Digitalização, Qualificações E Cibersegurança em Portugal – Fatores críticos numa Economia Digital impulsionada pela Covid-19

Ciclo de Seminários GEE/GPEARI (70.ª edição)

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**Diretor de Serviços de Análise Económica**

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- ➢ **Adoção digital e TIC**

- ➢ **Indivíduos e Famílias**

- ➢ **Empresas**

- ➢ **Redes Sociais**

- ➢ **Comércio eletrónico**

- ➢ **Administração pública**

- ➢ **Inovação digital**

- ➢ **Inteligência Artificial e Blockchain**

- ➢ **Cibersegurança e Privacidade**

- ➢ **Qualificações**

- ➢ **Covid-19 e Invasão da Ucrânia**

- ➢ **Comentários finais**

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REPÚBLICA PORTUGUESA
ECONOMIA E TRANSIÇÃO DIGITAL

➢ Revolução digital

➢ Processamento maciço de dados

➢ Desafios

**Big Data market size revenue forecast worldwide from 2021 to 2027**

(in billion U.S. dollars)
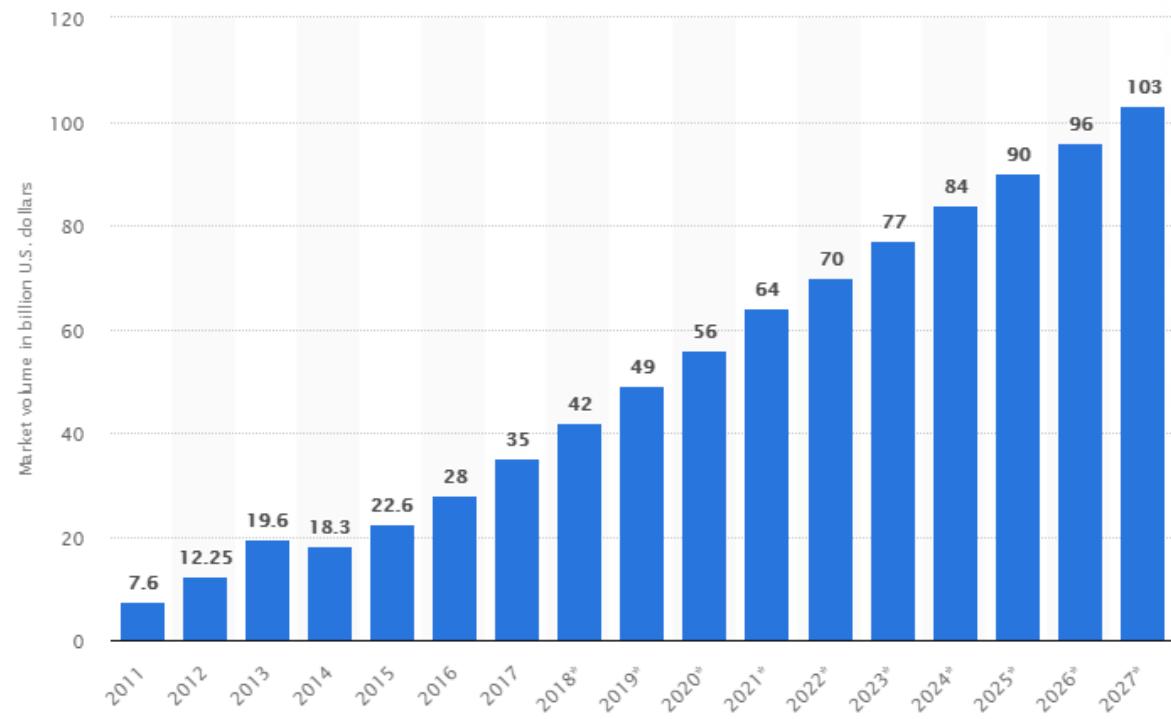
Source: Statista, 2020 (https://www.statista.com/statistics/254266/global-big-data-market-forecast/)
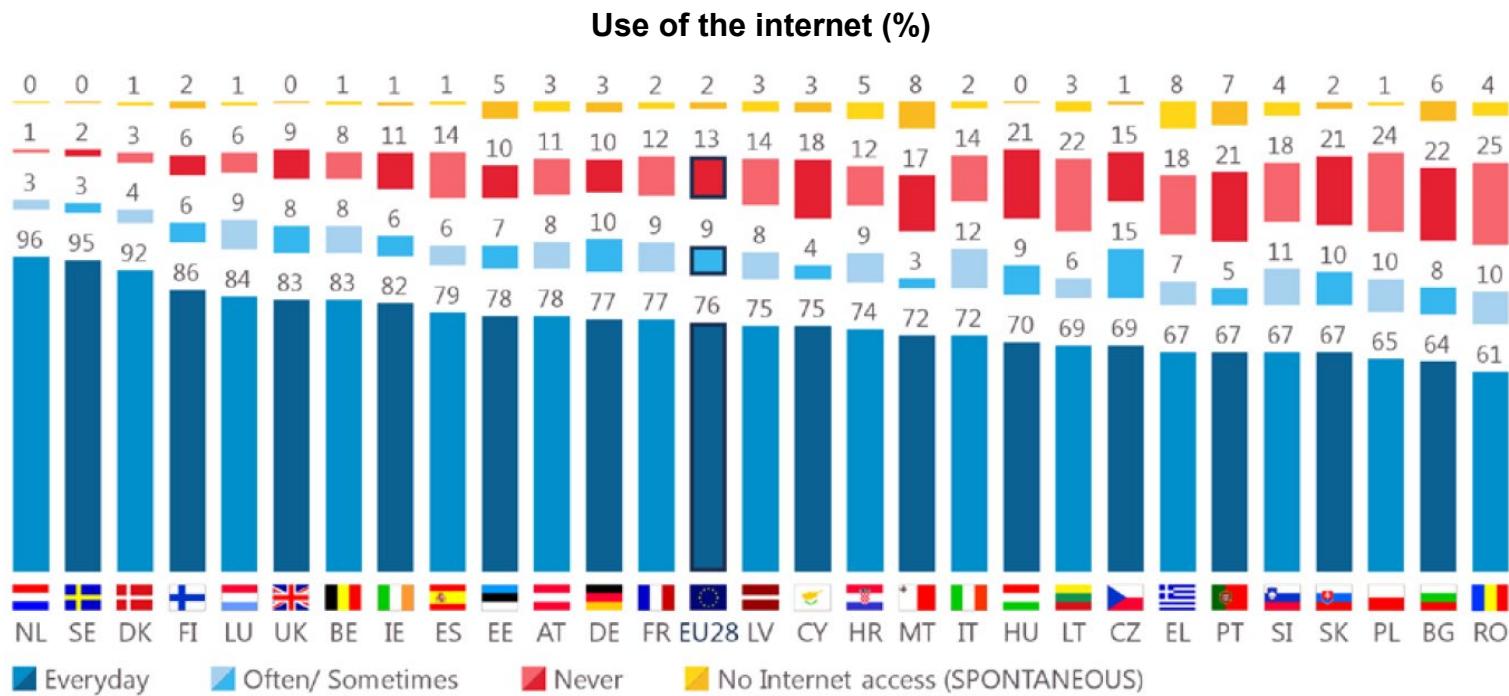
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PORTUGUESA
ECONOMIA E
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Use of the internet (%)

	NL	SE	DK	FI	LU	UK	BE	IE	ES	EE	AT	DE	FR	EU28	LV	CY	HR	MT	IT	HU	LT	CZ	EL	PT	SI	SK	PL	BG	RO
No Internet access (SPONTANEOUS)	0	0	1	2	1	0	1	1	1	5	3	3	2	2	3	3	5	8	2	0	3	1	8	7	4	2	1	6	4
Never	1	2	3	6	6	9	8	11	14	10	11	10	12	13	14	18	12	17	14	21	22	15	18	21	18	21	24	22	25
Often/ Sometimes	3	3	4	6	9	8	8	6	6	7	8	10	9	9	8	4	9	3	12	9	6	15	7	5	11	10	10	8	10
Everyday	96	95	92	86	84	83	83	82	79	78	78	77	77	76	75	75	74	72	72	70	69	69	67	67	67	67	65	64	61

■ Everyday ■ Often/ Sometimes ■ Never ■ No Internet access (SPONTANEOUS)

Base: all respondents (N=27,609)

Source: Europeans' attitudes towards cyber security, Special Eurobarometer 499, European Commission, January 2020

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Devices used to access internet – Smartphones (%)

|	ES	SE	AT	CY	IT	PT	BG	NL	HR	FI	LT	EL	DE	DK	LU	IE	RO	EU28	SI	MT	BE	UK	EE	HU	SK	FR	PL	LV	CZ
%	96	93	92	91	91	91	90	89	89	88	87	87	87	87	87	86	86	85	85	85	84	81	81	79	78	77	77	77	76
Δ	=	+4	+4	=	-2	+5	+3	-2	-2	+1	+7	+2	+3	+1	+1	-1	-5	+1	+1	+7	+6	-3	+5	+4	+11	+3	+2	-2	+1
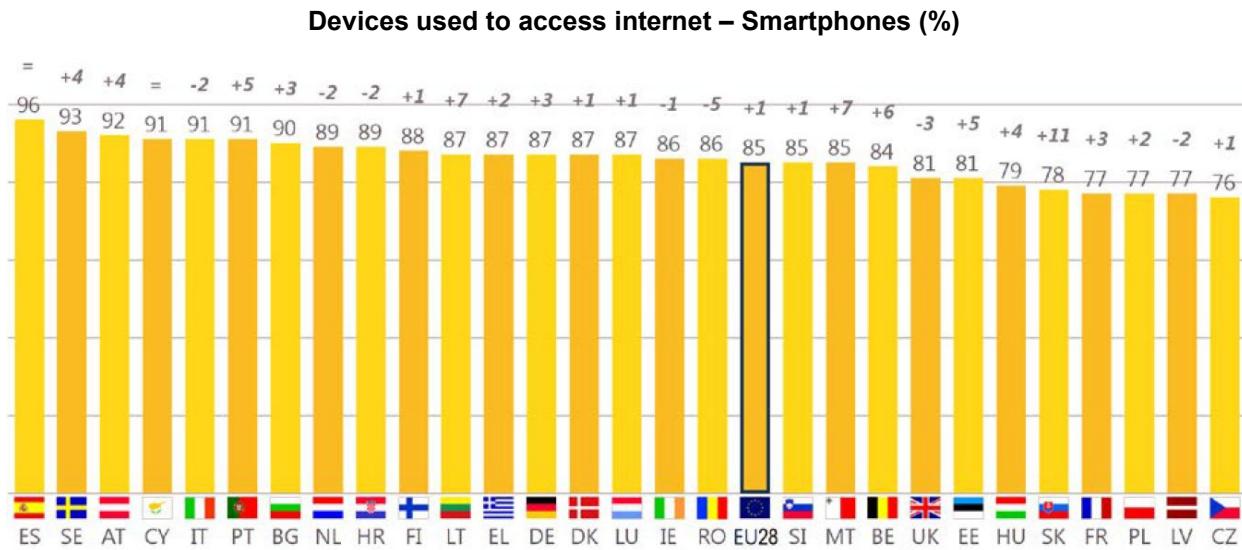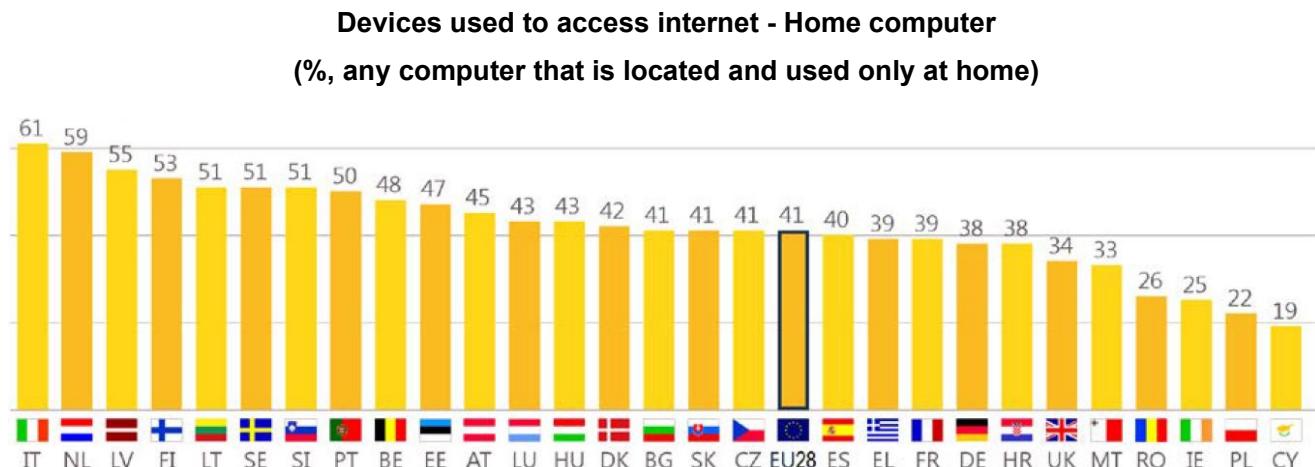
Base: respondents who use the Internet (N=23,420)

Source: Europeans' attitudes towards cyber security, Special Eurobarometer 499, European Commission, January 2020

Devices used to access internet - Home computer

(%, any computer that is located and used only at home)

|	IT	NL	LV	FI	LT	SE	SI	PT	BE	EE	AT	LU	HU	DK	BG	SK	CZ	EU28	ES	EL	FR	DE	HR	UK	MT	RO	IE	PL	CY
%	61	59	55	53	51	51	51	50	48	47	45	43	43	42	41	41	41	41	40	39	39	38	38	34	33	26	25	22	19

Base: respondents who use the Internet (N=23,420)

Source: Europeans' attitudes towards cyber security, Special Eurobarometer 499, European Commission, January 2020

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Devices used to access internet - Laptop (%, other than a home computer)
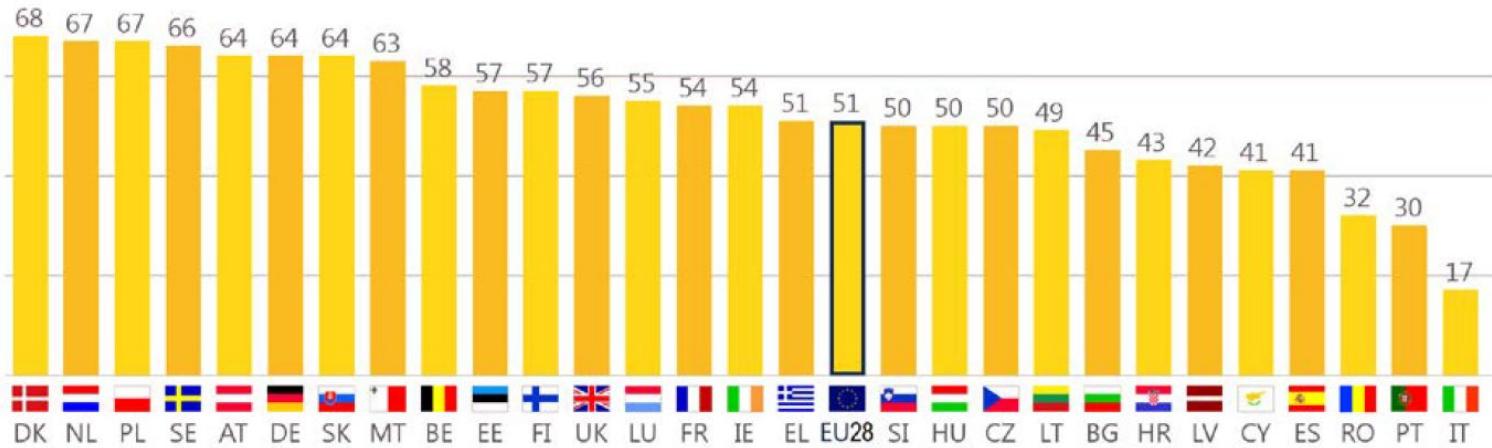
Base: respondents who use the Internet (N=23,420)

Source: Europeans' attitudes towards cyber security, Special Eurobarometer 499, European Commission, January 2020

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REPÚBLICA PORTUGUESA
ECONOMIA E TRANSIÇÃO DIGITAL

Activities done in the last 12 months - Email (%)

NL	SE	DK	FI	UK	LU	AT	DE	EE	FR	BE	SK	EU28	CZ	SI	LV	ES	IE	PT	LT	PL	MT	IT	HU	BG	EL	HR	CY	RO
98	96	95	94	88	87	86	86	84	84	84	82	80	80	78	78	77	76	75	75	72	70	68	66	66	64	55	52	39
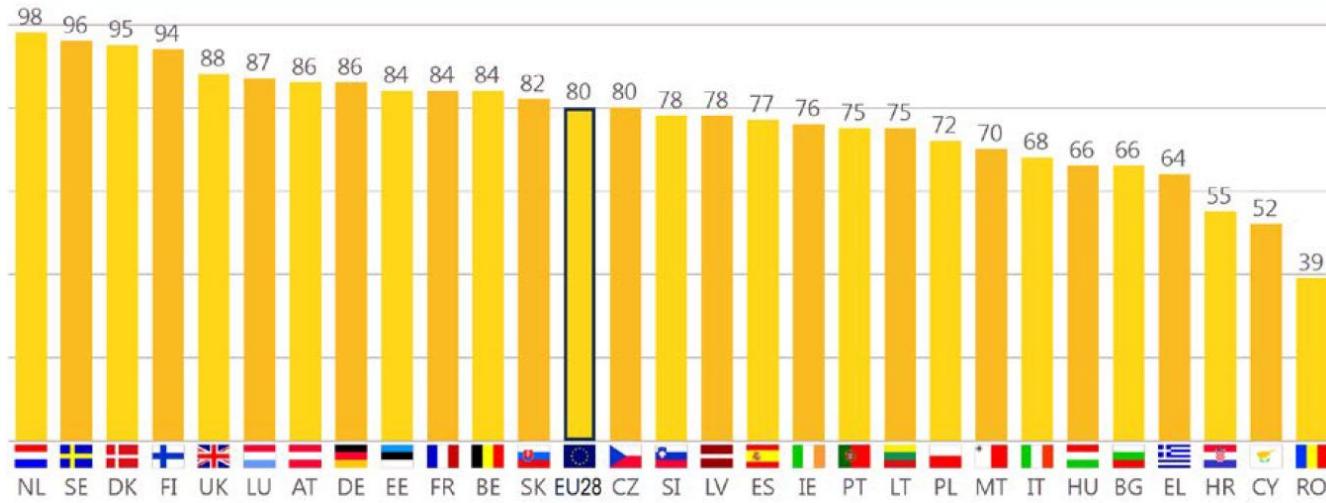
Base: respondents who use the Internet (N=23,420)

