Family doctor's offices' outpatient consultations data in the e-health system, 2015

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Introduction

Those running the health care policy increasingly need reliable and more detailed health statistics in order to plan and monitor effective strategies. In this respect, data quality is very important − the accuracy of the overview of developments in the health care system based on the existing data depends on it.

For the Health Statistics Department of the National Institute for Health Development (NIHD), as a central unit consolidating statistics in the areas of health and health care in Estonia, it is important that data obtained from the electronic health information system[1] (e-health or eHIS) are of an adequate quality for the production of health statistics. This means that there should be no contradictions in the data, data should conform to the developed classifications, reflect the actual situation and be up to date and reliable.

In the near future, the plan is to transition from reporting-based statistics to using the eHIS data. Based on eHIS data, more detailed statistics may be compiled about outpatient consultations (outpatient visits and home visits) than what has been enabled to date by data collected via reporting. The eHIS data are person-based, reflecting the age of the patient at the time of the case, and their place of residence.

This report provides an overview of outpatient consultations data transmitted to the eHIS by family doctor's offices in 2015. For the analysis, data from family doctor's offices were selected, since one half of outpatient consultations are made in primary health care. The objective is to analyse the quality of data and to assess their suitability for compiling statistics about outpatient visits and home visits, and in the future, also about telephone and e-consultations. To this end, we studied data from outpatient cases transmitted to the eHIS, and compared them to the consolidated data from the annual visit report collected by the NIHD.

Based on consolidated data collected by the NIHD, outpatient consultations statistics are currently published for two major age groups: children aged 0 to 14, and adults (aged 15 or older). Using the eHIS data, statistics can be published about smaller age groups or patients of a certain age.

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[1] The e-health information system (eHIS) is a data set in the national information system which processes data related to the area of health care for the conclusion and performance of agreements for the provision of health care services, for the assurance of the quality of health care services and of patients' rights and for the protection of public health, including the maintenance of registers reflecting health status and for health care management *(Health Services Organisation Act, subsection 59[1] (1))*.

County statistics are being published also currently. However, county shows the location of health care service provider. Based on the eHIS data, health care service provision may be analysed furthermore in terms of the place of residence of the patient, which provides an opportunity to plan health care resources more accurately regionally. Furthermore, telephone and e-consultations provided by nurses and physicians, missing in the current statistics, can be differentiated in the eHIS data.

The Health Statistics Department of the NIHD will use the results of the analysis to plan the compilation of national health statistics and forward the results obtained to specialists at the Health and Welfare Information Systems Centre and the Ministry of Social Affairs in order to improve the quality of data and reduce the occurrence of the identified problems in the future.

1. Source data

The analysis is based on an extract from outpatient epicrises[2] transmitted to the eHIS and compiled for outpatient cases[3] closed in 2015. Generally, the Health Statistics Department of the NIHD receives regular extracts from the eHIS data once a quarter, 30 days after the end of the quarter about the cases closed during the quarter. The analysis utilizes an eHIS extract as at 05.02.2016 from the summaries of all the cases closed in 2015 and transmitted to the eHIS by that date.

In addition to outpatient epicrisis, health care professionals are required to transmit to the eHIS relevant documents[4] for all the operations completed, for example, various medical examination notices, and certificates. These documents have not been analysed, since the objective was to establish whether and to what extent outpatient consultation statistics may be compiled based on outpatient epicrises.

For the analysis, data about all consultations indicated in the summaries of outpatient cases closed in 2015 have been extracted from eHIS database. Of these consultations, 1.6% (approximately 23 000 visits) were made before 2015.

The composition of the e-health information system data analysed was as follows:

1. name and commercial registry code of the health care service provider;
2. epicrisis number and specialty of the author of the epicrisis;
3. case start and end dates;
4. patient data (unique ID, age);
5. consultation's type and date.

