



## Cedefop country fact sheet

### Adult population with potential for upskilling and reskilling

# Bulgaria

Country fact sheets originate from the comparative analysis presented in Cedefop's 2020 study *[Empowering adults through upskilling and reskilling pathways. Volume 1: adult population with potential for upskilling and reskilling](#)*.

Due to data limitations, part of the analysis could not be performed at country level. The fact sheets are intended to stimulate reflection on whether the groups with the most potential for upskilling, according to the analysis conducted, are in line with defined national priorities. Analysis underpinning the country fact sheets could also be replicated using national data to overcome some of the limitations of the EU comparable data sets used.

#### **Disclaimer**

This fact sheet contains UK data and analysis based on research conducted before the United Kingdom's exit from the European Union on 31 January 2020. EU averages or other statistical parameters including the UK reflect the situation in the European Union before 31 January 2020 and should not be considered as representative of the situation in the EU thereafter. In this context 'EU-28' refers to the 28 EU Member States prior to 31 January 2020.

This fact sheet has neither been edited nor proofread by Cedefop's editing service.

#### Further information:

<http://www.cedefop.europa.eu/en/events-and-projects/projects/adult-learning>

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## Introduction

Due to data limitations, analysis of the low-skilled has been generally carried out using educational attainment levels or type of occupation <sup>(1)</sup>. However, as discussed in Cedefop (2017), this approach fails to capture the complexity of the low-skilled phenomenon. Educational attainment does not take into account different types of skills, abilities and factors that can result in low-skilled status, especially among adults: long-term unemployment and/or disengagement from the labour market, skill obsolescence due to ageing, rapid technological change, product/process innovation, changes in production processes and/or work organisation, skills mismatch and socioeconomic factors, such as migrant background and gender.

Further, this narrow conceptualisation fails to capture the role of other knowledge, skills and competences gained outside formal education environments, such as those acquired through training, informal learning and work experience.

Within this context, and in line with Cedefop (2017), Cedefop's study [\*Empowering adults through upskilling and reskilling pathways. Volume 1: adult population with potential for upskilling and reskilling\*](#) adopts a definition of low-skilled status for adults which moves beyond educational attainment, to embrace the different dimensions comprising the overall skills and competences of adults.

This broader conceptualisation of low skills looks at three skills dimensions:

- (a) educational attainment level;
- (b) computer and digital skills;
- (c) cognitive skills: literacy and numeracy.

It also includes adults with medium and high education levels, working in elementary occupations, as a proxy for people in potential risk of skill obsolescence and skill loss <sup>(2)</sup>.

For the purpose of the analysis underpinning this fact sheet, adults are people aged from 25 to 64. EU 28+ refers to the 28 EU Member States, plus Iceland and Norway.

Boxes 1 and 2 illustrate the main definitions and the source of information of the different skill domains used for the analyses.

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<sup>(1)</sup> Dieckhoff, 2008; Eurofound, 2008.

<sup>(2)</sup> Several studies show that job-worker mismatches induce cognitive decline with respect to immediate and delayed recall abilities, cognitive flexibility and verbal fluency (De Grip et al., 2008; Kureková, Haita and Beblavý, 2013; Kureková et al., 2013).

**Box 1. Concepts of low skills used in the analysis: definition and source****Educational attainment level:**

- low education refers to people who have successfully completed, at most, international standard classification of education (ISCED) levels 0-2 or ISCED 3c programmes lasting less than two years. ISCED 2011 is the reference international classification for organising education programmes and related qualifications by levels and fields:
  - ISCED 0: pre-primary education;
  - ISCED 1: primary education;
  - ISCED 2: lower secondary education;
  - ISCED 3: upper secondary education.

[Source of data used: European Union Labour Force Survey (EU LFS) 2016 anonymised microdata for research].

