emergency department

o Call 112 ambulance care

o Do something else *Please describe:* _____

FACTORS AFFECTING DECISION-MAKING

The next questions relate to general factors that may affect decision-making regarding health problems.

7. We are interested in how you feel about the following statements. Read each statement carefully. Indicate how you feel about each statement. *(Please mark one answer per statement)*

		Not at all true	Hardly true	Moderately true	Exactly true
1.	I can always manage to solve difficult problems if I try hard enough	O	O	O	O
2.	If someone opposes me, I can find the means and ways to get what I want	O	O	O	O
3.	It is easy for me to stick to my aims and accomplish my goals	O	O	O	O
4.	I am confident that I could deal efficiently with unexpected events	O	O	O	O
5.	Thanks to my resourcefulness, I know how to handle unforeseen situations	O	O	O	O
6.	I can solve most problems if I invest the necessary effort	O	O	O	O
7.	I can remain calm when facing difficulties because I can rely on my coping abilities	O	O	O	O
8.	When I am confronted with a problem, I can usually find several solutions	O	O	O	O
9.	If I am in trouble, I can usually think of a solution	O	O	O	O
10.	I can usually handle whatever comes my way	O	O	O	O

We used validated Danish, Dutch, and German versions of the Generalized Self-Efficacy scale, see http://userpage.fu-berlin.de/health/selfscal.htm (Schwarzer, R., & Jerusalem, M. (1995). Generalized Self-Efficacy scale. In J. Weinman, S. Wright, & M. Johnston, Measures in health psychology: A user’s portfolio. Causal and control beliefs (pp. 35- 37). Windsor, England: NFER-NELSON).

8. Over the last two weeks, how often have you been bothered by the following problems?

		Not at all	Several days	More than half the days	Nearly every day
1.	Feeling nervous, anxious or on edge	O	O	O	O
2.	Not being able to stop or control worrying	O	O	O	O

We used validate Danish, Dutch, and German versions of the Generalized Anxiety Disorder scale (GAD-2), see http://www.phqscreeners.com/select-screener (Kroenke K, Spitzer RL, Williams JB, Monahan PO, Lowe B. Anxiety disorders in primary care: prevalence, impairment, comorbidity, and detection. Ann Intern Med. 2007; 146: 317-25).

9. Do you have somebody to talk to if you have problems or you need support? *(Please only mark one answer)*

- o No, never or almost never
- o Yes, sometimes
- o Yes, often
- o Yes, always

We used two scales of the validated Health Literacy Questionnaire (HLQ). As the HLQ is copyrighted to Deakin University, publication of the items or scales is not permitted. *(Osborne RH, Batterham RW, Elsworth GR, Hawkins M, Buchbinder R. The grounded psychometric development and initial validation of the Health Literacy Questionnaire (HLQ). BMC Public Health. 2013; 13: 658).*

10. How severe would your child's medical problem have to be before you felt it was appropriate to contact …? *(Please mark one grade per row)*

	Not severe										Very severe	Don't know
… your own GP	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	O
… OOH primary care	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	O
… 112	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	O

11. The following statements concern your considerations for contacting OOH-PC. Please answer to which degree you agree with each statement. *(Please mark one answer per statement)*

		Totally agree	Agree	Not agree and not disagree	Disagree	Totally disagree	Don't know
1.	The OOH primary care is intended for all medical problems (including non-urgent problems) that occur outside my GP's normal opening hours	O	O	O	O	O	O
2.	I can contact OOH primary care at any time, because it is financed by taxation (Denmark)/my insurance (the Netherlands)	O	O	O	O	O	O
3.	I feel more personal barriers in relation to contacting OOH primary care than contacting my own GP during daytime	O	O	O	O	O	O
4.	I carefully consider whether I should contact OOH primary care, because I do not want to disturb the health professionals	O	O	O	O	O	O

12. In the past year, how many times have you contacted the following health care providers regarding yourself and/or your children? *(Please only mark one cross in each row – if you are unsure, please answer what you think is most accurate)*

	Never	1	2	3	4	5 or more	Don't know/ not relevant
Own GP	O	O	O	O	O	O	O
OOH primary care	O	O	O	O	O	O	O
Emergency department	O	O	O	O	O	O	O
112	O	O	O	O	O	O	O

13. How satisfied are <u>you</u> in general with the following health care providers? *(Please only mark one cross in each row)*

	Very satisfied	Satisfied	Not satisfied, not satisfied	Dissatisfied	Very dissatisfied	Don't know	Not relevant/ no contact
Own GP	O	O	O	O	O	O	O
OOH primary care	O	O	O	O	O	O	O
Emergency department	O	O	O	O	O	O	O
112	O	O	O	O	O	O	O

14. <u>During the last two years</u>, have <u>you</u> experienced practical problems in contacting your own GP during day time, due to … *(Please only mark one cross in each row)*

	No problems	Yes, few problems	Yes, some problems	Yes, many problems	Don't know	Not relevant
… your own working hours or private appointments?	O	O	O	O	O	O
… your GPs telephone accessibility?	O	O	O	O	O	O
...the possibility to make a telephone appointment with your GP?	O	O	O	O	O	O
… your GPs availability for a clinic appointment?	O	O	O	O	O	O
...the accessibility to your own GP practice by website (i.e. making a appointment, repeat prescription, asking questions)?	O	O	O	O	O	O

15. What is the expected travel time from your home to the nearest OOH primary care, using your usual means of transport (public or private)? *(Please only mark one answer)*

- o Less than 15 minutes
- o 15 to 30 minutes
- o 30 to 60 minutes
- o More than 60 minutes
- o Don't know

BACKGROUND INFORMATION

16. What is your age?

Age: ___ years

Question not in Dutch questionnaire as information was available directly from the consumer panel.

17. What is your sex?

o Male

o Female

18. Do you live together with another adult? *(Please give one or more answers)*

o No

o Yes, with friend(s)s or roommate(s)

o Yes, with adult child(ren)

o Yes, with wife/husband, partner

o Yes, with parent(s)

o Yes, in nursing home

o Yes, other. *Please describe:* _____

19. How many children do you have (including children for whom you are sharing care)?

Number of children: _____

20. What is the age of you oldest and youngest child (in years and months - for children above 3 years, year is sufficient)

Your oldest child: ..... years and ..... months

Your youngest child: ..... years and ..... months

21. In general, how easily can you arrange day care for your child in case of illness? *(Please only mark one answer)* ***(Only in questionnaire for parents)***

o Very easily

o Easily

o With difficult

o Very great difficult

o Not relevant

o Don't know

22. In general, how would you describe your own health? *(Please only mark one answer)*

- o Very good
- o Good
- o Fair
- o Bad
- o Very bad

23. In general, how would you describe your child's health? *(Please only mark one answer)*

- o Very good
- o Good
- o Fair
- o Bad
- o Very bad

24. What is the highest educational level that you have completed? *(Please only mark one answer)*

- o No education
- o Primary school
- o Lower secondary school
- o Higher secondary school
- o College – bachelor's degree
- o University – bachelor's degree
- o University – master's degree
- o PhD/doctoral
- o Other. *Please describe:* _____

Answering categories were adjusted to the education system of each country.

Question not in Dutch questionnaire as information was available directly from the consumer panel.

25. What is your current job position? *(Please only mark one answer – in case more answers apply, please mark the most accurate answer)*

- o Employed
- o Unemployed
- o Pre-pension/ pension
- o Care for family and household
- o Leave

- o Disabled
- o Student
- o Other. *Please describe:* _____

Question not in Dutch questionnaire as information was available directly from the consumer panel.

26. From which country of birth are you and your parents? *(Please only mark one cross in each row)*

	Denmark/The Netherlands	**Other, please write the country**
You	O	O _____
Your mother	O	O _____
Your father	O	O _____

27. Do you have a medical education? *(Please only mark one answer)*

- o No
- o Yes, I am a doctor
- o Yes, I am a nurse
- o Yes, I have had another medical education. *Please describe:* _____

28. Do you use healthcare applications (apps) or the Internet (e.g. 'Google search') when you experience a health problem? *(Please only mark one answer)*

- o Often
- o Sometimes
- o Rarely
- o Never → skip question 29
- o Don't know → skip question 29

29. In general, does using apps or the Internet (e.g. 'Google search') influence your need to contact healthcare professionals when you experience a health problem? *(Please only mark one answer)*

- o No
- o Yes, it mostly increases my need to contact
- o Yes, it sometimes increases and sometimes decrease my need to contact
- o Yes, it mostly decreases my need to contact
- o Don't know

COMMENTS

You are welcome to write your comments on the questionnaire here:

_____

_____

_____

Questionnaire for adults

In the English versions of the questionnaires, we write out-of-hours primary care, emergency department, and 112 ambulance care in the answering categories. Wording is adjusted in the language specific questionnaires to match the available services.

SITUATION DESCRIPTIONS

We present six fictive situations. Each of the situations describes an invented case including a health problem affecting your health occurring outside the office hours of your own GP. Please answer what action(s) you would most likely take in this situation at this moment.

We would like to know what you would choose to do in the given situation (i.e. which actions you would most likely take). You do not have to consider what would be the "right" thing to answer or what other people think you should do.

Case 1

Time: Sunday at 3 PM.

Situation: When you woke up this morning, your left leg was swollen and painful. The leg has a warm, red and painful area with a 10 cm diameter. You do not feel well. You are not sure whether you have a fever. You did not hit your leg.

1. **What would you do, at this moment?** *(Please give one or more answers)*

o Wait and see (no contact with a doctor or similar)

o Self-care (for example a pain killer)

o Ask your partner, a relative, or others for advice

o Check a medical reference book, the internet or an app (for example "Patienthåndbogen"/"Moet ik naar de dokter?")

o Contact own general practitioner the next working day

o Contact the out-of-hours primary care outside opening hours own GP

o Contact the emergency department

o Call 112 ambulance care

o Do something else *Please describe:* _____

Case 2

Time: Monday at 8 PM.

Situation: You have been suffering from a severe stomach ache that started suddenly two hours ago; something you have never had before. The pain seems to be localised in your upper stomach, radiating towards your shoulder blades. You have an urge to move around a lot, and you feel nauseous, but you do not vomit. You have had normal defecation patterns all day.

2. **What would you do, at this moment?** *(Please give one or more answers)*

o Wait and see (no contact with a doctor or similar)

o Self-care (for example a pain killer)

o Ask your partner, a relative, or others for advice

o Check a medical reference book, the internet or an app (for example "Patienthåndbogen"/"Moet ik naar de dokter?")

o Contact own general practitioner the next working day

o Contact the out-of-hours primary care outside opening hours own GP

o Contact the emergency department

- o Call 112 ambulance care
- o Do something else *Please describe:* _____

Case 3

Time: Wednesday at 6 PM.

Situation: This morning you suddenly got a severe back pain when lifting a bag with groceries. The pain is continuously present in your lower back. The pain does radiate to your left buttocks, and it limits your movements. You have taken paracetamol (Panadol), but this does not relieve the pain.

3. What would you do, at this moment? *(Please give one or more answers)*

- o Wait and see (no contact with a doctor or similar)
- o Self-care (for example a pain killer)
- o Ask your partner, a relative, or others for advice
- o Check a medical reference book, the internet or an app (for example "Patienthåndbogen"/"Moet ik naar de dokter?")
- o Contact own general practitioner the next working day
- o Contact the out-of-hours primary care outside opening hours own GP
- o Contact the emergency department
- o Call 112 ambulance care
- o Do something else *Please describe:* _____

Case 4

Time: Thursday at 7 PM.

Situation: You have been suffering from a severe sore throat for two days. You are also coughing slightly and feel feverish. You can take liquids, but swallowing is painful. You have to attend a wedding of a relative in two days.

4. What would you do, at this moment? *(Please give one or more answers)*

- o Wait and see (no contact with a doctor or similar)
- o Self-care (for example a pain killer)
- o Ask your partner, a relative, or others for advice
- o Check a medical reference book, the internet or an app (for example "Patienthåndbogen"/"Moet ik naar de dokter?")
- o Contact own general practitioner the next working day

- o Contact the out-of-hours primary care outside opening hours own GP
- o Contact the emergency department
- o Call 112 ambulance care
- o Do something else *Please describe:* _____

Case 5

Time: Wednesday at 7 PM.

