The Asylum Seekers Health and Wellbeing (TERTTU) Survey: a total population prospective study on the health and service needs of newly arrived asylum seekers.

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2018-027917
Article Type:	Protocol
Date Submitted by the Author:	14-Nov-2018
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Keywords:	Organisation of health services < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, EPIDEMIOLOGY, Protocols & guidelines < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, asylum seeker and refugee health, Health policy < HEALTH SERVICES ADMINISTRATION & MANAGEMENT

The Asylum Seekers Health and Wellbeing (TERTTU) Survey: a total population prospective study on the health and service needs of newly arrived asylum seekers.

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Keywords: organization of health services, health policy, protocols and guidelines, epidemiology, asylum seeker and refugee health

Word count abstract: 255 words

Word count main text: 3806 words

Abstract

Introduction

Health, wellbeing and health service needs of asylum seekers have emerged as urgent topics following the arrival of 2.5 million asylum seekers to EU between 2015 and 2016. However, representative information on the health, wellbeing and service needs of asylum seekers is scarce. The aim of the Asylum Seekers Health and Wellbeing (TERTTU) Survey is to 1) gather population-based representative information; 2) identify key indicators for systematic monitoring; 3) produce the evidence-base for development of systematic screening of asylum seekers health, wellbeing and health service needs.

Methods and analysis

TERTTU Survey is a population-based prospective study with a total population sample of newly arrived asylum seekers to Finland, including adults and children. Baseline data collection is carried out in reception centres in 2018 and consists of a face-to-face interview, self-administered questionnaire and a health examination following a standardised protocol. Altogether 1000 asylum seekers will be included into the study. Baseline data will be followed up with national electronic health record data encompassing the entire asylum process and later with national register data among persons who are granted asylum.

Ethics and dissemination

Ethical approval has been granted by the Coordinating Ethics Committee of the Helsinki and Uusimaa Hospital District. Participation is voluntary and based on written informed consent. Results will be widely disseminated on a national and international level to inform health and welfare policy as well as development of services for asylum seekers. Results of the study will constitute the evidence base for national-level development of the current initial health assessment for asylum seekers.

Strengths and limitations

- This is the first population-based face-to-face interview and health examination survey among newly arrived asylum seekers.
- The findings of the study will be used for identifying key indicators for health monitoring and will also produce unique information on the health status and health service needs of asylum seekers from the very early point of arrival to Finland.
- With participants' informed consent their baseline survey data will be supplemented with register-based follow-up data on the health and later service use of asylum seekers over the course of the asylum process.
- If feasible, those who have been granted asylum will be followed-up using national register-based data to examine the influence of migration-related factors on long-term trajectories of health and integration.
- Studying newly arrived asylum seekers poses methodological and logistical challenges as well as requires ability for quick responses in a rapidly changing setting.

1 Introduction

The peak in asylum applications to Europe between 2015 to 2016 highlighted the need for developing more effective policies for meeting both urgent and long-term healthcare needs of asylum seekers (1,2). An asylum seeker is defined based on their legal status as a person who has applied for international protection and is waiting for a decision on legal asylum, as opposed to a refugee who has already been granted legal asylum (3). Representative population-based information on the health and wellbeing of asylum seekers is needed to guide decision-making and planning of healthcare services for asylum seekers (1). Such information is, however, limited in Europe.

Previous studies have focused mainly on one area of health or wellbeing among asylum seekers, for example on infectious diseases (4), mental health (5), access to healthcare services (6) and human capital (7). These studies are generally limited in generalizability to the entire asylum seeker population in the given country due to sample size restrictions and sampling methodology. A further common limitation in previous studies is that asylum seekers and refugees are examined as one group. No previous studies among newly arrived asylum seekers including a nationally representative population-based sample and with standardised objective health examination measures have been identified. In Finland, current information on the health and wellbeing of asylum seekers is limited mainly to infectious disease screening (8) and access to healthcare and social services (9). More information is available on the health and wellbeing of persons of refugee origin that have a permanent residence status in Finland. Based on these studies, persons of refugee background have been found to be at a particular disadvantage with respect to a number of health outcomes, including a high incidence of chronic disease risk factors (10), mobility limitations (11) and poor mental health (12).

The Asylum Seekers Health and Wellbeing (TERTTU) Survey gathers systematic and representative interview and health examination data on the health, wellbeing and health service needs of newly arrived asylum seekers in Finland. The study is implemented as a part of an EU Asylum, Migration and Integration Fund project aiming at developing evidence-based health examination protocol for newly arrived asylum

seekers (13). The key purpose of the TERTTU Survey is to produce the evidence base for development of the current initial health assessment protocol. The TERTTU Survey is conducted in collaboration with the Finnish Immigration Service and the reception centres.

The Finnish Immigration Service under the Ministry of Interior is responsible for regulation, organisation, steering, supervision and funding of sheltering and health services for asylum seekers. Reception centres are the main providers of health care services for asylum seekers. Close collaboration with stakeholders (Finnish immigration Service and reception centres) allows for a unique opportunity for direct implementation of research findings into practice. Evidence-based development of the health examination protocol will promote equality in the access and quality of services provided for asylum seekers. Correct and timely identification of vulnerable populations as well as persons in need of services have significant impact on the immediate and long-term health of asylum seekers. Furthermore, it facilitates optimising of existing resources in healthcare provision.

The TERTTU Survey will produce population-based data on disease burden and service use of asylum seekers that will strengthen asylum seekers health monitoring at a national level. TERTTU Survey data will be used for identification of key indicators for systematic monitoring of asylum seekers health at a national level. In addition to direct implementation of research findings to the practical development of the health examination protocol, the TERTTU Survey will also generate a large amount of data that can be used for designing various health promotion measures in reception centres. Participants in the baseline TERTTU Survey will be followed up using register-based data. Register-linkage will provide with a unique opportunity to examine trajectories of health of asylum seekers from the very early stages of arrival to Finland.

2 Methods and analysis

The TERTTU Survey is coordinated by the Equality and Inclusion Unit of the National Institute for Health and Welfare, Finland. A multidisciplinary consortium was formed at the planning stage of the survey consisting of experts from different departments and units of the National Institute for Health and Welfare as well as from other collaborating bodies such as regional authorities, universities, non-governmental organisations and experts working in clinical practice. Conceptual framework of the TERTTU Survey is presented in Figure 1. Asylum seekers may arrive at any life stage and their health and wellbeing are influenced by pre-migration, migration process-related and post migration experiences. Sociodemographic and socioeconomic factors mediate the influence of migration-related factors and other exposures throughout the life course. Authorities and institutions regulating the asylum process have a central impact on health outcomes of asylum seekers through defining the rights for services and quality criteria for the services provided to asylum seekers.

[Figure 1 about here]

Asylum seekers are designated to a reception centre which is responsible for coordinating services. Therefore, planning and implementation of the survey were conducted in close collaboration with the Finnish Immigration Service and the transit reception centres in the cities of Helsinki, Oulu, Joutseno and Turku. Stages of the TERTTU Survey are outlined in Table 1.

[Table 1 about here]

Data collection of the TERTTU Survey is implemented by eight trained multilingual research nurses. In addition to having a good command of Finnish, languages spoken by research nurses include English, Arabic, Somali, Persian, Dari, Sorani dialect of Kurdish, Urdu, Russian, Portuguese and French. These languages have been the most common languages spoken by asylum seekers arriving to Finland over the previous years. All of the study material given to the participants (including information leaflets and consent forms), have been translated into English, Arabic, Somali, Persian, Sorani dialect of Kurdish and

Russian. Material is translated into additional languages over the course of the survey if needed. If the study participant speaks another language than the ones spoken by research nurses, a professional interpreter is used. Professional interpreters are used from accredited companies and are briefed concerning the importance of standardised protocol.

2.1 Study population

The study population includes all newly arrived asylum seekers, who have applied for asylum for the first time in Finland. Exclusion criteria are persons who: 1) reside in a detention centre; 2) have applied for asylum in another country and are transferred to Finland based on international agreements (internal transfer); 3) have been returned to Finland according to the Dublin regulation; 4) have previously had a residence permit in Finland and have now for some reason applied for an asylum; 5) babies born in Finland to asylum seeking parents who have already stayed in Finland for a longer period of time. New asylum seekers arrive to Finland spontaneously and the number of new arrivals varies on a weekly basis. Participants are recruited into the study approximately two weeks following registration of their asylum application in Finland. Such sampling frame requires continuous sampling of study participants compared with retrospective sampling that is generally used in health interview and health examination surveys. There are approximately 40-60 new asylum applications a week fitting the selection criteria of the study, which enables inclusion of the total population sample into the study.

Both adults and children are invited to participate in the study. This enables to link family members. The population-based sample is drawn on a weekly basis from an electronic database containing data on all asylum seekers in Finland and maintained by the Finnish Immigration Services. Each asylum seeker receives a unique identity number that is used throughout the asylum seeking process. Additional registered information includes date of the asylum application, name, sex, date and country of birth, nationality, mother tongue and desired language of the interpreter services.

2.2 Recruitment of study participants

Currently (2018), there are altogether 49 reception centres in Finland, out of which 43 are for adults and families and 6 for unaccompanied minors. The number of reception centres varies depending on the number of asylum applications and the speed of the decision processes. A substantial majority of adults and families are initially directed to transit reception centres, where they wait for the asylum interview. Transit reception centres are located in Helsinki (capital of Finland), Turku, Joutseno and Oulu (Figure 2). Some newly arrived asylum seekers arrange private housing for themselves. In such case, they are allocated to the geographically closest reception centre for provision of health and social services throughout the asylum process. Unaccompanied minors are usually directed to units for minors, where they remain throughout the entire asylum process. Since participants of the TERTTU Survey are recruited at an early stage of the asylum process, transit reception centres are the permanent study sites. However since the TERTTU Survey is based on a total population sample, the survey is conducted in any other national reception centres depending on where the persons included into the study sample are situated.

[Figure 2 about here]

Recruitment of study participants in transit reception centres is outlined in Figure 3. Recruitment is the responsibility of the research nurse. However, reception centre personnel have a central role in facilitating the initial contact between the research nurse and persons belonging to the study sample. An invitation with a set time for a reach-out appointment with the research nurse and a brief information leaflet are delivered to asylum seekers by reception centre personnel. The information leaflet is available in the study languages and is designed to be understandable even with limited language or literacy skills. [Link to Supplement Figure 1]

[Figure 3 about here]

The purpose of the reach-out appointment is that the research nurse makes personal contact with the persons invited to participate in the study. By providing information on the aims and content of the study,

the research nurse ensures that the person invited to participate has sufficient information to give informed consent for participation. Booking a reach-out time is the only possibility for personal contact as no telephone numbers are available for newly-arrived asylum seekers and research nurses do not have access to the living areas of the reception centres due to security regulations. If the asylum seeker does not arrive to their reach-out appointment, the research nurse requests the reception centre's social counselors to see if the person is in their dorm. If the person is on the premises of the reception centre, they are asked to come to the reception desk and talk with the research nurse. Otherwise, a new reach-out appointment is booked up to three times, unless the person expresses explicit decline from participation to reception centre personnel.

Asylum seekers living in other reception centres or in private housing are also approached through the reception centre as no personal contact information is initially available. The research nurse or the project coordinator contact the reception centre director via e-mail and explain the purpose of the study. Following this, the research nurse contacts the reception centre for specific arrangements. Telephone contact information is usually available for persons living in private housing and in such case the research nurse contacts persons invited to participate directly by telephone. In case of unaccompanied minors, the initial contact is with the reception centre to enquire for contact details of the legal guardian, who is approached by e-mail or by telephone by the research coordinator. If the legal guardian gives consent, the unaccompanied minor is contacted and invited to participate in the study.

Two hours are booked in the research nurses schedule for each reach out time, which allows for conduct of the study straight away if the person agrees to participate. Alternatively, another time is agreed upon. Prior to starting the interview and the health examination, the research nurse confirms the identity of the participant by checking their personal identification card. Participants are provided with detailed written information about the study, including the purpose of the study, how the collected information will be used, data protection, the rights of participants and who is responsible for conduct of the study. If written information is not available in the language spoken by the asylum seeker or the person is illiterate, the

research nurse goes through written information with assistance of the professional interpreter. The purpose of the study is explained to minors in an age-appropriate manner.

Participants are asked to sign written informed consent. Separate consent is acquired for: 1) the use of the data for research and development purposes within the National Institute for Health and Welfare; 2) sharing anonymised data with researchers outside the institute; 3) record linkage of electronic patient register data to survey data; 4) record linkage of national register data to survey data if asylum is granted in Finland. Guardians of minors sign informed consent. Additionally, children aged 7 years and older also give written informed consent. The consent form is designed in age-appropriate manner.

2.3 Power and data analysis

The aim is to gather data on a minimum of 1000 newly arrived asylum seekers. Of the 1000 participants, the projected sample sizes in each age group are 700 for adults and 100 for each of the minor groups (0-6 years, 7-12 years and 13-17 years). An estimate for a sample of 700 would have a confidence interval of roughly ± 3.5%, and ±5% when examined by sex (n=350). A sample of 100 for each minor age group would result to confidence intervals of ±10% or less. Projected confidence intervals will produce estimates of adequate accuracy (14).

Data on adults will be analysed by country or region of origin depending on the final group size. When statistically feasible, analyses will also be stratified by sex. Data on minors will be analysed divided into three age groups. Analyses will be conducted to take into account non-response. The effect of non-response will be assessed based on register data including age, sex and country of origin. Based on these analyses, sample weights will be calculated if necessary to correct for the effect of non-response.

Data will be examined using mean and median values and proportions. Linear regression will be applied to continuous variables, logistic regression to binary variables and multivariable linear regression to categorical variables. When feasible, findings of the TERTTU Survey will be compared with data of other

national population-based studies. In these cases, adjustment for age and sex will be applied. Total population sampling allows for examining family units. This provides with a unique opportunity to examine how the health, wellbeing and health service needs of for example parents influence those of their children.

2.4 Data collection

The study consists of a standardised face-to-face interview and a health examination. Duration of the study is approximately 1 hour if conducted in the mother tongue of the participant and approximately 2 hours if an interpreter is used. Some of the questions concerning mental health as well as sexual and reproductive health can be completed as self-administered questionnaires during the interview. The research nurse records whether these were interviewed or self-completed by the participants. Interviews and health examinations have been tailored for four age groups: 1) adults; 2) 13-17 year-olds; 3) 7-12 year-olds and 4) 0-6 years. Adults and 13-17 year-olds provide their own answers for the interview, whereas the guardians of 0-12 year-olds answer to the interview questions concerning children. Minors aged 0-12 years participate only in the health examination. Research nurses received extensive training over the course of eight days on research methods, purpose and content of the study, interview techniques as well as on conduct of standardised interview and health examination. Quality control of data collection is also monitored at different stages of data collection following the European Health Examination Survey (EHES) fieldwork quality control guidelines (15).

Face-to-face interview

The face-to-face interview consists of measures used for assessment of the health, wellbeing, service needs of asylum seekers as well as for identification of vulnerable populations. Use of simple language was taken into account. When appropriate, selected measures are comparable with those used in other population-based surveys conducted among the general population as well as among populations of migrant origin permanently living in Finland. The content of the interview by age group is outlined in Table 2. The themes covered in the interview for adults include sociodemographics, asylum seeking journey, literacy, previous socioeconomic status, health status, sexual and reproductive health, traumatic events, mental health, health behaviour and social networks. The interview for children under the age of 18 covers similar themes when relevant. Additionally, early childhood and development are also covered.

[Table 2 about here]

Health examination

Health examination measurements are carried out following EHES protocol (15). The content of the health examination is outlined in Table 3. The health examination of adults and 13-17 year-olds consists of standardised measurements of weight, height, waist circumference, upper arm circumference, blood pressure, and a dental examination. For children belonging to the 7-12 years age group, health examination consists of measurements of weight and height, dental examination and evaluation of condition of the skin. The health examination of children aged 0-6 years consists of evaluation of the condition of the skin and examination for Bacillus Calmette-Guérin (BCG) scar.

[Table 3 about here]

Linkage with register-based data

Upon separate consent, data collected during the TERTTU Survey can be supplemented with unified national electronic health record (EHR) data of the reception centres on the basis of the unique personal identity number. This allows for following the health of asylum seekers from the initial point of arrival to Finland throughout the entire reception processes. Upon a separate consent, data collected during the TERTTU Survey can be supplemented with data from the national registers on the health, wellbeing and health service use of those who have been granted an asylum (Table 4). Feasibility of this record linkage will be evaluated after a follow-up period. Record linkage with national registers provides with a unique opportunity to examine how the health of asylum seekers evolves throughout their life course.

[Table 4 about here]

Linkage with biological data from the ROKOIMMU Study

Parallel to the TERTTU Survey, a cross-sectional Immunity against vaccine preventable diseases (ROKOIMMU) Study is conducted between 2018 and 2019. The aim of the ROKOIMMU Study is to assess previous immunity against measles, mumps, rubella, diphtheria, tetanus and polio among asylum seekers coming from countries with higher incidence of vaccine preventable diseases (16). The ROKOIMMU Study recruits all asylum seekers from Afganistan, Iraq, Russia and Somalia who have not yet received vaccines in Finland, with the aim of gathering a minimum 100 samples per each study group. The blood samples are drawn in connection with the voluntary multiphasic screening for blood-borne and sexually transmitted infections currently offered to all asylum seekers during the initial health assessment. Nurses working in transit centers are responsible for recruitment of study participants. Participants provide written informed consent. Upon a separate consent, results from the ROKOIMMU Study can be linked with information on sociodemographics and self-reported history of vaccinations collected during the TERTTU Survey. The ROKOIMMU Study is coordinated by the National Institute for Health and Welfare and funded by the

National Vaccination Program. The ROKOIMMU Study has been approved by the Coordinating Ethics Committee of the Helsinki and Uusimaa Hospital District (HUS/3330/2017).

2.5 Patient and Public Involvement

The study was designed to fill the gap in knowledge on the health, wellbeing and health service use among asylum seekers. The study was designed consulting a consortium of experts on the topic of the health and wellbeing of asylum seekers. Persons with asylum seeker background were included into the steering committee and have provided their insights on the content of the study. No patients were directly involved in recruitment or conduct of the study. Results of the study benefit participants in that they receive information on their health and are consulted to seek further medical advice if a need for such is identified over the course of the study. Results will be disseminated in reception centres and through media and reports on a national level.