**Digital skills:**

- never used computer: refers to people who declare of having never used a computer [Source of data: Eurostat community statistics on information society (CSIS) 2015 anonymised microdata for research; CSIS 2014 for Iceland];
- low use of internet: refers to people who last used the internet more than three months prior to the survey interview or who have never used the internet [Source of data: CSIS 2015 anonymised microdata for research; CSIS 2014 for Iceland];
- below basic digital skills: among those people with last use of the internet less than three months prior to the survey interview, individuals who have carried out activities in, at most, one of the four digital competence dimensions surveyed: information, communication, content-creation and problem-solving [Source of data: CSIS 2015 anonymised microdata for research];
- low digital skills: refers to people who have either low use of the internet or below basic digital skills [Source of data: CSIS 2015 anonymised microdata for research];
- low problem-solving in technology-rich environments: refers to people who scored less than 241 points in PIAAC (i.e. below level 1 on the proficiency scale ranging from level 1 to level 3 of OECD PIAAC). Problem-solving in technology-rich environments is defined as 'using digital technology, communication tools and networks to acquire and evaluate information, communicate with others and perform practical tasks'. [Source of data: PIAAC 2012; 2015 public use files].

**Cognitive skills:**

- low literacy refers to people who scored less than 226 points in PIAAC (i.e. at most, level 1 on the proficiency scale ranging from below level 1 to level 5 of OECD PIAAC). Literacy refers to the ability to understand, evaluate, use and engage with written texts to participate in society, achieve one's goals, and develop one's knowledge and potential. [Source of data: PIAAC 2012; 2015 public use files];
- low numeracy refers to people who scored less than 226 points in PIAAC (i.e. at most, level 1 on the proficiency scale ranging from below level 1 to level 5 of OECD PIAAC). Numeracy refers to the ability to access, use, interpret and communicate mathematical information and ideas in order to engage in, and manage the mathematical demands of, a range of situations in adult life. [Source of data: PIAAC 2012; 2015 public use files];
- low cognitive skills: refers to people with low literacy and/or numeracy (see above) [Source of data: PIAAC 2012; 2015 public use files].

**At risk of skill loss:**

- medium-high educated at risk of skill loss: refers to people who have medium and high educational attainment levels and work in elementary occupations (international standard classification of occupations ISCO-08, group 9). Where, medium education is defined as having completed ISCED 3 programme of duration of two years or more or ISCED level 4 (post-secondary education), and high education is defined as having completed ISCED levels 5-8 (tertiary education). ISCED 2011.  
[Source of data used: EU LFS 2016 anonymised microdata for research].

Source: Cedefop.

**Box 2. Data sources****EU LFS 2016 anonymised microdata for research (3)**

The Eurostat-European Union labour force survey provides robust information for all the 28EU+ countries on labour market conditions and characteristics of low-educated adults and jobs. It contains data on a wide range of sociodemographic characteristics of individuals including education (ISCED) and training participation (in the four weeks before the survey interview), as well as on employment status and employment characteristics of the main job, including occupation (ISCO).  
<https://ec.europa.eu/eurostat/web/microdata/labour-force-survey>

**CSIS 2015 anonymised microdata for research (4)**

The Eurostat Community statistics on information society survey provides information on access and use of information and communication technologies (including computer use, internet access, digital competences) by households and individuals aged 16 to 74 in the EU-28+. It contains background information on gender, age, education level, employment status, occupation (manual vs non-manual job). CSIS 2015 covers the EU-28+ countries, apart from Iceland. CSIS 2014 have been used for Iceland.  
<https://ec.europa.eu/eurostat/web/microdata/community-statistics-on-information-society>

**PIAAC 2012; 2015 public use files – anonymised microdata (5)**

The Programme for the international assessment of adult competences (OECD PIAAC) contains information on cognitive skills (literacy and numeracy), problem-solving in technology-rich environments, computer experience, level of education (ISCED) and training, as well as, on a range of demographic, economic and social variables, including occupations (ISCO). PIAAC covers in total 21 countries of the EU-28+:

- 18 surveyed in round one (2012): AT, BE, CY, CZ, DE, DK, EE, ES, FI, FR, IE, IT, NL, NO, PL, SE, SK, UK;
- three surveyed in round two (2015): EL, LT, SI.

