Quality report on the statistics of outpatient consultations

Tervise Arengu Instituut
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National Institute for Health Development

Quality report on the statistics of outpatient consultations

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Summary

This report is on the quality of statistics of outpatient consultation (visits and home visits) in 2017. Statistical procedures described in the report are used to guarantee the quality of data.

The timeliness of data is an issue in data collection. In 2017 68% of health care providers obligated to submit data responded in time. After reminders, final data was received from 99% of those required to submit reports. All collected data have been published in the health statistics and health research database.

Statistics users are interested in a more detailed breakdown of statistics of outpatient consultations – by sex, age group and type of consultation (including phone and e-consultations). At the current arrangement of data collection, health statistics offer a health care provider's view of the services provided, not the individual's, that is, the patient's view. Regarding the developments of the Health Information System, there is hope of adopting an individual dataset of treatment cases, which would allow data to be presented in a more detailed manner. At that, a good coverage and quality of data must be guaranteed. Introducing administrative sources and validating their data, including the data submitted to the Health Information System, is part of the methodological development done by the National Institute for Health Development.

Several reports have been prepared on the topic of outpatient consultations which describe both the content of the data as well as the changes over time. Analyses can be found on the website of the National Institute for Health Development under health data:

**To open the link, click on the image of the analysis*

Introduction

This quality report is on the data collected with the health statistics questionnaire "Outpatient consultations" and the corresponding operational process.

In Estonia, the collection, processing and dissemination of health statistical data is done by the Department of Health Statistics (DHS) of the National Institute for Health Development (NIHD). The NIHD is a research and development institution under the administration of the Ministry of Social Affairs (MSA).

The tasks of the NIHD DHS include the collection, validation, processing and analysis of data, dissemination and archiving of Estonian health statistics, and methodological development of the field, including researching the possibilities for adoption of new data sources. The Department represents Estonia in the field of health statistics at international organisations (WHO, OECD, Eurostat, etc.) and transmits data of Estonian health statistics to them every year. The work of the NIHD DHS in collecting, processing and disseminating health statistics is compatible with international methods and in accordance with the principles of impartiality, reliability, relevance, confidentiality and transparency. The Department is professionally independent in the choice of statistical methods and is responsible for the production and dissemination of health statistical data.

The quality report gives an overview of the data collected with the questionnaire "Outpatient consultations" and the respondents, the process of producing and the principle of disseminating statistics and the quality of the 2017 data. The report is divided into seven chapters. The first chapter on the data collection and processing describes the legal basis for collecting health statistical reports and the collected data. In addition, an overview of the process of collecting and processing data and of the statistical population is given. The second part of the quality report focuses on the organisation of dissemination of statistics, gives an overview of the disseminated data, the metadata accompanying them and the principle of statistical confidentiality. Chapters 3 to 7 explain the principles of the quality of statistical output and conformity with them: relevance, precision and reliability, timeliness and punctuality, coherence and comparability, and accessibility and clarity.

Explanations to the terms and classifications of health statistics encountered in the report can be found in the health statistics dictionary on the NIHD website[1].

[1] The dictionary can be found on the NIHD website www.tai.ee → Health statistics → Metadata: http://www.tai.ee/et/tegevused/tervisestatistika/metaandmed/tervisestatistika-sonastik; direct link: http://pxweb.tai.ee/PXWeb2015/Resources/Info/sonastik/

1. Collection and processing of data

1.1 Mandate for data collection

Pursuant to section 47 of the Health Services Organisation Act, a health care provider (HCP) who has received an activity licence from the Health Board (HB) is required to submit health statistical reports to the institution determined by the minister responsible for the field, that is, to NIHD.

Legal persons providing health care services prepare and submit reports pursuant to their activities. Pursuant to clause 56 (1) 1) of the same Act, the minister responsible for the field establishes with a regulation the requirements for the preparation of reports on statistics, the composition of the data and the procedure for the submission of these.

The questionnaires were established by the Minister of Social Affairs with regulation No. 51 of 7 December 2012, "The requirements for the preparation of reports on health care statistics and economic activities in the field of health care, the composition of the data and the procedure for the submission of these". The minister responsible for the field confirms amended questionnaires with an amending regulation to the aforementioned regulation.

The questionnaire "Outpatient consultations" first used to collect data in 2017 was confirmed with regulation No. 68 of 6 December 2016 of the Minister of Social Affairs. The aforementioned Act and regulations are available both in the *Riigi Teataja*[2] as well as the health statistics subpage of the NIHD website.

Pursuant to subsection 4² (1) of the Health Services Organisation Act, use of the classifications, directories, address details of the State Information Systems[3] and standards of the Health Information System (HIS)[4] is mandatory upon maintaining records of the provision of a health care service. The regulation of the minister establishes that the NIHD determines the target units for every report, guarantees the submissions of reports, collects and validates the data and disseminates aggregate data.

Reports are submitted online via *A-veeb* which is the environment for collecting reports on health statistics. A link for entering *A-veeb*[5] can be found on the NIHD website. Questionnaires together with instructions will be made available on the NIHD website at least one year before the beginning of the reporting period. Questionnaires will be made available to HCPs in *A-veeb* two weeks before the end of the reporting period. Data respondents submitted reports through *A-veeb* for the first time in 2003.

The data of outpatient consultations of physicians and nurses were collected with two questionnaires from 2003 to 2016. The quarterly questionnaire "Physicians' visits and home visits" was used to collect data for compiling short-term statistics and the table "Outpatient care" of the annual questionnaire "Health care provider" was used to collect data about the independent consultations of nursing personnel in addition to visits and home visits of physicians.

