Human Capital
Digital Inclusion and Skills

Digital Economy and Society Index Report 2018
Human Capital

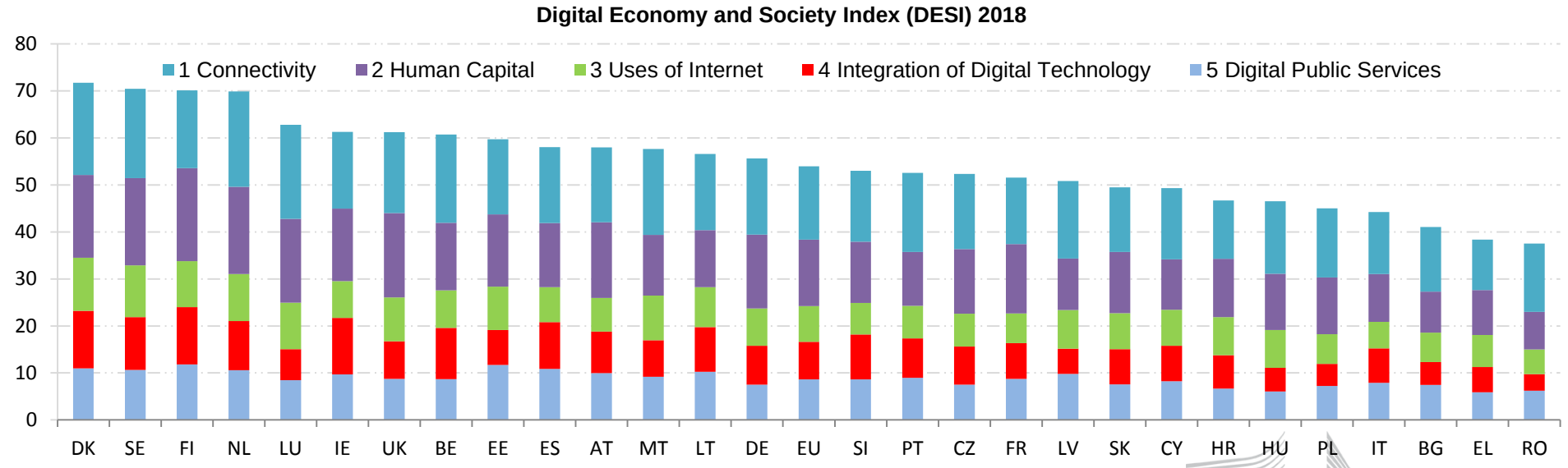
The Digital Economy and Society Index (DESI) is a composite index that summarises relevant indicators on Europe's digital performance and tracks the progress of EU Member States in digital competitiveness.

Denmark, Sweden, Finland and the Netherlands have the most advanced digital economies in the EU followed by Luxembourg, Ireland, the UK and Belgium.

Romania, Greece, Bulgaria and Italy have the lowest scores on the index.

The five dimensions of the DESI

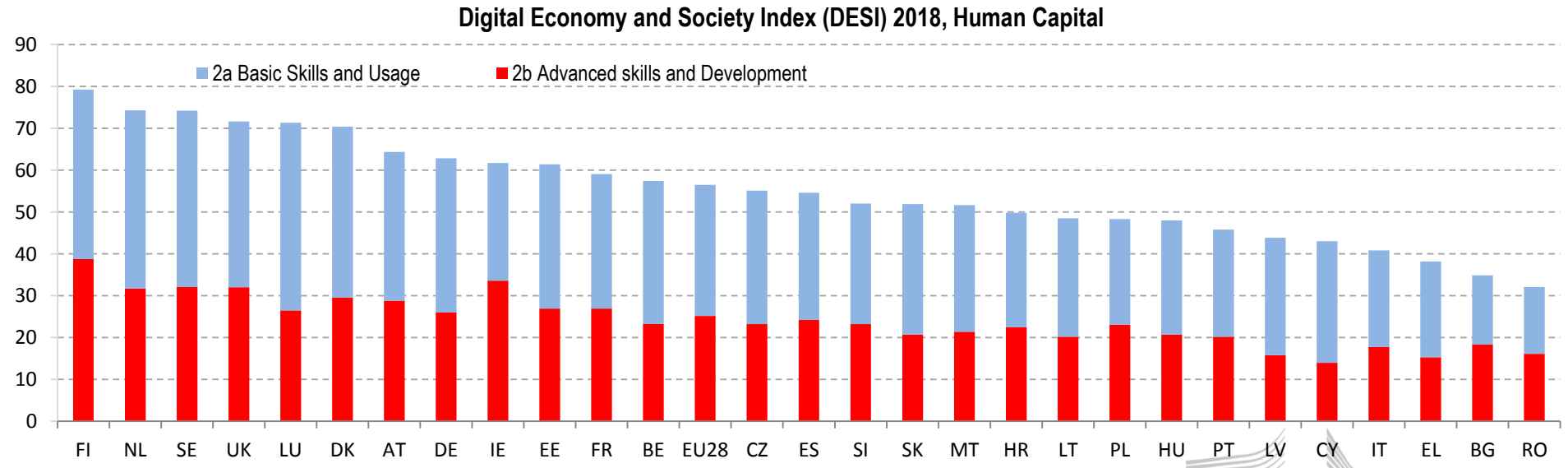
1 Connectivity	Fixed Broadband, Mobile Broadband, Fast and Ultrafast Broadband and prices
2 Human Capital	Basic Skills and Internet Use, Advanced skills and Development
3 Use of Internet Services	Citizens' use of Content, Communication and Online Transactions
4 Integration of Digital Technology	Business digitisation and eCommerce
5 Digital Public Services	eGovernment and eHealth



