Quality Report on the Statistics of Emergency and Reception Departments Work

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The **mission** of the National Institute for Health Development is to create and share knowledge for influencing the attitudes, behaviour, policies and the environment with evidence-based information with an aim of improving the well-being of the people in Estonia.

Contents

Summary

The report is on the quality of the statistics on the work of emergency and reception departments in 2018. Statistical procedures used to guarantee the quality of data are described in the report.

As of 2018, emergency medical care services are provided in all regional, central and general hospitals and one local hospital in Estonia.

Data on the work of emergency and reception departments (ED) is collected with the questionnaire "Hospital". In 2018, all 19 hospitals that provide emergency medical care services submitted data on their activity. Data was submitted in due time. The errors of collected data have always been corrected in cooperation with the contact person of the health care service provider (HCP) and published data is reliable. All collected data have been published in the Health Statistics and Health Research Database (HSHRD).

Statistics users are interested in a more detailed breakdown in comparison with the available data thus far. An overview of recipients of emergency medical care services is required by gender and age of the patient and their reason for contact. At the current methodology of data collection, health statistics offer a health care provider's view of the services provided, not the individual's, i.e. the patient's view. In relation to 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. Here, a good coverage and quality of data must be guaranteed. Introducing administrative data-sources and validating their data, including the data submitted to the Health Information System, is part of the methodological development work at the National Institute for Health Development (NIHD).

The work of emergency departments has not previously been separately analysed by NIHD, however, the "Development Plan of the Speciality of Emergency Medicine until 2020" (1), which was prepared in 2012, and the National Audit report "Emergency Medicine" (2) completed in 2018 are available.

Introduction

This quality report has been prepared on the statistical survey of **emergency and reception departments (ED) work for which data have been collected with the questionnaire** "Hospital".

In Estonia, the collection, processing and dissemination of health 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 complies 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 on the work of EDs of hospitals and the respondents, the process of producing and the principle of disseminating statistics and the quality of the 2018 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 (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 data to the institution determined by the minister responsible for the field, i.e. to NIHD (3).

Legal persons providing health care services prepare and submit data pursuant to their activities. Pursuant to subsection 56 (1) clause 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 list of variables 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" (4). The minister responsible for the field confirms amended questionnaires with an amending regulation to the aforementioned regulation.

Pursuant to subsection 4[2] (1) of the Health Services Organisation Act, use of the classifications, directories, address details of the State Information Systems[1] and standards of the Health Information System (HIS)[2] 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 survey, guarantees the submissions of data, collects and validates the data and disseminates aggregated data (3).

Data are submitted online via A-veeb which is the environment for collection of data on health statistics (5). A link for entering A-veeb[3] can also 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 reference period. Questionnaires will be made available to HCPs in A-veeb two weeks before the end of the reference period. Data respondents submitted data through A-veeb for the first time in 2003.

Data on the work of the ED was first published in 2006 when a section on emergency medicine was added to the questionnaire "Hospital", collecting data on the existence of an emergency department, number of emergency care patients, and their means of arrival and departure.

1.2 Purpose of data collection and the description of variables, questionnaire and guide

The aim of collection of data and compilation of statistics on the work of the ED is to get an overview by type of HCP (type of hospital). There are seven types of hospital in Estonia, four of which provide emergency medical care services (regional, central, general and local hospital). The data about the existence of an ED, number of beds intended for treatment of emergency care patients and on the

[1] Information on classifications used by the State Information System Authority (RIA) and in the state information system is available at the website of RIA https://www.ria.ee/.

[2] 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 at https://www.tehik.ee/

[3] 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/

arrival and departure of emergency care patients are presented in three tables of the questionnaire (Annex 1).

Questionnaire "Hospital" is mandatory for all health care service providers that hold an activity licence for provision of inpatient health services, whereas the data in the section 10 of the questionnaire "Work of the Emergency/Reception Department" shall be provided by all hospitals that have a reception department or room for admittance of emergency patients.

Although the meaning of emergency care has not been defined in the Health Services Organisation Act, a definition that was agreed upon in the work group for definitions of health care statistics of the Ministry of Social Affairs has been set out in the guidelines of the questionnaire "Hospital".