3 Ethics and Dissemination

Ethical aspects

Participation in the TERTTU Survey is based on voluntary informed written consent. Participants are informed concerning personal data protection, sovereignty of the study in terms of the person's asylum seeking process and confidentiality of the answers. It is made clear that the TERTTU Survey does not substitute the initial health assessment provided by the reception centres. Furthermore, participants are informed that they are fully entitled to decline from participation or interrupt participation at any moment without the need for providing a reason and that they are also entitled to request deletion of their data. Participants are also informed that they are entitled to leave some questions unanswered and that they may refuse any measurement.

All of the data is collected during a one-on-one research appointment. None of the data collected during the study is shared with a third person (for example spouse, parent of 13-17 year-olds who participate independently, or reception centre personnel). Research nurses are bound by a confidentiality clause and have been trained in key principles of research ethics. Professional interpreters provide their services via the telephone, which provides a higher degree of confidentiality for the participant.

Participants are given oral and written feedback on their health examination measures. If a need for further health care services arises over the course of the survey visit, research nurses recommend participants to contact the reception centre nurse. All of the TERTTU Survey data is managed following the National Institute for Health and Welfare's protocol for handling sensitive data. Each study participant is given a random study ID number and data is handled without personal identification information.

Incentives (for example bus cards, toy packages for children) valued at approximately 10 euros are given to all participants. The TERTTU Survey has been approved by the Coordinating Ethics Committee of the Helsinki and Uusimaa Hospital District (reference number HUS/3306/2017).

Dissemination of information about the TERTTU Survey

Information about the TERTTU Survey is broadly disseminated both at national and international level at all stages of the study. Since the TERTTU Survey has been specifically designed to bridge the gap in knowledge on the health and wellbeing of asylum seekers in Finland, Ministry of Interior, Ministry of Social Welfare and Health and Ministry of Economic Affairs and Employment are regularly updated on the progress of the study and these updates are transferred into various country reports compiled by the ministries. The TERTTU Survey has been presented to a number of international collaborators and at several international congresses. Possibilities for research collaboration with international partners will be explored.

The main findings of the baseline TERTTU Survey will be reported by the end of summer 2019 and they will be widely disseminated at both national and international level. Following this, TERTTU Survey data will be

available for research purposes upon an accepted study proposal. Evidence-based health examination protocol will be developed and disseminated across reception centres on a national level by the end of 2019.

Acknowledgements

The authors would like to acknowledge experts at the Finnish Immigration Service and all of the personnel of collaborating reception centres for their substantial efforts in facilitating implementation of the study. All of the participants in the study, the research nurses involved in baseline data collection, the multidisciplinary consortium of experts from the National Institute for Health and Welfare and collaborating bodies as well as the steering committee of the Developing the health examination protocol for asylum seekers in Finland project also need to be acknowledged. Finally, the authors would like to acknowledge Sinikka Kytö and Kaaren Erhola for the graphical visualization of the TERTTU Survey material.

Author contributions

AC and OS conceptualised the initial idea for the national-level project aiming at developing the health examination protocol for asylum seekers in Finland within which the TERTTU Survey is implemented. AC developed the original grant proposal. NS prepared the first draft of the manuscript. All authors have provided critical feedback and contributed to revision of the manuscript. All authors have read and approved the final manuscript.

Funding

TERTTU Survey is implemented as a part of the Developing the health examination protocol for asylum seekers in Finland: A national development project funded by the EU Asylum, Migration and Integration Fund.

Competing interests

None

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Table 1 Stages of the TERTTU Survey

Baseline data collection	
3-10/2017	Planning the data collection of the baseline TERTTU Survey.
9/2017-1/2018	Receiving Coordinating Ethics Committee of the Helsinki and Uusimaa Hospital District permission for implementing baseline and follow-up studies.
11/2017	Piloting the TERTTU Survey among volunteers with asylum seeker background.
12/2017-1/2018	Recruitment of the research nurses.
2/2018	Training of the research nurses.
3/2018-12/2018	Baseline data collection.
2/2019-4/2019	Data management, data quality assessment and analysis.
5-6/2019	Reporting basic findings.
7/2019 -	Data available for research purposes to other researchers upon an accepted study proposal by the National Institute for Health and Welfare.
7-12/2019	Dissemination of the main findings of the baseline TERTTU Survey and use for evidence-based development of the national health examination protocol for newly arrived asylum seekers.
1. Follow-up of TERTTU Survey participants	
2020 onwards	Linkage of reception centre electronic health records to baseline TERTTU Survey data based on unique asylum process identification number.
2. Follow-up of baseline TERTTU Survey participants	
2020 onwards	Feasibility of linking national register data to baseline TERTTU Survey data among persons granted asylum will be evaluated.

Table 2 Content of the interview of the Asylum Seekers Health and Wellbeing Survey (TERTTU)

Themes	Variable/measure	Questionnaire instrument/measures	Age group
Sociodemographics	Age, sex, year of birth, mother tongue, prior country of permanent residence	-	Adults 0-17 year-olds
Asylum seeking journey	Year when left permanent residence, route to Finland	Countries, types of housing and duration of stay in these locations during the asylum journey	Adults 0-17 year-olds
Literacy	Language skills, reading and writing skills	Mastery of languages other than mother tongue, ability to read and write (7+ year-olds)	Adults 0-17 year-olds
Previous socioeconomic status	Education, occupation	International Standard Classification of Education (ISCED-2011) (17), prior occupation	Adults
Health status	Self-rated health, presence of long-term conditions	Minimum European Health Module (MEHM) (18)	Adults 0-17 year-olds
	Chronic and infectious diseases, medications, current physical symptoms	Various health conditions diagnosed by a physician, need for regular medication, current medication, various somatic symptoms, tuberculosis symptoms, prior infectious diseases, vaccination history	Adults 0-17 year-olds
	Functional capacity	adapted from Washington Group Module (19)	Adults
		adapted from Unicef/ Washington Group Module (20)	0-17 year-olds
Early childhood and development	Gestation, early life development	Gestation week at birth, complications during birth, birth weight, height, early life development milestones	0-12 year-olds
	Growth and development	Previously identified problems in growth and development	0-17 year-olds
Sexual and reproductive health	Sexual behaviour	Questions related to risk behavior predisposing to sexually transmitted diseases	Adults 13-17 year-olds
	Male circumcision/female genital mutilation	Age of circumcision (if circumcised), problems associated with female genital mutilation	Adults 0-17 year-olds
	Pregnancies and births	Number of pregnancies, miscarriages, abortions, parity	Adults 13-17 year-olds
Traumatic events	Physical trauma due to accident/violence	Types of injuries before/during asylum journey	Adults
	Potentially traumatic life events	Various traumatic life events, adapted from Harvard Trauma Questionnaire (21) Potentially traumatic events, adapted from UCLA PTSD INDEX FOR DSM-IV (19)	Adults 0-17 year-olds

Mental health	Mental health symptoms	HSCL-25 (22,23), PROTECT-able SDQ	Adults 2-17 year-olds
Health behavior	Smoking	Frequency of smoking, use of different types of tobacco products	Adults 13-17 year-olds
	Alcohol use	Alcohol use, AUDIT-C (24) Alcohol use, adapted from ESPAD questionnaire (25)	Adults 13-17 year-olds
	Drugs	Use of intravenous and other drugs	Adults 13-17 year-olds
	Diet	Intake of selected food items	Adults 0-17 year-olds
	Dental health	Frequency of brushing teeth, latest visit to a dentist	Adults 0-17 year-olds
Social networks	Family members, contact with close ones	Whereabouts of close family members, being able to be in touch with close ones	Adults 0-17 year-olds

PROTECT, Process of recognition and Orientation of Torture Victims in European Countries to Facilitate Care and Treatment; AUDIT-C, AUDIT Alcohol Consumption Questionnaire; ESPAD, The European School Survey Project on Alcohol and Other Drugs.

Table 3 Content of the health examination of the Asylum Seekers Health and Wellbeing Survey (TERTTU)

Variable	Measurement tool	Measurement method	Age group
Weight	Seca 877	Measured wearing no shoes and only light clothing, with no heavy objects in the pockets. If the participant is pregnant, self-reported weight before pregnancy is recorded. (15)	Adults 7-17 year-olds
Height	Stand-alone stadiometer, Seca 217	Measured wearing no shoes and standing upright, looking straight ahead. (15)	Adults 7-17 year-olds
Waist circumference	Soft measuring tape, Hoechstmast	Measurement taken on bare skin on top of light clothing, half-way between the lowest rib and the top of iliac crest. (15)	Adults 13-17 year-olds
Upper arm circumference	Soft measuring tape, Hoechstmast	Measurement taken on bare skin, with the elbow resting comfortably on the surface of the table at a 90 degree angle.	Adults 13-17 year-olds
Blood pressure	Omron i-C10 digital blood pressure monitor	Measurement taken three times with a one minute interval on bare skin. (15)	Adults 13-17 year-olds
Pulse	Manually, with a stopwatch	Each pulse beat is counted for 60 seconds. (15)	Adults 13-17 year-olds
Dental examination	-	Existence of removable teeth prosthesis, number of teeth (without removable teeth prosthesis), standardised evaluation of dental health	Adults 7-17 year-olds
Skin condition	-	Standardised evaluation of skin condition (identification of bruises and rash)	0-12 year-olds
BCG scar	-	Standardised evaluation of the presence of Bacillus Calmette-Guérin (BCG) scar	0-6 year-olds

Table 4 Potential register linkages in the TERTTU Survey

National register	Type of information
Population Register Centre	Place of residence, marital status, nationality
Ministry of Employment and the Economy	Use of employment services, participation in activities for promoting employment
Social Insurance Institution of Finland	Social benefits and reimbursements for medical costs
National Institute for Health and Welfare	Number and reasons for healthcare visits and hospital care, procedures and treatments
Statistics Finland	Socio-economic position, education and causes of death

Figure legends

Figure 1 Conceptual framework of the TERTTU Survey (Figure 1 preferably reproduced in colour)

Figure 2 Permanent study locations in transit reception centres

Figure 3 Flow chart of the baseline TERTTU Survey

Supplement Figure 1 Brief information pamphlet given in connection with booking a time for a reach-out appointment

(Supplement Figure 1 preferably reproduced in colour)

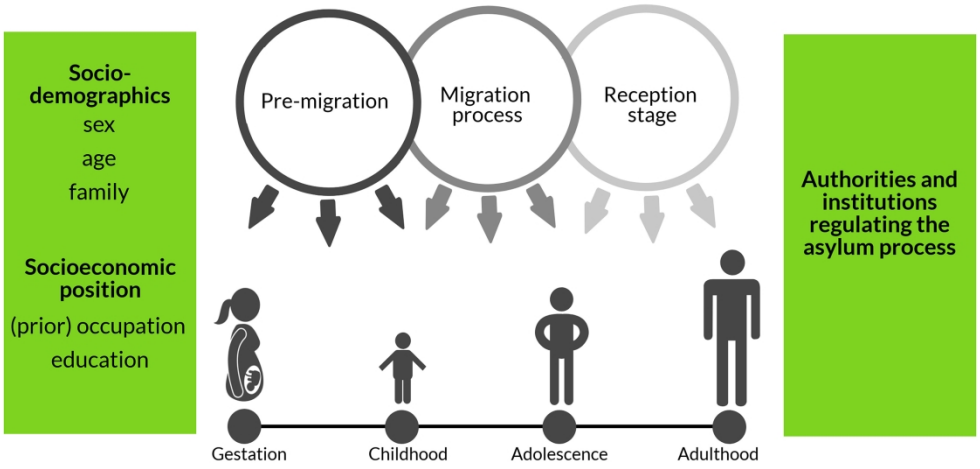
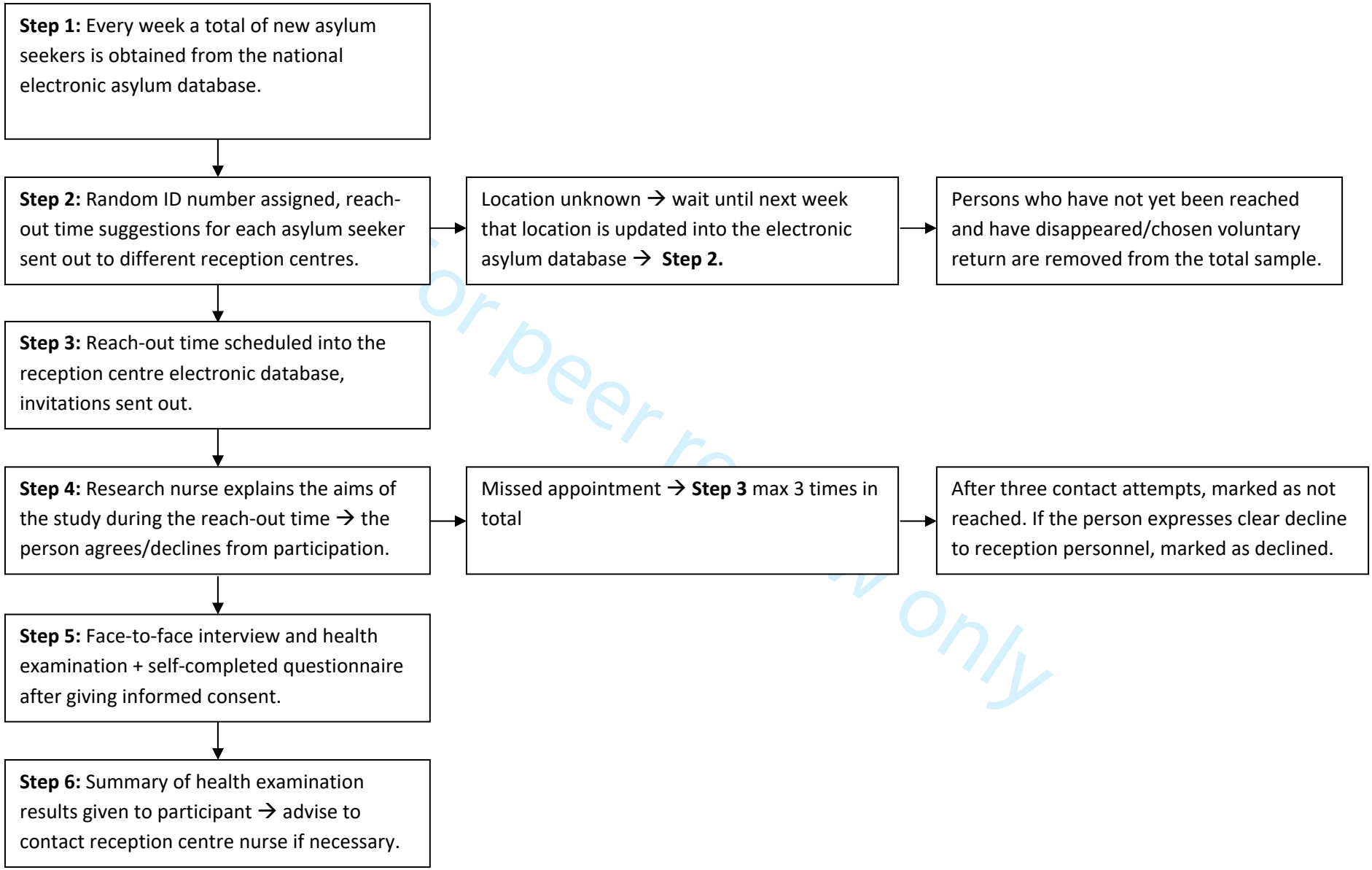


Figure 1 Conceptual framework of the TERTTU Survey

297x145mm (300 x 300 DPI)

Figure 2 Permanent study locations in transit reception centres

212x299mm (300 x 300 DPI)



TERTTU promotes the health and wellbeing of asylum seekers through:

Gathering representative information on the health of newly arrived asylum seekers

Developing the current health examination protocol

Developing unified practices across reception centers

Unified practices and evaluation tools. Right kind of help at the right time.

TERTTU

Developing the health examination protocol for newly arrived asylum seekers

Stages of the project

2017
Overview of current practices, electronic health record analysis

2018
Conducting a Health and Wellbeing Survey in reception centres

2019
Developing the health examination protocol

For more information: www.thl.fi/terttu-project

In co-operation

National Institute for Health and Welfare (THL) • Finnish Immigration Service

Supported by The European Union, the Asylum, Migration and Integration Fund (Amif)

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BMJ Open

The Asylum Seekers Health and Wellbeing (TERTTU) Survey: study protocol for a prospective total population health examination survey on the health and service needs of newly arrived asylum seekers in Finland

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2018-027917.R1
Article Type:	Protocol
Date Submitted by the Author:	24-Jan-2019
Complete List of Authors:	Skogberg, N. ; National Institute for Health and Welfare, Helsinki, Finland, Welfare Koponen, Päivikki; National Institute for Health and Welfare, Public Health Solutions Tiittala, Paula; National Institute for Health and Welfare Mustonen, Katri-Leena; National Institute for Health and Welfare, Welfare Lilja, Eero; National Institute for Health and Welfare, Welfare Snellman, Olli; Finnish Immigration Service Castaneda, Anu; National Institute for Health and Welfare, Welfare
Primary Subject Heading:	Epidemiology
Secondary Subject Heading:	Global health, Health services research, Health policy
Keywords:	Organisation of health services < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, EPIDEMIOLOGY, Protocols & guidelines < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, asylum seeker and refugee health, Health policy < HEALTH SERVICES ADMINISTRATION & MANAGEMENT

The Asylum Seekers Health and Wellbeing (TERTTU) Survey: study protocol for a prospective total population health examination survey on the health and service needs of newly arrived asylum seekers in Finland

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Keywords: organization of health services, health policy, protocols and guidelines, epidemiology, asylum seeker and refugee health

Word count abstract: 255 words

Word count main text: 3874 words

Abstract

Introduction

Health, wellbeing and health service needs of asylum seekers have emerged as urgent topics following the arrival of 2.5 million asylum seekers to EU between 2015 and 2016. However, representative information on the health, wellbeing and service needs of asylum seekers is scarce. The aim of the Asylum Seekers Health and Wellbeing (TERTTU) Survey is to 1) gather population-based representative information; 2) identify key indicators for systematic monitoring; 3) produce the evidence-base for development of systematic screening of asylum seekers' health, wellbeing and health service needs.

Methods and analysis

TERTTU Survey is a population-based prospective study with a total population sample of newly arrived asylum seekers to Finland, including adults and children. Baseline data collection is carried out in reception centres in 2018 and consists of a face-to-face interview, self-administered questionnaire and a health examination following a standardised protocol. Altogether 1000 asylum seekers will be included into the study. Baseline data will be followed up with national electronic health record data encompassing the entire asylum process and later with national register data among persons who are receive residency permits.

Ethics and dissemination

Ethical approval has been granted by the Coordinating Ethics Committee of the Helsinki and Uusimaa Hospital District. Participation is voluntary and based on written informed consent. Results will be widely disseminated on a national and international level to inform health and welfare policy as well as development of services for asylum seekers. Results of the study will constitute the evidence base for development and implementation of the initial health assessment for asylum seekers on a national level.

