Eurofound

Living conditions and quality of life

The European Child Guarantee workforce

Guaranteeing access to services for children in the EU

The European Foundation for the Improvement of Living and Working Conditions (Eurofound) is a tripartite European Union Agency established in 1975. Its role is to provide knowledge in the area of social, employment and work-related policies according to Regulation (EU) 2019/127.

Contents

Research context and objectives

The Council of the European Union approved the European Child Guarantee (ECG) with the objective of addressing and combating child poverty and exclusion (Council of the European Union, 2021). The ECG aims to provide access to essential services and support to children (defined as persons under 18 years old) in the following key areas: early childhood education and care (ECEC), education (including school-based activities and at least one healthy meal each school day), healthcare, nutrition, and housing. The workforce in these areas plays a vital role in delivering accessible and high-quality services.

Several recommendations from previous studies related to the ECG highlight the significance of workforce investment. For example, in Greece, one of the challenges is the lack of specialised ECEC teachers and personnel, primarily in rural and remote areas and islands. Rural areas also face a shortage of medical personnel in public hospitals, while it is challenging to boost healthcare capacity through policies if funds are limited. In addition, it is emphasised that psychosocial support should be integrated into existing services for vulnerable families, schools, and children, which requires a consistent presence of specialised professionals (UNICEF, 2021a).

In Lithuania, one of the main policy recommendations made during the preparatory phase of the Guarantee was to strengthen the teaching workforce, support the ECEC workforce, and increase the quality of monitoring activities. A major concern was the shortage of specialists, mostly because of the low pay in these domains – ECEC teachers and learning support specialists remain among the lowest-paid professionals in the country (UNICEF, 2021b).

National action plans should encompass goals, measures, broader strategies, and a data framework. Hence, the research on the workforce will help Member States when they report on the implementation of the national action plans.

The aim of this project is to provide categories and definitions of workforce related to ECG and to map relevant data sources across EU.

This working paper is organised in three main sections. The first section, "Defining and categorising the workforce relevant to ECG" is further divided into subsections for ECEC, education, healthcare, nutrition (with a subsection for "At least one healthy meal each school day"), and housing. Each of these subsections includes definitions of the specific field, national differences found when doing a country-level mapping of the workforce and a general discussion. There is also a subsection related to those jobs that span across all the key areas described above and/or that cannot be directly classified within one of them.

The second section includes mapping of the data sources at the international level relevant to the workforce categories identified in the first section. The document concludes with a third section summarising the main finds and classifications.

1. Defining and categorising the workforce relevant to the ECG

Methodology

This section aims to provide definitions and categories about the workforce relevant for the Guarantee. For this, international classifications like NACE and ISCO are used, in order to ensure that the definitions used are consistent and comparable across EU Member States. The goal is to create a framework that can be used across the EU.

In this research, the workforce is conceptualised as a "job", which involves combining occupations and sectors. A *job* is therefore a given *occupation* in a given *sector*.

The methodology adopts a three-step analytical strategy for each key area.

- **ISCO-08 Occupation Analysis**: The first step involves analysing the International Standard Classification of Occupations (ISCO-08) codes[1]. These codes are central in recognising which occupations align with the key areas of ECG. Given the diversity of national occupational standards, our analysis emphasises higher-level (i.e. more general and less specific, as in codes with fewer digits) ISCO-08 codes to ensure greater comparability across EU Member States. While national specificities[2] have been incorporated where possible, the preference is toward higher-level classifications that offer broader compatibility.
- **NACE Code Review**: Following the ISCO code review, the focus shifts to the Nomenclature of Economic Activities (NACE) codes[3]. These codes enable an understanding of the economic activities where these occupations predominantly operate.
- **ISCO-NACE combinations**: The final step consists of combining ISCO and NACE categories. This includes identifying jobs that fall under specific categories in both classification systems. For instance, not all economic activities (defined by NACE) classified under education are related to the ECG, (e.g., tertiary education). However, by including specific occupations defined by ISCO-08 code, this intersection or 'union' of two classifications enables to identify the workforce directly relevant to ECG. For example – cooks or chefs working at schools will be classified as ECG workforce under the areas of healthy nutrition and at least one healthy meal per school day, using both ISCO-08 (occupation is listed as "cook" or "chef" and NACE classification field is "education"). This process ensures that the identified workforce resonates with both the occupational and economic dimensions of the key areas where the ECG aims to increase accessibility.

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[1] ISCO-08 classification is a framework for organising jobs into a clearly defined set of groups according to the tasks undertaken. It has four main levels: major groups (1-digit), sub-major groups (2-digit), minor groups (3-digit), and unit groups (4-digit), reflecting increasing levels of specialisation. Additionally, there is a fifth level, which is not formally part of ISCO-08 and is used at the country-level, to provide more detailed classifications based on specific job titles. The fifth level ISCO codes are used throughout the report and include five or more digits depending on the country.

[2] In each observed country, country-level codes were examined to analyse, (a) whether international level codes are not relevant to ECG, but country-level codes are; and (b) to note whether specific national examples fit under the international 4-digit classification.

[3] Similar to ISCO-08, the NACE classification is a standardised system used across the EU for categorising economic activities. It's structured hierarchically into several levels: Sections (1-letter), Divisions (2-digit), Groups (3-digit), and Classes (4-digit), reflecting increasing levels of detail. While Sections categorise broad sectors like agriculture or manufacturing, Divisions, Groups, and Classes provide increasingly specific classifications. Some countries extend NACE with a fifth level for more detailed national categorisations.

-   Recognising that not all combinations of NACE and ISCO codes might be important, exclusions were applied, ensuring that the resultant categorisation is both accurate and relevant to the European Child Guarantee's objectives.

The methodological approach is similar to the approach used in ESSnet-CULTURE[4] and the European Jobs Monitor. Both involve a combination of NACE and ISCO classifications. Some categorisation work has already been conducted about jobs in ECEC in the SEEPRO-R (Systems of Early Education and Professionalisation – revised) project (IFP, undated).

The analysis was carried out as desk research looking at the official ISCO-08 classification (ILO, 2012), the international NACE 2 (Eurostat, 2008) and 2.1 (European Commission, 2023) classifications, and classifications of national occupations and economic fields. The working paper is accompanied by a comprehensive Excel file named "ECG workforce", where all categories and relevant country-level examples can be found together with national references. The Excel includes examples from 10 different countries – Belgium, Denmark, Estonia, Finland, Germany, Italy, Latvia, Lithuania, Poland and Portugal. The analysis was supported by national experts in Estonia and Lithuania.

The theoretical framework for this task is built around the following key areas: early childhood education and care (ECEC), education, healthcare, nutrition and housing.

There are two additional key areas:

1. A sub-category corresponding to "at least one healthy meal each school day", which is analysed within the healthy nutrition chapter. The subcategory of at least one healthy meal each school day includes school meals. School meals in turn include (a) the provision of meals at school and (b) the provision outside of meals outside of school but associated to it (e.g., food vouchers).
2. A category named "Other categories", which is related to horizontal occupations or fields, that are potentially related to ECG, but cannot be classified under the key areas described above or relate to more than one.

Currently, despite their crucial role, the workforce is not explicitly mentioned in many national action plans.

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[4] The Eurostat report ESSnet-Culture is "the main result of two years of works of this European workgroup on cultural statistics. The result of the ambition of the States and the intensive work of national experts, is based on using classifications and data sources that have been tested by the national statistical institutes, thus allowing States that do not have dedicated analysis services to produce cultural statistics." (ESSnet-Culture, 2012) [https://ec.europa.eu/assets/eac/culture/library/reports/ess-net-report_en.pdf]

ECEC

Definition, relevance, and principles

Early Childhood Education and Care (ECEC) refers to 'any regulated arrangement that provides education and care for children from birth to the compulsory primary school age – regardless of the setting, funding, opening hours or programme content – and includes centre and family day-care; privately and publicly funded provision; pre-school and pre-primary provision' (Council of the European Union, 2019).

It is acknowledged that particularly in the field of ECEC, a significant portion of care and educational work is often carried out within the family and community settings. These informal arrangements are typically characterised by a lack of formal contracts, regulatory oversight, or professional training. They no doubt play a crucial role in the care and educational infrastructure, especially in contexts where formal ECEC services are inaccessible, unaffordable, or insufficient to meet the demand.

That said, within the context of current ECG workforce categorisation, informal childcare activities and agreements will not be the subject of measurement or classification in subsequent analysis. Above anything, formal and registered agreement or contract is necessary for inclusion to the workforce of ECEC key area. Childminding by family members, friends or childminding without a contract is thus left out of following classification.

In terms of the European Child Guarantee workforce, the ECEC definition applies in rather straightforward way. The most relevant ECEC workforce can be directly identified by three ISCO-08 4-digit level categories:

- *1341 Child Care Services Managers*

- *2342 Early childhood educators,*

- *5311 Child Care Workers*.

Although two- or three-digit ISCO would be preferrable, these two-digit level categories do not differentiate jobs in other levels of education from those in the ECEC workforce (in cases of *234* and *531*) or are very heterogeneous in the case of *Professional Services Managers (134)*.

