



# Digital transformations and deprivation across Europe

Digitally deprived, disengaged and unconfident children in Europe

DigiGen Policy Forum

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# Introduction

- The COVID-19 pandemic has completely changed the need for internet connectivity and for technological devices across the population, but particularly among children.
- In an attempt to halt the spread of the virus, many countries have moved part or all their teaching online.
- Therefore, nowadays, for many children, having a computer connected to the internet makes the difference between being able to keep up with their education and falling badly behind.
- Also, interest and confidence in the use of digital devices is assumed for most children.
- Both **access and digital skills** are the object of our research.

# Literature review

- Much of the work on digital inequality — or, more specifically, the digital divide — has focused on access, the **“first-level” digital divide**, which was assumed to be largely resolved (Paus-Hasebrink et al., 2019; van Deursen and Helsper, 2015).
- This prompted a move to focus research on digital use and digital competencies, understood as “digital skills” and often referred to as the **“second-level” digital divide** (Hargittai, 2002; Ronchi and Robinson, 2019).
- However, the pandemic has shown us that the assumption that “now everybody has access to and can use the internet” (van Deursen et al., 2011, p. 126) is inaccurate.



# Preview of results

- According to the latest wave available of the EU-SILC, on average, in 2019, about **5% of children in Europe are digitally deprived**: that is, they live in a household that cannot afford to have a computer and/or live with adults who claimed they could not afford to have an internet connection for personal use at home.
- According to the latest wave available of PISA, on average, in 2018, about **6% of 15-year-olds in Europe are digitally disengaged and 8% are unconfident about their ICT usage**.
- Understanding who are the digitally deprived, digitally disengaged and digitally unconfident children in Europe is crucial if we are to design effective policies.



# Digital deprivation



# Data

- The database used in our study is the European Union - Statistics on Income and Living Conditions (EU-SILC) provided to researchers by Eurostat.
- Most of the analysis focuses on the last wave of data available, 2019, but results from regressions refer to the last five years.
- The EU-SILC has several advantages for the purposes of our analysis:
  - (i) it allows a comparative analysis across Europe, with evidence for 32 countries,
  - (ii) it provides very detailed information on the socio-economic background of children, as it includes data on household income, parental characteristics (such as labour market attachment), household structure, material deprivation, etc.
  - (iii) it allows us to track changes over time.



# Data

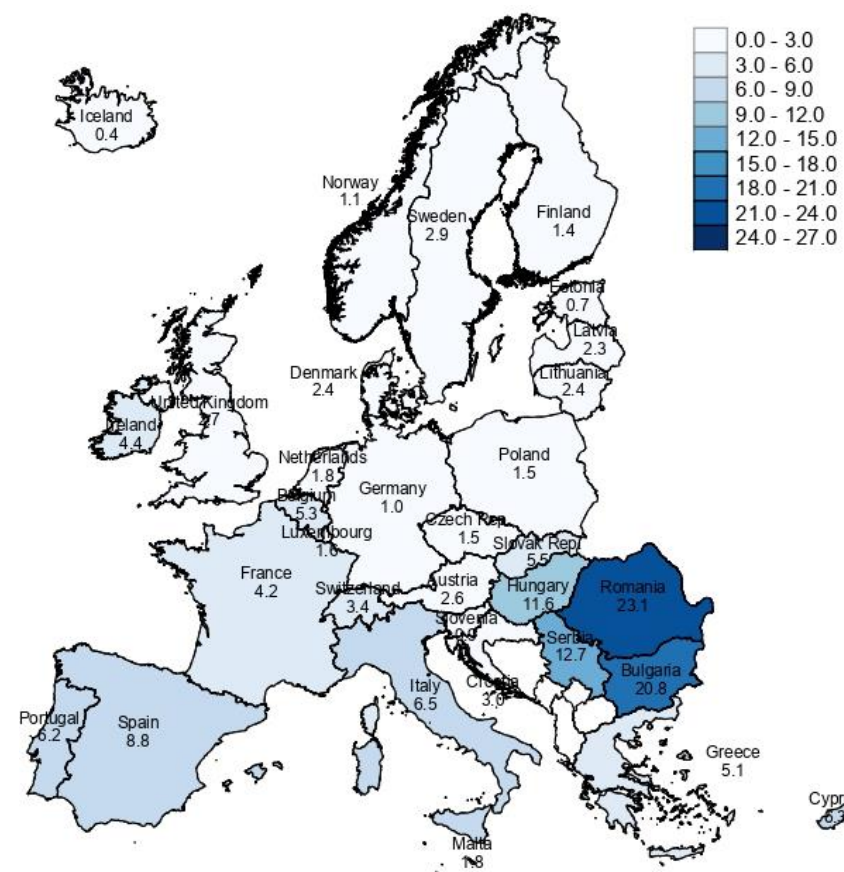
- The information relative to digital deprivation is contained in two variables:
  - *HS090* collects, at the household level, the answers to the question “**Does your household have a computer?**” If the answer is negative, the question continues as follows: “If you do not have a computer: (a) Would you like to have it but cannot afford it? or, (b) Do you not have one for other reasons e.g. you do not want or need it?”
  - *PD080* collects, at the individual level, the answers to the question “Do you have an **Internet connection for personal use when needed?**”. If the answer is no, the question continues as above.
- We define as “digitally deprived” those children that either live in a household that cannot afford to have a computer and/or live with adults that cannot afford internet connection.