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[2] Regulation No. 51 of 7 December 2012 of the Minister of Social Affairs, *Riigi Teataja*: https://www.riigiteataja.ee/akt/122122015027?leiaKehtiv

[3] You can find information about the Information System Authority (ISA) and the classifications used there from the ISA website
direct link: https://www.ria.ee/teejuht/riigi-infosusteemi-olemus-ja-komponendid/millest-koosneb-riigi-infosusteem

[4] You can read more about the Health Information System and the standards and classifications used there on the website of the Health and Welfare Information Systems Centre, direct link: www.e-tervis.ee

[5] You can get an overview of the *A-veeb* environment at www.tai.ee → Health statistics → Report submission environment; direct link: https://aveeb.sm.ee/

As of 2017, data of outpatient consultations of physicians and nursing personnel are collected by occupations with one annual questionnaire, "Outpatient consultations".

1.2 Purpose of data collection and description of variables; questionnaires and guide

The purpose of collecting data of outpatient consultations and producing statistics is to get an overview of the volume of outpatient care done by HCPs providing different outpatient services according to the activity area of the HCP. The report shows independent outpatient consultations – visits and home visits – of physicians and nursing personnel working at a hospital or for an outpatient care service provider.

All legal persons providing outpatient health care services are required to submit reports, except those that only provide emergency medical care, dental care or school health services.

A visit is the meeting of a person requiring medical care or consultation in health issues with a physician or a nurse. Generally, a visit takes place at the workplace of the health care professional at the registered or agreed upon time (reception hours). In case of a home visit, the meeting takes place at the home of the patient.

The data of visits and home visits are collected by the content of the work done, that is, by occupation. Coding of the occupations of health care personnel is based on the ISCO-08 "*International Standard Classification of Occupations 2008*". The NIHD, in cooperation with the Ministry of Social Affairs (MSA), Statistics Estonia and professional societies and associations, has developed a more detailed list of occupations of health care personnel[6] where the fifth and sixth number of the code determine the official title (e.g. 221101 "The work of a non-specialist physician") and the seventh and eighth number determine the sub-title (e.g. 22110101 "Assistant physician").

The list of occupations of physicians and nursing personnel used in the report has been compiled pursuant to the needs of the statistics user. Thirty-seven occupations of physicians and three occupations of nursing personnel have been differentiated. The data about dentists' activities, including consultations, is collected with the "Dentist's report".

The group "Children", that is persons 0 to 14 years old and the group "Adolescents and adults", that is persons 15 years old and older, are presented separately.

The questionnaire on outpatient consultations consists of two tables[7]:

Table 1 collects data of outpatient consultations by occupations of physicians, except dental care;

Table 2 collects data on independent outpatient of nursing personnel, where consultations of family nurses, midwives and home nurses are separately from the total number of consultations of nursing personnel.

The questionnaire is accompanied by the instructions for completing questionnaire which explain the general principles: variables and their definitions, ensuring data collection on a uniform basis and guaranteeing the comparability of statistics over the years. In addition, both intra-report checks as well as relation with other health statistics reports (e.g. "Psychiatric and behavioural disorders") have been presented in the instructions.

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[6] The coding of occupations of health care personnel ISCO-08: http://www.tai.ee/images/PDF/Klassifikaatorid/Tervishoiut88tajate_ametite_klassifikaator2.pdf

[7] The questionnaire and instructions of the questionnaire "Outpatient consultations" can be found on the NIHD website www.tai.ee → Health statistics → References to data providers; direct link: http://www.tai.ee/et/tegevused/tervisestatistika/viited-aruannete-esitajatele

The questionnaire and the instructions for completing questionnaire are available in *A-veeb* as well as on the NIHD website.

1.3 Methodology and statistical procedures

The Official Statistics Act defines that a statistical unit is an object or subject described by the data collected, processed and disseminated in the course of producing statistics. A statistical unit for the purposes of outpatient consultations statistics is both an HCP and its subdivision.

1.3.1 Statistical population

The basis for determining the statistical population of health care statistics is the national register of activity licences for the provision of health services which is administered by the Health Board (HB). The population includes all legal persons who have a valid activity licence for the provision of health care services in the register of activity licences.

Before 2014, the HB issued activity licences with a term of validity of five years. As of 1 July 2014, HCPs receive activity licences with an unspecified term of validity. HCPs might not inform the HB of postponing the commencement of the provision of the service stated on the activity licence or of the termination of the provision of service. Thus, it is not possible to determine whether a unit provided a health care service in the reporting year or which service they provided based solely on owning an activity licence.

To determine the population, the NIHD DHS holds a statistical register on HCPs that is updated quarterly. Different data sources are used in its updates. In addition to the HB information, the units are linked to the data of the relevant year from the Estonian Health Insurance Fund (EHIF), the Business Register (BR) and the Health Information System (HIS), as well as the data obtained straight from the units in the process of data collection.

The statistical register of HCPs includes the following characteristics from the following sources:

- Unique HCP ID-code created in *A-veeb*;
- "Business Register code (source: BR);
- "name of legal person (source: BR);
- "type of owner (source: BR);
- "type of HCP (source: HB);
- "type of hospital (source: HB);
- "legal form (source: BR);
- "places for activity of a legal person (source: HB);
- "contractual relationship with EHIF (source: EHIF);
- "parent and subsidiary status (source: BR);
- "start (and end) of activity licence term (source: HB);
- "activity licence number (source: HB);
- "start and end time of the economic activities of the legal person (source: BR).

The population for the survey "Outpatient consultations" includes all institutions and undertakings that have a valid licence to provide outpatient health care services in the national register of activity licences, except those HCPs that only provide emergency medical care, dental care or school health service. The number of HCPs who will be obliged to submit data is determined as of 15 December of the reporting year. However, should it become evident in the validation of data that some HCP has not had an obligation imposed on them, then it will be added during the data collection period on a rolling basis.

In the 2017 reporting year, the respondents included **948** units providing outpatient services, including 18 subdivisions. Altogether there were **52** hospitals, **478** family doctor's offices and **288** specialist health care providers, **36** rehabilitation care and **40** nursing care providers, and **54** other HCPs. Among other HCPs there are diagnostics providers, dental care providers and general medical care providers (except family doctors). Dental care providers generally do not belong to the target units of the questionnaire on outpatient consultation except the case there are physicians of another group of occupation (e.g. an oral-maxillofacial surgeon) working in the institution that provide outpatient consultations.

