Description of the 2021 register-based census methodology

Introduction

The organisation of a register-based population census presents a considerable challenge for the country and the success or failure of it will have a major impact on the country's reputation, especially with regard to its IT capacity.

The possibility of conducting a register-based population and housing census was considered in Estonia already before the previous census (PHC 2011) but it was concluded that the registers were not yet ready for this, nor had a register-based census methodology been developed in Estonia.

The development of a register-based census methodology in Estonia started already in 2010 with an inter-agency methodology project that gave a relatively negative assessment of the Estonian register system and questioned the country's ability to organise a register-based census. Between 2013 and 2021, the methodology team for the register-based census in Statistics Estonia worked in the following main directions:

1. cooperation with state registers to verify the quality of data therein, identify shortcomings, and support efforts to improve the quality;
2. development and testing of algorithms for the calculation of census variables based on the information in registers;
3. development of the methodology (indices) for correcting inaccuracies in register data using models based on the information obtained from multiple registers and other sources of information.

This document describes the methodology of calculating each of the register-based census characteristics for the 2021 census. The document is divided into four chapters. The first chapter gives an overview of the census populations: how the populations of persons, households and dwellings are compiled. The second chapter introduces the compulsory census characteristics of persons, about which all EU countries have to collect information. The third chapter describes the census characteristics ordered by the Estonian state. The last chapter details the methodology for the census characteristics of dwellings.

All subchapters outlining census characteristics of persons and dwellings are divided into three sections. First, the definition with which the census characteristics must comply is given. The definitions of mandatory census characteristics are based on EU regulations. For the national level characteristics, the definitions used in the previous census have been applied. Second, registers that have been used to compile the census characteristics are listed. Third, a description of the algorithm with which the particular census variable has been compiled is given.

The document will be continually updated in 2022, in accordance with the publication calendar. The dates of the updates are included in the titles of subchapters.

Contents

Definitions and abbreviations

ADS	Address Data System of the Land Board
ADS_OID	Address object identifier in the Address Data System
ADR_ID	Address identifier in the Address Data System
ARIREG	Commercial Register
EHAK	Estonian Administrative and Settlement Classification
EHIS	Estonian Education Information System
EHR	National Register of Buildings
EMPIS	Estonian Unemployment Information System
EMSR	Estonian Medical Birth Register
EMTAK	Estonian Classification of Economic Activities
ESD	Social tax declaration in special cases
ESU	Estonian Social Survey
e-File	e-File, online information system
ETR	Register of Residence and Work Permits
ETU	Estonian Labour Force Survey
FIDEK form E	Business income of a resident natural person
FIDEK form A	Income tax return for a resident natural person
FIE	Self-employed person
INF1	Disclosure of recipients of dividends, payments of equity
ISCED	International Standard Classification of Education
KIR	Prisoners' Register
KIRST	Health Insurance Database
KMAIS	Identity Documents Database
KOPIS	Mandatory Funded Pension Register
KOV	Municipality
KR	Land Register
KVKR	National Defence Obligation Register
LEKU	Comparative survey on household and place of residence data
Traffic Register	Traffic Register of the Transport Administration
MKR	Register of Taxable Persons
NUTS	Geographical nomenclature subdividing the economic territory of the European Union into regions (*Nomenclature d'Unités Territoriales Statistiques*)
PÕMAK	Database of Agricultural Holdings
REGREL	Register-based population and housing census
REL	Population and housing census

RETS	Estonian Medical Prescription Centre
RIHA	Administration system of the state information system
RK	Ethnic Nationality Classification
RR	Population Register
SA	Statistics Estonia
SAP	State Personnel and Payroll Database
SKA	Estonian National Social Insurance Board
SKAIS	Social Security Information System
SPI	Business register for statistical purposes
SPR	Causes of Death Register
STAR	Social Services and Benefits Registry
TETRIS	Database of Work Ability Assessment and Work Ability Allowance
TÖR	Employment Register
TSD	Declaration of income and social tax, unemployment insurance premiums and contributions to mandatory funded pension
TSD Annex 1 A	Payments made to resident natural persons
TSD Annex 2 A	Payments made to non-resident natural persons

1. Populations

In the case of a register-based census, the most important issue is related to the quality of the registers due to inaccurate data provided by the population. Estonia's greatest problem in this respect is the inaccuracy of residence data in the Population Register (PR).

With this in mind, Statistics Estonia has developed an 'index methodology' (the residency and location index) to verify and specify the register data, using a wide range of other registers and data sources.