Strengths and limitations

- This is the first population-based face-to-face interview and health examination survey among newly arrived asylum seekers in Finland.
- The findings of the study will be used for producing unique information on the health status and health service needs of asylum seekers from the very early point of arrival to Finland and for identification of key indicators for health monitoring.
- With participants' informed consent their baseline survey data will be supplemented with register-based follow-up data on the health and later service use of asylum seekers over the course of the asylum process.
- If feasible, those who have been granted a residency permit will be followed-up using national registers to examine the influence of migration-related factors on long-term trajectories of health and integration.
- Studying newly arrived asylum seekers poses methodological and logistical challenges as well as requires ability for quick responses in a rapidly changing setting.

1 Introduction

The peak in asylum applications to Europe between 2015 to 2016 highlighted the need for developing more effective policies for meeting both urgent and long-term healthcare needs of asylum seekers (1,2). An asylum seeker is defined based on their legal status as a person who has applied for international protection and is waiting for a decision on legal asylum, as opposed to a refugee who has already been granted legal asylum (3). Representative population-based information on the health and wellbeing of asylum seekers is needed to guide decision-making and planning of healthcare services for asylum seekers (1). Such information is, however, limited in Europe.

Previous studies have focused mainly on one area of health or wellbeing among asylum seekers, for example on infectious diseases (4-6), mental health (7,8), access to healthcare services (9,10) and human capital (11). Asylum seekers have been reported to be disproportionally burdened by communicable and non-communicable diseases, including a high prevalence of respiratory, gastrointestinal, dermatological and sexually transmitted diseases (5,6,12), poor dental health (5) and physical limitations (10). Prevalence of clinically significant symptoms of depression, anxiety and risk for post-traumatic stress disorder have also been reported to be significantly higher among asylum seekers compared with the general population in receiving countries (7,8). Asylum seekers have also been reported to have a higher prevalence of unmet needs for care, hospital admissions and visits to a psychotherapist but less visits to a general physician compared with the general German population (10).

Previous studies on the health and wellbeing of asylum seekers are generally limited in generalizability to the entire asylum seeker population in the given country due to sample size restrictions and sampling methodology. A further common limitation in previous studies is that asylum seekers and refugees are examined as one group. No previous studies among newly arrived asylum seekers including a nationally representative population-based sample and with standardised objective health examination measures have been identified. In Finland, current information on the health and wellbeing of asylum seekers is limited mainly to infectious disease screening (13) and access to healthcare and social services (14).

According to a recent healthcare register-based study, the most common reasons for healthcare visits among asylum seekers in Finland are dental and musculoskeletal problems and mental health symptoms (15). More information is available on the health and wellbeing of persons of refugee origin that have a permanent residence status in Finland. Based on these studies, persons of refugee background have been found to be at a particular disadvantage with respect to a number of health outcomes, including a high incidence of chronic disease risk factors (16), mobility limitations (17) and poor mental health (18).

The main objective of The Asylum Seekers Health and Wellbeing (TERTTU) Survey is to gather systematic and representative interview and health examination data on the health, wellbeing and health service needs of newly arrived asylum seekers in Finland. Participants in the baseline TERTTU Survey will be followed up using register-based data, providing a unique opportunity to examine trajectories of health of asylum seekers from the very early stages of arrival to Finland. The TERTTU Survey data will be used for identification of key indicators for systematic monitoring of asylum seekers health at a national level. The study will also generate data that can be used for designing health promotion measures in reception centres. Correct and timely identification of vulnerable populations and persons in need of services is likely to have significant impact on the immediate and long-term health of asylum seekers (19). Furthermore, it facilitates optimising of existing resources in healthcare provision (20).

2 Methods and analysis

The TERTTU Survey is coordinated by the Equality and Inclusion Unit of the National Institute for Health and Welfare, Finland. The study is conducted in collaboration with the Finnish Immigration Service and the reception centres as a part of an EU Asylum, Migration and Integration Fund project aiming at developing evidence-based health examination protocol for newly arrived asylum seekers (21). The Finnish Immigration Service under the Ministry of Interior is responsible for regulation, organisation, steering, supervision and funding of sheltering and health services for asylum seekers, whereas the reception centres are the main providers of health care services (22). Close collaboration with stakeholders provides with a unique opportunity for direct implementation of research findings into practice. Evidence-based development of the health examination protocol will promote equality in the access and quality of services provided for asylum seekers. Stages of the TERTTU Survey are outlined in Table 1.

[Table 1 about here]

A multidisciplinary consortium was formed at the planning stage of the survey consisting of experts from different departments and units of the National Institute for Health and Welfare as well as from other collaborating bodies such as regional authorities, universities, non-governmental organisations and experts working in clinical practice. Conceptual framework of the TERTTU Survey is presented in Figure 1. Asylum seekers may arrive at any life stage and their health and wellbeing are influenced by pre-migration, migration process-related and post migration experiences. Sociodemographic and socioeconomic factors mediate the influence of migration-related factors and other exposures throughout the life course (23). Authorities and institutions regulating the asylum process have a central impact on health outcomes of asylum seekers through defining the rights for services and quality criteria for the services provided to asylum seekers.

[Figure 1 about here]

Data collection of the TERTTU Survey is implemented by eight trained multilingual research nurses. In addition to having a good command of Finnish, languages spoken by research nurses include English, Arabic, Somali, Persian, Dari, Sorani dialect of Kurdish, Urdu, Russian, Portuguese and French. All of the study material given to the participants (including information leaflets and consent forms), have been translated into the most common languages spoken by asylum seekers, which are English, Arabic, Somali, Persian, Sorani dialect of Kurdish and Russian. Material is translated into additional languages over the course of the survey if needed. If the study participant speaks another language than the ones spoken by research nurses, a professional interpreter is used. Professional interpreters are used from accredited companies and are briefed concerning the importance of standardised protocol.

2.1 Study population

The study population includes all newly arrived asylum seekers, who have applied for asylum for the first time in Finland. Exclusion criteria are persons who: 1) reside in a detention centre; 2) have applied for asylum in another country and are transferred to Finland based on international agreements (internal transfer); 3) have been returned to Finland according to the Dublin regulation; 4) have previously had a residence permit in Finland; 5) children born in Finland. The number of asylum applications varies on a weekly basis. Participants are recruited into the study approximately two weeks following registration of their asylum application in Finland. Such sampling frame requires continuous sampling of study participants compared with retrospective sampling that is generally used in health interview and health examination surveys. There are approximately 40-60 new asylum applications a week fitting the selection criteria of the study, which enables inclusion of the total population sample into the study.

Both adults and children are invited to participate in the study. This enables to link family members. The population-based sample is drawn on a weekly basis from an electronic database containing data on all asylum seekers in Finland and maintained by the Finnish Immigration Services. Each asylum seeker receives a unique identity number that is used throughout the asylum seeking process. Additional registered

information includes date of the asylum application, name, sex, date and country of birth, nationality, mother tongue and desired language of the interpreter services.

2.2 Recruitment of study participants

Currently (2018), there are altogether 49 reception centres in Finland, out of which 43 are for adults and families and 6 for unaccompanied minors. The number of reception centres varies depending on the number of asylum applications and the speed of the decision processes. A substantial majority of adults and families are initially directed to transit reception centres, where they wait for the asylum interview. Transit reception centres are located in Helsinki (capital of Finland), Turku, Joutseno and Oulu (Figure 2). Some newly arrived asylum seekers arrange private housing for themselves. In such case, they are allocated to the geographically closest reception centre for provision of health and social services throughout the asylum process. Unaccompanied minors are usually directed to units for minors, where they remain throughout the entire asylum process. Since participants of the TERTTU Survey are recruited at an early stage of the asylum process, transit reception centres are the permanent study sites. However since the TERTTU Survey is based on a total population sample, the survey is conducted in any other national reception centres depending on where the persons included into the study sample are situated.

[Figure 2 about here]

Recruitment of study participants in transit reception centres is outlined in Figure 3. Recruitment is the responsibility of the research nurse. However, reception centre personnel have a central role in facilitating the initial contact between the research nurse and persons belonging to the study sample. An invitation with a set time for a reach-out appointment with the research nurse and a brief information leaflet are delivered to asylum seekers by reception centre personnel. The information leaflet is available in the study languages and is designed to be understandable even with limited language or literacy skills. [Link to Supplement Figure 1]

[Figure 3 about here]

The purpose of the reach-out appointment is that the research nurse makes personal contact with the persons invited to participate in the study. By providing information on the aims and content of the study, the research nurse ensures that the person invited to participate has sufficient information to give informed consent for participation. Booking a reach-out time is the only possibility for personal contact as no telephone numbers are available for newly-arrived asylum seekers and research nurses do not have access to the living areas of the reception centres due to security regulations. If the asylum seeker does not arrive to their reach-out appointment, the research nurse requests the reception centre's social counselors to see if the person is in their dorm. If the person is on the premises of the reception centre, they are asked to come to the reception desk and talk with the research nurse. Otherwise, a new reach-out appointment is booked up to three times, unless the person expresses explicit decline from participation to reception centre personnel.

Asylum seekers living in other reception centres or in private housing are also approached through the reception centre as no personal contact information is initially available. The research nurse or the project coordinator contact the reception centre director via e-mail and explain the purpose of the study. Following this, the research nurse contacts the reception centre for specific arrangements. Telephone contact information is usually available for persons living in private housing and in such case the research nurse contacts persons invited to participate directly by telephone. In case of unaccompanied minors, the initial contact is with the reception centre to enquire for contact details of the legal guardian, who is approached by e-mail or by telephone by the research coordinator. If the legal guardian gives consent, the unaccompanied minor is contacted and invited to participate in the study.

Two hours are booked in the research nurses schedule for each reach out time, which allows for conduct of the study straight away if the person agrees to participate. Alternatively, another time is agreed upon. Prior to starting the interview and the health examination, the research nurse confirms the identity of the participant by checking their personal identification card. Participants are provided with detailed written

information about the study, including the purpose of the study, how the collected information will be used, data protection, the rights of participants and who is responsible for conduct of the study. If written information is not available in the language spoken by the asylum seeker or the person is illiterate, the research nurse goes through written information with assistance of the professional interpreter. The purpose of the study is explained to minors in an age-appropriate manner.

Participants are asked to sign written informed consent. Separate consent is acquired for: 1) the use of the data for research and development purposes within the National Institute for Health and Welfare; 2) sharing anonymised data with researchers outside the institute; 3) record linkage of electronic patient register data to survey data; 4) record linkage of national register data to survey data if asylum is granted in Finland. Guardians of minors sign informed consent. Additionally, children aged 7 years and older also give written informed consent. The consent form is designed in age-appropriate manner.

2.3 Data collection

The study consists of a standardised face-to-face interview and a health examination. Duration of the study is approximately 1 hour if conducted in the mother tongue of the participant and approximately 2 hours if an interpreter is used. Some of the questions concerning mental health as well as sexual and reproductive health can be completed as self-administered questionnaires during the interview. The research nurse records whether these were interviewed or self-completed by the participants. Interviews and health examinations have been tailored for four age groups: 1) adults; 2) 13-17 year-olds; 3) 7-12 year-olds and 4) 0-6 years. Adults and 13-17 year-olds provide their own answers for the interview, whereas the guardians of 0-12 year-olds answer to the interview questions concerning children. Minors aged 0-12 years participate only in the health examination. Research nurses received extensive training over the course of eight days on research methods, purpose and content of the study, interview techniques as well as on conduct of standardised interview and health examination. Quality control of data collection is also

monitored at different stages of data collection following the European Health Examination Survey (EHES) fieldwork quality control guidelines (24).

Face-to-face interview

The face-to-face interview consists of measures used for assessment of the health, wellbeing, service needs of asylum seekers as well as for identification of vulnerable populations. Use of simple language was taken into account. When appropriate, selected measures are comparable with those used in other population-based surveys conducted among the general population as well as among populations of migrant origin permanently living in Finland. The content of the interview by age group is outlined in Table 2. The themes covered in the interview for adults include sociodemographics, asylum seeking journey, literacy, previous socioeconomic status, health status, sexual and reproductive health, traumatic events, mental health, health behaviour and social networks. The interview for children under the age of 18 covers similar themes when relevant. Additionally, early childhood and development are also covered.

[Table 2 about here]

Health examination

Health examination measurements are carried out following EHES protocol (24). The content of the health examination is outlined in Table 3. The health examination of adults and 13-17 year-olds consists of standardised measurements of weight, height, waist circumference, upper arm circumference, blood pressure, and a dental examination. For children belonging to the 7-12 years age group, health examination consists of measurements of weight and height, dental examination and evaluation of condition of the skin. The health examination of children aged 0-6 years consists of evaluation of the condition of the skin and examination for Bacillus Calmette-Guérin (BCG) scar.

[Table 3 about here]

Linkage with register-based data

Upon separate consent, data collected during the TERTTU Survey can be supplemented with unified national electronic health record (EHR) data of the reception centres on the basis of the unique personal identity number. This allows for following the health of asylum seekers from the initial point of arrival to Finland throughout the entire reception processes. Upon a separate consent, data collected during the TERTTU Survey can be supplemented with data from the national registers on the health, wellbeing and health service use of those who have been granted an asylum (Table 4). Feasibility of this record linkage will be evaluated after a follow-up period. Record linkage with national registers provides with a unique opportunity to examine how the health of asylum seekers evolves throughout their life course.

[Table 4 about here]

Linkage with biological data from the Immunity Against Vaccine Preventable Diseases Study

Parallel to the TERTTU Survey, a cross-sectional Immunity Against Vaccine Preventable Diseases Study is conducted between 2018 and 2019. The aim of the Immunity Against Vaccine Preventable Diseases Study is to assess previous immunity against measles, mumps, rubella, diphtheria, tetanus and polio among asylum seekers coming from countries with higher incidence of vaccine preventable diseases (25). The study recruits all asylum seekers from Afganistan, Iraq, Russia and Somalia who have not yet received vaccines in Finland, with the aim of gathering a minimum 100 samples per each study group. Blood samples are drawn in connection with the voluntary multiphasic screening for blood-borne and sexually transmitted infections currently offered to all asylum seekers during the initial health assessment. Nurses working in transit centers are responsible for recruitment of study participants. Participants provide written informed consent. Upon a separate consent, results from the Immunity Against Vaccine Preventable Diseases Study can be linked with information on sociodemographics and self-reported history of vaccinations collected during the TERTTU Survey. The Immunity Against Vaccine Preventable Diseases Study is coordinated by the National Institute for Health and Welfare and funded by the National Vaccination Program. The study has been approved by the Coordinating Ethics Committee of the Helsinki and Uusimaa Hospital District (HUS/3330/2017).

2.4 Power and data analysis

The aim is to gather data on a minimum of 1000 newly arrived asylum seekers. Of the 1000 participants, the projected sample sizes in each age group are 700 for adults and 100 for each of the minor groups (0-6 years, 7-12 years and 13-17 years). An estimate for a sample of 700 would have a confidence interval of roughly ± 3.5%, and ±5% when examined by sex (n=350). A sample of 100 for each minor age group would result to confidence intervals of ±10% or less. Projected confidence intervals will produce estimates of adequate accuracy (26). The minimum sample size for the study was calculated manually. The limited

project time frame and resources restrict using an ideally larger sample. The formula for calculations is enclosed as supplementary material [Link to Supplement Figure 2].

The main findings of the study will be reported as a report focusing on basic findings as mean and median values, as well as proportions and their confidence intervals. These will be presented separately for adults, 13-17 year-olds, 7-12 year-olds and 0-6 year-olds, and by regions of origin. The categories for regions of origin will depend on the final number of participants from different regions. Groupings will be made according to established regional categories, for example according to the United Nations Statistics Division groupings (27) or the World Bank regional groupings (28). The effect of non-response will be assessed based on age, sex and country of origin of all asylum seekers registered in the national electronic asylum database maintained by the Finnish Immigration Service. Based on these analyses, sample weights will be calculated, if necessary, to correct for the effect of non-response.

Following the publication of the basic report, data will be made available to researchers for in-depth analyses. Total population sampling allows to examine family units. This provides with a unique opportunity to examine how the health, wellbeing and health service needs of, for example, parents influence those of their children in later in-depth analyses. These regression analyses will be carried out using a mixed model that includes family unit as a random effect.

2.5 Patient and Public Involvement

The study was designed to fill the gap in knowledge on the health, wellbeing and health service use among asylum seekers. The study was designed consulting a consortium of experts on the topic of the health and wellbeing of asylum seekers. Persons with asylum seeker background were included into the steering committee and have provided their insights on the content of the study. No patients were directly involved in recruitment or conduct of the study. Results of the study benefit participants in that they receive information on their health and are consulted to seek further medical advice if a need for such is identified

over the course of the study. Results will be disseminated in reception centres and through media and reports on a national level.

3 Ethics and Dissemination

Ethical aspects

Participation in the TERTTU Survey is based on voluntary informed written consent. Participants are informed concerning personal data protection, sovereignty of the study in terms of the person's asylum seeking process and confidentiality of the answers. It is made clear that the TERTTU Survey does not substitute the initial health assessment provided by the reception centres. Furthermore, participants are informed that they are fully entitled to decline from participation or interrupt participation at any moment without the need for providing a reason and that they are also entitled to request deletion of their data. Participants are also informed that they are entitled to leave some questions unanswered and that they may refuse any measurement.

All of the data is collected during a one-on-one research appointment. None of the data collected during the study is shared with a third person (for example spouse, parent of 13-17 year-olds who participate independently, or reception centre personnel). Research nurses are bound by a confidentiality clause and have been trained in key principles of research ethics. Professional interpreters provide their services via the telephone, which provides a higher degree of confidentiality for the participant.

Participants are given oral and written feedback on their health examination measures. If a need for further health care services arises over the course of the survey visit, research nurses recommend participants to contact the reception centre nurse. All of the TERTTU Survey data is managed following the National Institute for Health and Welfare's protocol for handling sensitive data. Each study participant is given a random study ID number and data is handled without personal identification information.

Incentives (for example bus cards, toy packages for children) valued at approximately 10 euros are given to all participants. The TERTTU Survey has been approved by the Coordinating Ethics Committee of the Helsinki and Uusimaa Hospital District (reference number HUS/3306/2017).

Dissemination of information about the TERTTU Survey

Information about the TERTTU Survey is broadly disseminated both at national and international level at all stages of the study. Since the TERTTU Survey has been specifically designed to bridge the gap in knowledge on the health and wellbeing of asylum seekers in Finland, Ministry of Interior, Ministry of Social Welfare and Health and Ministry of Economic Affairs and Employment are regularly updated on the progress of the study and these updates are transferred into various country reports compiled by the ministries. The TERTTU Survey has been presented to a number of international collaborators and at several international congresses. Possibilities for research collaboration with international partners will be explored.