1.3.2 The process of data collection and validation

The process of data collection and validation has been divided between statisticians and analysts in the NIHD DHS.

The obligation to report is activated in *A-veeb* by the statistician responsible for the city/county two weeks before the end of the reporting period. This means that the questionnaire for submitting data will be made active in *A-veeb* for all HCPs included in the target population. HCPs are required to submit the report by 1 March of the year following the reporting year at the latest.

In *A-veeb*, every respondent, that is, an HCP and its independently reporting subdivision, has its own unique ID-code. Logging into *A-veeb* and completing questionnaire is ID-login-based. A representative of an HCP can use either an ID-card or Mobile-ID to authenticate themselves. An HCP does not have access to the data of other respondents. The data of all respondents can be seen by employees of the NIHD DHS.

The task of statisticians is to be the main contact person of the respondents, advise them, be responsible for the collection of data using the reminder system agreed upon and to check for initial errors, including results of the automatic checks in *A-veeb*. The task of the analysts is second stage data validation and giving advice to statisticians and respondents in more complex issues.

Initial data validation takes place by means of the automatic checks added to the questionnaires in *A-veeb*. There are three types of data checks in *A-veeb*:

- **table conditions** – checks within tables that look at the existence of data submitted in the rows and columns of tables and the logical relationships between them;
- **form conditions** – checks between tables. In the questionnaire "Outpatient consultations", there is no relation between the data of two tables but there are relations with the data of the other surveys. If there are shown the persons consulted at an outpatient consultation of a psychiatrist in the questionnaire "Psychiatric and behavioural disorders", then the visits of psychiatrists must be reflected in table 1 of the "Outpatient consultations" questionnaire;
- **comparison of reports** – a tool for comparing selected characteristics by years (usable as of the data of 2015). The comparison gives a quick overview of changes in the volume of work and services provided by years and enables to quickly identify likely insufficiently submitted data.

Errors identified with checks are reflected in *A-veeb* by the questionnaire under subpages "Relations" and "Conditions". Control relationships are displayed both verbally and as a formula in a separate table. In case of an error/errors, it can be seen in the comparison of the table columns "Checked" and "OK" where the error was made. If required, the errors can be corrected or exceptions that cannot be regarded as errors due to the specifics of the work of the HCP be explained in the comment field.

Health care providers that did not provide service or have finished activity in the reporting year confirm a so-called zero report in *A-veeb*, that is, they choose the field "Zero report" without completing questionnaire. In case of an uncertainty, e.g. if there is a valid contract with the EHIF or if it is an HCP

that has been actively operating thus far, statisticians will get in touch to confirm that it has not been an erroneous choice.

The submitted data and results of the automatic checks of the web system are reviewed by DHS statisticians. Statisticians get in touch with respondents to specify data and correct them cooperatively, if so required.

In case an HCP obliged to submit data has not duly completed questionnaire or confirmed a zero report, statisticians will send to the unit a reminder via e-mail. After two months, a reminder letter with the signature of the director of the NIHD is sent to the institution that has not submitted a report. Upon further non-submission of the report, the Health Board is notified, which carry out state supervision over the performance of the established requirements pursuant to section 60 of the Health Services Organisation Act. A reminder letter to the institution with information about the potential imposing of a penalty payment is sent by The Health Board.

Data imputation is applied for non-responses which will further be discussed under clause 4.2.

Data collection and initial data quality checking and error correction takes place until mid-April, that is one and a half months after the submission deadline. After that, data will reach the second stage of checking by analysts dealing with a specific health statistical topic during which the data will be processed and relations between data will further be checked.

The target units who have provided outpatient care services and the data of their treatment cases are compared with the dataset of EHIF contractual partners in the processing of data. It must be considered that not all providers of outpatient services are contractual partners of EHIF and EHIF does not fund all health care services[8]. The purpose of the comparison is to determine whether the units that have entered into contracts submit reports to NIHD. It can also be assessed how large is the volume of health care services that remain outside the volume of EHIF contracts.

There were 752 HCPs out of 948 providing outpatient services who had a contract with the EHIF in 2017, all of whom also submitted data to the NIHD. All family doctor's offices, 44 out of 52 hospitals, 177 out of 288 specialist health care providers, 24 out of 40 nursing care providers and 5 out of 36 rehabilitation care providers, altogether 79% of all units, were contractual partners of EHIF.

The data of outpatient consultations are compared to the data of the previous years. In this stage, data from other reports submitted to *A-veeb* by the same institution, such as "Health care personnel", "Hourly wage of health care personnel" and "Psychiatric and behavioural disorders" are also included in the checking. If there are large changes in the volume of the unit's activity or services provided then the data is first compared to the information provided in other reports, if possible (e.g. new/departed employees, increase/decrease in service sales volume). If changes are not explained by other reports, the data provider is contacted, and it is clarified whether there are mistakes in the submitted data and what are the reasons for the changes.

In general, an additional check will be performed if the data has changed by one fif

[8] The Estonian Health Insurance Fund pays for the health care services of an insured person only in the case the health care provider has a contract with the Health Insurance Fund and the Fund only pays for those health care services that are included in the list of health care services and the provision of which has medical reasons.

th or more and also if consultations of jobs that have not occurred before have been added or vice-versa. For example, if a family doctor's office presents data on the consultations of a gynaecologist or a midwife that have not occurred before and the health care personnel report also does not show persons working on these jobs. Since the reports cover different time periods ("Health care personnel" is submitted on November) there may be differences between data in some cases.

Relation between visits and treatment cases are also checked. For example, table 1 of the questionnaire covers psychiatrist visits by adults and children, which is compared to the number of persons who have received outpatient consultations by psychiatrists presented in the questionnaire "Psychiatric and behavioural disorders". This means that the total number of outpatient visits of psychiatrists should generally be larger than the total number of persons consulted.

In case of differences, data providers must provide explanatory comments to the data. In the absence of explanations, the data provider will be contacted for data specification.