Both indices use Estonia's system of administrative registers, which uses common identifiers and allows linking and combining the data of different registers. Assuming that, nowadays, people living and working in Estonia inevitably leave traces of activity in the form of records in various databases, it is possible to verify the person's residence in the country as well as connections between persons and their locations on an annual basis. Such verification is based on signs of life, signs of partnership, and signs of location recorded in registers every year. The annual indices are established as linear combinations of the respective signs, which makes it possible to trace yearly the change in a person's status.

The indices are calculated for all persons who have ever received an Estonian personal identification code. This makes it possible to monitor transnational persons who have left Estonia, including to detect whether they have returned, or how trans-boundary commuters move between their homeland and other countries (Tiit, Vähi, Kool, 2018).

Even though the general indexing principles have been established and model parameters have undergone empirical assessment, the methodology is still evolving, and new signs can be added each year, depending on new information (including big data) becoming available. The accuracy of index-based estimates is assessed through the use of additional surveys and estimation errors are presented along with the results. Adding new information (further signs) will result in the consistent improvement of the accuracy of index-based estimates.

1.1. Population of persons

To form a population of individuals, Ene-Margit Tiit and Ethel Maasing have developed a residency index (Tiit, Maasing, 2016) that uses information from a wide range of databases to assess the likelihood of a person being in Estonia.

In accordance with international rules, included in the census are persons who, at the time of the census, are permanent residents, i.e. persons who have lived in the country for at least one year, or who have lived in the country for a shorter period but intend to stay for at least one year. Those who left the country less than a year ago but do not intend to stay abroad for more than a year are also enumerated. People who left the country more than a year ago are excluded from the census.

Determining all these conditions is difficult in a register-based census, as it is not possible to ask people about their intentions. However, a general assumption was made: if a person has registered his or her arrival when entering the country, he or she intends to stay for at least one year, and if the person has registered his or her departure, he or she intends to stay in another country for at least one year.

Long-term stay or non-stay in Estonia can be established with a fairly high degree of probability using the so-called signs of life, i.e. person's activity in various state registers. To this end, a residency index was developed, which is calculated annually for each person who is either a resident or could become a resident. The value of an index varies between 0 and 1 and every year it indicates the probability of a person being a resident of Estonia. The formula for calculating the index uses the person's residency status in the previous year and the signs of life collected in the previous year:

$$R(k) = 0{,}8 * R(k-1) + 0{,}2 * \sum_{i=1}^{n} a_i * E_i$$

In the formula, each state register corresponds to a sign of life E_i, with a value of 0 if the person was not active in that register during the previous year, and with a value of 1 if the person was active (at least once) in that register. If the value of the index is above the threshold of 0.7, the person is considered to be resident.

The coefficients a_i, the threshold 0.7, and the parameter values 0.2 and 0.8 are statistically defined in such a way that the indexed residents are as close as possible to the definition of residents formulated in the census condition. The statistical estimation error for the presented procedure is of the order of 0.05%, i.e. about 700 persons in case of Estonia.

The value of the index is calculated for all persons in the extended population. That includes persons who were in the population of the census in 2011 or in the Estonian Population Register (in 2012−2017). Each year, the extended population is updated on the basis of information gathered from the Population Register. Persons included in the extended population may have a registered residence in Estonia or abroad, or it may not be registered at all. These people may also be placed in the 'passive' part of the Population Register. In 2017, the index was calculated for more than 1.6 million people. This will also allow the designation of returnees as residents if they have an Estonian personal identification code.

The index is calculated annually for persons alive at the beginning of the year, using all known administrative registers (and their independent sub-registers), and finding for each person all the signs of life acquired in the previous year. This is how Statistics Estonia calculates Estonia's population as of 2016. The size of population defined in this manner is 2−3% smaller than the size of population in the Population Register, since in the index-based population census, unregistered migration is taken into account as well. As the annual size of population is calculated on the basis of index, the population of residents is also the population of persons in the register-based population and housing census.

Table 1. Registers and explanations of signs of life

No of register	No of sign of life	Register	Name of sign of life	Explanation
1	1	ETR	ETR	Person was in the ETR as at 31 December (has a valid residence or work permit)
2	2	EHIS	EHIS	Person was a pupil (primary, general, vocational, higher education) as at 10 November or 31 December
	3		EHIS_PEDA	Data on teachers are received from the registry holder once a year as at 10 November and 31 December of the previous year
	4		HUVIHARIDUS	Data are received from the registry holder once a year as at 10 November and 31 December of the previous year. This sign of life is ascribed to a person who has participated in at least one activity related to hobby education during the year (children and pensioners, who might otherwise get few signs of life, will thus be included)
3	5	TÖR	TOR	Person was in TÖR for at least one day
4	6	STAR	STAR	Person is in STAR, i.e. has received or applied for some form of social allowance, income-related support (e.g. subsistence benefit), etc. from the municipality
5	7	KVKR	KVKR	Person was in mandatory service in the defence forces or in alternative service
6	8	Traffic Register	LR_JL	Person made or exchanged a driving licence
	9		LR_OM	Person has bought or sold a vehicle, has been the user of a leased vehicle, or has been the user of a vehicle bought from or sold to a legal person