Consolidated data of outpatient visits, home visits, and telephone consultations, originating in the 2015 "Health care institution" report (Table 3, "Outpatient care") and provided by family doctor's offices to the Health Statistics Department of the NIHD, were compared to the data in the eHIS. The report covers the outpatient consultations indicated on treatment invoices compiled in 2015. Thus, similarly to the eHIS data set the consolidated data collected via reports include data from outpatient consultations made in 2014 if treatment invoices for them were compiled in 2015. The proportion of

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[2] Epicrises – summary of the case of a patient recording the dynamic of the given case based on the relevant information at the physician's disposal. All visits made during a case are indicated on an epicrisis.

[3] Outpatient case – actions related to the investigations or treatment of a patient within a single specialty in outpatient health care at a health care institution.

[4] The list of documents transmitted to the eHIS is specified in section 59² of the Health Services Organisation Act, "Transmission of data to the health information system", both outlining the composition of the data transmitted and setting out the list of documents.

consultations made during previous periods cannot be estimated in data collected via reports.

Statistics compiled based on data collected via reports are published by the location of health care service providers. To ensure regional comparability, data about institution locations were added to the eHIS data at the county level (including Tallinn and Tartu separately). The location identifier was obtained from the statistical register of health care service providers administered by the Health Statistics Department of the NIHD.

In order to estimate the quantity of data missing due to the late transmission of epicrises to the eHIS, extracts from the summaries of cases closed in 2016, and from the times of transmission of the summaries of cases closed in 2015 to the eHIS (as at 20.03.2017), received from the Health and Welfare Information Systems Centre, were used.

The composition of the data set referred to last was as follows:

1. name and commercial registry code of the health care service provider;
2. epicrisis number;
3. the time an epicrisis was first entered into the eHIS;
4. case start and end dates.

2. Data quality

2.1 Data coverage

In 2015, there were 468 family doctor's offices operating in Estonia, all of which transmitted at least one outpatient epicrisis to the eHIS in 2015. Accordingly, all family doctors offices have the ability to transmit data. As at 05.02.2016, slightly more than 1.3 million outpatient epicrises had been transmitted to the eHIS about cases closed in 2015.

2.1.1 Outpatient epicrises

In the eHIS, the classification of the specialties of health care professionals[5] is used when the transmitter's specialty is indicated. As a result, the analysis divides epicrises into epicrises of physicians' and those of nursing staff (hereinafter: nurses) based on the profession of the health care professional who has compiled the document. The 2015 data included 1.26 million epicrises compiled by physicians and 54 000 compiled by nurses.

Transmission of epicrises to the eHIS by physicians and nurses varies greatly between different family doctor's offices (Figure 1). In 2015, all family doctors offices transmitted epicrises compiled by physicians to the eHIS. The average number of epicrises compiled by physicians per family doctor's office was 2675 (median[6] 1444; min 6; max 78 000). Doctor's epicrises were transmitted in numbers above average by 28% of family doctor's offices. Approximately 22% of family doctor's offices transmitted fewer than 500 epicrises compiled by physicians per year.

Epicrises compiled by nurses were transmitted to the eHIS by only 25% of family doctor's offices. The average number of nurse epicrises per family doctor's office was 465 (median 11; min 1; max 39 000). Half of the institutions transmitted fewer than 10 epicrises compiled by nurses per year.

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[5] The eHIS specialty classification – http://pub.e-tervis.ee/classifications/Erialad
[6] Median – number for which greater than and smaller than values equal in the variation series
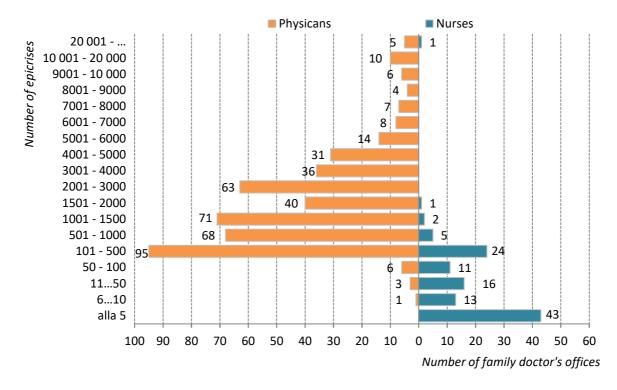
Figure 1. **Transmission of epicrises to eHIS compiled by family doctor's office physicians and nurses, 2015**

Specific rules on data transmission have not been agreed with family doctors and have not been defined in the guidelines. Family doctors do not know what data to transmit to the eHIS on what documents. Since the number of patients contacting a family doctor is very high, it does not seem expedient to physicians to record each outpatient consultation or action in the eHIS. Often, data for repeat visits or minor or recurring diagnoses (e.g. acute upper respiratory tract infections) are not transmitted to the eHIS. In the opinion of physicians, if all information were transmitted to the eHIS, the volume of data would become so great that it would be very difficult to locate relevant information about a patient.