Source: Europeans' attitudes towards cyber security, Special Eurobarometer 499, European Commission, January 2020

Activities done in the last 12 months - Online social networks (%)
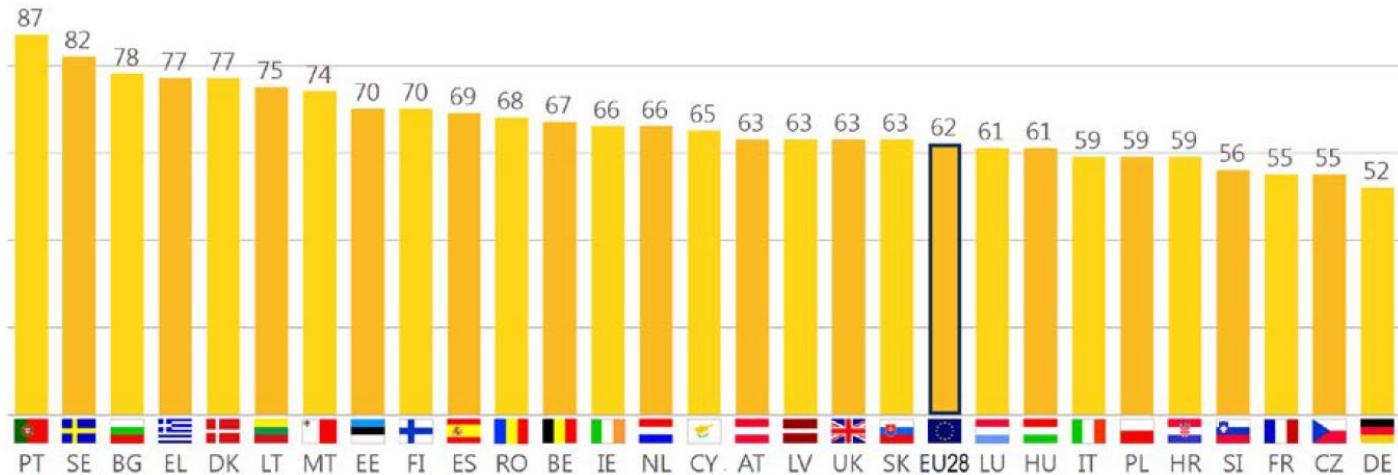
Base: respondents who use the Internet (N=23,420)

Source: Europeans' attitudes towards cyber security, Special Eurobarometer 499, European Commission, January 2020

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Activities done in the last 12 months - Online Banking (%)
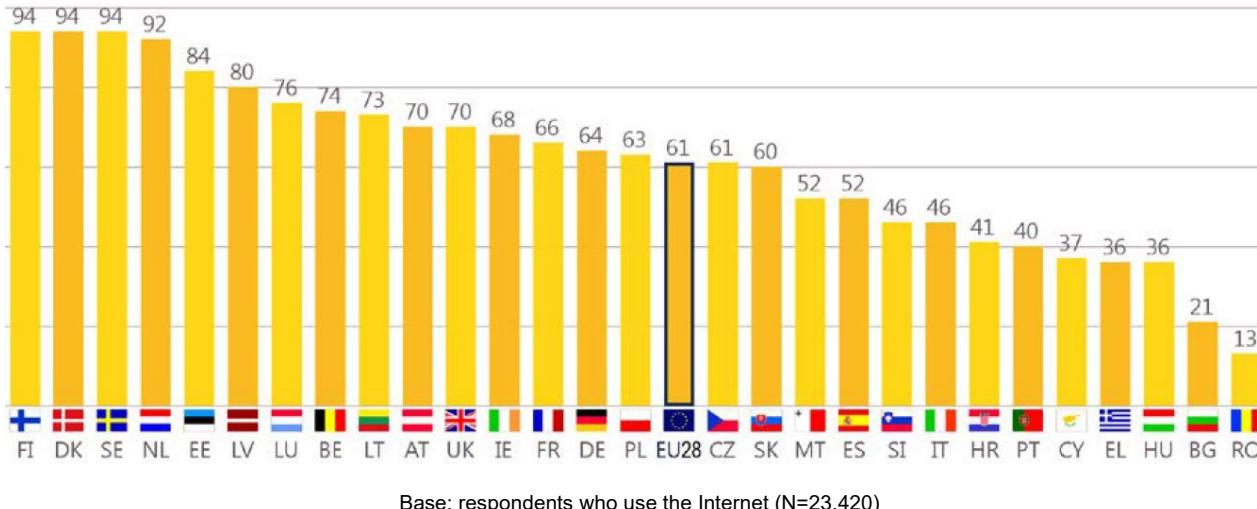
FI	DK	SE	NL	EE	LV	LU	BE	LT	AT	UK	IE	FR	DE	PL	EU28	CZ	SK	MT	ES	SI	IT	HR	PT	CY	EL	HU	BG	RO
94	94	94	92	84	80	76	74	73	70	70	68	66	64	63	61	61	60	52	52	46	46	41	40	37	36	36	21	13

Base: respondents who use the Internet (N=23,420)

Source: Europeans' attitudes towards cyber security, Special Eurobarometer 499, European Commission, January 2020

Activities done in the last 12 months - Buying goods or services

(%, e.g. concert tickets, train tickets)
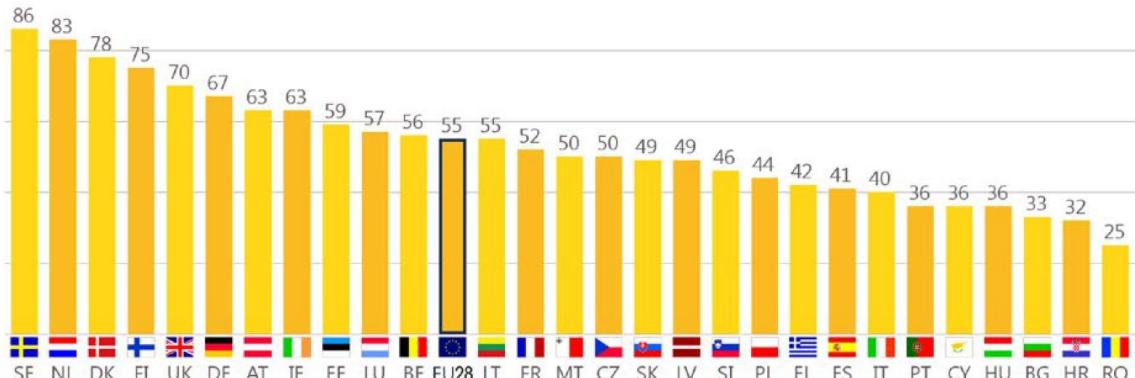
SE	NL	DK	FI	UK	DE	AT	IE	EE	LU	BE	EU28	LT	FR	MT	CZ	SK	LV	SI	PL	EL	ES	IT	PT	CY	HU	BG	HR	RO
86	83	78	75	70	67	63	63	59	57	56	55	55	52	50	50	49	49	46	44	42	41	40	36	36	36	33	32	25

Base: respondents who use the Internet (N=23,420)

Source: Europeans' attitudes towards cyber security, Special Eurobarometer 499, European Commission, January 2020

Households with internet access (Percentage of households)
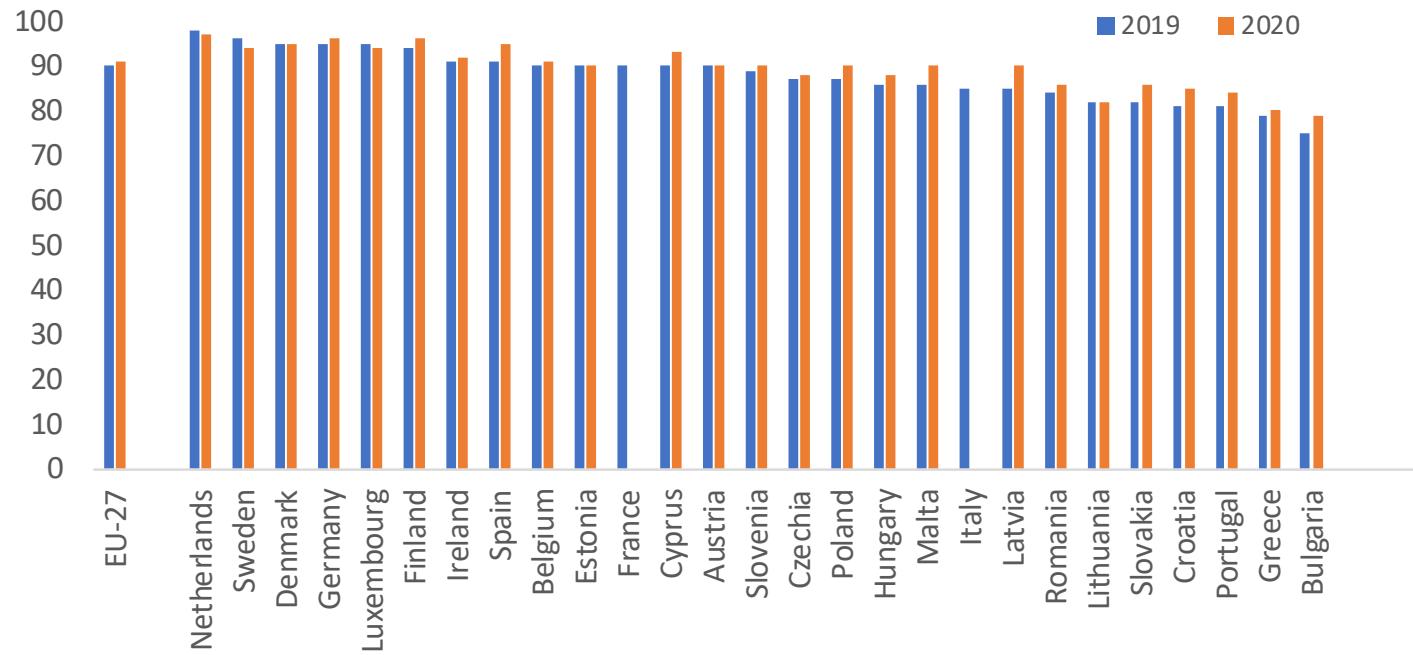
Note: data refers to the first quarter of the reference year.

Source: Broadband and connectivity – households, Eurostat, 2021 (isoc_bde15b_h)

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Internet broadband access in rural and urban households

(Share of households with broadband Internet access at home in each category, 2017)
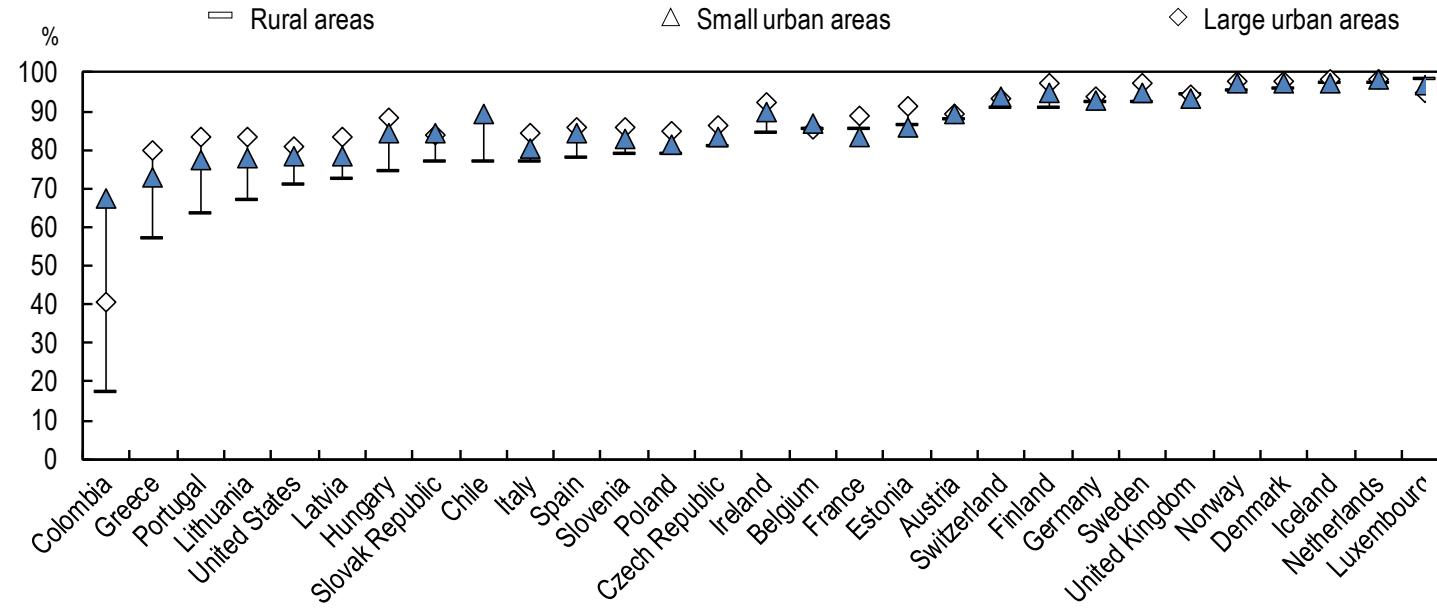
Source: OECD Skills Outlook 2019, OECD, 2019 ["OECD (2017), ICT Access and Usage by Households and Individuals Database, http://oe.cd/hhind.]

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Reasons for not having Internet access at home (Share of households without Internet at home reporting a given reason for not having Internet access, 2017)
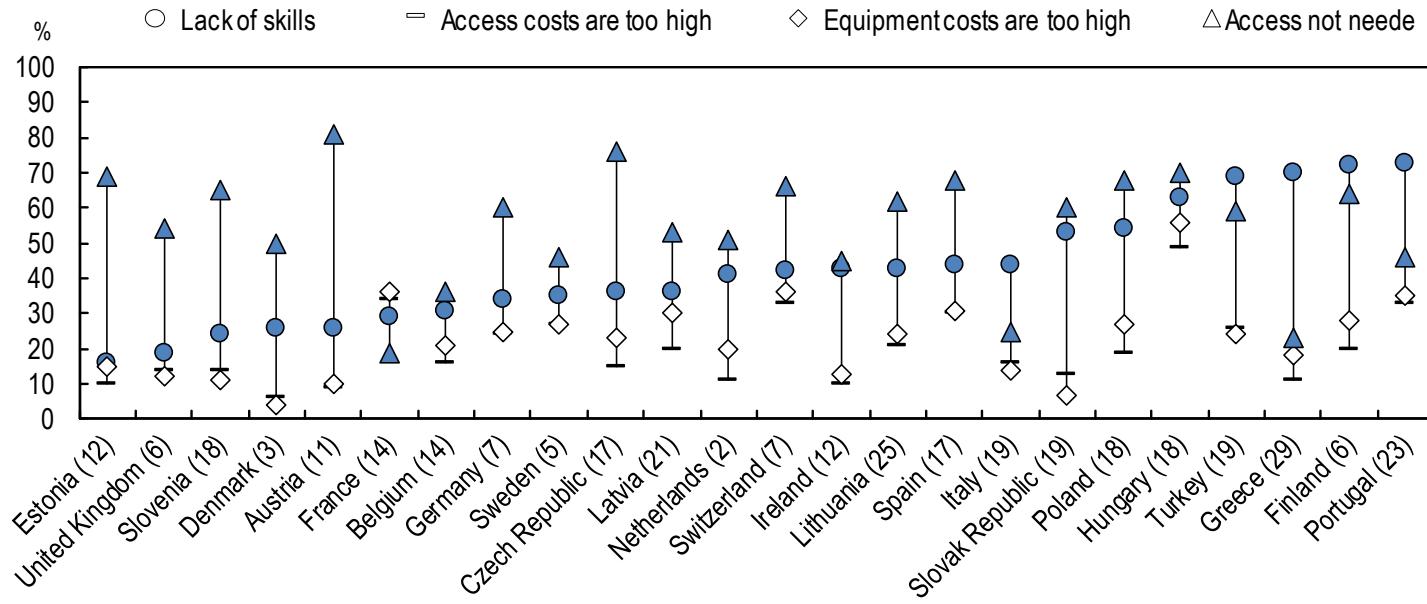
Source: OECD Skills Outlook 2019, OECD, 2019 [Eurostat (2017), European Community Survey on ICT Usage in Households and by Individuals.]