No of register	No of sign of life	Register	Name of sign of life	Explanation
	10		LR_EKSAM	Person has taken a theory or driving test for the right to drive a motor vehicle
7	11	e-File	ET	Person has attended a hearing or interrogation; person has committed a criminal offence or misdemeanor and is associated with the event; person has personally received a document for which information on receipt is required (excl. notifications sent by electronic means)
8	12	EMPIS	TK	Person has been unemployed or a jobseeker (in EMPIS of the Estonian Unemployment Insurance Fund)
9	13	PKR/SKAIS	SKA_INST	Person is in 24-hour special care by the state
	14		SOTS_TOET	Person or his or her ward has received social allowance from the state
	15		SKA_PENS	Person is paid a state pension into an Estonian bank account (excl. those whose pension is paid into a foreign account or who live abroad)
	16		PERE_TOET	Person receives family allowance or has a child for whom it is paid
	17		VANEMAH	Person receives parental benefit or has a child for whom it is paid
	18		SKA_P_TV	Person has a valid disability and/or incapacity for work certificate (incl. those who have not been awarded pension for incapacity for work) for at least one day
10	19	KIRST	HAMBARAVI	Person has been reimbursed for dental care or dentures
	20		RAVIARVE	Person has a medical bill
	21		LAPSVABASTUS	Person has been absent from work due to childbirth or adoption (has a certificate for maternity or adoption leave) for at least one day
	2		TOOVOIMETUS	A certificate of incapacity for work (sickness benefit, care allowance) has been issued to person for at least one day
	23		KINDLUSTUS	Person has had state health insurance from the Health Insurance Fund at least once in the year preceding the data extraction from the Population Register (excl. those who had only the following insurances: person up to the age of 19, foreign student, Estonian pensioner in another EU Member State, and family member living in an EU Member State)
11	24	RETS	DIGIRETSEPT	Person has purchased electronically prescribed medication (the person who bought the medication, not the person for whom it was prescribed) during the year
12	25	KMAIS	KMAIS	Person has replaced an identity document in 2016. Person has applied for the document in Estonia, and it has been issued in Estonia, not in a foreign mission
13	26	KIR	VANGIS	Person has been detained or under probation supervision for at least one day

No of register	No of sign of life	Register	Name of sign of life	Explanation
	27		VANGI_KUL	Person has visited someone jailed in Estonia
14	28	RR	ABIELU	Person has entered into contract of marriage in Estonia
	29	RR	LAHUTUS	Person has registered for divorce in Estonia
15	30	SAP	SAP	Person has worked in a state agency for at least one day a year
16	31	TETRIS	TOOVOIM	Person has a valid certificate of reduced capacity for work and/or has applied for an assessment of capacity for work
	32	RR	EL_MUUTUS	During the year, person has registered a new residence in Estonia down to the level of dwelling (the previous registered dwelling-level residence was also located in Estonia)
17	33	ESFAR	ESF	Person has participated in ESF activities for at least one day a year. This is not a register but a large survey data set (data collection of participants in the activities of the European Social Fund in Statistics Estonia in 2014−2025)
18	34	MKR	TSD	TSD Annex 1A has been submitted for person: payments made to resident natural persons, withheld income tax, contributions to mandatory funded pension and unemployment insurance premiums, and calculated social tax and unemployment insurance premiums paid by employer

1.2. Population of households – from 06.09.2022

1.3. Population of dwellings – from 05.07.2022

2. Information about persons (mandatory in the EU)

2.1. Place of usual residence

Definition

A place of residence is considered permanent if, at the time of the census, the person has lived or intends to live there for 12 months. In cases where it is not possible to measure the intention to reside in a particular location, the place of residence where the person is registered shall be accepted as the place of usual residence.

Exceptions

(a) Where a person regularly lives in more than one residence during the year, the residence where he or she spends the majority of the year shall be taken as his or her place of usual residence regardless of whether this is located elsewhere within the country or abroad. However, a person who works away from home during the week and who returns to the family home at weekends shall consider the family home to be his or her place of usual residence, regardless of whether his or her place of work is elsewhere in the country or abroad.