In 2017, nearly 200 data providers were contacted (19%) and asked for specifications on the provided data. Feedback was received from almost every HCPs, half of whom made corrections to the submitted data. As previously mentioned, a large part of the questions was related to a significant increase or decrease in the number of consultations by physicians and/or nurses, and to the specification of jobs. If there have been consultations of some job, the person working on that job should be shown, and vice-versa. Less than half of the specifications to the questions did not bring any correction in the data. Some of them were informative to the person checking the data, however, they were a burdensome factor to the respondent, both in terms of time and resources.

Some errors in the reports may be corrected by NIHD statisticians themselves. There are often situations where the data provider has not filled in subfields in the table of the independent work of a nurse (table 2). For example, family nurse consultations have not been presented separately from the total number of consultations of nursing personnel. This error can be corrected by a statistician on their own, if the data provider is a family doctor's office and person working as a nurse has been shown in the "Health care personnel" or "Hourly wage of health care personnel" report. To avoid the same error next year, statisticians will notify the data provider of the error via e-mail. There are sometimes errors also made in data rows. For example, data have been mixed up between rehabilitation physicians and occupational health physicians or physicians of internal medicine and family doctors. Mix-ups of adult and child rows have also occurred in completing questionnaire.

Even though almost all jobs of health care personnel are represented in the list in the report, there are still cases of consultations being marked on line No. 38 "Other" of table 1 of the questionnaire. According to the instructions for completing questionnaire an explanation about job's visits must be provided to the comment field of the questionnaire upon filling in the row. In general, the field remains empty after specification and the consultations can be classified to the jobs in the list. In 2017, only consultations of laboratory physicians which are not in the list remained on the row "Other".

Upon analysing the 2017 data, a significant decrease of consultations of family doctors could be observed. If in previous years, the decrease in the consultations of family doctors could be observed in relation to the increase of independent consultations of nursing personnel, then in this year, the number of independent consultations of nurses did not increase. The number of family doctor's offices also decreased in 2017, however, the decrease was not due to a decrease in the volume of work of family doctors. It became apparent that an amendment had been made to the marking of automatic issuing of a repeat prescription in the information system of family doctors (the Medisoft programme). This means that if the programme previously marked a recurring prescription extension as a repeat visit, EHIF health service code 9002[9], then as of March 2017, it may be coded with code 9018, which is a phone consultation. Since the data about phone consultations of physicians are not collected by

[9] Annex 8 to the EHIF funding contract of general medical care. Codes of activities within capitation https://www.haigekassa.ee/sites/default/files/%C3%9CRL%202018/%C3%9CRL_lisa_8_2018.pdf

the NIHD and the related change was in EHIF service codes, then the 2016 and 2017 EHIF data had to be compared to assess the effect of the change. The number of phone consultations increased twice in the comparison of EHIF statistics on health care services of the two years[10].

1.4 Changes in data collection and variables

The variables of the questionnaires confirmed with the regulation is amended pursuant to need but no more frequently than once per year for next year's reporting.

Changes in questionnaires are related to the addition of new health care services and treatment methods, restructuring or amendments to classifications in use. Updates to questionnaires have been brought along by addition of new data sources or updating is required due to international obligations of the Republic of Estonia. Amendment proposals are made by analysts working with specific data and statistics users: professional societies of the health field, HCPs, the MSA, etc. Proposals are discussed with the MSA and the relevant professional societies within whose competence is the coordination of the topics of this medical field. The relevant professional societies and HCPs will be notified of changes in questionnaires and asked for their opinion already in the drafting process, but during draft coordination at the latest. Updated questionnaires are approved with a regulation by the minister responsible for the field before the beginning of the reporting period and HCPs and software developers will be notified of thereof at the training courses of respondents which take place at the end of every year[11]. Training materials will be made available on NIHD websites tai.ee and terviseinfo.ee and they will be added to the section of health statistics trainings. In addition, HCPs will be sent a circular letter and the main companies offering IT-support to HCPs will be informed.

In 2017, trainings for respondents of health statistics were held in Toila, Tartu and Tallinn. 198 people participated in the three events altogether (about 14% of HCPs), 233 registered beforehand. 97% of participants in Tallinn, 95% in Tartu and 91% in Toila were completely or rather satisfied with the training (figure 1).

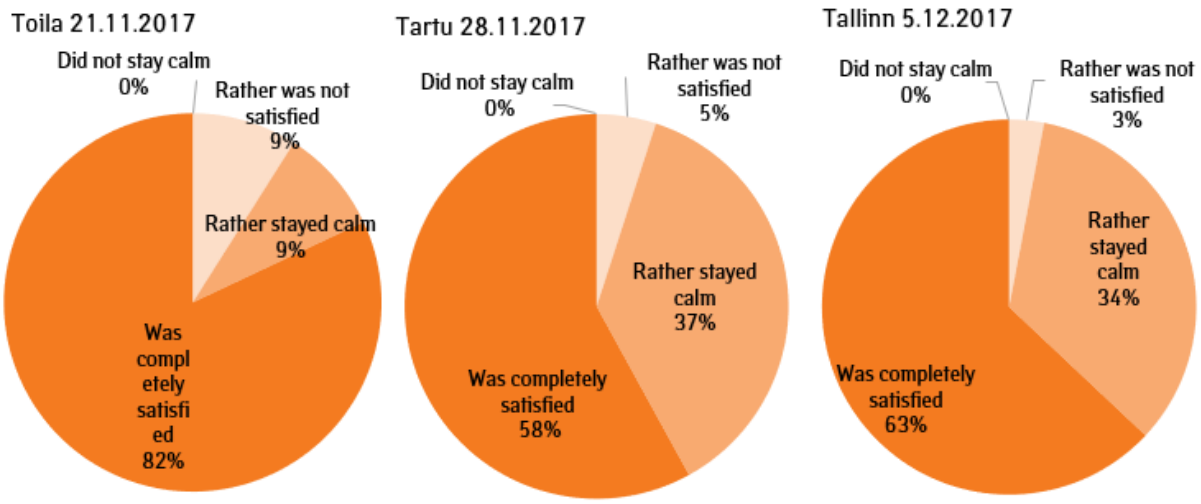

Figure 1. Participant satisfaction with the training of respondents in Toila, Tartu and Tallinn, 2017