The main findings of the baseline TERTTU Survey will be reported by the end of summer 2019 and they will be widely disseminated at both national and international level. Following this, TERTTU Survey data will be available for research purposes upon an accepted study proposal. Evidence-based health examination protocol will be developed and disseminated across reception centres on a national level by the end of 2019.

Acknowledgements

The authors would like to acknowledge experts at the Finnish Immigration Service and all of the personnel of collaborating reception centres for their substantial efforts in facilitating implementation of the study. All of the participants in the study, the research nurses involved in baseline data collection, the multidisciplinary consortium of experts from the National Institute for Health and Welfare and

collaborating bodies as well as the steering committee of the Developing the health examination protocol for asylum seekers in Finland project also need to be acknowledged. Finally, the authors would like to acknowledge Sinikka Kytö and Kaaren Erhola for the graphical visualization of the TERTTU Survey material.

Author contributions

AC and OS conceptualised the initial idea for the national-level project aiming at developing the health examination protocol for asylum seekers in Finland within which the TERTTU Survey is implemented. AC developed the original grant proposal. NS, AC, PK, KL and EL have been involved in planning and coordination of the study. OS has been the main contact on the behalf of the collaborating partner (Finnish Immigration Service). PT has been involved in the design and coordination of the Immunity Against Vaccine Preventable Diseases Study. NS prepared the first draft of the manuscript. All authors (AC, PK, KL, PT, OS, NS) have provided critical feedback and contributed to revision of the manuscript. All authors have read and approved the final manuscript.

Funding

TERTTU Survey is implemented as a part of the Developing the health examination protocol for asylum seekers in Finland: A national development project funded by the EU Asylum, Migration and Integration Fund.

Competing interests

The authors declare no competing interests.

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Table 1 Stages of the TERTTU Survey

Baseline data collection	
3-10/2017	Planning the data collection of the baseline TERTTU Survey.
9/2017-1/2018	Receiving Coordinating Ethics Committee of the Helsinki and Uusimaa Hospital District permission for implementing baseline and follow-up studies.
11/2017	Piloting the TERTTU Survey among volunteers with asylum seeker background.
12/2017-1/2018	Recruitment of the research nurses.
2/2018	Training of the research nurses.
3/2018-12/2018	Baseline data collection.
2/2019-4/2019	Data management, data quality assessment and analysis.
5-6/2019	Reporting basic findings.
7/2019 -	Data available for research purposes to other researchers upon an accepted study proposal by the National Institute for Health and Welfare.
7-12/2019	Dissemination of the main findings of the baseline TERTTU Survey and use for evidence-based development of the national health examination protocol for newly arrived asylum seekers.
1. Follow-up of TERTTU Survey participants	
2020 onwards	Linkage of reception centre electronic health records to baseline TERTTU Survey data based on unique asylum process identification number.
2. Follow-up of baseline TERTTU Survey participants	
2020 onwards	Feasibility of linking national register data to baseline TERTTU Survey data among persons granted asylum will be evaluated.

Table 2 Content of the interview of the Asylum Seekers Health and Wellbeing Survey (TERTTU)

Themes	Variable/measure	Questionnaire instrument/measures	Age group
Sociodemographics	Age, sex, year of birth, mother tongue, prior country of permanent residence	-	Adults 0-17 year-olds
Asylum seeking journey	Year when left permanent residence, route to Finland	Countries, types of housing and duration of stay in these locations during the asylum journey	Adults 0-17 year-olds
Literacy	Language skills, reading and writing skills	Mastery of languages other than mother tongue, ability to read and write (7+ year-olds)	Adults 0-17 year-olds
Previous socioeconomic status	Education, occupation	International Standard Classification of Education (ISCED-2011) (29), prior occupation	Adults
Health status	Self-rated health, presence of long-term conditions	Minimum European Health Module (MEHM) (30)	Adults 0-17 year-olds
	Chronic and infectious diseases, medications, current physical symptoms	Various health conditions diagnosed by a physician, need for regular medication, current medication, various somatic symptoms, tuberculosis symptoms, prior infectious diseases, vaccination history	Adults 0-17 year-olds
	Functional capacity	adapted from Washington Group Module (31)	Adults
		adapted from Unicef/ Washington Group Module (32)	0-17 year-olds
Early childhood and development	Gestation, early life development	Gestation week at birth, complications during birth, birth weight, height, early life development milestones	0-12 year-olds
	Growth and development	Previously identified problems in growth and development	0-17 year-olds
Sexual and reproductive health	Sexual behaviour	Questions related to risk behavior predisposing to sexually transmitted diseases	Adults 13-17 year-olds
	Male circumcision/female genital mutilation	Age of circumcision (if circumcised), problems associated with female genital mutilation	Adults 0-17 year-olds
	Pregnancies and births	Number of pregnancies, miscarriages, abortions, parity	Adults 13-17 year-olds
Traumatic events	Physical trauma due to accident/violence	Types of injuries before/during asylum journey	Adults
	Potentially traumatic life events	Various traumatic life events, adapted from Harvard Trauma Questionnaire (33) Potentially traumatic events, adapted from UCLA PTSD INDEX FOR DSM-IV (31)	Adults 0-17 year-olds

Mental health	Mental health symptoms	HSCL-25 (34,35), PROTECT-able SDQ	Adults 2-17 year-olds
Health behavior	Smoking	Frequency of smoking, use of different types of tobacco products	Adults 13-17 year-olds
	Alcohol use	Alcohol use, AUDIT-C (36) Alcohol use, adapted from ESPAD questionnaire (37)	Adults 13-17 year-olds
	Drugs	Use of intravenous and other drugs	Adults 13-17 year-olds
	Diet	Intake of selected food items	Adults 0-17 year-olds
	Dental health	Frequency of brushing teeth, latest visit to a dentist	Adults 0-17 year-olds
Social networks	Family members, contact with close ones	Whereabouts of close family members, being able to be in touch with close ones	Adults 0-17 year-olds

PROTECT, Process of recognition and Orientation of Torture Victims in European Countries to Facilitate Care and Treatment; AUDIT-C, AUDIT Alcohol Consumption Questionnaire; ESPAD, The European School Survey Project on Alcohol and Other Drugs.

Table 3 Content of the health examination of the Asylum Seekers Health and Wellbeing Survey (TERTTU)

Variable	Measurement tool	Measurement method	Age group
Weight	Seca 877	Measured wearing no shoes and only light clothing, with no heavy objects in the pockets. If the participant is pregnant, self-reported weight before pregnancy is recorded. (24)	Adults 7-17 year-olds
Height	Stand-alone stadiometer, Seca 217	Measured wearing no shoes and standing upright, looking straight ahead. (24)	Adults 7-17 year-olds
Waist circumference	Soft measuring tape, Hoechstmast	Measurement taken on bare skin on top of light clothing, half-way between the lowest rib and the top of iliac crest. (24)	Adults 13-17 year-olds
Upper arm circumference	Soft measuring tape, Hoechstmast	Measurement taken on bare skin, with the elbow resting comfortably on the surface of the table at a 90 degree angle.	Adults 13-17 year-olds
Blood pressure	Omron i-C10 digital blood pressure monitor	Measurement taken three times with a one minute interval on bare skin. (24)	Adults 13-17 year-olds
Pulse	Manually, with a stopwatch	Each pulse beat is counted for 60 seconds. (24)	Adults 13-17 year-olds
Dental examination	-	Existence of removable teeth prosthesis, number of teeth (without removable teeth prosthesis), standardised evaluation of dental health	Adults 7-17 year-olds
Skin condition	-	Standardised evaluation of skin condition (identification of bruises and rash)	0-12 year-olds
BCG scar	-	Standardised evaluation of the presence of Bacillus Calmette-Guérin (BCG) scar	0-6 year-olds

Table 4 Potential register linkages in the TERTTU Survey

National register	Type of information
Population Register Centre	Place of residence, marital status, nationality
Ministry of Employment and the Economy	Use of employment services, participation in activities for promoting employment
Social Insurance Institution of Finland	Social benefits and reimbursements for medical costs
National Institute for Health and Welfare	Number and reasons for healthcare visits and hospital care, procedures and treatments
Statistics Finland	Socio-economic position, education and causes of death

Figure legends

Figure 1 Conceptual framework of the TERTTU Survey (Figure 1 preferably reproduced in colour)

Figure 2 Permanent study locations in transit reception centres

Figure 3 Flow chart of the baseline TERTTU Survey

Supplement Figure 1 Brief information pamphlet given in connection with booking a time for a reach-out appointment

(Supplement Figure 1 preferably reproduced in colour)

Supplement Figure 2 Formula for calculating the sample size of the TERTTU Survey

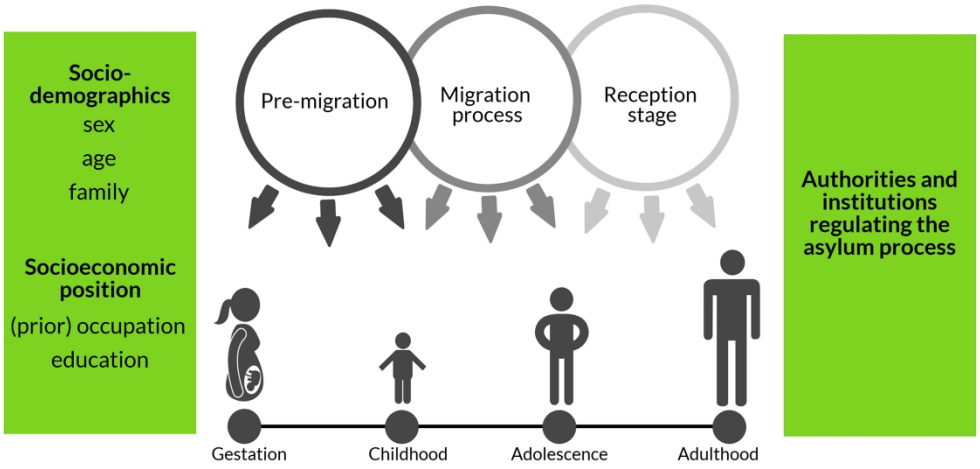
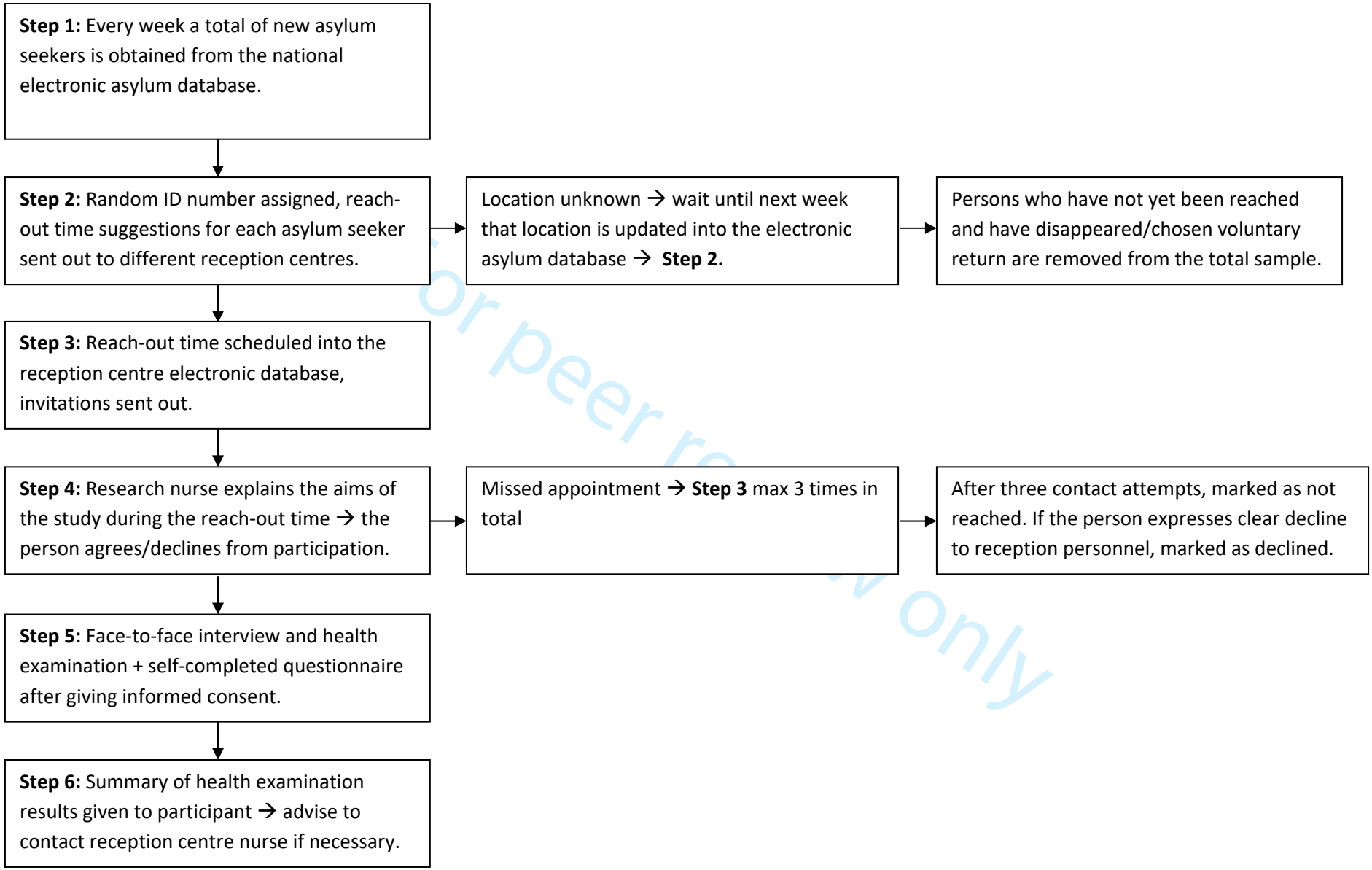


Figure 1 Conceptual framework of the TERTTU Survey

297x145mm (300 x 300 DPI)

Figure 2 Permanent study locations in transit reception centres

212x299mm (300 x 300 DPI)



TERTTU promotes the health and wellbeing of asylum seekers through:

Gathering representative information on the health of newly arrived asylum seekers

Developing the current health examination protocol

Developing unified practices across reception centers

Unified practices and evaluation tools. Right kind of help at the right time.

TERTTU

Developing the health examination protocol for newly arrived asylum seekers

Stages of the project

2017
Overview of current practices, electronic health record analysis

2018
Conducting a Health and Wellbeing Survey in reception centres

2019
Developing the health examination protocol

For more information: www.thl.fi/terttu-project

In co-operation

National Institute for Health and Welfare (THL) • Finnish Immigration Service

Supported by The European Union, the Asylum, Migration and Integration Fund (Amif)

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Notation

n	sample size
$z_{1-\alpha/2}$	level of confidence according to the standard normal distribution
P	estimated proportion of the population
d	margin of error

Assuming a simple random sample, the estimated population proportion with a specifed absolute precision is

$$n = z^2_{1-\alpha/2} P(1-P)/d^2 \quad \text{(Lwanga and Lemeshow 1991, p. 25).}$$

This is equivalent with

$$d = z_{1-\alpha/2}\sqrt{\frac{P(1-P)}{n}}.$$

For a 95 % confidence level $z_{1-\alpha/2} \approx 1.96$ and for an unknown estimated proportion we use $P = 0.5$ where the term $P(1-P)$ reaches its maximum value. Thus, we get

$$d = 1.96\sqrt{\frac{0.5(1-0.5)}{n}} = \frac{0.98}{\sqrt{n}}.$$

Example

If $n = 100$ then $d = 0.98/\sqrt{100} = 0.098$.

A sample size of 100 would have a 95 % confidence interval of ±9.8 % or less.

BMJ Open

The Asylum Seekers Health and Wellbeing (TERTTU) Survey: study protocol for a prospective total population health examination survey on the health and service needs of newly arrived asylum seekers in Finland

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2018-027917.R2
Article Type:	Protocol
Date Submitted by the Author:	11-Feb-2019
Complete List of Authors:	Skogberg, N. ; National Institute for Health and Welfare, Helsinki, Finland, Welfare Koponen, Päivikki; National Institute for Health and Welfare, Public Health Solutions Tiittala, Paula; National Institute for Health and Welfare Mustonen, Katri-Leena; National Institute for Health and Welfare, Welfare Lilja, Eero; National Institute for Health and Welfare, Welfare Snellman, Olli; Finnish Immigration Service Castaneda, Anu; National Institute for Health and Welfare, Welfare
Primary Subject Heading:	Epidemiology
Secondary Subject Heading:	Global health, Health services research, Health policy
Keywords:	Organisation of health services < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, EPIDEMIOLOGY, Protocols & guidelines < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, asylum seeker and refugee health, Health policy < HEALTH SERVICES ADMINISTRATION & MANAGEMENT

The Asylum Seekers Health and Wellbeing (TERTTU) Survey: study protocol for a prospective total population health examination survey on the health and service needs of newly arrived asylum seekers in Finland

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Keywords: organization of health services, health policy, protocols and guidelines, epidemiology, asylum seeker and refugee health

Word count abstract: 255 words

Word count main text: 4074 words

Abstract

Introduction

Health, wellbeing and health service needs of asylum seekers have emerged as urgent topics following the arrival of 2.5 million asylum seekers to EU between 2015 and 2016. However, representative information on the health, wellbeing and service needs of asylum seekers is scarce. The aim of the Asylum Seekers Health and Wellbeing (TERTTU) Survey is to 1) gather population-based representative information; 2) identify key indicators for systematic monitoring; 3) produce the evidence-base for development of systematic screening of asylum seekers' health, wellbeing and health service needs.

Methods and analysis

TERTTU Survey is a population-based prospective study with a total population sample of newly arrived asylum seekers to Finland, including adults and children. Baseline data collection is carried out in reception centres in 2018 and consists of a face-to-face interview, self-administered questionnaire and a health examination following a standardised protocol. Altogether 1000 asylum seekers will be included into the study. Baseline data will be followed up with national electronic health record data encompassing the entire asylum process and later with national register data among persons who are receive residency permits.

Ethics and dissemination

Ethical approval has been granted by the Coordinating Ethics Committee of the Helsinki and Uusimaa Hospital District. Participation is voluntary and based on written informed consent. Results will be widely disseminated on a national and international level to inform health and welfare policy as well as development of services for asylum seekers. Results of the study will constitute the evidence base for development and implementation of the initial health assessment for asylum seekers on a national level.