Hence, the following EU-28+ countries are not covered by this survey: BG, HR, HU, IS, LU, LV, MT, NO, PT, RO. Some other countries did not participate in the assessment of proficiency in problem-solving in technology-rich environments: CY, ES, FR and IT.  
<http://www.oecd.org/site/piaac/>

Source: Cedefop.

(3) Eurostat, a.

(4) Eurostat, b.

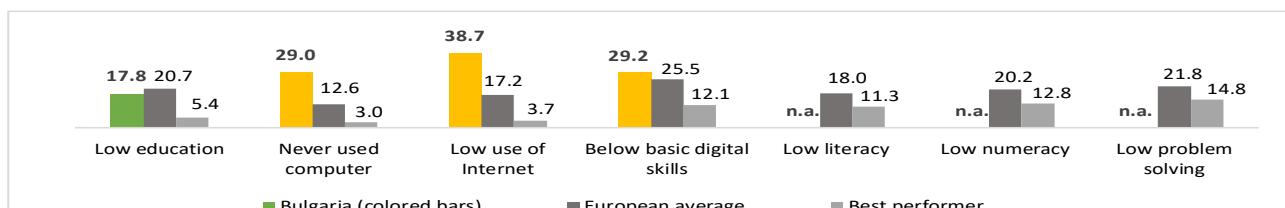
(5) OECD, a; b.



## How many adults at risk of low skills?

**Bulgaria has a high share of adults with low computer and digital skills** when compared to both the EU 28+ unweighted average and the best performing countries (i.e., those countries having the lowest shares of low skilled adult populations). In 2015 the share of adults who have never used computer and the one with below basic digital skills was 29%, while the share of adults who never used or used Internet rarely was almost 39% (Fig.1). On the other hand, **the incidence of adults with low levels of educational attainment is lower** than those observed on average in the EU28+ countries. Data on cognitive skills (literacy and numeracy) and on problem solving in technology-rich environments are not available for Bulgaria.

Figure 1 – incidence of low skills among adults aged 25-64 by type of skills (%)

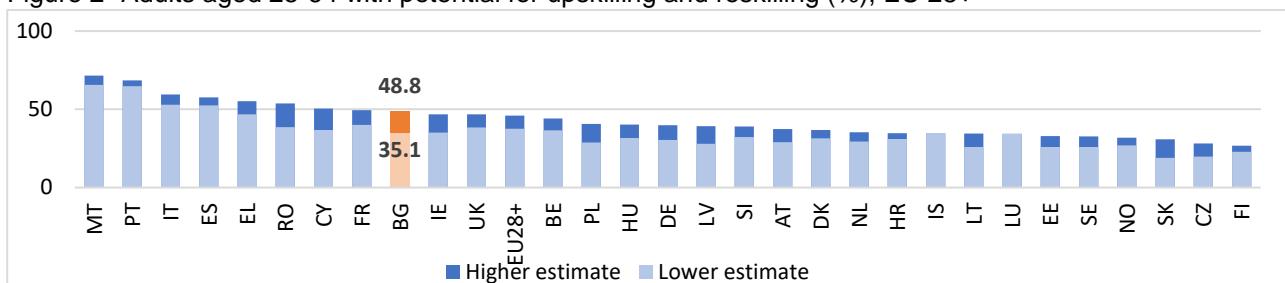


Note: European average: unweighted average of EU28+ countries for which data are available. n.a. data not available. Best performer countries (those with reliable data) with the lowest share of low-skilled adult population aged 25-64. Best performer: Low education (LT), Never used computer (NL), Low use of Internet (FI), Below basic digital skills (LU), Low literacy (FI), Low numeracy (CZ), Low problem solving in technology-rich environments (NO)