Households without access to internet at home, because the access and equipment costs are too high (Percentage of households, 2011, 2015 and 2019)
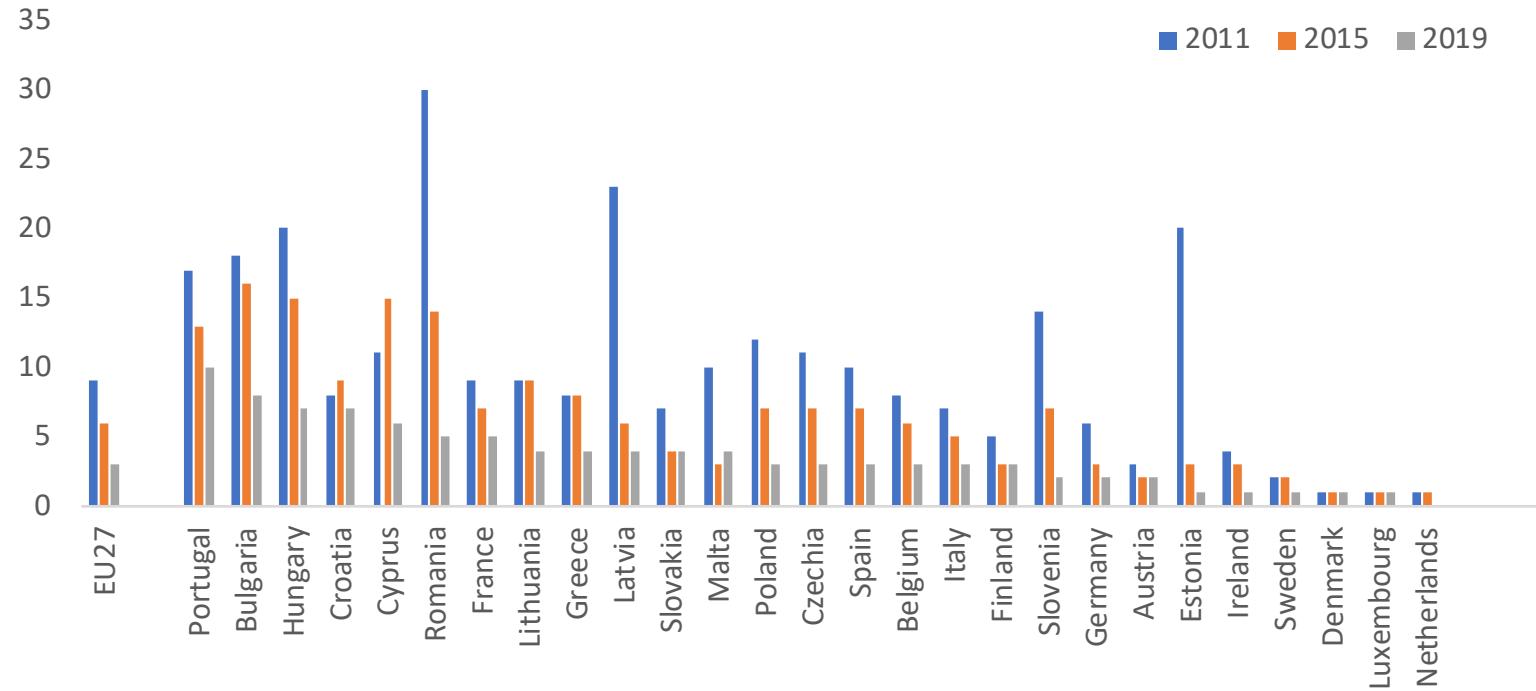
Source: Eurostat (ISOC_PIBI_RNI)

High-speed broadband

(Percentage of fibre connections in total fixed broadband, 2009 and 2018)
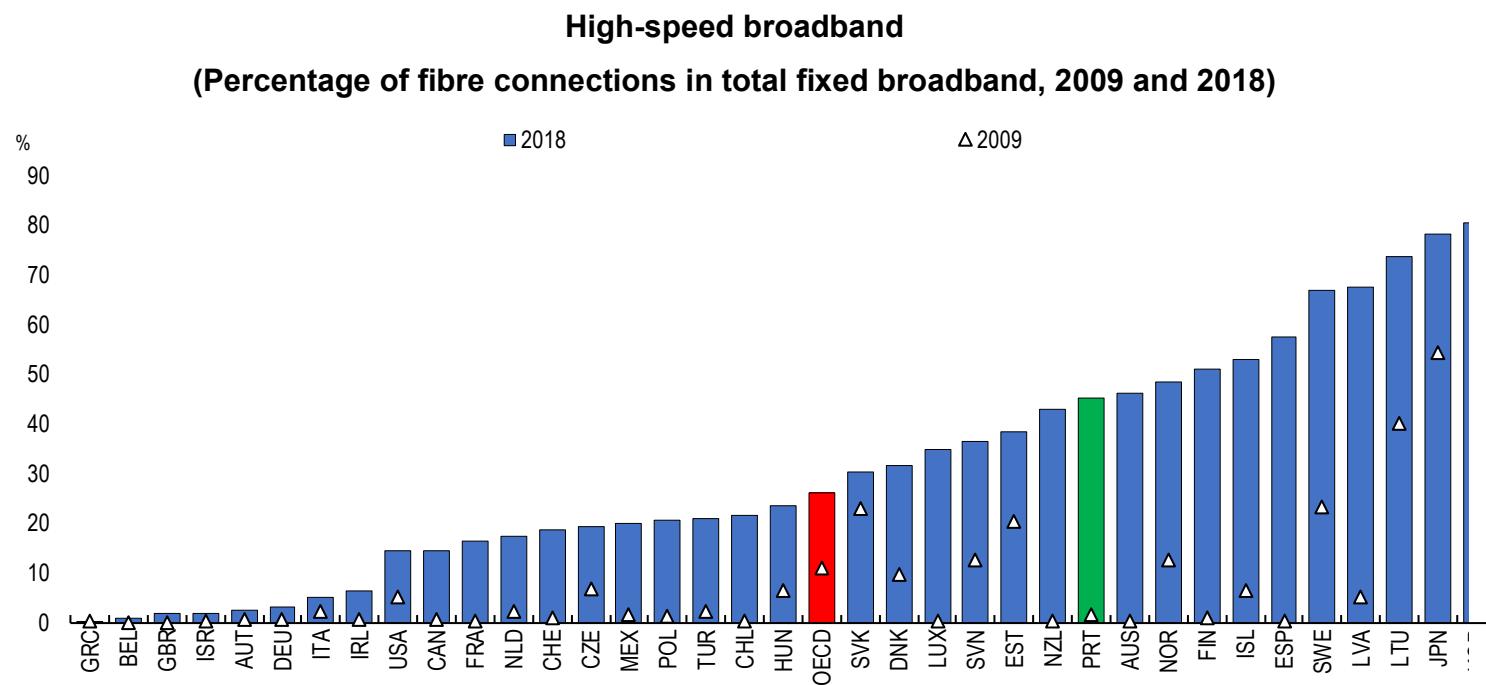
Note: 2010 for Canada, Turkey and United Kingdom instead of 2009.

Source: OECD Broadband Database (https://www.oecd.org/sti/broadband/broadband-statistics/)

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Fixed broadband subscriptions with contracted speed faster than 25/30 Mbps and 100 Mbps, 2018
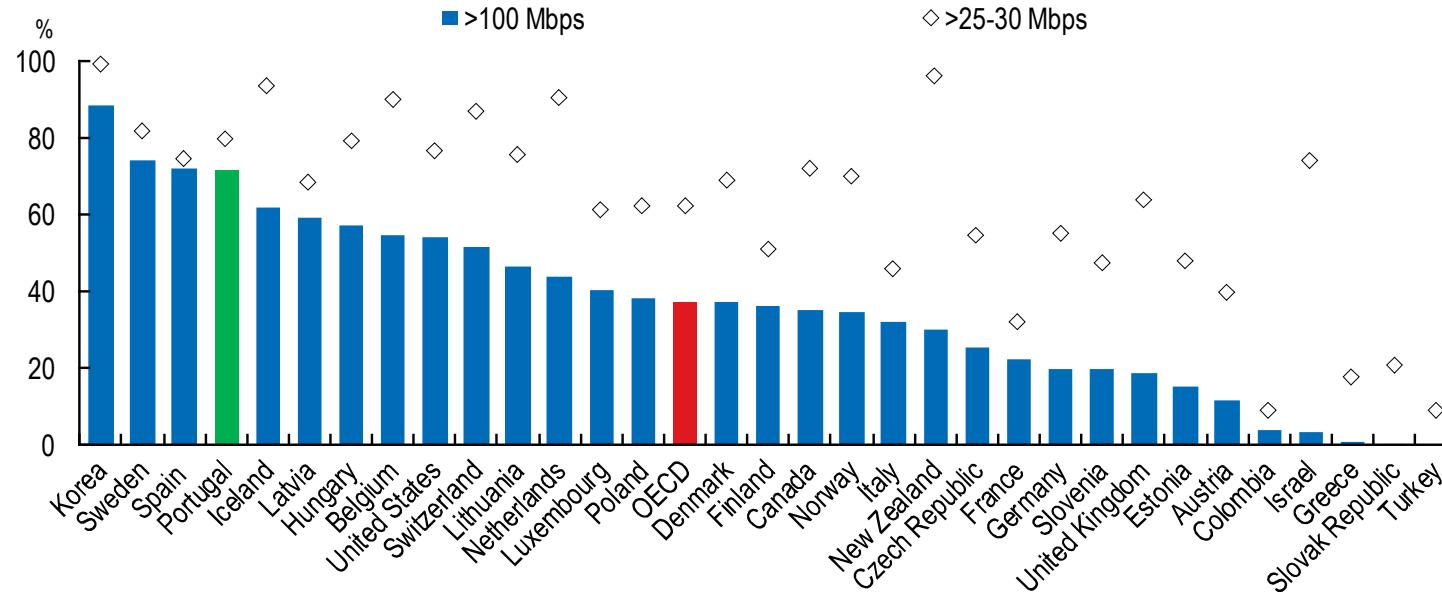
Source: OECD Digital Economy Outlook 2020, OECD, 2020 [OECD (2020), Broadband Portal (database),
www.oecd.org/sti/broadband/oecdbroadbandportal.htm.]

Households with minimum 30 Mbps of fixed broadband coverage

(As a percentage of all households in total and rural areas, 2018)
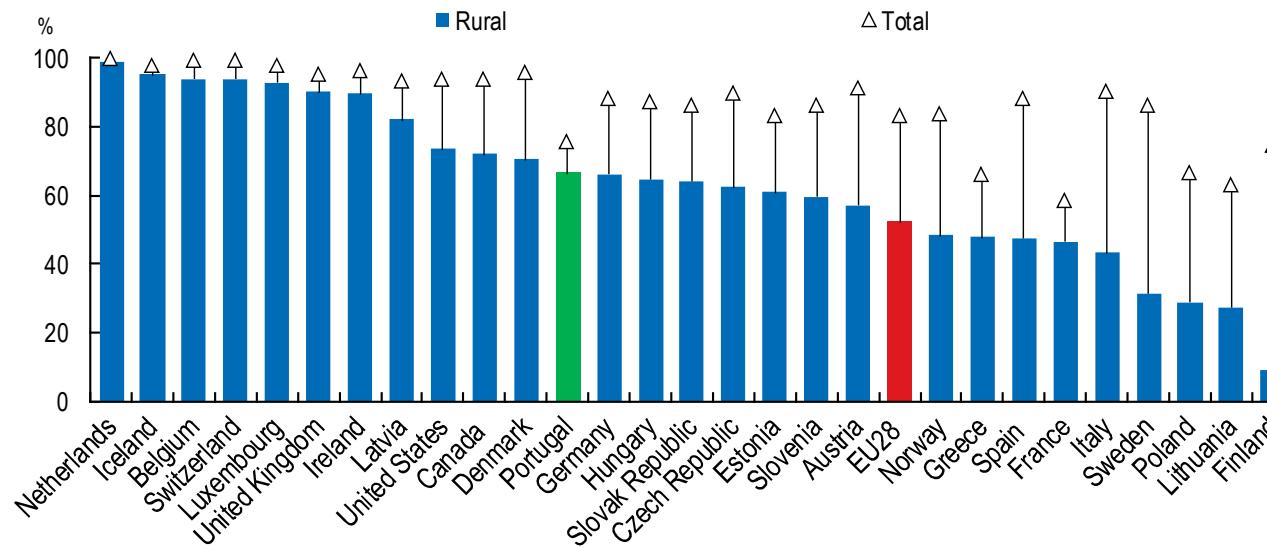
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ECONOMIA E TRANSIÇÃO DIGITAL

Mobile broadband subscriptions (per 100 inhabitants, June 2019)

■ Data and voice subscriptions ■ Data-only subscriptions ■ Total (breakdown not available)

Per 100 inhabitants

Source: Digital Economy Outlook 2020, OECD, 2020 [OECD (2020), Broadband Portal (database),
www.oecd.org/sti/broadband/oecdbroadbandportal.htm.]

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Adoção digital e TIC

Households with 4G/LTE mobile coverage

(As a percentage of all households in total and rural areas, 2018)
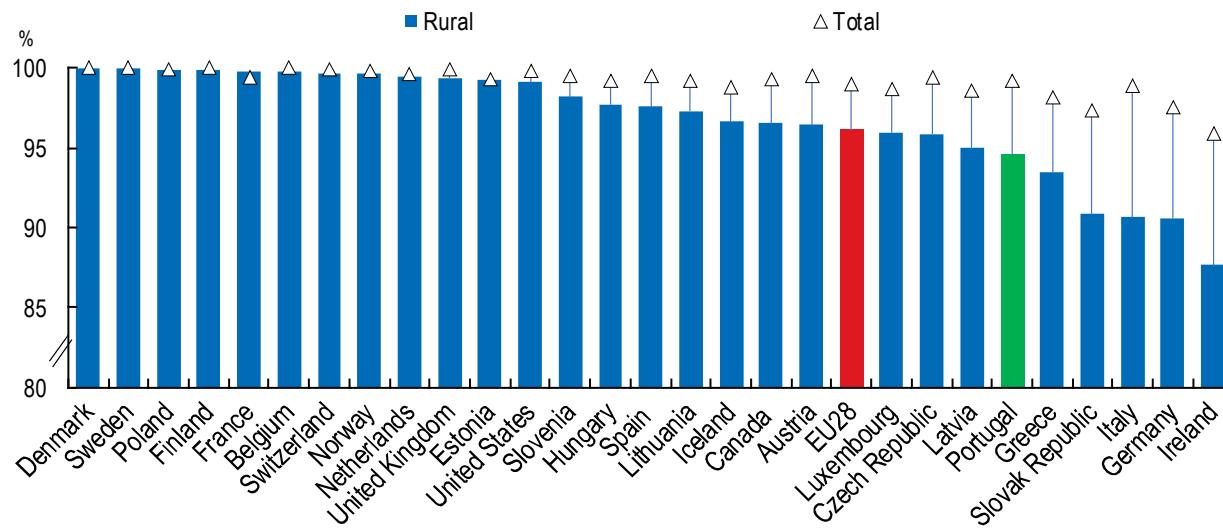
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Average experienced download speed of fixed broadband connections (Mbps, July 2019)
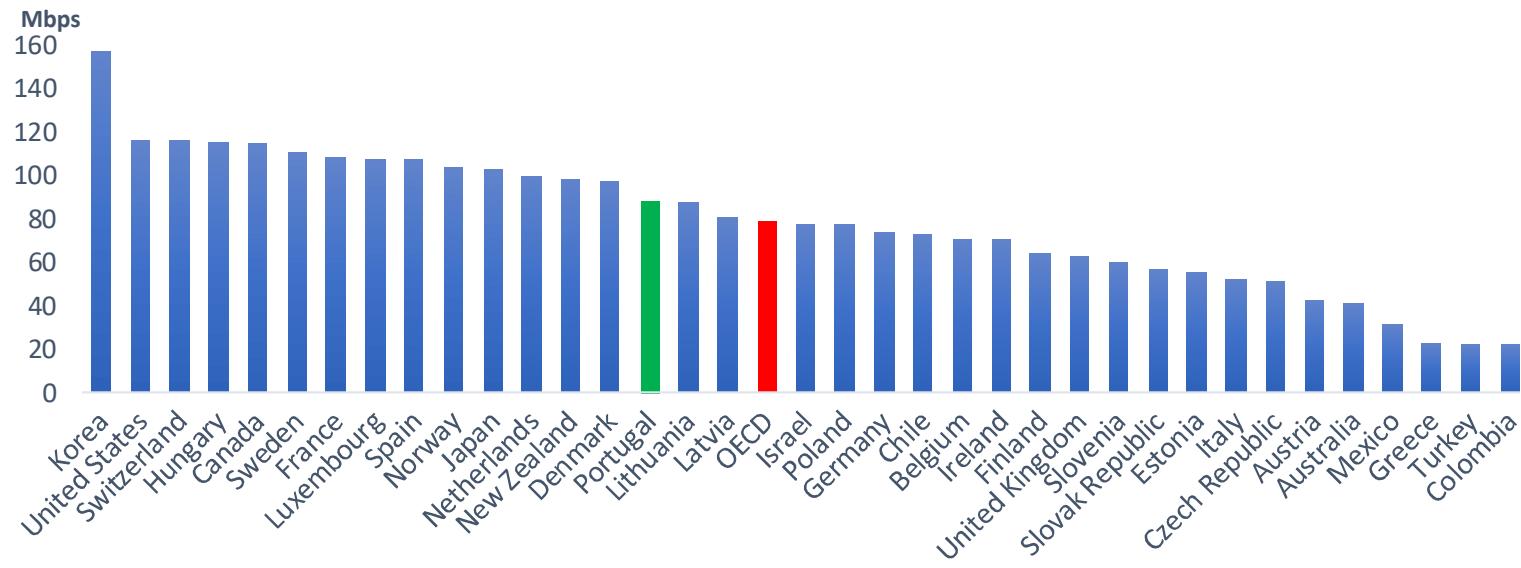
Source: OECD Digital Economy Outlook 2020, OECD, 2020 [Ookla (2019), "Speedtest Global Index", www.speedtest.net/global-index, M-Lab (2019), "Worldwide Broadband Speed League", www.cable.co.uk/broadband/speed/worldwide-speed-league; and Steam (2019) "Steam Global Traffic Map", https://store.steampowered.com/stats/content.]
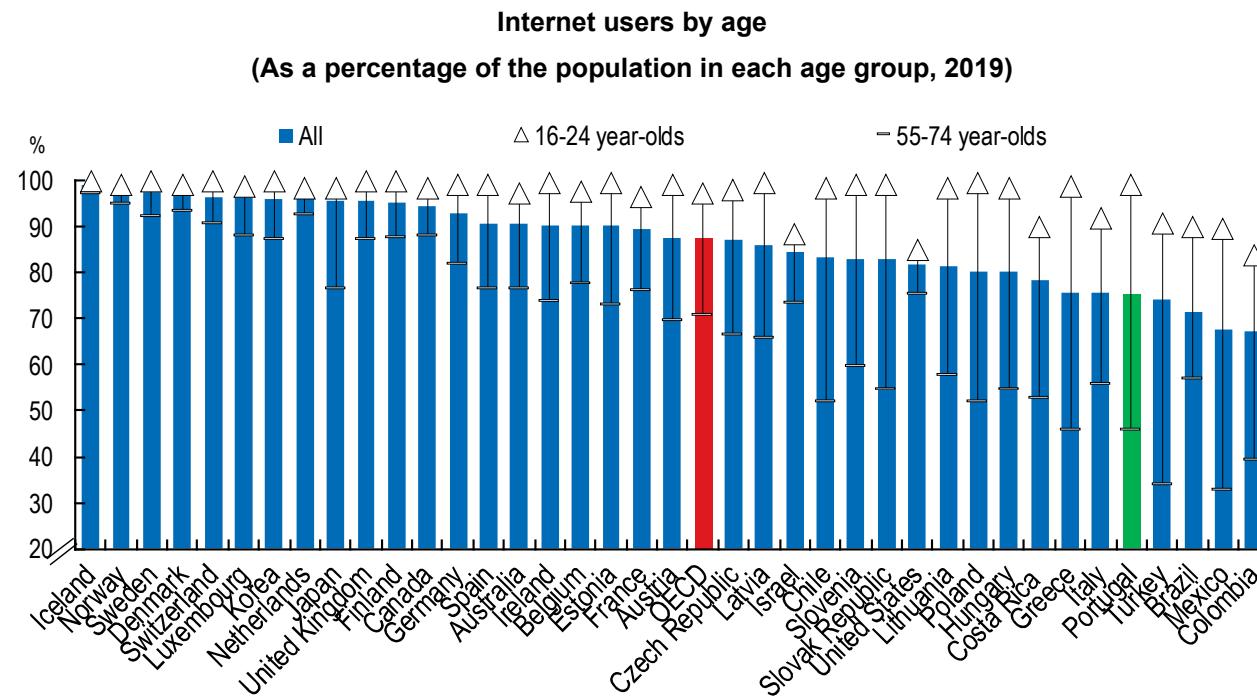
Internet users by age

