

Comparability, Availability and Use of Medication eHealth Services in the Nordic Countries

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Abstract— A prescription and medication service that is optimised to protect against unnecessary harm is an essential component of a safer healthcare system. To this means, the Nordic countries have put considerable efforts in digitizing their prescription and dispensing processes and making medication related eHealth services available for clinicians, pharmacists and patients. As these e-services are being established and applied, there is a need to monitor and learn from their use. This paper reports from a sub-study of a larger activity on developing indicators for monitoring eHealth services in the Nordic countries. We describe different medication eHealth services and compare their availability to professionals and patients in the Nordic countries and the

usage rates. We found that an ePrescription service is available for clinicians and patients in all Nordic countries, but services that enable renewal or viewing of prescriptions by patients are not commonly available yet. The usage rate of the e-services was not systematically registered in all the Nordic countries at the time of the study, so a comparison between the countries was impossible. A major challenge when comparing medication eHealth services is the fact that definitions of the service itself as well as the indicators used to monitor it vary between countries. The main output is a knowledge-based discussion from the Nordic context on indicators for monitoring eHealth services, evaluated by the potential outcome in terms of comparability and benchmarking.

Keywords- medication eHealth services; medication data; ePrescription; medication list; indicators; monitoring; comparability, availability and use.

I. INTRODUCTION

Elaborating on the paper “Challenges of Comparing Medication eHealth Services in the Nordic Countries” [1] from the IARIA conference “GLOBAL HEALTH 2015, The Fourth International Conference on Global Health Challenges”, this paper offers a discussion on the availability and use of medication related eHealth services in the Nordic countries.

Most nations now devote large resources in digitizing their healthcare systems and in building eHealth services for healthcare professionals and patients. These technological solutions allow better quality and exchange of information between health professionals as well as between health professionals and patients. The assumption is that a better flow of information will consequently lead to better health outcome. As such services have been built and taken into use, there is a need for monitoring and assessing the use of these services for mutual learning and improvement [2].

Although it is acknowledged that eHealth solutions are key measures to handle the challenges in modern healthcare [3][4][5][6][7] acquisition, implementation and development of eHealth has not been systematically based on evaluations and monitoring of the everyday ehealth communication practices in the healthcare services or the health communication of the citizens. Assessments of existing eHealth services’ availability, use and usability can contribute to improve healthcare services. In a meta-review of eHealth implementation studies, Mair et al. [8] showed that while some eHealth evaluation studies are used to influence utilization and future eHealth implementations, other studies deal with patient safety and efforts made to avoid clinical errors. Sound eHealth evaluation studies can inform strategic planning and improve eHealth activities and communication for different stakeholders [3][9][10].

What characterizes eHealth services that are available at a national level in the Nordic countries and how are these being used? These are some of the questions that the Nordic eHealth Research Network (NeRN) has posed in an inter-Nordic collaboration on developing indicators for monitoring eHealth. NeRN is a research group [11] reporting to the eHealth group of the Nordic Council of Ministers, and is working with development, testing and assessment of a common set of indicators for monitoring eHealth in the Nordic countries (Finland, Sweden, Norway, Iceland and Denmark), plus Greenland, the Faroe Islands and Åland. The focus has been on developing and subsequently testing indicators for monitoring eHealth, and the test results have been evaluated by potential outcome in terms of comparability and benchmarking. This kind of benchmarking work can support political decision-making

in healthcare as well as the development of existing and new eHealth services.

The data referred to in this paper are based on the study Nordic eHealth Benchmarking - Status 2014 [12] conducted by NeRN and reported to the eHealth Group of the Nordic Council of Ministers. The focus is on the comparability of indicators across different healthcare systems.

This paper addresses the issue of availability and use of ePrescription related *eHealth services* and offers a comparison of the availability and use for patients and healthcare professionals in the Nordic countries. The following research question guides the work presented in this paper:

What are the availability and usage rates of ePrescription and eMedication list services in the Nordic countries?

The research question encompasses information from indicators identified by NeRN. The indicators relevant for this paper are: 1) Availability of a national ePrescription service, 2) Availability of a national electronic medication list of prescribed and dispensed medication, 3) Availability of electronic medication renewal, 4) Availability of electronic viewing of patient’s own medication data.