## Estimation of the adult population with potential for upskilling and reskilling

Based on the above data, **in Bulgaria the share of adult population with potential for upskilling and reskilling is estimated to range between 35.1% and 48.8% of its total adult population, that is to say from 1.4 to 1.9 million adults, depending on the measure of digital competences considered.**

Figure 2- Adults aged 25-64 with potential for upskilling and reskilling (%), EU 28+



Note: Population with potential for upskilling (estimate): adults with either: low education; low digital skills (higher estimate) or never used computer (lower estimate); low literacy and/or low numeracy; as well as medium-high educated (ISCED2011 level 3 2-year+ to level 8) at risk of skill loss, working in elementary occupations- ISCO08 level 9). For countries not surveyed by PIAAC (BG, HR, HU, IS, LU, LV, MT, PT, RO), low cognitive skills (low literacy and/or low numeracy skills) is assumed to be equal to the average level observed in surveyed countries. EU28+: population weighted average.

## Who are the adults most at risk of low skills?

Due to data limitation and reliability, identification of the groups of adults most at risk of low skills, and by skill dimension, could be performed only by labour market status (unemployed, inactive and employed) and by age groups (young adults aged 25 to 34, adults aged 35 to 54 and older adults aged 55 to 64). When data were available and reliable at country level, in the country factsheets, this analysis was complemented by analysis by gender and country of origin.

The risk of being low-skilled has been calculated using the four indicators illustrated in box 3.

**Box 3. Measures of low skills used in the analysis**

- (a) **the absolute risk of low skills**, calculated as the simple share of individuals with low skills among those of the same sociodemographic subgroup<sup>(6)</sup>. It represents the incidence of low skills in the subgroup population;
- (b) **the relative risk of low skills**, calculated as the share of low-skilled adults in the sociodemographic subgroup (absolute risk) over the share of low-skilled among the whole adult population aged 25 to 64 in the country<sup>(7)</sup>. It compares the incidence of low skills in the subgroup to the incidence of low skills in the total adult population of the country. Values above/below 100 indicate that the risk of low skills is higher/lower for the subgroup than the average risk observed for the total adult population of the country;
- (c) **the low skills composite index**, calculated as the arithmetic mean of the relative risk of low skills in education, digital skills, literacy and numeracy. It provides the average risk of low skills in the four domains analysed. Again, values of the index above/below 100 indicate a higher/lower than average risk;
- (d) **the relative performance index of low skills**, calculated as the relative risk of low skills within the country over the relative risk of low skills observed on average in the EU-28+ for the same sociodemographic subgroup<sup>(8)</sup>. It compares the relative performance in terms of low skills of the subgroup in the country to the relative performance of the subgroup in the EU-28+ as a whole. Values above 100 indicate that the relative risk of low skills registered by the subgroup within the country is higher than the one registered by the same subgroup on average in the EU-28+. As opposite, values below 100 indicate a lower relative risk.

Source: Cedefop.

According to this analysis, **in Bulgaria low skills are particularly high among people in the older age groups and among unemployed and inactive people**. Among the total number of adults with potential for upskilling and reskilling estimated above, unemployed aged 55-64; people out of the labour force (inactive) aged 35-54; and unemployed aged 35-54 present on average the highest share of low skills in all domains considered: education and digital skills (i.e. low use of Internet or below basic digital skills). In addition, also other categories of unemployed and inactive people present a higher than average risk of being low skilled (i.e. all those groups whose composite index is above 100, Fig. 3).

<sup>(6)</sup> Absolute risk of low skills calculated as:

$(\text{low skilled population})_{ij}/(\text{total population})_{ij}$ ; where subscript i refers to subgroup and j to country.