(b) Primary and secondary school pupils and students who are away from home during the school term and regardless of how often they return to their family home, shall consider their family home to be their place of usual residence (regardless of whether they are pursuing their education elsewhere in the country or abroad).

(c) Tertiary students who are away from home while at college or university shall consider their term-time address to be their place of usual residence regardless of whether this is an institution (such as a boarding school) or a private residence and regardless of whether they are pursuing their education elsewhere in the country or abroad. Exceptionally, where the place of education is within the country, the family home can be considered as the place of usual residence.

(d) An institution shall be taken as the place of usual residence of all its residents who at the time of the census have spent, or are likely to spend, 12 months or more living there.

(e) The general rule in relation to where most of the daily period of rest is spent applies to persons doing compulsory military service and to members of the armed forces who live in military barracks or camps.

(f) The place of enumeration shall be taken as the place of usual residence of homeless or roofless persons, nomads, vagrants, and persons with no concept of usual residence.

(g) A child who alternates between two places of residence (for instance if his or her parents are divorced) shall consider the one where he or she spends the majority of the time as his or her place of usual residence. Where an equal amount of time is spent with both parents, the place of usual residence shall be the one where the child is found at the time on census night or, alternatively, the household where the child has his or her legal or registered residence.

(h) Merchant seamen and fishermen usually resident in the country but at sea at the time of the census (including those who have no place of residence other than their quarters aboard ship) shall be included.

(i) Persons who may be irregularly staying or undocumented, as well as asylum seekers and persons who have applied for, or been granted, refugee status or similar types of international protections, provided that they meet the criteria for the usual residence in the country, shall be included. The intention is not to distinguish these persons separately, but rather to ensure that they are not missed from the enumeration.

(j) Children born in the 12 months before the census reference time and whose families are usually resident in the country at the census reference time shall be included.

(k) Persons whose stay in the country (actual and/or intended) is exactly one year shall be included. Military, naval, and diplomatic personnel and their families.

(l) Foreign military, naval and diplomatic personnel, and their families, located in the country, regardless of their duration of stay shall be excluded from the usually resident population of a country.

(m) Where the duration of residence outside of the country can be established for national military, naval and diplomatic service personnel and their families located outside the country, the following shall be applied:

— if they are residing abroad for less than 12 months and they are intending to return to the place of departure, they shall be allocated within the country in accordance with the rules for usual residence. They could be allocated to (by decreasing order of priority):

    (i)   the family home address within the country, if any, or

    (ii)   the duty station within the country to which they were attached before leaving.

— If they are residing abroad for at least 12 months or if they are not intending to return to the place of departure (even if returning in the country within a 12-month period), they shall be attributed to a 'virtual place' (extra-region) of the country of departure.

On the basis of the definition of the place of usual residence, persons usually resident in the place of enumeration but absent, or expected to be absent, at the time of the census for less than one year shall be considered as temporarily absent persons and thus included in the total population. In contrast, persons living or expected to live outside the place of enumeration for one year or more shall not be considered temporarily absent and shall therefore be excluded from the total population. This is regardless of the length of visits that they may pay to their families from time to time.

Persons who are enumerated but do not meet the criteria for usual residence in the place of enumeration, i.e. do not live or do not expect to live in the place of enumeration for a continuous period of at least 12 months, are considered temporarily present and are therefore not counted in the total usual resident population.

Geographical area		GEO.N.	GEO.M.	GEO.H.
0.	Total	0.	0.	0.
x.	All NUTS 3 regions		x.	x.
	x.x. All LAU 2 regions			x.x.

In Estonia, LAU 2 regions are municipalities.

On NUTS 3 level, the counties are grouped as follows:

- Northern Estonia: Harju county

- Western Estonia: Hiiu, Lääne, Pärnu, and Saare county

- Central Estonia: Järva, Lääne-Viru, and Rapla county

- North-Eastern Estonia: Ida-Viru county

- Southern Estonia: Jõgeva, Põlva, Tartu, Valga, Viljandi, and Võru county.

Sources

The following registers are used to establish the usual place of residence: e-File, KIRST, Traffic Register, MKR, RETS, Population Register, STAR, Elering, TETRIS, VANGIS, KR, PHC 2011, EHIS, KMAIS, KOPIS, and TÖR.

Algorithm

In the register-based census, the place of usual residence is determined using the location index methodology developed from the residency index, and the partnership index methodology used in the second pilot census. The location index is designed to answer two questions: where and with whom does a person live. In other words, the distribution of people into households and their places of residence are determined simultaneously.

The workflow of the location index is as follows. Various datasets are used to collect signs that could indicate whether two people live in the same household (Table 1). Such signs include signs of partnership but, unlike in the partnership index, there are no restrictions on gender, age, or blood relationship of the persons. Therefore, parenthood or the payment of child allowance to an adult caring for a child are also suitable linking signs.