In the Human Capital dimension of DESI 2018, Finland, the Netherlands, Sweden, the United Kingdom, Luxembourg and Denmark obtained the highest scores. Romania, Bulgaria, Greece and Italy had the lowest ones.

The Human Capital dimension of DESI has two sub-dimensions covering **'basic skills and usage'** and **'advanced skills and development'**. The former includes indicators on internet use by individuals and digital skills (individuals with at least basic skills as per the Digital Skills Indicator). The latter includes indicators on ICT specialist employment and graduates in STEM (Science, Technology Engineering and Mathematics) disciplines. According to 2017 data, the Netherlands, Sweden and Luxembourg are the top performers in basic skills and usage; Finland, Ireland, Sweden and the UK had the highest scores in advanced skills and development. Romania, Bulgaria, Greece and Italy rank lowest overall on DESI's Human Capital dimension.

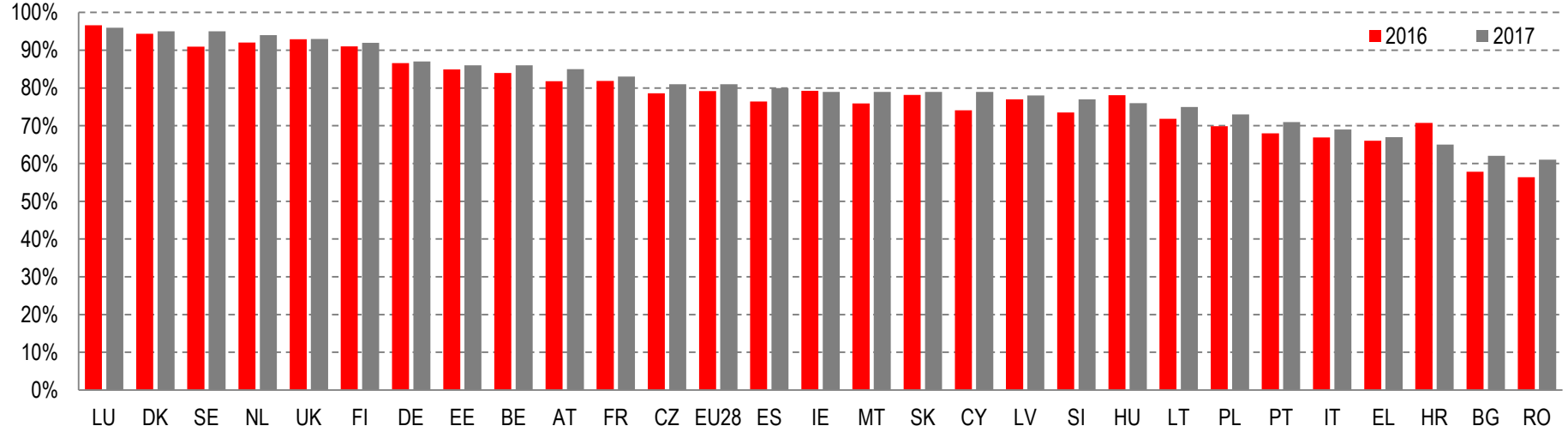
	EU 28
2a1 Internet Users % individuals	81% 2017
2a2 Basic Digital Skills % individuals	57% 2017
2b1 ICT Specialists % total employment	3.7% 2016
2b2 STEM Graduates Graduates in STEM per 1000 individuals (aged 20 to 29)	19.1 2015



The differences in regular internet use shrank further in 2017. However, in some Member States, over a third of the population still does not go online on a regular basis.

In Member States such as **Luxembourg, Denmark, Sweden and the Netherlands**, the **vast majority of the population uses the internet at least once a week**. Those countries in the process of **catching up** with top-performing Member States, such as **Austria, Belgium, Germany and Estonia**, saw further improvements in this respect in 2017. **Cyprus, Spain and Slovenia** also made significant progress and now stand very close to the EU average. Noteworthy increases were likewise recorded in both **Romania** (+ 5pp. compared with 2016) and **Bulgaria** (+ 4pp.), although 39 % and 38 % of their respective populations still do not go on line on a regular basis. Both Member States are also among those with the largest increases in their rates of regular internet use over the period 2010-2017, together with Cyprus (+29pp.), Greece (+26 pp.), the Czech Republic (+23pp.), Spain (+22pp.) and Italy (+21pp.).