Furthermore, physicians do not know whether to transmit outpatient epicrises in addition to children's medical examination notices (e.g. growth and immunisation notices) and adults' medical certificates to the eHIS. Some family doctor's offices transmit also an epicrisis with every notice or certificate. Generally, an epicrises is not compiled in addition to medical certificate or children's medical examination notices, but only when health problems become apparent during an outpatient visit. According to the information obtained from the Health and Welfare Information Systems Centre, the children's medical examination notice is effectively a document recording an outpatient visit, in addition to which an outpatient epicrisis does not have to be filled. In the case of adults, however, compiling an epicrisis is the first step in the process of issuing a certificate. On an epicrisis,

the physician records entries about investigations or examinations needed in order to obtain a certificate. If the renewal of a certificate is involved, and new medical investigations do not need to be completed, there is no need for an outpatient epicrisis.

Information systems designed for family doctors employ various practices. In fact, users of the Watson software are unable to send a notice about the growth of children in any other way except as part of an outpatient epicrisis. Users of the Medicum software do not transmit medical examination notices to the eHIS, and data from children's immunisations or examinations are also reflected in outpatient epicrises.

It became apparent that statistics on outpatient consultations cannot be compiled based on outpatient epicrisis only. In order to obtain the necessary data, information on various documents has to be combined. This is complicated by the fact that there are many different documents and some outpatient consultations are duplicated due to the simultaneous transmission of both epicrises and notices. Some of the outpatient visits related to the issuing of medical certificates is not reflected in the eHIS. This analysis does not investigate what proportion of outpatient visits are added from other eHIS documents.

2.1.2 Outpatient consultations

Since eHIS data do not include data for the health care professional, who has made the consultation, the analysis divides outpatient consultations into physician and nurse consultations based on the profession of the health care professional who has compiled the epicrises. The 1.3 million outpatient epicrises transmitted to the eHIS indicated slightly more than 1.25 million outpatient consultations and approximately 159 000 telephone consultations. Overall, only 22.7% of data collected via reports for 2015 had been transmitted to the eHIS, that is, data had not been transmitted about approximately 4.2 million outpatient consultations. The profession of the health care professional who had compiled the epicrisis was not indicated in the case of 892 outpatient consultations. While evaluating data coverage based on the profession of the health care professional, the data referred to last were omitted from the analysis.

Health statistics use outpatient consultation as a general term for health care professionals' outpatient visits and home visits.[7] On the eHIS list[8], consultation type includes furthermore electronic

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[7] Health statistics glossary – http://pxweb.tai.ee/PXWeb2015/Resources/Info/sonastik/
[8] Consultation type list in the eHIS – http://pub.e-tervis.ee/classifications/Visiidi%20t%C3%BC%C3%BCp

and telephone consultations, additionally telemedia and video consultations, and consultations between physicians, between health care professionals, and between health care professionals and other specialists. By type, outpatient consultations in the eHIS were divided as follows: 88% were outpatient visits, 11.1% telephone consultations, and 0.9% home visits. Outpatient consultations were divided similarly also in data collected via reporting: 88% outpatient visits, 11% physician telephone consultations and 1 % home visits.

Compared to reporting-based statistics, data for physicians' outpatient visits and home visits covered in eHIS 28% and 32%, respectively (Table 1). Telephone consultations by physicians were indicated in the e-health information system for 24% of data collected via reporting.