Emergency care	is a health care service that the health care service provider provides as part of emergency aid and/or outside the waiting list.

Other variables regarding the emergency department covered in the questionnaire are defined as follows:

Emergency patient	is a patient who requires urgent or emergency care, i.e. the patient is acutely, seriously ill, injured or requires psychiatric care. This includes patients who require unscheduled urgent emergency care or require care for their own safety.
Emergency Department (ED)	a department at a hospital, with instruments and furnishings that comply with the requirements established for types of hospitals, which provides all emergency care services.
Reception department/room	admittance of emergency patients in a department/room that does not have to conform to the requirements of an emergency department, e.g. specialised emergency admittance in a first aid centre or in the psychiatric, paediatric, ophthalmology, gynaecology department (except for all labours as these are not considered emergency care), etc.

Table 10.1 of the questionnaire reflects the existence of an ED and/or reception department/room intended for admittance of emergency patients and number of beds in the ED.

Tables 10.2 and 10.3 include information on the arrival and departure of only emergency patients and are based on the medical history.

In Table 10.2, emergency patients are divided by their means of arrival and age group (persons aged 0–14 and persons aged 15 and older). Means of arrival are divided as follows: ambulance, referral from another health care institution, arrived independently, other. "Other" includes patients who were transported by the police, emergency medical care call-backs and referrals of health care personnel working at the same hospital.

Table 10.3 illustrates departures from the department on the basis of the data from "Result" section of the patient record and data from the operation protocol of the medical history of hospital admissions who received surgical care. "Hospitalised patients" – subdivided into patients who received emergency surgical and conservative care.

The questionnaire is accompanied by instructions which explain the general principles for completing questionnaire: variables and their definitions, ensuring data collection on a uniform basis and guaranteeing the comparability of statistics over the years. In addition, both internal checks in questionnaire as well as relation with other health statistics data have been presented in the instructions.

Questionnaire and its instructions are available in the A-veeb (5) as well as at the website of NIHD (http://www.tai.ee/et/tegevused/tervisestatistika/viited-aruannete-esitajatele). The section 10 of the questionnaire "Hospital" has been added to the report (Annex 1).

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 of the current survey includes the HCP or 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 statistical 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 on the basis of an activity licence whether and what type of health care service a unit provided in the reference year.

To determine the statistical 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 HCPs.

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

- HCP's unique 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 of the survey on the work of ED includes all HCPs that hold an activity licence for provision of inpatient health care services and emergency medical care services. The number of HCPs required to complete the questionnaire is fixed as at 15 December of the reference year.

Respondents of reference year 2018 included **19 hospitals**, including three regional hospitals (North Estonia Medical Centre, Tartu University Hospital and Tallinn Children's Hospital). Tallinn Children's Hospital provides emergency medical care only to children. The level of help provided by EDs of central hospitals (Pärnu Hospital, East-Viru Central Hospital, East-Tallinn Central Hospital and West-Tallinn Central Hospital) does not significantly differ from that provided in EDs of regional hospitals, the only difference is the absence of consultation and treatment options offered by certain specialists (e.g. cardiovascular surgeon, neurological surgeon) pursuant to the requirements of types of hospital. EDs of central and regional hospitals differ in regard to the requirements for emergency and crisis behaviour and readiness (1). The report was also submitted by 11 general hospitals (Narva Hospital, Valga Hospital, Kuressaare Hospital, Järvamaa Hospital, Põlva Hospital, Rakvere Hospital, Raplamaa Hospital, Läänemaa Hospital, Hiiumaa Hospital, Viljandi Hospital and South Estonia Hospital) and one local hospital (Jõgeva Hospital).

1.3.2 The process of data collection and validation

The data on the work of the ED is checked by an analyst of NIHD DHS, who shall contact the HCP if necessary, although for the majority of surveys, a check of data is carried out in two phases in cooperation of the department analyst and statistician.

The obligation to report is activated in A-veeb by the statistician of NIHD DHS 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 data by 1 March of the year following the reference year at the latest.