One could argue that *5311 Child Care Workers* should be included in ECEC. Another possibility would be to consider it related to "other services category", as on country-level, there are several occupations better suited to other key areas (e.g., *53110002 Out of school hours care worker* and *53110006 Nurse* in EE, *134104 Director of an orphanage or boarding house* in LT). However, as defined by ILO, *5311 Child Care Workers* includes "babysitter; childcare worker; family day care worker; nanny; out of school hours care worker" (ILO, 2010). Code *5311* thus includes jobs that pertain to ECEC. There are some country level exceptions but nevertheless, in most countries, the country level codes fit directly within ECEC.

Other alternative to ISCO is to use NACE only qualification. The workforce categorised under two NACE codes are suitable identify ECEC related jobs:

- *85.1 Pre-Primary education*

- *88.91 Child day-care activities[5]*.

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[5] This includes activities of day nurseries for pupils, including day-care activities for children with disabilities. As per EC, baby-sitting activities are to be classified in 88.91. (Eurostat, 2006).

Both codes are present in NACE rev 2 and in rev 2.1[6]. In the case of ECEC, all the workforce under these codes can be classified as relevant to ECG. Therefore, there is no need to combine ISCO-08 with NACE, as both classifications can be used separately.

National differences

The few country-level differences that can be found are mainly in ISCO-08 and not NACE 5-digit level categories. In the case of ECEC, these national ISCO differences can be considered minor as they do not impact the overall classification. For example – in contrast to Poland and Lithuania, where *2342 Early childhood educators* are divided into kindergarten teachers and (general) teachers of preschool educations, Estonia further differentiates teachers for physical education and music teachers, while Latvia separates music and sports teachers. Slightly larger differences can be seen under *5311 Child care workers*, with occasional unique occupation titles being singled out in each country. This enables a potential possibility for more in-depth mapping and differentiation of occupations, should it be necessary in future cases.

In a few cases, country-level codes can arguably be related to key areas of education (*53110008 Teacher in the school boarding house* in EE) or adequate housing (*531105 Foster parent* in PL). Thus, these cases ought to be excluded from the ECEC workforce.

Discussion

The workforce and jobs in ECEC can be classified relatively straightforward by using ISCO level 4 together or NACE level 3 and level 4 codes. Using ISCO-08 4-digit level categories, such as *1341*, *2342*, and *5311*, provides a level of granularity and specificity that can help in defining roles and responsibilities. The same applies to the use of NACE codes *85.1* and *88.91*. Even so, there is a minor risk of including too many occupations regarding the *ISCO 5311* category, as on country-level, it includes codes that are related to education and housing. However, as there are only a few such cases, it is relevant for corresponding countries to exclude such cases and it does not influence wider ECEC workforce classification.

Education

Definition, relevance, and principles

The education workforce in the context of the European Child Guarantee can be defined as a professionals engaged in educational activities in primary and secondary education as well as school-based activities. This covers roles such as teachers, school administrators, and support staff who facilitate educational outcomes.

There are 12 different relevant ISCO level 4 categories outlined in key area of education. These groups can be clustered by specific role as follows:

1. Educational Leadership and Management:

    - *1345 Education Managers*

2. Specialised Teaching Professionals:

    - *2320 Vocational Education Teachers*

    - *2330 Secondary Education Teachers*

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[6] From 2025 onwards, European statistics will start being produced based on NACE Rev. 2.1. In this report, both revisions will be included when relevant.

Disclaimer: This working paper has not been subject to the full Eurofound evaluation, editorial and publication process.

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- *2341 Primary School Teachers*

- *2353 Other Language Teachers*

- *2354 Other Music Teachers*

- *2355 Other Arts Teachers*

- *2356 Information Technology Trainers*

- *2359 Teaching Professionals Not Elsewhere Classified*

3. Educational Support, Special Needs, and Methods:

- *2351 Education Methods specialists*

- *2352 Special Needs Teacher*

- *5312 Teachers' Aides*

A simpler classification of occupations is a separation of (1) Two-digit ISCO code *23 Teaching Professionals* and (2) Other educational management and support workers (including *ISCO 1345, 5312 and 9629*). Nonetheless, clear exclusions from *23 Teaching professionals* would be necessary, mostly related to higher education (*2310 University and Higher Education Teachers*) and ECEC (*2342 Early Childhood Educators).*

Table 1: Workforce in education, ISCO-08 classification

ISCO 2-digit level	ISCO 3	ISCO 4	Relevance to ECG
13 Production and Specialized Services Managers	134 Professional Services Managers	1345 Education Managers	Relevance appears in country-level under occupations of school principals, head of vocational department or similar. 1345 itself includes managers of higher education, which needs to be excluded.
23 Teaching Professionals	232 Vocational Education Teachers	2320 Vocational Education Teachers	Related to university education, but in many countries it is parallel to secondary education.
	233 Secondary Education Teachers	2330 Secondary Education Teachers	All directly relevant.
	234 Primary School and Early Childhood Teachers	2341 Primary School Teachers	
	235 Other Teaching Professionals	2351 Education Methods specialists	
		2352 Special Needs Teacher	
		2353 Other Language Teachers	
		2354 Other Music Teachers	
		2355 Other Arts Teachers	
		2356 Information Technology Trainers	

		2359 Teaching Professionals Not Elsewhere Classified	
53 Personal Care Workers	531 Child Care Workers and Teachers' Aides	5312 Teachers' Aides	Relevant due to few country-level occupations (531201 Teacher's assistant for a foreigner's child, PL).

Source: Authors' compilation based on official ISCO classification

While education can be defined only by ISCO, other alternative is to use only NACE qualification. Following level 3 and level 4 NACE codes will allow to identify ESG education workforce profile:

- *85.2 Primary education*

- *85.3 Secondary education* (in NACE rev 2.1 "*Secondary and post-secondary non-tertiary education*")

- *85.41 Post-secondary non-tertiary education* (in rev 2.1 it is mapped under *85.33 "Post-secondary non-tertiary education"*)[7]

- *85.5 Other education*

- *85.6 Educational support activities*

Not all sectors related to education will be relevant. The previous list notably excludes *85.1 Pre-Primary Education* (classified under ECEC), 85.42 *Tertiary Education* (not relevant) and *72 – Scientific research and development* (related to higher education, R&D and hence not relevant to ECG). Providing a meal each school day is addressed in the section on healthy nutrition, which means that this Education section will not cover jobs related to food preparation, even if these roles are within the context of school canteens.

For education, in most situations combining NACE and ISCO is not necessary. This becomes relevant in case only 1 or 2 digit NACE or ISCO codes are available. This will be addressed in chapter 2.

National differences

National differences are found at level 5 ISCO occupations and are predominantly influenced by the level of detail with which different subject-related teachers or specialists are defined at the specific country-level. For instance, Lithuania has no level 5 ISCO specifications for *2341 primary school teachers*. In contrast, in Poland there are over 14 different teachers, ranging from *234101 Ethics teacher in primary school* to *234118 Physical education teacher in primary school*. Meanwhile, Estonia identifies 14 distinct education methods specialists, Lithuania recognises 11, while Germany, Denmark and Portugal list only 1.

Discussion

In education and its associated sectors, it is clear how to classify conventional roles and activities that are directly related to teaching. Most of education specialists are classified under level 2 ISCO *23 Teaching Professionals*. The main exception here is *231 University and Higher Education Teachers*, who are omitted from the ECG workforce. University and higher education teachers work with students who are predominantly over the age of 18, thus falling outside the scope of education under ECG purposes.

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[7] For students aged less than 18.

Other education professionals can be found at level 4 and categorised as "Other educational management and support workers" (including ISCO *1345*, *2635*, *5312* and *9629*). In certain countries, such as Poland (PL), Estonia (EE), and Lithuania (LT), there is a wide range of occupational classifications at the country-level. Alternatively, in countries like Finland (FI), Denmark (DK) and Portugal (PT), these country-level classifications are much less prevalent.

There are also specific activities and roles that might have indirect or marginal associations with the education sector, such as *NACE 49.31 (Scheduled passenger transport by road* -> school buses), ISCO 2635 Social Work and Counselling Professionals -> youth counsellors and child protection professionals) and school related medicine and meal preparation (chefs and cooks working in schools). These codes remain secondary to the core educational framework and will be addressed in other sections of the report.

Healthcare

Definition, relevance, and principles

The term "healthcare" refers to all activities primarily aimed at promoting, restoring, or maintaining health (WHO, 2000). The Council Recommendation establishing the ECG mentions a variety of healthcare services, including but not limited to dental care, ophthalmology, screening programs, disease prevention and health promotion programs, vaccination, parenting support, curative or rehabilitative follow-up, treatment of developmental problems, mental health services, periodic medical examinations, access to medicines, rehabilitation services for children with disabilities, etc (Council of the European Union, 2021).

The European Social Policy Analysis Network (ESPAN) analysed access for children in need to key healthcare services in EU in the following fields: access to general practitioner (GP), infant nurses, vaccination, specialist care, dental care, and prescribed medicines (Baptista et al, 2023). Similarly to adults, access to the high-quality healthcare services in general contributes to the well-being of children.

Healthcare workers in general are classified using the ISCO-08 from the ILO, and specific details can be found in NHWA (National Health Workforce Accounts) Handbook[8]. In context of ECG, only ISCO-08 is taken into consideration when identifying the relevant workforce, without combining ISCO with NACE categories. This is possible, as all the relevant healthcare workforce can be categorised by ISCO codes, while the same is not true with NACE categories. However, unlike education and ECEC, where all or most workers are relevant to the ECG, not all hospital workers are regarded as relevant for the ECG. In addition, nearly every healthcare professional is working in hospitals or medical centres, making combinations of ISCO-08 and NACE unnecessary.