Strengths and limitations

- This is the first population-based face-to-face interview and health examination survey producing extensive information on the health and service needs of newly arrived asylum seekers in Finland.
- Total population sampling and inclusion of both adults and children into the survey allows for analysis of family units.
- The prospective study design allows for examining trajectories of health of asylum seekers from the early point of arrival to Finland throughout the course of the asylum process, and if feasible, also after receiving a residence permit in Finland.
- Pragmatic factors restricting the sample size of the study may lead to less precise estimates and requires conduct of analysis using groupings by region, rather than by country of origin.

1 Introduction

The peak in asylum applications to Europe between 2015 to 2016 highlighted the need for developing more effective policies for meeting both urgent and long-term healthcare needs of asylum seekers (1,2). An asylum seeker is defined based on their legal status as a person who has applied for international protection and is waiting for a decision on legal asylum, as opposed to a refugee who has already been granted legal asylum (3). Representative population-based information on the health and wellbeing of asylum seekers is needed to guide decision-making and planning of healthcare services for asylum seekers (1). Such information is, however, limited in Europe.

Previous studies have focused mainly on one area of health or wellbeing among asylum seekers, for example on infectious diseases (4-6), mental health (7,8), access to healthcare services (9,10) and human capital (11). Asylum seekers have been reported to be disproportionally burdened by communicable and non-communicable diseases, including a high prevalence of respiratory, gastrointestinal, dermatological and sexually transmitted diseases (5,6,12), poor dental health (5) and physical limitations (10). Prevalence of clinically significant symptoms of depression, anxiety and risk for post-traumatic stress disorder have also been reported to be significantly higher among asylum seekers compared with the general population in receiving countries (7,8). Asylum seekers have also been reported to have a higher prevalence of unmet needs for care, hospital admissions and visits to a psychotherapist but less visits to a general physician compared with the general German population (10).

Previous studies on the health and wellbeing of asylum seekers are generally limited in generalizability to the entire asylum seeker population in the given country due to sample size restrictions and sampling methodology. A further common limitation in previous studies is that asylum seekers and refugees are examined as one group. No previous studies among newly arrived asylum seekers including a nationally representative population-based sample and with standardised objective health examination measures have been identified. In Finland, current information on the health and wellbeing of asylum seekers is limited mainly to infectious disease screening (13) and access to healthcare and social services (14).

According to a recent healthcare register-based study, the most common reasons for healthcare visits among asylum seekers in Finland are dental and musculoskeletal problems and mental health symptoms (15). More information is available on the health and wellbeing of persons of refugee origin that have a permanent residence status in Finland. Based on these studies, persons of refugee background have been found to be at a particular disadvantage with respect to a number of health outcomes, including a high incidence of chronic disease risk factors (16), mobility limitations (17) and poor mental health (18).

The main objective of The Asylum Seekers Health and Wellbeing (TERTTU) Survey is to gather systematic and representative interview and health examination data on the health, wellbeing and health service needs of newly arrived asylum seekers in Finland. Participants in the baseline TERTTU Survey will be followed up using register-based data, providing a unique opportunity to examine trajectories of health of asylum seekers from the very early stages of arrival to Finland. The TERTTU Survey data will be used for identification of key indicators for systematic monitoring of asylum seekers health at a national level. The study will also generate data that can be used for designing health promotion measures in reception centres. Correct and timely identification of vulnerable populations and persons in need of services is likely to have significant impact on the immediate and long-term health of asylum seekers (19). Furthermore, it facilitates optimising of existing resources in healthcare provision (20).

2 Methods and analysis

The TERTTU Survey is coordinated by the Equality and Inclusion Unit of the National Institute for Health and Welfare, Finland. The study is conducted in collaboration with the Finnish Immigration Service and the reception centres as a part of an EU Asylum, Migration and Integration Fund project aiming at developing evidence-based health examination protocol for newly arrived asylum seekers (21). The Finnish Immigration Service under the Ministry of Interior is responsible for regulation, organisation, steering, supervision and funding of sheltering and health services for asylum seekers, whereas the reception centres are the main providers of health care services (22). Close collaboration with stakeholders provides with a unique opportunity for direct implementation of research findings into practice. Evidence-based development of the health examination protocol will promote equality in the access and quality of services provided for asylum seekers. Stages of the TERTTU Survey are outlined in Table 1.

[Table 1 about here]

A multidisciplinary consortium was formed at the planning stage of the survey consisting of experts from different departments and units of the National Institute for Health and Welfare as well as from other collaborating bodies such as regional authorities, universities, non-governmental organisations and experts working in clinical practice. Conceptual framework of the TERTTU Survey is presented in Figure 1. Asylum seekers may arrive at any life stage and their health and wellbeing are influenced by pre-migration, migration process-related and post migration experiences. Sociodemographic and socioeconomic factors mediate the influence of migration-related factors and other exposures throughout the life course (23). Authorities and institutions regulating the asylum process have a central impact on health outcomes of asylum seekers through defining the rights for services and quality criteria for the services provided to asylum seekers.

[Figure 1 about here]

Data collection of the TERTTU Survey is implemented by eight trained multilingual research nurses. In addition to having a good command of Finnish, languages spoken by research nurses include English, Arabic, Somali, Persian, Dari, Sorani dialect of Kurdish, Urdu, Russian, Portuguese and French. All of the study material given to the participants (including information leaflets and consent forms), have been translated into the most common languages spoken by asylum seekers, which are English, Arabic, Somali, Persian, Sorani dialect of Kurdish and Russian. Material is translated into additional languages over the course of the survey if needed. If the study participant speaks another language than the ones spoken by research nurses, a professional interpreter is used. Professional interpreters are used from accredited companies and are briefed concerning the importance of standardised protocol.

2.1 Study population

The study population includes all newly arrived asylum seekers, who have applied for asylum for the first time in Finland. Exclusion criteria are persons who: 1) reside in a detention centre; 2) have applied for asylum in another country and are transferred to Finland based on international agreements (internal transfer); 3) have been returned to Finland according to the Dublin regulation; 4) have previously had a residence permit in Finland; 5) children born in Finland. The number of asylum applications varies on a weekly basis. Participants are recruited into the study approximately two weeks following registration of their asylum application in Finland. Such sampling frame requires continuous sampling of study participants compared with retrospective sampling that is generally used in health interview and health examination surveys. There are approximately 40-60 new asylum applications a week fitting the selection criteria of the study, which enables inclusion of the total population sample into the study.

Both adults and children are invited to participate in the study. This enables to link family members. The population-based sample is drawn on a weekly basis from an electronic database containing data on all asylum seekers in Finland and maintained by the Finnish Immigration Services. Each asylum seeker receives a unique identity number that is used throughout the asylum seeking process. Additional registered

information includes date of the asylum application, name, sex, date and country of birth, nationality, mother tongue and desired language of the interpreter services.

2.2 Recruitment of study participants

Currently (2018), there are altogether 49 reception centres in Finland, out of which 43 are for adults and families and 6 for unaccompanied minors. The number of reception centres varies depending on the number of asylum applications and the speed of the decision processes. A substantial majority of adults and families are initially directed to transit reception centres, where they wait for the asylum interview. Transit reception centres are located in Helsinki (capital of Finland), Turku, Joutseno and Oulu (Figure 2). Some newly arrived asylum seekers arrange private housing for themselves. In such case, they are allocated to the geographically closest reception centre for provision of health and social services throughout the asylum process. Unaccompanied minors are usually directed to units for minors, where they remain throughout the entire asylum process. Since participants of the TERTTU Survey are recruited at an early stage of the asylum process, transit reception centres are the permanent study sites. However since the TERTTU Survey is based on a total population sample, the survey is conducted in any other national reception centres depending on where the persons included into the study sample are situated.

[Figure 2 about here]

Recruitment of study participants in transit reception centres is outlined in Figure 3. Recruitment is the responsibility of the research nurse. However, reception centre personnel have a central role in facilitating the initial contact between the research nurse and persons belonging to the study sample. An invitation with a set time for a reach-out appointment with the research nurse and a brief information leaflet are delivered to asylum seekers by reception centre personnel. The information leaflet is available in the study languages and is designed to be understandable even with limited language or literacy skills. [Link to Supplement Figure 1]

[Figure 3 about here]

The purpose of the reach-out appointment is that the research nurse makes personal contact with the persons invited to participate in the study. By providing information on the aims and content of the study, the research nurse ensures that the person invited to participate has sufficient information to give informed consent for participation. Booking a reach-out time is the only possibility for personal contact as no telephone numbers are available for newly-arrived asylum seekers and research nurses do not have access to the living areas of the reception centres due to security regulations. If the asylum seeker does not arrive to their reach-out appointment, the research nurse requests the reception centre's social counselors to see if the person is in their dorm. If the person is on the premises of the reception centre, they are asked to come to the reception desk and talk with the research nurse. Otherwise, a new reach-out appointment is booked up to three times, unless the person expresses explicit decline from participation to reception centre personnel.

Asylum seekers living in other reception centres or in private housing are also approached through the reception centre as no personal contact information is initially available. The research nurse or the project coordinator contact the reception centre director via e-mail and explain the purpose of the study. Following this, the research nurse contacts the reception centre for specific arrangements. Telephone contact information is usually available for persons living in private housing and in such case the research nurse contacts persons invited to participate directly by telephone. In case of unaccompanied minors, the initial contact is with the reception centre to enquire for contact details of the legal guardian, who is approached by e-mail or by telephone by the research coordinator. If the legal guardian gives consent, the unaccompanied minor is contacted and invited to participate in the study.

Two hours are booked in the research nurses schedule for each reach out time, which allows for conduct of the study straight away if the person agrees to participate. Alternatively, another time is agreed upon. Prior to starting the interview and the health examination, the research nurse confirms the identity of the participant by checking their personal identification card. Participants are provided with detailed written

information about the study, including the purpose of the study, how the collected information will be used, data protection, the rights of participants and who is responsible for conduct of the study. If written information is not available in the language spoken by the asylum seeker or the person is illiterate, the research nurse goes through written information with assistance of the professional interpreter. The purpose of the study is explained to minors in an age-appropriate manner.

Participants are asked to sign written informed consent. Separate consent is acquired for: 1) the use of the data for research and development purposes within the National Institute for Health and Welfare; 2) sharing anonymised data with researchers outside the institute; 3) record linkage of electronic patient register data to survey data; 4) record linkage of national register data to survey data if asylum is granted in Finland. Guardians of minors sign informed consent. Additionally, children aged 7 years and older also give written informed consent. The consent form is designed in age-appropriate manner.

2.3 Data collection

The study consists of a standardised face-to-face interview and a health examination. Duration of the study is approximately 1 hour if conducted in the mother tongue of the participant and approximately 2 hours if an interpreter is used. Some of the questions concerning mental health as well as sexual and reproductive health can be completed as self-administered questionnaires during the interview. The research nurse records whether these were interviewed or self-completed by the participants. Interviews and health examinations have been tailored for four age groups: 1) adults; 2) 13-17 year-olds; 3) 7-12 year-olds and 4) 0-6 years. Adults and 13-17 year-olds provide their own answers for the interview, whereas the guardians of 0-12 year-olds answer to the interview questions concerning children. Minors aged 0-12 years participate only in the health examination. Research nurses received extensive training over the course of eight days on research methods, purpose and content of the study, interview techniques as well as on conduct of standardised interview and health examination. Quality control of data collection is also

monitored at different stages of data collection following the European Health Examination Survey (EHES) fieldwork quality control guidelines (24).

Face-to-face interview

The face-to-face interview consists of measures used for assessment of the health, wellbeing, service needs of asylum seekers as well as for identification of vulnerable populations. Use of simple language was taken into account. When appropriate, selected measures are comparable with those used in other population-based surveys conducted among the general population as well as among populations of migrant origin permanently living in Finland. The content of the interview by age group is outlined in Table 2. The themes covered in the interview for adults include sociodemographics, asylum seeking journey, literacy, previous socioeconomic status, health status, sexual and reproductive health, traumatic events, mental health, health behaviour and social networks. The interview for children under the age of 18 covers similar themes when relevant. Additionally, early childhood and development are also covered.

[Table 2 about here]

Health examination

Health examination measurements are carried out following EHES protocol (24). The content of the health examination is outlined in Table 3. The health examination of adults and 13-17 year-olds consists of standardised measurements of weight, height, waist circumference, upper arm circumference, blood pressure, and a dental examination. For children belonging to the 7-12 years age group, health examination consists of measurements of weight and height, dental examination and evaluation of condition of the skin. The health examination of children aged 0-6 years consists of evaluation of the condition of the skin and examination for Bacillus Calmette-Guérin (BCG) scar.

[Table 3 about here]

Linkage with register-based data

Upon separate consent, data collected during the TERTTU Survey can be supplemented with unified national electronic health record (EHR) data of the reception centres on the basis of the unique personal identity number. This allows for following the health of asylum seekers from the initial point of arrival to Finland throughout the entire reception processes. Upon a separate consent, data collected during the TERTTU Survey can be supplemented with data from the national registers on the health, wellbeing and health service use of those who have been granted an asylum (Table 4). Feasibility of this record linkage will be evaluated after a follow-up period. Record linkage with national registers provides with a unique opportunity to examine how the health of asylum seekers evolves throughout their life course.

[Table 4 about here]

Linkage with biological data from the Immunity Against Vaccine Preventable Diseases Study

Parallel to the TERTTU Survey, a cross-sectional Immunity Against Vaccine Preventable Diseases Study is conducted between 2018 and 2019. The aim of the Immunity Against Vaccine Preventable Diseases Study is to assess previous immunity against measles, mumps, rubella, diphtheria, tetanus and polio among asylum seekers coming from countries with higher incidence of vaccine preventable diseases (25). The study recruits all asylum seekers from Afganistan, Iraq, Russia and Somalia who have not yet received vaccines in Finland, with the aim of gathering a minimum 100 samples per each study group. Blood samples are drawn in connection with the voluntary multiphasic screening for blood-borne and sexually transmitted infections currently offered to all asylum seekers during the initial health assessment. Nurses working in transit centers are responsible for recruitment of study participants. Participants provide written informed consent. Upon a separate consent, results from the Immunity Against Vaccine Preventable Diseases Study can be linked with information on sociodemographics and self-reported history of vaccinations collected during the TERTTU Survey. The Immunity Against Vaccine Preventable Diseases Study is coordinated by the National Institute for Health and Welfare and funded by the National Vaccination Program. The study has been approved by the Coordinating Ethics Committee of the Helsinki and Uusimaa Hospital District (HUS/3330/2017).

2.4 Power and data analysis

The aim is to gather data on a minimum of 1000 newly arrived asylum seekers. The minimum sample size for the study was calculated manually. Limited project time frame and resources restrict gathering a larger sample. The formula for calculations is enclosed as supplementary material [Link to Supplement Figure 2]. Based on register data on the numbers, country of origin and age of first-time asylum applicants between the years of 2014 and 2016, it is projected that a sample of 1000 participants would constitute of 700 for adults and 100 minors for each of the minor age groups (0-6 years, 7-12 years and 13-17 years). This estimation was calculated assuming simple random sampling. In practice, however, with total population

sampling, participation in the study will be influenced by family clusters. Members of the same family are likely to either all participate in the study or decline from participation. Calculation of estimates assuming cluster sampling was, however, not possible at the planning stage of the study because the available register data on asylum applicants from the previous years does not include information on how many families have arrived, nor on the composition of these families.

Using simple random sampling, an estimate of 700 adults would have a confidence interval of roughly ± 3.5%, and ±5% when examined by sex (n=350). A sample of 100 for each minor age group would result to confidence intervals of ±10% or less. Thus, projected confidence intervals will produce estimates of adequate accuracy if simple random sampling was applied (26). Cluster sampling will likely produce wider confidence intervals than simple random sampling. This issue will be counteracted by using finite population correction (27), the formula for which is presented in the Supplement Figure 2. After finite population correction is applied, it is expected that despite cluster sampling, data on a minimum of 1000 persons will nonetheless produce estimates of adequate accuracy. Family clusters will be taken into account in all of the data analyses following the end of data collection.

The main findings of the study will be reported as a report focusing on basic findings as mean and median values, as well as proportions and their confidence intervals. These will be presented separately for adults, 13-17 year-olds, 7-12 year-olds and 0-6 year-olds, and by regions of origin. The categories for regions of origin will depend on the final number of participants from different regions. Groupings will be made according to established regional categories, for example according to the United Nations Statistics Division groupings (28) or the World Bank regional groupings (29). The effect of non-response will be assessed based on age, sex and country of origin of all asylum seekers registered in the national electronic asylum database maintained by the Finnish Immigration Service. Based on these analyses, sample weights will be calculated, if necessary, to correct for the effect of non-response.

Following the publication of the basic report, data will be made available to researchers for in-depth analyses. Total population sampling allows to examine family units. This provides with a unique opportunity

to examine how the health, wellbeing and health service needs of, for example, parents influence those of their children in later in-depth analyses. These regression analyses will be carried out using a mixed model that includes family unit as a random effect.

2.5 Patient and Public Involvement

The study was designed to fill the gap in knowledge on the health, wellbeing and health service use among asylum seekers. The study was designed consulting a consortium of experts on the topic of the health and wellbeing of asylum seekers. Persons with asylum seeker background were included into the steering committee and have provided their insights on the content of the study. No patients were directly involved in recruitment or conduct of the study. Results of the study benefit participants in that they receive information on their health and are consulted to seek further medical advice if a need for such is identified over the course of the study. Results will be disseminated in reception centres and through media and reports on a national level.

3 Ethics and Dissemination

Ethical aspects

Participation in the TERTTU Survey is based on voluntary informed written consent. Participants are informed concerning personal data protection, sovereignty of the study in terms of the person's asylum seeking process and confidentiality of the answers. It is made clear that the TERTTU Survey does not substitute the initial health assessment provided by the reception centres. Furthermore, participants are informed that they are fully entitled to decline from participation or interrupt participation at any moment without the need for providing a reason and that they are also entitled to request deletion of their data.

Participants are also informed that they are entitled to leave some questions unanswered and that they may refuse any measurement.

All of the data is collected during a one-on-one research appointment. None of the data collected during the study is shared with a third person (for example spouse, parent of 13-17 year-olds who participate independently, or reception centre personnel). Research nurses are bound by a confidentiality clause and have been trained in key principles of research ethics. Professional interpreters provide their services via the telephone, which provides a higher degree of confidentiality for the participant.

Participants are given oral and written feedback on their health examination measures. If a need for further health care services arises over the course of the survey visit, research nurses recommend participants to contact the reception centre nurse. All of the TERTTU Survey data is managed following the National Institute for Health and Welfare's protocol for handling sensitive data. Each study participant is given a random study ID number and data is handled without personal identification information.