The research question is separated into the following sub-questions:

- Is an ePrescription service available?
- Is a national electronic medication list comprising prescribed and dispensed medication available?
- Is it possible for patients to renew their prescriptions electronically?
- Is it possible for patients to view their ePrescriptions?
- Given that the eHealth service is available, what is the usage rate?

The subsequent part of Section I discusses notions concerning Medication eHealth Services. Section II describes the methods used in the project. Section III offers a presentation of the results, and Section IV includes the discussion. Section V comprises concluding remarks.

Medication eHealth Services

Medication eHealth services include a variety of different systems and e-services related to medication management for patients, pharmacists and healthcare professionals. In this paper we cover the national ePrescription service. We have not included the closed-loop for medication management processes in hospitals. Access to information about medication is crucial for high quality healthcare and patient safety [13]. Viewing an up-to-date list of current medications is a prerequisite when prescribing a new drug, administering medications or assessing potential

side effects, decreasing errors when dispensing medications, for preventing medication errors and adverse drug events in the healthcare system [14], as well as for control of financial aspects for prescription products. From the patient's perspective, having an updated list of their medications is an effective means of ensuring that the healthcare professionals they encounter on their path through the health system are kept aware of some of the most important aspects of their health.

A central element of medication eHealth services is the electronic recording of prescriptions. The representations of prescriptions can be described as involving four different characteristics: Prescription as the *decision to medicate*, Prescription as assigning a *right to collect a medication* (Prescribe), Prescription as a *collection action* (Dispensing of a medication) and Prescription as an *administered action*. Administering medication includes several actions: The doctor decides whether the medication should be injections (i.e., intramuscular, depot etc), tablets, etc., and the nurse or the patient (if self-care) administers in line with the prescribed instruction. For health professionals the administering also comprises the task of documentation. As such, the *decision to medicate*, *prescribing*, *dispensing* and *administering medicine*, are different aspects of a

Medication eHealth service in form of an ePrescription service, as suggested in Figure 1.

The decision to medicate is the first step, where the healthcare professional decides when and how the patient should be medicated. ePrescribing is the electronic prescribing of medicine by a healthcare professional to a patient and making it electronically available to a pharmacy, where the medicine can be dispensed and picked up by the patient. The prescription is a signed artifact (document) that describes the medication and how it shall be taken. It gives the patient the right to pick up the medication at the pharmacy and use it according to the description. In a hospital, the healthcare professional does not need to send the prescription to an external server and can proceed directly from deciding to medicate to dispensing of the medicine, thus passing by one step shown in the general process in Figure 1.