[10] EHIF statistics on health care services. https://www.haigekassa.ee/haigekassa/aruanded-eelarve-ja-statistika/finantsnaitajad/tervishoiuteenuste-statistika

[11] Training materials can be found on the NIHD website www.tai.ee → Health statistics → Trainings & events; direct link: http://www.tai.ee/et/tegevused/tervisestatistika/koolitused-ja-sundmused

1.5 Reporting burden

The reporting burden must be limited to the least possible resource cost for HCPs. Therefore, the purpose of NIHD is to reduce the respondent burden over time based on the expansion of opportunities to adopt administrative data sources. Administrative data sources will be used in every possible case to avoid repeated requests for data.

One administrative data source for producing statistics on consultations would be EHIF data which include information based on treatment invoices, that is, only data of cases paid for by EHIF. Services paid for by patients, however, are not reflected there. In addition, the EHIF does not have data on those HCPs that do not have the relevant EHIF contract.

Another alternative would be the HIS, but the quality of reported data is still not high enough to produce reliable statistics. The NIHD conducted a survey in 2017 which analysed the 2015 data of outpatient consultations submitted to HIS by family doctor's offices. The results of the survey[12] revealed that the coverage of submitted data on consultations was very low – just 22% compared to NIHD data. It was confirmed that the HIS data does not allow to differentiate consultations between physicians and nurses and there are challenges in information exchange between different parties.

A survey about submitting data to HIS was conducted among specialist health care providers. 30 out of 90 institutions (33%) involved in the sample gave feedback. The survey showed that 282 (98%) specialist health care providers had interfaced with HIS in 2017 and just 187 HCPs (66%) had submitted at least one document to HIS. Non-submission of data was justified several times with the reason that the health care provider did not have an EHIF contract and was therefore not obligated to submit data. Non-submission was also justified with protecting the patient's interests and the patient's request not to communicate data to third parties, this especially in case of psychiatric and other extremely delicate data.

The NIHD DHS has not assessed the reporting burden on HCPs in the submission of reports of health care statistics. In case other amendments are made to data collection, the proposals will first be discussed with partners concerned by the amendments. The possibilities to obtain required data will be determined, as well as how much resources should be spent to get a result with a high enough quality.

[12] Outpatient consultations of family doctor's offices in the data of the Health Information System in 2015. https://intra.tai.ee//images/prints/documents/149872658710_Perearstiabiasutuste_ambulatoorsed_visiidid_tervise%20infos%C3%BCsteemi%20andmetes_2015_a.pdf

2. Dissemination of statistics

Statistics are disseminated pursuant to the dissemination policy of health statistics[13]. The dissemination policy determines the products and services of health statistics, dissemination principles, quality requirements for statistics and data protection rules. All statistics users receive equal treatment, the data are released simultaneously to all users. The release dates of statistics are public and announced beforehand.

Health statistics are first published in the Health Statistics and Health Research Database[14] (HSHRD). Data about outpatient consultations are disseminated under HSHRD topic "Use of healthcare and reasons for treatment" under the name "Outpatient visits and home visits"[15]. Data have been presented about Estonia as a whole and by occupation of health care personnel, HCP location on the county level and by HCP service type. It is important to consider with these statistics that this is a health care provider's view that does not show patients by their place of residence.

In table AV10, outpatient and home visits of physicians have been presented by occupation, age group and county. These data have been presented as a ratio per 1000 inhabitants in table AV13. In table AV20, outpatient and home visits of physicians have been presented by patient's age group and type of HCP. Outpatient and home visits of nursing personnel and midwives by patient's age group and type of HCP have been presented in table AV30. In addition, outpatient and home visits of family doctor's offices by patient's age group and HCP's county have been presented separately in table AV40. In table AV41, outpatient and home visits of physicians have been presented by patient's age group and HCP's county.

The analyst working with the data and the Head of the DHS are responsible for the dissemination. The data are updated once a year pursuant to the release calendar. The date of last update is added to every HSHRD table under "General information". Metadata which include used terms and methodology are presented beside every data table. Errors found in already disseminated data will be corrected and users will be notified of corrections in the comments under each table. In general, the table footnotes include explanations to amendments made in the past year.

2.1. Notification of release

The frequency and dates of releasing statistics are announced in the health statistics release calendar[16]. Next year's release calendar will be published at least three months before the beginning of the year of data collection. The dates in the calendar follow the duration of stages of statistics production agreed upon in the work plan of the department. Release dates for the statistics in the database are available in the calendar both chronologically and by database topics. Upcoming release dates will be announced on both www.tai.ee and www.terviseinfo.ee home pages under the events section. The relevant statistics in the database will be made available to statistics users on the release date at 10 a.m.

[13] The dissemination policy of health statistics is available on the NIHD website www.tai.ee → Health statistics → Policies; direct link: http://www.tai.ee/images/PDF/Tervisestatistika_levipoliitika.pdf

[14] Health Statistics and Health Research Database: www.tai.ee/tstua

[15] Direct link to statistics of outpatient consultations: http://pxweb.tai.ee/PXWeb2015/pxweb/et/03Tervishoiuteenused/03Tervishoiuteenused__01Vastuvotud/?tablelist=true

[16] The release calendar is available on the website of the NIHD www.tai.ee → Health statistics → Health statistics release calendar or the website of the Health Statistics and Health Research Database; direct link: http://pxweb.tai.ee/PXWeb2015/Resources/Info/avaldamiskalender.html

Facebook news have been published on statistics of outpatient consultations which are prepared by the analyst in charge and coordinated with the Head of department and the Head of public relations of the NIHD before publication. The news is published either by the Head of public relations or by the database administrator and it can be read via the Twitter news feed on the front page of the database, tai.ee and NIHD Facebook page, and the newsletter. The news contains a short overview of the disseminated data.