(As a percentage of the population in each age group, 2019)

Source: OECD Digital Economy Outlook 2020, OECD, 2020 [OECD (2020), ICT Access and Usage by Households and Individuals Database, http://oe.cd/hhind.]

Frequent Internet use by age and educational attainment

(As a percentage of the population in each age group, 2019)

A. Among individuals aged 55-74
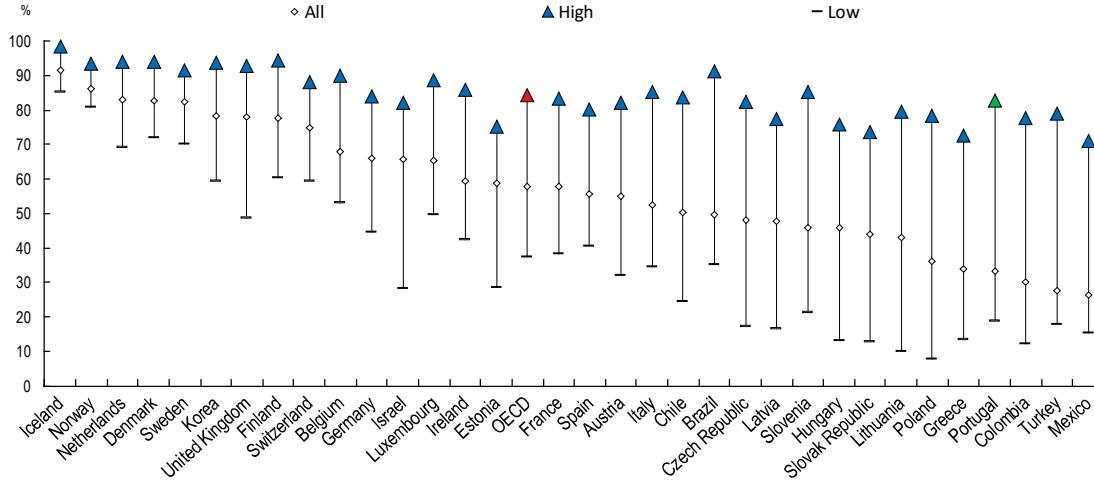
B. Among individuals aged 16-24
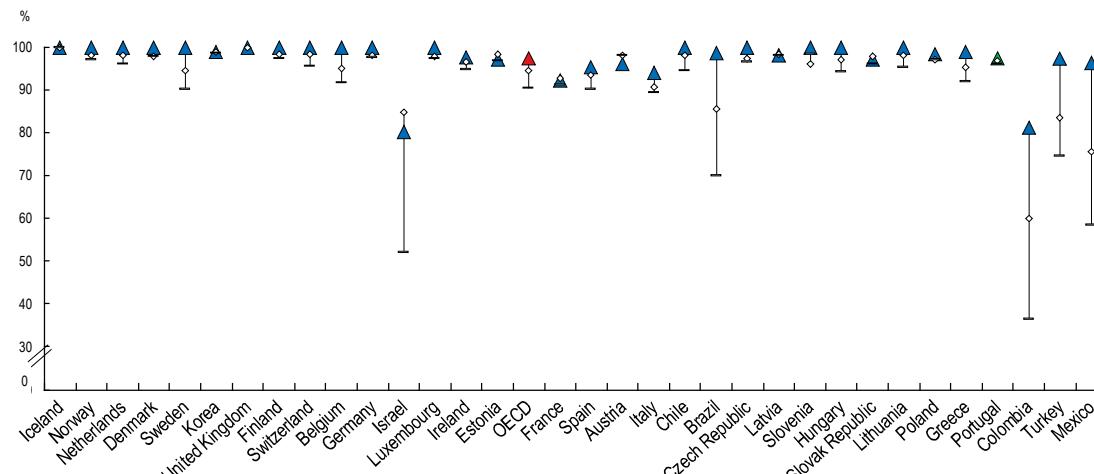
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Broadband connectivity by size

(As a percentage of enterprises in each employment size class, 2019)
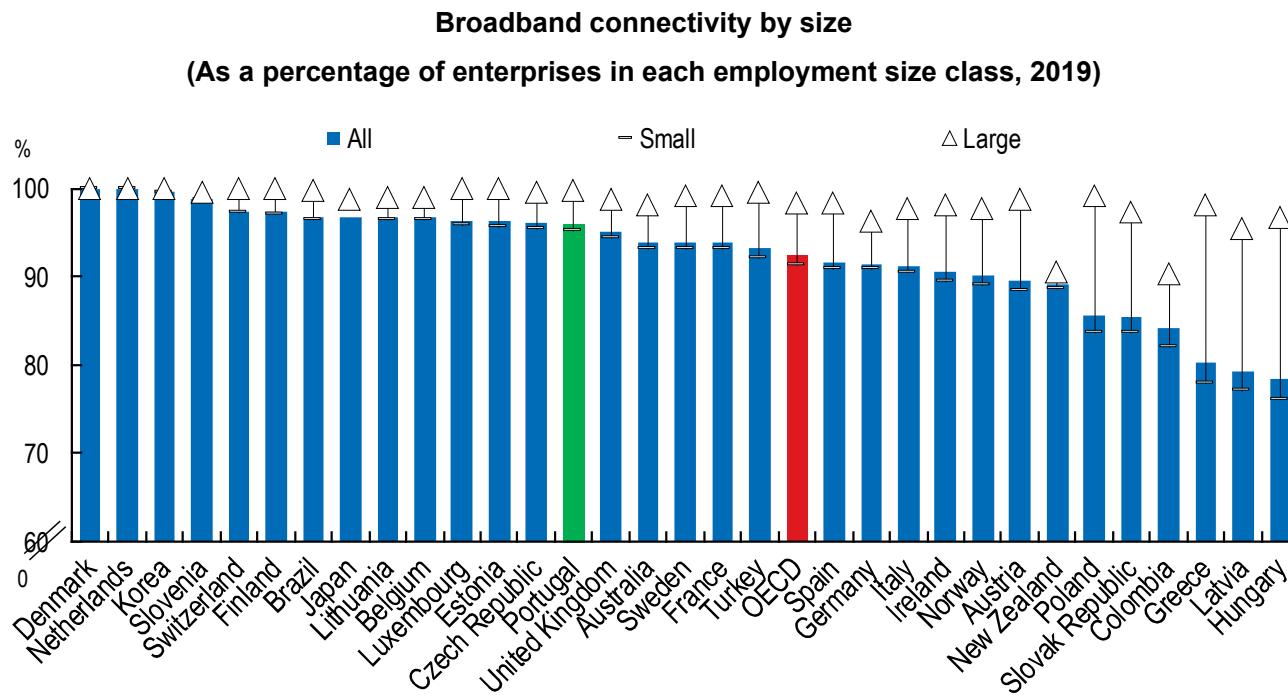
Source: OECD Digital Economy Outlook 2020, OECD, 2020 [OECD (2020), ICT Access and Usage by Businesses Database, http://oe.cd/bus.]

Enterprises with broadband connections, by speed

(As a percentage of all enterprises, 2018)

Legend: ■ All ▨ Breakdown not available ■ At least 30 Mbps, 2018 ◇ At least 30 Mbps, 2011

Source: OECD, ICT Access and Usage by Businesses Database (http://oe.cd/bus), December 2018.

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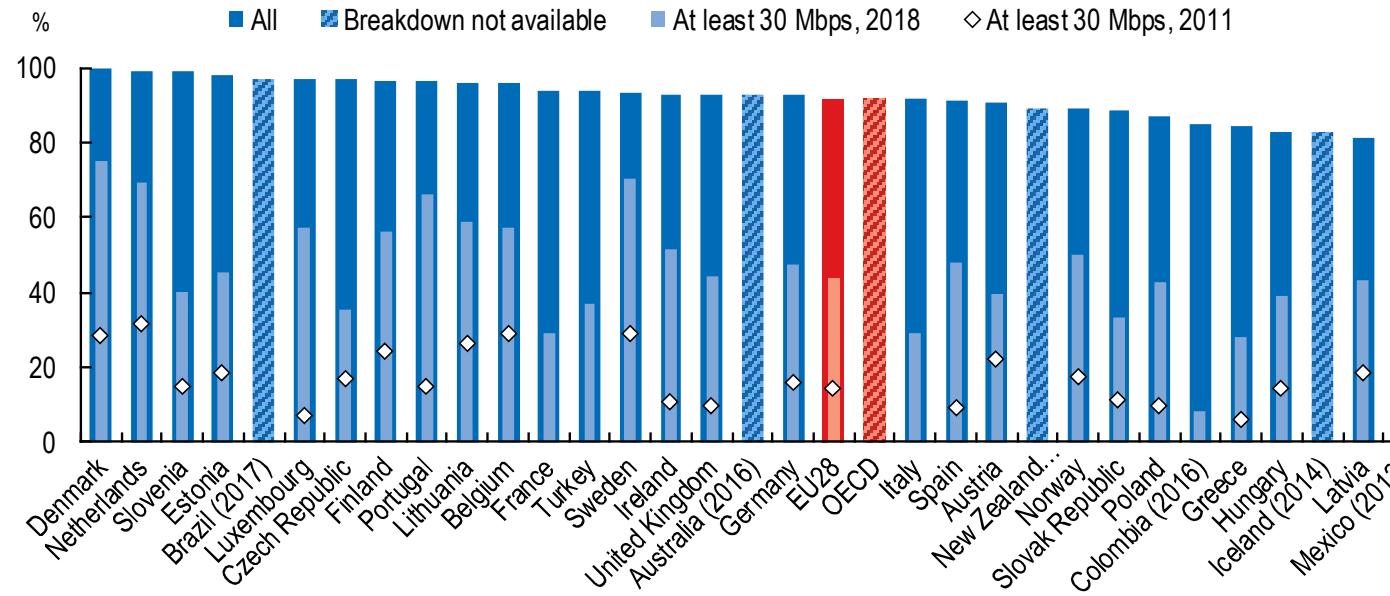
Enterprises with fast internet connection by size (Share of enterprises with contracted download speed of the fastest fixed internet connection is at least 100Mb/s, 2019)
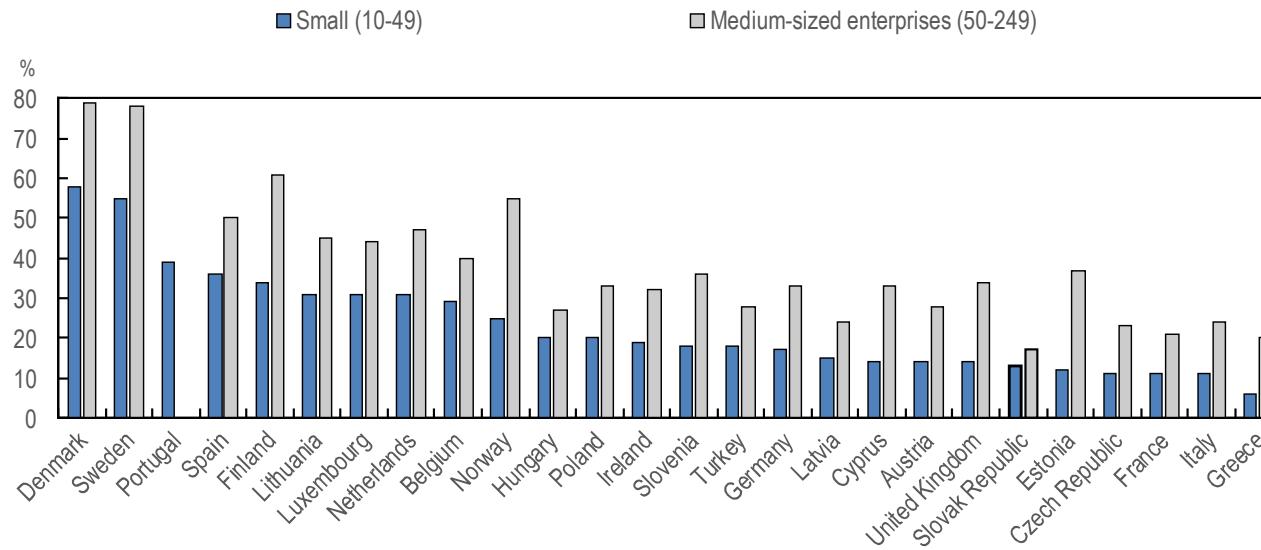
Note: Only enterprises from the non-financial sector are considered.

Diffusion of selected ICT tools and activities in enterprises

(As a percentage of enterprises with ten or more persons employed, 2019)
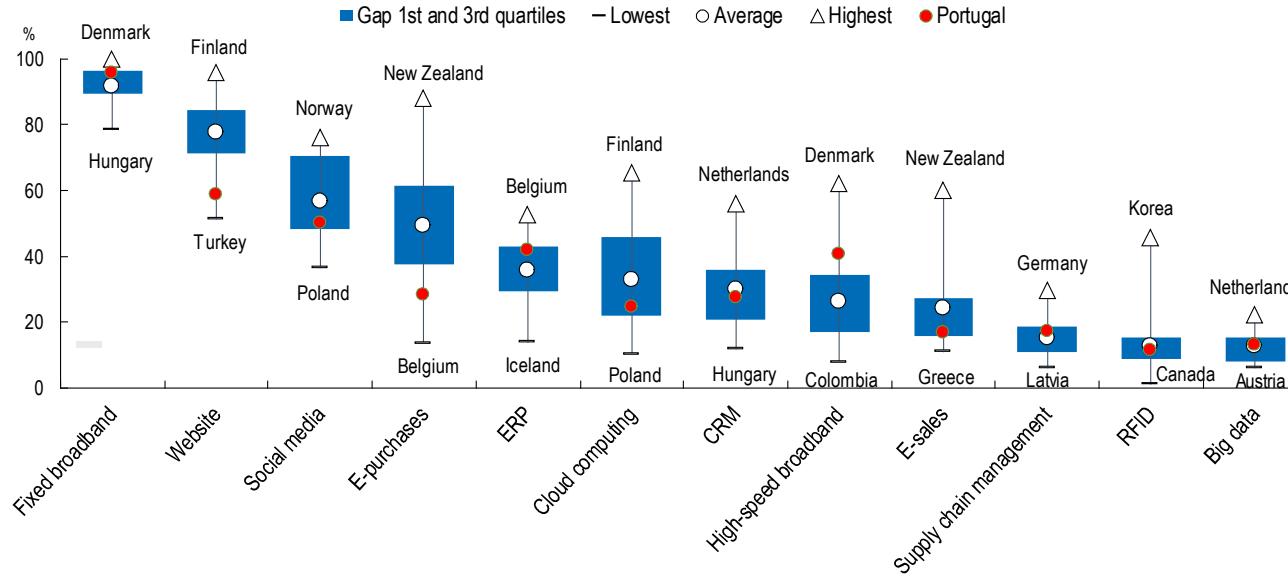
Source: OECD Digital Economy Outlook 2020, OECD, 2020 [OECD (2020), ICT Access and Usage by Businesses Database, http://oe.cd/bus and Eurostat, Digital Economy and Society Statistics, Comprehensive Database.]