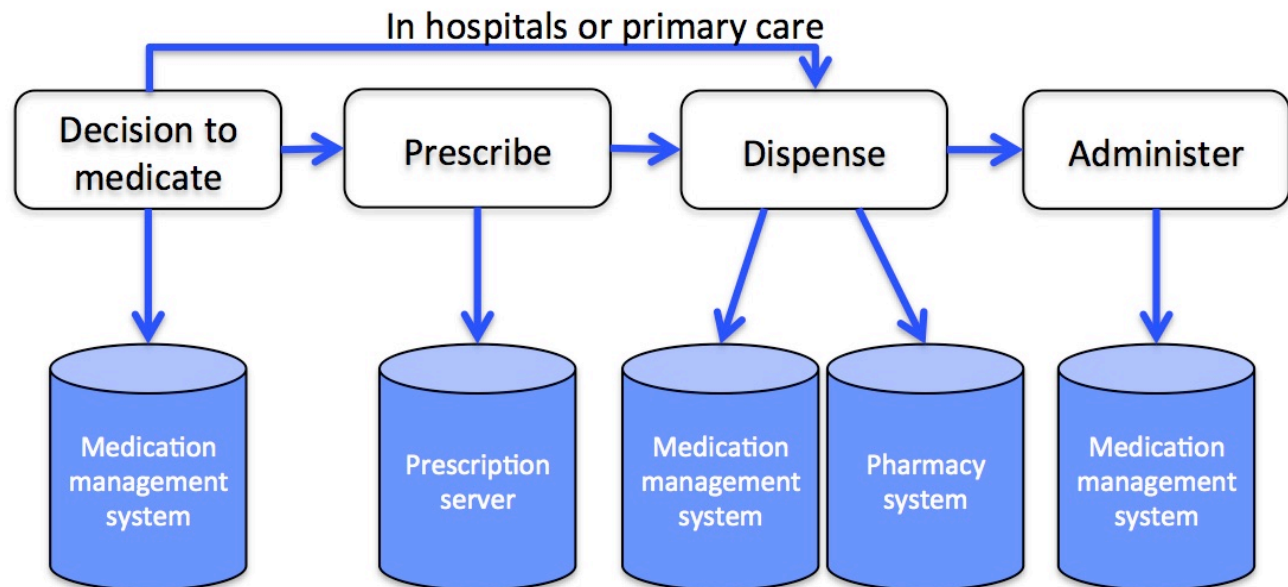


Figure 1. Overview of the process of a prescription from decision to medicate to administration of the medicine and local and national repositories where the data is stored during different phases of the project.

Dispensing is the retrieval of a prescription and the dispensing of the medicine to the patient. The patient consequently administers the medication, when consuming it, or in the case of intravenous medication being administered by healthcare professionals, the administration lies upon the healthcare professional. A prescription list is an overview of the prescription artefacts (the right to collect the medication) of the patient, whereas the medication list is the overview of the medications that are prescribed *and* dispensed to the patient. An eMedication list service allows for both patients and professionals to access it. However, the medication list is not a complete list of all medications of the patient since over the counter medication will not be included in this list. The medication list completeness is one indicator, and only when over-the-counter and herbal medications are included, can it be said to be complete.

Figure 1 illustrates worktasks related to medication, and the storage of data related to each task. The decision of medication is noted by the healthcare professional in a Medication Management System (MMS), which is the Medication section in the EPR-system. In most Nordic countries, the vast majority are sent as an electronic order. Outside hospitals a prescription can be issued on a sheet of paper, telephoned to a pharmacy or sent as an electronic order to a prescription server, where it can be accessed by pharmacies. When a drug is dispensed at a hospital it will be documented in the MMS, if it is dispensed at a pharmacy it will be documented in a pharmacy system – in some countries at a national level. Health care professionals at hospitals, in clinics and long term care facilities store information about the administration of drugs in a MMS, where the system has been implemented. Information on administration performed by the patient himself outside the clinical setting is not recorded in any official health information system in the Nordic countries. Only health care administered (or observed administered) medication will be noted, whereas self-administered medication outside hospitals, clinics etc. are usually not noted anywhere. Although there are some recent emerging mHealth tools, which can follow the act of self-administration [15], it is not possible to register systematically whether dispensed medications are actually administered at home.

II. MATERIAL AND METHODS

The indicators used in “The Nordic eHealth Benchmarking. Status 2014.”- study [12] were derived from a rating survey performed in 2013, constructed on the basis of national survey questionnaires in the Nordic countries, an OECD model survey developed in 2012 [16], eHealth policy analysis performed in 2013 and variables presented in the eHealth evaluation literature [17].

Data about the indicators for ePrescription and eMedication list services arose from discussions in a series of workshops with participants from all the Nordic countries

arranged by the NeRN and a summary of the national survey questionnaires in the Nordic countries performed from 2010-2014 [12]. The results are presented as proportion of public healthcare organisations having the functionality within each of the Nordic countries.

The study was conducted through four main tasks:

Task 1: Prioritizing functionalities, for which common indicators are needed, and defining measures for availability, usage rate and usability (Responsibility: National Institute for Health and Welfare (THL), Finland, main authors Hannele Hyppönen and Sabine Koch).

Task 2: Collection and reporting of results of eHealth functionality availability, usability and benefit-variables from national surveys (Responsibility: University of Oulu, Finland, main authors Maarit Kangas and Jarmo Reponen).

Task 3: Defining the availability of common usage rate variables from log files (Responsibility: University of Aalborg, Denmark, main authors Christian Nørh and Sidsel Villumsen).