Table 1. Coverage of physician and nurse outpatient consultation data in the e-health information system, 2015

	Physicians			Nurses		
	eHIS	Reporting	Coverage, %	eHIS	Reporting	Coverage, %
Outpatient consultations	1 208 031	4 361 772	27.7	66 429	1 246 850	5.3
Outpatient visits	1 196 418	4 325 104	27.7	65 802	1 227 192	5.4
Home visits	11 613	36 668	31.7	627	19 658	3.2
Telephone consultations	141 879	587 800	24,1	16 564	…	…

… – data not collected
In addition to eHIS data, there are 892 visits for which the profession of the health care professional is not known.

In terms of regions, physician outpatient consultations data were transmitted to the eHIS most often by family doctor's offices in Valga and Ida-Viru Counties and in Tallinn and Tartu. Physician outpatient consultations data coverage is lower in Hiiu and Pärnu Counties, where less than 15% of the consultations data were transmitted (Figure 2).
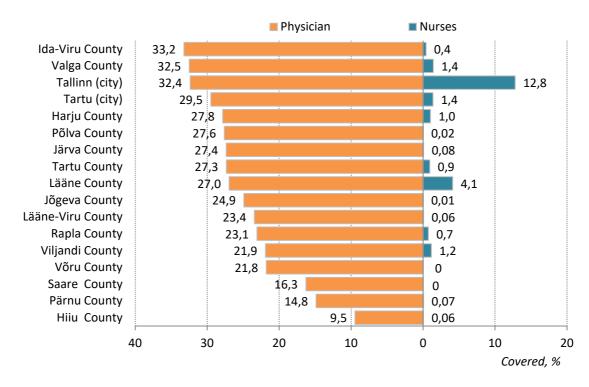
Figure 2. Coverage of physician and nurse outpatient consultation data in the eHIS according to family doctor's office location, 2015

Note: Harju County does not include Tallinn, and Tartu County does not include the city of Tartu.

Data from nurse outpatient visits and home visits in the eHIS covered only 5% and 3% of the actual numbers, respectively. In the case of half of the family doctor's offices submitting nurse outpatient consultations, their number in the eHIS is below 100. By comparison, in data collected via reporting, only five family doctor's offices indicated fewer than 100 outpatient consultations made by nurses. The number of nurse telephone consultations cannot be compared to data collected via reports, since there is no relevant reporting. At the same time, there is no reason to believe that the coverage for nurse telephone consultations is markedly different from the rest of the work.

Nurse outpatient consultations data were transmitted to the eHIS most often by family doctor's offices in Tallinn: approximately 13% of data collected via reporting. In the rest of the counties, the coverage of data from consultations made by nurses and transmitted to the e-health information system ranges from 0% to 5%.

As part of a case, entries on an epicrisis transmitted to the eHIS may be recorded by both the physician and the nurse. This means that an epicrisis compiled by a physician may also indicate outpatient consultations made by a nurse. Generally, epicrises are compiled and transmitted by nurses when only nurses have been handling the cases and there have been no physician outpatient consultations as part of them. At the same time, there are also family doctor's offices where a

physician has been consulted on a case followed by a nurse, who records it on the epicrisis she or he has compiled.

In eHIS data, outpatient consultation made by physicians and nurses cannot be differentiated based on the profession of the author of the epicrisis. The author of an epicrisis cannot be automatically considered the person who made the consultation reflected on the epicrisis. Therefore, the numbers of consultations actually made by physicians and nurses cannot be differentiated based on eHIS data. In terms of physician consultations, there may be over-coverage instead if nurse consultations are recorded in epicrises compiled by physicians.

2.2 Duplicate data

Before the eHIS data set can be used to compile statistics, any duplicate data have to be removed. Duplicate data could arise from both the repeated transmission of epicrises to the eHIS, and from the repeated indication of the same outpatient or home visits on a single epicrisis. Recurring entries made up a small, statistically insignificant portion, approximately 1% of all the outpatient consultation data; however, when the data of mainly one county or age group are duplicated, the proportion of the error may become significantly greater. In addition, data coverage during the period analysed was low in terms of outpatient consultations, which means that with an increase in the volume of data, the numbers and proportion of duplicate entries may grow if no attention is paid to it.