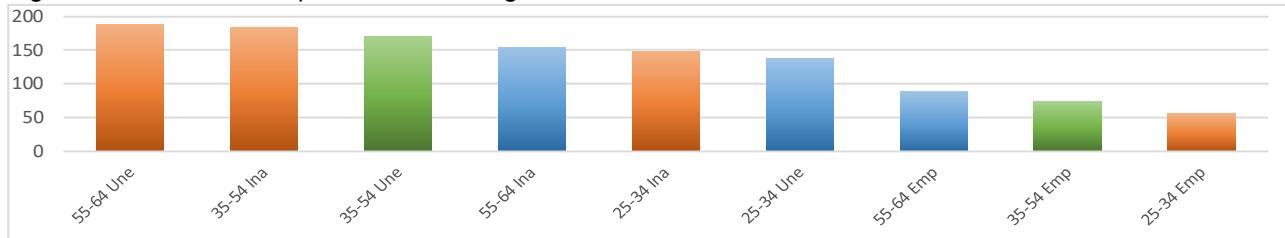
<sup>(7)</sup> Relative risk of low skills calculated as:

$\{[(\text{low-skilled population})_{ij}/(\text{total population})_{ij}]/[(\text{low-skilled population})_i/(\text{total population})_i]\} \times 100$ ; where subscript i refers to subgroup and j to country.

<sup>(8)</sup> Relative performance index calculated as:  $[(\text{relative risk of low skills})_{ij}/(\text{relative risk of low skills})_{i\text{EU28+}}] \times 100$ ; where subscript i refers to subgroup, j to country and EU28+ to European average.



Figure 3 – low skills composite index\*, Bulgaria



(\*) Low skills composite index: calculated as the arithmetic mean of the relative risk of being low skilled in two domains: Low Education; Low Digital skills. For each skill domain, the relative risk is calculated as the share of low skilled in the socio-demographic group over the share of low skilled among adults aged 25-64 in the country. Values of the index below 100 indicate a lower than average risk; values above 100 indicate higher than average risk.

Source: Eurostat, a [2016]; Eurostat, b [2015]; OECD, a; b.

To investigate better the skill needs of the subgroups of low-skilled adults identified above, we proceed with investigating the risk of being low-skilled in four skill dimensions: education, digital, literacy, numeracy. Analysis is presented according to employment status. For each subgroup the following results are presented:

- (a) the absolute risk of low skills, registered by the subgroup in each of the four skills dimensions;
- (b) the relative performance index of low skills, calculated as the relative risk of low skills within the country over the relative risk of low skills observed on average in the EU 28+ for the same sociodemographic subgroup (<sup>9</sup>).

## Unemployed adults

**Among the unemployed, the groups most at risk of low skills are individuals aged 55-64 and 35-54.** They present a very high risk of having low digital skills and low educational attainment levels as compared to the country and EU 28+ averages (Tab. 1). Data are not available for literacy and numeracy.

Table 1- Unemployed adults: absolute risk of being low skilled by age and type of skill, Bulgaria

Age	Education	Digital skills	Literacy	Numeracy
55-64	41,6	96,5	n.a.	n.a.
35-54	37,0	90,0	n.a.	n.a.
25-34	28,8	75,4	n.a.	n.a.
Total pop 25-64: Country average	17,8	67,9	n.a.	n.a.
Total pop 25-64: European average	23,2	43,0	20,8	24,3

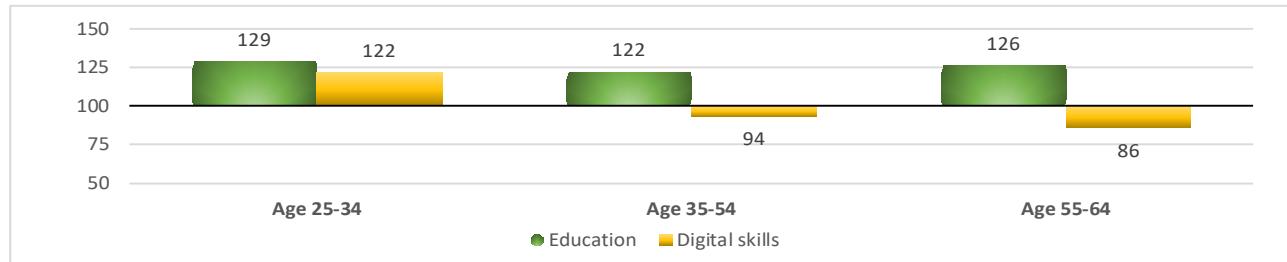
Note: European weighted average: Education (EU28+); Digital skills (EU28, NO); Literacy and Numeracy (AT, BE, CY, CZ, DE, DK, EE, EL, ES, FI, FR, IE, IT, LT, NL, NO, PL, SE, SI, SK, UK). n.a.: data not available.