Task 4: Reporting of results of Nordic eHealth access, usage rate, usability and benefits (Responsibility: THL, Finland).

In the first task, three methodological approaches were applied: 1) content analysis of the existing national eHealth monitoring surveys for listing of existing measures (variables), 2) quantitative and qualitative analysis of rating survey results for key stakeholders to prioritize the measures and 3) analysis of the Nordic eHealth policies. The second task was based on the rated list of variables from the first task and survey data in each of the countries. The methods for harvesting log data for task 3 were different in the various countries due to different systems and practices.

The study has methodological limitations that should be identified. There were some differences in the data collection methods of the Nordic national surveys, sampling and response rates. National surveys were targeted to different professional groups (either availability or usability and experienced benefits of services). Some included private practice while other did not. For example, the proportion of public health organizations where electronic prescription renewal was available for patients was either based on expert knowledge (Denmark, Iceland, Norway, Sweden) or data collected from the organizational national survey where the Chief Medical Officers (CMO) and Chief Intelligence Officers (CIO's) were the target population (Finland). Furthermore, there is a limitation in the comparability of usage rate as the availability and granularity of log data varied between the countries. The variation in methods limits comparison of the results. However, the availability of an ePrescription service was a

national functionality within all the Nordic countries, and therefore comparability was not an issue for that indicator.

III. RESULTS

When presenting the results, the sub-questions are addressed separately. Each Section shows the results of the availability and the usage rate from the 2014 status of Nordic eHealth benchmarking [12]. The overall results indicate that the availability of electronic medication services varies, and there are differences between the countries in how systematic they are in registering usage rate.

A. Availability and use of a national ePrescription service

This Nordic indicator is identical to an OECD indicator (Availability of making prescriptions electronically available to pharmacies outside of own organization – answer option “Yes, any pharmacy outside of my organization”), but measured at a national level.

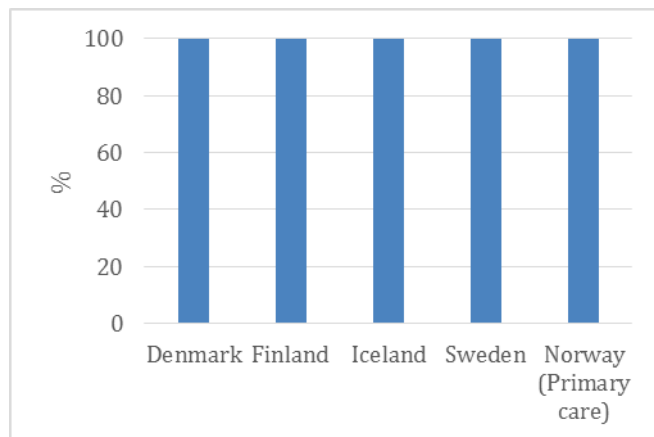


Figure 2. Availability of an ePrescription service.

Figure 2 shows that by the end of May 2014, all the Nordic countries had a national ePrescription service in place. In Finland, Denmark, Iceland and Sweden, ePrescription is available at a national level, i.e., at all public hospitals within the country, for all GP's, and at every pharmacy in the country. In Finland, the roll-out of ePrescription to the private sector health care providers is currently almost complete (including dentists), but at the time of the data collection in 2014, only public sector physicians and dentists had access to the service. In Norway, all pharmacies, general practitioners, private specialists, dentists and emergency doctors, and all (non-hospital) doctors allowed to prescribe drugs have access to ePrescription.

The professional usage of electronic list of patient prescriptions was measured as a proportion of viewings of prescriptions by professionals (nominator) by all

prescriptions (paper based, telephone based or electronic prescriptions) made per year (denominator). This included both national and available regional data on electronic and paper-based prescriptions outside own organisation. In the study, there were differences in the availability of data, as the Nordic countries have different practices for how to log data. In Denmark, there is 100% viewing, in Finland 37%, in Iceland 6%, in Sweden 0.3%. At the time of the study there was no data available from Norway on this indicator.