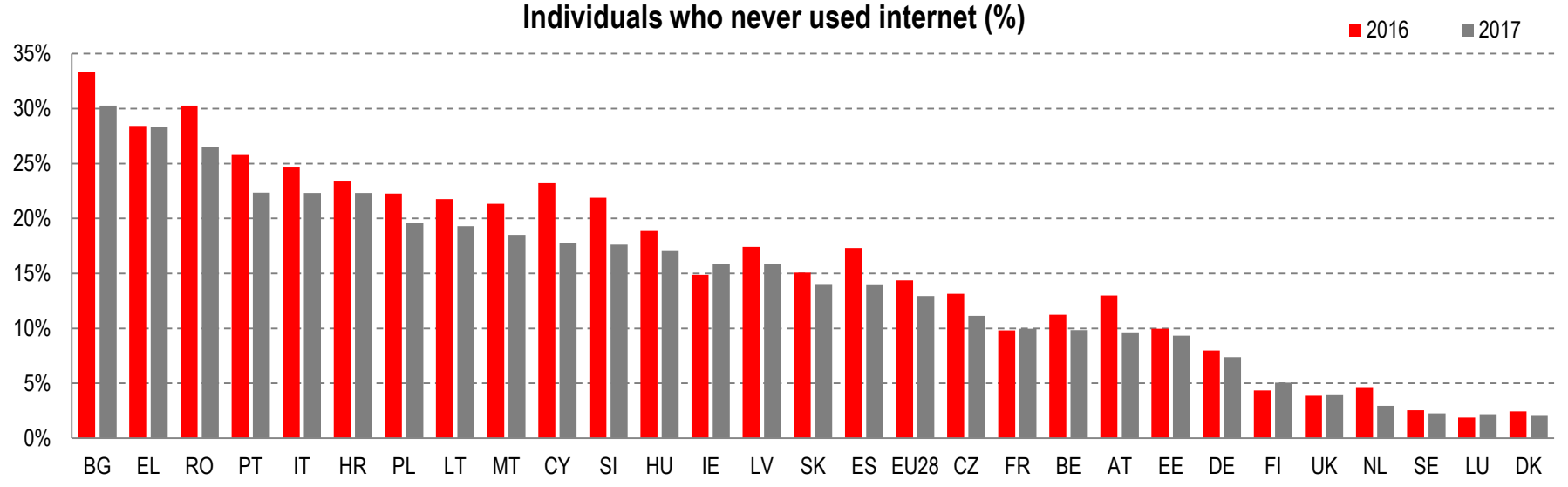
Regular Internet use in the EU (% of individuals using the internet at least once a week)



Source: Eurostat

The share of people in the EU who have never gone online decreased again in 2017, although the current share of 13 % warrants further efforts. Despite convergent trends, large disparities remain across Member States.

The share of EU citizens not using the Internet fell in nearly all Member States in 2017. On average, it decreased by 1 pp. in 2017 (to 13 %) compared to a year earlier. Proportionally, the Members States featuring the largest reductions were **Cyprus**, where the share of people aged 16-74 who have never used the internet shrank by 5 pp., **Slovenia** and **Romania** (both -4 pp.). Austria, Bulgaria, Poland, Portugal and Spain also made good progress in this respect (-3 pp.) The Member States where the share of non-internet users fell the most between 2010 and 2017 are Romania (-31 pp.), Cyprus (-27 pp.), Greece (-24 pp.), and Portugal (-23 pp.).