Unlike the absolute risk, the **relative performance index** of low skills (Fig. 4) pinpoints country critical areas (those above 100) for socio-demographic groups as compared to the performance they register on average across the EU 28+. In Bulgaria, for instance, unemployed young adults (25-34) have a higher relative risk of having low digital skills as compared to the relative risk observed on average by the same group in the EU 28+, while all groups of unemployed adults have a higher relative risk of having low education.

<sup>9</sup> The countries considered in the EU 28+ average change according to the database and skill considered: EU28+ for education (EU-LFS 2016); EU28 plus NO for digital skills (CSIS 2015); AT, BE, CY, CZ, DE, DK, EE, EL, ES, FI, FR, IE, IT, LT, NL, NO, PL, SE, SI, SK, UK for literacy and numeracy (OECD- PIAAC 2012;2015).



Figure 4 – Unemployed adults: relative performance index of low skills by age and type of skill, Bulgaria



Note: **Relative risk of low skills within the country over the relative risk of low skills observed on average in EU28+ for the same socio-demographic group.** Values of the index below/above 100 indicate that the relative risk of low skills for the specific socio-demographic group in the country is lower/higher as compared to the relative risk for the specific socio-demographic group in the EU 28+ average.

## Inactive adults

**Among inactive adults, the groups most at risk of low skills are adults aged 35-54 and 55-64.** They present a higher risk of having low digital skills and low educational attainment levels compared to the average risk registered in the country and in the EU28+ (Tab. 2). However, also the younger adults aged 25-34 out of the labour force show a relatively high risk of having low educational attainment levels.

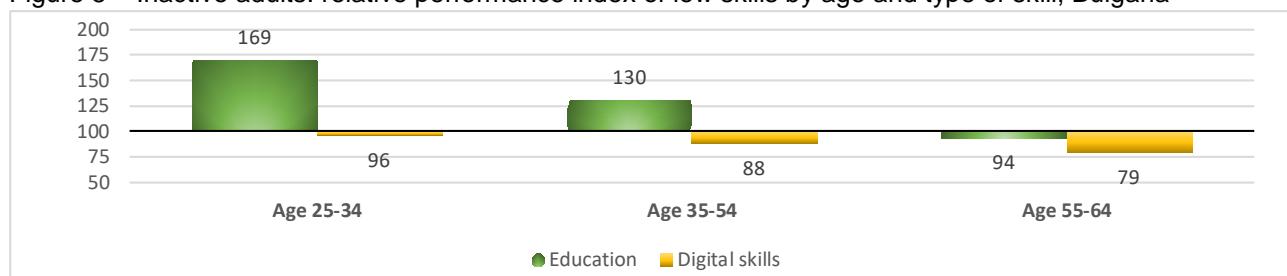
Table 2- Inactive adults: absolute risk of being low skilled by age and type of skill, Bulgaria

Age	Education	Digital skills	Literacy	Numeracy
35-54	43,0	85,5	n.a.	n.a.
55-64	29,7	95,0	n.a.	n.a.
25-34	39,3	51,5	n.a.	n.a.
Total pop 25-64: Country average	17,8	67,9	n.a.	n.a.
Total pop 25-64: European average	23,2	43,0	20,8	24,3

Note: European weighted average: Education (EU28+); Digital skills (EU28, NO); Literacy and Numeracy (AT, BE, CY, CZ, DE, DK, EE, EL, ES, FI, FR, IE, IT, LT, NL, NO, PL, SE, SI, SK, UK). n.a.: data not available.