When looking at the proportion of viewings by professionals by electronic prescriptions made per year (denominator), we see that the results are similar. In Denmark, the number is 100%, in Finland 60%, in Iceland 9%, in Sweden 0.3%. There was no data available from Norway on the nominator.

The results above demonstrate that although the ePrescription service is available in all the Nordic countries, the knowledge and systematic collection about the usage rate vary. One needs to keep in mind that in Iceland the viewing of prescriptions by doctors across healthcare institutions was in a pilot phase at the time of the study. Hence, only a small portion of physicians within Iceland had access to this service. In Finland the national ePrescription had just become available for many organisations in the public sector and was not available for private practitioners. Lower availability as well as requirement to change work practices in order to view the prescriptions from the national database may account for lower usage rates in Finland. Denmark has had this functionality available on a national level to healthcare professionals since 2010 – excluding professionals in the municipalities who were fully implemented by 2014.

B. Availability of a national electronic list of prescribed and dispensed medication

The indicator is identical to the OECD indicator (Availability of information on dispensing status by the pharmacist, answer option “Yes, for most or all of my patients”). It measures the availability of information about medication that has been previously prescribed and dispensed (including prescriptions from other institutions).

However, the contents of this indicator vary in the Nordic countries. A national list of prescribed and dispensed medication is not necessarily the same as the patient's current medication list, since for example, the medication dispensed while admitted to a hospital or purchased without a prescription may not be included.

Figure 3 shows the availability of national electronic lists of prescriptions and dispensings in the Nordic countries. In Denmark, the medication list has been 100% available since 2010, including all types of prescriptions made outside hospitals as well as all medications prescribed on discharge from the hospital.

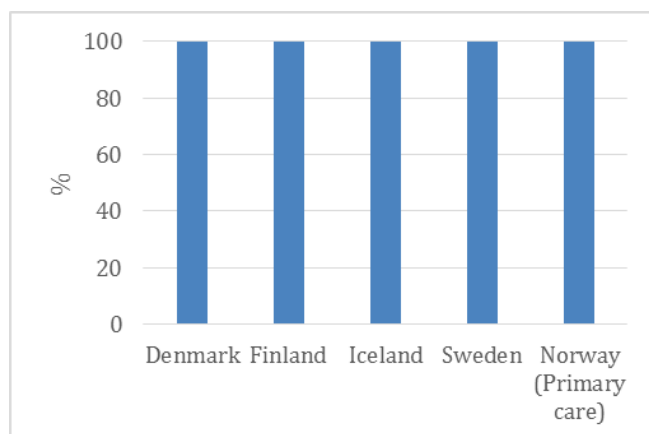


Figure 3. Availability of a national level list of prescriptions and dispensings in public sector.

In Finland, the national prescription database shows prescribed and dispensed medication, which in public sector was 100% in 2014, but not those administered during hospital stay. Patients can preclude health professionals from accessing the data. The national list of prescriptions does not include prescriptions on paper or prescriptions that have been made by phone, nor prescriptions related to social care. From 2015, the national KANTA-system generates a comprehensive list of current medication for the patient from the prescription database and data from individual electronic patient record (EPR) systems, including medication administered during hospital stay and all types of prescriptions.

In Iceland, the availability of the national list of prescribed and dispensed medicine is 100%, since 2014, and includes all ePrescriptions, both prescribed and dispensed, as well as some paper and telephone prescriptions. All paper and telephone prescriptions are available in 2015. As in Finland, the medication list does not include the medication administered during hospital stay. By law the medication is made viewable for the past three years within the national pharmaceutical database. Patients cannot opt out of this service, meaning that the doctor treating the patient does not need the patient's permission to access his/her medical history.

In Norway, the availability of list of prescriptions and dispensings in primary care is 100%. A national medication list is to be found in the "Kjernejournal" (Summary care record), and it may also be accessed via the national portal "helsenorge.no". "Kjernejournal" is running as (in 2014) a pilot implementation in two regions. "Kjernejournal" contains a list of the medicines the patient has been prescribed (both ePrescriptions and paper prescriptions) in Norwegian pharmacies. Medicines the patient purchased without a prescription, received at an emergency department, hospital / nursing home or purchased abroad will not appear. Prescriptions that have

been dispensed are stored in the "Kjernejournal" for three years.