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Social media users vs. Total Population

(Active social media users as a percentage of the total population, January 2021)
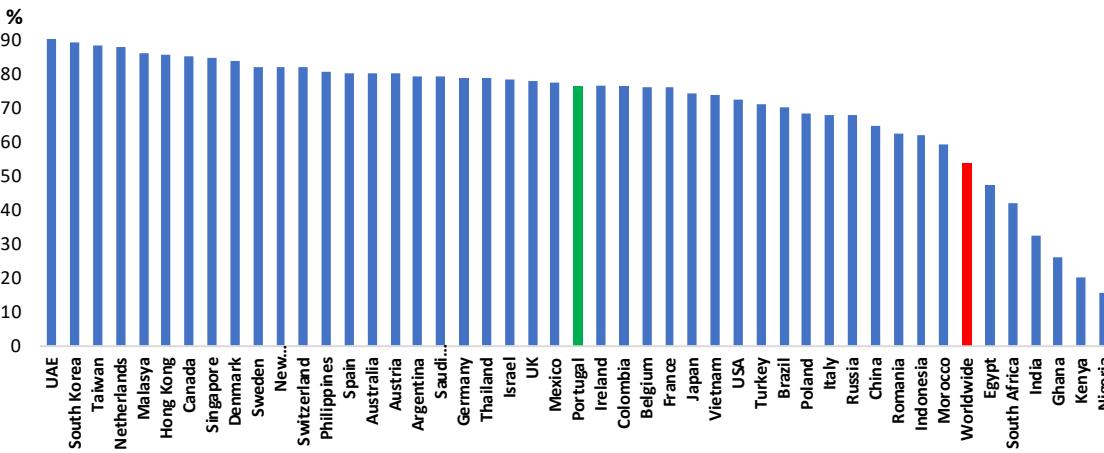
Notes: User figures may not represent unique individuals. Difference in local data availability mean country figures may not correlate with global totals.

Source: Digital 2021 – Kepios, We Are Social/Hootsuit, 2021

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Eligible audience reach rate: Facebook (The number of users that advertisers can reach on Facebook compared to the population aged 13+, January 2021)
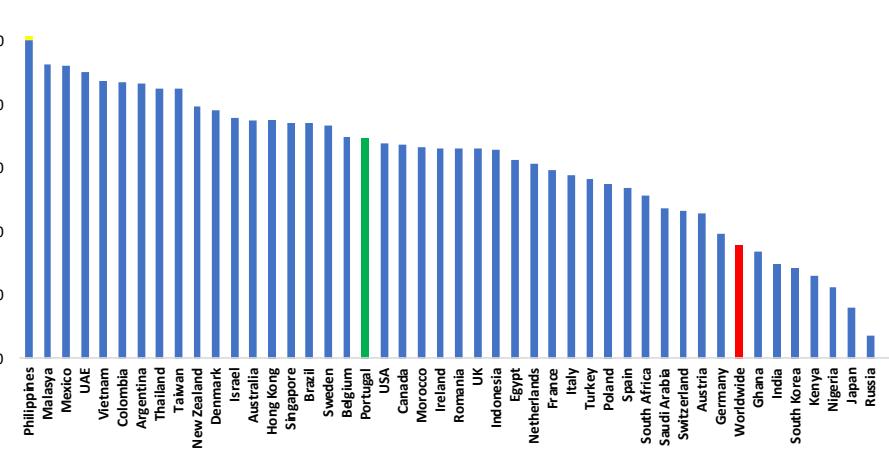

Note: Users may not represent unique individuals. Values should not exceed 100% but data are shown "as-is" to enable readers to make their own judgments.

Source: Digital 2020 and 2021, We Are Social/Hootsuit, 2021

Eligible audience reach rate: LinkedIn (The number of members that advertisers can reach on LinkedIn compared to the population aged 18+, January 2021)
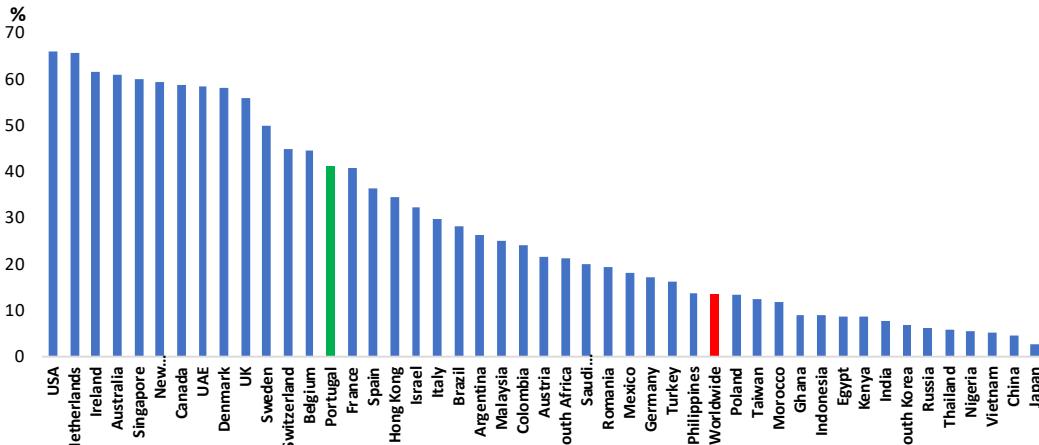
Note: Members may not represent unique individuals or monthly active users.
Source: Digital 2020 and 2021, We Are Social/Hootsuit, 2021

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Facebook users by language (Facebook users as share of total advertising audience who speak each language, January 2021)
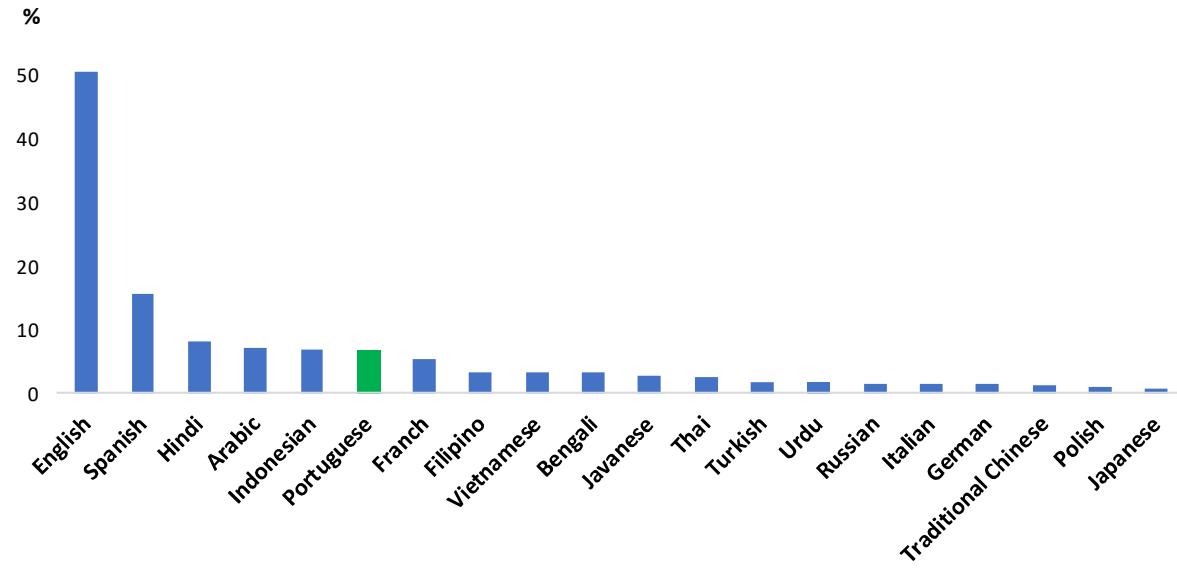

Notes: Share represents the numbers of active Facebook users who speak each language as a percentage of Facebook's total global advertising audience. Users may not represent unique individuals.

Source: Digital 2021 – Kepios, We Are Social/Hootsuit, 2021

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Enterprises using social media, 2019
A. By firm size

Legend: ■ All ■ 2013 — Small ◇ Medium ● Large

Countries (left to right): Norway, Iceland, Denmark, Netherlands, Sweden, United Kingdom, Ireland, Belgium, Finland, Brazil, Australia, Luxembourg, Canada, Austria, OECD, Lithuania, Greece, EU28, Spain, Slovenia, Switzerland, France, Portugal, Turkey, Estonia, Germany, Czech Republic, Italy, Slovak Republic, Latvia, Hungary, Japan, Poland

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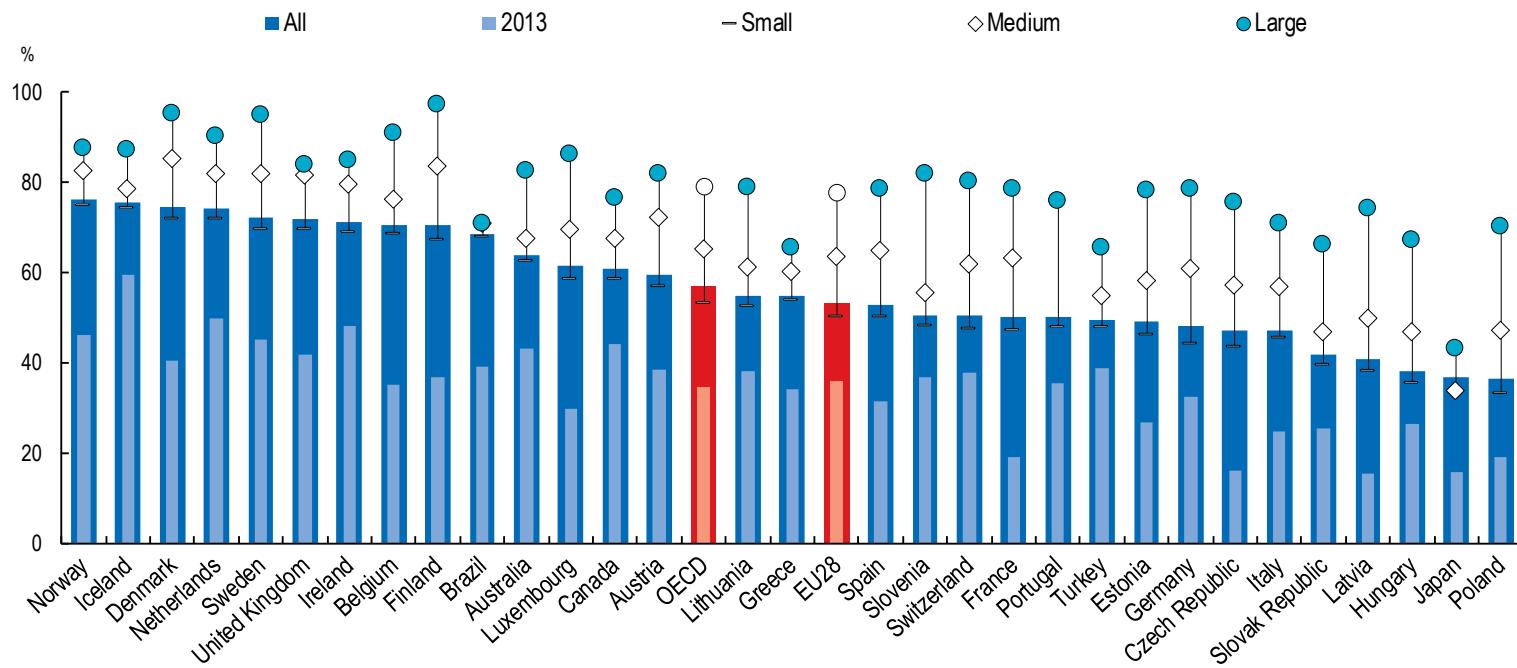
Diffusion of online purchases

(Individuals having ordered goods or services online as a percentage of all individuals, 2019)
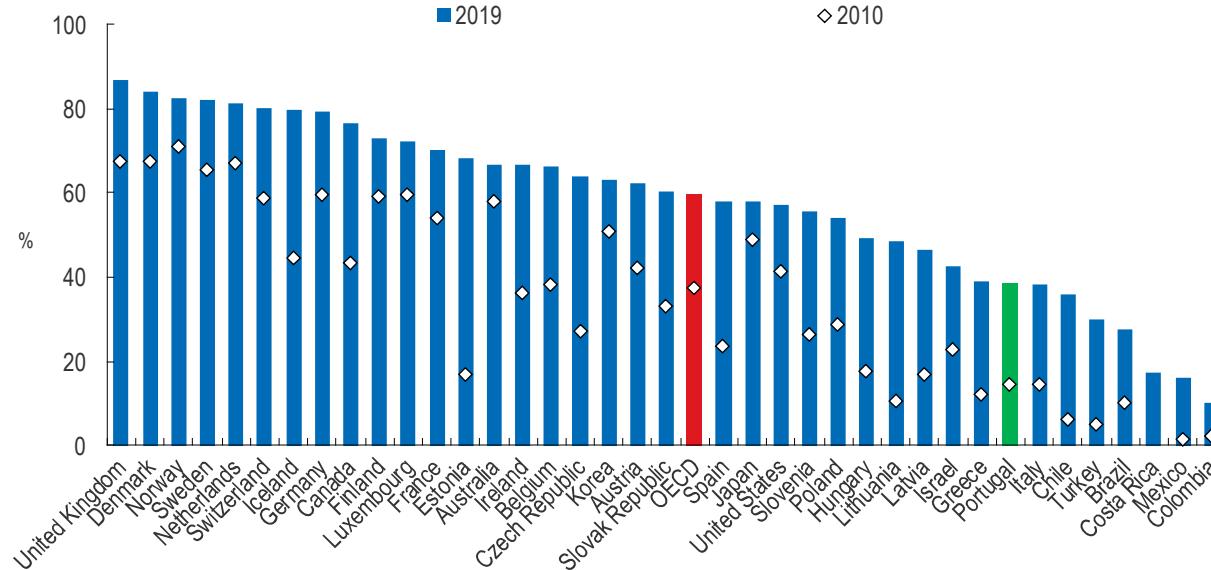
Source: OECD Digital Economy Outlook 2020, OECD, 2020 [OECD (2020), ICT Access and Usage by Households and Individuals

Database, http://oe.cd/hhind.]

Individuals who sold goods or services on the Internet, by income

(As a percentage of individuals in each quartile, 2019)
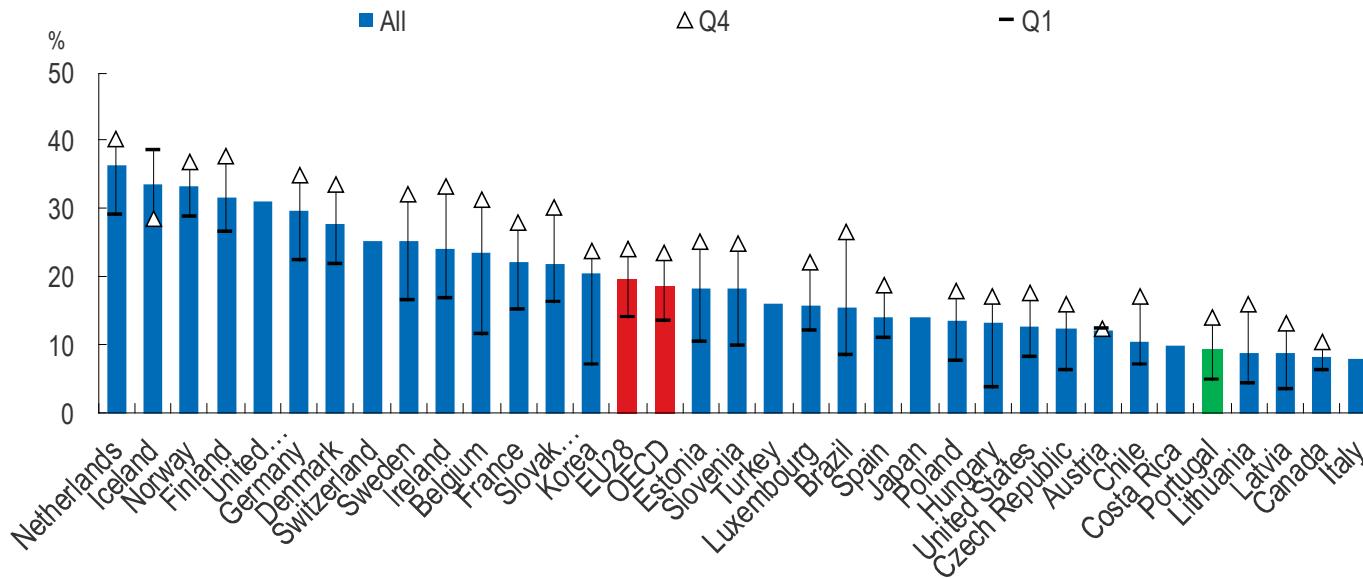
Source: OECD Digital Economy Outlook 2020, OECD, 2020 [OECD (2020), ICT Access and Usage by Households and Individuals Database, http://oe.cd/hhind and Eurostat, Digital Economy and Society Statistics, Comprehensive Database.]