Situation: You accidently stepped on a piece of glass with your left foot 30 minutes ago. The piece of glass seems to have come out. The bleeding seems to have lessened. The wound is about 3 cm long and is 1-2 mm broad. Your tetanus vaccination is up to date.

5. What would you do, at this moment? *(Please give one or more answers)*

- o Wait and see (no contact with a doctor or similar)
- o Self-care (for example put a plaster on)
- o Ask your partner, a relative, or others for advice
- o Check a medical reference book, the internet or an app (for example "Patienthåndbogen"/"Moet ik naar de dokter?")
- o Contact own general practitioner the next working day
- o Contact the out-of-hours primary care outside opening hours own GP
- o Contact the emergency department
- o Call 112 ambulance care
- o Do something else *Please describe:* _____

Case 6

Time: Saturday at 4 PM.

Situation: Your left foot was twisted yesterday when you were walking in the forest. Your left ankle was directly painful and swollen. Initially, you were able to walk on the injured foot, but now you are unable to even rest on it. Your left ankle is quite painful and seems swollen compared to the right one.

6. What would you do, at this moment? *(Please give one or more answers)*

- o Wait and see (no contact with a doctor or similar)
- o Self-care (for example put ice on)
- o Ask your partner, a relative, or others for advice

o Check a medical reference book, the internet or an app (for example “Patienthåndbogen”/”Moet ik naar de dokter?”)

o Contact own general practitioner the next working day

o Contact the out-of-hours primary care outside opening hours own GP

o Contact the emergency department

o Call 112 ambulance care

o Do something else *Please describe:* _____

FACTORS AFFECTING DECISION-MAKING

The next questions relate to general factors that may affect decision-making regarding health problems.

7. We are interested in how you feel about the following statements. Read each statement carefully. Indicate how you feel about each statement. *(Please mark one answer per statement)*

		Not at all true	Hardly true	Moderately true	Exactly true
1.	I can always manage to solve difficult problems if I try hard enough	O	O	O	O
2.	If someone opposes me, I can find the means and ways to get what I want	O	O	O	O
3.	It is easy for me to stick to my aims and accomplish my goals	O	O	O	O
4.	I am confident that I could deal efficiently with unexpected events	O	O	O	O
5.	Thanks to my resourcefulness, I know how to handle unforeseen situations	O	O	O	O
6.	I can solve most problems if I invest the necessary effort	O	O	O	O
7.	I can remain calm when facing difficulties because I can rely on my coping abilities	O	O	O	O
8.	When I am confronted with a problem, I can usually find several solutions	O	O	O	O
9.	If I am in trouble, I can usually think of a solution	O	O	O	O
10.	I can usually handle whatever comes my way	O	O	O	O

We used validated Danish, Dutch, and German versions of the Generalized Self-Efficacy scale (Schwarzer, R., & Jerusalem, M. (1995). Generalized Self-Efficacy scale. In J. Weinman, S. Wright, & M. Johnston, Measures in health psychology: A user’s portfolio. Causal and control beliefs (pp. 35- 37). Windsor, England: NFER-NELSON).

8. Over the last two weeks, how often have you been bothered by the following problems?

		Not at all	Several days	More than half the days	Nearly every day
1.	Feeling nervous, anxious or on edge	O	O	O	O
2.	Not being able to stop or control worrying	O	O	O	O

We used validate Danish, Dutch, and German versions of the Generalized Anxiety Disorder scale (GAD-2), see http://www.phqscreeners.com/select-screener (Kroenke K, Spitzer RL, Williams JB, Monahan PO, Lowe B. Anxiety disorders in primary care: prevalence, impairment, comorbidity, and detection. *Ann Intern Med*. 2007; 146: 317-25).

9. Do you have somebody to talk to if you have problems or you need support? *(Please only mark one answer)*

- o No, never or almost never
- o Yes, sometimes
- o Yes, often
- o Yes, mostly

We used two scales of the validated Health Literacy Questionnaire (HLQ). As the HLQ is copyrighted to Deakin University, publication of the items or scales is not permitted *(Osborne RH, Batterham RW, Elsworth GR, Hawkins M, Buchbinder R. The grounded psychometric development and initial validation of the Health Literacy Questionnaire (HLQ). BMC Public Health. 2013; 13: 658).*

10. How severe would your medical problem have to be before you felt it was appropriate to contact …? *(Please mark one grade per row)*

	Not severe										Very severe	Don't know
… your own GP	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	O
… OOH primary care	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	O
… 112	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	O

11. The following statements concern your considerations for contacting OOH-PC. Please answer to which degree you agree with each statement. *(Please mark one answer per statement)*

		Totally agree	Agree	Not agree and not disagree	Disagree	Totally disagree	Don't know
1.	The OOH primary care is intended for <u>all</u> medical problems (including non-urgent problems) that occur outside my GP's normal opening hours	O	O	O	O	O	O
2.	I can contact OOH primary care at any time, because it is financed by taxation (Denmark)/my insurance (the Netherlands, Switzerland)	O	O	O	O	O	O
3.	I feel more personal barriers in relation to contacting OOH primary care than contacting my own GP during daytime	O	O	O	O	O	O
4.	I carefully consider whether I should contact OOH primary care, because I do not want to disturb the health professionals	O	O	O	O	O	O

12. In the past year, how many times have <u>you</u> contacted the following health care providers <u>regarding yourself and/or your children</u>? *(Please only mark one cross in each row– if you are unsure, please answer what you think is most accurate)*

	Never	1	2	3	4	5 or more	Don't know/ not relevant
Own GP	O	O	O	O	O	O	O
OOH primary care	O	O	O	O	O	O	O
Emergency department	O	O	O	O	O	O	O
112	O	O	O	O	O	O	O

13. How satisfied are you in general with the following health care providers? *(Please only mark one cross in each row)*

	Very satisfied	Satisfied	Not satisfied, not satisfied	Dissatisfied	Very dissatisfied	Don't know	Not relevant/ no contact
Own GP	O	O	O	O	O	O	O
OOH primary care	O	O	O	O	O	O	O
Emergency department	O	O	O	O	O	O	O
112	O	O	O	O	O	O	O

14. During the last two years, have you experienced practical problems in contacting your own GP during day time, due to … *(Please only mark one cross in each row)*

	No problems	Yes, few problems	Yes, some problems	Yes, many problems	Don't know	Not relevant
… your own working hours or private appointments?	O	O	O	O	O	O
… your GPs telephone accessibility?	O	O	O	O	O	O
...the possibility to make a telephone appointment with your GP?	O	O	O	O	O	O
… your GPs availability for a clinic appointment?	O	O	O	O	O	O
...the accessibility to your own GP practice by website (i.e. making an appointment, repeat prescription, asking questions)?	O	O	O	O	O	O

15. What is the expected travel time from your home to the nearest OOH primary care, using your usual means of transport (public or private)? *(Please only mark one answer)*

- o Less than 15 minutes
- o 15 to 30 minutes
- o 30 to 60 minutes
- o More than 60 minutes
- o Don't know

BACKGROUND INFORMATION

16. What is your age?

Age: ___ years

Question not in Dutch questionnaire as information was available directly from the consumer panel.

17. What is your sex?

o Male

o Female

Question not in Dutch questionnaire as information was available directly from the consumer panel.

18. Do you live together with another adult? *(Please give one or more answers)*

o No

o Yes, with friend(s)s or roommate(s)

o Yes, with adult child(ren)

o Yes, with wife/husband, partner

o Yes, with parent(s)

o Yes, in nursing home

o Yes, other. *Please describe:* _____

19. In general, how would you describe your own health? *(Please only mark one answer)*

o Very good

o Good

o Fair

o Bad

o Very bad

20. What is the highest educational level that you have completed? *(Please only mark one answer)*

o No education

o Primary school

o Lower secondary school

o Higher secondary school

o College – bachelor's degree

o University – bachelor's degree

o University – master's degree

- o PhD/doctoral
- o Other. *Please describe:* _____

Answering categories were adjusted to the education system of each country.

Question not in Dutch questionnaire as information was available directly from the consumer panel.

21. What is your current job position? *(Please only mark one answer - in case more answers apply, please mark the most accurate answer)*

- o Employed
- o Unemployed
- o Pre-pension/ pension
- o Care for family and household
- o Leave
- o Disabled
- o Student
- o Other. *Please describe:* _____

Question not in Dutch questionnaire as information was available directly from the consumer panel.

22. From which country of birth are you and your parents? *(Please only mark one cross in each row)*

	Denmark/The Netherlands/Switzerland	**Other, please write the country**
You	O	O _____
Your mother	O	O _____
Your father	O	O _____

23. Do you have a medical education? *(Please only mark one answer)*

- o No
- o Yes, I am a doctor
- o Yes, I am a nurse
- o Yes, I have had another medical education. *Please describe:* _____

24. Do you use healthcare applications (apps) or the Internet (e.g. 'Google search') when you experience a health problem? *(Please only mark one answer)*

- o Often
- o Sometimes

- o Rarely
- o Never → skip question 25
- o Don't know → skip question 25

25. In general, does using apps or the Internet (e.g. 'Google search') influence your need to contact healthcare professionals when you experience a health problem? *(Please only mark one answer)*

- o No
- o Yes, it mostly increases my need to contact
- o Yes, it sometimes increases and sometimes decrease my need to contact
- o Yes, it mostly decreases my need to contact
- o Don't know
- o Not relevant – rarely/never use this

The Swiss questionnaire had four extra questions concerning ethnicity, being listed at a GP, and the insurance model.

COMMENTS

You are welcome to write your comments on the questionnaire here:

_____

_____

_____

Table 1. Description of background characteristics of Danish population per age group, for respondents and non-respondents						
Age group	**0-4 years**		**30-39 years**		**50-59 years**	
	Respondents	**Non-respondents**	**Respondents**	**Non-respondents**	**Respondents**	**Non-respondents**
Age citizen (mean)	2.0 (1.9-2.1)	2.1 (1.9-2.2)	34.7 (34.5-35.0)	34.8 (34.6-35.0)	54.2 (54.0-54.5)	54.3 (54.0-54.5)
Gender citizen (%)						
- Male	50.3 (46.3-54.4)	51.8 (47.8-55.6)	38.0 (33.4-42.7)	55.2 (51.7-58.7)	45.0 (41.2-48.8)	54.6 (50.4-58.7)
- Female	49.7 (45.6-53.7)	48.2 (44.4-52.2)	62.0 (57.3-66.5)	44.8 (41.3-48.3)	55.1 (51.2-58.8)	45.4 (41.3-49.6)
Region citizen (%)						
- Capital	32.3 (28.6-36.3)	36.1 (32.5-40.0)	35.2 (30.8-39.8)	37.1 (33.8-40.6)	25.9 (22.7-29.4)	32.8 (29.0-36.8)
- Zealand	12.6 (10.1-15.6)	12.4 (10.1-15.2)	13.6 (10.6-17.5)	11.4 (9.4-13.9)	16.9 (14.2-20.0)	14.3 (11.6-17.5)
- South	20.3 (17.2-23.8)	20.2 (17.3-23.6)	18.2 (14.8-22.1)	20.3 (17.6-23.3)	22.9 (19.8-26.2)	21.6 (18.4-25.3)
- Central	23.6 (20.3-27.3)	23.1 (20.0-26.6)	24.9 (21.1-29.3)	20.9 (18.2-23.9)	23.5 (20.4-26.9)	20.7 (17.5-24.3)
- North	11.2 (8.9-14.0)	8.1 (6.2-10.5)	8.2 (5.9-11.2)	10.3 (8.3-12.6)	10.9 (8.7-13.5)	10.6 (8.3-13.5)
Education level, ethnicity and living status were not available for the non-respondents. We checked the general population: respondents seem more slightly more often native and a bit higher educated.						