Signs that connect a person with various locations (Table 2) are also important, whether they are possible places of residence (e.g. address in the Population Register, property, dwelling connected into the electricity grid) or simply indications to the area in which the person lives (e.g. GP, workplace, school, pharmacy where electronically prescribed medication was purchased).

Table 2. Signs linking individuals

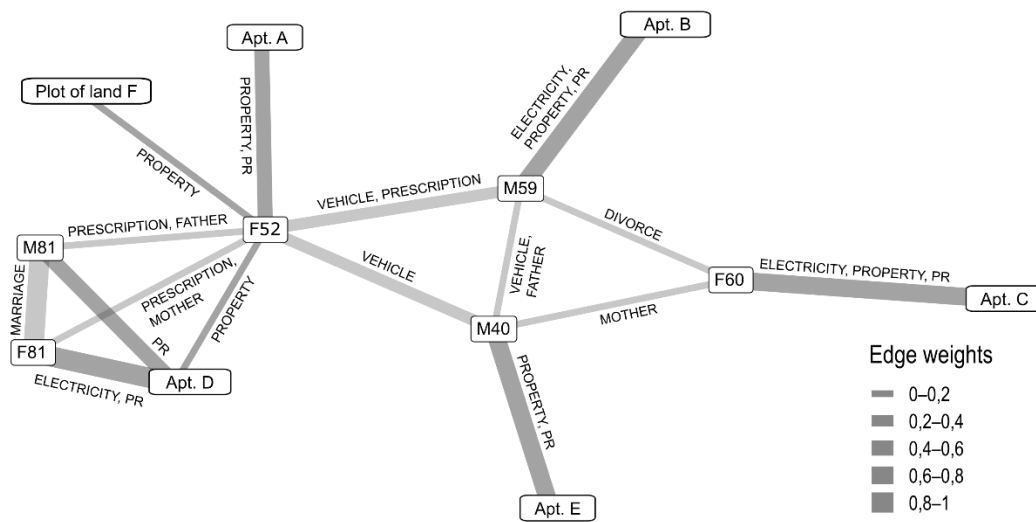| Database	Link between persons
E-File, information system for the expedited payment order procedure	Persons are *on the same side* in a maintenance dispute (e.g. the recipient and the child for whom maintenance is paid)
	Persons are *opposing parties* in a maintenance dispute (e.g. the recipient and the payer)
Health Insurance Information System	One person has cared for another person in the year preceding the census
Traffic Register	Persons are linked to the same vehicle (e.g. owner and user of the car)
Register of Taxable Persons	Persons have jointly taken out a housing loan (information provided by the bank for the interest refund)
	Person has declared the training expenses of another person on his or her income tax return
	Person received income tax exemption for two or more children. The link is between the child and the declarant
	One spouse has transferred tax-free income to the other spouse
Estonian Medical Prescription Centre	Person has purchased electronically prescribed medication on behalf of another person
Population Register	Persons are married
	Persons are divorced
	Person is the mother of the other
	Person is the father of the other
	An adult serves as the guardian of another adult
	Child is separated from parent
	Person has partial or limited right of custody over child's property and/or child
	Person has full right of custody over child's property and child
	Person receives family allowance for a child
	Person receives parental benefit for a child
	An adult receives extra leave to care for a disabled adult
Social Services and Benefits Registry	Persons in the same household have received subsistence benefit

Table 3. Signs linking persons and locations

Database	Link between person and location	Location accuracy
Elering	Person has an electricity contract at a particular address	Possible place of residence
Register of persons registered as unemployed or jobseekers, and of provision of labour market services	Person's place of residence	Possible place of residence
	Person's place of residence	Possible place of residence
Prisoners' Register	Place of residence of prisoners, detained persons, persons in custody, and probationers	Possible place of residence
Land Register	Real estate belonging to person	Possible place of residence
Population Register	Person's registered place of residence	Possible place of residence
	Person's additional address	Possible place of residence
	Person's previous places of residence	Possible place of residence
	Person's place of stay (e.g. dormitory)	Possible place of residence
Population and housing census of 2011	Addresses of the person and his or her mother	Possible place of residence
Social Services and Benefits Registry	Person's place of residence	Possible place of residence
Register of Taxable Persons	Real estate purchased with a person's housing loan	Possible place of residence
Estonian Education Information System	Kindergarten of child	Municipality
	School of vocational or higher education student	Municipality
	School of pupil in general education	Municipality
	Teacher's place of work	Municipality
Health Insurance Information System	Dental care institution visited by the person	Municipality
	Medical institution visited by the person	Municipality
	Person's GP	Municipality
Identity Documents Database	Place of receipt of an identity document	Municipality
Mandatory Funded Pension Register	Address of person who has joined the second pension pillar	Municipality
Estonian Medical Prescription Centre	Pharmacy in which the person has purchased electronically described medication	Municipality
Employment Register	Person's place of work	Municipality