Percentage of small enterprises using e-commerce, by enterprise size (2019)

Legend: ■ Own websites or apps   ◆ E-commerce marketplaces
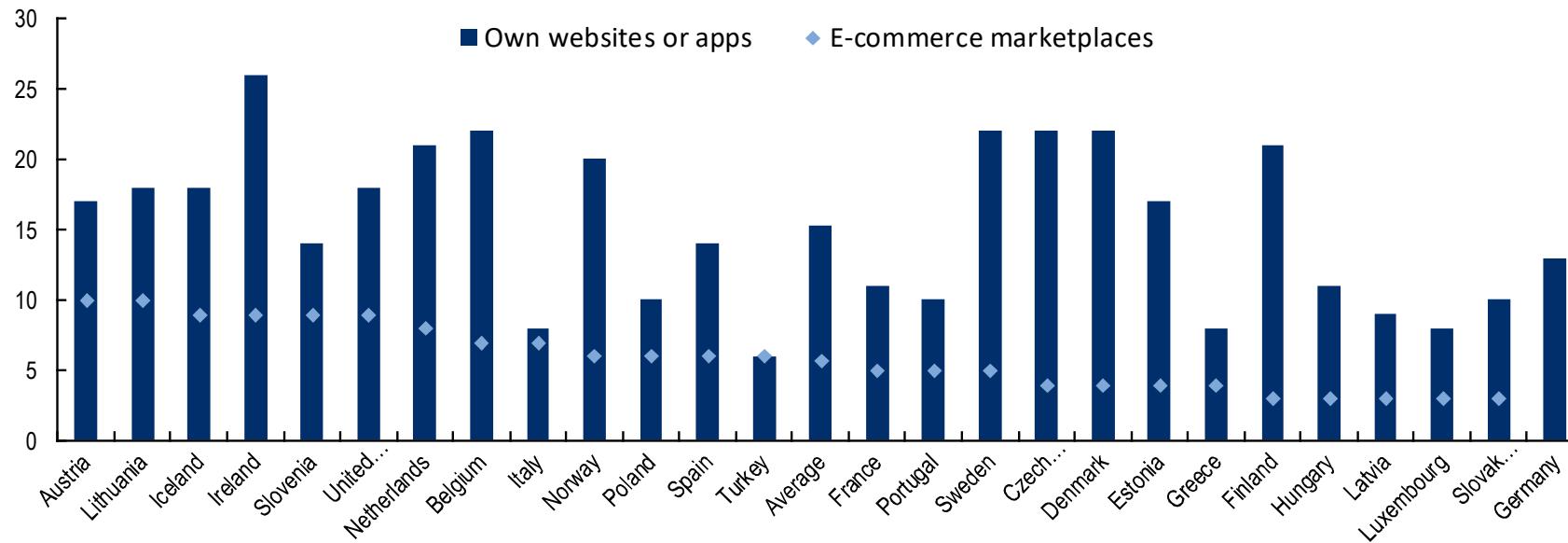
Note: Data only cover enterprises with ten or more persons employed. Small enterprises are defined as with between 10 and 49 employees.

E-Commerce adoption

(Percentage of internet users aged 16 to 64, Q3 2019/2020)

Source: Digital 2020 and 2021 - Global Web Index (survey), We Are Social/Hootsuit, 2020 and 2021
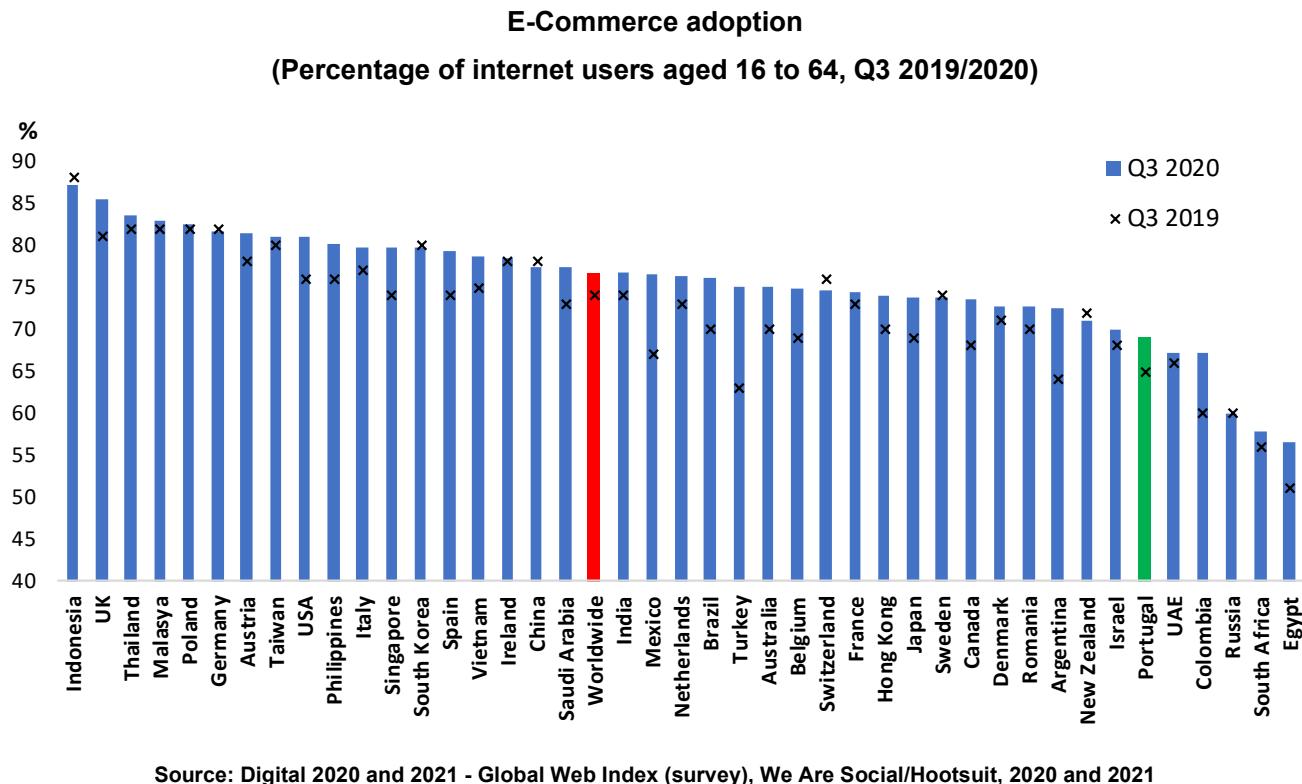
Main payment methods for online shoping

Payment method	Percentage
Paypal	47,9%
MB	45,7%
Debit card	26,2%
Virtual credit card (1)	24,3%
Credit Card	23,3%
Bank transfer	13,9%
Cash on delivery	11,7%
Pre-paid card	5,6%
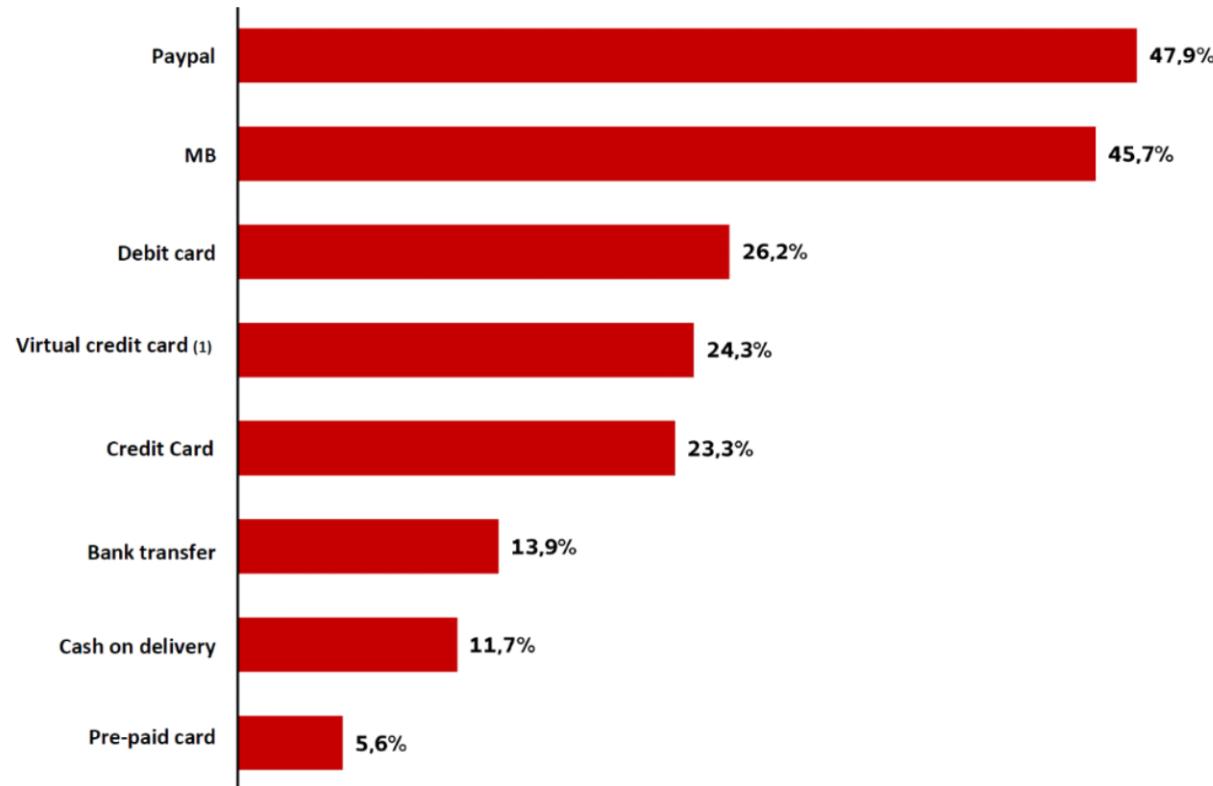
(1) –includes Mbnet, Mbway, Revolut,etc.

Source: E-commerce Report 2020 (data collected in Portugal between July and September 2020), CTT, 2020

Age gap in online purchasing

(Share of individuals participating in e-commerce, 2019 or latest available year)
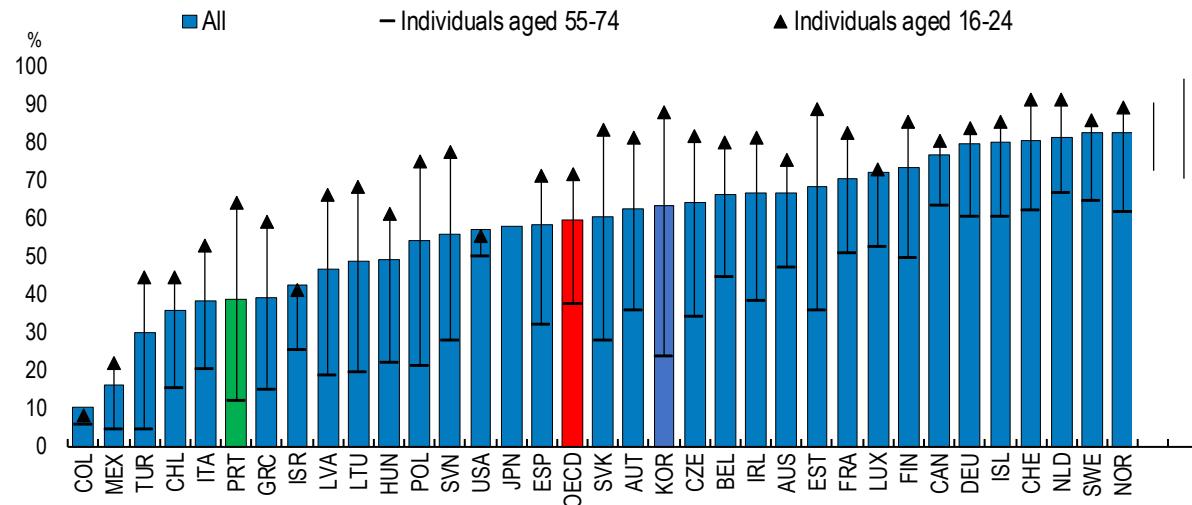
Note: Data refer to 2018 for Canada, Columbia, Japan and Mexico, 2017 for Chile, Israel and United States, 2016 for Australia.

**Source: OECD ICT Access and Usage by Individuals Database**

Governments with a user-driven approach, 2019
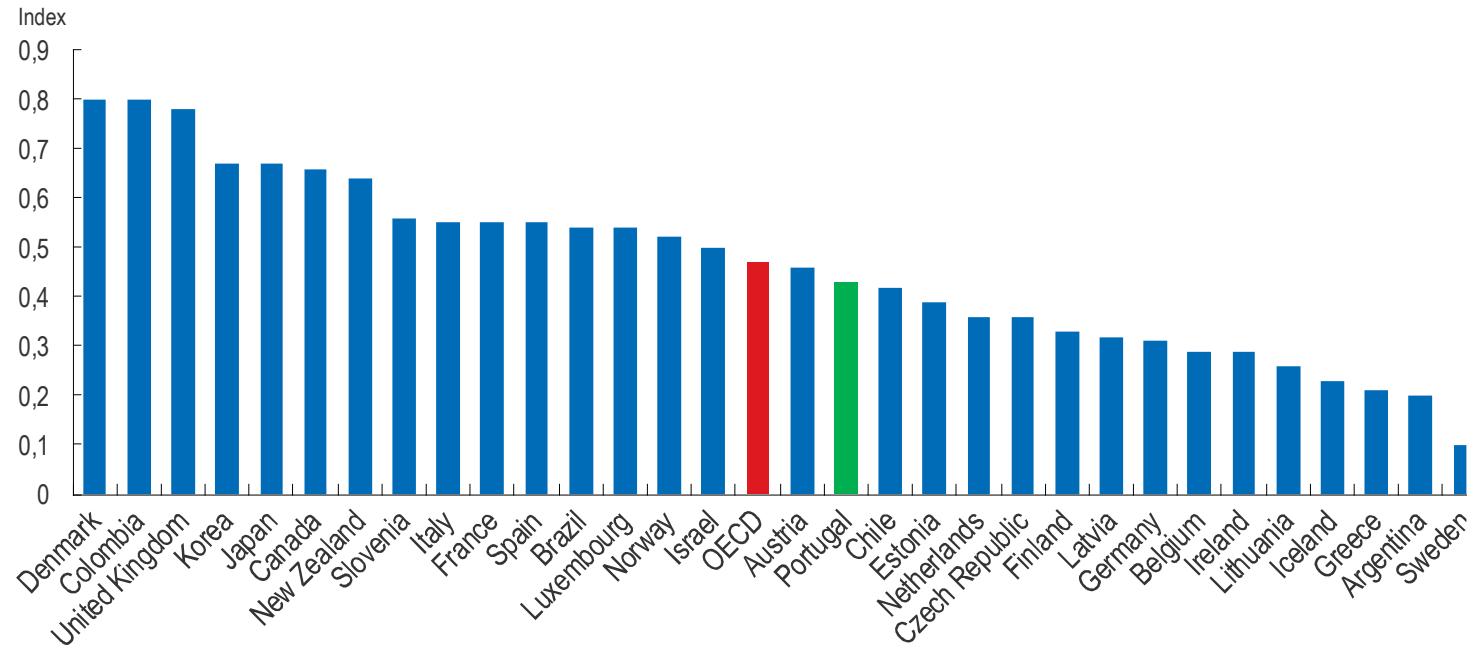
Source: OECD Digital Economy Outlook 2020, OECD, 2020 [OECD calculations based on OECD Survey on Digital Government.]

Countries with a government as a platform approach, 2019
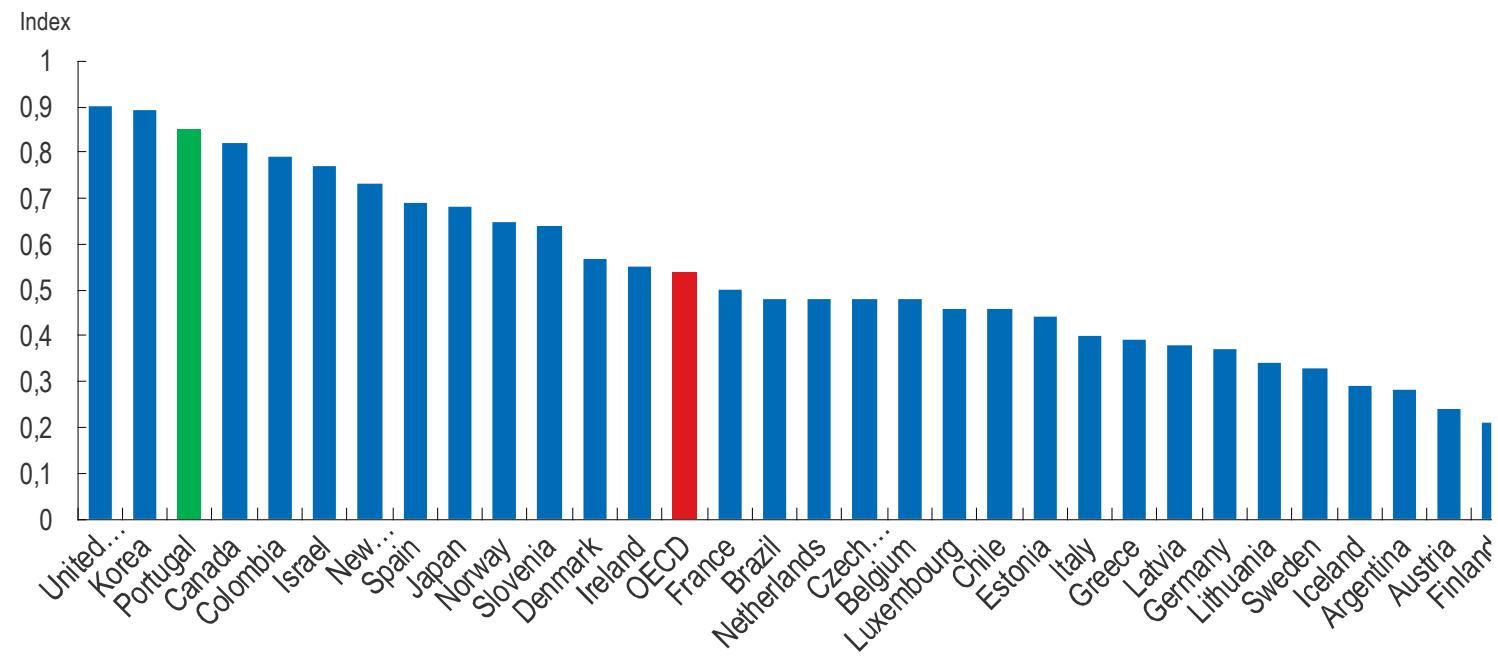
Source: OECD Digital Economy Outlook 2020, OECD, 2020 [OECD calculations based on OECD Survey on Digital Government.]