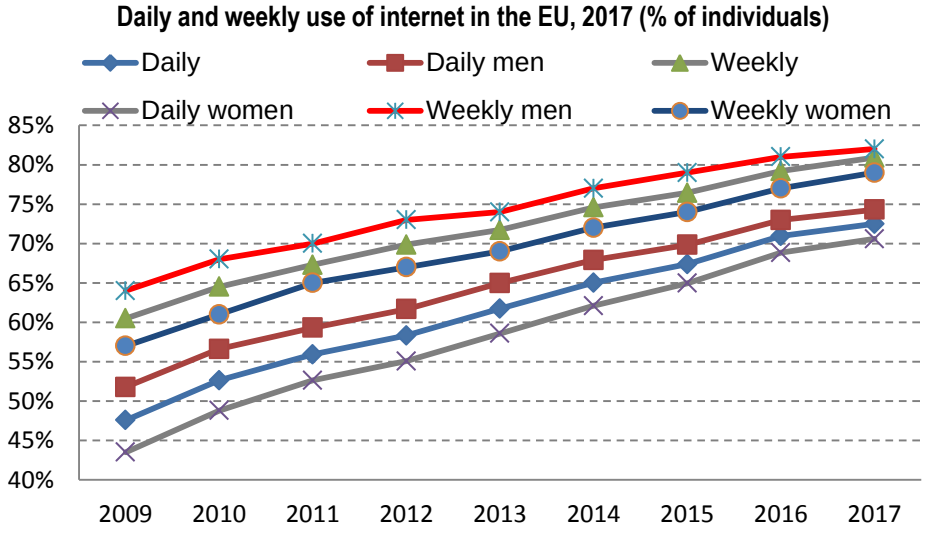
Source: Eurostat

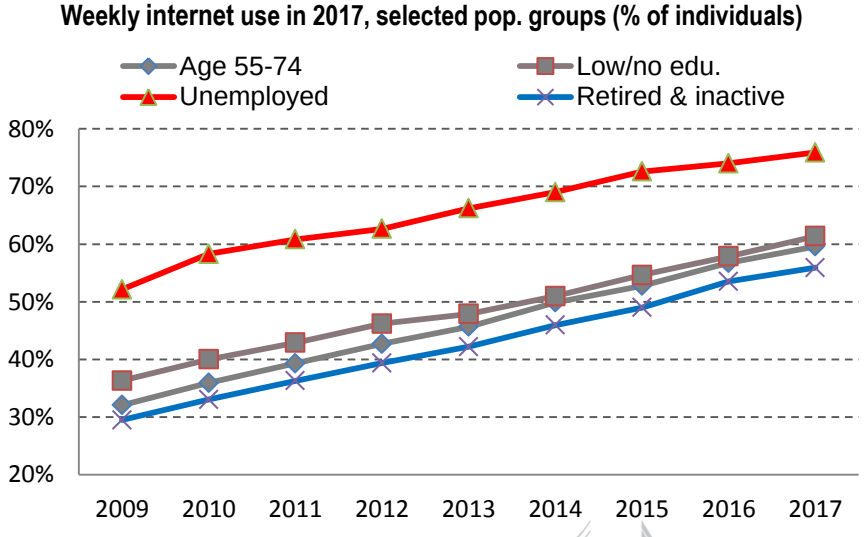
81 % of EU citizens go online at least weekly and 72 % do so every day. A gender gap persists but it is narrowing. Despite ongoing improvements, particularly in some Member States, the elderly and those with low education levels or on low incomes continue to be at risk of digital exclusion.

In 2017, **81% of Europeans used the internet at least weekly** and about **72 % daily or almost,** compared, respectively, with 79 % and 71 % a year earlier.

Proportionately, **men use the internet more than women** (at least weekly: 82 % vs. 79 %; daily or almost: 74 % vs. 71 %), although **the difference is narrowing** (at least weekly: from 5 pp. in 2015 to 3 pp. in 2017).

People with **low education levels** or on **low incomes**, as well as the **elderly** and the **retired or inactive tend to be comparatively less active internet users**: although internet use rates among these groups are increasing, within each of them, about 4 in 10 people do not use the internet regularly. This means that **digital exclusion risks** are **particularly high** for people from these groups.