Unlike the absolute risk, the relative performance index of low skills (Fig. 5) pinpoints country critical areas (those above 100) for socio-demographic groups as compared to the performance they register on average across the EU 28+. In Bulgaria, for instance, inactive adults aged 25-34 and 35-54 have a higher relative risk of having low education as compared to the relative risk observed on average by the same groups in the EU 28+.

Figure 5 – Inactive adults: relative performance index of low skills by age and type of skill, Bulgaria



Note: **Relative risk of low skills within the country over the relative risk of low skills observed on average in EU28+ for the same socio-demographic group.** Values of the index below/above 100 indicate that the relative risk of low skills for the specific socio-demographic group in the country is lower/higher as compared to the relative risk for the specific socio-demographic group in the EU 28+ average.



## Employed adults

**Employed adults of all groups considered show a lower risk of having low educational attainment levels with respect to both the country and the EU 28+ average.** However, for those aged above 35 the risk of having insufficient digital skills is high even among employed adults (Tab. 3).

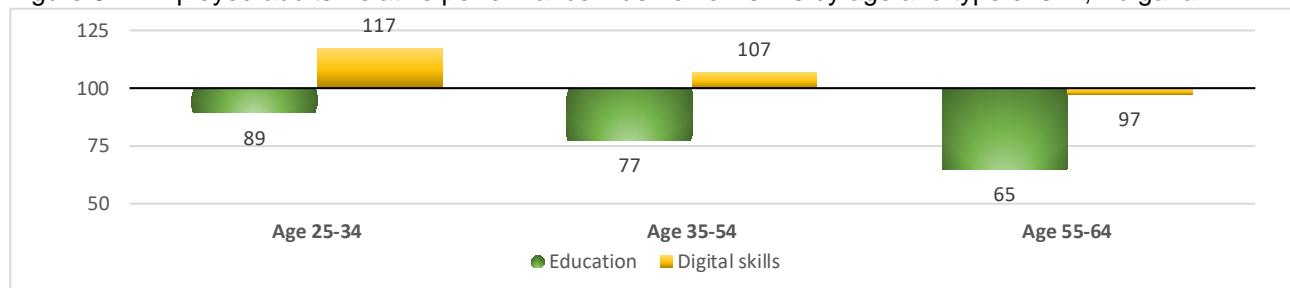
Table 3- Employed adults: absolute risk of being low skilled by age and type of skill, Bulgaria

Age	Education	Digital skills	Literacy	Numeracy
55-64	11,4	75,3	n.a.	n.a.
35-54	10,4	61,1	n.a.	n.a.
25-34	8,5	41,8	n.a.	n.a.
Total pop 25-64: Country average	17,8	67,9	n.a.	n.a.
Total pop 25-64: European average	23,2	43,0	20,8	24,3

Note: European weighted average: Education (EU28+); Digital skills (EU28, NO); Literacy and Numeracy (AT, BE, CY, CZ, DE, DK, EE, EL, ES, FI, FR, IE, IT, LT, NL, NO, PL, SE, SI, SK, UK). n.a.: data not available.

The **relative performance index** of low skills (Fig. 6) pinpoints country critical areas (those above 100) for socio-demographic groups as compared to the performance they register on average across the EU 28+. In Bulgaria, for instance, employed adults aged 25-34 and 35-54 have a higher relative risk of having low digital skills as compared to the relative risk observed on average by the same group in the EU 28+.

Figure 6 – Employed adults: relative performance index of low skills by age and type of skill, Bulgaria



Note: **Relative risk of low skills within the country over the relative risk of low skills observed on average in EU28+ for the same socio-demographic group.** Values of the index below/above 100 indicate that the relative risk of low skills for the specific socio-demographic group in the country is lower/higher as compared to the relative risk for the specific socio-demographic group in the EU 28+ average.