2.2. Metadata

Metadata have been published in HSHRD and tai.ee website under the health statistics subpage[17]. In addition to the aforementioned, a health statistics dictionary has also been published there from which one can find explanations to terms in the field of health statistics.

Publication of metadata in HSHRD together with statistics creates context to disseminated data for data users. The availability of metadata supports clarity and unambiguity in the use of data and eliminates interpretation of data in a manner that is not methodologically correct.

Metadata published in HSHRD include:

- explanations to the characteristics used in data collection and dissemination;
- a short overview of methodology;
- descriptions of classifications used in data processing;
- tables of equivalences for classifications in case there have been changes to classifications used in the published time series;
- references to literature related to the topic;
- the date of update of data tables;
- in case of correction of disseminated statistics, an explanation in the comment section under the table about which data were revised and when. Footnotes can generally be seen for one year as of making the correction.

In case a user need to specify the contents of data tables or metadata, contact details of the analyst working with the statistics of the relevant field can be found under the link "Terms and methodology".

Metadata are corrected when changes are made to the methodology in use, for example, by way of supplementing classifications or variables, updates to data collection, etc. Corrections to the data of outpatient consultations (the quarterly questionnaire that was valid back then) were made in 2015 in relation to the introduction of new physician's occupations and updates. With the implementation of a new questionnaire in 2017, the variables of both outpatient visits and home visits of physicians and nursing personnel was changed – visits of occupational health nurses are no longer presented separately from the independent consultations of nursing personnel, nor are data any longer collected on the work of school health care provider. In addition, consultations due to illness are no longer presented separately from the total number of consultations. In addition to the consultations of midwives and home nurses, family nurse visits and home visits are also presented separately in the table of independent consultations of nursing personnel.

[17] Information is on the NIHD website www.tai.ee → Health statistics → Metadata; direct link: http://www.tai.ee/et/tegevused/tervisestatistika/metaandmed

2.3. Confidentiality

Statistical confidentiality means that the privacy of respondents is guaranteed, the data they submitted is only used for statistical purposes and the information will not be disclosed to third parties. Upon observing confidentiality, the respondent cannot be directly or indirectly identified based on the disseminated data.

The DHS observes the Official Statistics Act and the European Statistics Code of Practice in the dissemination of data, both of which determine the rules of statistical confidentiality. Data will be disseminated with such a level of aggregation that the contents of one field in a data table is composed of statistics received from at least three respondents, except for county data. The data protection rules applied in the dissemination of health statistics are established in the dissemination policy of health statistics. Ensuring confidentiality regarding statistics of outpatient consultations has not required the application of additional methodologies.

2.4. Other information about dissemination

The NIHD DHS regularly submits Estonian health and health care statistics to international organisations: Eurostat, WHO and OECD. The links to the databases of these organisations are available on the NIHD website[18].

3. Relevance

Relevance means the compatibility of statistics with the users' need. The disseminated information must be relevant and necessary to the users, as sufficient as possible and the collection and dissemination of data lacking public interest should be forgone.

Health statistics data are used by specialists organising the health care system, both on the state and local municipality level, as well as HCPs themselves and research and educational institutions. Health statistics data are used in devising policies, development plans, development of strategies and concepts, preparing analyses, reports and statistical overviews and in research and teaching. In addition, international obligations are also considered in planning data collection, if possible.

A survey on needs of data users is conducted after every third year and the latest survey was in 2018, the summary of which is being prepared. The results of the survey conducted in 2014 and the answers on the proposals made have been published on the NIHD website[19].

Statistics users were interested in adding midwifery care providers as service providers to the division of data of outpatient consultations. Yet, since there are only a few independent midwifery care providers, they have not been presented separately from nursing care providers. However, the data on visits and home visits of midwives have been published.

It was observed in the pilot study on joining the former quarterly questionnaire "Physicians' visits and home visits" and table 3 "Outpatient consultations" of the annual questionnaire "Health care provider" that a statistics user (including the Association of Family Doctors of Estonia) needs the data about

[18] Information is on the NIHD website www.tai.ee → Health statistics → Dissemination of data; direct link: http://www.tai.ee/et/tegevused/tervisestatistika/tegevused/andmete-avaldamine

[19] Information is on the NIHD website www.tai.ee → Health statistics → Activities → Statistical works, direct link: http://www.tai.ee/et/tegevused/tervisestatistika/tegevused/statistikatood

family nurses separately from the independent consultations of nursing personnel, therefore, the requirement was fulfilled and the amendment was made to the 2017 questionnaire.

In the latest data users' survey, conducted in 2018, proposals were made for the requirement of comprehensive and more detailed statistics of consultations, for example, a division of consultations by patients' age groups of five years and a distinction between men and women is also required.

With the current method of data collection, respondents upload aggregated statistics to the *A-veeb* table, which means that people are not able to be matched to their diagnoses and the services provided to them. Regarding the developments of the HIS, there is a hope of using an individual dataset of patients as a data source in the future, which would allow to expand opportunities for analysis and provide more detailed statistics to users of data. At that, it is important to attain a high enough quality and coverage of HIS data for this purpose.

After every three years, the DHS conducts a survey among users of health statistics to find out who are the users of health statistics, that is, the users of the HSHRD, what are their data requirements and whether the disseminated statistics meet their requirements. The latest health statistics user survey was conducted in 2016, previous surveys took place in 2013, 2010 and 2007. The report on the user survey is published on the NIHD website[20]. According to the health statistics user survey, the most used information transmission channel is the Health Statistics and Health Research Database, followed by publications and analyses, metadata and press releases in the field of health statistics. The number of followers of the release calendar has increased.

4. Accuracy and reliability

Statistics reflect reality in an accurate and reliable manner. The submitted data and the statistical output are regularly evaluated and their correctness checked. Sampling errors and non-sampling errors are measured, and the statistics production process is improved as a result of the analyses.