Next, the likelihood that the persons linked by a sign actually do live together is assessed. Similar to the partnership index, information on actual cohabitation is available from large household surveys: the Estonian Social Survey and the Estonian Labour Force Survey. Based on survey data, the model parameters are estimated and then the probabilities are calculated for all pairs of individuals found in the registers.

The probability of a person living at a particular location is calculated in a similar manner. The various links with a specific address and municipality as well as the person's distance from his or her workplace, school or kindergarten are taken into account.

Persons, places, and the links between them can be described mathematically as a *graph*. Graphs consist of vertices and edges connecting them. For example, social networks can be viewed as a graph: vertices are people, and edges are friendships. Sometimes weights are assigned to the edges. For instance, in transportation, the weight of a road (edge) connecting two geographical points (vertices) may be the length

of the road. In this case, vertices are people and places, and edges are the links between them. Weights are the statistically estimated probabilities of two persons living together or of a person dwelling in the particular place (Figure 1).

Figure 1. Fragment of a graph of persons and locations. The vertices indicating persons show the person's sex and age. The width of lines indicates the likelihood of persons living together (light lines) or of a person dwelling in the particular place (dark lines). The labels on the edges indicate the nature of the link: PRESCRIPTION – one person has bought electronically prescribed medication on behalf of another person, PR – place of residence according to the Population Register, VEHICLE – persons are linked to the same vehicle, e.g. users of the same car. The figure has been previously published in the journal *Akadeemia* (Tiit, Visk, Maasing, Levenko, Lehto, 2021).

In the analysis of social networks, *community detection* plays an important role. In mathematical terms, the search is for a set of vertices that are closely related to each other and weakly related to other vertices. The household with its place of residence can also be seen as such a sub-graph. The core of the location index is the subdivision of the graph of people and places into sub-graphs that contain one or more persons and at least one possible place of residence, using a community detection algorithm. Persons in the same sub-graph form a household and their place of residence is also in this sub-graph.

If more than one residence is associated with a household, the most likely of these is selected. This is done by taking into account the household's weights for each place, electricity consumption, size of dwelling, and amenities (central heating, bathroom, toilet, water). Electricity consumption data are obtained from Elering, and size and amenity data from the Building Register. Although the location index includes a wide range of registers in the sample, in most cases individuals have the strongest association with the PR residence. For instance, in 2022, the location index left 74% of the individuals in their PR place of residence.

The algorithm described above is applied to people belonging to private households. Persons known to be homeless or living in an institution, i.e. belonging to an institutional household, are identified separately. Data on the homeless population are obtained from municipalities, data on nursing homes and special care homes from the Social Protection Information System, data on substitute homes from the Social Services and Benefits Data Register, and data on prisoners from the Prisoners' Register. Monastery residents are identified by their PR residential address. In addition, information on places of stay found in the Population Register is used – under the new Population Register Act, which entered into force in 2019, a number of institutions, including social welfare institutions, are obliged to register their inhabitants in the Population Register.

2.2. Sex and age

Definition

The characteristics sex and age are designed to break down any total or subtotal referring to persons. Age is the person's age in completed years at the moment of census (early morning of 31.12.2021).

Sources

Sex and date of birth are determined from the person's Estonian personal identification code retrieved from the Population Register.

Algorithm

Sex and date of birth (year, month, date) are determined from the first seven digits of the personal identification code.

Meaning of the first digit of the personal identification code: 1 − a man born in 1800−1899, 2 − a woman born in 1800−1899, 3 − a man born in 1900−1999, 4 − a woman born in 1900−1999, 5 − a man born in 2000−2099, 6 − a woman born in 2000−2099. The second and third digit mark the last two digits of the year of birth; the fourth and fifth digit denote the month of birth (January − 01, February − 02, etc.), and the sixth and seventh digit mark the date of birth.

2.3. Legal marital status

Definition

Marital status is defined as the (legal) conjugal status of an individual in relation to the marriage laws (or customs) of the country (that is *de jure* status).

The person shall be classified according to his or her most recently acquired legal marital status at the moment of census.

In Member States where the legislation includes provisions for married partners or partners in registered partnership to be 'legally separated', such 'legally separated' persons shall be classified under 'Married or in registered partnership' (LMS.L. 2. and LMS.H. 2.).