# Children's digital deprivation across countries and over time

- On average, 5.3% of children in Europe are digitally deprived.
- Differences across Europe of digital deprivation among school-aged children are large.
- The choropleth map shows two country clusters with a certain North-South divide:
  - Less than 2% in Iceland, Finland, Norway...
  - Romania, 23.1%; Bulgaria, 20.8%.

Figure 1: Percentage of digitally deprived school-aged children (6-16), Europe, 2019

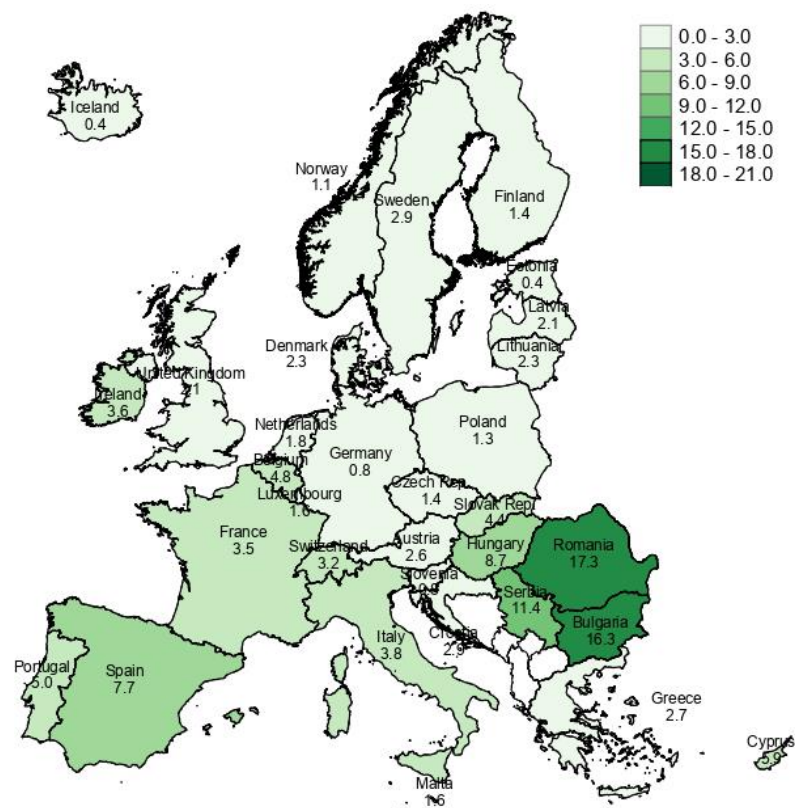


Source: Ayllón et al. (2021)



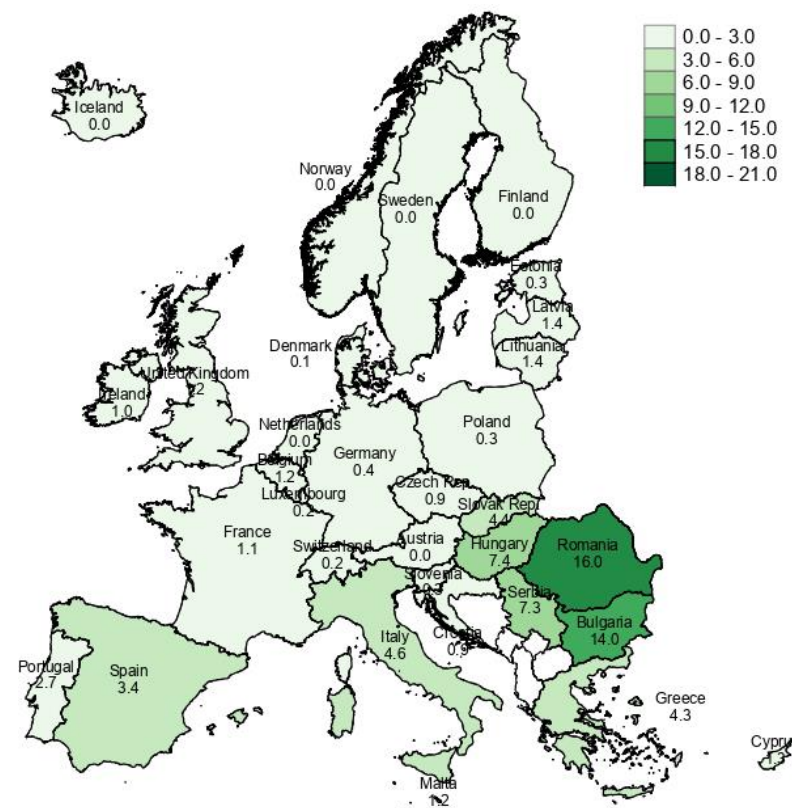
# Children's digital deprivation across countries and over time

Figure 2a: Percentage of school-aged children (6–16) who live in a household that cannot afford a computer, Europe, 2019.



Source: Ayllón et al. (2021)

Figure 2b: Percentage of school-aged children (6–16) who live in a household that cannot afford an internet connection, Europe, 2019.