Healthcare consists of a broad range of professionals. While some exclusively offer services to children (e.g., *221232 Pediatrician*, LT), the majority covers the entire population. The health data from Estonia (The National Institute for Health Development, 2020) indicates that children aged 0-14 account for about 20% of all visits to general medicine, emergency medicine, and dentists. For specialist doctor outpatient treatment, this percentage is 13% (ISCO-08 5-digit level).

Two most important categories on ISCO 2 level are *22 Health Professionals* and *32 Health Associate Professionals*, both including sub-categories that are mostly relevant. At the same time these categories also include veterinarians (*225* and *324*), so ISCO 3 or 4 level categories are more applicable. Of note, some professions may have specific unit group codes at the ISCO level that

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[8] NHWA uses ISCO-08 to classify healthcare related workforce (NHWA, 2020).

combine both "Professionals" and "Associate Professionals" within the same profession, as seen in the case of nursing (*2221* and *3221*) and midwifery (*2222* and *3222*) (NHWA, 2020).

On ISCO 3 level, the same categories as of ISCO 2 level are included, but with the following exclusions (see table 2 "NOT INCLUDED"):

- *223 Traditional and Complementary Medicine Professionals* together with *323 Traditional and Complementary Medicine Associate Professionals*, as they primarily practice alternative approaches of healthcare.

- *321 Medical and Pharmaceutical Technicians* responsible for ensuring the proper functioning of medical equipment and pharmaceutical processes, perform clinical tests etc. Unlike other healthcare workers, they don't make decisions about patient care and usually have different type of training and qualification.

On ISCO 4 level the following categories are excluded (see table 2 "NOT INCLUDED"):

- *2265 Dieticians and Nutritionists,* which is a category of the ECG field of nutrition.

- *2263 Environmental and Occupational Health and Hygiene Professionals* and *3257 Environmental and Occupational Health Inspectors and Associates* that are mostly work-related categories (e.g., *226301 Work Safety Specialist*, BE) and therefore not related to those under 18 years.

- *3252 Medical Records and Health Information Technicians,* because similarly to *321,* they don't make decisions about patient care and usually have different type of training and qualification.

On ISCO 4 level the following professions are included in addition to previous categories, which are directly related to offering healthcare services:

- *1342 Health Services Managers*

- *2634 Psychologists*

- *5321 Health Care Assistants*

5321 Health Care Assistants[9] (e.g., *532101 Hospital nurse*, BE; *53212 Nurses specializing in intellectual disability care*, FI; *532102 Medical supervisors*, PL) are medical assistants working in healthcare. Level 2 or level 3 categories (*53 Personal Care Workers* and *532 Personal Care Workers in Health Services*) are not included entirely because there are sub-categories with professions mostly[10] specialised to the home-based care or residential care in institutions that are usually directed to older people.

Narrowing down healthcare for ECG resulted in 23 ISCO-08 4-digit level categories, listed in the table below. The table also highlights categories that are not included.

Table 2: Workforce in healthcare, ISCO-08 classification

ISCO 2	ISCO 3[11]	ISCO 4
	134 Professional Services Managers	1342 Health Services Managers
	ONLY RELEVANT ON ISCO 4 LEVEL	*OTHER SUB-CATEGORIES NOT INCLUDED*

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[9] (ISCO 2) *53 Personal Care Workers* and (ISCO 3) *532 Personal care workers in health services.*
[10] With few exceptions – see table 3.
[11] Complete list for Health Professionals and Health Associate Professionals, NOT including *225 Veterinarians and 324 Veterinary Technicians and Assistant*.

13 Production and Specialised Services Managers	*OTHER SUB-CATEGORIES NOT INCLUDED*	
22 Health Professionals[12]	221 Medical doctors	2211 Generalist Medical Practitioners
		2212 Specialist Medical Practitioners
	222 Nursing professionals and midwives	2221 Nursing Professionals
		2222 Midwifery Professionals
	223 Traditional and Complementary Medicine Professionals NOT INCLUDED	
	224 Paramedical Practitioners	2240 Paramedical Practitioners
	226 Other health professionals	2261 Dentists
		2262 Pharmacists
		2263 Environmental and Occupational Health and Hygiene Professionals NOT INCLUDED
		2264 Physiotherapists
		2265 Dieticians and Nutritionists NOT INCLUDED
		2266 Audiologists and Speech Therapists
		2267 Optometrists and Ophthalmic Opticians
		2269 Health Professionals n.e.c.
26 Legal, Social and Cultural Professionals	263 Social and Religious Professionals *ONLY RELEVANT ON ISCO 4 LEVEL*	2634 Psychologists
		OTHER SUB-CATEGORIES NOT INCLUDED
	OTHER SUB-CATEGORIES NOT INCLUDED	
32 Health Associate Professionals[13]	*321 Medical and Pharmaceutical Technicians NOT INCLUDED*	
	322 Nursing and Midwifery Associate Professionals	3221 Nursing Associate Professionals
		3222 Midwifery Associate Professionals
	323 Traditional and Complementary Medicine Associate Professionals NOT INCLUDED	
	325 Other Health Associate Professionals	3251 Dental Assistants and Therapists
		3252 Medical Records and Health Information Technicians NOT INCLUDED
		3253 Community Health Workers
		3254 Dispensing Opticians
		3255 Physiotherapy Technicians and Assistants
		3256 Medical Assistants

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[12] *225 Veterinarians* are included in the 2-digit ISCO.
[13] *324 Veterinary Technicians and Assistants* are included in the 2-digit ISCO.

		3257 Environmental and Occupational Health Inspectors and Associates NOT INCLUDED
		3258 Ambulance Workers
		3259 Health Associate Professionals n.e.c.
53 Personal Care Workers	532 Personal Care Workers in Health Services ONLY RELEVANT ON ISCO 4 LEVEL	5321 Health Care Assistants
		OTHER SUB-CATEGORIES NOT INCLUDED
	OTHER SUB-CATEGORIES NOT INCLUDED	

Source: Authors' compilation based on official ISCO classification

National differences

- There are slight country-level variations under each category that should be accounted in case of more narrow or comparative analysis. For example, clinical psychologists can be found under *2269 Health Professionals n.e.c.* (EE) or *2634 Psychologists* (IT). For the EU countries covered in this report, the exact country-level details can be found on accompanying Excel file "ECG workforce".

- In Lithuania and Poland, the category *1342 Health Services Managers* include *134206 Chief obstetrician* (LT) or *134206 Ward midwife*, whereas in other countries covered by the report, the category consists purely of managerial roles.

- Of note, in Poland, there are classifications *223101 Midwife (*and relevant *223201 – 223207)*, while 2231 and 2232 NACE codes don't exist for other countries nor in recent classifications in general. The category of *2212 Specialist Medical Practitioners* consists of many occupations on country-level (ISCO 5), where even specific paediatric specialists can be determined (e.g., 221262 *Pediatric Orthopedic Traumatologist*, LT; *22122701 Child Psychiatrist*, EE).

Some ISCO 4 categories often might include the relevant workforce, but not sufficiently to associate them effectively with the ECG. In this case, relevant workforce could be defined by specific country-level (ISCO 5) codes. If thorough ISCO 5 level data is available, categories that need to be revised at the country-level are:

- ISCO 4 categories illustrated in table 2 to see if some professions[14] can be removed;

- ISCO 4 categories illustrated in table 3 to see if some professions can be added:
  - o *2263 Environmental and Occupational Health and Hygiene Professionals* – although it is mostly work-related category, for some countries (LT, LV, IT) it includes paediatricians.
  - o *5322 Home-based Personal Care Workers*
  - o *5329 Personal Care Workers in Health Services n.e.c.*

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[14] Those that are not related to children, e.g., geriatrics professionals (*22210901 Geriatric Nurse*, EE).

Table 3: Workforce in healthcare, ISCO-08 classification: categories only relevant on country-level

ISCO 2	ISCO 3	ISCO 4	ISCO 5
22 Health Professionals	226 Other health professionals	2263 Environmental and Occupational Health and Hygiene Professionals	226308 Pediatrician (LT) 241105 General pediatrician (IT) 2412024 Pediatrician (IT) 221283 Pediatrician (LV) 221285 Pediatric pneumonologist (LV)
53 Personal Care Workers	532 Personal care workers in health services	5322 Home-based Personal Care Workers	*Some examples:* 532201 Babysitter for sick children (LV) 53220003 Home birth assistant (EE)
		5329 Personal Care Workers in Health Services n.e.c.	*Some examples:* 532906 Woman's assistant during pregnancy and childbirth (doula) (PL) 532901 Dental nurse (BE) 532902 Pharmacy assistant (BE)

Source: Authors' compilation based on official ISCO classification

Discussion

Regarding healthcare workforce in ECG, the main challenge revolves around narrowing down a wide range of professionals who provide services to all age groups. Some of the workforce definitions in the ISCO 4 level, such as *2212 Specialist Medical Practitioners* and *2221 Nursing Professionals*, are still relatively broad.