The breakdown 'Legal marital status' is designed to break down any total or subtotal referring to persons.

	Legal marital status	LMS.L.	LMS.H.
0.	Total	0.	0.
1.	Never married and never in registered partnership	1.	1.
2.	Married or in registered partnership	2.	2.
	2.1. In an opposite-sex marriage or registered partnership		2.1.
	2.2. In a same-sex marriage or registered partnership		2.2.
3.	Widowed or registered partnership ended with the death of partner (and not remarried or in a registered partnership)	3.	3.
4.	Divorced or registered partnership legally dissolved (and not remarried or in a registered partnership)	4.	4.
5.	Not stated	5.	5.

In the previous census, a distinction was made between marriage and registered partnership; this is not the case in the 2021 census.

As of the register-based population and housing census of 2021, it is not possible to form the subdivisions of same-sex and opposite-sex registered partnerships. Registered Partnership Act is in force since 01.01.2016, but there are no implementing provisions and therefore no data have been collected in the registers.

Sources

Legal marital status is allocated based on Population Register data and PHC 2011.

Algorithm

The marital status in the Population Register is considered a priority because it is based on records; PHC 2011 data are only added if the person is not in the Population Register. 15- to 17-year-olds are considered unmarried if no other marital status can be allocated to them on the basis of the above; persons under 15 years of age are considered unmarried regardless of their marital status in the Population Register or PHC 2011.

2.4. Country of birth

Definition

Information on the place of birth is collected according to the place of usual residence of the mother at the time of the birth, or, if not available, the place in which the birth took place. Information on the country of birth is collected on the basis of international boundaries existing at the moment of census.

Sources

Sources are Population Register (country of birth and mother's usual place of residence at the time of the birth), Statistics Estonia's data of births (RAAB), and PHC 2011. In case of PR, data extracted as at 31 December 2005 are used.

Algorithm

Country of birth algorithm differs by year of birth.

- For persons born before 1970, the country of birth is imputed based on PHC 2011 data and, if missing, from country of birth data in the Population Register.
- For persons born between 1971 and 2011, country of birth characteristics in the Population Register and PHC 2011 data are used. First, information retrieved from the PHC 2011 data is used, then the information on the country of birth taken from the PR, and lastly, the information on the mother's place of residence in the PR at the time of person's birth.
- For persons born after 2011, Estonia is assigned as the country of birth for those who have been registered as born in Estonia in Statistics Estonia's database of births. For foreign-born, first the PR's country of birth data is used. If this data is insufficient, the mother's place of residence at the time of person's birth is used.

2.5. Country of citizenship

Definition

Citizenship is defined as the particular legal bond between an individual and the State, acquired by birth or naturalisation, whether by declaration, choice, marriage, or other means according to national legislation.

A person of two or more citizenships is allocated to only one country, to be determined in the following order of precedence:

1. reporting country; or

2. if the person does not have the citizenship of the reporting country: other EU Member State; or

3. if the person does not have the citizenship of another EU Member State: other country outside the European Union.

Where there are cases of dual citizenship where both countries are within the European Union but neither is the reporting country, Member States shall determine which country of citizenship is to be allocated.

Sources

Country of citizenship is noted on the basis of Population Register, PHC 2011, and LTR data.

Algorithm

Country of citizenship in the Population Register is considered a priority as it is based on records; PHC 2011 data is only added if the person belonging in the population is not in the PR. In addition, as of 01.01.2021, data is complemented with information retrieved from the Short-Term Employment Register (LTR).

2.6. Place of usual residence one year prior to census – from 23.11.2022

2.7. Location of place of work – from 15.12.2022

2.8. Current activity status – from 15.12.2022

2.9. Occupation – from 15.12.2022

2.10. Industry (branch of economic activity) – from 15.12.2022

2.11. Status in employment – from 15.12.2022

2.12. Educational attainment – from 03.08.2022

2.13. Ever resided abroad and year of arrival in the country (from 1980) – from 23.11.2022

2.14. Locality

2.15. Household status – from 06.09.2022

2.16. Family status – from 06.09.2022

2.17. Type of family nucleus – from 06.09.2022

2.18. Size of family nucleus – from 06.09.2022

2.19. Type of private household – from 06.09.2022

2.20. Size of private household – from 06.09.2022

3. Information about persons (national)

Below is the information on such census characteristics that are compiled at the request of national consumers. Other EU countries are not required to collect this data.

3.1. Ethnic nationality

Definition

Persons had the right to declare themselves as members of the nationality group to which they felt the strongest ethnic and cultural connection. Persons who felt belonging to more than one ethnic nationality chose the one that was most important to them.