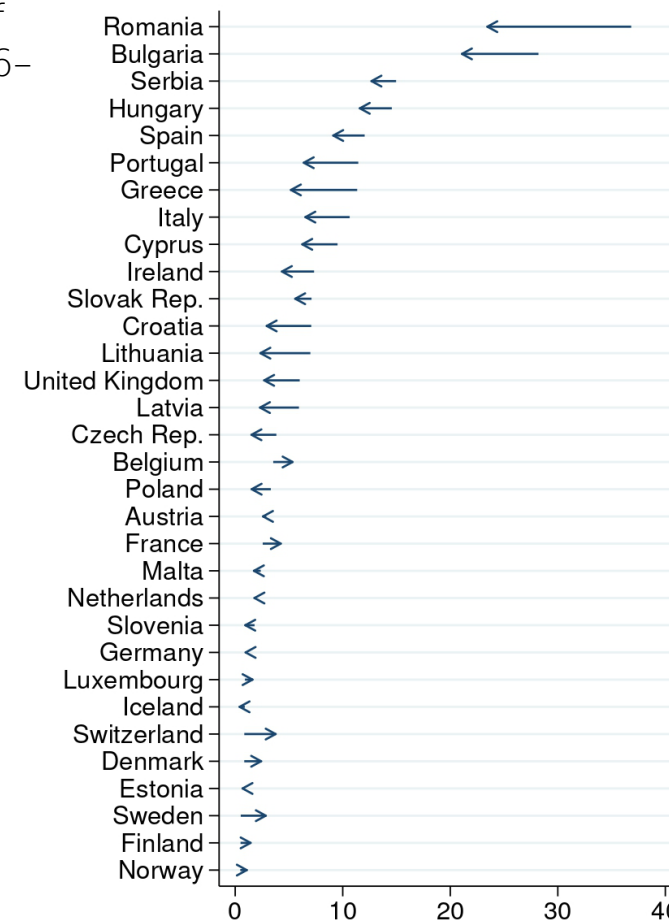
Source: Ayllón et al. (2021)



# Children's digital deprivation across countries and over time

- The great majority of countries — and particularly those most affected by the problem — have moved in the right direction.

Figure 3: Percentage of school-aged children (6–16) digitally deprived, Europe, 2015–2019

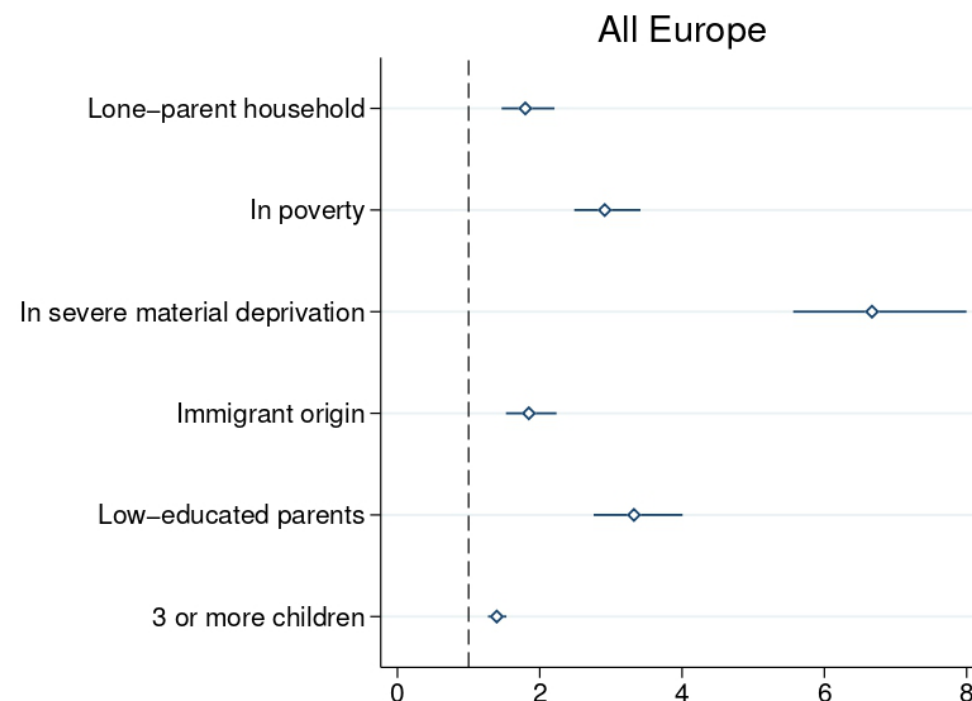


Source: Ayllón et al. (2021)

# Who are the digitally deprived children in Europe?

- At the European level one characteristic clearly stands out as being very closely linked to children's digital deprivation: living in **severe material deprivation**. That increases the risk of suffering digital deprivation by a factor of 6.7. Being poor and having low-educated parents are also relevant factors — these variables multiply the risk of being digitally deprived by a factor of 2.9 and 3.3, respectively.
- All other risk factors considered are positive (albeit at a lower level) and statistically significant at 99%.

Figure 4: Probability of being digitally deprived, by socio-economic characteristics in school-aged children (6–16 years), Europe, 2015–2019