There were approximately 9400 fully duplicate entries where all data fields in the data set analysed recurred. These are entries in the case of which the same outpatient or home visit has been indicated on a single epicrisis two to four times as part of a single case. Also, epicrises containing overlapping information are transmitted to the eHIS. There are cases where several epicrises have been transmitted for a single case, so that each epicrisis contains the same number of outpatient consultations. It is possible that the physician has re-opened the epicrisis after transmitting data to the eHIS, added test results to it, and compiled it as a new document, instead of sending a new version of the same document. Such duplicate outpatient consultations in the data set numbered approximately 2700.

In addition, there are cases where several epicrises have been transmitted for a single case, yet the number of outpatient consultations is different. This situation may arise if a physician closes a case and transmits data to the eHIS, but the patient re-contacts the physician afterwards. If a physician

updates an epicrisis and transmits it as a new document, this is reflected in the eHIS data as if the patient had visited the physician multiple times on the same day. To avoid errors, it is necessary, when an epicrisis previously transmitted to the eHIS is being updated, to update the version of the existing document in the system instead of compiling it as a new epicrisis. According to family doctors, they do not always have the time to retrieve an epicrisis already transmitted to the eHIS for a version update, and it is easier to compile a new document.

2.3 Wrong consultation date

Data for outpatient consultations which dates predate the case start or postdate the case end have been transmitted to the eHIS. Such consultations in the data set number approximately 8000 (0.6%). Some examples:

1. The consultation date predates the case start significantly – the consultation and case start day and month are the same, but the year is different (Table 2, rows 1–3).

2. The consultation date predates the case start – the case start and end are on the same date, which means that the consultation can have occurred on that day only (Table 2, rows 4–6).

Table 2. Consultation date before case start, cases closed in 2015

Line No.	Consult. date	Case start	Case end
1	18.12.2014	18.12.2015	02.01.2015
2	20.12.2014	20.12.2015	02.01.2015
3	29.12.2014	29.12.2015	09.01.2015
4	09.12.2014	13.01.2015	13.01.2015
5	27.11.2014	15.01.2015	15.01.2015
6	31.12.2014	08.01.2015	08.01.2015

3. The consultation date postdates the case end (Table 3, rows 1–2). In the case of such data, a query should be submitted to the health care service provider in order to clarify the date with the error and then make corrections.

Table 3. Consultation date after case end, cases closed in 2015

Line No.	Consult. date	Case start	Case end
1	04.01.2016	15.12.2015	30.12.2015
2	04.01.2016	12.11.2015	17.11.2015
3	13.08.2018	13.08.2015	18.08.2015
4	03.02.5015	03.02.2015	19.02.2015

Generally, the problems described in Chapters 2.2 and 2.3 can be prevented already when data are entered in family doctor's information systems. To this end, software developers have to create data controls, for example, to compare the consultation date to the case start and end dates, and to check the multiplicity of consultations within a single case. A consultation cannot occur before the case start or after the case end; the same consultation should not be indicated on an epicrisis several times.

2.4 Occupation of the health care professional who has performed the consultation

Outpatient consultations made at family doctor's offices include outpatient visits, home visits and telephone consultations of both family doctors and medical specialists working at the same institutions. Also, the independent work by both, family nurses and other nursing staff who working at family doctor's offices.

In terms of health statistics, it is important to know the position[9] of the health care professional who made the outpatient consultation. Primarily for the reason that, in the provision of general health care, consultation may be done also by other (specialist) physicians in addition to family doctor's, such as general medical practitioners or pediatrician, who may be working both as family doctors and in positions corresponding to their specialties. Furthermore, at family doctor's offices nurses responsible for general care, health nurses, and occupational health nurses or midwives work both as family nurses and in positions corresponding to their specialties. Data for 2015 transmitted to the eHIS included 3% of physician consultations in the case of which the specialty of the author of the epicrisis was other than family medicine, for instance, physician, pediatrician or internist. Among nurse independent consultations, for 65% of the consultations the specialty of the author of the epicrisis was other than family nurse, being predominantly nurse responsible for general care.