Each respondent, i.e. HCP, has a unique ID-code in A-veeb. 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.

Initial data validation takes place by means of the automatic checks added to A-veeb. A-veeb includes three types of data checks (table and form conditions and comparison with data of other reports), although only two are used in the case of the data regarding the work of the ED:

Table conditions	checks within tables that look at the existence of data submitted in the rows and columns of tables and the logical checks between them
Form conditions	checks between tables. For instance, the condition of tables 10.2 and 10.3, in which "the total number of patients who arrived at the ED shall equal to the number of those who departed from the ED" or the link between tables 10.1 and 10.2 *"If the ED has been indicated in section "existence of an emergency department and number of beds" of the report, arrivals to the ED (children + adults) shall be indicated as well"*, etc.

Errors identified with automatic checks are reflected in A-veeb by the questionnaire under subpages "Relations" and "Conditions". Descriptions of checks are displayed both as text 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. Submitted data and results of the checks described in the web

system are reviewed by the analyst, who shall contact the respondent for clarification and correction of errors, if necessary.

Facilities that did not provide the emergency medical care service in the reference year or have ceased operation either confirm a zero report in A-veeb, i.e. they choose the field "Zero report" without filling in the questionnaire or they leave tables 10.1–10.3 of the questionnaire blank. 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 operating thus far, the HCP shall be contacted to confirm that it has not been a mistake. As the tables on the work of the ED is part of the questionnaire "Hospital", the questionnaire is generally not approved as a "Zero report" in full.

Most HCPs provide data by the end of March, while a few hospitals submit data later. Data collection and quality checking and error correction takes place until the end of April, i.e. two months after the submission deadline. Dissemination of statistics on the work of the ED along with a press release shall take place in mid-May.

The facilities who have provided inpatient care services and the data of their treatment cases are compared with the dataset of EHIF contractual partners in the processing of data. In March, EHIF shall publish detailed data of ED treatment cases, which have also been added to the data exchange contract of NIHD and EHIF. However, health care statistics consist more treatment cases than the dataset of EHIF. Differences between the two datasets arise from the fact that the data of EHIF have been submitted by expenditure year, whereas health care statistics record data by the date of provision of service. Although emergency care is provided to everyone regardless of the coverage of health insurance and it is funded by EHIF (6), there are also cases that do not require emergency care but are still urgent. In addition, the data of EHIF does not include treatment cases, in which the medical invoice is covered by an insurance company or the patient themselves, i.e. EU citizens or citizens who do not have a European health insurance card (EHIC). For instance, the number of patients who arrived at the ED differed by nearly 10% in the two datasets in 2017 as well as in 2018. Comparison of the datasets of EHIF and NIHD is important as it ensures high-quality data and reveals the overall functioning of EDs.

The data on the work of EDs are compared to the data submitted in previous years. As the number of respondents as well as the amount of data is not substantial, more thorough checks shall be carried out by individual institutions. Data of previous years is generally used to analyse shares and proportions, e.g. means by which patients arrive to the ED. Moreover, it is important to ensure that HCPs reflect data in correct columns in the table. For instance, in regard to admittance of emergency patients, respondents often mix up departments that comply with the requirements of provision of emergency medicine and other reception departments intended for emergency patients.

If there are large changes in the volume of the facility's work or services provided then the data is first compared to the information provided in other reports (e.g. new/departed employees, increase/decrease in service sales volume). If changes are not explained by other reports, the facility is contacted, and it is clarified whether there are mistakes in the submitted data or what the reasons for the changes are.

An additional check shall generally be carried out if the work volume of an institution changes. In terms of data on the work of the ED, a need for an additional check can be pointed out if an emergency department and/or reception department closes down, opens or the number of beds changes. In case of differences, facilities are able to provide explanatory comments to the data. In the absence of explanations, the facility will be contacted for the specification of data.

In 2018, nine hospitals were contacted for clarification of data. All hospitals provided feedback and six had to make amendments. As previously described, the amendments regarded stating data in the wrong column or a change in the number of beds. In the case of two hospitals, it was necessary to specify the increased proportion of children who had arrived at the ED as well as changes in the

proportion of overall patients of the emergency department or reception department, while the second hospital had to also clarify an overall increase of the number of patients who turned to the ED.