Table 2. Description of background characteristics of Dutch population per age group, for respondents and general population

Age group	**0-4 years**		**30-39 years**		**50-59 years**	
Characteristics	**Respondents**	**General population**[1]	**Respondents**	**General population**	**Respondents**	**General population**
Age citizen (mean)	1.7 (1.6-1.8)	2.0	34.8 (34.6-35.0)	34.5	54.6 (54.4-54.8)	54.4
Gender citizen (%)						
- Male	*Not available – only gender parent*	51.2 (51.1-51.3)	50.2 (46.1-54.2)	50.1 (50.0-50.2)	52.9 (49.0-56.8)	50.2 (50.1-50.2)
- Female		48.8 (48.7-48.9)	49.8 (45.8-53.9)	49.9 (49.8-50.0)	47.1 (43.2-51.0)	49.8 (50.0-50.0)
Region (%)						
- Groningen	3.1 (2.0-4.7)	3.1 (3.0-3.1)	3.4 (2.2-5.2)	3.2 (3.2-3.3)	3.6 (2.4-5.4)	3.3 (3.3-3.3)
- Friesland	3.7 (2.5-5.5)	3.7 (3.6-3.7)	2.5 (1.5-4.2)	3.4 (3.4-3.5)	3.5 (2.3-5.2)	3.8 (3.8-3.8)
- Drenthe	2.4 (1.5-4.0)	2.6 (2.5-2.6)	2.2 (1.3-3.7)	2.5 (2.4-2.5)	3.3 (2.2-5.0)	3.1 (3.0-3.1)
- Overijssel	6.9 (5.2-9.2)	7.0 (6.9-7.0)	7.4 (5.6-9.8)	6.6 (6.5-6.6)	7.0 (5.3-9.2)	6.5 (6.5-6.6)
- Gelderland	11.9 (9.6.-14.7)	11.5 (11.5-11.6)	11.3 (9.0-14.1)	11.0 (11.0-11.0)	13.1 (10.7-16.0)	12.2 (12.2-12.3)
- Utrecht	9.0 (7.0-11.5)	8.4 (8.3-8.4)	9.6 (7.5-12.3)	8.1 (8.0-8.1)	6.5 (4.8-8.7)	7.1 (7.1-7.1)
- Noord-Holland	15.8 (13.1-18.9)	16.8 (16.7-16.9)	18.1 (15.2-21.4)	18.0 (18.0-18.1)	15.6 (13.0-18.7)	16.1 (16.0-16.1)
- Zuid-Holland	22.5 (19.4-26.0)	23.0 (22.9-23.1)	21.3 (18.2-24.8)	22.8 (22.7-22.8)	18.0 (15.2-21.2)	20.6 (20.5-20.6)
- Zeeland	1.9 (1.1-3.4)	2.1 (2.1-2.1)	1.9 (1.0-3.3)	2.0 (1.9-2.0)	2.5 (1.6-4.1)	2.3 (2.2-2.3)
- Flevoland	3.7 (2.5-5.5)	2.8 (2.8-2.9)	3.2 (2.1-5.0)	2.6 (2.6-2.6)	2.8 (1.8-4.5)	2.4 (2.4-2.5)
- Noord-Brabant	14.2 (11.6-17.1)	13.9 (13.8-14.0)	13.7 (11.1-16.7)	14.2 (14.2-14.3)	16.3 (13.6-19.4)	15.2 (15.1-15-2)
- Limburg	4.8 (3.4-6.8)	5.2 (5.1-5.2)	5.4 (3.8-7.5)	5.7 (5.7-5.7)	7.7 (5.9-10.1)	7.4 (7.4-7.4)

[1]*Information was only available on children for the general population, whereas information on the respondents was on parent/care-giver, who was the decision maker and answered the questionnaire.*

Table 3. Description of background characteristics of Swiss population per age group, for respondents and general population

Age group	**30-40 years**		**50-60 years**	
	Respondents[1,2]	**General population[3]**	**Respondents**	**General population[3]**
Age respondent (mean)	34.9 (34.7-35.2)	34.5	54.5 (54.2-54.7)	54.2
Gender respondent (%)				
- Male	42.3 (38.3-46.3)	50.3 (50.2-50.4)	48.1 (44.1-52.1)	50.4 (50.3-50.5)
- Female	57.7 (53.7-61.7)	49.7 (49.6-49.8)	51.9 (47.9-55.9)	49.6 (49.5-49.6)
Education level (%)		***(35-44 years)***		***(55-64 years)***
- Low	4.6 (3.2-6.6)	11.5	9.7 (7.6-12.4)	15.5
- Middle	59.4 (55.3-63.3)	42.5	66.1 (62.1-69.8)	62.4
- High	36.1 (32.3-40.0)	46.0	24.2 (20.9-27.8)	22.1
Ethnicity (%)				
- Native	64.0 (60.0-67.8)	62.8 (62.7-62.9)	70.3 (66.4-73.8)	80.0 (80.0-80.1)
- Immigrant	36.0 (32.2-40.0)	37.2 (37.1-37.3)	29.7 (26.2-33.6)	20.0 (19.9-20.0)

[1]Respondi panel company; [2]Bilendi panel company; [3]*According to the federal statistical office of Switzerland* https://www.bfs.admin.ch/bfs/en/home/statistics/population.html

STROBE 2007 (v4) Statement—Checklist of items that should be included in reports of *cross-sectional studies*

Section/Topic	Item #	Recommendation	Reported on page #
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	2
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	4
Objectives	3	State specific objectives, including any prespecified hypotheses	4
Methods			
Study design	4	Present key elements of study design early in the paper	4,5
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	5,6,9
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	4,5
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	6
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	6
Bias	9	Describe any efforts to address potential sources of bias	*5*
Study size	10	Explain how the study size was arrived at	8
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	9
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	9-10
		(*b*) Describe any methods used to examine subgroups and interactions	n.a.
		(*c*) Explain how missing data were addressed	n.a.
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	n.a.
		(*e*) Describe any sensitivity analyses	n.a.
Results			

Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	10
		(b) Give reasons for non-participation at each stage	n.a.
		(c) Consider use of a flow diagram	n.a.
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	10
		(b) Indicate number of participants with missing data for each variable of interest	10
Outcome data	15*	Report numbers of outcome events or summary measures	13
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	n.a.
		(*b*) Report category boundaries when continuous variables were categorized	n.a.
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	n.a.
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	n.a.
Discussion			
Key results	18	Summarise key results with reference to study objectives	15
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	17-19
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	16,17
Generalisability	21	Discuss the generalisability (external validity) of the study results	16-19
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	19

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

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Help-seeking behaviour outside office hours in Denmark, the Netherlands, and Switzerland: a questionnaire study exploring responses to hypothetical cases

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Help-seeking behaviour outside office hours in Denmark, the Netherlands, and Switzerland: a questionnaire study exploring responses to hypothetical cases

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ABSTRACT

Objectives: We aim to study the preferred behaviour among individuals from different age groups in three countries when acute health problems occur outside office hours and thereby to explore variations in help-seeking behaviour.

Design: A questionnaire study exploring responses to six hypothetical cases describing situations with a potential need for seeking medical care and questions on background characteristics.

Setting: General population in Denmark, the Netherlands, and Switzerland.

Population: Danish, Dutch, and Swiss individuals from three age groups (0-4, 30-39, 50-59 years).

Main outcome measures: Distribution of intended help-seeking preferences per case per age group, compared between countries. Differences in percentage of help-seeking outside office hours per age group and country, crude and adjusted for background characteristics.

Results: Danish and Dutch parents of children aged 0-4 years differed in intended help-seeking behaviour for five out of six cases (abdominal pain, red eyes, rash, relapse fever, chicken pox); Danish parents significantly more often chose to contact OOH care than Dutch parents. For adults aged 30-39 years, no significant difference between the three countries was found for contacting OOH care. Swiss adults aged 50-59 years had the highest percentage of OOH contacts (38.3%), followed by the Danish (33.4%) and the Dutch (32.5%).

Conclusion: Some differences in help-seeking behaviour outside office hours exist between Danish, Dutch, and Swiss individuals, particularly for parents of young children. The question remains whether these differences result from individual preferences, cultural disparities, and/or health services variations. Future research should focus on identifying explanations for these differences to reduce undesirable use of out-of-hours care.

ARTICLE SUMMARY

Strengths and limitations of this study:

- The study is based on representative population samples from three countries
- An extensive procedure was followed to ensure high quality of the case development
- Using hypothetical cases to measure intended help-seeking behaviour could have introduced social desirability bias, and the responses may thus not represent actual behaviour
- The choice of cases could have affected the results

Keywords: after-hours care, primary health care, emergency medical services, help-seeking behaviour

INTRODUCTION

Many European countries face high demands in out-of-hours (OOH) care, e.g. primary care, emergency departments (EDs), and emergency medical services (EMS).[1-3] This can lead to high workload, excessive use of resources, and increased costs.[4-6] High workload may lead to longer waiting times, work pressure for OOH staff, and risk of safety incidents. At the same time, the service delivery by general practitioners (GPs) to OOH primary care is challenged due to fewer available GPs, low work satisfaction, and need for off-duty time.[7]

The help-seeking behaviour among individuals varies between European countries, with differing numbers of ED visits and GP consultations.[8-10] The number of GP consultations per patient ranges from 2.9 to 11.8 per year in European countries,[9] whereas the proportion of patients who visited the ED in the past year varied between 18% and 40%.[8] Similar differences also seem apparent in OOH primary care. In a previous study, we found differences in help-seeking behaviour between Danish and Dutch individuals; the Danes contacted OOH primary care about twice as often as the Dutch.[11]

Differences between countries may be related to the organisation of healthcare systems and OOH care (such as fees, accessibility, and availability), the composition of populations,[12] culture, and/or public expectations to healthcare services. Exploring differences in help-seeking behaviour could be a first step to identify factors with a potential for intervention to optimise help-seeking behaviour and requests. Thus, we aim to study how individuals from different age groups in three countries (i.e. Denmark, the Netherlands, and Switzerland) react to hypothetical scenarios about acute health problems occurring outside office hours.

METHODS

Design and population

We performed a questionnaire study exploring responses to hypothetical cases by sending questionnaires with hypothetical paper case scenarios to Danish, Dutch, and Swiss individuals in December 2015 and January 2016. This study was part of a project of the European research network for out-of-hours primary health care (EurOOHnet).[13] Simultaneously, a second paper has been written on factors related to intended help-seeking OOH.[14] We included a random selection of individuals from three age groups (i.e. parents of children aged 0-4 years, adults aged 30-39 years, and adults aged 50-59 years). Pre-defined age groups were preferred to ensure construction of explicit cases and to obtain sufficient power for identifying differences for each separate age group. Age groups were based on a previous study, which found the largest differences in the use of OOH care to be between Danish and Dutch individuals for both age groups 0-4 years and 20-35 years.[11] We composed the age group of individuals aged 30-39 years as we expected more homogeneity in this group than in the group of individuals aged 25-35 years. In this study, we added the age group 50-59 years to examine the robustness of our results.

We used the Danish Civil Registration System to randomly select representative individuals among the five Danish regions. We excluded individuals living in institutions and individuals with address protection. The Dutch and Swiss samples were selected using consumer panels (the Netherlands: TNS Nipo; Switzerland: Respondi and Bilendi).[15-17] The Dutch sample represented the population on age, gender, and region (0-4 years), and age, gender, region, education, and ethnicity (both adult age groups). For Switzerland, it was only possible to include adults selected on age by using two panels to reach 600 respondents as information about children of panel members was not available.

Settings

In Denmark, 99% of citizens are listed with a GP. Through the GP, they have access to the entire public (tax-funded) healthcare system, which is free of charge for the patients.[18] Outside office hours, patients can contact OOH primary care or the prehospital Emergency Medical Services (EMS), depending on the severity

and urgency of the health problem. Referral from either primary care or EMS is generally a prerequisite for an emergency department (ED) visit, specialist care, or hospital admission, although self-referral to the ED exists. For most OOH primary care services, GPs perform the telephone triage and are remunerated on a fee-for-service basis. The Netherlands has a similar system, with the GP serving as a gatekeeper.[19] Citizens must have private health insurance, which gives free access to primary care throughout and outside office hours. Nurses and practice assistants answer the telephone in the Dutch OOH primary care services and perform the triage under supervision by GPs. All professionals working in OOH primary care get paid per hour. A referral is usually a prerequisite for access to the ED and hospital visits, although self-referral to the ED exists. In Switzerland, OOH care is organised locally, and organizational models vary between regions. The most widespread models include rotation systems, which are most often combined with EMS telephone triage, walk-in centres (e.g. group practices offering OOH care), and general practices integrated in the ED. No gate-keeping system exists, and referral from a GP is thus not needed for access to the ED and specialist care. OOH care is covered by the mandatory health insurance plan, except for an annual deductible rate ranging between CHF 300 to 2,500 (EUR 275 to 2300) and a 10% co-payment.