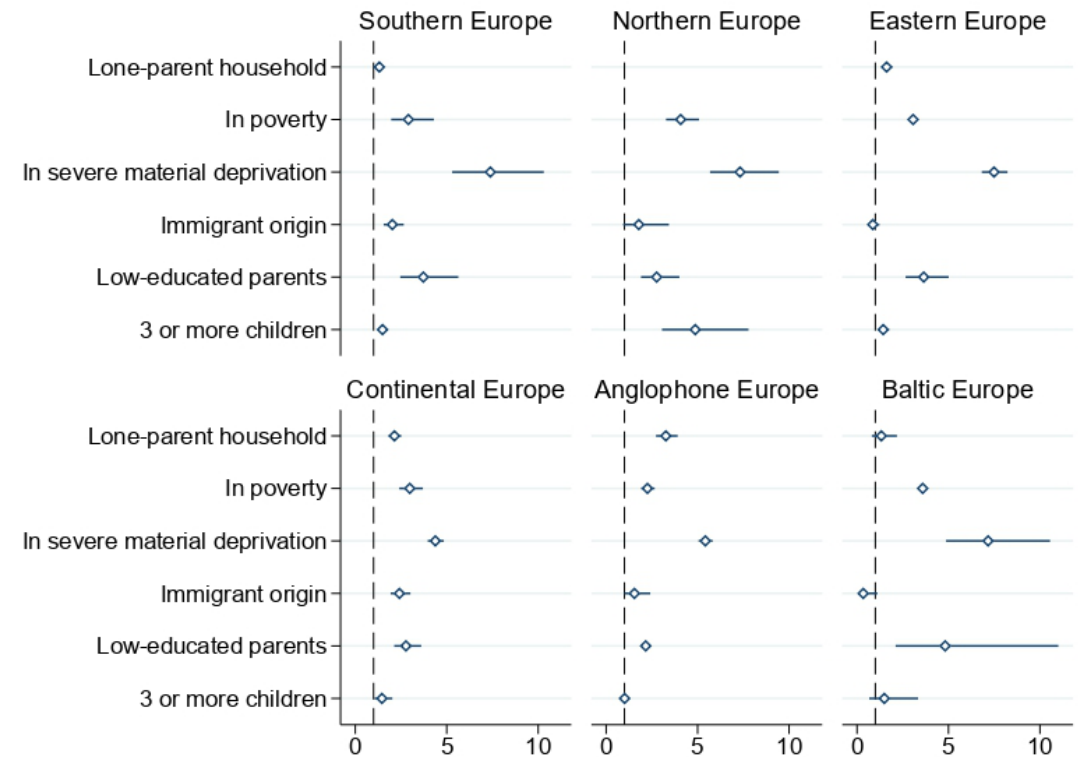


Source: Ayllón et al. (2021)

# Who are the digitally deprived children in Europe?

- We find that the large bulk of the risk factors considered are positively linked to digital deprivation — though the strength of the association varies by context.
- In all groups of countries, the characteristic most strongly associated with digital deprivation is living in a household with severe material deprivation.

Figure 5: Probability of being digitally deprived, by socio-economic characteristics in school-aged children (6–16 years), European country clusters, 2015–2019



Source: Ayllón et al. (2021)

# Towards a new definition of “material deprivation”?

- We consider the possibility of including our indicator of digital deprivation in the well-established definition of “material deprivation” and “severe material deprivation” used by the European Commission to monitor the progress of European societies.
- A household is in (severe) “material deprivation” if cannot afford (four) three or more of the following items:
  - (i) to avoid arrears in rent, mortgage or utility bills;
  - (ii) to keep the home adequately heated;
  - (iii) to face unexpected expenses;
  - (iv) to eat meat or proteins regularly;
  - (v) to go on holiday;
  - (vi) to have a television set;
  - (vii) to have a washing machine;
  - (viii) to have a car;
  - (ix) to have a telephone.

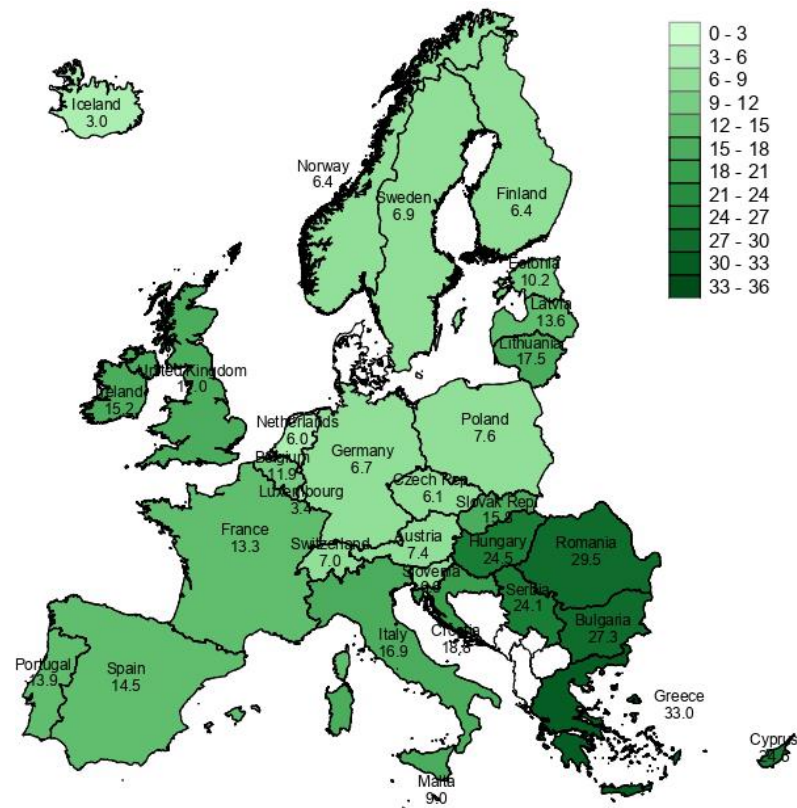
# Towards a new definition of “material deprivation”

- Our proposal consists of adding a tenth item to the list: inability to afford a computer and/or internet connection.
- On average, 13.9% and 6.1% of Europe's children live in material and severe material deprivation.
- When accounting for digital deprivation, we find that 14.8% and 7.4% of school-aged children in Europe live in material and severe material deprivation.
- At country level, we observe important differences regarding such a change. While in some countries the change is negligible, in Romania we observe an increase of 3.7 p.p. in material deprivation that takes account of digital deprivation and 5.5 p.p. in the corresponding figure for severe material deprivation. Large increases are also to be found in Spain (2.1 p.p. and 2.7 p.p.) and in Bulgaria (1.5 p.p. and 2.9 p.p.).