**Box 4 – Risk of low skills among adult women**

In Bulgaria, women account for approximately 49% of the adult population with low education and low digital skills. Among adult women, the absolute risk of low skills is higher for digital skills (67%) as compared to education. However, when compared to the average risk (relative risk of low skills) women show a lower risk of low skills both in education and in digital skills (2% lower).

The breakdown by employment status shows that the relative risk of low skills is higher among women out of the labour force (inactive) and among unemployed women both for education and digital skills. Low skilled inactive adult women represent between 13% and 28% of the low skilled adult population, depending on the skill dimension considered.

<b>Females aged 25-64</b>	<b>Low education</b>	<b>Low digital skills</b>
Absolute risk of low skills among fem 25-64	17.3	66.5
Relative risk of low skills: total fem 25-64	97	98 (48.6)
Relative risk: unemployed fem 25-64	189	127 (11.2)
Relative risk: inactive fem 25-64	198	125 (12.8)
Relative risk: employed fem 25-64	48	81 (24.5)

(incidence of low skilled females 25-64 on total low skilled population in %). n.a.: data not available

## References

[URLs accessed 11.9.2019]

Cedefop (2017). *Investing in skills pays off: the economic and social cost of low-skilled adults in the EU*. Luxembourg: Publications Office. Cedefop research paper; No 60. <https://www.cedefop.europa.eu/en/publications-and-resources/publications/5560>

De Grip, A. et al. (2008). Job-worker mismatch and cognitive decline. *Oxford economics papers*, Vol. 60, No 2, pp. 237-253. [https://econpapers.repec.org/article/oupoxecpp/v\\_3a60\\_3ay\\_3a2008\\_3ai\\_3a2\\_3ap\\_3a237-253.htm](https://econpapers.repec.org/article/oupoxecpp/v_3a60_3ay_3a2008_3ai_3a2_3ap_3a237-253.htm)

Dieckhoff, M. (2008). Skills and occupational attainment: a comparative study of Germany, Denmark and the UK. *Work, employment and society*, Vol. 22, No 1, pp. 89-108.

Eurofound (2008). *Who needs upskilling? Low-skilled and low-qualified workers in the European Union*. [https://www.eurofound.europa.eu/sites/default/files/ef\\_publication/field\\_ef\\_document/ef0897en.pdf](https://www.eurofound.europa.eu/sites/default/files/ef_publication/field_ef_document/ef0897en.pdf)

Kureková, L.; Haita, C.; Beblavý, M. (2013). *Being and becoming low-skilled: a comprehensive approach to studying low-skillness*. NEUJOBS working paper; No 4.3.1. [https://www.academia.edu/23527945/Being\\_and\\_Becoming\\_Low-Skilled\\_A\\_Comprehensive\\_Approach\\_to\\_Studying\\_Low-Skillness](https://www.academia.edu/23527945/Being_and_Becoming_Low-Skilled_A_Comprehensive_Approach_to_Studying_Low-Skillness)

Kureková, L. et al. (2013). *Demand for low- and medium-skilled workers across Europe: between formal qualifications and non-cognitive skills*. NEUJOBS working paper; No 4.3.3. [http://biblioteka-krk.ibe.edu.pl/opac\\_css/doc\\_num.php?explnum\\_id=592](http://biblioteka-krk.ibe.edu.pl/opac_css/doc_num.php?explnum_id=592)

## Data sources

Eurostat (a). *European Union Labour Force Survey (EU LFS)* [database: anonymised microdata for research]. <http://epp.eurostat.ec.europa.eu/portal/page/portal/microdata/lfs>

Eurostat (b). *Community Statistics on Information Society (CS/S)* [database: anonymised microdata for research]. <https://ec.europa.eu/eurostat/web/microdata/community-statistics-on-information-society>

OECD (a). *PIAAC 2012: public-use files (anonymised microdata)* [database]. <http://www.oecd.org/site/piaac/>

OECD (b). *PIAAC 2015: public-use files (anonymised microdata)* [database]. <http://www.oecd.org/site/piaac/>