Development of questionnaires

We developed questionnaires containing hypothetical cases that described situations with a potential acute need for medical care outside office hours. As a measure of urgency, all cases varied in the type of care needed (Appendix). The questionnaires for children and adults mainly differed on presented cases. The questionnaires also included questions on background characteristics (i.e. age, sex, social support, living status, education level, employment, and ethnicity) and on factors related to help-seeking based on Andersen's behavioural model.[12] The questions on factors related to help-seeking were part of a larger study and will be described in further detail in another scientific article focusing on factors related to intended help-seeking outside office hours.

Cases

The development of cases followed several steps: collecting and selecting relevant and representative cases, assessing the type of care needed (performed by an expert panel), and making the final selection using Rasch analysis. We collected cases from previous studies.[20-22] We also added new cases to include frequent reasons for encounter (based on an analysis of data from Danish and Dutch OOH primary care) and to ensure that we included cases from all urgency levels (based on the telephone guideline from the Dutch Association of GPs to categorise the cases).[23] We selected different health problems for the cases for each age group separately to ensure that the urgency levels were not immediately obvious. For cases regarding children, we defined a specific age for the child as even small age differences in this group can change the help-seeking behaviour considerably for the same illness. For the adults, no specific age was presented as the individuals were intended to see themselves in the described situation. All cases included a specific weekday and time. The list of potentially relevant cases was discussed at several internal meetings with researchers and GPs (to ensure representativeness of cases) and in two feedback rounds by email involving eight lay persons and five academic GPs (to check for recognisability and clarity). We selected 20 cases involving children and 32 cases involving adults to be presented for the expert panel. The relevance of the health problems described was checked and found relevant for the Swiss healthcare system. In this process, we used cases written in English.

We sent the cases to a convenience sample of 29 GPs using the following inclusion criteria: ≥2 years GP experience, ≥6 OOH shifts per year, varying regions within the countries, and good knowledge of English. This expert panel assessed the most appropriate type of care needed per case to enable us to include cases of different levels of urgency.

After the expert round, we ranked the cases on type of care needed as we aimed to select cases that represented different levels of care with only a few cases per urgency level. We excluded cases that appeared to be unclear. We selected 11 cases for children and 13 cases for adults; these numbers were estimated to be sufficient for selection of cases to be included in the final questionnaire after additional analysis.

The cases were then translated from English into Danish. To ensure high quality of the translation, we followed the standard translation procedure in healthcare: backward-forward translation with a subsequent consensus meeting before creating the final document.[24] The cases were randomly ranked, and questions on background characteristics were added to the questionnaires. Individuals were asked about their expected choice of action per case, and each question had the following multiple choice answering categories: 'Wait and see (no contact with a health care provider)', 'Self-care (for example a pain killer)', 'Ask my partner, a relative, or others for advice', 'Check a guidebook, the internet or an app', 'Contact my own GP the next working day', 'Contact OOH primary care', 'Contact the ED', 'Contact 112/144 ambulance care', and 'Other'. Questionnaires were sent to 150 Danish individuals per age group (with one reminder). A total of 18 parents and 30 adults responded: 11 aged 30-39 years and 19 aged 50-59 years. The cases were treated as items in a Rasch analysis. This was done to eliminate redundant cases with respect to estimating the latent variable for intention to seek help. Cases were reduced, and we selected six cases for children and six for adults.

Pilot testing

We tested the readability and feasibility of the Danish questionnaires by performing cognitive interviews and pilot testing. Due to pragmatic considerations, we performed only one pilot test in Denmark. After interviewing eight patients at a GP practice, we sent the questionnaire to 50 Danish individuals per age groups (with one reminder). The response rate was 38% for 0-4 years, 28% for 30-39 years, and 50% for 50-

59 years. The pilot testing resulted in minor adjustments of layout. The final Danish questionnaire was translated into Dutch and German using the usual translation procedure.[24]

Power calculation

A power calculation showed that we needed 600 returned questionnaires per age group to be able to find an 8% difference between countries, which we considered a clinically relevant difference. Expecting an average response rate of 40%, we chose to send 1,200 questionnaires per age group in the Danish population. The Dutch panel expected higher response rate and aimed to collect 600 returned questionnaires per age group within one week of data collection. The Swiss panel invited all members in the adult groups and stopped the data collection when 600 respondents had been reached.

Data collection

The Danish individuals received an invitation letter with a personal internet link to a web-based survey and a paper questionnaire in January 2016. One reminder was sent three weeks later. Dutch individuals received an e-mail invitation to the online questionnaire in December 2015. One reminder was sent for age groups 0-4 and 30-39 years to achieve 600 respondents per group, whereas no reminder was needed for age group 50-59 years. The data collection ended after one week. Swiss individuals received their invitation via e-mail in December 2015, and the data collection ended when 600 respondents had been included per age group.

Analysis

We performed descriptive analyses of the Danish respondents and non-respondents and identified the main characteristics for each age group as the Danish selection was random. We also performed descriptive analyses to compare respondents with the general population in the Netherlands and Switzerland. This was

done because we wanted to check the representativeness of the consumer panels that we used in these two countries. Next, we calculated the distribution of the individual help-seeking behaviour per case and stratified for age group and country to investigate intended help-seeking behaviour.

We dichotomised the intended help-seeking behaviour into 'no OOH contact' ('Wait and see', 'Self-care', 'Ask my partner, a relative, or others for advice', 'Check a guidebook, the internet or an app', 'Contact my own GP the next working day') and 'OOH contact' ('Contact OOH primary care', 'Contact ED', 'Contact 112/144 ambulance care'). After calculating the percentage of individuals contacting OOH care, we studied differences between Danish, Dutch, and Swiss individuals per case and age groups by using chi-square and ANOVA tests. For each respondent, we calculated a score between 0 and 6 for the cases in which 'OOH contact' had been chosen. Finally, we performed three linear regression analyses for each age group to see if there were any differences between the Danish, Dutch, and Swiss individuals regarding their choice to contact OOH care using the mean score (range 0-6). We adjusted for background characteristics (i.e. age, gender, education, ethnicity, employment, and living status). Differences with a p-value of <0.05 were considered significant.

Patient involvement

The study was conducted using a random selection of citizens, who were all potential users of the healthcare system (patients). We asked eight lay persons to check the cases for recognisability and clarity. A selection of citizens got a questionnaire as part of our pilot study. We have no fixed plans to disseminate our study results to citizens, although we hope that the results will be used for interventions to influence use of out-of-hours care, for example to inform patients. If possible, dissemination of results in lay press will be done.

RESULTS

Study population

Table 1 describes the final respondents of our study after data cleaning. In Denmark, we included 572 respondents for children (response rate: 47.7%), 429 for 30-39 years (response rate: 35.8%), and 652 for 50-59 years (response rate: 54.4%). In the Netherlands, we included 621 respondents for children (response rate: 65.4%), 592 for 30-39 years (response rate: 62.3%), and 633 for 50-59 years (response rate: 66.5%). The Swiss panel included 589 final respondents for age group 30-39 years and 595 for age group 50-59 years. However, due to the data collection strategy, we obtained no information on response rate for the Swiss panel. When comparing respondents in different age groups between countries, we found some significant (although small) differences for gender, age, and ethnicity for respondents of age group 0-4 years (Table 1). For both adult age groups, we found significant differences for gender (Dutch respondents were more often female), education (Dutch aged 50-59 years more often had low education level), and ethnicity (Swiss respondents were more often immigrants).

Table 1. Description of the study population per age group and country

Age group	**0-4 years**[2]		**30-39 years**			**50-59 years**		
Country	**DK** N=572	**NL** N=621	**DK** N=429	**NL** N=592	**CH** N=589	**DK** N=652	**NL** N=633	**CH** N=595
Age respondent (mean, (95% CI))	34.4 (34.0-34.8)	35.4 (34.9-35.8)	34.8 (34.6-35.1)	34.8 (34.6-35.0)	34.9 (34.7-35.2)	54.4 (54.1-54.6)	54.6 (54.4-54.8)	54.5 (54.2-54.7)
Gender respondent (%, (95% CI))								
- Male	14.4 (11.7-17.5)	37.7 (33.9-41.6)	37.7 (33.2-42.4)	50.2 (46.1-54.2)	42.3 (38.3-46.3)	44.9 (41.1-48.8)	52.9 (49.0-56.8)	48.1 (44.1-52.1)
- Female	85.6 (82.5-88.3)	62.3 (58.4-66.1)	62.4 (57.6-66.8)	49.8 (45.8-53-9)	57.7 (53.7-61.7)	55.1 (51-2-58.9)	47.1 (43.2-51.0)	51.9 (47.9-55.9)
Education level[1] (%, (95% CI))								
- Low: ≤ 10 years	4.4 (3.0-6.4)	7.0 (5.2-9.3)	6.4 (4.4-9.1)	9.3 (7.2-11.9)	4.6 (3.2-6.6)	13.5 (11.0-16.3)	25.4 (22.2-29.0)	9.7 (7.6-12.4)
- Middle: >10 & ≤ 15 years	33.5 (29.7-37.4)	30.1 (26.6-33.9)	41.0 (36.4-45.8)	43.4 (39.5-47.4)	59.4 (55.3-63.3)	55.0 (51.1-58.8)	43.9 (40.1-47.8)	66.1 (62.1-69.7)

- High: > 15 years	62.1 (58.1-66.1)	62.9 (59.0-66.6)	52.6 (47.8-57.3)	47.3 (43.3-51.3)	36.1 (32.3-40.0)	31.6 (28.1-35.3)	30.6 (27.2-34.4)	24.2 (20.9-27.8)
Ethnicity (%, (95% CI))								
- Native	85.5 (82.3-88.2)	81.8 (78.5-84.6)	84.8 (81.0-87.9)	76.1 (72.5-79.4)	64.3 (60.4-68.1)	92.0 (89.6-93.9)	87.1 (84.2-89.5)	70.3 (66.4-73.8)
- Western immigrant	10.2 (8.0-13.0)	7.4 (5.6-9.8)	9.0 (6.6-12.2)	10.2 (8.0-13.0)	31.6 (27.9-35.5)	6.4 (4.8-8.6)	9.1 (7.1-11.6)	27.9 (24.4-31.6)
- Non-western immigrant	4.3 (2.9-6.3)	10.8 (8.6-13.5)	6.2 (4.2-8.9)	13.7 (11.1-16.7)	4.1 (2.8-6.0)	1.6 (0.8-2.9)	3.8 (2.6-5.6)	1.8 (1.0-3.3)

DK: Denmark, NL: Netherlands, CH: Switzerland

[1] This categorisation was made according to the ISCED guidelines[25]; [2]Switzerland had no age group 0-4 years, due to restrictions of the consumer panels.

We compared the Danish respondents and non-respondents. For the age groups 30-39 years and 50-60 years, we found that respondents were more often female (Appendix, Table 1). The Dutch respondents were compared with the general population. Adult respondents were slightly more often highly educated and native Dutch compared to the general population (Appendix, Table 2). The Swiss respondents were also compared with the general population. Swiss respondents were more often female, had middle-level education, and were native Swiss (Appendix, Table 3).

Help-seeking at case level - children

Figure 1 shows help-seeking behaviour per age group, per case, and per country. Danish and Dutch parents differed in their intended help-seeking in most of the presented cases. The Dutch parents chose 'wait and see' more often than the Danish parents, who more often answered that they would contact their own GP or OOH primary care. Overall, the Danish parents chose to contact OOH acute care more often than Dutch parents, with significant differences for the five following cases. For 'red eyes', 18.7% of the Danish parents chose to contact OOH acute care, compared to 12.4% among Dutch parents. For 'rash', 23.4% of Danish and 16.4% of Dutch parents would contact OOH acute care. For 'chicken pox', 31.8% of Danish and 15.8% of Dutch parents would contact OOH acute care. For 'relapse fever', 59.5% of Danish and 41.6% of Dutch parents would contact OOH acute care. For 'abdominal pain', 84.4% of Danish and 79.1% of Dutch parents would contact OOH acute care.