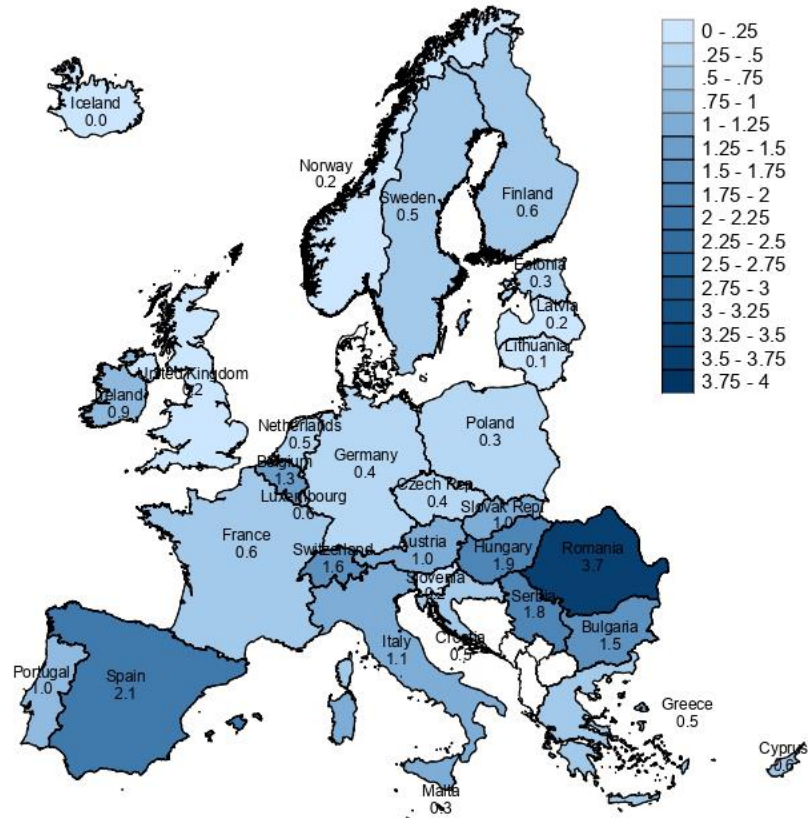
# Towards a new definition of “material deprivation”

Figure 6a: Percentage of school-aged children (6–16) who live in material deprivation), Europe, 2019



Source: Ayllón et al. (2021)

Figure 6b: Percentage point change in material deprivation (when including digital deprivation) of school-aged children (6–16), Europe, 2019



Source: Ayllón et al. (2021)



# Digital interest and confidence





# Data

- We use data from the 2015 and 2018 waves of the OECD's Programme for International Student Assessment (PISA).
- We measure **students' lack of interest towards ICT** by using the answers to the following six questions: 1) "I forget about time when I'm using digital devices"; 2) "The internet is a great resource for obtaining information I am interested in (e.g. news, sports, dictionary)"; 3) "It is very useful to have social networks on the internet"; 4) "I am really excited discovering new digital devices or applications"; 5) "I really feel bad if no internet connection is possible"; and, 6) "I like using digital devices". All the questions have four possible answers ranging from "strongly disagree", "disagree", "agree" and "strongly agree" which we grade from 1 to 4.
- We define a child as "digitally disengaged" if it has a score of interest towards ICT below or equal to 12 points.