In general, as a result of the analysis, it is recommended that healthcare workforce would be defined

- by ISCO-08 classification only

- by using at least 3 level ISCO classifications, preferably ISCO-08 4-digit level categories (23) listed in table 2

- if the data is available, on country level (ISCO 5) with some country-specific modifications

Nutrition

Definition, relevance, and principles

Nutrition within the ECG means 'a balanced meal consumption, which provides children with nutrients necessary for their physical and mental development and for physical activity that complies with their physiological needs' (Council of the European Union, 2021);

Some of the healthy nutrition measures mentioned in the Recommendation establishing the ECG are the following: [15]

- upholding nutritional standards in early childhood education and care institutions and schools that cater to specific dietary requirements

- extending support for healthy meals beyond school days, including through in-kind contributions or financial aid, especially during extraordinary situations such as school closures

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[15] *Ibid.*

- offering comprehensive information on healthy nutrition for children to both children and their families

The workforce related to these measures are therefore mostly cooks and kitchen workers in ECEC or educational field or residential care facilities. Different dieticians and nutritionists – usually referred alongside with health workforce – also contribute. Compiling the workforce related to ECG field of healthy nutrition (including food safety) involves the same steps followed in the previous sections: first selecting categories for ISCO, then selecting suitable NACE categories and finally making combinations of ISCO and NACE.

The workforce related to the provision free meals at school is further analysed separately as an additional sub-section "*at least one healthy meal each school day*". While the categories "*healthy nutrition*" and "*at least one healthy meal each school day*" can be analysed together in most cases, the specifics of where and how to differentiate these two will be addressed in that sub-section.

Categories for ISCO-08

From ISCO-08, two categories are both relevant and operational regardless of the institution where professional work – *2265 Dieticians and Nutritionists* and *3257 Environmental and Occupational Health Inspectors and Associates*. Level 3 ISCO-08 *226 Other Health Professionals* is not suitable for classifying healthy nutrition workforce, as it predominantly includes a variety of health professionals from dentists to physiotherapists. Similarly, level 3 ISCO-08 *325 Other health associate professionals* is too heterogeneous and consists of dentals assistants, opticians etc.

Dieticians and nutritionists plan and conduct food service or nutritional programs to promote and maintain health and to prevent and treat illness and disease. Their tasks include planning and overseeing diets and menus, educating on nutrition, supervising meal preparation, assessing health and dietary data, monitoring food quality, calculating nutritional content, implementing, and assessing nutrition programs, providing nutrition education and consultation, and collaborating with health professionals on patient nutrition needs (ILO, 2010). In some countries (e.g. Estonia), they also develop nutritional products and conduct and share research on nutrition (EMTAK, 2008).

Meanwhile, occupational health inspectors and associates include professionals directly responsible for food sanitation and safety. Country-level examples include *325701 Food inspector* (BE), *325721 Food hygiene and safety inspector* (LT) and *311942 Specialist In Food Quality* (LV).

Few other ISCO-08 codes are relevant. Even so, these need to be combined with suitable NACE code(s) to be included as ECG workforce. Such occupations are defined by:

- Two-digit ISCO-08 codes:

  - *94 Food Preparation Assistants.* This includes four-digit *9411 Fast Food Preparers* and *9412 Kitchen Helpers.*

- Three-digit ISCO-08 codes:

  - *512 Cooks*

- Four-digit ISCO-08 codes:

  - *3434 Chefs.*

On the international level, it might be more operational to use three-digit *343 Artistic, Cultural and Culinary Associate Professionals,* as four-digit codes are not necessarily used in many studies. This needs to be done in combination with NACE code for education (*85*) and with note, that category *343* also includes *3431 Photographers*, *3432 Interior Designers and Decorators* and *3433 Gallery,*

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Museum and Library Technicians, which need to be excluded from healthy nutrition. It is, however, unlikely that such professions are commonplace in schools, which increases the suitability of *343*.

Categories for NACE

The most important sector here is education, defined by NACE code *P – Education* or *85 - Education.* It is necessary to remove third-level *85.4 Higher education,* which is relevant for adult population. As not all education workers are not related to healthy nutrition, NACE code for education further needs to be combined with suitable ISCO-08 occupations, which is done in the following step.

Other relevant NACE is fourth-level *88.91 Child day-care activities*. Here, second or even third-level NACE is not suitable, as second-level code *88 - Social work activities without accommodation* directly includes the older people and *88.9 - Other social work activities without accommodation* includes a broad level of social and welfare services rather than the provision of food or nutritional programs.

Combinations of ISCO and NACE

Combining ISCO and NACE means that the relevant workforce is defined as all the suitable occupations (defined by ISCO) within relevant economic activities (defined by NACE). Such combinations are outlined in following table:

Table 4: Healthy nutrition - workforce defined in combination of ISCO-08 and NACE

NACE	ISCO 2	ISCO 3	ISCO 4	Comments and national examples
85 Education	94 Food Preparation Assistants	941 Food Preparation Assistants	9411 Fast Food Preparers 9412 Kitchen Helpers	Suitable combination is NACE and ISCO level 2. National examples: 941201 Cook's Helper (LV), 941210 Help in the kitchen (DK), 941202 Cook's assistant (except home kitchen) (LT).
	51 Personal Services workers	512 Cooks	5120 Cooks	Suitable combination is NACE and ISCO level 3. National examples: 512001 Cook (PL), 512009 Food vendor (LT)
	34 Legal, Social, Cultural and Related Associate Professionals	343 Artistic, Cultural and Culinary Associate Professionals	3434 Chefs	Suitable combinations is NACE and ISCO level 3, but some exclusions from ISCO need to be made. National examples: 34340 Chef (PT), 34340004 Sous-chef (EE)

Source: Authors' compilation based on official ISCO and NACE classifications

Subsection: At least one healthy meal each school day

In most practical cases, *healthy nutrition* and *at least one healthy meal each school day* are largely similar and can be analysed and categorised together. However, the latter category specifically

includes school meals, which are further divided into two subcategories: a) the provision of meals within schools, and b) provision outside of schools, but related to it.

The provision of meals within schools involves culinary tasks in an educational environment. These roles typically include cooking staff employed within schools that have been categorised above. In contrast, for the subcategory related to provision outside of schools, there isn't typically a distinct profession or institution dedicated solely to this aspect. If such institutions do exist, they can vary significantly between different countries. This means that for ECG purposes, there is no international level ISCO-08 or NACE code that could be categorised under this subcategory.

Table 5: Workforce involvement in child nutrition and meal provision

Workforce classification	Category				Comments
	Healthy nutrition	At least one healthy meal each school day	The provision of meals within schools	The provision outside of the school but associated to it	
2265 Dieticians and Nutritionists	+	+	+	-	Nutritionists assess, plan and implement programmes and menus to improve the impact of food and nutrition on health. Includes school menu planning
3257 Environmental and Occupational Health Inspectors and Associates.	+	+	+	-	Implementing, evaluating and inspecting programmes and menus. Includes school catering and menus
3434 Chefs combined with NACE 85 Education	+	+	+	-	Directly related to healthy nutrition and provision of meals within schools
512 Cooks combined with NACE 85 Education	+	+	+	-	
94 Food Preparation Assistants combined with NACE 85 Education	+	+	+	-	
512 Cooks combined with NACE 88.91 Child day-care activities	+	-	-	-	Directly related to healthy nutrition and provision of meals within day-care centres, which provide meals and snacks as part of their daily services and create healthy eating habits.
94 Food Preparation Assistants combined with NACE 88.91 Child day-care activities	+	-	-	-	
512 Cooks combined with NACE 88.91 Child day-care activities	+	-	-	-	

Source: Authors' compilation based on official ISCO and NACE classifications

National differences

Within workforce related to healthy nutrition, there is a rather large variance of ISCO codes on country-level. This can mostly be seen by level of detail of the occupational codes. For example – how many different types of kitchen helpers are defined ranges from none (BE, IT, FI, DE) to six (EE). As a generalisation within reviewed countries and professions, there seems to be more variance of occupations in Baltic counties and rather less country-level variance in countries such as Portugal, Italy or Finland.

Occasionally, even the structure of the codes differs, which means that country-level codes are not necessarily listed, where they would be expected under the international nomenclature. For example – international four-digit ISCO for dieticians and nutritionists is *2265* and therefore national examples would be expected in format of *2265*****. Whereas in Poland one can find *human nutrition specialist* under *229302* and in Italy there is *241712 Nutritionist doctor.* In Germany – where the country-level nomenclature is in most cases different from international, related occupations can be seen with codes 8176*.

In addition to occupations and fields listed above, some countries might benefit adding *9111 Domestic Cleaners and Helpers* (ISCO-08) to NACE categories, if they have defined national categories such as *911104 Assistant cook in the home kitchen* (LT) and *911105 Kitchen assistant* (LT), as these might be relevant in some cases.

Other countries might benefit from workforce of possible school caterers. However, this can only be implemented if there are relevant country-level NACE codes available for *56 Food and beverage service activities -> 56.2 Event catering and other food service activities -> 56.29 Other food service activities*. In most cases, there is little difference between NACE codes on country-level.

Discussion

- In most cases, the defining the workforce in healthy nutrition, both NACE and ISCO categories are needed. While majority of the workforce is related to schools, not all education workers (as defined by NACE) are relevant to healthy nutrition. Similarly, not all kitchen staff relates to children nor ECG purposes. Two occupations that can be defined solely by ISCO-08 are nutritionists (*2265)* and health inspectors (*3257*), as both directly contribute to ensuring healthy nutrition standard and practises for children and are integral part within the ECG framework.