In Sweden, the list of medications that have been dispensed to the patient has been available since 2012. The patient decides if the doctor is allowed to see the information in the database. A consent is needed from the patient. Very few patients i.e., 3-4.000 patients out of 9 million actually choose to hide their information.

In the NeRN Status Report, the frequency of use of electronic prescriptions is not monitored. However, NeRN suggests that the indicators "proportion of dispensed prescriptions of electronic prescriptions made" and "proportion of dispensing list viewings by professionals (excluding pharmacists) of electronic prescriptions made" could be additional indicators for monitoring usage rate of electronic prescriptions.

C. Availability of electronic medication renewal

This indicator shows the availability of services that enable electronic medication renewal for patients at the national level. The indicator is identical to the OECD indicator. Some countries have data for local functionality while other countries have data for the national functionality.

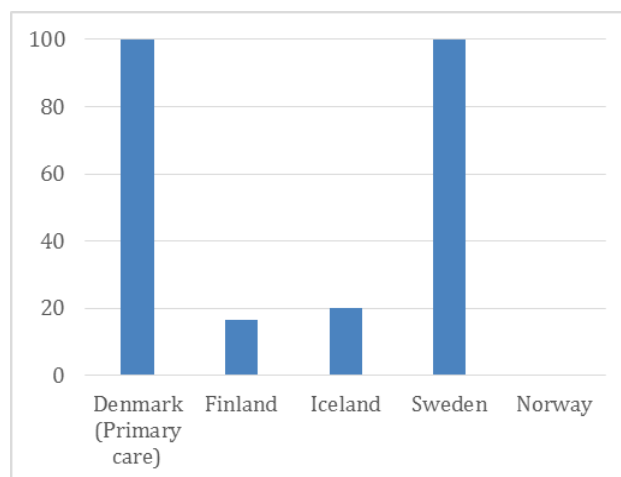


Figure 4. Availability of electronic medication renewal.

Figure 4 shows the availability of electronic medication renewal services in the Nordic countries. In Denmark, there is 100% availability of electronic medication renewal in primary care at a national level.

In Finland, this was an organizational activity in 2014, but currently this functionality is available for citizens via the national patient portal. In 2014, the patient needed to contact the pharmacy or primary health care centre to ask for a renewal, although some organizations provide an electronic web portal to mediate the request as depicted in Figure 4.

In Iceland, only a few healthcare institutions offered this service in 2014. The functionality was in the form of patients sending an e-mail from the healthcare organization's web site that offered these services for their patients and requesting the medication renewal. However, this is currently being implemented via a national patient portal and is expected to be at a national level before end of 2015.

In Norway, this service has not been established at the national level. General practitioners can offer service functionalities for patients depending on what portal provider they have chosen.

In Sweden, electronic medication renewal has been available since 2012 in the national service "My healthcare contacts (MVK)". MVK is a citizen web portal that enables secure communication between patient/ consumer/ customer and healthcare and long-term care. The patient can book and rebook appointments, renew prescriptions, order a copy of his patient record and in some county councils also access it.

The usage rate of electronic medication renewal is based on the OECD variable "frequency of use of electronic prescription renewal requests by patients". The results show that none of the Nordic countries have a systematic overview, in log data, of electronic renewal requests made by patients.

D. Availability of electronic viewing of patient's own prescription

This indicator concerns electronic services that enable patients to view their own medication data. We present data for services at a national level. The indicator is not completely identical to the OECD indicator (Availability for patients to remotely access the Medication lists from their provider-maintained electronic record): The OECD indicator focuses on local level availability of a medication list, the Nordic indicator on a national level availability of a list of prescriptions and dispensed medication.