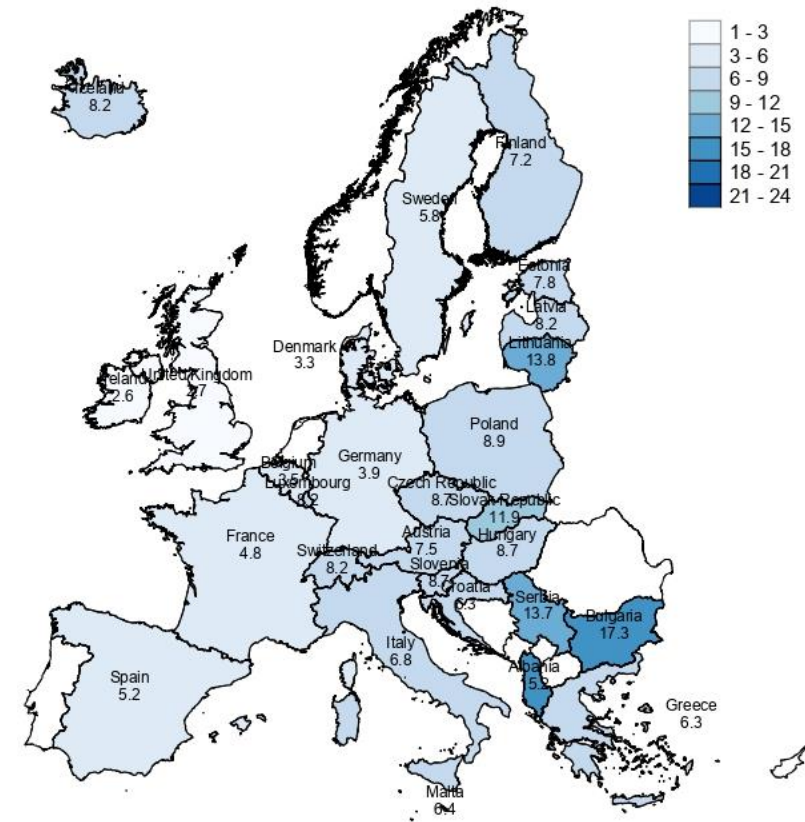
# Data

- We measure **students' lack of confidence towards ICT** in a similar fashion by using the answers to the following questions: 1) "I feel comfortable using digital devices that I am less familiar with"; 2) "If my friends and relatives want to buy new digital devices or applications, I can give them advice"; 3) "I feel comfortable using my digital devices at home", 4) "When I come across problems with digital devices, I think I can solve them"; 5) "If my friends and relatives have a problem with digital devices, I can help them". Again, all the questions have four possible answers ranging from "strongly disagree", "disagree", "agree" and "strongly agree" which we grade from 1 to 4.
- We define a child as "digitally unconfident" if it has a score of confidence below or equal to 10 points.

# Children's digital disengagement across countries and over time

- On average, in 2019, 6% of 15-year-olds in Europe are digitally disengaged.
- We find two country clusters with a certain West–East divide.
- Whereas in Belgium (3.5%), France (4.8%), Germany (3.9%) and Spain (5.2%) the percentages of digitally disengaged children are low, in Eastern Europe such percentages are high: 17.3% in Bulgaria, 15.2% in Albania or 13.7% in Serbia.

Figure 7: Percentages of digitally disengaged children, Europe, 2018

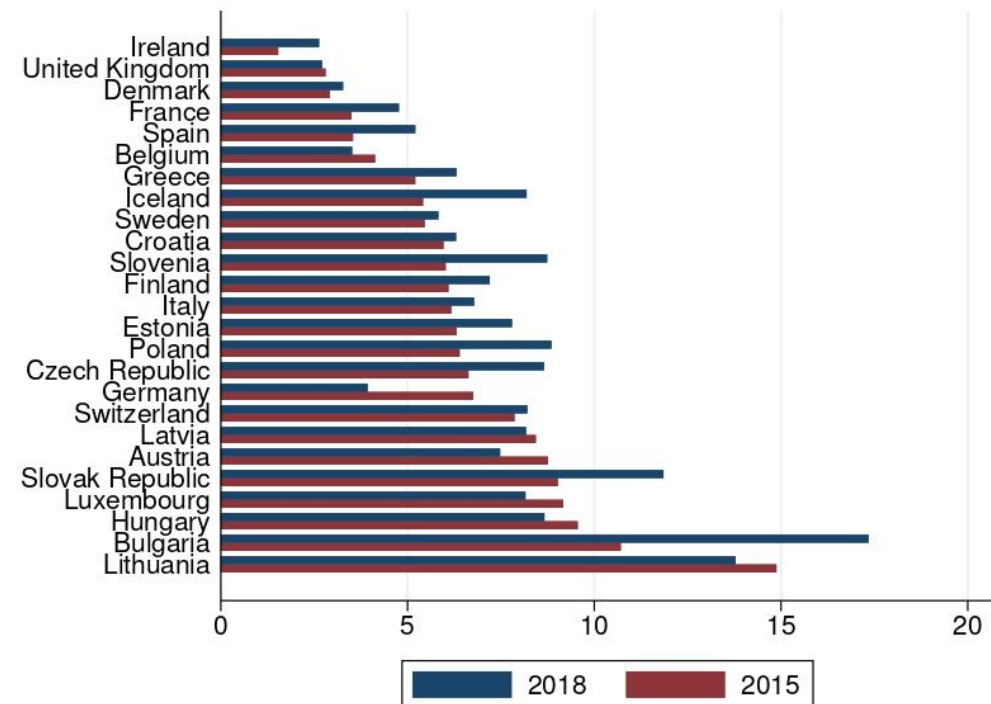


Source: Ayllón et al. (2021)

# Children's digital disengagement across countries and over time

- Countries that had already low percentages in 2015, generally maintain them in 2018. However, a slight increase is found for example, in Estonia, Greece, Spain, Finland, France and Iceland.
- In contrast, in Austria, Belgium, Hungary, Lithuania, Luxembourg, Latvia and the United Kingdom, the percentages have dropped.