Figure 1. Description of individuals help seeking per case, stratified for age group and country (distribution of choices)

(figure 1)

Help-seeking at case level - adults

We also found some differences in intended help-seeking behaviour among adults from different countries (Figure 1). In the age group 30-39 years, the Swiss more often chose to contact the ED than Danish and Dutch adults. Overall, the choices for different types of care varied per case. Additionally, adults aged 30-39 years differed in the frequency of contacting OOH acute care, with varying differences per case. For 'sore throat' (Danes: 7.5%, Dutch: 3.6%, Swiss: 10.9%), 'acute back pain' (Danish: 14.1%, Dutch: 10.8%, Swiss: 28.4%), and 'ankle distortion' (Danes: 40.3%, Dutch: 43.1%, Swiss: 44.3%), the Swiss adults significantly more often chose to contact OOH care than the Danish and Dutch, although with relatively small differences. For 'wounded foot' (Danes: 26.1%, Dutch: 34.0%, Swiss: 30.8%) and 'acute stomach pain' (Danes: 42.0%, Dutch: 54.4%, Swiss: 41.6%), Dutch adults significantly more often chose to contact OOH care.

In the age group 50-59 years, the Swiss also more often chose to contact the ED compared to the Danish and Dutch adults in this group. No clear pattern was seen for the other types of care. The Swiss adults more often chose to contact OOH care for two cases: 'sore throat' (Danish: 5.7%, Dutch: 2.7%, Swiss: 14.1%) and 'acute back pain' (Danish: 12.1%, Dutch: 8.1%, Swiss: 32.5%). For 'wounded foot', the Dutch and Swiss adults significantly more often chose to contact OOH care than the Danes (Danes: 26.1%, Dutch: 34.0%, Swiss: 30.8%). The Dutch significantly more often chose OOH care for 'acute stomach pain' (Danes: 42.0%, Dutch: 54.4%, Swiss: 41.6%).

Adjusted differences in help-seeking

Table 2 shows that the Dutch parents significantly less often chose to contact OOH care than Danish parents (mean: 2.25 versus 2.91 out of 6 cases). For adults aged 30-39 years, no significant differences were found between the three countries when correcting for age, gender, education, ethnicity, employment, and

living status. Swiss adults aged 50-59 years more often chose to contact OOH care than the Danish (mean: 2.58 versus 2.34 out of 6 cases).

Table 2. Association between country and out-of-hours help-seeking per age group

	0-4 years		**30-39 years**		**50-59 years**	
	Crude N=1,186	**Adjusted[1] N=1,161**	**Crude N=1,602**	**Adjusted[1] N=1,585**	**Crude N=1,864**	**Adjusted[1] N=1,844**
Denmark (ref) (mean (95%CI))	2.31 (2.20;2.42)	2.91 (2.53;3.30)	1.75 (1.61;1.89)	2.15 (1.78;2.51)	2.00 (1.89;2.12)	2.34 (1.90;2.77)
Netherlands (B, mean (95%CI))	-0.54* 1.78 (1.66;1.87)	-0.66* 2.25 (1.87;2.63)	0.16 1.91 (1.79;2.02)	0.11 2.26 (1.90;2.61)	-0.04 1.96 (1.84;2.07)	-0.10 2.24 (1.81;2.66)
Switzerland (B, mean (95%CI))	*Not available*	*Not available*	0.22* 1.97 (1.85;2.09)	0.16 2.31 (1.94;2.68)	0.29* 2.30 (2.18;2.41)	0.24* 2.58 (2.14;3.02)

**Significant difference (p<.005) compared with reference group; [1]Adjusted for age, gender, education, ethnicity, employment, and living status.*

DISCUSSION

Main findings

Danish and Dutch parents of children aged 0-4 years differed in help-seeking behaviour for five out of six cases (i.e. abdominal pain, red eyes, rash, relapse fever, chicken pox); the Dutch more often chose 'wait and see' than the Danish. For these cases, Danish parents significantly more often chose to contact OOH care than Dutch parents (difference varying from 1.1% to 17.9%). Also a regression analysis showed that Dutch parents significantly less often chose to contact OOH care than Danish parents. For adult citizens, we

found varying choices of responses for many of the presented cases. A regression analysis showed that the Swiss adults aged 50-59 years more often chose OOH care than the Danish and Dutch.

Comparison with existing literature

We found a difference in help-seeking behaviour between Denmark, the Netherlands, and Switzerland; this difference was varying for different age groups. In a previous study, we found that the Danes had higher consumption of OOH primary care than the Dutch, particularly for young children.[11] This difference between parents of young children was also apparent in our study. The question is what the underlying explanations could be for this consistent difference. A difference in employment exists between Danish and Dutch parents as Danish women more frequently are working full-time.[26] Danish women thus have fewer opportunities to visit the GP during daytime. Furthermore, the role of the Danish GP in childcare is different from that of the Dutch GP. Danish GPs have an active role as they see also young children for preventive issues, which could make parents more prone to contact primary care. In contrast, Dutch GPs do not play a role in preventive care for young children. Perhaps other cultural differences may be important factors. For example, there is a strong focus on work-life balance in Denmark (including extensive maternity leave). Differences between the Danish and the Dutch healthcare systems may play a smaller role as we did not find any differences in the help-seeking between adults. Besides, the two healthcare systems seem quite similar. Yet, the direct telephone access to a GP (who answers the telephone) in the OOH primary services in Denmark may encourage parents to seek advice or help at the OOH primary care service. Additionally, problems with the accessibility and availability of one's own GP are also issues that are discussed in both countries.

We did not find a significant difference in help-seeking between Danish and Dutch adults, while a previous study showed a small difference between Danish and Dutch adults.[11] Yet, we found a difference for Swiss adults aged 50-59 years who more often chose to contact OOH care than Danish and Dutch adults. Swiss adults more often answered 'wait and see', but they also more often chose 'ED'. The difference in

healthcare systems (with or without gate-keeping) seems to influence the intended help-seeking behaviour. The organisation of the Swiss healthcare system without the gate-keeping role of the GP may make citizens contact the ED more often, in particular for injury-related health problems, which were described in three of the six cases targeting adults.[27] In Denmark and the Netherlands, patients are strongly encouraged to contact primary care in case of an acute problem in order to assess the necessity of a subsequent referral to ED or secondary care. In the Netherlands, contacting the ED without a referral results in a fee for the citizen (own risk) as these ED visits are not covered by the health insurance. For Danish citizens, an ED visit is free, but citizens are strongly encouraged to first contact primary care, where triage is done. A healthcare system based on gate-keeping may thus lead to less (unnecessary) use of the ED, but not necessarily to lower use of OOH care in general.

Help-seeking behaviour is related to many factors, as also found by Andersen.[12] We focused on differences between countries and corrected for main variations between the populations (i.e. age, gender, education, ethnicity, employment, and living status). Several studies have shown an effect of these characteristics on help-seeking behaviour.[28] Yet, several other influential factors have also been identified, such as psychological characteristics and usual behaviour.[12] It could be that population differences relating to other factors may cause the variation between countries concerning help-seeking behaviour.

Strengths and limitations

The chosen design of using invented cases to measure intended help-seeking behaviour had several strengths and limitations. Strengths were that the respondents received the same cases, making comparisons more straightforward, and that persons who do not use OOH care or healthcare at all were also included. A limitation was the risk of introducing social desirability bias, with the response not representing actual behaviour. Additionally, the absence of emotional reactions that occur in real-life situations could have influenced the response. However, according to the theory of planned behaviour,

behaviour is mainly determined by behavioural intentions.[29] A review of literature on theory of planned behaviour concluded that behavioural intentions do predict behavior,[30] while Nagai found that help-seeking intentions are an important predictor of help-seeking behavior.[31] Several studies used hypothetical case scenarios in out-of-hours care and other settings.[10,32,33] Thus, we found that the chosen design was the most feasible and appropriate in relation to our aim.

OOH care is a complex issue, which currently faces challenges in many European countries. We were able to include citizens from three countries for our study by using a consumer panel in two countries. Our Danish sample was representative for the general population, and our Dutch and Swiss panels were also able to select quite representative samples for a range of background characteristics although some small statistically significant differences existed. We followed an extensive procedure to ensure high quality of the case development, which is a strength of this study. However, the varying relatively low response rates and the data collection method through consumer panels (ending the collection when about 600 respondents had been included) introduced a risk of selection bias. Additionally, our non-response analyses showed that adult respondents more often were female than non-respondents. Respondents also seemed to be higher educated and were more often native citizens than the general population. Therefore, we adjusted for these background factors in our final analyses. We found some differences in the intended help-seeking between the three countries after correcting for differences in several background variables. Yet, different recruitment methods may have introduced some bias, although the effect on differences between the countries and differences between populations and culture remains unclear.

We used six cases per age group, and the selected cases represented varying health problems with different levels of severity and appropriate healthcare actions. The choice of cases could have affected the differences found. Other health problems may thus have given different results, for example due to differences in culture, traditional treatment, or the healthcare system. However, for the age group 0-4

years, the results for the individual cases all showed the same trend, which suggests that case selection is a minor problem. For adults, the direction of differences varied per case. For the three cases on acute injuries, the organisation of healthcare may have played a role. The use of three age groups with varying results limited the generalisability of our results to the entire population of the included countries. The results could be rather different for other groups, such as the elderly. Finally, to obtain an eight percent difference between groups, we needed 600 respondents; this was not achieved for all age groups.

Implications for research and/or practice

We compared help-seeking behaviour between countries and found some differences. Further investigation of possible explanations for these differences is highly relevant, in particular concerning parents of young children. The differences were distinct in this group, and the use of OOH primary care is known to be high in this age group.[11] Identifying explanations for the differences found may help us reduce the use of OOH care in this group of patients.

Future research should also focus on other factors related to a high likelihood of contacting OOH care as this insight could be used to investigate whether interventions could be made to reduce the workload at OOH care while still addressing the highly relevant contacts. It could be interesting to see if differences in preferred actions also exist between healthcare professionals from different countries as this could imply differences in the approach to healthcare provision and cultural variations.

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COMPETING INTEREST

The authors have declared no competing interests.

ETHICAL APPROVAL

The project was approved by the Danish Data Protection Agency (J.no. 2013-41-2104). According to Danish law, approval from the Committee on Health Research Ethics of the Central Denmark Region was not needed as the study did not include biomedical intervention. The research ethics committee of the Radboud university medical center (CMO Arnhem-Nijmegen) was consulted and concluded that the study did not fall within the remit of the Medical Research Involving Human Subjects Act (WMO) (file number: 2013/379). According to current Swiss law on human research, anonymously collected data require no approval by a regional ethics committee.

DATA SHARING STATEMENT

The dataset will be available on request.

AUTHORS' CONTRIBUTION

LH designed the study, performed the data collection, interpreted the data and drafted the manuscript. EK participated in designing the study and interpretation of the data, and critically revised the manuscript. AHC performed statistical analyses and critically revised the manuscript. GM and MS participated in the interpretation of the data and critically revised the manuscript. OS performed the data collection and

critically revised the manuscript. MBC designed the study and critically revised the manuscript. All authors read and approved the final manuscript.

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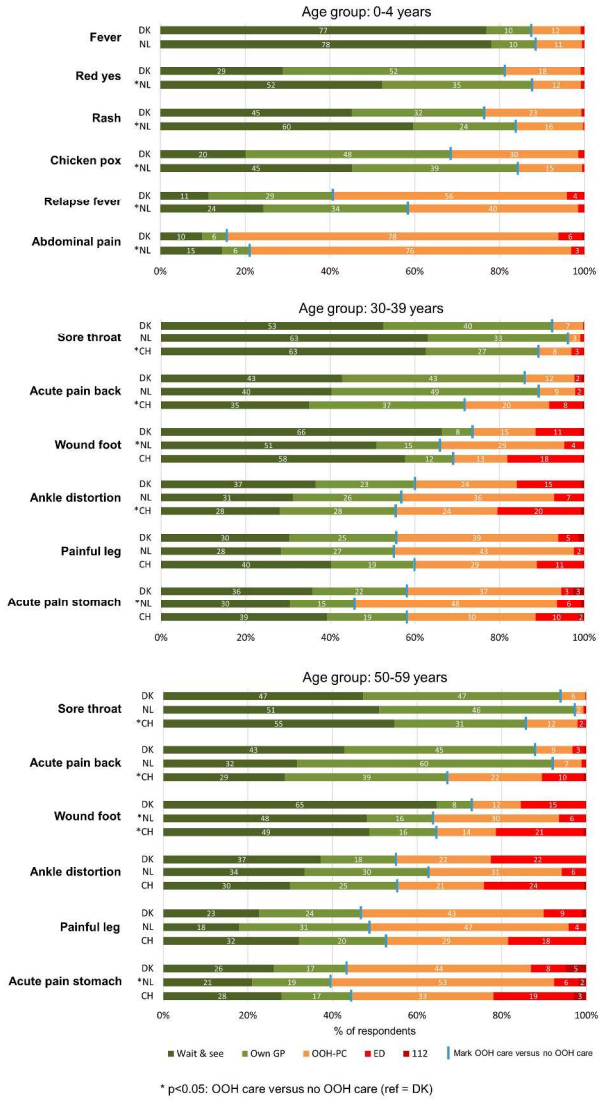

Description of individuals help seeking per case, stratified for age group and country (distribution of choices)

250x399mm (300 x 300 DPI)

APPENDIX

Questionnaire for children

In the English versions of the questionnaires, we write out-of-hours primary care, emergency department, and 112 ambulance care in the answering categories. The wording was culturally adapted in the language-specific questionnaires to match the available services.