Reception rooms of one local hospital and one central hospital were closed in 2018. In terms of the closure of the reception room of the central hospital in question, patients are asked to hereinafter turn to the emergency medical centre of the same hospital with traumas or problems that require urgent care. Therefore, the capacity of the emergency department did not decline, but merely marked the merger of two previously separate units. The emergency reception room at the local hospital in question was closed, however, there is another hospital in the same county that has an emergency department.

The number of beds in the ED increased in one regional hospital, as the hospital was granted an additional department for admittance of emergency patients. It was also revealed that one hospital had included all patients who had arrived at the reception department over several years, regardless of whether the visit was for emergency care or scheduled, including inpatient treatment or day care. Since it is a local hospital, it does not significantly affect the overall number of emergency patients in Estonia, as the number of patients is not that large, however, it does affect data by type of hospital. It was also revealed that the statistics of one general hospital lacked data on patients who had received emergency care from traumatologists in previous years, which resulted in an increase of emergency patients of general hospitals. As the number of emergency patients grew in most hospitals in 2018, it does not significantly affect overall data regarding Estonia.

Asking for clarifications is important because in addition to correction of data errors or inaccuracies, analysts also often receive constructive criticism and get a better understanding of the content of data.

1.4 Changes in data collection and variables

The variables 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 generally 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 the questionnaire has required updating 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 and also later during draft coordination. Updated questionnaires are approved with a regulation by the minister responsible for the field before the beginning of the reference period and HCPs and software developers will be notified thereof at the training courses of respondents which take place at the end of every year. Training materials will be made available on NIHD websites tai.ee and terviseinfo.ee and will be added to the section of health statistics trainings (http://www.tai.ee/et/tegevused/tervisestatistika/koolitused-ja-sundmused). In addition, HCPs will be sent a circular letter and the main companies offering IT-support to HCPs will be informed.

In 2018, trainings for respondents of health statistics were held in Jõhvi, Tartu and Tallinn. Based on the anonymous feedback survey, all participants were entirely or rather satisfied with the training (Figure 1).

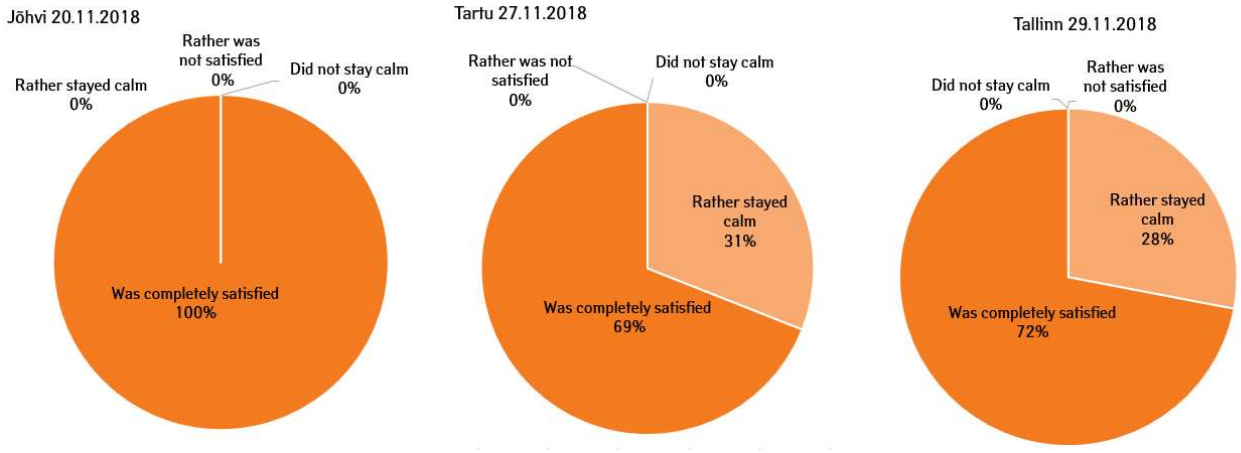

Figure 1. Participant satisfaction with the training of respondents in Toila, Tartu and Tallinn, 2017