Figure 8: Percentages of digitally disengaged children, Europe, 2015-2018

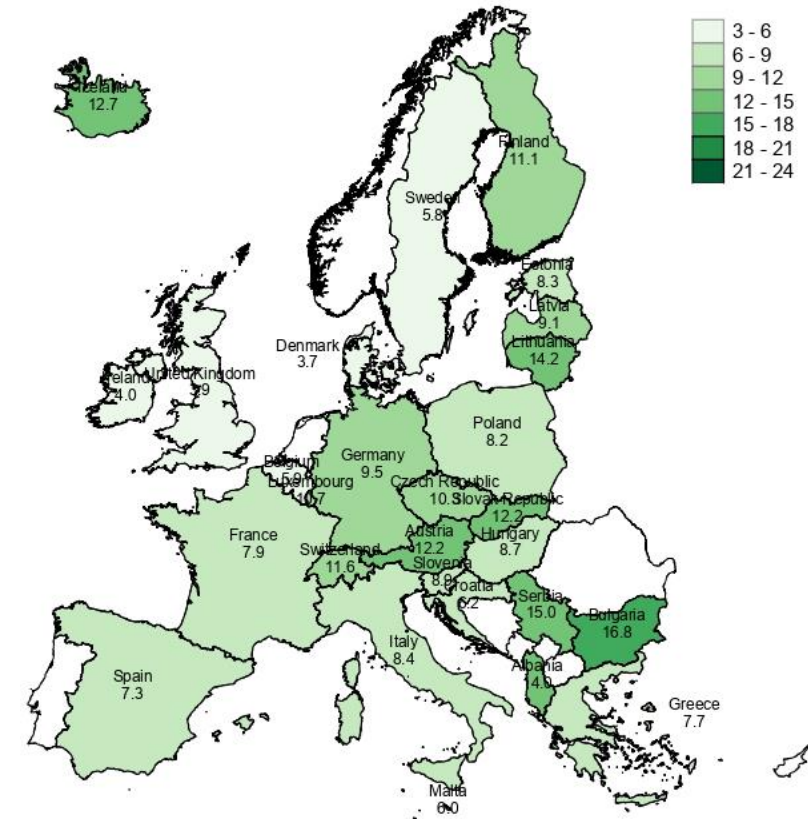


Source: Ayllón et al. (2021)

# Children's lack of digital confidence across countries and over time

- On average, in 2019, 8% of 15-year-olds in Europe are digitally unconfident.
- As with the ICT lack of interest scores, again, a certain West-East divide is found.
- In Bulgaria 16.8% and in Serbia 15.0% but also 14.2% in Lithuania or 11.1% in Finland.

Figure 9: Percentages of digitally unconfident children, Europe, 2018

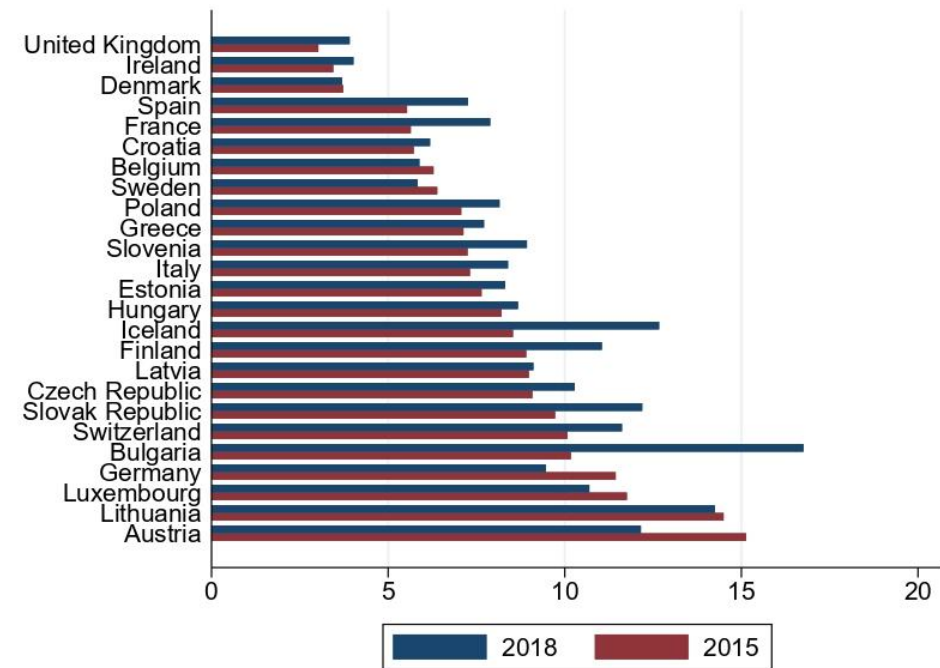


Source: Ayllón et al. (2021)

# Children's lack of digital confidence across countries and over time

- We find a decrease in the prevalence in Austria, Belgium, Denmark, Germany, Lithuania, Luxembourg and Sweden.
- Again, Bulgaria is the country where the number of digitally unconfident children has increased the most, with about 6.5 percentage points.
- In a similar vein, Iceland has seen an important increase of 4.1 percentage points.

Figure 10: Percentages of digitally unconfident children, Europe, 2015-2018



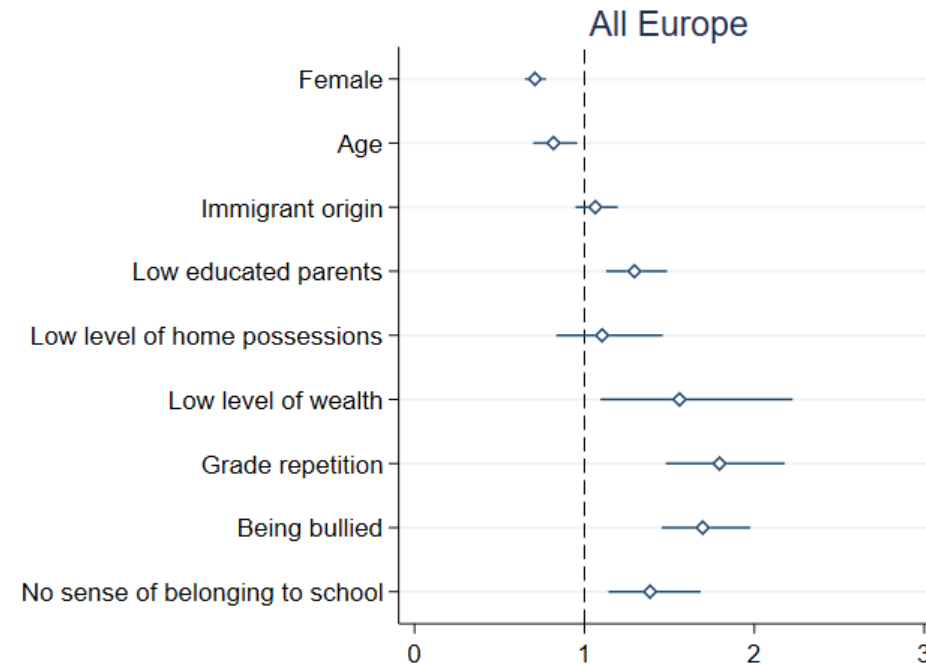
Source: Ayllón et al. (2021)