- Overall, unlike education and in some cases of ECEC, healthy nutrition does not offer too many opportunities for in-depth country-level mapping. While there are countries that list occupations with several national specifications, such cases are not common over EU. Furthermore, these occupations are mostly categorised under chefs or cooks and add minor and often unrelated details considering ECG purposes.

- It is important to be aware of two key considerations regarding the current classification system:

  o The workforce categories for "Healthy Nutrition" and "At least one healthy meal each school day" will generally overlap, except for meal provision in day-care activities.

  o There are no internationally defined distinct occupations or fields that are (1) recognised by NACE or ISCO classifications and (2) are dedicated solely to the subcategory of provision of meals outside of schools but related to it. Such workforce is too specific to narrow down even when considering the country-level.

Adequate housing

Definition, relevance, and principles

ECG includes the provision of adequate housing and ensuring that children and their families receive adequate temporary accommodation. These are important mechanisms for tackling social exclusion of children and minimising the risk of homelessness. The ECG is committed to moving away from institutional care for children, instead prioritising care within a family setting or a community environment that is of high quality (Council of the European Union, 2021).

Workforce related to adequate housing will be defined by NACE (both 2. and 2.1) categories only, focusing on residential and childcare activities, and other similar social work activities. This is because the occupations by ISCO-08 are not comprehensive in this case. For example, the category *2635 Social Work and Counselling Professionals* includes only some relevant sub-categories on national ISCO 5 level, *e.g. 263508 Family Foster Care Coordinator* (PL), and many others cannot be interpreted in the context of adequate housing at all. Also, categories of NACE enable defining the workforce without limitations related to job titles/classifications - which can vary significantly.

Concerning NACE, the relevant codes are as follows (all the relevant 3-digit NACE categories only consist of the 4-digit categories mentioned here):

- 87.2 *Residential care activities for persons living with or having a diagnosis of a mental illness or substance abuse,*
  - o *87.20 Residential care activities for persons living with or having a diagnosis of a mental illness or substance abuse,*
- *87.9 Other residential care activities*
  - o *87.90 Other residential care activities;*[16]
- *88.9 Other social work activities without accommodation*
  - o *88.91 Child day-care activities;*
  - o *88.99 Other social work activities without accommodation n.e.c.*

Here, *87.90* directly addresses replacement home services and orphanages (also temporary homeless shelters), while 87.20 is specially connected to persons with disabilities. *88.91* includes day-care activities for children with disabilities*. 88.99* relates to adoption activities, protection of children from violence, prevention of abuse, helping migrants, etc.

National differences

National differences aren't as relevant in this section. It is suggested to stick to the 4-level NACE classifications, as they are internationally comparable.

There is possible to additionally determine some of the relevant workforce with country-level ISCO-08 codes, but this would not be comparable across different countries.

Discussion

There are 4 relevant NACE (2. and 2.1.) codes that can be used if defining workforce for ECG field of adequate housing, such as listed above.

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[16] NACE 2.1: *87.99 Other residential care activities n.e.c.* The content of the NACE Rev 2 class is fully covered in the corresponding NACE Rev 2.1 class.

Other categories

There are some areas go beyond the key areas outlined above, or that cannot be easily put in one single area. For instance, the Croatian national action plan emphasises social services and further creation of social mentor jobs to address the children leaving care. In addition to Croatia, increase in social workers and support teachers is a priority for several other countries, including Germany, Italy and Spain. Meanwhile in Estonia, the level 5 NACE code *94993* captures *Youth and Child Associations and Organizations Promoting Youth and Child Welfare*, with over 400 such associations currently working in Estonia. Such organisations range from child protection unions to youth centres (Inforegister, undated).

This section will thus briefly look further into other national classifications to map similar NACE or ISCO codes related to organisations, that might overlap or cross some or all of the key ECG areas. Additionally, there is workforce for whom there were no measures found in national action plans but could still be part of the measures in the ECG.

Social services workforce (*ISCO 2635 Social Work and Counselling Professionals, 3412 Social Work Associate Professionals* and beyond)

- Social services include a range of professionals from child and youth counsellors to youth work managers and child protection professionals. Their roles clearly revolve around the well-being and support of children and youth, which can impact educational and health outcomes. In ISCO classifications, the most relevant code is *2635 Social Work and Counselling Professionals*. Even so, classifying these roles strictly under education or any of the five fields might miss the broader context in which they operate.
- Several country-level ISCO codes are found at country level codes. In Latvia and Estonia, with one of the most detailed national levels, fifth-level codes under 3412 are often the same as in other countries under the code 2635: (*341201 Social Caregiver* and *341203 Organizer Of Social Assistance*; 34120015 Foster parent). In Italy similar occupations can be found under 3451. However, such code is not applicable in any other country besides Italy.
- Few other related codes are relevant at the country-level. Such cases include 134104 Director of an orphanage or boarding house in Lithuania. This occupation is classified under fourth level code 1341 *Child Care Services Managers*, which is categorised to ECEC. Another example is 531105 Foster parent in Poland, with subcategory of *5311 Child Care Workers*, also mainly relevant to ECEC.

Protective service workers (ISCO *541 Protective Service Workers*)

- Within broader understanding, certain protective service roles emerge as directly relevant, especially when analysed in the context of specific national scenarios. Estonia's *54120006 Juvenile Police Officer, 54120010 Web Constable*, and Poland's *541201 Guard at the Juvenile Detention Facility* fits this frame.
- The role of the *Juvenile Police Officer* extends beyond traditional policing. Given that many disadvantaged children encounter challenges like domestic unrest or community violence, these officers safeguard their right to a safe home environment, aligning with the ECG's objectives.
- The *Web Constable's* role is vital in the digital realm. Disadvantaged children may lag in online educational engagement but still face cyber risks. By ensuring online safety, Web Constables strive to reduce this digital disparity. They contribute to making both the home and the online environment safer for children, ensuring that the digital divide doesn't exacerbate the existing socio-economic disparities.

- Most notably, the *Guard at the Juvenile Detention Facility* plays a direct role in the realm of adequate housing. The very essence of their job is to oversee and ensure the safety and security of young people within a detention facility. Their presence and actions guarantee that detained children are housed in an environment where their basic rights are upheld, their safety is ensured, and any potential harm is mitigated.

<u>Other horizontal categories</u>

- Transport and Logistics: *NACE 49.31 - Scheduled passenger transport by road*. This code captures a broad range of transport services, including school buses. The problem here is similar, as while school and kindergarten buses directly enable educational access, not all road transport services share this educational objective. It would be an oversimplification to label all scheduled road transport as educational merely because a subset serves schools. This code is thus relevant only on country level, otherwise not at all.
- 3422 Sports Coaches, Instructors and Officials is an interdisciplinary category, having significant impact on the physical and mental health of children and adolescents. Sports coaches influence different sides of children and adolescents' development. They contribute to physical health through promoting exercise and active lifestyles, which is a direct component of the ECG's "healthy nutrition" area. They support the development of teamwork, discipline, and self-esteem, which ties into mental health and educational objectives by fostering social skills and resilience. Additionally, their role in structured activities provides a form of social support and community engagement, linking to objectives for social inclusion and participation. All of which are important regarding disadvantaged children (Eime et al, 2013; Clarke and Thévenon 2022).

2. Mapping of sources of quantitative and qualitative information about the workforce

Introduction

The objective of this section is to map the sources of quantitative and qualitative information relevant to the workforce identified in Task 1. The emphasis is placed on EU-wide surveys such as the EU Labour Force Survey (EU-LFS) due to their extensive coverage and relevance across Member States. These pan-European surveys related to ECG workforce are listed and described briefly in table 6, including information about its regularity, coverage of EU Member States, available ECG fields etc.

Three of the most relevant surveys are the European Working Conditions Surveys (EWCS), European Social Survey (ESS), and EU-LFS. The EU statistics on income and living conditions (EU-SILC) and Structure of Earning Survey (SES) are generally less applicable for identifying ECG workforce, as out of all ECG fields, they are only relevant for education – a field for which other surveys, including the TALIS (The Teaching and Learning International Survey) and Eurydice are more comprehensive (see tables 6 and 7).

The structure of this chapter is as follows. First, based on workforce categories created in chapter 1, respective minimally suitable workforce categories[17] will be defined for each ECG field. This is followed by an overview of relevant surveys (table 6) and interlinking them with workforce of ECG fields. Table 7 summarises and connects the possibilities for identifying the workforce for each ECG field in these surveys. After this, the most important surveys will be briefly described. This includes the steps for identifying ECG workforce, available socio-demographic and occupational background variables for additional analysis, relevant data about working conditions and comments about practical implementation of data usage. The report concludes with a summary.

Minimally suitable workforce categories

ECEC
Early Childhood Education and Care workforce can be defined in two ways:

- three ISCO 4-digit categories: *1341 Child Care Services Managers*, *2342 Early childhood educators* and *5311 Child Care Workers*
  OR
- two NACE categories: *85.1 Pre-Primary education* and *88.91 Child day-care activities.*

In case of ISCO, 4-digits are a necessity, and this is the minimum required level to differentiate the ECEC workforce. 3-digit ISCO categories do not differentiate ECEC workforce from education (in cases of *234* and *531*) or are very heterogeneous in the case of *134*. Here, by using *134*, one would

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[17] "Minimally suitable workforce categories" refer to the least detailed level of occupational and/or industry classification that can still provide a meaningful and relevant identification of the workforce within a specific sector, albeit with certain limitations that are outlined in following subchapter. Table 7 then summarises and connects each ECG field with each survey, indicating whether workforce in some key ECG area can be identified fully and as classified in chapter 1 (indicated by +), identified by minimally suitable conditions, marked as (+), or not identified at all (marked as −).

include health services managers, aged care services managers, social welfare managers, financial and insurance services branch managers, which are all completely unrelated to ECG to the extent it would dilute the definition of ECEC workforce to being not meaningful.