Incentives (for example bus cards, toy packages for children) valued at approximately 10 euros are given to all participants. The TERTTU Survey has been approved by the Coordinating Ethics Committee of the Helsinki and Uusimaa Hospital District (reference number HUS/3306/2017).

Dissemination of information about the TERTTU Survey

Information about the TERTTU Survey is broadly disseminated both at national and international level at all stages of the study. Since the TERTTU Survey has been specifically designed to bridge the gap in knowledge on the health and wellbeing of asylum seekers in Finland, Ministry of Interior, Ministry of Social Welfare and Health and Ministry of Economic Affairs and Employment are regularly updated on the progress of the study and these updates are transferred into various country reports compiled by the ministries. The TERTTU Survey has been presented to a number of international collaborators and at several international congresses. Possibilities for research collaboration with international partners will be explored.

The main findings of the baseline TERTTU Survey will be reported by the end of summer 2019 and they will be widely disseminated at both national and international level. Following this, TERTTU Survey data will be available for research purposes upon an accepted study proposal. Evidence-based health examination protocol will be developed and disseminated across reception centres on a national level by the end of 2019.

Acknowledgements

The authors would like to acknowledge experts at the Finnish Immigration Service and all of the personnel of collaborating reception centres for their substantial efforts in facilitating implementation of the study. All of the participants in the study, the research nurses involved in baseline data collection, the multidisciplinary consortium of experts from the National Institute for Health and Welfare and collaborating bodies as well as the steering committee of the Developing the health examination protocol for asylum seekers in Finland project also need to be acknowledged. Finally, the authors would like to acknowledge Sinikka Kytö and Kaaren Erhola for the graphical visualization of the TERTTU Survey material.

Author contributions

AC and OS conceptualised the initial idea for the national-level project aiming at developing the health examination protocol for asylum seekers in Finland within which the TERTTU Survey is implemented. AC developed the original grant proposal. NS, AC, PK, KL and EL have been involved in planning and coordination of the study. OS has been the main contact on the behalf of the collaborating partner (Finnish Immigration Service). PT has been involved in the design and coordination of the Immunity Against Vaccine Preventable Diseases Study. NS prepared the first draft of the manuscript. All authors (AC, PK, KL, PT, OS,

NS) have provided critical feedback and contributed to revision of the manuscript. All authors have read and approved the final manuscript.

Funding

TERTTU Survey is implemented as a part of the Developing the health examination protocol for asylum seekers in Finland: A national development project funded by the EU Asylum, Migration and Integration Fund.

Competing interests

The authors declare no competing interests.

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Table 1 Stages of the TERTTU Survey

Baseline data collection	
3-10/2017	Planning the data collection of the baseline TERTTU Survey.
9/2017-1/2018	Receiving Coordinating Ethics Committee of the Helsinki and Uusimaa Hospital District permission for implementing baseline and follow-up studies.
11/2017	Piloting the TERTTU Survey among volunteers with asylum seeker background.
12/2017-1/2018	Recruitment of the research nurses.
2/2018	Training of the research nurses.
3/2018-12/2018	Baseline data collection.
2/2019-4/2019	Data management, data quality assessment and analysis.
5-6/2019	Reporting basic findings.
7/2019 -	Data available for research purposes to other researchers upon an accepted study proposal by the National Institute for Health and Welfare.
7-12/2019	Dissemination of the main findings of the baseline TERTTU Survey and use for evidence-based development of the national health examination protocol for newly arrived asylum seekers.
1. Follow-up of TERTTU Survey participants	
2020 onwards	Linkage of reception centre electronic health records to baseline TERTTU Survey data based on unique asylum process identification number.
2. Follow-up of baseline TERTTU Survey participants	
2020 onwards	Feasibility of linking national register data to baseline TERTTU Survey data among persons granted asylum will be evaluated.

Table 2 Content of the interview of the Asylum Seekers Health and Wellbeing Survey (TERTTU)

Themes	Variable/measure	Questionnaire instrument/measures	Age group
Sociodemographics	Age, sex, year of birth, mother tongue, prior country of permanent residence	-	Adults 0-17 year-olds
Asylum seeking journey	Year when left permanent residence, route to Finland	Countries, types of housing and duration of stay in these locations during the asylum journey	Adults 0-17 year-olds
Literacy	Language skills, reading and writing skills	Mastery of languages other than mother tongue, ability to read and write (7+ year-olds)	Adults 0-17 year-olds
Previous socioeconomic status	Education, occupation	International Standard Classification of Education (ISCED-2011) (30), prior occupation	Adults
Health status	Self-rated health, presence of long-term conditions	Minimum European Health Module (MEHM) (31)	Adults 0-17 year-olds
	Chronic and infectious diseases, medications, current physical symptoms	Various health conditions diagnosed by a physician, need for regular medication, current medication, various somatic symptoms, tuberculosis symptoms, prior infectious diseases, vaccination history	Adults 0-17 year-olds
	Functional capacity	adapted from Washington Group Module (32)	Adults
		adapted from Unicef/ Washington Group Module (33)	0-17 year-olds
Early childhood and development	Gestation, early life development	Gestation week at birth, complications during birth, birth weight, height, early life development milestones	0-12 year-olds
	Growth and development	Previously identified problems in growth and development	0-17 year-olds
Sexual and reproductive health	Sexual behaviour	Questions related to risk behavior predisposing to sexually transmitted diseases	Adults 13-17 year-olds
	Male circumcision/female genital mutilation	Age of circumcision (if circumcised), problems associated with female genital mutilation	Adults 0-17 year-olds
	Pregnancies and births	Number of pregnancies, miscarriages, abortions, parity	Adults 13-17 year-olds
Traumatic events	Physical trauma due to accident/violence	Types of injuries before/during asylum journey	Adults
	Potentially traumatic life events	Various traumatic life events, adapted from Harvard Trauma Questionnaire (34) Potentially traumatic events, adapted from UCLA PTSD INDEX FOR DSM-IV (32)	Adults 0-17 year-olds

Mental health	Mental health symptoms	HSCL-25 (35,36), PROTECT-able SDQ	Adults 2-17 year-olds
Health behavior	Smoking	Frequency of smoking, use of different types of tobacco products	Adults 13-17 year-olds
	Alcohol use	Alcohol use, AUDIT-C (37) Alcohol use, adapted from ESPAD questionnaire (38)	Adults 13-17 year-olds
	Drugs	Use of intravenous and other drugs	Adults 13-17 year-olds
	Diet	Intake of selected food items	Adults 0-17 year-olds
	Dental health	Frequency of brushing teeth, latest visit to a dentist	Adults 0-17 year-olds
Social networks	Family members, contact with close ones	Whereabouts of close family members, being able to be in touch with close ones	Adults 0-17 year-olds

PROTECT, Process of recognition and Orientation of Torture Victims in European Countries to Facilitate Care and Treatment; AUDIT-C, AUDIT Alcohol Consumption Questionnaire; ESPAD, The European School Survey Project on Alcohol and Other Drugs.

Table 3 Content of the health examination of the Asylum Seekers Health and Wellbeing Survey (TERTTU)

Variable	Measurement tool	Measurement method	Age group
Weight	Seca 877	Measured wearing no shoes and only light clothing, with no heavy objects in the pockets. If the participant is pregnant, self-reported weight before pregnancy is recorded. (24)	Adults 7-17 year-olds
Height	Stand-alone stadiometer, Seca 217	Measured wearing no shoes and standing upright, looking straight ahead. (24)	Adults 7-17 year-olds
Waist circumference	Soft measuring tape, Hoechstmast	Measurement taken on bare skin on top of light clothing, half-way between the lowest rib and the top of iliac crest. (24)	Adults 13-17 year-olds
Upper arm circumference	Soft measuring tape, Hoechstmast	Measurement taken on bare skin, with the elbow resting comfortably on the surface of the table at a 90 degree angle.	Adults 13-17 year-olds
Blood pressure	Omron i-C10 digital blood pressure monitor	Measurement taken three times with a one minute interval on bare skin. (24)	Adults 13-17 year-olds
Pulse	Manually, with a stopwatch	Each pulse beat is counted for 60 seconds. (24)	Adults 13-17 year-olds
Dental examination	-	Existence of removable teeth prosthesis, number of teeth (without removable teeth prosthesis), standardised evaluation of dental health	Adults 7-17 year-olds
Skin condition	-	Standardised evaluation of skin condition (identification of bruises and rash)	0-12 year-olds
BCG scar	-	Standardised evaluation of the presence of Bacillus Calmette-Guérin (BCG) scar	0-6 year-olds

Table 4 Potential register linkages in the TERTTU Survey

National register	Type of information
Population Register Centre	Place of residence, marital status, nationality
Ministry of Employment and the Economy	Use of employment services, participation in activities for promoting employment
Social Insurance Institution of Finland	Social benefits and reimbursements for medical costs
National Institute for Health and Welfare	Number and reasons for healthcare visits and hospital care, procedures and treatments
Statistics Finland	Socio-economic position, education and causes of death

Figure legends

Figure 1 Conceptual framework of the TERTTU Survey (Figure 1 preferably reproduced in colour)

Figure 2 Permanent study locations in transit reception centres

Figure 3 Flow chart of the baseline TERTTU Survey

Supplement Figure 1 Brief information pamphlet given in connection with booking a time for a reach-out appointment

(Supplement Figure 1 preferably reproduced in colour)

Supplement Figure 2 Formula for calculating the sample size of the TERTTU Survey

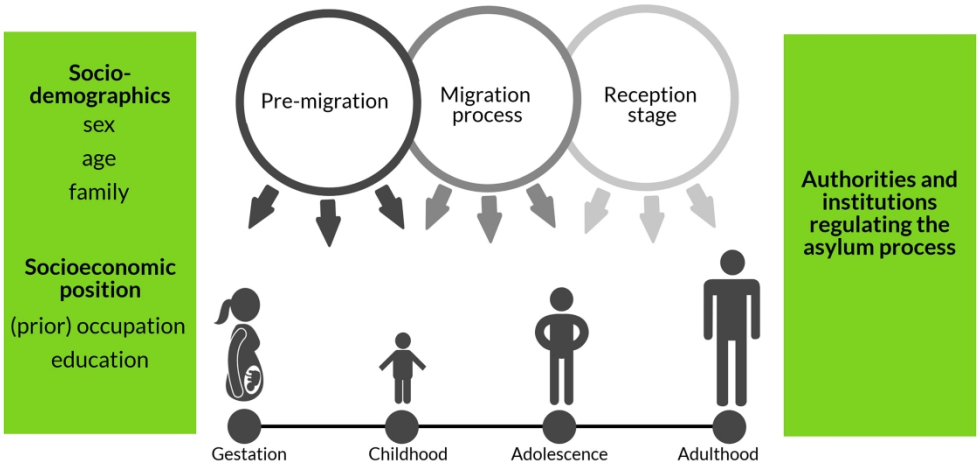
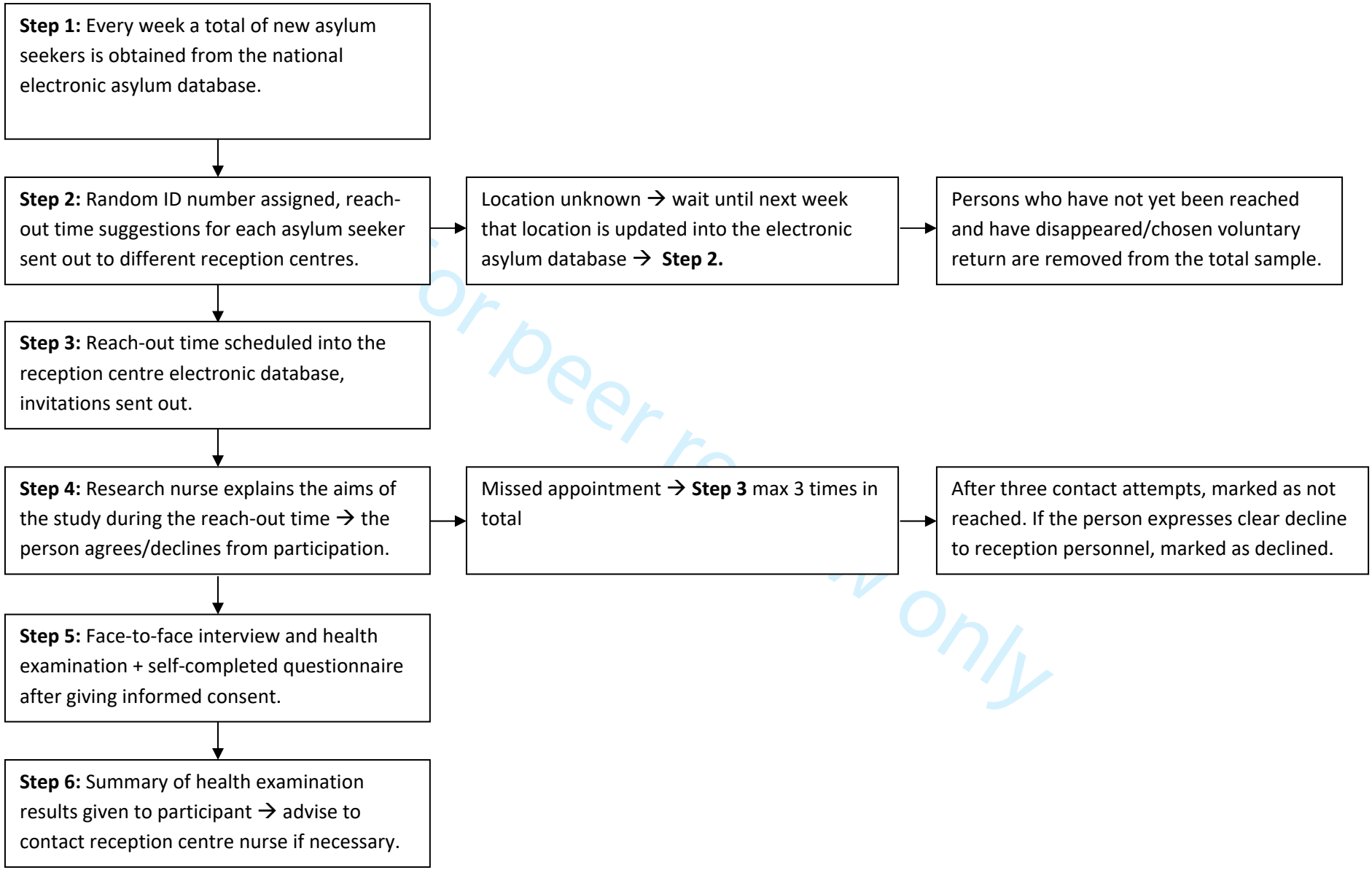


Figure 1 Conceptual framework of the TERTTU Survey

297x145mm (300 x 300 DPI)

Figure 2 Permanent study locations in transit reception centres

212x299mm (300 x 300 DPI)



TERTTU promotes the health and wellbeing of asylum seekers through:

Gathering representative information on the health of newly arrived asylum seekers

Developing the current health examination protocol

Developing unified practices across reception centers

Unified practices and evaluation tools. Right kind of help at the right time.

TERTTU

Developing the health examination protocol for newly arrived asylum seekers

Stages of the project

2017
Overview of current practices, electronic health record analysis

2018
Conducting a Health and Wellbeing Survey in reception centres

2019
Developing the health examination protocol

For more information: www.thl.fi/terttu-project

In co-operation

National Institute for Health and Welfare (THL) • Finnish Immigration Service

Supported by The European Union, the Asylum, Migration and Integration Fund (Amif)

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Notation

N	total population size
n	sample size
$z_{1-\alpha/2}$	level of confidence according to the standard normal distribution
P	estimated proportion of the population
d	margin of error

Assuming a simple random sample, the estimated population proportion with a specified absolute precision is

$$n = z^2_{1-\alpha/2} P(1-P)/d^2_{srs} \quad \text{(Lwanga and Lemeshow 1991, p. 25).}$$

This is equivalent with

$$d_{srs} = z_{1-\alpha/2}\sqrt{\frac{P(1-P)}{n}}.$$

For a 95 % confidence level $z_{1-\alpha/2} \approx 1.96$ and for an unknown estimated proportion we use $P = 0.5$ where the term $P(1-P)$ reaches its maximum value. Thus, we get

$$d = 1.96\sqrt{\frac{0.5(1-0.5)}{n}} = \frac{0.98}{\sqrt{n}}.$$

Example

If $n = 100$ then $d_{srs} = 0.98/\sqrt{100} = 0.098$.

A sample size of 100 would have a 95 % confidence interval of ±9.8 % or less.

Margin of error in survey data

A sample that includes complex survey design such as different sampling probablilities or cluster sampling, should account for the design effect. The design effect

$$DEFF = var(survey)/var(srs),$$

where $var(survey)$ is the variation based on the survey design and $var(srs)$ is the variance assuming a simple random sampling.

If the sample includes a significant amount of the total population, a finite population correction can be applied. The formula for the correction is

$$FPC = \sqrt{\frac{N-n}{N-1}}.$$

A margin of error that accounts for design effect and finite population correction is

$$d_{survey} = z_{1-\alpha/2}\sqrt{\frac{P(1-P)}{n}} \times DEFF \times FPC$$

(Lehtonen and Pahkinen 2004).

BMJ Open

The Asylum Seekers Health and Wellbeing (TERTTU) Survey: study protocol for a prospective total population health examination survey on the health and service needs of newly arrived asylum seekers in Finland

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2018-027917.R3
Article Type:	Protocol
Date Submitted by the Author:	27-Feb-2019
Complete List of Authors:	Skogberg, N. ; National Institute for Health and Welfare, Helsinki, Finland, Welfare Koponen, Päivikki; National Institute for Health and Welfare, Public Health Solutions Tiittala, Paula; National Institute for Health and Welfare Mustonen, Katri-Leena; National Institute for Health and Welfare, Welfare Lilja, Eero; National Institute for Health and Welfare, Welfare Snellman, Olli; Finnish Immigration Service Castaneda, Anu; National Institute for Health and Welfare, Welfare
Primary Subject Heading:	Epidemiology
Secondary Subject Heading:	Global health, Health services research, Health policy
Keywords:	Organisation of health services < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, EPIDEMIOLOGY, Protocols & guidelines < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, asylum seeker and refugee health, Health policy < HEALTH SERVICES ADMINISTRATION & MANAGEMENT

The Asylum Seekers Health and Wellbeing (TERTTU) Survey: study protocol for a prospective total population health examination survey on the health and service needs of newly arrived asylum seekers in Finland

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Keywords: organization of health services, health policy, protocols and guidelines, epidemiology, asylum seeker and refugee health

Word count abstract: 255 words

Word count main text: 4120 words

Abstract

Introduction

Health, wellbeing and health service needs of asylum seekers have emerged as urgent topics following the arrival of 2.5 million asylum seekers to EU between 2015 and 2016. However, representative information on the health, wellbeing and service needs of asylum seekers is scarce. The aim of the Asylum Seekers Health and Wellbeing (TERTTU) Survey is to 1) gather population-based representative information; 2) identify key indicators for systematic monitoring; 3) produce the evidence-base for development of systematic screening of asylum seekers' health, wellbeing and health service needs.