The statistics of outpatient consultations are based on a complete sample of outpatient service providers which excludes sampling errors and the DHS is consistently doing focused work to ensure the quality of data.

4.1. Response rate

The statistical population of the 2017 survey "Outpatient consultations" included 948 HCPs. The data were submitted on time for 1 March 2018 by 645 HCPs, which is 68% of the units in the population (see table 1). After reminder letters were sent, a further 299 units submitted the report. Thus, there were 939 units that submitted the report, that is 99% of the units in the population. Sixteen HCPs did not submit a report, eight of them terminated their activity in the reporting year.

Table 1. HCPs that provided outpatient services and the response rate in the 2017 report

	Number of HCPs	Response rate
Population	**948**	**100%**
… submitted the report on time	645	68%
… submitted the report before data aggregation	939	99%

[20] Reports are published on the NIHD website www.tai.ee → Health statistics → Activities → Annual reports & reports, direct link: http://www.tai.ee/et/tegevused/tervisestatistika/tegevused/aastaaruanded-a-raportid

To compensate for non-responses, data were imputed for eight HCPs on the basis of the data of the previous periods. There were 63 zero reports, including HCPs that terminated their activity in the reporting year and also new health care providers that received activity licences but did not begin providing services in the reporting period or did not do outpatient consultations. The final response rate, together with imputed reports, was 99.6%.

4.2. Data loss and imputation

Upon non-responses, imputation is used in statistics production: both full imputation which means the assignment of data for an independently active non-responded unit, as well as partial imputation which means filling in the data gaps in the submitted report.

Upon imputation of the number of consultations, the service provision volume of the three previous years of the unit is taken into account and the missing values are added using the arithmetic mean of the three years. In case there are no data from previous years on the unit, the profile of the unit is taken as a basis for imputation: the number of employees, place of operation on a county level, services provided, average number of visits and home visits, and a similar donor unit is looked up whose data of the past three years can be used for imputation. Data is imputed for active units. Demographic attributes characterising a unit are added to the analysis from the DHS statistical register.

In 2017, the data of eight units were imputed based on the existing information of consultations.

4.3. Assessment of over-coverage and under-coverage

The population of the survey "Outpatient consultations" includes all units with a valid licence to provide an outpatient service issued by the Health Board. Information is available on the activities of units in the 2017 population, therefore the possibility of under-coverage is minimal.

It is important to consider in the over- and under-coverage assessment of the data of outpatient consultations that nearly half of the volume of outpatient consultations is made in family doctor's offices. Therefore, primarily changes occurring in the organisation of work of general medical care affect the number of outpatient consultations.

In 2017, a technical change was introduced to the information system of family doctors (see last paragraph of clause 1.3.2) due to which the number of visits of family doctors decreased by 11% compared to 2016. By adding EHIF treatment invoice data to the comparison, where there were 7% fewer visits of family doctors in 2017 than in the reporting, and by taking into account the average change per year of the last ten years (-0.3%), it can estimably be said that there is an over-coverage of up to 4% in the visits of physicians.

Most of home visits of physicians is also made by family doctors. Among specialists, oncologists make the most home visits, accounting for 7% on average of the total number of home visits. By comparison, using EHIF treatment invoice data on home visits of family doctors, they show an up to 12% difference compared to reporting data, depending on the year. In the reporting data, the average annual decrease over ten years in home visits of family doctors is up to 11%. However, it was specifically 2017 when the number of home visits of family doctors increased by 5.5% compared to 2016, even though EHIF data show an 11% decrease.

The number of consultations of nursing personnel has gradually increased in ten years, 17% in a year on average. Considering the decisions made in the health care system (in 2010, nurses were given additional rights for independent work; in 2013, additional funding for a second family nurse was implemented, etc.) which led to the growth in consultations of nursing personnel, it is also reflected in the data of outpatient consultations. The growth rate of visits of nursing personnel slowed down in

2017 compared to previous years. Feedback from HCPs revealed that in previous years, data occasionally included both manual activities of nursing personnel as well as phone consultations, which, however, are not regarded as independent visits of a nurse. As with physicians, the visits of family nurses constitute the majority (70%) of the visits of nursing personnel. EHIF data show that phone consultations account for nearly 40% of the work of a family nurse. Therefore, the fast increase in visits of nursing personnel and their volume may be overestimated according to reporting data.

In fact, there is no good comparative dataset in Estonia to assess the over- or under-coverage of the data of outpatient consultations. The data collection methodology of EHIF is based on the funding of a service and contracts entered into with HCPs which, however, excludes those consultations paid for by the patients themselves and those HCPs that do not have a contract with EHIF. Therefore, the assessment of over- and under-coverage is inaccurate.

5. Timeliness and punctuality

Punctually released statistics will be made accessible to users on the previously announced date and time. Upon a change in the due date the users will be notified ahead and an explanation for the change of date will be provided. Timeliness measures the time delay between the reference period in which the data were collected and the time the data were released. Both the requirements of users as well as the time spent on statistics production are taken into account in the implementation of timeliness. It is important to release analysed results as soon as possible after the reporting period and to allow the user to use the data that is as current as possible in a longer time series.

The completed health statistical questionnaire "Outpatient consultations" is submitted by HCPs by 1 March of the year following the reporting year. Determining the release date of data is based on the NIHD DHS work process time table for the production of statistics of outpatient consultations. The data of outpatient consultations are released in the HSHRD in the beginning of the fourth quarter of the year following the reporting year. The release of the statistics of outpatient consultations has not been postponed before, but in 2018, the release date was postponed by two days which was announced in the release calendar two months in advance.

Considering the two-stage data checking and the summer vacations of respondents, it is not possible to bring the release dates significantly more forward. Compared to neighbouring states, our release dates are indeed later. Both in Latvia and Finland, statistics on outpatient consultations are released in the first half of the year. We communicate data to international data queries on time.