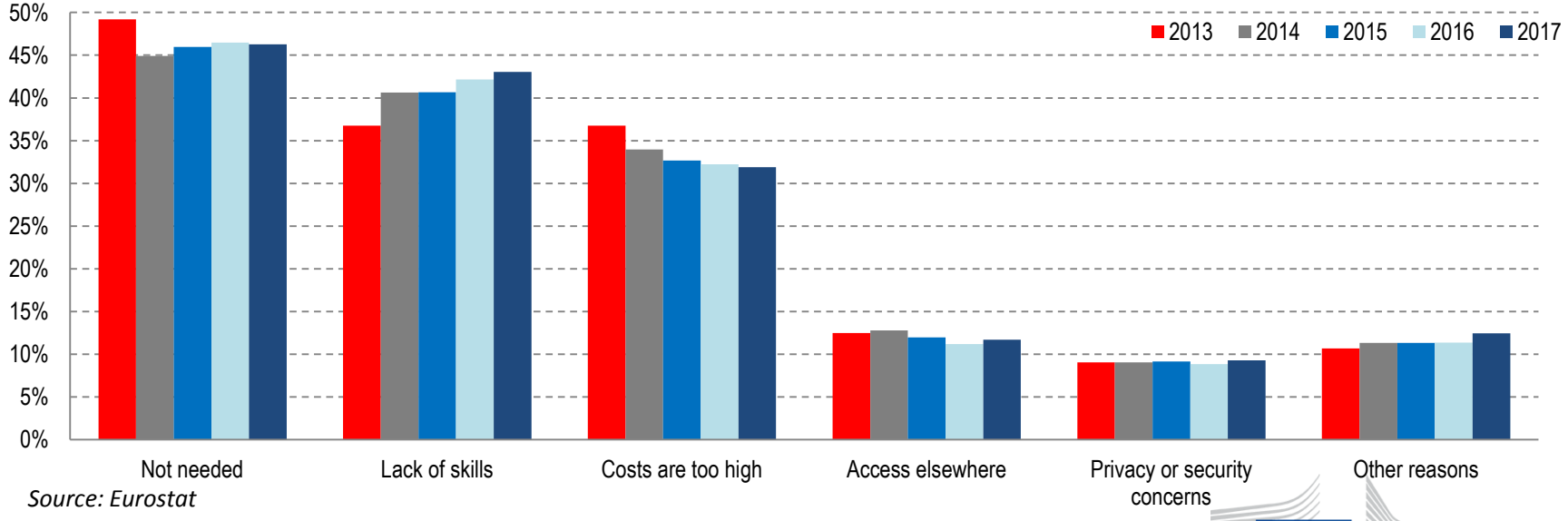


Source: Eurostat

Lack of need or interest, insufficient skills and cost-related barriers continue to be the most common reasons given by households for not having internet access at home. 2017 data confirm the growing importance of digital skills in the fight against digital exclusion.

The three main reasons evoked by households for not having internet access remain, respectively, the **lack of need or interest** (46 % of households without internet access in 2017), **insufficient skills** (43 %) and **high access and equipment costs** (32 %). The deterring effect of each of these factors varies significantly in strength across Member States. For example, only 8 % of Danish households without internet access mentioned costs as a barrier but as many as 57 % did so in Croatia and Hungary. **Lack of relevant skills remains by far the fastest-growing factor deterring households from having internet access at home** (+11 pp. since 2010) and, to the extent that it **limits awareness of potential benefits from digitisation**, may also be among the reasons behind the large numbers of European households still claiming that they do not have internet access at home because they do not need it.

Barriers to internet access at home in the EU, 2017 (% households without internet access)



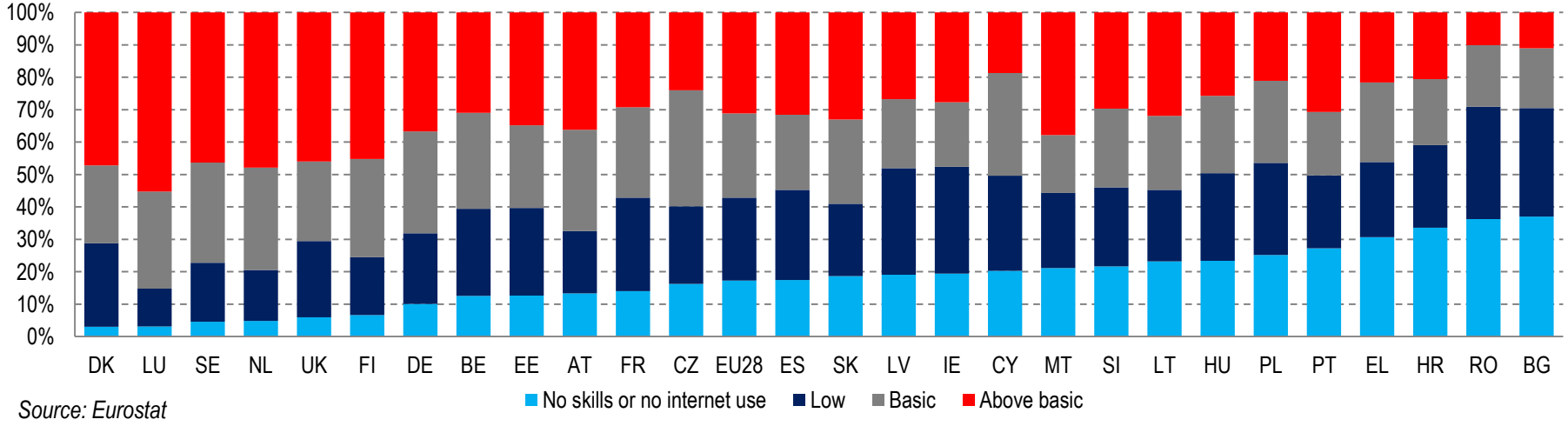
Source: Eurostat

In 2017, 43 % of the EU population had an insufficient level of digital skills. 17 % had none at all, as they did not use the internet or barely did so.

According to the **Digital Skills Indicator**, a composite indicator based on the Digital Competence Framework for Citizens*, **17 % of the EU population had no digital skills in 2017**, the main reason being that they did not use the internet or did so only seldom. This represents an improvement (i.e. decrease) of 2 pp. compared to 2016. The share of EU citizens without basic digital skills, in turn, went down by 1 pp. (to 43 %). However, these figures imply serious risks of digital exclusion in a context of rapid digitisation. There are **proportionally more men than women with at least basic digital skills** (respectively, 60 % and 55 %). In addition, only about 31 % of people with low education levels or no education have at least basic digital skills. This figure is also significantly lower among those living in rural areas (49 %), who tend to be relatively older, than for their city-dwelling counterparts (63 %).

There are still **major disparities across Member States**. The share of people with at least basic digital skills ranges from 29 % in Bulgaria and Romania (despite noticeable progress in both these countries in 2017) to 85 % in Luxembourg and 79 % in the Netherlands.

