



METHODOLOGICAL EXPLANATION

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CAREERS OF DOCTORATE HOLDERS

This methodological explanation relates to the data releases:

- Careers of doctorate holders, Slovenia, multianually (First Release)



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1 PURPOSE

The purpose of publishing the data is to present data on the careers of doctorate holders, i.e. to show data on employment and careers of doctorate holders, and on their international mobility.

2 LEGAL FRAMEWORK

- [Annual Programme of Statistical Surveys \(LPSR\) \(only in Slovene\)](#)
- [National Statistics Act \(OJ RS, No. 45/95 and 9/01\)](#)

3 UNIT DESCRIBED BY THE PUBLISHED DATA

The units described by the published data are doctorate holders aged up to 69 years with permanent or temporary residence in Slovenia.

4 SELECTION OF OBSERVATION UNIT

Observation units are doctorate holders, irrespective of whether the doctorate was obtained in Slovenia or abroad, aged up to 69 years, with permanent or temporary residence in Slovenia.

The observation units are selected from the available administrative and other records or surveys: the annual statistical survey of graduates - doctorate holders, the Statistical Register of Employment, the Unemployment Register, and the Central Population Register

This is a sample survey. The sampling frame included persons from several sources who were on 31 December 2020 registered as doctorate holders.

The sample was simple, random and stratified. The strata were defined according to gender, age groups of doctorate holders and main fields of science and technology. There was a special stratum for persons for whom we had no data on the fields of science from which they had a doctorate. The sample size was 3,600 persons.

5 SOURCES AND METHODS OF DATA COLLECTION

Data are collected multiannually.

Data were collected with the web questionnaire *Kariera doktorjev znanosti, 2020*. The reporting units (persons) were informed that the web questionnaire is

available and asked to complete it.

Some of the data were taken from other statistical sources or surveys: Graduates in tertiary education, Incomes of the population, Population census 2021, Statistical register of employment.

Data referring to the unemployed were taken from the Unemployment Register, and basic data such as country of birth and age were taken from the Central Population Register.

6 DEFINITIONS

A doctorate holder is a person who was awarded one or more doctorates, finished educational programme at the third level and after the end of the study obtained the academic title of a doctor of science.

A researcher is a professional who on 31 December 2020 was engaged in research and/or experimental work, i.e. conception or creation of new knowledge, products, procedures, methods or systems and managed such projects (no matter if this was in the primary or secondary job).

To sort data by **fields of science**, we used the International Classification of Fields of Science and Technology (FOS) 2007.

Time from enrolment to completion of the doctorate is time from the year in which the person enrolled in the doctoral studies and the higher education institution formally approved the enrolment in the doctoral studies to the year in which the persons completed their doctoral studies.

An internationally mobile doctorate holder is a person who in the period between 1 January 2011 and 31 December 2020 moved to a country that is not their usual residence for a period of at least three months because of doctoral studies, work or research.

Enterprises or organizations in which the doctorate holders were employed were classified into the following five **sectors of employment**:

1. **Business enterprise sector** includes enterprises whose primary activity is the market production of goods or services for sale to the general public at an economically significant price.
2. **Government sector** includes non-financial corporations under public control and other central government units, other local government units and direct budgetary users.
3. **Higher education sector** covers universities and other institutions in which post secondary education takes place, irrespective of the source of finance and legal status. Also included are research institutes, experimental units and clinics under the direct supervision of public higher education institutions.
4. **Other education sector** comprises all institutions carrying out pre-school, primary or secondary education, whatever their source of finance and legal status.

5. **Private non-profit sector** covers private non-profit institutions serving private persons and households. The institutions are financed by the founder in the form of gifts in kind, with part of the funds contributed by enterprises and the government.

7 EXPLANATIONS

7.1 CLASSIFICATIONS

Most of the results are published by international classification [Field of Science and Technology – FOS 2007](#).

7.2 DATA PROCESSING

DATA EDITING

Data were edited with the combination of systematic corrections, individual corrections and imputation procedures. The following imputation methods were used: **logical imputations and hot-deck imputations**.

For more, see the general methodological explanations [Statistical data editing](#).

WEIGHTING

With weighting adjustment we want to achieve representativeness of the sample, so that the weighted data give us as good population estimates as possible. The process of weighting depends on the sampling design, the unit non-response rate and available auxiliary variables used for calibration. The final weight is the product of the sampling weight, the non-response weight and the calibration factor.

SEASONAL ADJUSTMENT

Seasonal adjustment is not applicable.

7.3 INDICES

Indices are not published.

7.4 PRECISION

In statistical surveys different kinds of errors can occur (e.g. sampling error, non-response error, measurement error) influencing the reliability and accuracy of the statistical results. Errors deriving from the random mechanisms determine the precision and consequently the reliability of the statistical estimates. The

precision of the statistical estimate is estimated by calculating the standard error (SE). The Statistical Office of the Republic of Slovenia draws attention to less reliable estimates by flagging them with a special sign.

If the table contains estimated population totals of (continuous) variables, estimated averages of continuous variables or estimated ratios of population totals of (continuous) variables, publishing limitations are determined by the relative standard errors or the coefficients of variation (CV). In such cases it holds:

If the coefficient of variation (CV) is

- 10% or below ($CV \leq 10\%$), the estimate is reliable enough and is published without limitations;
- between 10% and up to 30% ($10\% < CV \leq 30\%$), the estimate is less reliable and is flagged for caution with letter M;
- over 30% ($CV > 30\%$), the estimate is too unreliable to be published and therefore suppressed for use by letter N.

For more, see the general methodological explanations [Precision of statistical estimates](#).

7.5 OTHER EXPLANATIONS

8 PUBLISHING

- SiStat Database: [Development and Technology](#) - Research, Development and Innovation, Careers of doctorate holders; data are published as absolute numbers by NUTS 0 level.
- First Release (Development and Technology; Research, Development, Innovation): »Careers of doctorate holders«.

9 REVISION OF THE DATA

9.1 PUBLISHING OF PRELIMINARY AND FINAL DATA

Provisional data are not disseminated. Only final data are published.

9.2 FACTORS INFLUENCING COMPARABILITY OVER TIME

There is no break in time series. All data are comparable.

10 OTHER METHODOLOGICAL MATERIALS

Methodological materials on SURSs website are available at <https://www.stat.si/statweb/en/Methods/QuestionnairesMethodologicalExplanationsQualityReports>.

- Questionnaire (only in Slovene):
 - Questionnaire for the statistical survey on careers of doctorate holders, 2020

Theme: Development and technology, Subtheme: Research, Development, Innovation.