SITUATION DESCRIPTIONS

We present six fictive situations. Each of the situations describes an invented case including a health problem affecting your **child's** health occurring outside the office hours of your own GP. Please answer what action(s) you would most likely take in this situation at this moment.

We would like to know what you would choose to do in the given situation (i.e. which actions you would most likely take). You do not have to consider what would be the "right" thing to answer or what other people think you should do.

In the cases we refer to a specific age. We ask you to pretend that your son/daughter is of the age stated in the case.

Case 1

Time: Saturday at 3 PM.

Situation: Your 4-year-old child has had abdominal pain for two days, and the pain is increasing in severity. He has a fever (39.6°C). He has vomited twice today and has not eaten anything for the entire day. He will not drink much. He has a little bit of diarrhoea. You cannot comfort him by reading a book, and he does not want to play by himself.

1. **What would you do, at this moment?** *(Please give one or more answers)*

o Wait and see (no contact with a doctor or similar)

o Self-care (for example a pain killer)

o Ask your partner, a relative, or others for advice

o Check a medical reference book, the internet or an app (for example "Patienthåndbogen"/"Moet ik naar de dokter?")

o Contact own general practitioner the next working day

o Contact the out-of-hours primary care outside opening hours own GP

o Contact the emergency department

o Call 112 ambulance care

o Do something else *Please describe:* _____

Case 2

Time: Sunday evening at 4 PM.

Situation: Your 3-year-old child has a cold and has had red eyes with discharge since two days. He is also sniffing. The eye discharge is yellow, and the eye lids stick together slightly. He is watching television.

2. **What would you do, at this moment?** *(Please give one or more answers)*

o Wait and see (no contact with a doctor or similar)

o Self-care (for example rinse with boiled water)

o Ask your partner, a relative, or others for advice

o Check a medical reference book, the internet or an app (for example "Patienthåndbogen"/"Moet ik naar de dokter?")

o Contact your child's own general practitioner the next working day

o Contact the out-of-hours primary care outside opening hours own GP

o Contact the emergency department

- o Call 112 ambulance care
- o Do something else *Please describe:* _____

Case 3

Time: Saturday at 3 PM.

Situation: Your 15-month-old child has woken after his nap with a temperature of 39.8°C. He already seemed listless before his nap today. He has not vomited, has no diarrhoea and no skin rash. He wants to sit with you and watch television. He does not want to eat anything, but drinks small amounts of cold water.

3. What would you do, at this moment? *(Please give one or more answers)*

- o Wait and see (no contact with a doctor or similar)
- o Self-care (for example a pain killer)
- o Ask your partner, a relative, or others for advice
- o Check a medical reference book, the internet or an app (for example "Patienthåndbogen"/"Moet ik naar de dokter?")
- o Contact your child's own general practitioner the next working day
- o Contact the out-of-hours primary care outside opening hours own GP
- o Contact the emergency department
- o Call 112 ambulance care
- o Do something else. *Please describe:* _____

Case 4

Time: Saturday at 3 PM.

Situation: Your 2-year-old child wakes up after his nap with red rash across arms, legs, chest and face. The rash is itching. He is alert, is playing as usual and has no other complaints and no fever.

4. What would you do, at this moment? *(Please give one or more answers)*

- o Wait and see (no contact with a doctor or similar)
- o Self-care
- o Ask your partner, a relative, or others for advice
- o Check a medical reference book, the internet or an app (for example "Patienthåndbogen"/"Moet ik naar de dokter?")
- o Contact your child's own general practitioner the next working day

- o Contact the out-of-hours primary care outside opening hours own GP
- o Contact the emergency department
- o Call 112 ambulance care
- o Do something else *Please describe:* _____

Case 5

Time: Thursday at 7 PM.

Situation: Your 8-month-old child has a fever. Last week, he had a common cold with a fever. He was also coughing. He seemed to recover, but now the fever has returned (temperature: 39.1°C). He does not drink a lot, and he is still coughing. Your child wants to sit with you all the time, but you cannot comfort him.

5. What would you do, at this moment? *(Please give one or more answers)*

- o Wait and see (no contact with a doctor or similar)
- o Self-care (for example a pain killer)
- o Ask your partner, a relative, or others for advice
- o Check a medical reference book, the internet or an app (for example "Patienthåndbogen"/"Moet ik naar de dokter?")
- o Contact your child's own general practitioner the next working day
- o Contact the out-of-hours primary care outside opening hours own GP
- o Contact the emergency department
- o Call 112 ambulance care
- o Do something else *Please describe:* _____

Case 6

Time: Sunday at 5 PM.

Situation: For one day, your 2-year-old child has had red skin and fluid-filled blisters, mostly on the chest and belly. He is a bit warm (temperature: 38.1°C), complains of a sore throat and generally does not seem fit. He drinks and eats as usual and is as alert as usual.

6. What would you do, at this moment? *(Please give one or more answers)*

- o Wait and see (no contact with a doctor or similar)
- o Self-care (for example a pain killer)
- o Ask your partner, a relative, or others for advice

o Check a medical reference book, the internet or an app (for example “Patienthåndbogen”/”Moet ik naar de dokter?”)

o Contact your child’s own general practitioner the next working day

o Contact the out-of-hours primary care outside opening hours own GP

o Contact the emergency department

o Call 112 ambulance care

o Do something else *Please describe:* _____

FACTORS AFFECTING DECISION-MAKING

The next questions relate to general factors that may affect decision-making regarding health problems.

7. We are interested in how you feel about the following statements. Read each statement carefully. Indicate how you feel about each statement. *(Please mark one answer per statement)*

		Not at all true	Hardly true	Moderately true	Exactly true
1.	I can always manage to solve difficult problems if I try hard enough	O	O	O	O
2.	If someone opposes me, I can find the means and ways to get what I want	O	O	O	O
3.	It is easy for me to stick to my aims and accomplish my goals	O	O	O	O
4.	I am confident that I could deal efficiently with unexpected events	O	O	O	O
5.	Thanks to my resourcefulness, I know how to handle unforeseen situations	O	O	O	O
6.	I can solve most problems if I invest the necessary effort	O	O	O	O
7.	I can remain calm when facing difficulties because I can rely on my coping abilities	O	O	O	O
8.	When I am confronted with a problem, I can usually find several solutions	O	O	O	O
9.	If I am in trouble, I can usually think of a solution	O	O	O	O
10.	I can usually handle whatever comes my way	O	O	O	O

We used validated Danish, Dutch, and German versions of the Generalized Self-Efficacy scale, see http://userpage.fu-berlin.de/health/selfscal.htm (Schwarzer, R., & Jerusalem, M. (1995). Generalized Self-Efficacy scale. In J. Weinman, S. Wright, & M. Johnston, Measures in health psychology: A user’s portfolio. Causal and control beliefs (pp. 35- 37). Windsor, England: NFER-NELSON).

8. Over the last two weeks, how often have you been bothered by the following problems?

		Not at all	Several days	More than half the days	Nearly every day
1.	Feeling nervous, anxious or on edge	O	O	O	O
2.	Not being able to stop or control worrying	O	O	O	O

We used validate Danish, Dutch, and German versions of the Generalized Anxiety Disorder scale (GAD-2), see http://www.phqscreeners.com/select-screener (Kroenke K, Spitzer RL, Williams JB, Monahan PO, Lowe B. Anxiety disorders in primary care: prevalence, impairment, comorbidity, and detection. Ann Intern Med. 2007; 146: 317-25).

9. Do you have somebody to talk to if you have problems or you need support? *(Please only mark one answer)*

- o No, never or almost never
- o Yes, sometimes
- o Yes, often
- o Yes, always

We used two scales of the validated Health Literacy Questionnaire (HLQ). As the HLQ is copyrighted to Deakin University, publication of the items or scales is not permitted. *(Osborne RH, Batterham RW, Elsworth GR, Hawkins M, Buchbinder R. The grounded psychometric development and initial validation of the Health Literacy Questionnaire (HLQ). BMC Public Health. 2013; 13: 658).*

10. How severe would your child's medical problem have to be before you felt it was appropriate to contact …? *(Please mark one grade per row)*

	Not severe										Very severe	Don't know
… your own GP	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	O
… OOH primary care	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	O
… 112	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	O

11. The following statements concern your considerations for contacting OOH-PC. Please answer to which degree you agree with each statement. *(Please mark one answer per statement)*

		Totally agree	Agree	Not agree and not disagree	Disagree	Totally disagree	Don't know
1.	The OOH primary care is intended for all medical problems (including non-urgent problems) that occur outside my GP's normal opening hours	O	O	O	O	O	O
2.	I can contact OOH primary care at any time, because it is financed by taxation (Denmark)/my insurance (the Netherlands)	O	O	O	O	O	O
3.	I feel more personal barriers in relation to contacting OOH primary care than contacting my own GP during daytime	O	O	O	O	O	O
4.	I carefully consider whether I should contact OOH primary care, because I do not want to disturb the health professionals	O	O	O	O	O	O

12. In the past year, how many times have you contacted the following health care providers regarding yourself and/or your children? *(Please only mark one cross in each row – if you are unsure, please answer what you think is most accurate)*

	Never	1	2	3	4	5 or more	Don't know/ not relevant
Own GP	O	O	O	O	O	O	O
OOH primary care	O	O	O	O	O	O	O
Emergency department	O	O	O	O	O	O	O
112	O	O	O	O	O	O	O

13. How satisfied are <u>you</u> in general with the following health care providers? *(Please only mark one cross in each row)*

	Very satisfied	Satisfied	Not satisfied, not satisfied	Dissatisfied	Very dissatisfied	Don't know	Not relevant/ no contact
Own GP	O	O	O	O	O	O	O
OOH primary care	O	O	O	O	O	O	O
Emergency department	O	O	O	O	O	O	O
112	O	O	O	O	O	O	O

14. <u>During the last two years</u>, have <u>you</u> experienced practical problems in contacting your own GP during day time, due to … *(Please only mark one cross in each row)*

	No problems	Yes, few problems	Yes, some problems	Yes, many problems	Don't know	Not relevant
… your own working hours or private appointments?	O	O	O	O	O	O
… your GPs telephone accessibility?	O	O	O	O	O	O
...the possibility to make a telephone appointment with your GP?	O	O	O	O	O	O
… your GPs availability for a clinic appointment?	O	O	O	O	O	O
...the accessibility to your own GP practice by website (i.e. making a appointment, repeat prescription, asking questions)?	O	O	O	O	O	O

15. What is the expected travel time from your home to the nearest OOH primary care, using your usual means of transport (public or private)? *(Please only mark one answer)*

- o Less than 15 minutes
- o 15 to 30 minutes
- o 30 to 60 minutes
- o More than 60 minutes
- o Don't know

BACKGROUND INFORMATION

16. What is your age?

Age: ___ years

Question not in Dutch questionnaire as information was available directly from the consumer panel.