When using NACE, the minimum necessary level is 4-digit NACE. While 85.1 can be identified on the NACE level 3, it is not possible to use level 3 category *88.9*, which includes "*other social work activities without accommodation*" and relates to adequate housing.

ECEC data is mainly available in EWCS and ESS. Both surveys offer detailed quantitative information about working conditions, with EWCS being preferred for description of wider working environment (e.g. gender segregation) whereas ESS offers a large variety of socio-demographic background variables (e.g. migrant status of parents).

Another source for ECEC information is the SEEPRO-R country profiles (IFP, undated), which provide an overview of the professional education/training systems and general workforce issues of ECEC staff in 30 countries (EU27 + UA, UK, RU). The drawback of SEEPRO-R is that it is not regularly updated, as most recent country profiles are from 2017.

Additionally, OECD Starting Strong Teaching and Learning International Survey (TALIS Starting Strong) is an international survey of the ECEC workforce that includes information about educational and professional background, professional development, working week and professional practises. That said, TALIS Starting Strong covers 10 countries, several of which are not EU members.

Education

In education, recommended workforce category levels are level 3 NACE and level 4 ISCO. Minimum suitable levels are level 1 NACE (P – Education) and level 3 ISCO categories. However:

If NACE is available on level 1 or level 2, it includes pre-primary education and tertiary education. Thus, for correct identification, on this level NACE needs to be combined with a suitable level 3 ISCO code. From level 3 onwards, NACE can be used without ISCO. Similarly, level 3 ISCO offers reasonable accuracy for categorising the workforce on its own. In case of availability of 2-digit ISCO, the only functioning category is *23 Teaching Professionals,* which then needs to be combined with suitable level 3 NACE for accurate categorisation. If level 2 NACE is available, the biggest inaccuracy would be the inclusion of higher education workforce.

Education can be considered the best-covered ECG field in surveys, with quantitative data about the workforce available in EWCS, ESS, EU-LFS, TALIS and to some extent EU-SILC and SES. While the first four enable the researcher to use comprehensive socio-demographic and occupational background variables, the focus in LFS and SES is more on income-patterns. Eurydice supports the previous surveys with mostly qualitative country-level reports.

Healthcare

In healthcare, recommended workforce category level is level 4 ISCO. The least necessary for defining healthcare workforce are 3-digit ISCO categories. This excludes *1342 Health Services Managers*, *2634 Psychologists*, and *5321 Health Care Assistants,* all of which are relevant only on ISCO level 4. Also, this includes some categories that otherwise would be excluded, for example *2263 Environmental and Occupational Health and Hygiene Professionals* and *3252 Medical Records and Health Information Technicians.*

On similar basis and as an alternative, ISCO 2-digit categories of *22 Health Professionals* and *32 Health Associate Professionals* can only be used if there are additional variables that enable distinguishing and excluding veterinarians (ISCO *225* and *324*) – for example, if there are ISCED-F 2013 categories *08 Agriculture, forestry, fisheries and veterinary* and/or *084 Veterinary* defined.

Due to the requirement for availability of 3-digit ISCO, information about healthcare workforce can be best found in EWCS, ESS and EU-LFS. Similarly to ECEC and education, these surveys offer detailed information about working conditions and socio-demographic backgrounds and somewhat more limited data about income. EU-SILC and SES, where income-patterns and distribution is well covered, are not usable as ISCO classification is limited to 2-digits or less.

The bi-annual OECD "Health at a Glance" (HAAG) country reports offer comprehensive overview of health sector for all EU countries, although the workforce is mostly limited to general categories of doctors. The European Health Interview Survey (EHIS) is another source of information covering health status, health care use, health determinants, and socio-economic background variables. The focus is nevertheless on the EU citizens and not necessarily healthcare workforce. The other main limitation is the periodicity of six years. EHIS includes all of EU27 with five additional countries.

Nutrition

In nutrition, the recommended workforce categories are level 4 ISCO and level 4 NACE. The minimum suitable levels are level 3 ISCO and level 2 NACE[18], where ISCO and NACE must be combined. This comes with several restrictions.

- Using 3-digit ISCO means using category *343 Artistic, Cultural and Culinary Associate Professionals*, which includes several professions not related to healthy nutrition. Using *343* in combination with NACE code for education (*85*) makes it suitable for defining nutrition workforce. Without this combination, *343* is too vague to use.
- In a similar way, while 4-digit *2265 Dieticians and Nutritionists* and *3257 Environmental and Occupational Health Inspectors and Associates* would identify the workforce on its own, 3-digit *226* needs to be combined with NACE code for education.
- ISCO *941* and ISCO *512* can directly be combined with *85 Education* with no restrictions.
- While 4-digit *3257* is directly related to nutrition, 3-digit *325* is not suitable even in combination with NACE code for education. In case of availability of level 3 and not level 4 ISCO codes, this means excluding 3257 from nutrition related workforce altogether.
- In the case of NACE *88.91 Child day-care activities* that was identified in chapter 1, this cannot be used as level 2 ISCO *88 - Social work activities without accommodation,* as this directly includes older people. Similarly to previous case, this means that when level 4 NACE is not available, *88.91* should be excluded from workforce altogether.

Nutrition workforce data can be identified in EWCS and ESS with good coverage on working conditions and socio-demographic background. However, since ISCO and NACE need to be combined for workforce identification, the sample size is a major limitation in both surveys and connecting data from different years is recommended. Here, LFS might be a reasonable alternative, although with a limitation of including higher education workforce due to level 1 NACE codes.

Adequate housing

In case of adequate housing, ideal workforce is defined by level 4 NACE, while minimum suitable level is level 3 NACE. As *87 Residential care activities* and *88 Social work activities without accommodation* are too wide, they must be at least 3-digit NACE categories as mentioned in 1st chapter: *87.2 Residential care activities for mental retardation, mental health, and substance abuse*; *87.9 Other residential care activities*; *88.9 Other social work activities without accommodation.*

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[18] In case of education, level 1 and level 2 are the same.

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Identifying the workforce data for adequate housing is challenging and can quantitatively be done only in EWCS.

Other categories

Regarding to other categories, there are no compromises possible, which means that both optimal and minimum suitable category is level 4 ISCO. The focus lies on social services workforce (ISCO *2635 Social Work and Counselling Professionals*, *3412 Social Work Associate Professionals*), which must be available as at least 4-digit ISCO. If so, the workforce of other categories is fully identifiable. This is possible in EWCS and ESS.

Overview of available data related to ECG workforce

Table 6: Overview of main surveys related to potential ECG workforce

Abbr.	Source	Fields	Sample	ISCO / NACE levels available	Periodicity	Last data	Coverage	Regional level of data	Availability
EWCS	European Working Conditions Surveys	1, 2, 3, 4, 6	Individuals	NACE at 3-digit level ISCO at 4-digit	Every five years, currently changing	2021 latest available	EU + (NO, CH) + UK, Al, BA, XK, ME, MK, RS	Country-level	Available on Eurofounds's website
ESS	European Social Survey	1, 2, 3, 4, 6	Individuals	NACE at 2-digit level, ISCO at 4-digit level	Every second year	2022 latest available, but each round lasts two years	Most of EU, but varying participation in each round + (IS, NO, CH) + IE, ME, MK, RS, UK	NUTS 3 level	Microdata publicly available on ESS website (ESS, undated)
EU-LFS	EU Labour Force Survey	2, 3, (4), (6)	Household	NACE at 1-digit level* ISCO at 3-digit level	Quarterly and annual	Available 2023 Q3	EU27 + (IS, NO, CH) + (ME, MK, RS, TR). Microdata for scientific purposes for EU27, (IS, NO, CH) and partially UK	NUTS level 2 with further aggregation in some countries	Population, employment, working time, job permanency, professional status etc available at Eurostat's online database in the 'Employment and unemployment' folder (Eurostat [t_employ]).
EJM	The European Jobs Monitor	Varies based on thematic report	Dependent on other surveys	NACE at 1-digit level ISCO at 2-digit level	Annual	Available 2021	EU	Country-level	Publicly available reports on Eurofound's website (Hurley et al, 2021)

EU-SILC	EU statistics on income and living conditions	(2)	Both household and individual data	NACE at 2 digit-level ISCO at 2 digit-level	Annual	2023	EU + (IS, NO, CH) + AL, XK, ME, MK, RS, TR	NUTS 2 level NUTS 1 level microdata	Publicly available at Eurostat's website (Eurostat [t_ilc]). Microdata available for scientific purposes for recognised research entities.
SES	Structure of Earning Survey	(2)	Individuals	NACE at 2-digit level, ISCO at 1-digit level[19],	Every four years	2018 latest available	EU + (IS, NO, CH) + ME, MK, RS, TR.	Country-level, with some data potentially available at the NUTS 2 level	Publicly available on Eurostat's website (Eurostat [t_earn])
Eurydice	Teachers' and school heads' salaries and allowances in Europe	2	Country level data, both statuary and actual	*full-time, fully qualified teachers and school heads in public schools*	Annual	2021/2022	EU, 37 European countries	Country-level	Reports publicly available (Eurydice, 2023)
TALIS	The Teaching and Learning International Survey	2	Individuals	*Teachers and school leaders*	Every five years	2018 latest available	48 countries and territories, including EU27, except DE, GR, IE, LU	Regional level	Available on OECD website (OECD 2018a)
TALIS Starting Strong	The Starting Strong Teaching and Learning International Survey	1	Individuals	*Staff and leaders working in "pre-primary education" (i.e. ISCED level 02)*	Every five years	2018 available	CL, DK, DE, IS, IL, JP, KR, NO, TR. DK, DE, IL and NO also surveyed	Country-level	Available on OECD website (OECD 2018b)

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[19] ISCO is collected at 2-digit level and if possible 3-digit level, whereas it is published on 1-digit level.