Methods and analysis

TERTTU Survey is a population-based prospective study with a total population sample of newly arrived asylum seekers to Finland, including adults and children. Baseline data collection is carried out in reception centres in 2018 and consists of a face-to-face interview, self-administered questionnaire and a health examination following a standardised protocol. Altogether 1000 asylum seekers will be included into the study. Baseline data will be followed up with national electronic health record data encompassing the entire asylum process and later with national register data among persons who are receive residency permits.

Ethics and dissemination

Ethical approval has been granted by the Coordinating Ethics Committee of the Helsinki and Uusimaa Hospital District. Participation is voluntary and based on written informed consent. Results will be widely disseminated on a national and international level to inform health and welfare policy as well as development of services for asylum seekers. Results of the study will constitute the evidence base for development and implementation of the initial health assessment for asylum seekers on a national level.

Strengths and limitations

- This is the first population-based face-to-face interview and health examination survey producing extensive information on the health and service needs of newly arrived asylum seekers in Finland.
- Total population sampling and inclusion of both adults and children into the survey allows for analysis of family units.
- The prospective study design allows for examining trajectories of health of asylum seekers from the early point of arrival to Finland throughout the course of the asylum process, and if feasible, also after receiving a residence permit in Finland.
- Pragmatic factors restricting the sample size of the study may lead to less precise estimates and requires conduct of analysis using groupings by region, rather than by country of origin.

1 Introduction

The peak in asylum applications to Europe between 2015 to 2016 highlighted the need for developing more effective policies for meeting both urgent and long-term healthcare needs of asylum seekers (1,2). An asylum seeker is defined based on their legal status as a person who has applied for international protection and is waiting for a decision on legal asylum, as opposed to a refugee who has already been granted legal asylum (3). Representative population-based information on the health and wellbeing of asylum seekers is needed to guide decision-making and planning of healthcare services for asylum seekers (1). Such information is, however, limited in Europe.

Previous studies have focused mainly on one area of health or wellbeing among asylum seekers, for example on infectious diseases (4-6), mental health (7,8), access to healthcare services (9,10) and human capital (11). Asylum seekers have been reported to be disproportionally burdened by communicable and non-communicable diseases, including a high prevalence of respiratory, gastrointestinal, dermatological and sexually transmitted diseases (5,6,12), poor dental health (5) and physical limitations (10). Prevalence of clinically significant symptoms of depression, anxiety and risk for post-traumatic stress disorder have also been reported to be significantly higher among asylum seekers compared with the general population in receiving countries (7,8). Asylum seekers have also been reported to have a higher prevalence of unmet needs for care, hospital admissions and visits to a psychotherapist but less visits to a general physician compared with the general German population (10).

Previous studies on the health and wellbeing of asylum seekers are generally limited in generalizability to the entire asylum seeker population in the given country due to sample size restrictions and sampling methodology. A further common limitation in previous studies is that asylum seekers and refugees are examined as one group. No previous studies among newly arrived asylum seekers including a nationally representative population-based sample and with standardised objective health examination measures have been identified. In Finland, current information on the health and wellbeing of asylum seekers is limited mainly to infectious disease screening (13) and access to healthcare and social services (14).

According to a recent healthcare register-based study, the most common reasons for healthcare visits among asylum seekers in Finland are dental and musculoskeletal problems and mental health symptoms (15). More information is available on the health and wellbeing of persons of refugee origin that have a permanent residence status in Finland. Based on these studies, persons of refugee background have been found to be at a particular disadvantage with respect to a number of health outcomes, including a high incidence of chronic disease risk factors (16), mobility limitations (17) and poor mental health (18).

The main objective of The Asylum Seekers Health and Wellbeing (TERTTU) Survey is to gather systematic and representative interview and health examination data on the health, wellbeing and health service needs of newly arrived asylum seekers in Finland. Participants in the baseline TERTTU Survey will be followed up using register-based data, providing a unique opportunity to examine trajectories of health of asylum seekers from the very early stages of arrival to Finland. The TERTTU Survey data will be used for identification of key indicators for systematic monitoring of asylum seekers health at a national level. The study will also generate data that can be used for designing health promotion measures in reception centres. Correct and timely identification of vulnerable populations and persons in need of services is likely to have significant impact on the immediate and long-term health of asylum seekers (19). Furthermore, it facilitates optimising of existing resources in healthcare provision (20).

2 Methods and analysis

The TERTTU Survey is coordinated by the Equality and Inclusion Unit of the National Institute for Health and Welfare, Finland. The study is conducted in collaboration with the Finnish Immigration Service and the reception centres as a part of an EU Asylum, Migration and Integration Fund project aiming at developing evidence-based health examination protocol for newly arrived asylum seekers (21). The Finnish Immigration Service under the Ministry of Interior is responsible for regulation, organisation, steering, supervision and funding of sheltering and health services for asylum seekers, whereas the reception centres are the main providers of health care services (22). Close collaboration with stakeholders provides with a unique opportunity for direct implementation of research findings into practice. Evidence-based development of the health examination protocol will promote equality in the access and quality of services provided for asylum seekers. Stages of the TERTTU Survey are outlined in Table 1.

[Table 1 about here]

A multidisciplinary consortium was formed at the planning stage of the survey consisting of experts from different departments and units of the National Institute for Health and Welfare as well as from other collaborating bodies such as regional authorities, universities, non-governmental organisations and experts working in clinical practice. Conceptual framework of the TERTTU Survey is presented in Figure 1. Asylum seekers may arrive at any life stage and their health and wellbeing are influenced by pre-migration, migration process-related and post migration experiences. Sociodemographic and socioeconomic factors mediate the influence of migration-related factors and other exposures throughout the life course (23). Authorities and institutions regulating the asylum process have a central impact on health outcomes of asylum seekers through defining the rights for services and quality criteria for the services provided to asylum seekers.

[Figure 1 about here]

Data collection of the TERTTU Survey is implemented by eight trained multilingual research nurses. In addition to having a good command of Finnish, languages spoken by research nurses include English, Arabic, Somali, Persian, Dari, Sorani dialect of Kurdish, Urdu, Russian, Portuguese and French. All of the study material given to the participants (including information leaflets and consent forms), have been translated into the most common languages spoken by asylum seekers, which are English, Arabic, Somali, Persian, Sorani dialect of Kurdish and Russian. Material is translated into additional languages over the course of the survey if needed. If the study participant speaks another language than the ones spoken by research nurses, a professional interpreter is used. Professional interpreters are used from accredited companies and are briefed concerning the importance of standardised protocol.

2.1 Study population

The study population includes all newly arrived asylum seekers, who have applied for asylum for the first time in Finland. Exclusion criteria are persons who: 1) reside in a detention centre; 2) have applied for asylum in another country and are transferred to Finland based on international agreements (internal transfer); 3) have been returned to Finland according to the Dublin regulation; 4) have previously had a residence permit in Finland; 5) children born in Finland. The number of asylum applications varies on a weekly basis. Participants are recruited into the study approximately two weeks following registration of their asylum application in Finland. Such sampling frame requires continuous sampling of study participants compared with retrospective sampling that is generally used in health interview and health examination surveys. There are approximately 40-60 new asylum applications a week fitting the selection criteria of the study, which enables inclusion of the total population sample into the study.

Both adults and children are invited to participate in the study. This enables to link family members. The population-based sample is drawn on a weekly basis from an electronic database containing data on all asylum seekers in Finland and maintained by the Finnish Immigration Services. Each asylum seeker receives a unique identity number that is used throughout the asylum seeking process. Additional registered

information includes date of the asylum application, name, sex, date and country of birth, nationality, mother tongue and desired language of the interpreter services.

2.2 Recruitment of study participants

Currently (2018), there are altogether 49 reception centres in Finland, out of which 43 are for adults and families and 6 for unaccompanied minors. The number of reception centres varies depending on the number of asylum applications and the speed of the decision processes. A substantial majority of adults and families are initially directed to transit reception centres, where they wait for the asylum interview. Transit reception centres are located in Helsinki (capital of Finland), Turku, Joutseno and Oulu (Figure 2). Some newly arrived asylum seekers arrange private housing for themselves. In such case, they are allocated to the geographically closest reception centre for provision of health and social services throughout the asylum process. Unaccompanied minors are usually directed to units for minors, where they remain throughout the entire asylum process. Since participants of the TERTTU Survey are recruited at an early stage of the asylum process, transit reception centres are the permanent study sites. However since the TERTTU Survey is based on a total population sample, the survey is conducted in any other national reception centres depending on where the persons included into the study sample are situated.

[Figure 2 about here]

Recruitment of study participants in transit reception centres is outlined in Figure 3. Recruitment is the responsibility of the research nurse. However, reception centre personnel have a central role in facilitating the initial contact between the research nurse and persons belonging to the study sample. An invitation with a set time for a reach-out appointment with the research nurse and a brief information leaflet are delivered to asylum seekers by reception centre personnel. The information leaflet is available in the study languages and is designed to be understandable even with limited language or literacy skills. [Link to Supplement Figure 1]

[Figure 3 about here]

The purpose of the reach-out appointment is that the research nurse makes personal contact with the persons invited to participate in the study. By providing information on the aims and content of the study, the research nurse ensures that the person invited to participate has sufficient information to give informed consent for participation. Booking a reach-out time is the only possibility for personal contact as no telephone numbers are available for newly-arrived asylum seekers and research nurses do not have access to the living areas of the reception centres due to security regulations. If the asylum seeker does not arrive to their reach-out appointment, the research nurse requests the reception centre's social counselors to see if the person is in their dorm. If the person is on the premises of the reception centre, they are asked to come to the reception desk and talk with the research nurse. Otherwise, a new reach-out appointment is booked up to three times, unless the person expresses explicit decline from participation to reception centre personnel.

Asylum seekers living in other reception centres or in private housing are also approached through the reception centre as no personal contact information is initially available. The research nurse or the project coordinator contact the reception centre director via e-mail and explain the purpose of the study. Following this, the research nurse contacts the reception centre for specific arrangements. Telephone contact information is usually available for persons living in private housing and in such case the research nurse contacts persons invited to participate directly by telephone. In case of unaccompanied minors, the initial contact is with the reception centre to enquire for contact details of the legal guardian, who is approached by e-mail or by telephone by the research coordinator. If the legal guardian gives consent, the unaccompanied minor is contacted and invited to participate in the study.

Two hours are booked in the research nurses schedule for each reach out time, which allows for conduct of the study straight away if the person agrees to participate. Alternatively, another time is agreed upon. Prior to starting the interview and the health examination, the research nurse confirms the identity of the participant by checking their personal identification card. Participants are provided with detailed written

information about the study, including the purpose of the study, how the collected information will be used, data protection, the rights of participants and who is responsible for conduct of the study. If written information is not available in the language spoken by the asylum seeker or the person is illiterate, the research nurse goes through written information with assistance of the professional interpreter. The purpose of the study is explained to minors in an age-appropriate manner.

Participants are asked to sign written informed consent. Separate consent is acquired for: 1) the use of the data for research and development purposes within the National Institute for Health and Welfare; 2) sharing anonymised data with researchers outside the institute; 3) record linkage of electronic patient register data to survey data; 4) record linkage of national register data to survey data if asylum is granted in Finland. Guardians of minors sign informed consent. Additionally, children aged 7 years and older also give written informed consent. The consent form is designed in age-appropriate manner.

2.3 Data collection

The study consists of a standardised face-to-face interview and a health examination. Duration of the study is approximately 1 hour if conducted in the mother tongue of the participant and approximately 2 hours if an interpreter is used. Some of the questions concerning mental health as well as sexual and reproductive health can be completed as self-administered questionnaires during the interview. The research nurse records whether these were interviewed or self-completed by the participants. Interviews and health examinations have been tailored for four age groups: 1) adults; 2) 13-17 year-olds; 3) 7-12 year-olds and 4) 0-6 years. Adults and 13-17 year-olds provide their own answers for the interview, whereas the guardians of 0-12 year-olds answer to the interview questions concerning children. Minors aged 0-12 years participate only in the health examination. Research nurses received extensive training over the course of eight days on research methods, purpose and content of the study, interview techniques as well as on conduct of standardised interview and health examination. Quality control of data collection is also

monitored at different stages of data collection following the European Health Examination Survey (EHES) fieldwork quality control guidelines (24).

Face-to-face interview

The face-to-face interview consists of measures used for assessment of the health, wellbeing, service needs of asylum seekers as well as for identification of vulnerable populations. Use of simple language was taken into account. When appropriate, selected measures are comparable with those used in other population-based surveys conducted among the general population as well as among populations of migrant origin permanently living in Finland. The content of the interview by age group is outlined in Table 2. The themes covered in the interview for adults include sociodemographics, asylum seeking journey, literacy, previous socioeconomic status, health status, sexual and reproductive health, traumatic events, mental health, health behaviour and social networks. The interview for children under the age of 18 covers similar themes when relevant. Additionally, early childhood and development are also covered.

[Table 2 about here]

Health examination

Health examination measurements are carried out following EHES protocol (24). The content of the health examination is outlined in Table 3. The health examination of adults and 13-17 year-olds consists of standardised measurements of weight, height, waist circumference, upper arm circumference, blood pressure, and a dental examination. For children belonging to the 7-12 years age group, health examination consists of measurements of weight and height, dental examination and evaluation of condition of the skin. The health examination of children aged 0-6 years consists of evaluation of the condition of the skin and examination for Bacillus Calmette-Guérin (BCG) scar.

[Table 3 about here]

Linkage with register-based data

Upon separate consent, data collected during the TERTTU Survey can be supplemented with unified national electronic health record (EHR) data of the reception centres on the basis of the unique personal identity number. This allows for following the health of asylum seekers from the initial point of arrival to Finland throughout the entire reception processes. Upon a separate consent, data collected during the TERTTU Survey can be supplemented with data from the national registers on the health, wellbeing and health service use of those who have been granted an asylum (Table 4). Feasibility of this record linkage will be evaluated after a follow-up period. Record linkage with national registers provides with a unique opportunity to examine how the health of asylum seekers evolves throughout their life course.

[Table 4 about here]

Linkage with biological data from the Immunity Against Vaccine Preventable Diseases Study

Parallel to the TERTTU Survey, a cross-sectional Immunity Against Vaccine Preventable Diseases Study is conducted between 2018 and 2019. The aim of the Immunity Against Vaccine Preventable Diseases Study is to assess previous immunity against measles, mumps, rubella, diphtheria, tetanus and polio among asylum seekers coming from countries with higher incidence of vaccine preventable diseases (25). The study recruits all asylum seekers from Afganistan, Iraq, Russia and Somalia who have not yet received vaccines in Finland, with the aim of gathering a minimum 100 samples per each study group. Blood samples are drawn in connection with the voluntary multiphasic screening for blood-borne and sexually transmitted infections currently offered to all asylum seekers during the initial health assessment. Nurses working in transit centers are responsible for recruitment of study participants. Participants provide written informed consent. Upon a separate consent, results from the Immunity Against Vaccine Preventable Diseases Study can be linked with information on sociodemographics and self-reported history of vaccinations collected during the TERTTU Survey. The Immunity Against Vaccine Preventable Diseases Study is coordinated by the National Institute for Health and Welfare and funded by the National Vaccination Program. The study has been approved by the Coordinating Ethics Committee of the Helsinki and Uusimaa Hospital District (HUS/3330/2017).

2.4 Power and data analysis

The aim is to gather data on a minimum of 1000 newly arrived asylum seekers. The minimum sample size for the study was calculated manually. Limited project time frame and resources restrict gathering a larger sample. The formula for calculations is enclosed as supplementary material [Link to Supplement Figure 2]. Based on register data on the numbers, country of origin and age of first-time asylum applicants between the years of 2014 and 2016, it is projected that a sample of 1000 participants would constitute of 700 for adults and 100 minors for each of the minor age groups (0-6 years, 7-12 years and 13-17 years). This estimation was calculated assuming simple random sampling. In practice, however, with total population

sampling, participation in the study will be influenced by family clusters. Members of the same family are likely to either all participate in the study or decline from participation. Calculation of estimates assuming cluster sampling was, however, not possible at the planning stage of the study because the available register data on asylum applicants from the previous years does not include information on how many families have arrived, nor on the composition of these families.

Using simple random sampling, an estimate of 700 adults would have a confidence interval of roughly ± 3.5%, and ±5% when examined by sex (n=350). A sample of 100 for each minor age group would result in confidence intervals of ±10% or less. Thus, projected confidence intervals will produce estimates of adequate accuracy if simple random sampling were applied (26). It should be, however, stressed that the confidence intervals presented above were calculated using simple random sampling, whereas in practice cluster sampling (from family units) will be done. This is an acknowledged limitation in this study's power calculations. Therefore, the provided confidence intervals should be viewed as initial estimates only, and wider confidence intervals than these are expected. This issue will be counteracted by using finite population correction (27), the formula for which is presented in the Supplement Figure 2. After finite population correction is applied, it is expected that despite cluster sampling, data on a minimum of 1000 persons will nonetheless produce estimates of adequate accuracy. Family clusters will be taken into account in all of the data analyses following the end of data collection.

The main findings of the study will be reported as a report focusing on basic findings as mean and median values, as well as proportions and their confidence intervals. These will be presented separately for adults, 13-17 year-olds, 7-12 year-olds and 0-6 year-olds, and by regions of origin. The categories for regions of origin will depend on the final number of participants from different regions. Groupings will be made according to established regional categories, for example according to the United Nations Statistics Division groupings (28) or the World Bank regional groupings (29). The effect of non-response will be assessed based on age, sex and country of origin of all asylum seekers registered in the national electronic asylum

database maintained by the Finnish Immigration Service. Based on these analyses, sample weights will be calculated, if necessary, to correct for the effect of non-response.

Following the publication of the basic report, data will be made available to researchers for in-depth analyses. Total population sampling allows to examine family units. This provides with a unique opportunity to examine how the health, wellbeing and health service needs of, for example, parents influence those of their children in later in-depth analyses. These regression analyses will be carried out using a mixed model that includes family unit as a random effect.