17. What is your sex?

o Male

o Female

18. Do you live together with another adult? *(Please give one or more answers)*

o No

o Yes, with friend(s)s or roommate(s)

o Yes, with adult child(ren)

o Yes, with wife/husband, partner

o Yes, with parent(s)

o Yes, in nursing home

o Yes, other. *Please describe:* _____

19. How many children do you have (including children for whom you are sharing care)?

Number of children: _____

20. What is the age of you oldest and youngest child (in years and months - for children above 3 years, year is sufficient)

Your oldest child: ..... years and ..... months

Your youngest child: ..... years and ..... months

21. In general, how easily can you arrange day care for your child in case of illness? *(Please only mark one answer)* ***(Only in questionnaire for parents)***

o Very easily

o Easily

o With difficult

o Very great difficult

o Not relevant

o Don't know

22. In general, how would you describe your own health? *(Please only mark one answer)*

- o Very good
- o Good
- o Fair
- o Bad
- o Very bad

23. In general, how would you describe your child's health? *(Please only mark one answer)*

- o Very good
- o Good
- o Fair
- o Bad
- o Very bad

24. What is the highest educational level that you have completed? *(Please only mark one answer)*

- o No education
- o Primary school
- o Lower secondary school
- o Higher secondary school
- o College – bachelor's degree
- o University – bachelor's degree
- o University – master's degree
- o PhD/doctoral
- o Other. *Please describe:* _____

Answering categories were adjusted to the education system of each country.

Question not in Dutch questionnaire as information was available directly from the consumer panel.

25. What is your current job position? *(Please only mark one answer – in case more answers apply, please mark the most accurate answer)*

- o Employed
- o Unemployed
- o Pre-pension/ pension
- o Care for family and household
- o Leave

- o Disabled
- o Student
- o Other. *Please describe:* _____

Question not in Dutch questionnaire as information was available directly from the consumer panel.

26. From which country of birth are you and your parents? *(Please only mark one cross in each row)*

	Denmark/The Netherlands	**Other, please write the country**
You	O	O _____
Your mother	O	O _____
Your father	O	O _____

27. Do you have a medical education? *(Please only mark one answer)*

- o No
- o Yes, I am a doctor
- o Yes, I am a nurse
- o Yes, I have had another medical education. *Please describe:* _____

28. Do you use healthcare applications (apps) or the Internet (e.g. 'Google search') when you experience a health problem? *(Please only mark one answer)*

- o Often
- o Sometimes
- o Rarely
- o Never → skip question 29
- o Don't know → skip question 29

29. In general, does using apps or the Internet (e.g. 'Google search') influence your need to contact healthcare professionals when you experience a health problem? *(Please only mark one answer)*

- o No
- o Yes, it mostly increases my need to contact
- o Yes, it sometimes increases and sometimes decrease my need to contact
- o Yes, it mostly decreases my need to contact
- o Don't know

COMMENTS

You are welcome to write your comments on the questionnaire here:

_____

_____

_____

Questionnaire for adults

In the English versions of the questionnaires, we write out-of-hours primary care, emergency department, and 112 ambulance care in the answering categories. Wording is adjusted in the language specific questionnaires to match the available services.

SITUATION DESCRIPTIONS

We present six fictive situations. Each of the situations describes an invented case including a health problem affecting your health occurring outside the office hours of your own GP. Please answer what action(s) you would most likely take in this situation at this moment.

We would like to know what you would choose to do in the given situation (i.e. which actions you would most likely take). You do not have to consider what would be the "right" thing to answer or what other people think you should do.

Case 1

Time: Sunday at 3 PM.

Situation: When you woke up this morning, your left leg was swollen and painful. The leg has a warm, red and painful area with a 10 cm diameter. You do not feel well. You are not sure whether you have a fever. You did not hit your leg.

1. **What would you do, at this moment?** *(Please give one or more answers)*

o Wait and see (no contact with a doctor or similar)

o Self-care (for example a pain killer)

o Ask your partner, a relative, or others for advice

o Check a medical reference book, the internet or an app (for example "Patienthåndbogen"/"Moet ik naar de dokter?")

o Contact own general practitioner the next working day

o Contact the out-of-hours primary care outside opening hours own GP

o Contact the emergency department

o Call 112 ambulance care

o Do something else *Please describe:* _____

Case 2

Time: Monday at 8 PM.

Situation: You have been suffering from a severe stomach ache that started suddenly two hours ago; something you have never had before. The pain seems to be localised in your upper stomach, radiating towards your shoulder blades. You have an urge to move around a lot, and you feel nauseous, but you do not vomit. You have had normal defecation patterns all day.

2. **What would you do, at this moment?** *(Please give one or more answers)*

o Wait and see (no contact with a doctor or similar)

o Self-care (for example a pain killer)

o Ask your partner, a relative, or others for advice

o Check a medical reference book, the internet or an app (for example "Patienthåndbogen"/"Moet ik naar de dokter?")

o Contact own general practitioner the next working day

o Contact the out-of-hours primary care outside opening hours own GP

o Contact the emergency department

- o Call 112 ambulance care
- o Do something else *Please describe:* _____

Case 3

Time: Wednesday at 6 PM.

Situation: This morning you suddenly got a severe back pain when lifting a bag with groceries. The pain is continuously present in your lower back. The pain does radiate to your left buttocks, and it limits your movements. You have taken paracetamol (Panadol), but this does not relieve the pain.

3. What would you do, at this moment? *(Please give one or more answers)*

- o Wait and see (no contact with a doctor or similar)
- o Self-care (for example a pain killer)
- o Ask your partner, a relative, or others for advice
- o Check a medical reference book, the internet or an app (for example "Patienthåndbogen"/"Moet ik naar de dokter?")
- o Contact own general practitioner the next working day
- o Contact the out-of-hours primary care outside opening hours own GP
- o Contact the emergency department
- o Call 112 ambulance care
- o Do something else *Please describe:* _____

Case 4

Time: Thursday at 7 PM.

Situation: You have been suffering from a severe sore throat for two days. You are also coughing slightly and feel feverish. You can take liquids, but swallowing is painful. You have to attend a wedding of a relative in two days.

4. What would you do, at this moment? *(Please give one or more answers)*

- o Wait and see (no contact with a doctor or similar)
- o Self-care (for example a pain killer)
- o Ask your partner, a relative, or others for advice
- o Check a medical reference book, the internet or an app (for example "Patienthåndbogen"/"Moet ik naar de dokter?")
- o Contact own general practitioner the next working day

- o Contact the out-of-hours primary care outside opening hours own GP
- o Contact the emergency department
- o Call 112 ambulance care
- o Do something else *Please describe:* _____

Case 5

Time: Wednesday at 7 PM.

Situation: You accidently stepped on a piece of glass with your left foot 30 minutes ago. The piece of glass seems to have come out. The bleeding seems to have lessened. The wound is about 3 cm long and is 1-2 mm broad. Your tetanus vaccination is up to date.

5. What would you do, at this moment? *(Please give one or more answers)*

- o Wait and see (no contact with a doctor or similar)
- o Self-care (for example put a plaster on)
- o Ask your partner, a relative, or others for advice
- o Check a medical reference book, the internet or an app (for example "Patienthåndbogen"/"Moet ik naar de dokter?")
- o Contact own general practitioner the next working day
- o Contact the out-of-hours primary care outside opening hours own GP
- o Contact the emergency department
- o Call 112 ambulance care
- o Do something else *Please describe:* _____

Case 6

Time: Saturday at 4 PM.

Situation: Your left foot was twisted yesterday when you were walking in the forest. Your left ankle was directly painful and swollen. Initially, you were able to walk on the injured foot, but now you are unable to even rest on it. Your left ankle is quite painful and seems swollen compared to the right one.

6. What would you do, at this moment? *(Please give one or more answers)*

- o Wait and see (no contact with a doctor or similar)
- o Self-care (for example put ice on)
- o Ask your partner, a relative, or others for advice

o Check a medical reference book, the internet or an app (for example “Patienthåndbogen”/”Moet ik naar de dokter?”)

o Contact own general practitioner the next working day

o Contact the out-of-hours primary care outside opening hours own GP

o Contact the emergency department

o Call 112 ambulance care

o Do something else *Please describe:* _____

FACTORS AFFECTING DECISION-MAKING

The next questions relate to general factors that may affect decision-making regarding health problems.

7. We are interested in how you feel about the following statements. Read each statement carefully. Indicate how you feel about each statement. *(Please mark one answer per statement)*

		Not at all true	Hardly true	Moderately true	Exactly true
1.	I can always manage to solve difficult problems if I try hard enough	O	O	O	O
2.	If someone opposes me, I can find the means and ways to get what I want	O	O	O	O
3.	It is easy for me to stick to my aims and accomplish my goals	O	O	O	O
4.	I am confident that I could deal efficiently with unexpected events	O	O	O	O
5.	Thanks to my resourcefulness, I know how to handle unforeseen situations	O	O	O	O
6.	I can solve most problems if I invest the necessary effort	O	O	O	O
7.	I can remain calm when facing difficulties because I can rely on my coping abilities	O	O	O	O
8.	When I am confronted with a problem, I can usually find several solutions	O	O	O	O
9.	If I am in trouble, I can usually think of a solution	O	O	O	O
10.	I can usually handle whatever comes my way	O	O	O	O

We used validated Danish, Dutch, and German versions of the Generalized Self-Efficacy scale (Schwarzer, R., & Jerusalem, M. (1995). Generalized Self-Efficacy scale. In J. Weinman, S. Wright, & M. Johnston, Measures in health psychology: A user’s portfolio. Causal and control beliefs (pp. 35- 37). Windsor, England: NFER-NELSON).

8. Over the last two weeks, how often have you been bothered by the following problems?

		Not at all	Several days	More than half the days	Nearly every day
1.	Feeling nervous, anxious or on edge	O	O	O	O
2.	Not being able to stop or control worrying	O	O	O	O

We used validate Danish, Dutch, and German versions of the Generalized Anxiety Disorder scale (GAD-2), see http://www.phqscreeners.com/select-screener (Kroenke K, Spitzer RL, Williams JB, Monahan PO, Lowe B. Anxiety disorders in primary care: prevalence, impairment, comorbidity, and detection. *Ann Intern Med*. 2007; 146: 317-25).

9. Do you have somebody to talk to if you have problems or you need support? *(Please only mark one answer)*

- o No, never or almost never
- o Yes, sometimes
- o Yes, often
- o Yes, mostly

We used two scales of the validated Health Literacy Questionnaire (HLQ). As the HLQ is copyrighted to Deakin University, publication of the items or scales is not permitted *(Osborne RH, Batterham RW, Elsworth GR, Hawkins M, Buchbinder R. The grounded psychometric development and initial validation of the Health Literacy Questionnaire (HLQ). BMC Public Health. 2013; 13: 658).*

10. How severe would your medical problem have to be before you felt it was appropriate to contact …? *(Please mark one grade per row)*

	Not severe										Very severe	Don't know
… your own GP	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	O
… OOH primary care	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	O
… 112	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	O

11. The following statements concern your considerations for contacting OOH-PC. Please answer to which degree you agree with each statement. *(Please mark one answer per statement)*

		Totally agree	Agree	Not agree and not disagree	Disagree	Totally disagree	Don't know
1.	The OOH primary care is intended for <u>all</u> medical problems (including non-urgent problems) that occur outside my GP's normal opening hours	O	O	O	O	O	O
2.	I can contact OOH primary care at any time, because it is financed by taxation (Denmark)/my insurance (the Netherlands, Switzerland)	O	O	O	O	O	O
3.	I feel more personal barriers in relation to contacting OOH primary care than contacting my own GP during daytime	O	O	O	O	O	O
4.	I carefully consider whether I should contact OOH primary care, because I do not want to disturb the health professionals	O	O	O	O	O	O

12. In the past year, how many times have <u>you</u> contacted the following health care providers <u>regarding yourself and/or your children</u>? *(Please only mark one cross in each row– if you are unsure, please answer what you think is most accurate)*

	Never	1	2	3	4	5 or more	Don't know/ not relevant
Own GP	O	O	O	O	O	O	O
OOH primary care	O	O	O	O	O	O	O
Emergency department	O	O	O	O	O	O	O
112	O	O	O	O	O	O	O

13. How satisfied are you in general with the following health care providers? *(Please only mark one cross in each row)*

	Very satisfied	Satisfied	Not satisfied, not satisfied	Dissatisfied	Very dissatisfied	Don't know	Not relevant/ no contact
Own GP	O	O	O	O	O	O	O
OOH primary care	O	O	O	O	O	O	O
Emergency department	O	O	O	O	O	O	O
112	O	O	O	O	O	O	O

14. During the last two years, have you experienced practical problems in contacting your own GP during day time, due to … *(Please only mark one cross in each row)*

	No problems	Yes, few problems	Yes, some problems	Yes, many problems	Don't know	Not relevant
… your own working hours or private appointments?	O	O	O	O	O	O
… your GPs telephone accessibility?	O	O	O	O	O	O
...the possibility to make a telephone appointment with your GP?	O	O	O	O	O	O
… your GPs availability for a clinic appointment?	O	O	O	O	O	O
...the accessibility to your own GP practice by website (i.e. making an appointment, repeat prescription, asking questions)?	O	O	O	O	O	O

15. What is the expected travel time from your home to the nearest OOH primary care, using your usual means of transport (public or private)? *(Please only mark one answer)*

- o Less than 15 minutes
- o 15 to 30 minutes
- o 30 to 60 minutes
- o More than 60 minutes
- o Don't know

BACKGROUND INFORMATION

16. What is your age?

Age: ___ years

Question not in Dutch questionnaire as information was available directly from the consumer panel.