In order to differentiate on what position a health care professional is working, the specialty acquired by the health care professional is not enough, and it is also necessary to know her or his occupation at the institution. On an epicrisis transmitted to the eHIS, there is no indication of the occupation of the health care professional who has made the outpatient consultation; instead, there is the specialty of the author of the epicrisis only. As a result, physician and nurse consultation data transmitted to the eHIS and collected via reports may be compared only on the basis of the profession (physician, nurse), and it is not possible to obtain the position information necessary for health statistics, which has been used in the collection and publication of data to date.

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[9] The basis for coding positions – ISCO-08 International Standard Classification of Occupations 2008

2.5 Time of the transmission of outpatient epicrises to the e-health information system

The analysis estimated how many outpatient and home visits would not be reflected in statistics when the eHIS data are used, for the reason that by the time when data are queried the epicrises of closed cases have not been transmitted to the eHIS yet, or cases have been open and, as a result the data are not in the eHIS.

As stated above, the Health Statistics Department of the NIHD receives extracts from the eHIS data once a quarter, 30 days after the end of the quarter, about the cases terminated during the quarter. If after 30 days no case data have been transmitted to the eHIS, these are omitted from statistics, since epicrises transmitted later are not reflected in subsequent extracts.

In order to analyse the number of missing outpatient consultations, the times of transmission to the eHIS of summaries of cases closed in 2015 were analysed. Approximately 60% of the epicrises were transmitted to the eHIS on the day of the end of the case, and another 19% on the following day. Of all the outpatient epicrises transmitted to the eHIS, 93% had been received not later than within 30 days from the end of the cases.

Since an extract for statistics is produced from the eHIS data 30 days after the end of the quarter, it is important to see what proportion of epicrises had been transmitted by that time. After 30 days from the end of the quarter, on average 96.5% of the summaries of the cases closed in the relevant quarter had been transmitted to the eHIS. On average, one consultation was indicated per epicrisis. Accordingly, due to the delay in the transmission of epicrises, approximately 3.5% of the outpatient consultations made at family doctor's offices during the year about which information is transmitted to the eHIS at all would be omitted from statistics. Since the extract from the cases closed in 2015 was made a month after the end of the year, not on a quarterly basis, the delay in sending epicrises resulted in the omission of 1.8% of the visits transmitted to the eHIS during the year from the data set.

In the case of some health care service providers, a large portion of data was omitted from the 2015 data set. There were family doctor's offices, which have transmitted to the eHIS even up to 90% of the summaries of cases closed during a quarter after the time limit relevant for compiling statistics, that is, later than 30 days from the end of the relevant quarter. Most of them transmitted many epicrises to the eHIS at a time retroactively; however, there were also family doctor's offices that indeed transmitted data with great delay regularly.

The principles of the closing of an outpatient case have not been agreed. According to the World Health Organization, a case generally ends once three months have passed from the start of the case. This is important when health data for patients with long-term or chronic illnesses are transmitted to the eHIS. If the family doctor has referred the patient to a medical specialist, the case remains open until the patient has returned to the family doctor, whereas getting a consultation with a medical specialist can take several months. Cases remain open also if the persons have been issued with certificates for sick or care leave, which may also last for a longer period.

Accordingly, outpatient consultations made at the end of the period may be left out of health statistics. One solution would be to end all cases as at the end of the year and re-open them at the beginning of the year. However, it is not known whether this kind of action would be acceptable to family doctors.

In order to estimate the scale of the problem, it was investigated what proportion of outpatient consultations data were omitted from the data set analysed due to the fact that cases had been begun in 2015 but ended the following year. Summaries for cases closed in 2016 and transmitted to the eHIS included approximately 17 000 epicrises with more than 26 000 consultations, compiled for cases begun in 2015. Consequently, approximately 2% of consultations were omitted from the data set of 2015 consultations due to cases begun in 2015 but not completed by the end of that year. For that reason, it is necessary to be able to transmit data to the eHIS immediately after the consultation, not upon closing of the case. Another option when outpatient consultation statistics are being compiled is to wait for the cases closed in the first quarter of the following year, and to postpone the publication of statistics until then. This way, only 0.2% of the outpatient consultations made in 2015 and indicated in the summaries of cases closed after the first quarter in 2016 would be omitted from the data set.