Digital skills of the EU population, 2017 (% of individuals, by skills level)**



Source: Eurostat

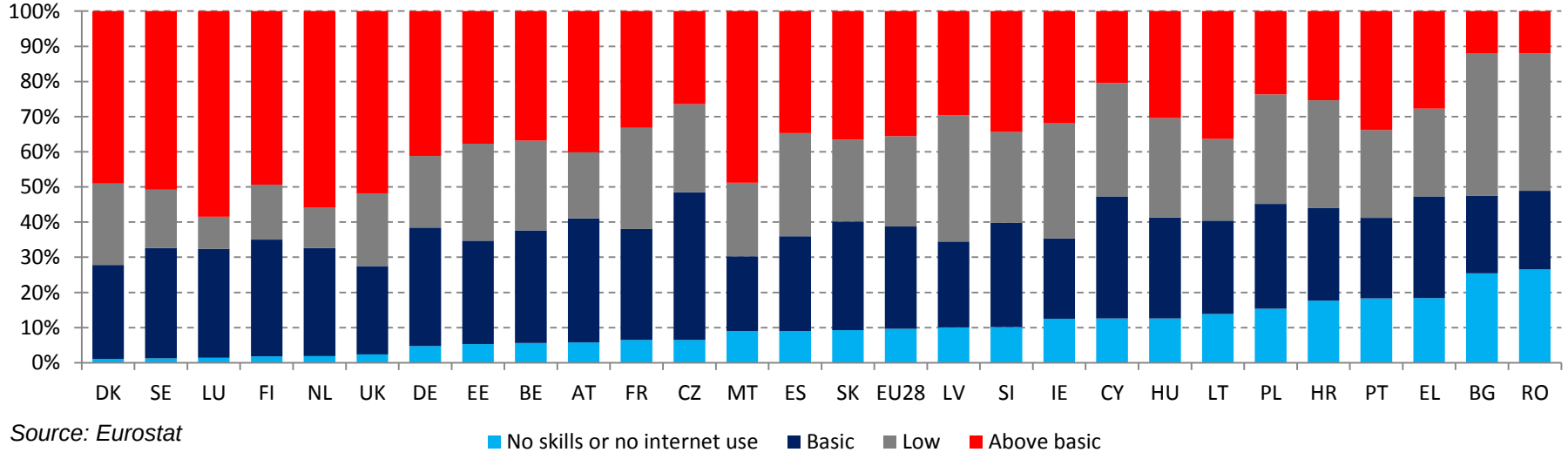
*More details at: https://ec.europa.eu/jrc/digcomp. **To be classified as *low skilled*, an individual has to have carried out activities from only one of the four Digital Competence dimensions considered (information, communication, content-creation and problem-solving). B*asic skills* means that an individual has *basic skills* in at least one dimension, but *no skills* in none. To be classified as *above basic*, the individual has to score *above basic* in all dimensions. Data not available for Italy.

European Commission

In 2017, 10 % of the EU labour force had no digital skills, mostly because they did not use the internet. 35 % did not have at least basic digital skills, which are now required in most jobs.

The share of the **EU's active labour force** (employed and unemployed) that can be considered to have **no digital skills** (essentially because they do not use the internet or do so only seldom) **went from 11 % in 2016 to 10 % in 2017**. This share is much higher in Member States like Romania (26 %), Bulgaria (25 %) and Portugal (18 %), although they are among those showing the largest improvements in this respect compared to last year's figures. Conversely, **a very large proportion of the labour force** (between 82 % and 89 %) **in Member States such as Luxembourg, the Netherlands, Finland and Sweden has at least basic digital skills**, and half of it or more have above basic skills. Digital skills are of critical importance not only for **accessing the labour market** but also for being able to **harness the benefits** of transformation currently underway. Bridging this gap, as well as **addressing digital skills deficits** in certain segments of the labour force, such as older cohorts or blue-collar workers, will thus be essential to bring about an inclusive digital economy and society.