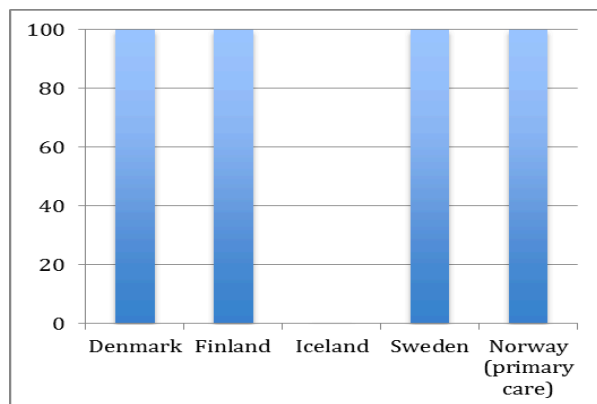


Figure 5. Availability of patients' viewing electronically of own medication data

Figure 5 shows the availability of patients' viewing electronically of own medication (prescriptions and dispensings, where available) data. In Denmark, patients have had the opportunity to view their own medication data covering the past two years since 2009. In the beginning, it only enabled viewing of prescriptions made outside hospitals. Since 2013, viewings of prescriptions made by hospital personnel have been included.

In Finland, all patients have since 2013 had access to all prescriptions that are in the prescription database. This service did not exist in Iceland until October 2014 via the national patient portal. Currently in Iceland, it only includes ePrescribed medications. However, plans are already underway to enhance these services to include also paper- and telephone prescribed medication.

Norway established this service in 2012-2013 via "My prescriptions" in helsenorge.no [18]. The service currently enables viewing of the most recent prescriptions made by general practitioners.

In Sweden, this service has been available since 2012 as a national service through "My healthcare contacts" (MVK).

Availability for patients viewing of medication data that (public/private sector) professionals have prescribed is a feature of national health information systems in the Nordic countries.

The usage rate of electronic viewing of patients own prescriptions, i.e., active list of patients current medication via the national information system, was not benchmarked within the Nordic countries. However, OECD covers this in the model survey ("Availability for patients to remotely access the Medication lists from their provider-maintained electronic record – usage rate").

IV. DISCUSSION

The Nordic countries seem relatively homogeneous and comparable in terms of political systems, infrastructure, culture, and educational, social- and healthcare systems; however providing comparable eHealth indicators from surveys across the Nordic countries involves a number of challenges. The eHealth functionalities, albeit spoken of in same terms (e.g., ePrescription service), were not identical in different Nordic countries. The samples of the survey varied: in Denmark, a representative sample of clinical end users participated whereas in the other countries leaders in health care institutions were approached. The survey questions were formulated in the language of the respective countries, and the time and frequency of the surveys varied. Detailed discussions of these differences settled most of the variance they introduced, and the results obtained on the medication issues were quite comparable.

Comparable e-services regarding the ePrescription include availability of the prescriptions for pharmacies and

patients on national level, and availability of the list of medicines prescribed to the patient on national level, i.e., the proportion of public and/or private organizations where prescribed medicine outside their own organization, are available in all the Nordic countries. Although ePrescription is available, it is still possible to issue prescriptions on paper or by telephoning the pharmacy. This proportion has not been measured, but it is assumed that it is neglectable given the high number of prescriptions made electronically.

The ePrescription services are well established and mature in all of the Nordic countries. However, the availability of viewing the prescriptions on a national level is still in a pilot phase in some of the countries.

The availability of a national list of prescribed and dispensed medication has also, by 2014, reached a level of saturation. In Denmark, this service has been available for some years. Although the service is available in all the countries, the architecture of the systems behind the services differ significantly, but a detailed analysis of these differences has not been targeted in this study. A special feature for patients to hide specific medications is available in all countries for similar ethical reasons.

An e-service to renew medication is not available in all of the Nordic countries. In Denmark and Sweden the service has been available for some years; however it is implemented in different ways. In Denmark, this service was implemented for all patients to use as part of the agreement between the general practitioners and the regions who pay them fee for service. In Sweden, the service is available to all citizens through a national portal. In other countries this service was available only through dedicated organizations.

The service that enables patients to view their own prescriptions has been implemented in all of the Nordic countries.

However, when going into detail about the content of the indicators, the NeRN group realized that characteristics of the eHealth functionalities as well as the monitoring data provided in national surveys and logs varied somewhat between the respective countries.