eGovernment Benchmark - Overall country performance (2019 biennial average)
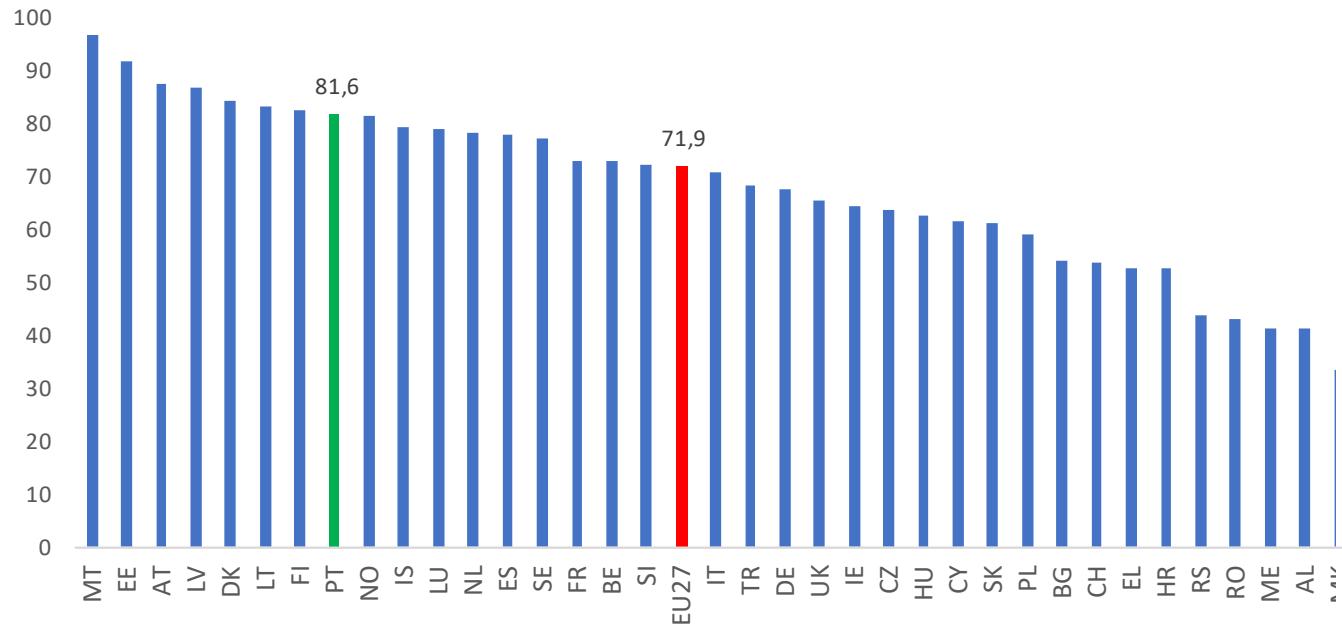
Source: eGovernment Benchmark 2020, European Commission, October 2020 (https://ec.europa.eu/digital-single-market/en/news/egovernment-benchmark-2020-egovernment-works-people)

Score in open-useful-reusable government data

(OURdata Index scores in the dimensions of data availability, accessibility and reusability, 2019)
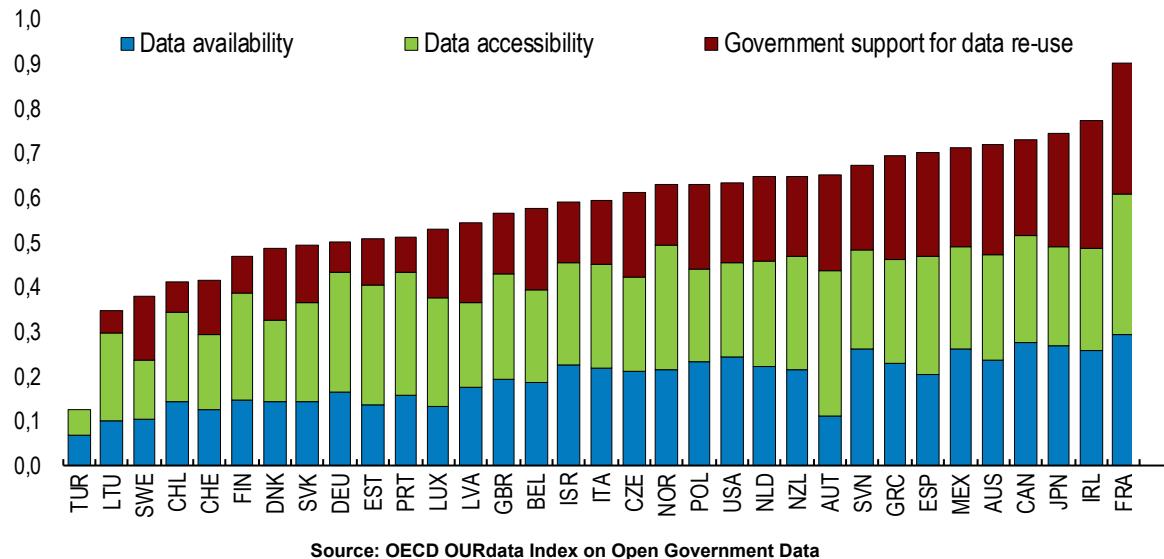
Source: OECD OURdata Index on Open Government Data

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Individuals who used the Internet to interact with public authorities, by educational attainment

(As a percentage of individuals in each group, 2019)
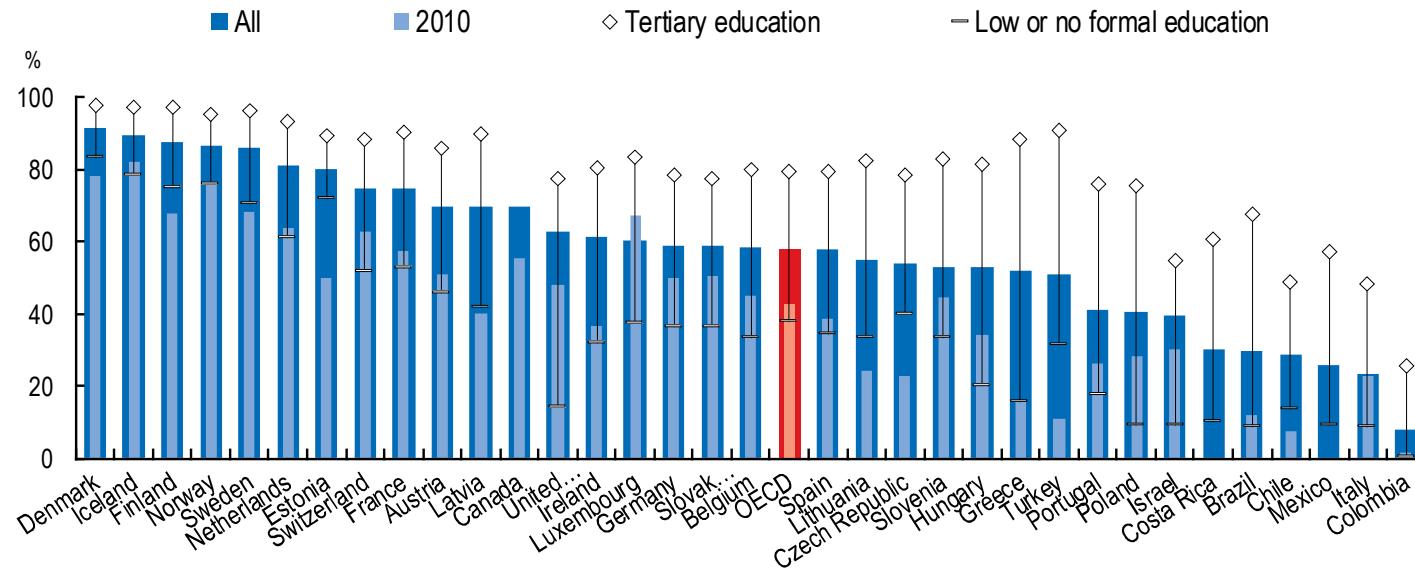
Source: OECD Digital Economy Outlook 2020, OECD, 2020 [OECD (2020), ICT Access and Usage by Households and Individuals Database, http://oe.cd/hhind.]

Business R&D expenditure, total and information industries

(As a percentage of gross domestic product, 2017)
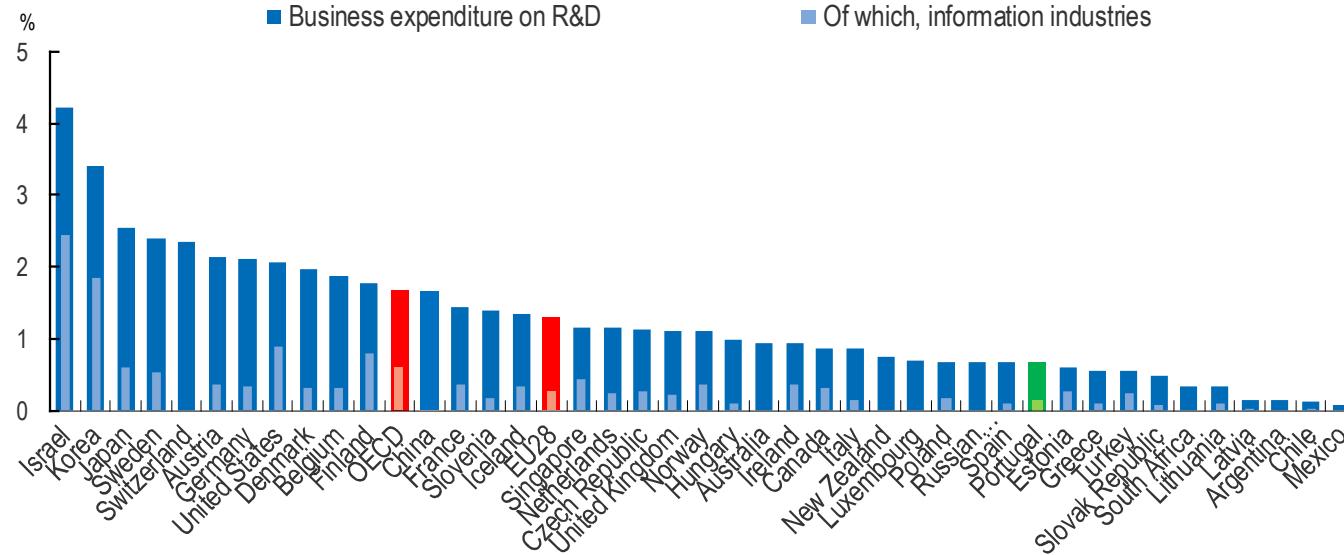
Source: OECD Digital Economy Outlook 2020, OECD, 2020 [OECD based on ANBERD (database), http://oe.cd/anberd and Main Science and Technology Indicators (database), http://oe.cd/msti.]
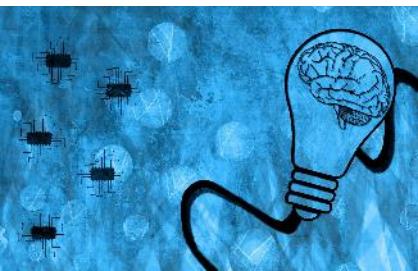
Top 10% most-cited documents in computer science (Percentage of domestic documents (fractional counts) in the top 10% citation-ranked documents, 2018)
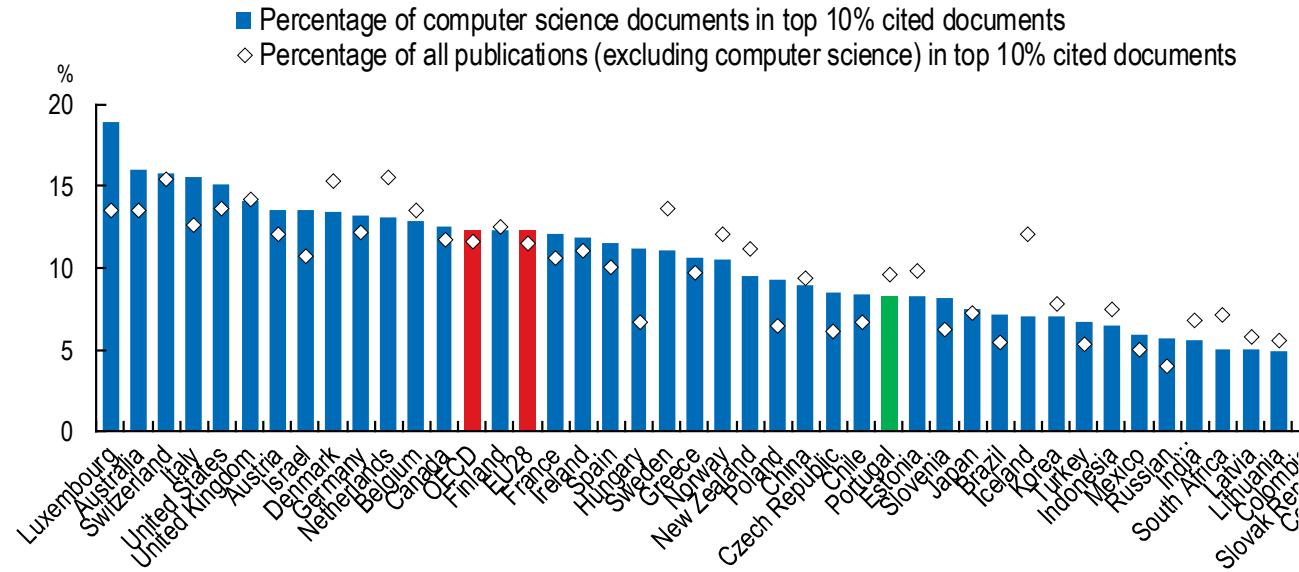
■ Percentage of computer science documents in top 10% cited documents
◇ Percentage of all publications (excluding computer science) in top 10% cited documents

Source: OECD Digital Economy Outlook 2020, OECD, 2020 [OECD calculations based on Scopus Custom Data, Elsevier, Version 1.2018; and 2018 Scimago Journal Rank from the Scopus journal title list.]
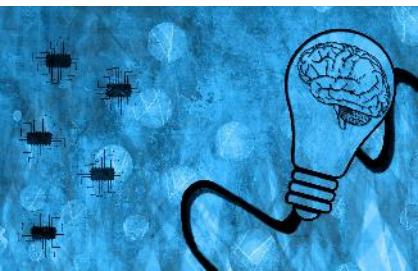
Top-cited scientific publications related to AI (Economies with the largest number of AI-related documents among the 10% most cited publications, 2016 and 2006)
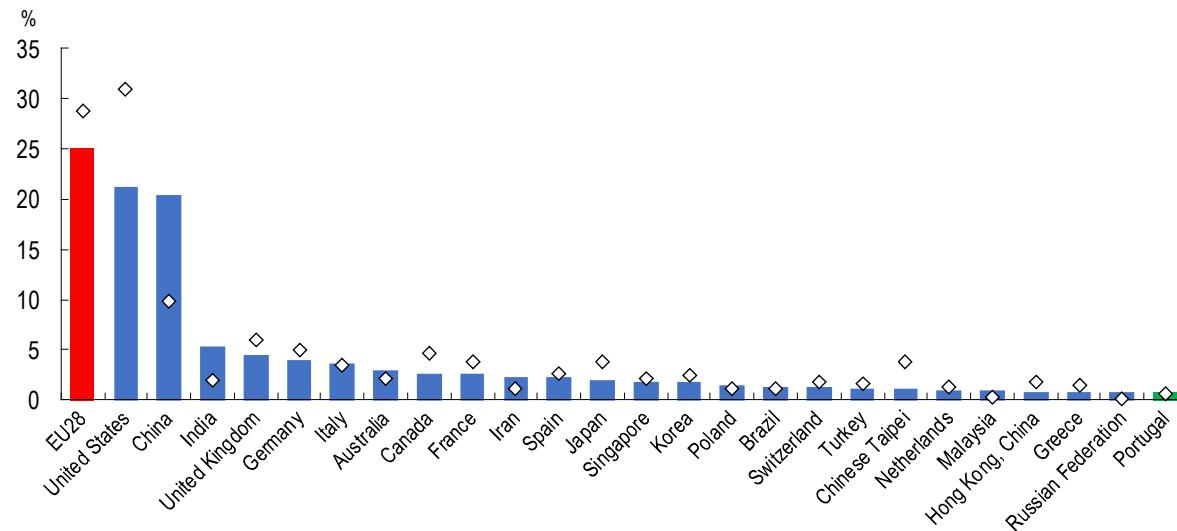
Source: The Digitalisation of Science, Technology and Innovation: Key Developments and Policies, OECD, 2020 [OECD Measuring the Digital Transformation: A Roadmap for the Future, OECD Publishing, Paris, https://doi.org/10.1787/9789264311992-en - OECD calculations based on Scopus Custom Data, Elsevier, Version 1.2018 and 2018 Scimago Journal Rank from the Scopus journal title list, January 2019.]