The questionnaire regarding the work of the ED was last changed in 2014 when the distinction between the work of the ED and the reception department/room and the number of beds by department was introduced. For provision of care to emergency patients, some hospitals also have specialised reception departments or rooms for emergency patients in addition to the emergency department, which are located separately from the latter. The three largest areas of specialised reception departments are emergency gynaecology, psychiatry and infectious diseases. The need for change arose from the need to assess the readiness of hospitals for admittance of emergency patients and to organise health care personnel of emergency medicine units.

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 is the data of EHIF, which contains information based on medical invoices, i.e. only data on cases paid by EHIF. It is important to take into account that the data of EHIF regarding services provided by HCPs are based on the expenditure year and broken down by the date of reimbursement of the expenditure for provision of the service to the HCP, which may, however, differ from the date of actual provision of the service. Furthermore, the dataset of EHIF also lacks data on treatment cases that are not funded by EHIF (see Chapter 1.3.2).

Another alternative data source is the Health Information System. A document for submission of data on the work of ED to the Health Information System has currently not been developed and current outpatient and inpatient patient summaries lack the so-called "ED feature", which could help distinguish the work of the ED from that of other departments of the hospital. It was already revealed in the report "Standardised Process of Emergency Medical Care in Hospitals" (7) compiled in 2012 by the Estonian Hospitals Association that linking the data on EDs with the Health Information System would be an extremely resource-intensive project. It was observed that the ED

card/document has been described and implemented in functioning hospitals, but since the variables of the so-called new ED card is significantly different from the current card, it is necessary to describe and implement it again (7).

Analyses carried out by NIHD have also revealed low coverage of the data in the Health Information System, which prevents compilation of high-quality statistics. It was revealed in a survey, which compared the inpatient and day care patient summaries sent by the Health Information System with the data collected with NIHD's questionnaires "Hospital" and "Day Care", that the amount of inpatient and day care patient summaries sent by the Health Information System has proved unsatisfactory. Data coverage across all hospitals constituted 88% for inpatient care and 93% for day care. Although the indices had increased by 9% in comparison to 2013, they are still insufficient to produce high-quality statistics (8).

The NIHD DHS has not assessed the administrative load of HCPs in the submission of data 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. Possibilities to obtain required data will be determined, as well as how much resources should be spent to get a desired high-quality result.

2 Dissemination of statistics

Statistics are disseminated pursuant to the dissemination policy of health statistics (9). 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 (HSHRD – www.tai.ee/tstua). Data on the work of the ED are published under the topic "Ambulance and emergency care" of the area "Use of healthcare and reasons for treatment" of HSHRD.

(http://pxweb.tai.ee/PXWeb2015/pxweb/et/03Tervishoiuteenused/03Tervishoiuteenused_03Kiirabi/?tablelist=true).

Data have been published about Estonia and by county and type of HCP. It is important to consider that this is a health care provider's view which does not give information about patients by their place of residence.

Tables KE30 and KE31 in the database include information about existence of an ED by type and county of hospital. Tables **KE32** and **KE33** set out the data of emergency patients by their means of arrival and departure and type of hospital. Moreover, data on the arrival of patients have also been published by age groups, i.e. children (0–14) and adults (15 and older). Table **KE34** includes data on the number of beds for admittance of patients in the ED. In addition, data on the work of the ED in hospitals included in the Hospital Network Development Plan (HNDP) have also been published in **Table HH05.** All hospitals that provided data on their emergency department in 2018 belong to the HNDP.

The analyst working with the data and the Head of NIHD DHS are responsible for 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 each 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

Frequency and release dates of statistics are set out in the health statistics release calendar (http://pxweb.tai.ee/PXWeb2015/Resources/Info/avaldamiskalender.html). Next year's release calendar will be published at least three months before the beginning of the year. The dates in the calendar follow the duration of stages of statistics production agreed upon in the work plan of the department. Release dates set out in the release calendar can be ranked chronologically by topics. Upcoming release dates will be announced on the websites www.tai.ee and www.terviseinfo.ee under the events section. Relevant statistics in the database will be made available to statistics users on the release date at 10 a.m.