Sources

Ethnic nationality is recorded based on data in the Population Register, PHC 2011, EMSR, and KMAIS.

Algorithm

If a person's ethnic nationality is the same in all three sources (PR, PHC 2011, EMSR), the same in two of them, or recorded in only one of the sources, that ethnic nationality is assigned for the person.

If a different ethnic nationality is recorded for a person is various sources, the person will be assigned the ethnic nationality with the most recent amendment date.

Children (under 18 years of age) – if the ethnic nationality of the child is not indicated in any of the registers, the ethnic nationality of the mother will be assigned to the child.

If ethnic nationality has been entered in KMAIS later than in the last source, or was missing from an earlier source, the ethnic nationality entered in KMAIS will be recorded as the person's ethnic nationality.

3.2. Mother tongue

Definition

Mother tongue is the language acquired in early childhood as the first language; usually the language in which the person is most proficient. If the person's mother tongue was missing, the mother tongue of his or her mother (provided that the father's mother tongue is the same or unknown) will be noted as that person's mother tongue.

Sources

Annual data extractions from the Population Register since 2005, PHC 2011, EHIS, and KMAIS.

Algorithm

From the data in three sources (PR, PHC 2011, and KMAIS), the language most recently entered in the databases is selected as the person's mother tongue. If data are still missing after that, the mother tongue reported in EHIS are added. And if the mother tongue is not indicated in that register either, the mother tongue of the mother will be recorded as the person's mother tongue (provided that the father's mother tongue is the same or the father has no mother tongue recorded).

3.3. Number of children given birth to

Definition

The number of live births in a woman's lifetime. Adopted children are not taken into account here. This characteristic is noted for women of at least 15 years of age.

Sources

Sources are PHC 2011, PHC 2000, EMSR, Population Register.

Algorithm

When determining the number of children, three sources are compared, and the highest result is selected:

1. PHC 2011 data showing the woman's number of children as at 31.12.2011, plus the number of children born in the period of 01.01.2012 – 30.12.21 based on the EMSR.

2. To get the total number of children in the EMSR data set, the number of children born most recently is added to the number of children born earlier.

3. Number of children obtained from the child-mother relationship file compiled based on EMSR, PHC 2011, PHC 2000, and PR.

In addition to the number of children given birth to, it must be decided for whom the lack of information on children indicates that there are no children and for whom the number of children is simply unknown. Persons who meet the following conditions are considered as childless.

- Women who declared in the PHC 2011 that they have no children, who have lived continuously in Estonia since the census, and who have no children according to other sources. Permanent residence in Estonia is determined on the basis of the latest extract from the Population Register.

- Women who have permanently resided in Estonia since the age of 15 and who have no children according to other sources. Permanent residence in Estonia is determined on the basis of the latest extract from the Population Register, using the same characteristics as in the previous point – the latest age at which the person moved to Estonia must be < 15.

- Women who declared in the PHC 2011 not to have given birth and who were over the childbearing age (women aged 50 and older) at the time of the PHC.

- Women whose childbearing age (15) begins in the year 1990 and who have no children according to various data sets.

- Estonian citizens who have no children according to other sources.

3.4. Age at birth of first child

Definition

Age at birth of first child is calculated for all women aged 15 and over with at least one child.

Sources

Sources are PHC 2011, PHC 2000, EMSR, Population Register.

Algorithm

A woman's age at the birth of her first child is obtained by subtracting the date of birth of the first child from the date of birth of the mother. Age at birth of first child is calculated for all women aged 15 and over living in Estonia who have given birth and whose number of children is known.

3.5. Secondary place of residence – from 23.11.2022

3.6. Native origin – from 04.10.2022

3.7. Sources of subsistence – from 15.12.2022

4. Housing-related characteristics

4.1.   Housing arrangements – from 05.07.2022

4.2.   Tenure status of households – from 05.07.2022

4.3.   Type of living quarters – from 05.07.2022

4.4.   Occupancy status of conventional dwellings – from 05.07.2022

4.5.   Type of ownership – from 05.07.2022

4.6.   Number of occupants – from 05.07.2022

4.7.   Useful floor space and/or number of rooms of housing units – from 05.07.2022

4.8.   Density standard – from 05.07.2022

4.9.   Water supply system – from 05.07.2022

4.10. Toilet facilities – from 05.07.2022

4.11. Bathing facilities – from 05.07.2022

4.12. Type of heating – from 05.07.2022

4.13. Dwellings by type of building – from 05.07.2022

4.14. Dwellings by period of construction – from 05.07.2022

4.15. Location of living quarters – from 05.07.2022

5. References

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