6. Coherence and comparability

Statistics are consistent over time, definitions and methodology do not change. Statistics are produced on the basis of unified classifications and standards. Equivalent data from different sources can be combined and used together. Upon an interruption in comparability over time or introducing changes to definitions and methodology, the reasons for the break in the time series will be explained. Even if chronological continuity is maintained or a so-called bridge made to continue the time series while making methodological changes, it is necessary to describe the changes to statistics users and this description is publicly available for everybody.

The predecessors to the annual questionnaire "Outpatient consultations" were the quarterly questionnaire "Physicians' visits and home visits" and the table "Outpatient care" of the annual questionnaire "Health care provider". The aforementioned questionnaires have been in use in the *A-veeb* collection environment since 2003. Data on outpatient consultations were then collected on 33 physician's occupations.

- **In 2004**, a 34th physician's occupation was added – emergency medicine physician; independent consultations of nursing personnel were not differentiated by occupation and were collected as one consolidated row.
- **In 2005**, the series for phone consultations by physicians was added to the annual questionnaire.
- In 2009, separate series were added for the consultations of home nurses, midwives and occupational health nurses under the independent consultations of nursing personnel.
- **In 2011**, consultations of providers of school health services were added to the annual questionnaire.
- **In 2015**, regarding amendment to regulation No. 110 of 28 November 2001 of the Minister of Social Affairs "List of specialist fields of specialised medical care" which entered into force on 1 January 2014 (adopted 20 June 2013; published RT I, 28 June 2013) where cardiac surgery and vascular surgery specialities were detached from cardiovascular surgery, the relevant occupations of physicians were added to the list of occupations of the quarterly questionnaire – "Cardiac surgeon" and "Vascular surgeon". In addition, the relevant official titles of two new specialities were added to the list of occupations of physicians – "Allergist-immunologist" and "Medical geneticist" and the titles of three occupations were updated without changing their content: "General practitioner, resident" was substituted with the words "Non-specialised physician"; "Traumatologist-orthopaedist" was substituted with "Orthopaedist"; "Oncologist (radiochemotherapy)" was substituted with "Oncologist (radiation and chemotherapy)".

In 2017, data collection for outpatient consultations stopped using two different questionnaires and statistics of outpatient consultations of physicians and nursing personnel started to be collected on one annual questionnaire. The introduction of the questionnaire "Outpatient consultations" was preceded by coordination with respondents, statistics users and organisers of the health care system and a pilot study was also conducted to avoid subsequent differences of opinion. The use of two questionnaires was stopped because changes in the Estonian health care system are no longer as fast and there is no need for short-term statistics. This also brought along a significant decrease in the administrative load of HCPs.

The data of outpatient consultations is compared to the data collected with the questionnaires "Health care personnel", "Hourly wage of health care personnel" and "Psychiatric and behavioural disorders".

Data on consultations are also compared to the data from the EHIF dataset. The EHIF dataset is based on the invoices of the funding of health care services and is affected by the choice of contractual partners, the volume of contracts entered into and the performance of these volumes. Therefore, the EHIF dataset only includes a part of provided outpatient services. The missing part consists of cases the patient paid for in full. Therefore, the EHIF dataset on its own is not sufficient to compare with the statistics of outpatient consultations collected by NIHD or to use as a substitute data source to produce national health statistics. However, consultations on EHIF treatment invoices are compared on the basis of health service codes with the reporting data of NIHD to ensure the quality of the data of NIHD.

Health statistics are based on international methodology and are therefore comparable with the statistics of other EU, WHO and OECD states – e.g. number of consultations of physicians per inhabitant. The data on outpatient consultations by doctors is collected internationally, this includes both visits of family doctors as well as specialists in the offices of health care personnel and visits in the homes of patients, or, in our terms, visits and home visits. Consultations do not include phone consultations, laboratory studies, visits of dentists or consultations of nursing personnel (OECD)[21].

[21] OECD Health Statistics 2018 Definitions, Sources and Methods - file:///C:/Users/evaa/Downloads/HEALTH_PROC_1_1_Doctors%20consultations%20(in%20all%20settings).pdf

7. Accessibility and clarity

The released statistics must be accessible, easily found in terms of physical location, their release format comprehensible and supplied with instructions for the user. The instructional materials contain explanations about the release format and the possibilities to change it, about making a request for information and an overview of the rules of responding to it, and a price list of paid services. The principle of clarity in statistics means that data have been released with a high enough level of detail and quality, and that they are clearly and unambiguously understood.

The data collected with health statistical reports are released in the public NIHD health statistics database HSHRD. Data tables about statistics on outpatient consultations are published under database topic "Use of healthcare and reasons for treatment" under the name "Outpatient and home visits". Table headings include information about the contents and figures of the table. All data collected with the questionnaire have also been disseminated.

Variables and their definitions, classifications used in data collection, also the data collection methodology together with questionnaires and instructions are included in the section "Terms and methodology" beside the table.

Instructions on the front page of the database give an overview of the possibilities of using the database. A user is able to formulate data tables according to their needs in HSHRD, download them in different file formats (px, xlsx, csv, json) and create figures. In case the detail level of HSHRD data is not sufficient for the user, it is possible to make a request for information to the NIHD to ask for additional information. A response to the request for information is given in five working days as of the working day following its registration. Response to a request for information is free. If compliance with a request for information requires additional analyses, the request for information is classified as a custom order. A custom order has to be coordinated with the NIHD DHS.

References

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Health and health care statistics:

- **Health statistics and health research database**
  http://www.tai.ee/tstua
- **Website of Health Statistics Department of National Institute for Health Development**
  http://www.tai.ee/en/r-and-d/health-statistics/activities
- **Dataquery to National Institute for Health Development**
  tai@tai.ee
- **Database of Statistics Estonia**
  http://www.stat.ee/en
- **Statistics of European Union**
  http://ec.europa.eu/eurostat
- **European health for all database (HFA-DB)**
  http://data.euro.who.int/hfadb/
- **OECD's statistical databases (OECD.Stat)**
  http://stats.oecd.org/index.aspx?DataSetCode=HEALTH_STAT