17. What is your sex?

o Male

o Female

Question not in Dutch questionnaire as information was available directly from the consumer panel.

18. Do you live together with another adult? *(Please give one or more answers)*

o No

o Yes, with friend(s)s or roommate(s)

o Yes, with adult child(ren)

o Yes, with wife/husband, partner

o Yes, with parent(s)

o Yes, in nursing home

o Yes, other. *Please describe:* _____

19. In general, how would you describe your own health? *(Please only mark one answer)*

o Very good

o Good

o Fair

o Bad

o Very bad

20. What is the highest educational level that you have completed? *(Please only mark one answer)*

o No education

o Primary school

o Lower secondary school

o Higher secondary school

o College – bachelor's degree

o University – bachelor's degree

o University – master's degree

- o PhD/doctoral
- o Other. *Please describe:* _____

Answering categories were adjusted to the education system of each country.

Question not in Dutch questionnaire as information was available directly from the consumer panel.

21. What is your current job position? *(Please only mark one answer - in case more answers apply, please mark the most accurate answer)*

- o Employed
- o Unemployed
- o Pre-pension/ pension
- o Care for family and household
- o Leave
- o Disabled
- o Student
- o Other. *Please describe:* _____

Question not in Dutch questionnaire as information was available directly from the consumer panel.

22. From which country of birth are you and your parents? *(Please only mark one cross in each row)*

	Denmark/The Netherlands/Switzerland	**Other, please write the country**
You	O	O _____
Your mother	O	O _____
Your father	O	O _____

23. Do you have a medical education? *(Please only mark one answer)*

- o No
- o Yes, I am a doctor
- o Yes, I am a nurse
- o Yes, I have had another medical education. *Please describe:* _____

24. Do you use healthcare applications (apps) or the Internet (e.g. 'Google search') when you experience a health problem? *(Please only mark one answer)*

- o Often
- o Sometimes

- o Rarely
- o Never → skip question 25
- o Don't know → skip question 25

25. In general, does using apps or the Internet (e.g. 'Google search') influence your need to contact healthcare professionals when you experience a health problem? *(Please only mark one answer)*

- o No
- o Yes, it mostly increases my need to contact
- o Yes, it sometimes increases and sometimes decrease my need to contact
- o Yes, it mostly decreases my need to contact
- o Don't know
- o Not relevant – rarely/never use this

The Swiss questionnaire had four extra questions concerning ethnicity, being listed at a GP, and the insurance model.

COMMENTS

You are welcome to write your comments on the questionnaire here:

_____

_____

_____

Table 1. Description of background characteristics of Danish population per age group, for respondents and non-respondents						
Age group	**0-4 years**		**30-39 years**		**50-59 years**	
	Respondents	**Non-respondents**	**Respondents**	**Non-respondents**	**Respondents**	**Non-respondents**
Age citizen (mean)	2.0 (1.9-2.1)	2.1 (1.9-2.2)	34.7 (34.5-35.0)	34.8 (34.6-35.0)	54.2 (54.0-54.5)	54.3 (54.0-54.5)
Gender citizen (%)						
- Male	50.3 (46.3-54.4)	51.8 (47.8-55.6)	38.0 (33.4-42.7)	55.2 (51.7-58.7)	45.0 (41.2-48.8)	54.6 (50.4-58.7)
- Female	49.7 (45.6-53.7)	48.2 (44.4-52.2)	62.0 (57.3-66.5)	44.8 (41.3-48.3)	55.1 (51.2-58.8)	45.4 (41.3-49.6)
Region citizen (%)						
- Capital	32.3 (28.6-36.3)	36.1 (32.5-40.0)	35.2 (30.8-39.8)	37.1 (33.8-40.6)	25.9 (22.7-29.4)	32.8 (29.0-36.8)
- Zealand	12.6 (10.1-15.6)	12.4 (10.1-15.2)	13.6 (10.6-17.5)	11.4 (9.4-13.9)	16.9 (14.2-20.0)	14.3 (11.6-17.5)
- South	20.3 (17.2-23.8)	20.2 (17.3-23.6)	18.2 (14.8-22.1)	20.3 (17.6-23.3)	22.9 (19.8-26.2)	21.6 (18.4-25.3)
- Central	23.6 (20.3-27.3)	23.1 (20.0-26.6)	24.9 (21.1-29.3)	20.9 (18.2-23.9)	23.5 (20.4-26.9)	20.7 (17.5-24.3)
- North	11.2 (8.9-14.0)	8.1 (6.2-10.5)	8.2 (5.9-11.2)	10.3 (8.3-12.6)	10.9 (8.7-13.5)	10.6 (8.3-13.5)
Education level, ethnicity and living status were not available for the non-respondents. We checked the general population: respondents seem more slightly more often native and a bit higher educated.						

Table 2. Description of background characteristics of Dutch population per age group, for respondents and general population

Age group	**0-4 years**		**30-39 years**		**50-59 years**	
Characteristics	**Respondents**	**General population**[1]	**Respondents**	**General population**	**Respondents**	**General population**
Age citizen (mean)	1.7 (1.6-1.8)	2.0	34.8 (34.6-35.0)	34.5	54.6 (54.4-54.8)	54.4
Gender citizen (%)						
- Male	*Not available – only gender parent*	51.2 (51.1-51.3)	50.2 (46.1-54.2)	50.1 (50.0-50.2)	52.9 (49.0-56.8)	50.2 (50.1-50.2)
- Female		48.8 (48.7-48.9)	49.8 (45.8-53.9)	49.9 (49.8-50.0)	47.1 (43.2-51.0)	49.8 (50.0-50.0)
Region (%)						
- Groningen	3.1 (2.0-4.7)	3.1 (3.0-3.1)	3.4 (2.2-5.2)	3.2 (3.2-3.3)	3.6 (2.4-5.4)	3.3 (3.3-3.3)
- Friesland	3.7 (2.5-5.5)	3.7 (3.6-3.7)	2.5 (1.5-4.2)	3.4 (3.4-3.5)	3.5 (2.3-5.2)	3.8 (3.8-3.8)
- Drenthe	2.4 (1.5-4.0)	2.6 (2.5-2.6)	2.2 (1.3-3.7)	2.5 (2.4-2.5)	3.3 (2.2-5.0)	3.1 (3.0-3.1)
- Overijssel	6.9 (5.2-9.2)	7.0 (6.9-7.0)	7.4 (5.6-9.8)	6.6 (6.5-6.6)	7.0 (5.3-9.2)	6.5 (6.5-6.6)
- Gelderland	11.9 (9.6.-14.7)	11.5 (11.5-11.6)	11.3 (9.0-14.1)	11.0 (11.0-11.0)	13.1 (10.7-16.0)	12.2 (12.2-12.3)
- Utrecht	9.0 (7.0-11.5)	8.4 (8.3-8.4)	9.6 (7.5-12.3)	8.1 (8.0-8.1)	6.5 (4.8-8.7)	7.1 (7.1-7.1)
- Noord-Holland	15.8 (13.1-18.9)	16.8 (16.7-16.9)	18.1 (15.2-21.4)	18.0 (18.0-18.1)	15.6 (13.0-18.7)	16.1 (16.0-16.1)
- Zuid-Holland	22.5 (19.4-26.0)	23.0 (22.9-23.1)	21.3 (18.2-24.8)	22.8 (22.7-22.8)	18.0 (15.2-21.2)	20.6 (20.5-20.6)
- Zeeland	1.9 (1.1-3.4)	2.1 (2.1-2.1)	1.9 (1.0-3.3)	2.0 (1.9-2.0)	2.5 (1.6-4.1)	2.3 (2.2-2.3)
- Flevoland	3.7 (2.5-5.5)	2.8 (2.8-2.9)	3.2 (2.1-5.0)	2.6 (2.6-2.6)	2.8 (1.8-4.5)	2.4 (2.4-2.5)
- Noord-Brabant	14.2 (11.6-17.1)	13.9 (13.8-14.0)	13.7 (11.1-16.7)	14.2 (14.2-14.3)	16.3 (13.6-19.4)	15.2 (15.1-15-2)
- Limburg	4.8 (3.4-6.8)	5.2 (5.1-5.2)	5.4 (3.8-7.5)	5.7 (5.7-5.7)	7.7 (5.9-10.1)	7.4 (7.4-7.4)

[1]*Information was only available on children for the general population, whereas information on the respondents was on parent/care-giver, who was the decision maker and answered the questionnaire.*

Table 3. Description of background characteristics of Swiss population per age group, for respondents and general population

Age group	**30-40 years**		**50-60 years**	
	Respondents[1,2]	**General population[3]**	**Respondents**	**General population[3]**
Age respondent (mean)	34.9 (34.7-35.2)	34.5	54.5 (54.2-54.7)	54.2
Gender respondent (%)				
- Male	42.3 (38.3-46.3)	50.3 (50.2-50.4)	48.1 (44.1-52.1)	50.4 (50.3-50.5)
- Female	57.7 (53.7-61.7)	49.7 (49.6-49.8)	51.9 (47.9-55.9)	49.6 (49.5-49.6)
Education level (%)		***(35-44 years)***		***(55-64 years)***
- Low	4.6 (3.2-6.6)	11.5	9.7 (7.6-12.4)	15.5
- Middle	59.4 (55.3-63.3)	42.5	66.1 (62.1-69.8)	62.4
- High	36.1 (32.3-40.0)	46.0	24.2 (20.9-27.8)	22.1
Ethnicity (%)				
- Native	64.0 (60.0-67.8)	62.8 (62.7-62.9)	70.3 (66.4-73.8)	80.0 (80.0-80.1)
- Immigrant	36.0 (32.2-40.0)	37.2 (37.1-37.3)	29.7 (26.2-33.6)	20.0 (19.9-20.0)

[1]Respondi panel company; [2]Bilendi panel company; [3]*According to the federal statistical office of Switzerland* https://www.bfs.admin.ch/bfs/en/home/statistics/population.html

STROBE 2007 (v4) Statement—Checklist of items that should be included in reports of *cross-sectional studies*

Section/Topic	Item #	Recommendation	Reported on page #
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	2
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	4
Objectives	3	State specific objectives, including any prespecified hypotheses	4
Methods			
Study design	4	Present key elements of study design early in the paper	4,5
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	5,6,9
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	4,5
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	6
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	6
Bias	9	Describe any efforts to address potential sources of bias	*5*
Study size	10	Explain how the study size was arrived at	8
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	9
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	9-10
		(*b*) Describe any methods used to examine subgroups and interactions	n.a.
		(*c*) Explain how missing data were addressed	n.a.
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	n.a.
		(*e*) Describe any sensitivity analyses	n.a.
Results			

Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	10
		(b) Give reasons for non-participation at each stage	n.a.
		(c) Consider use of a flow diagram	n.a.
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	10
		(b) Indicate number of participants with missing data for each variable of interest	10
Outcome data	15*	Report numbers of outcome events or summary measures	13
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	n.a.
		(*b*) Report category boundaries when continuous variables were categorized	n.a.
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	n.a.
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	n.a.
Discussion			
Key results	18	Summarise key results with reference to study objectives	15
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	17-19
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	16,17
Generalisability	21	Discuss the generalisability (external validity) of the study results	16-19
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	19

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.