2.5 Patient and Public Involvement

The study was designed to fill the gap in knowledge on the health, wellbeing and health service use among asylum seekers. The study was designed consulting a consortium of experts on the topic of the health and wellbeing of asylum seekers. Persons with asylum seeker background were included into the steering committee and have provided their insights on the content of the study. No patients were directly involved in recruitment or conduct of the study. Results of the study benefit participants in that they receive information on their health and are consulted to seek further medical advice if a need for such is identified over the course of the study. Results will be disseminated in reception centres and through media and reports on a national level.

3 Ethics and Dissemination

Ethical aspects

Participation in the TERTTU Survey is based on voluntary informed written consent. Participants are informed concerning personal data protection, sovereignty of the study in terms of the person's asylum seeking process and confidentiality of the answers. It is made clear that the TERTTU Survey does not

substitute the initial health assessment provided by the reception centres. Furthermore, participants are informed that they are fully entitled to decline from participation or interrupt participation at any moment without the need for providing a reason and that they are also entitled to request deletion of their data. Participants are also informed that they are entitled to leave some questions unanswered and that they may refuse any measurement.

All of the data is collected during a one-on-one research appointment. None of the data collected during the study is shared with a third person (for example spouse, parent of 13-17 year-olds who participate independently, or reception centre personnel). Research nurses are bound by a confidentiality clause and have been trained in key principles of research ethics. Professional interpreters provide their services via the telephone, which provides a higher degree of confidentiality for the participant.

Participants are given oral and written feedback on their health examination measures. If a need for further health care services arises over the course of the survey visit, research nurses recommend participants to contact the reception centre nurse. All of the TERTTU Survey data is managed following the National Institute for Health and Welfare's protocol for handling sensitive data. Each study participant is given a random study ID number and data is handled without personal identification information.

Incentives (for example bus cards, toy packages for children) valued at approximately 10 euros are given to all participants. The TERTTU Survey has been approved by the Coordinating Ethics Committee of the Helsinki and Uusimaa Hospital District (reference number HUS/3306/2017).

Dissemination of information about the TERTTU Survey

Information about the TERTTU Survey is broadly disseminated both at national and international level at all stages of the study. Since the TERTTU Survey has been specifically designed to bridge the gap in knowledge on the health and wellbeing of asylum seekers in Finland, Ministry of Interior, Ministry of Social Welfare and Health and Ministry of Economic Affairs and Employment are regularly updated on the progress of the

study and these updates are transferred into various country reports compiled by the ministries. The TERTTU Survey has been presented to a number of international collaborators and at several international congresses. Possibilities for research collaboration with international partners will be explored.

The main findings of the baseline TERTTU Survey will be reported by the end of summer 2019 and they will be widely disseminated at both national and international level. Following this, TERTTU Survey data will be available for research purposes upon an accepted study proposal. Evidence-based health examination protocol will be developed and disseminated across reception centres on a national level by the end of 2019.

Acknowledgements

The authors would like to acknowledge experts at the Finnish Immigration Service and all of the personnel of collaborating reception centres for their substantial efforts in facilitating implementation of the study. All of the participants in the study, the research nurses involved in baseline data collection, the multidisciplinary consortium of experts from the National Institute for Health and Welfare and collaborating bodies as well as the steering committee of the Developing the health examination protocol for asylum seekers in Finland project also need to be acknowledged. Finally, the authors would like to acknowledge Sinikka Kytö and Kaaren Erhola for the graphical visualization of the TERTTU Survey material.

Author contributions

AC and OS conceptualised the initial idea for the national-level project aiming at developing the health examination protocol for asylum seekers in Finland within which the TERTTU Survey is implemented. AC developed the original grant proposal. NS, AC, PK, KL and EL have been involved in planning and

coordination of the study. OS has been the main contact on the behalf of the collaborating partner (Finnish Immigration Service). PT has been involved in the design and coordination of the Immunity Against Vaccine Preventable Diseases Study. NS prepared the first draft of the manuscript. All authors (AC, PK, KL, PT, OS, NS) have provided critical feedback and contributed to revision of the manuscript. All authors have read and approved the final manuscript.

Funding

TERTTU Survey is implemented as a part of the Developing the health examination protocol for asylum seekers in Finland: A national development project funded by the EU Asylum, Migration and Integration Fund.

Competing interests

The authors declare no competing interests.

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Table 1 Stages of the TERTTU Survey

Baseline data collection	
3-10/2017	Planning the data collection of the baseline TERTTU Survey.
9/2017-1/2018	Receiving Coordinating Ethics Committee of the Helsinki and Uusimaa Hospital District permission for implementing baseline and follow-up studies.
11/2017	Piloting the TERTTU Survey among volunteers with asylum seeker background.
12/2017-1/2018	Recruitment of the research nurses.
2/2018	Training of the research nurses.
3/2018-12/2018	Baseline data collection.
2/2019-4/2019	Data management, data quality assessment and analysis.
5-6/2019	Reporting basic findings.
7/2019 -	Data available for research purposes to other researchers upon an accepted study proposal by the National Institute for Health and Welfare.
7-12/2019	Dissemination of the main findings of the baseline TERTTU Survey and use for evidence-based development of the national health examination protocol for newly arrived asylum seekers.
1. Follow-up of TERTTU Survey participants	
2020 onwards	Linkage of reception centre electronic health records to baseline TERTTU Survey data based on unique asylum process identification number.
2. Follow-up of baseline TERTTU Survey participants	
2020 onwards	Feasibility of linking national register data to baseline TERTTU Survey data among persons granted asylum will be evaluated.

Table 2 Content of the interview of the Asylum Seekers Health and Wellbeing Survey (TERTTU)

Themes	Variable/measure	Questionnaire instrument/measures	Age group
Sociodemographics	Age, sex, year of birth, mother tongue, prior country of permanent residence	-	Adults 0-17 year-olds
Asylum seeking journey	Year when left permanent residence, route to Finland	Countries, types of housing and duration of stay in these locations during the asylum journey	Adults 0-17 year-olds
Literacy	Language skills, reading and writing skills	Mastery of languages other than mother tongue, ability to read and write (7+ year-olds)	Adults 0-17 year-olds
Previous socioeconomic status	Education, occupation	International Standard Classification of Education (ISCED-2011) (30), prior occupation	Adults
Health status	Self-rated health, presence of long-term conditions	Minimum European Health Module (MEHM) (31)	Adults 0-17 year-olds
	Chronic and infectious diseases, medications, current physical symptoms	Various health conditions diagnosed by a physician, need for regular medication, current medication, various somatic symptoms, tuberculosis symptoms, prior infectious diseases, vaccination history	Adults 0-17 year-olds
	Functional capacity	adapted from Washington Group Module (32)	Adults
		adapted from Unicef/ Washington Group Module (33)	0-17 year-olds
Early childhood and development	Gestation, early life development	Gestation week at birth, complications during birth, birth weight, height, early life development milestones	0-12 year-olds
	Growth and development	Previously identified problems in growth and development	0-17 year-olds
Sexual and reproductive health	Sexual behaviour	Questions related to risk behavior predisposing to sexually transmitted diseases	Adults 13-17 year-olds
	Male circumcision/female genital mutilation	Age of circumcision (if circumcised), problems associated with female genital mutilation	Adults 0-17 year-olds
	Pregnancies and births	Number of pregnancies, miscarriages, abortions, parity	Adults 13-17 year-olds
Traumatic events	Physical trauma due to accident/violence	Types of injuries before/during asylum journey	Adults
	Potentially traumatic life events	Various traumatic life events, adapted from Harvard Trauma Questionnaire (34) Potentially traumatic events, adapted from UCLA PTSD INDEX FOR DSM-IV (32)	Adults 0-17 year-olds

Mental health	Mental health symptoms	HSCL-25 (35,36), PROTECT-able SDQ	Adults 2-17 year-olds
Health behavior	Smoking	Frequency of smoking, use of different types of tobacco products	Adults 13-17 year-olds
	Alcohol use	Alcohol use, AUDIT-C (37) Alcohol use, adapted from ESPAD questionnaire (38)	Adults 13-17 year-olds
	Drugs	Use of intravenous and other drugs	Adults 13-17 year-olds
	Diet	Intake of selected food items	Adults 0-17 year-olds
	Dental health	Frequency of brushing teeth, latest visit to a dentist	Adults 0-17 year-olds
Social networks	Family members, contact with close ones	Whereabouts of close family members, being able to be in touch with close ones	Adults 0-17 year-olds

PROTECT, Process of recognition and Orientation of Torture Victims in European Countries to Facilitate Care and Treatment; AUDIT-C, AUDIT Alcohol Consumption Questionnaire; ESPAD, The European School Survey Project on Alcohol and Other Drugs.

Table 3 Content of the health examination of the Asylum Seekers Health and Wellbeing Survey (TERTTU)

Variable	Measurement tool	Measurement method	Age group
Weight	Seca 877	Measured wearing no shoes and only light clothing, with no heavy objects in the pockets. If the participant is pregnant, self-reported weight before pregnancy is recorded. (24)	Adults 7-17 year-olds
Height	Stand-alone stadiometer, Seca 217	Measured wearing no shoes and standing upright, looking straight ahead. (24)	Adults 7-17 year-olds
Waist circumference	Soft measuring tape, Hoechstmast	Measurement taken on bare skin on top of light clothing, half-way between the lowest rib and the top of iliac crest. (24)	Adults 13-17 year-olds
Upper arm circumference	Soft measuring tape, Hoechstmast	Measurement taken on bare skin, with the elbow resting comfortably on the surface of the table at a 90 degree angle.	Adults 13-17 year-olds
Blood pressure	Omron i-C10 digital blood pressure monitor	Measurement taken three times with a one minute interval on bare skin. (24)	Adults 13-17 year-olds
Pulse	Manually, with a stopwatch	Each pulse beat is counted for 60 seconds. (24)	Adults 13-17 year-olds
Dental examination	-	Existence of removable teeth prosthesis, number of teeth (without removable teeth prosthesis), standardised evaluation of dental health	Adults 7-17 year-olds
Skin condition	-	Standardised evaluation of skin condition (identification of bruises and rash)	0-12 year-olds
BCG scar	-	Standardised evaluation of the presence of Bacillus Calmette-Guérin (BCG) scar	0-6 year-olds

Table 4 Potential register linkages in the TERTTU Survey

National register	Type of information
Population Register Centre	Place of residence, marital status, nationality
Ministry of Employment and the Economy	Use of employment services, participation in activities for promoting employment
Social Insurance Institution of Finland	Social benefits and reimbursements for medical costs
National Institute for Health and Welfare	Number and reasons for healthcare visits and hospital care, procedures and treatments
Statistics Finland	Socio-economic position, education and causes of death

Figure legends

Figure 1 Conceptual framework of the TERTTU Survey (Figure 1 preferably reproduced in colour)

Figure 2 Permanent study locations in transit reception centres

Figure 3 Flow chart of the baseline TERTTU Survey

Supplement Figure 1 Brief information pamphlet given in connection with booking a time for a reach-out appointment

(Supplement Figure 1 preferably reproduced in colour)

Supplement Figure 2 Formula for calculating the sample size of the TERTTU Survey

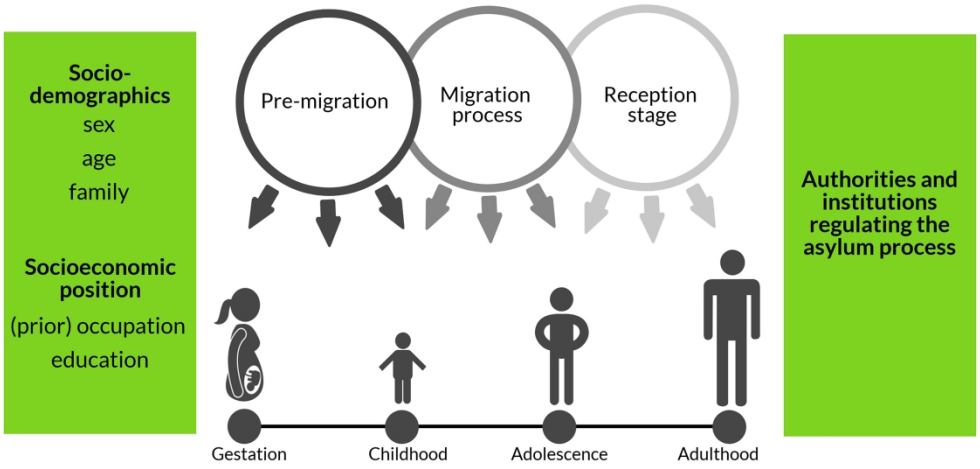

Figure 1 Conceptual framework of the TERTTU Survey

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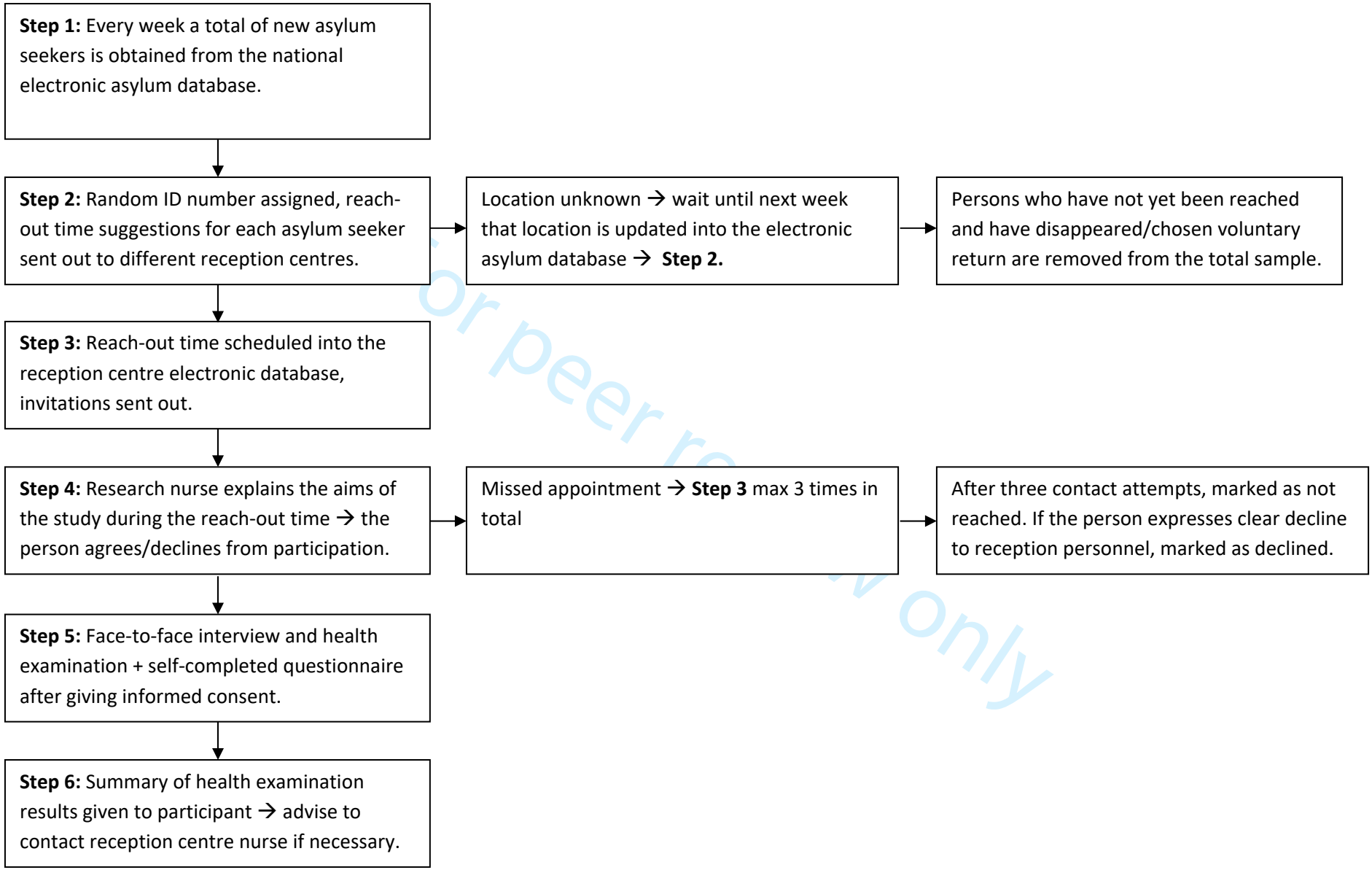
Figure 2 Permanent study locations in transit reception centres

212x299mm (300 x 300 DPI)



TERTTU promotes the health and wellbeing of asylum seekers through:

Gathering representative information on the health of newly arrived asylum seekers

Developing the current health examination protocol

Developing unified practices across reception centers

Unified practices and evaluation tools. Right kind of help at the right time.

TERTTU

Developing the health examination protocol for newly arrived asylum seekers

Stages of the project

2017
Overview of current practices, electronic health record analysis

2018
Conducting a Health and Wellbeing Survey in reception centres

2019
Developing the health examination protocol

For more information: www.thl.fi/terttu-project

In co-operation

National Institute for Health and Welfare (THL) • Finnish Immigration Service

Supported by The European Union, the Asylum, Migration and Integration Fund (Amif)

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Notation

N	total population size
n	sample size
$z_{1-\alpha/2}$	level of confidence according to the standard normal distribution
P	estimated proportion of the population
d	margin of error

Assuming a simple random sample, the estimated population proportion with a specified absolute precision is

$$n = z^2_{1-\alpha/2} P(1-P)/d^2_{srs} \quad \text{(Lwanga and Lemeshow 1991, p. 25).}$$

This is equivalent with

$$d_{srs} = z_{1-\alpha/2}\sqrt{\frac{P(1-P)}{n}}.$$

For a 95 % confidence level $z_{1-\alpha/2} \approx 1.96$ and for an unknown estimated proportion we use $P = 0.5$ where the term $P(1-P)$ reaches its maximum value. Thus, we get

$$d = 1.96\sqrt{\frac{0.5(1-0.5)}{n}} = \frac{0.98}{\sqrt{n}}.$$

Example

If $n = 100$ then $d_{srs} = 0.98/\sqrt{100} = 0.098$.

A sample size of 100 would have a 95 % confidence interval of ±9.8 % or less.

Margin of error in survey data

A sample that includes complex survey design such as different sampling probablilities or cluster sampling, should account for the design effect. The design effect

$$DEFF = var(survey)/var(srs),$$

where $var(survey)$ is the variation based on the survey design and $var(srs)$ is the variance assuming a simple random sampling.

If the sample includes a significant amount of the total population, a finite population correction can be applied. The formula for the correction is

$$FPC = \sqrt{\frac{N-n}{N-1}}.$$

A margin of error that accounts for design effect and finite population correction is

$$d_{survey} = z_{1-\alpha/2}\sqrt{\frac{P(1-P)}{n}} \times DEFF \times FPC$$

(Lehtonen and Pahkinen 2004).