The availability of a national ePrescription service was saturated, but the content measured was different between the Nordic countries. In the definitions of the indicators, the fact whether the medication was prescribed, dispensed or administered was not clearly specified, or the data were not available because the question was not asked specifically in the surveys. It became apparent that the content of ePrescriptions and the measurements of them varied between the countries making detailed explanation in the presentation of the results necessary for each indicator and each country.

Another point, which makes comparison difficult, is the fact that ePrescription does not cover paper-based prescriptions per se, which are regulated in another way than electronic prescriptions. It has different consequences in the respective countries. In Denmark, for instance the paper-based prescriptions will be synchronized with the electronic overview of the patient's own prescriptions once the medicine has been dispensed in a pharmacy. A related issue is that while ePrescriptions are 1-1 prescribed and dispensed medication, where the paper based prescription can hold prescriptions of several different medicines on the same piece of paper.

The e-services in this paper more specifically referred to as *the medication eHealth service*, may have different scopes, i.e., intended coverage area. While some e-services are accessible at a national level, others are either limited geographically to a regional level, administratively to the hospitals or the organizations, or to specific roles, for example to healthcare professionals and not to patients. The focus in this study was the availability of medication eHealth services at a national level and availability at a more granular level was therefore not presented.

The study also showed that there are different practices in the Nordic countries whether they are systematically logging usage rate of the electronic medication services. It was possible to retrieve log data about use of ePrescription viewing in Denmark, Finland, and Iceland but due to different systems in the countries, the definitions of the denominators varied slightly. Furthermore, as this service was in a pilot phase in Iceland at the time of the study, comparability was an issue. There were no systematic log data available on the usage of the other e-medication services discussed here, i.e., viewing by patients and electronic renewal requests by patients.

V. CONCLUSION

The study showed that the availability of patients' prescription information and ePrescriptions made available to any pharmacy is acknowledged via the national ePrescription systems in each Nordic country. Moreover, the availability of medication renewal requests as well as the availability of electronic viewing of patients' own prescriptions is comprehensive on national level in some countries (Sweden, Denmark, Finland and Iceland). Patients' access to view their prescription data electronically is also broad. However, the NeRN findings demonstrated that the services are carried out differently in the respective countries and also definitions of indicators vary between countries hampering comparison. The implementation of eHealth services within healthcare is expected to enhance patient safety and quality of healthcare delivery. Prerequisites to access this goal are that the complete list of patient's current medication is available and systematically used to inform clinical decision-making. The results of this

study provide valuable information to guide decision making at the healthcare and eHealth policy level with regard to development, acquisition, implementation and assessment of eHealth services. Furthermore, it highlights the need for implementation of standardized, accessible systems for monitoring and benchmarking eHealth services.

Benchmarking is important in order to detect possible benefits in use of the eHealth service and to identify best practise in the respective countries that consequently could inform the development in other countries. Benchmarking is also important for detecting possible problems and risks. Despite of the limitations of the work, NERN succeeded in benchmarking availability and use of several Health Information Exchange (HIE) and Patient Health Record (PHR) functionalities, including the eHealth services related to medication. The results show that the Nordic countries advances in eHealth services for healthcare professionals and for citizens. The results and the experiences from the study generate the following recommendations [12]:

1) The Nordic countries should agree on common indicators, in order to monitor the same aspects and consequently exchange knowledge and “best practise” in eHealth service provision; 2) The Nordic countries should provide access to log data for monitoring and research (and not only key numbers or forecasts); 3) Since there are great differences in the national architectures, there is a need for more detailed comparison of the data retrieval processes and outcomes in the respective countries; 4) As the utilities health record systems in Iceland shows, usability and expected utility is not just about high eHealth budgets, but about wise practices; 5) One anticipated impact of ePrescription /comprehensive medication list is the reduction of medication errors. Although the results from Denmark showed the opposite (the patient safety reporting system is more comprehensive than in the other countries, and is thus detecting more medication errors and near-misses), it is assumed that if a systematic and coordinated practice with registration of prescriptions and medication lists is introduced, the proportion of medication errors will fall.

The data in this paper are based on the results from the Nordic eHealth Benchmarking status 2014. It must be noted that the eHealth services are continuously under development in the Nordic countries. This study would assumingly have different results if conducted in 2016.

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