The statistics on the work of the ED have been published in a press release which is 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 the HSHRD, in the health statistics section of tai.ee website (http://www.tai.ee/et/tegevused/tervisestatistika/metaandmed). Metadata also include the health statistics glossary, which sets out all definitions of health statistics characteristics (http://pxweb.tai.ee/PXWeb2015/Resources/Info/sonastik/).

Publication of metadata in HSHRD creates context to disseminated data for data users. The availability of metadata supports clarity and unambiguity 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 classification in case there have been changes to classification in the published time series of data;
- references to literature related to the topic;
- contact data of the analyst working with relevant statistics for specification of data or metadata;
- the date of update of data tables;
- in case of correction of already disseminated statistics, an explanation in the comment section under the table about which data were corrected and when. Footnotes can generally be seen for one year as of making the correction.

Metadata are corrected when changes are made to the methodology in use, for example, by way of supplementing classifications or definitions, updates to data collection, etc. A methodological change was implemented in ED data in 2016: referrals of the hospital's own health care personnel and ED call-backs were previously included in the variables "referred from another health care institution", whereas now they are described under "arrived by other means" (see Table KE32 of database). In 2016, the list of health care services of the Estonian Health Insurance Fund was also supplemented by the emergency medical care service by the patent triage category, which resulted

in the decline of referrals of emergency patients to inpatient care, i.e. use of emergency intensive care beds (see Table KE33 of database).

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 (9). As of 2018, data on local hospitals are no longer disseminated among statistics on ED data, as only one such hospital provides this data. The data of the local hospital are provided among data concerning general hospitals and a relevant note shall be added. Based on the hospitals in the HNDP, the data of the local hospital included therein are published in Table HH05 in the section, for which the permission of all HNDP hospitals has been requested.

2.4 Other information about the dissemination

The NIHD DHS regularly forwards Estonian health and health care statistics to international organisations: to Eurostat, WHO and OECD. The links to the databases of these organisations are set out on the website of NIHD (http://www.tai.ee/et/tegevused/tervisestatistika/tegevused/andmete-avaldamine). ED data are not collected on the international level.

3 Relevance

Relevance means the compatibility of statistics with the requirements of users. 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 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.

The requirements of users are surveyed every three years, the most recent survey was conducted in 2018. The results and the opinions of the DHS on the proposals made have been published on the NIHD website[4].

Proposals contain a need for more detailed statistics. For instance, information on the gender and age of emergency patients and reasons for turning to the ED is required.

Based on the current method of data collection, respondents upload aggregated statistics to the A-veeb questionnaire, which means that people are not able to be matched to their diagnoses, reason for contact and the services provided to them.

[4] 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

Regarding the developments of the Health Information System, 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 Health Information System data.

Moreover, users of health statistics are surveyed every three years to determine the users of health statistics, including HSHRD, their data requirements and the compliance of existing data to those 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 website of NIHD (http://www.tai.ee/et/tegevused/tervisestatistika/tegevused/aastaaruanded-a-raportid).

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 on the work of the ED are based on a complete sample of emergency 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 concerning the work of the emergency department in 2018 consisted of 20 hospitals, 19 of which submitted the questionnaire on time by 1 March 2019. One HCP confirmed the report after the deadline for data submission and one hospital stopped providing emergency services and submitted part of the questionnaire empty. The final response rate was 100%.

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 operating but non-reporting unit, as well as partial imputation which means filling in the data gaps in the submitted questionnaire.

Upon imputation, 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 counterpart unit is looked up whose data of the past three years can be used for imputation. Data is imputed for operating units. Demographic attributes characterising a unit are added to the analysis from the DHS statistical register. Imputation has not been used upon processing the data on the work of the ED.