Digital skills of the EU labour force, 2017 (% individuals, by skills level)*



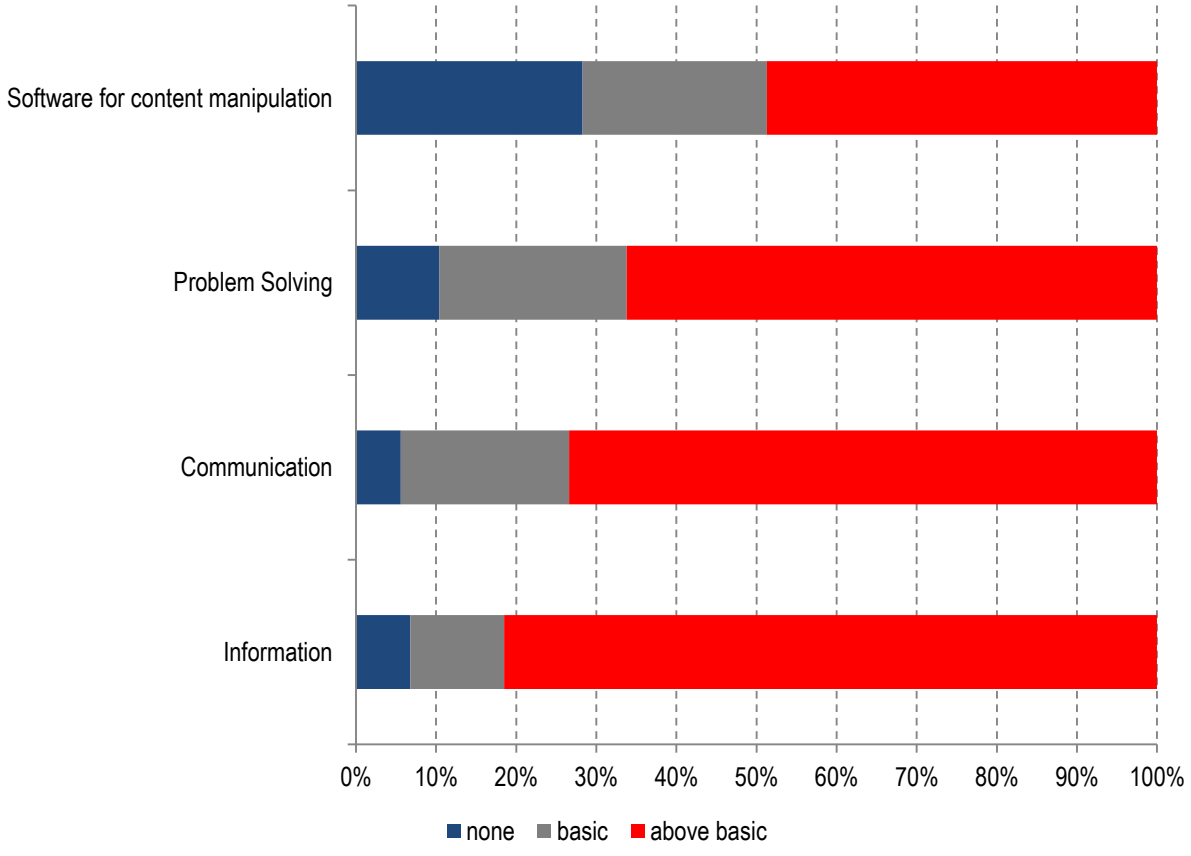
Source: Eurostat

* Data not available for Italy

The share of the EU's internet users without software-related skills (28 %) remained stable in 2017

Advanced **digital skills are becoming a prerequisite for entry into many jobs*** and have a wide range of applications, even beyond domains where they are needed for core tasks. Across competence dimensions, the **largest skills deficit,** both among the active labour force and the population at large, relates to the **use of software for content manipulation**. **Almost one in three internet users in the EU has no skills in this area** (i.e. they declared to not to have carried out any of the activities considered under this dimension, which range from relatively basic text treatment and spreadsheet-based work to video editing and coding). **This share is particularly large in Member States like Bulgaria, Romania (about 51 % of internet users)** as well as Latvia (40 %) and Ireland (39 % down from 44 % in 2016). Conversely, in others like **Luxembourg, Portugal, the UK and the Netherlands**, a **large majority of internet users has above basic software skills** (69 %, 58 % -both- and 57 % respectively). By type of activity, only about 7 % and 30 % of EU internet users had, respectively, **written code** and used **spreadsheet advanced functions**. In contrast, 82 % and 73 % can be considered to have above basic skills in, respectively the **information** and **communication** dimensions.

Digital skills, by competence dimension and level, 2017 (% of internet users)