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							the staff and leaders working with children under age 3		
ECS	European Company Survey	(2, 3, 4, 5)	Organi-sations	NACE at 2-digit level	Every four years	2019 latest available	EU + UK; earlier rounds include (IS, NO, CH) + (ME, MK, RS, TR)	Country-level	Publications available on Eurofound's website (Eurofound, 2019)
EHIS	European Health Interview Survey	(3)	Individuals	NACE at 1-digit level ISCO at 1-digit level	Every six years	2019 latest available	EU + IS, NO, RS, AL, TR. In earlier rounds, coverage in EU varies significantly.	NUTS 2 level	Publications (Eurostat undated) and dataset ("t_hlth) available at Eurostat website.
HAAG	OECD Health data and publications, including "Health at a Glance"	3	Country level data	N/A. "Doctors" and "nurses" are main categories.	Annual, publications every two years	2023 latest available	Most of EU + CN, US, CA, UK, JP etc for dataset. EU27 + NO + IS for HAAG	Country level data	Publications (OECD, 2023) and data available at OECD Data.

Source: Authors' compilation based on relevant pan-European surveys

Notes: *In EU-LFS, there is a 4–digit level on a voluntary basis.*

In column "Fields", number 1 represents ECEC, 2 Education, 3 Healthcare, 4 Nutrition, 5 Adequate housing and 6 Other categories. Parentheses indicate availability at minimal suitable level.

Of note, some additional workforce-related data sources tracking regulations across EU are as follows:

- database of wages, working time and collective disputes (Eurofound, 2023a)
- statutory minimum wages (Eurofound, 2023b)

Table 7: Possibilities for identifying the workforce in various datasets for each ECG field

ECG field	EWCS ISCO (4) NACE (3)	ESS ISCO (4) NACE (2)	EU-LFS ISCO (3) NACE (1)	EU-SILC ISCO (2) NACE (2)	SES ISCO (1) NACE (2)
ECEC	+	+	-	-	-
Education	+	+	+	(+)	(+)
Healthcare	+	+	+	-	-
Nutrition	+	+	(+)	-	-
Adequate housing	+	-	-	-	-
Other	+	+	(+)	-	-

Source: Authors' compilation based on relevant pan-European surveys

Notes: *+ Workforce can be identified. (+) Only minimally suitable categories can be identified. - Workforce cannot be identified.*

Brief description of main datasets

The following summary is compiled by authors. This overview of each pan-European survey includes four key components:

- identification of ECG-related workforce
- socio-demographic and occupational background
- details on working conditions - compensation and income (either salary and/or wage), work-life balance, training, part time work etc
- brief overview of additional relevant data
- insights into the practical implementation of the data analysis

In general, the focus is on number of workers, their working conditions, salaries and/or wages (depending on the survey) and work-life balance.

EWCS - European Working Conditions Surveys (Eurofound, 2021)

ECG fields: ECEC, education, healthcare, other

Identification of workforce

Step-by-step approach:
- main activity status (self-defined) and status in employment
- ISCO-08 (4-digit)
- NACE rev 2.1 (3-digit level)
- *availability of other distributions of 5 sectors on general level, and public/private/third sector distribution*

Socio-demographic background indicators for additional analysis is as follows: gender, age, household size, highest level of education (ISCED 2013), etc.
Occupational background indicators for additional analysis: job and establishments characteristics, work (activity) characteristics, e.g. place of work, contact with customers
Additional relevant data about working conditions and compensation is as follows:

- information about income and it's characteristics
- financial security
- includes condensed OECD job quality questions
- job demands: unsocial working time, job insecurity, physical risks, physical demands
- job resources: autonomy, job prospects, intrinsic rewards, training, organisational participation, flexible working arrangements, autonomy, social support
- collective quality of working life
- work organisation, job resources and well-being at work, work–life conflicts
- individual quality of working life module
- working hours, paid and unpaid work, health and well-being, ability to make ends meet
- separate topic of time use and work-life balance variables

The practical implementation of the data analysis has pros and cons. EWCS data is of high quality, available for all EU countries, and it focuses specifically on working conditions and relevant topics.
It also includes a wider description of the whole working environment (e.g., experience on gender segregation). This is the only dataset where the ECG field of adequate housing workforce can be identified. The biggest drawback is sample size, which may be too small for a detailed analysis for ECG workforce categories.

ESS – European Social Survey

ECG fields: healthcare and "other" categories; partially ECEC, education and nutrition.

Identification of workforce

Step-by-step approach:
- employment relation, e.g. doing paid work as an employee, self-employed, or working for family business
- ISCO-08 (level 4)
- industry, NACE rev 2 (2-digit)
- *as an additional control variable for education and healthcare: what type of organisation work/worked for -> other public sector (such as education and health)*

Socio-demographic background indicators for additional analysis are gender, age, highest level of education (ISCED) and status of education, data about household and other household members, country of residence with details about immigrant status, regional unit (NUTS level 3) and type of domicile, languages spoken, subjective well-being, etc.
Occupational background indicators for additional analysis are establishment size, employment contract limited or unlimited duration, member of trade union or similar organisation, number of employees respondent has/had, number of people responsible for in job, responsible for supervising other employees.

Additional relevant data about working conditions is as follows:
- income and compensation: main source of household income, household's total net income and feeling about household income
- work-life balance: total contracted hours per week in main job with and without overtime, and how often are employees expected to work overtime
- respondent allowed to decide how daily work is organised
- allowed to influence policy decisions about activities of organisation
- online/mobile communication makes it easy to work from home or place of choice
- employees expected to be responsive outside working hours (how often)
- partner/family fed up with pressure of one's job (how often)
- being satisfied in one's main job

The practical implementation of the data analysis has several strengths. The data is available for most EU countries – which slightly varies across ESS rounds. It is also easily accessible in several formats and with

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academically recognised quality. ESS enables variety and different perspectives of working conditions and offers a unique insight into socio-demographic background, e.g. education or migration status of parents. In contrast, there is no individual income variable – only household income – and salary and wage are not separated but referred to as "income".

As for coverage, there is no data about Malta and Luxembourg in last two rounds (9 and 10). Also, in some cases the sample size for ECG workforce categories may be too small for a detailed analysis. Therefore, it can be useful to merge the data from the last two ESS rounds for a larger dataset, which can easily be done in ESS webpage.

EU LFS – EU Labour Force Survey

ECG fields: ECEC, education, healthcare, partially "other" category.

Identification of workforce

Step-by-step approach:
- employment relation, e.g. doing paid work as an employee, self-employed, working full-time or part-time, working on a temporary contract
- ISCO-08 (3-digit level)
- NACE rev 2 (2-digit level)

Socio-demographic background indicators for additional analysis are gender, age group, highest level and field of education (ISCED), status of education, country and years of residence, regional unit (NUTS level 2), marital status, nationality, country of birth, relationship to reference person in household (partner, father, mother).

Occupational background indicators for additional analysis are occupation, full time and part time distinction, permanency of work, reasons for temporary work, economic activity of work unit, country and region of place of work, variables for second job, (unpaid) overtime hours, shift work, evening work, etc., search for employment, hours worked, paid or unpaid overtime, wish to work more or less, details about second job.

Additional relevant data about working conditions is as follows:
- monthly pay from main job (decile)
- paid and unpaid overtime in the reference week in the main job
- number of hours per week usually worked *vs.* worked in reference week
- number of hours that the person would like to work in total
- working at home
- reasons for searching/not searching for another job, including satisfaction with working conditions
- accidents at work, and work related health problems (ad hoc module in years 2020, 2013 and 2007)
- work organisation and working time arrangements (ad hoc module in 2019)
- reconciliation between work and family life (ad hoc module in 2018, 2010 and 2005)

The practical implementation of the data analysis has pros and cons. The data for ECEC, education and healthcare are available for all EU, candidate**,** and EFTA countries, although different fields are found under different modules in data tree. Publicly available data is well structured, easily approachable and with academically recognised quality. There are numerous socio-demographic and occupational background variables, with emphasis on working hours and search for employment.

However, there are only few questions related to working conditions besides working hours and are often included in ad hoc modules in irregular years. The lack of frequency in certain data aspects means that the LSF may not capture the rapid changes occurring in the labour market or provide the immediate, in-depth data that policymakers might require for decision-making. The income variable is rather straightforward, describing only decile of net income. The database lacks necessary granularity of occupations for housing and nutrition.