# Who are the digitally disengaged children in Europe?

- One characteristic is being very closely linked to children's lack of interest in ICT: grade repetition.
- Little bonding with own school, low-educated parents, being bullied and low level of wealth also increase the likelihood of being digitally disengaged.
- We find no statistically significant differences in immigrant origin and with low level of home possessions.

Figure 11: Probability of being digitally disengaged, by at-risk and demographic characteristics, Europe, 2018

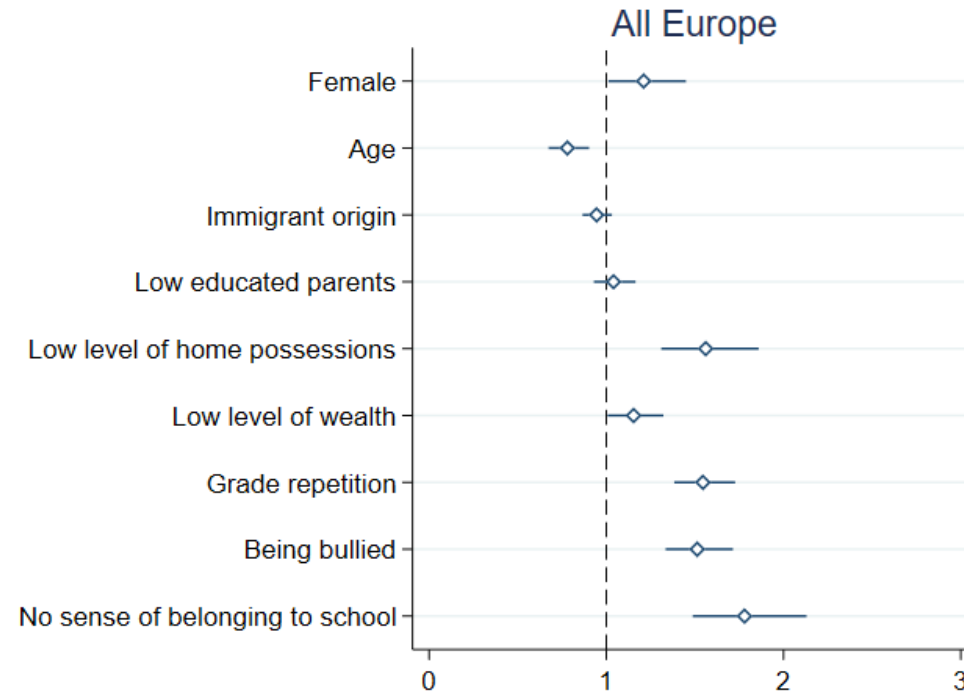


Source: Ayllón et al. (2021)

# Who are the digitally unconfident children in Europe?

- Subjective feelings of little bonding with the school is the most interlinked factor to lack of digital confidence.
- Grade repetition, low level of home possessions and being bullied also increase the risk of being digitally unconfident by a factor of 1.5.
- As for wealth, low-educated parents and immigrant origin, we do not find a statistically significant relationship.

Figure 12: Probability of being digitally unconfident, by at-risk and demographic characteristics, Europe, 2018



Source: Ayllón et al. (2021)



# Concluding remarks

- Digital deprivation is a problem among school-aged children in certain European countries particularly regarding the inability to afford a computer.
- The phenomena is particularly widespread in Southern and Eastern European countries.
- It affects children that cohabit with low educated parents, in poverty and especially in severe material deprivation. However, the heterogeneity of characteristics that describe a digitally deprived child is large across countries.
- Despite its importance, digital deprivation is not part of the EU definition of “material deprivation” or “severe material deprivation”
- We argue that (particularly now) digital deprivation should be considered as part of the definition of material deprivation used by the European Commission to monitor the situation of member States.

# Concluding remarks

- Following our definition for lack of digital interest and lack of digital confidence, we find that, approximately, 6% of 15-year-olds in Europe are digitally disengaged and 8% are unconfident about their ICT usage.
- The prevalence of such phenomenon differs across European countries in a similar fashion that the results obtained regarding digital deprivation.
- Albeit the disparities in children's socio-economic characteristics linked to ICT lack of interest and confidence between country clusters, we find that grade repetition, below average home possessions (e.g. material deprivation) and no sense of belonging to school, to be the main determinants of both problems.
- Policy initiatives should prompt children's digital skills, which now are an essential pillar in the educational system.

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# DigiGen



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