Summary

This report is based on an analysis of outpatient summaries or epicrises for cases closed in 2015 and transmitted to the e-health information system (eHIS) by family doctor's offices. The objective was to establish whether the data in the eHIS reflect all the outpatient consultations made in 2015 and whether based on these data statistics that meet the quality criteria for national statistics may be compiled. Based on the results of the analysis, there have been presented several conclusions and recommendations to which the most attention should be directed.

Results and conclusions

1. All family doctor's offices operating in Estonia in 2015 transmitted at least one outpatient epicrisis to the eHIS during that period. However, outpatient consultations data coverage is low: only 22% of the actual volume. In terms of regions, outpatient and home visits data were transmitted to the eHIS most often by family doctor's offices in Ida-Viru County and Tallinn, and least often by family doctor's offices in Hiiu and Pärnu Counties.

   Due to low coverage, statistics on outpatient consultations cannot be compiled based on the eHIS data. It needs to be investigated why so few data are transmitted to the eHIS, and to decide based on that what measures should be implemented in order to promote data transmission. Certainly, it is important that the transmission of data to the eHIS and their subsequent use would be as straightforward and convenient for the health care professional as possible.

2. Family doctors do not know what data to transmit to the eHIS on an outpatient epicrisis. Often, data related to repeat visits or to minor or recurring diagnoses are not transmitted. Some data are duplicated by transmitting data about an outpatient visit in the form of both an outpatient epicrisis and a medical examination notice. Some of the outpatient visits related to the issuing of medical certificates is not reflected in the eHIS at all.

   Working with various bodies, including professional associations and national institutions (Ministry of Social Affairs, Health and Welfare Information Systems Centre, National Institute for Health Development, Health Insurance Fund), firm and unambiguous definitions and rules have to be agreed as to what data on what documents family doctors and nurses have to transmit to the eHIS. Agreements have to be written down in guidelines, with the information transmitted to physicians and nurses.

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To compile statistics about outpatient consultations, information from various eHIS documents has to be combined, which requires additional time. In addition, also the quality of data from other documents has to be analysed separately, and various data sets have to be combined in order to compile statistics.

3. Visits by physicians and nurses cannot be differentiated based on eHIS data, since these are reflected together on the same epicrisis. Also, data are missing about the positions of both the health care professional who compiled the epicrisis, and the health care professional who made the outpatient consultation.

    When eHIS data are used, all outpatient consultation statistics time series published to date, for example, visit numbers in terms of professions and positions of health care service providers, cannot be continued. To this end, on the outpatient epicrisis or on the medical examination notice a data field has to be created for the health care professional that actually made the consultation, including her or his position.

4. On outpatient epicrises, data transmitted repeatedly make up approximately 1%, whereas entries with incorrect dates account for 0.6%.

    If data coverage were sufficient, errors in the data set would not present significant obstacles to compiling statistics. However, technical solutions need to be employed more than previously in order to assure the quality of data. In family doctor's information systems, control links have to be created, for example, comparison of the consultation date to the case start and end dates, and checks on the multiplicity of consultations within a single case. An outpatient consultation cannot occur before the case start or after the case end; the same consultation should not be indicated on an epicrisis several times. Collaboration has to be pursued with the developers of information systems for family doctors in order to identify problems and find solutions.

5. Of all the summaries of outpatient cases closed in 2015, and transmitted to the eHIS, 96.5% had been received within the time limit relevant for compiling statistics, that is, in 30 days from the end of the quarter. Approximately 2% of the visits made in 2015 were reflected on summaries for cases closed the following year.
    In order for data from incomplete cases to not be omitted from statistics, the existing data collection policy should be changed. Data should be transmitted to the eHIS immediately

after the visit, not upon the end of the case.

In order to compile visit statistics based on the data in the eHIS, the Health Statistics Department of the National Institute for Health Development should receive an extract once a year, after the end of the first quarter, from the documents transmitted to eHIS for all the cases closed the previous year. This would help to reduce any deficiencies due to the late transmission of data.

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