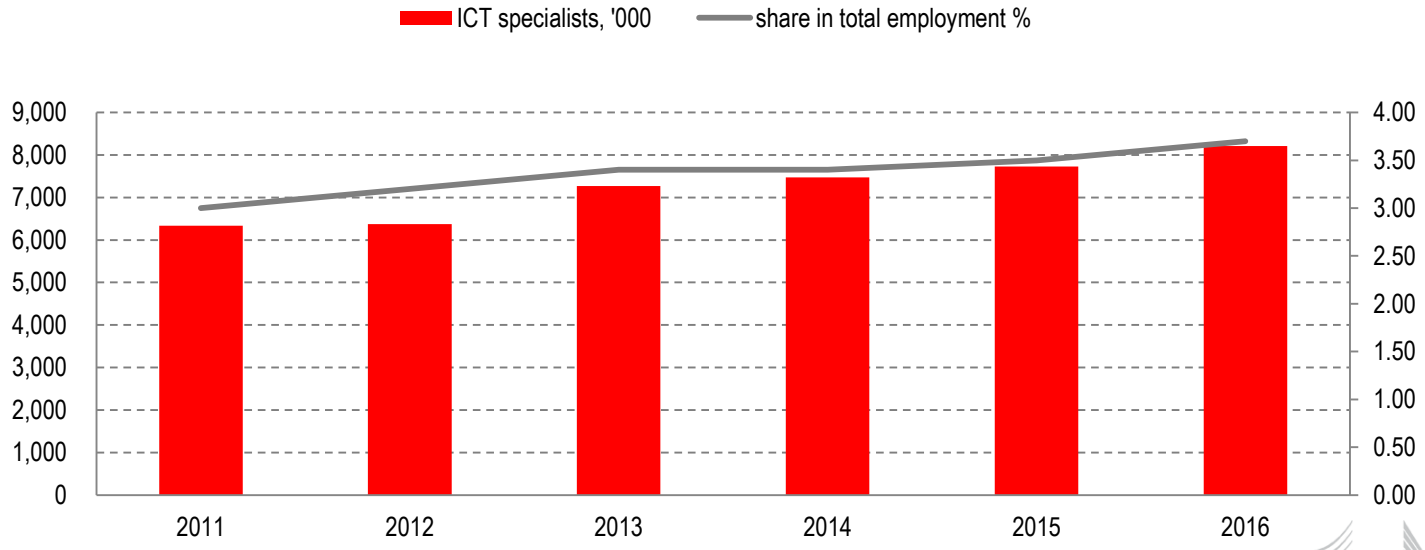
Source: Eurostat

*Berger and Frey (2016), quoted in Cedefop (2016), 'The Great Divide: Digitalisation and digital skill gaps in the workforce', #ESJsurvey Insights, No. 9, Thessaloniki: Greece.

Employment of ICT specialists in the EU grew by 500,000 between 2015 and 2016 to reach 8.2 million workers. However, the employment potential of specialised ICT skills remains underexploited.

8.2 million persons were employed as Information and Communication Technologies (ICT) specialists in the EU in 2016. This amounts to about 3.7 % of total employment. These figures represent an improvement compared with a year earlier (7.7 million and 3.5 % of employment), thus confirming the positive trends observed in recent years (between 2011 and 2016, the number of ICT specialists grew by 1.8 million and their share in total employment went from 3.0 % to 3.7 %). 83 % of all ICT specialists employed in the **EU in 2016 were men, and nearly 62 % had at least** tertiary education. The Member States employing the most ICT specialists were the **UK** (1.6 million), **Germany** (1.5 million) and **France** (1.0 million). The highest shares of ICT specialists in total employment were recorded in **Finland** (6.6 %) and **Sweden** (6.3 %) and **Estonia** (5.3 %); the lowest in **Greece** (1.4 %), **Romania** (2.0 %), **Cyprus** and **Latvia** (both 2.2 %). In 2016, 1 in 5 enterprises in the **EU** employed ICT specialists and nearly 1 in 10 (9 %) recruited or tried to recruit ICT specialists. However, 41 % of enterprises which recruited or tried to recruit them had difficulties in filling vacancies. Despite the positive evolution in recent years, the **gap between demand and supply of ICT specialists in the EU is expected to widen further** and, as suggested also by the growing numbers of vacancies, the employment potential of specialised ICT skills remains underexploited.

Employment of ICT specialists in the EU, 2011-2016



Source: Eurostat

Through its Digital Skills and Jobs Coalition, the Commission seeks to further reduce digital skills gaps by fostering the sharing, replication and upscaling of best practices in areas such as training and matching for digital jobs, certification and awareness raising.

At the end of 2016, the Commission launched the **Digital Skills and Jobs Coalition**, which brings together Member States and stakeholders from the private and public sectors **to develop a large digital talent pool and ensure that Europe's citizens and labour force are equipped with adequate digital skills**. By means of pledging action and identifying and sharing best practices that can be replicated and scaled up, the Coalition's activities have so far benefited several million citizens, with over 3.7 million trainings in digital skills provided, more than a million digital skills certifications, 4,500 events having reached over a million people and more than 9,000 job placements and internships offered.

The Commission monitors progress annually as part of the DESI. The Digital Skills and Jobs Coalition is one of the 10 concrete actions under the **New Skills Agenda for Europe**, which prioritises digital skills in all its actions.

More than 90 pledges have been made by enterprises, education providers and NGOs committing to reduce digital skills gaps by taking actions such as training courses, matching for digital jobs, certification and awareness raising. **18 National Coalitions** for Digital Skills and Jobs have also been launched in Member States.

The **Digital Opportunity Traineeship** has been launched to help young people improve their digital skills and consider a career in the digital sector. This pilot initiative provides cross-border traineeships to 6,000 students and recent graduates of all disciplines so they get hands-on digital experience in fields demanded by the market. In June 2017, the European conference on IT professionalism* focused on the development of a European Framework for the IT profession building on the European e-Competence Framework (e-CF) for IT professionals*, a new version of which will be presented in 2019.

* http://ictprofessionalism.eu
** http://www.ecompetences.eu