EJM – European Jobs Monitor

ECG fields: Partially all categories covered in EU-LFS

Identification of workforce

Step-by-step approach:
- jobs, classified by sector and occupation, are ranked according to mean hourly wage
- this classification is then used to study on a continuous basis the changes in the structure of employment in different countries, as well as at aggregate EU level
- ISCO-08 (2-digit level)
- NACE rev 2 (1-digit level)

Socio-demographic background indicators for additional analysis are gender, age group, highest level and field of education (ISCED), employment status, employment sector, country, nationality, country of birth.
Occupational background indicators for additional analysis are occupation, sector classification, wage quintile levels, job-wage quintiles, task content indicators, methods, and tools used at work.

Additional relevant data about working conditions depends on thematic report. Latest report (Hurley et al, 2021) analyses, how increases in labour supply have been distributed by sector, occupation and across the wage distribution. The primary focus was on gender, with a secondary focus on ageing. Considerable focus on explained and unexplained part of gender pay-gap.

The practical implementation of the data analysis. The European Jobs Monitor tracks structural change in European labour markets. Its analytical nature distinguishes it from surveys like EU-SILC or the EU LFS, focusing instead on synthesising and interpreting data derived from these and other sources, such as the Structure of Earnings Survey (SES). This approach allows for a broad overview of employment trends and an assessment of job quality within the EU countries.

EU-SILC – EU statistics on income and living conditions

ECG fields: partially education

Identification of workforce

Step-by-step approach:
- main activity status (self-defined) and status in employment
- ISCO-08 (2-digit)
- industry, NACE rev 2 (2-digit)

Socio-demographic background indicators for additional analysis are gender, age, highest level of education (ISCED 2011) and status of education, data about household and other household members, country of residence with details about immigrant status, dwelling type and tenure station, region of residence (NUTS level 2), etc.
Occupational background indicators for additional analysis are permanency of main job, full or part-time main job, supervisory responsibility, information about previous jobs.

Additional relevant data about working conditions is as follows:
- employee income (cash or near cash and non-cash)
- self-employment income variables
- social benefits
- household income
- financial security and welfare
- overall quality of life and health
- type of physical activity when working

- other work-related benefits such as company car, contribution to individual private pension plan
- reasons for increase/decrease in household income
- time spent working, e.g. hours worked per week
- implicitly related variables under Personal Data and Quality of Life modules, e.g. satisfaction with time use (amount of leisure time) or frequency of contacts with family and relatives

The practical implementation of the data analysis shows that even though EU-SILC is one of the most comprehensive surveys in relation to incomes, it is foremost limited by insufficient level of ISCO and NACE separation. EU-SILC data is high-quality, available for all EU countries, and it covers variety and different perspectives of financial benefits and some other working conditions and relevant topics. It is collected both via surveys/interviews and from administrative data (including the data about economic activity and income). The sample size is large and generalisable. Some of the data is easily acceptable, other must be applied for. Financial income is covered well. Even so, due to the limited differentiation of NACE and ISCO codes, most ECG fields cannot be sufficiently analysed. Educational attainment level (ISCED 2011) is included, but not fields of education (ISCED-F 2013). For ECG field of healthcare, this kind of additional information would be extremely beneficial. It would enable distinguishing and eliminating veterinarians (ISCO 324 and 225) from the pool of *22 Healthcare professionals* and *32 Healthcare associate professionals*, making these operational categories for EU-SILC data - which they currently are not.

SES – Structure of Earnings Survey

ECG fields: Partially education, healthcare with strong compromises

Identification of workforce

Step-by-step approach:
- type of employment contract, management position
- ISCO-08 (1-digit level)
- NACE rev 2 (2-digit level, but occasionally aggregated groups)
- *additional variables for full time work, length of service*

Socio-demographic background indicators for additional analysis are gender, age group, highest level of completed education (ISCED-97)

Occupational background indicators for additional analysis are occupation, management profession, geographical location of the statistical unit, total number of employees in local unit, length of service.

Additional relevant data about working conditions is as follows:
- gross annual earnings
- earnings related to overtime, special payments for shift work
- annual bonuses and allowances not paid at each pay period
- annual payments in kind, other annual days of paid absence
- annual days of holiday leave
- taxes and other compulsory social contributions paid by employer
- compulsory social security payments
- size of the enterprise to which the local unit belongs, total number of employees in the local unit
- collective pay agreement
- number of overtime hours paid in the reference month
- share (%) of a full-timer's normal hours (with up to 2 decimal places)

The practical implementation of SES is rather difficult under ECG purposes. As indicated by its name, the data has numerous variables about structure of income and offers a promising insight related to fair compensation and work-life balance. Even so, occupations are only available at 1-digit level and NACE at 2-digit level, where several categories are combined, which makes SES data usable only for education by using corresponding NACE code (*85 Education*). On the other hand, this includes NACE categories related to pre-primary education (*85.1*) and tertiary education (*85.42),* which mean clear overestimation of the ECG

workforce. Nutrition and "other" categories are not identifiable, while ECEC is partially included under education.

All in all, while SES data can be used for insights into earnings in field of education, it lacks the necessary detail when defining workforce in other fields.

Conclusions

The European Child Guarantee has brought the need for a precise and actionable understanding of the workforce to the forefront. This report includes a set of classifications using ISCO and NACE codes that align with the ECG's key areas. Focus on high-level categories ensures comparability across EU Member States while providing enough detail to be operational and relevant.

In education and ECEC, specific ISCO and NACE codes can be straightforwardly applied, providing a clear framework for defining the workforce. In the case of ECEC, 4-digit ISCO categories or 3-digit NACE categories are a necessity, with no possible compromises to be made. Minimum viable level in education is level 1 NACE and 3-digit ISCO.

In healthcare, the ECG workforce is defined solely by ISCO-08 classification, where both 3-digit and 4-digit level categories are applicable. Nutrition presents more complex challenges. In addition to two key occupations that can be defined by solely by ISCO-08, nuanced approach that combines both ISCO and NACE codes is required. The minimum suitable levels are level 3 ISCO and level 2 NACE. The key area of adequate housing involves an even more granular analysis, using 3-digit NACE categories.

The analysis also recognises horizontal occupations relevant to multiple ECG areas, where the priority is defining social services workforce. Social services include a wide range of professionals from child and youth councillors to your work managers and child protection professionals. Their roles revolve around the well-being and support of children and youth, which can impact educational and health outcomes. While there is one clear 4-digit ISCO, more precise classification can often be found only on country-level, but with big variability.

Table 8: Optimal and minimum viable classification of workforce

	ISCO		NACE		Comments
	Recommended	Minimum viable	Recommended	Minimum viable	
ECEC	4-digit	4-digit	Level 3	Level 3	Workforce is defined by ISCO or NACE, but ISCO is preferred. There are many possibilities for country-level mapping.
Education	4-digit	3-digit	Level 4	Level 2	Workforce is defined by ISCO or NACE. Minimum viable level includes higher education. There are many specific occupations on country-level.
Healthcare	4-digit	3-digit	Not recommended	Not recommended	Workforce is defined by ISCO. There are some possibilities for country-level mapping

Nutrition	4-digit	3-digit	Level 4	Level 2	Workforce is defined by combination of ISCO and NACE There are not many opportunities for in-depth country-level mapping.
Adequate housing	NA	NA	Level 4	Level 3	Workforce is defined by NACE. Country-level is not relevant.
Other	4-digit	4-digit	NA	NA	Workforce is defined by ISCO

Source: Authors' compilation based on official ISCO and NACE classifications

Sources of quantitative and qualitative information

Chapter 2 identifies various pan-European surveys, such as the European Working Conditions Survey (EWCS), European Social Survey (ESS), and EU Labour Force Survey (EU-LFS), for their relevance and applicability in identifying the ECG workforce. While each survey offers unique insights, they also come with clear limitations for ECG purposes.

Two of the most operational surveys regarding workforce categorisation are EWCS and ESS due to their detailed occupational organisation. **EWCS** provides detailed data on working conditions and working environment (e.g., experience on gender segregation). This is the only dataset where the ECG field of adequate housing workforce can be identified. However, in most cases, the sample size for ECG workforce categories may be too small for a detailed analysis - on 2015, the sample size was slightly more than 1000 per country on average. **ESS** offers a broad perspective ESS on working conditions and additional relevant topics. Even so, there is a lack of both direct income variable and there are occasional missing EU countries.

The **EU-LFS** provides extensive demographic and occupational data, yet it may not capture rapid labour market changes or detailed working conditions. LFS covers most ECG key areas, but not nutrition and housing. **EJM** is instead focused on synthesising and interpreting data, that is mostly derived from LFS. This allows for a broad overview of employment trends and an assessment of job quality within the EU countries.

EU-SILC data is high-quality, available for all EU countries, and it covers variety and different perspectives of financial benefits and some other working conditions and relevant topics. The sample size is large and generalisable. Nevertheless, from ECG key areas, only education is sufficiently covered. **SES** is rather difficult to use on its own under ECG purposes. While SES data has numerous variables about structure of income and offers a promising insight related to fair compensation and work-life balance, occupations are only available at 1-digit level and NACE at 2-digit level with several categories combined. This makes SES data usable only for education by using corresponding NACE code. Compared to studies described above, **Euridyce**, **TALIS**, **ECS** etc offer more niche potential for analysis of ECG key areas. While topically insightful, these analyses are mostly done with specific subgroup in mind (teachers, companies), offering little information on other fields.

Disclaimer: This working paper has not been subject to the full Eurofound evaluation, editorial and publication process.

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