4.3 Assessment of over-coverage and under-coverage

Data on the work of the ED are submitted by hospitals that have internal HCP information systems, which consist of various programmed technical solutions for assessment of the work of the institution and quality assurance. Therefore, the possibility of over- or undercoverage in the

checked and specified data t is minimal, **provided that institutions follow the instructions described in the guide**.

Comparison of data by HCP with the data of EHIF reveals that the number of patients who have arrived at the ED is similar in both datasets across the years. This should confirm the fact that undercoverage is not an issue in health statistics.

It was revealed in 2018 upon clarification of the data of one hospital that there is an inaccuracy in ED patient records. The data of the hospital in question had, over several years, included all patients who had arrived to the reception department, including patients who had a scheduled visit or had been subject to outpatient care or day care. Since it is a local hospital, it does not significantly affect the overall number of emergency patients in Estonia, as the number of patients is not that high, however, it does affect data by type of hospital. It was promised that emergency patients shall hereinafter be distinguished from scheduled and other patients.

It was also revealed that the statistics of one general hospital lacked data on patients who had received emergency care from traumatologists in previous years. They were added to the report in 2018, which resulted in an 8.5% increase in emergency patients in general hospitals (2017 vs. 2018). As the number of emergency patients increased in most hospitals, including general hospitals, by 1,000 patients on average this year, the increase in patients of that general hospital did not have an overall effect on the data of Estonia.

Therefore, there have been some cases of over- as well as undercoverage in data, however, the overall data is always reliable and of high-quality.

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.

HCPs submit data on the work of the ED by 1 March of the year following the reference year. Determination of the release date of data is based on the NIHD DHS work process time table. Data are released in the HSHRD in May, in the middle of the second quarter of the year following the reference year.

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.

Emergency medicine has been distinguished as an independent physician speciality in Estonia since 2000. ED statistics have been compiled as of 2006. Even though emergency medicine has undergone rapid development in Estonia, emergency medicine is still considered a sub-speciality in many other EU member states and efforts to get it recognised as an independent speciality are ongoing (1).

Implementation of common definitions remains a continuous issue in Estonia as well. The term "emergency care" has not been defined in legislation, however, one possible definition has been agreed upon in the work group for definitions of health statistics of the Ministry of Social Affairs and set out in the instructions of the questionnaire "Hospital".

Although health statistics are based on an international methodology and are comparable with the statistics of the countries of the European Union, WHO and OECD, the data on the work of the ED in Estonian hospitals have not been published on an international level.

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 questionnaires are released in the public NIHD health statistics database. Data tables that reflect the statistics on the work of emergency departments are published in the database under the topic "Ambulance and emergency care" of the area "Use of healthcare and reasons for treatment". Table headings include information about the contents and variables. All data collected with the questionnaire have also been disseminated.

The 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 present data tables according to the needs in HSHRD, download them in different file formats (px, xlsx, csv, json) and prepare a chart. 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.

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Annex 1

Tables for health care statistical questionnaire "Hospital" on the work of the emergency department

10. Work of the emergency/reception department Table 10.1. Existence of department and number of beds

			Number of beds as at the end of the year	
		If yes, mark 1	Number of intensive care beds at the ED	Number of observation spots
A	B	1	2	3
ED	01			
Reception department/room	02		X	

10. Work of the emergency/reception department Table 10.2. Arrival of emergency patients

		Total	of which at the ED		of which at the reception department/room	
			0–14	15 and older	0–14	15 and older
A	B	1	2	3	4	5
Total number of arrivals	01					
brought in by ambulance	02					
referred from another health care institution	03					
came independently	04					
other	05					

10. Work of the emergency/reception department Table 10.3. Departure of emergency patients

		Total	of which at the ED		of which from the reception department/room
			total	including intensive care beds	
A	B	1	2	3	4
Total number of patients who left the ED	01				
hospitalised	02				
including for emergency surgical care	02.1				
conservative care	02.2				
sent to another hospital without hospitalisation	03				
went home	04				
died	05				

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/tegevused/tervisestatistika
- **Dataquery to National Institute for Health Development**
  tai@tai.ee
- **Database of Statistics Estonia**
  http://www.stat.ee/
- **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