**Challenges for data-intensive research in different countries**
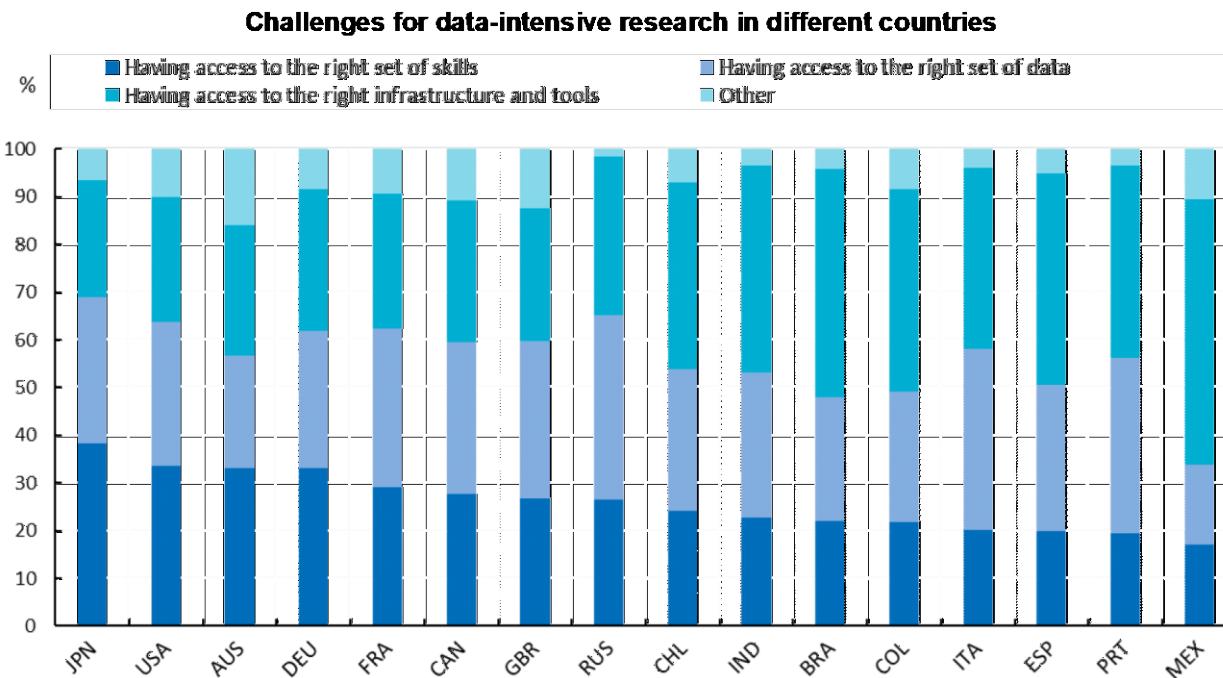
Most important challenge faced by scientific authors, by country of residence. Percentage of authors within each field selecting the relevant option. Note: Weighted estimates based on sampling weights adjusted for nonresponse.

Source: Bello and Galindo–Rueda (2020), based on the OECD International Survey of Scientific Authors 2018. http://oe.cd/issa.
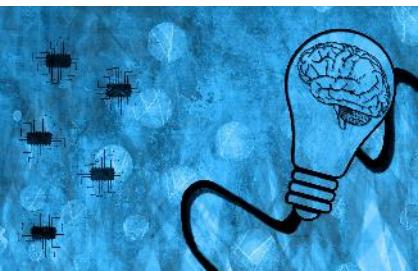
Portugal ranks in the 25th position among EU countries and is considered a beginner as regards to Open Data maturity.

Open Data in Europe 2020

■ Policy ■ Impact ■ Portal ■ Quality
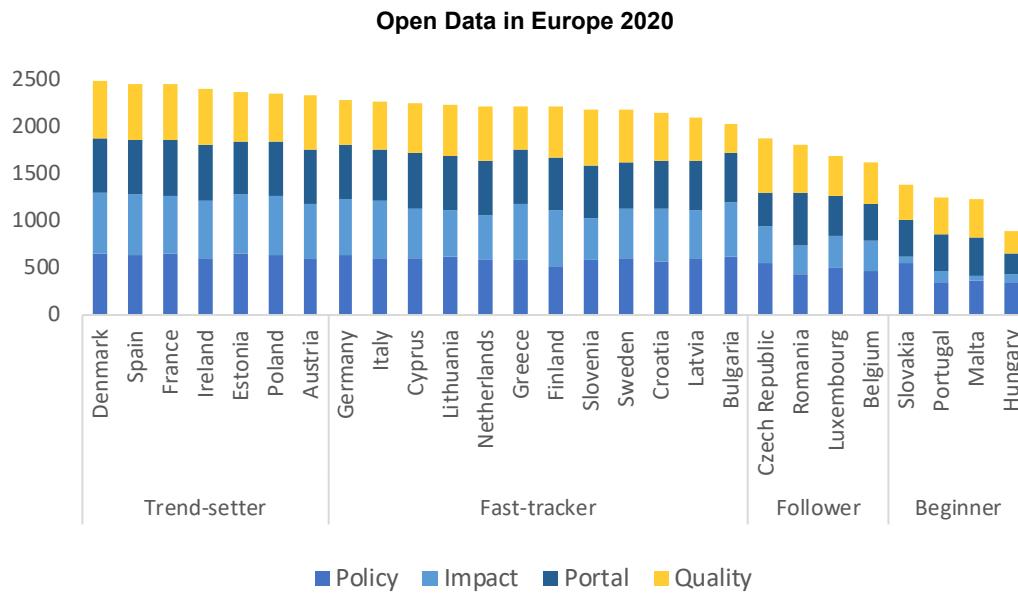
Source: Open Data Maturity Report 2020, European Data Portal, European Commission, 2020
(https://www.europeandataportal.eu/en/dashboard/2020)

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Inteligência Artificial e Blockchain

Overview of Member States' Artificial Intelligence strategies as of February 2020

Country		Status	Date
	Austria	Final draft	June 2019
	Belgium	In progress	
	Bulgaria	In progress	
	Croatia	Final draft	Nov. 2019
	Cyprus	Published	Jan. 2020
	Czech Republic	Published	May 2019
	Denmark	Published	March 2019
	Estonia	Published	July 2019
	Finland	Published	Oct. 2017
	France	Published	March 2018
	Germany	Published	Nov. 2018
	Greece	In progress	
	Hungary	Action plan	Nov. 2019
	Ireland	In progress	

| Country		Status	Date
	Italy	Final draft	July 2019
	Latvia	Published	Feb. 2020
	Lithuania	Published	April 2019
	Luxembourg	Published	May 2019
	Malta	Published	Oct. 2019
	Netherlands	Published	Oct. 2019
	Poland	Final draft	Aug. 2019
	Portugal	Published	June 2019
	Romania	In progress	
	Slovakia	Published	Oct. 2019
	Slovenia	In progress	
	Spain	Final draft	Nov. 2019
	Sweden	Published	May 2019

Source: Artificial intelligence, blockchain and the future of Europe: How disruptive technologies create opportunities for a green and digital economy, European Commission and European Investment Bank, 2021

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Overview of Member States' Blockchain strategies as of May 2020

Country		Status	Date
	Austria	None	
	Belgium	None	
	Bulgaria	None	
	Croatia	None	
	Cyprus	Published	Jun 2019
	Czech Republic	Other activities	May 2019
	Denmark	None	
	Estonia	Other activities	
	Finland	Proposed	May 2019
	France	In progress	Apr 2019
	Germany	Published	Sep 2019
	Greece	None	
	Hungary	None	
	Ireland	Other activities	May 2019

Country		Status	Date
	Italy	In progress	Dec 2018
	Latvia	In progress	Feb 2019
	Lithuania	Other activities	Mar 2020
	Luxembourg	Other activities	Jun 2018
	Malta	Published	May 2018
	Netherlands	Published	Jun 2018
	Poland	None	
	Portugal	None	
	Romania	None	
	Slovakia	Published	2019
	Slovenia	Action planned	May 2018
	Spain	None	
	Sweden	None	

Source: Artificial intelligence, blockchain and the future of Europe: How disruptive technologies create opportunities for a green and digital economy, European Commission and European Investment Bank, 2021

COVID-19 Hindsight
Risks that worsened the most since the start of the COVID-19 crisis

■ Economic   ■ Environmental   ■ Geopolitical   ■ Societal   ■ Technological

Risk	%
Social cohesion erosion	27.8%
Livelihood crises	25.5%
Climate action failure	25.4%
Mental health deterioration	23.0%
Extreme weather	22.7%
Debt crises	13.8%
Cybersecurity failures	12.4%
Infectious diseases	10.9%
Digital inequality	10.5%
Backlash against science	9.5%
Biodiversity loss	8.4%
Geoeconomic confrontations	8.2%
Human environmental damage	7.8%
Youth disillusionment	7.1%
Interstate relations fracture	7.0%
Prolonged stagnation	6.9%
Asset bubble burst	6.7%
Social security collapse	6.2%
Involuntary migration	5.4%
Adverse tech advances	5.3%
Tech governance failure	4.5%
Geopolitical resource contestation	4.4%
Digital power concentration	4.3%
Public infrastructure failure	4.2%
Industry collapse	4.1%
Price instability	3.3%
Commodity shocks	3.0%
Interstate conflict	2.9%
Natural resource crises	2.7%
State collapse	2.6%
IT infrastructure breakdown	2.4%
Multilateralism collapse	2.2%
Illicit economic activity	2.2%
Pollution harms to health	1.9%
Terrorist attacks	1.6%
Geophysical disasters	0.8%
Weapons of mass destruction	0.3%

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Concerns about using the internet for activities such as online banking or buying goods and services online (% concerned about someone misusing personal data)
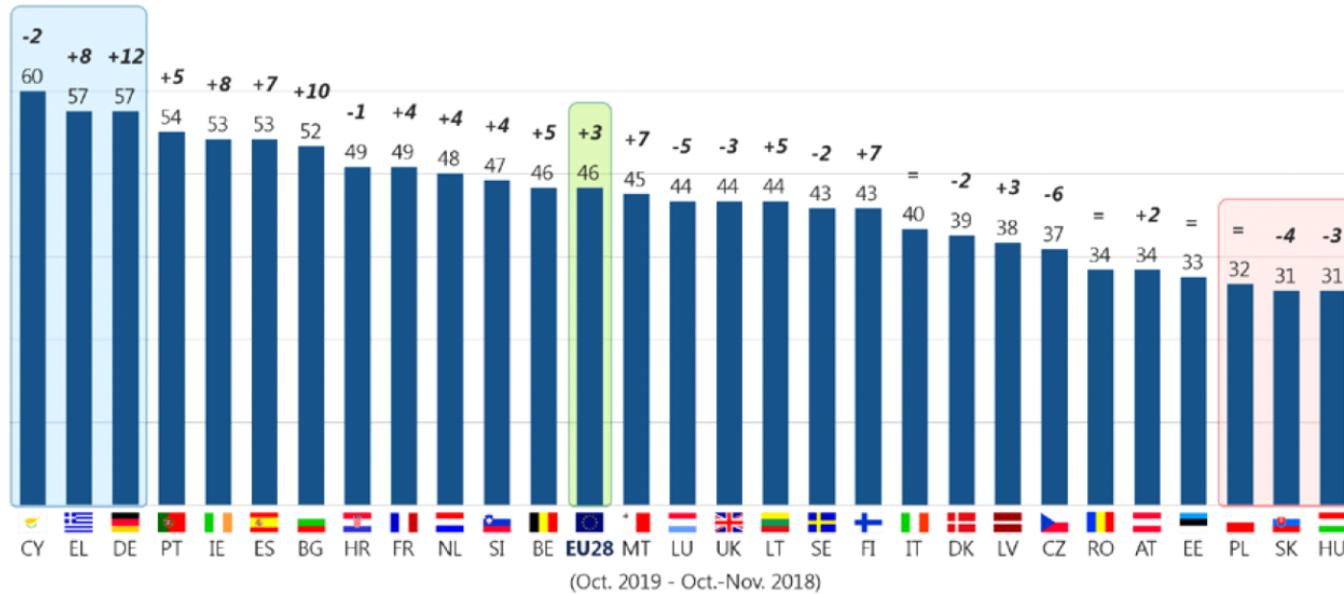
Base: respondents who use the Internet (N=23,420)

Source: Europeans' attitudes towards cyber security, Special Eurobarometer 499, European Commission, January 2020

Concerns about using the internet for activities such as online banking or buying goods and services online (% concerned about security of online payments)
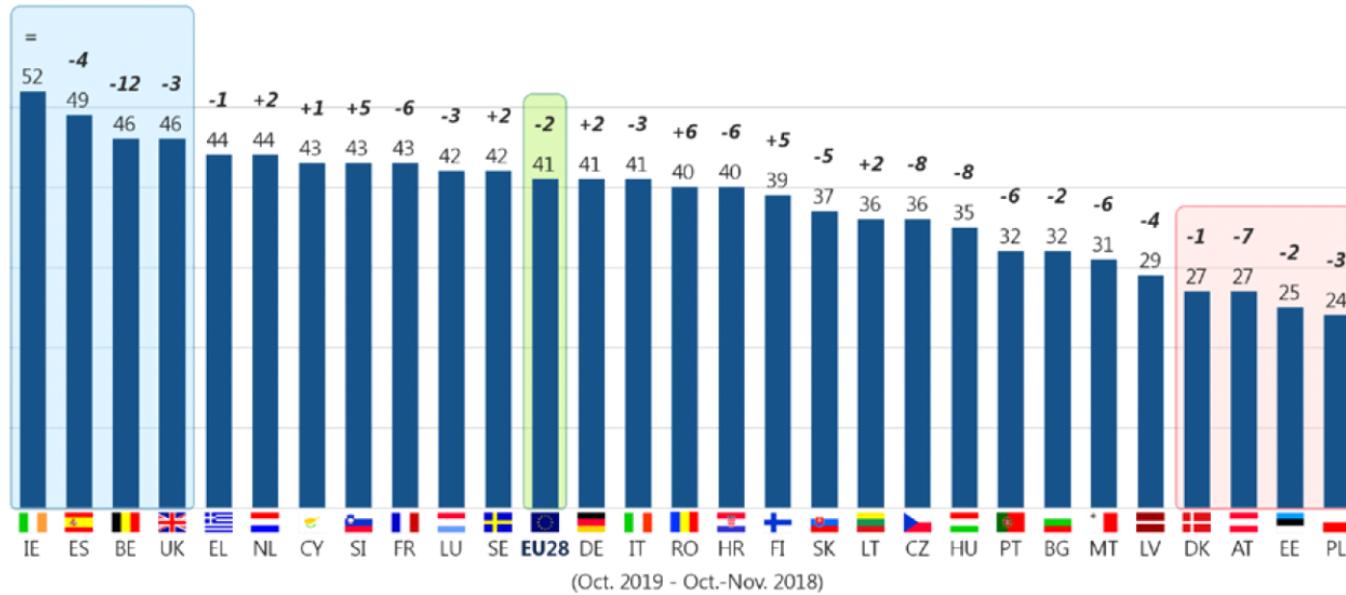
	IE	ES	BE	UK	EL	NL	CY	SI	FR	LU	SE	EU28	DE	IT	RO	HR	FI	SK	LT	CZ	HU	PT	BG	MT	LV	DK	AT	EE	PL
Change	=	-4	-12	-3	-1	+2	+1	+5	-6	-3	+2	-2	+2	-3	+6	-6	+5	-5	+2	-8	-8	-6	-2	-6	-4	-1	-7	-2	-3
%	52	49	46	46	44	44	43	43	43	42	42	41	41	41	40	40	39	37	36	36	35	32	32	31	29	27	27	25	24

(Oct. 2019 - Oct.-Nov. 2018)

Base: respondents who use the Internet (N=23,420)

Source: Europeans' attitudes towards cyber security, Special Eurobarometer 499, European Commission, January 2020

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People that feel well informed about the risks of cybercrime (%)
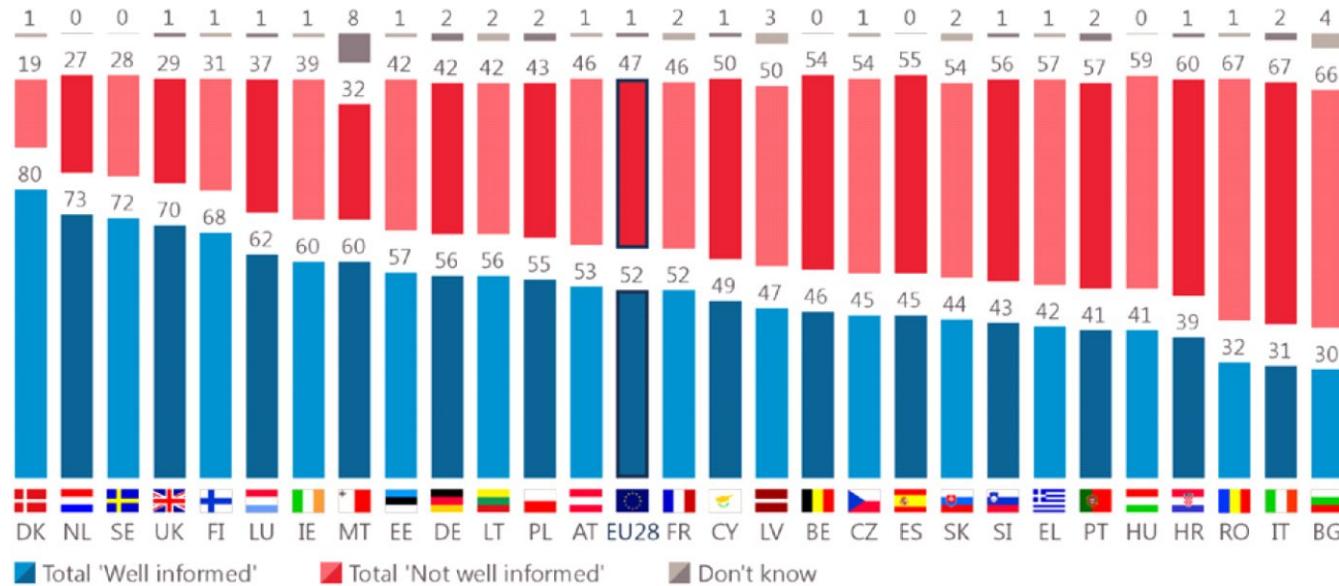
Base: all respondents (N=27,609)

Source: Europeans' attitudes towards cyber security, Special Eurobarometer 499, European Commission,

January 2020

Cybercrime - Complaints received

(2016 - 2020)
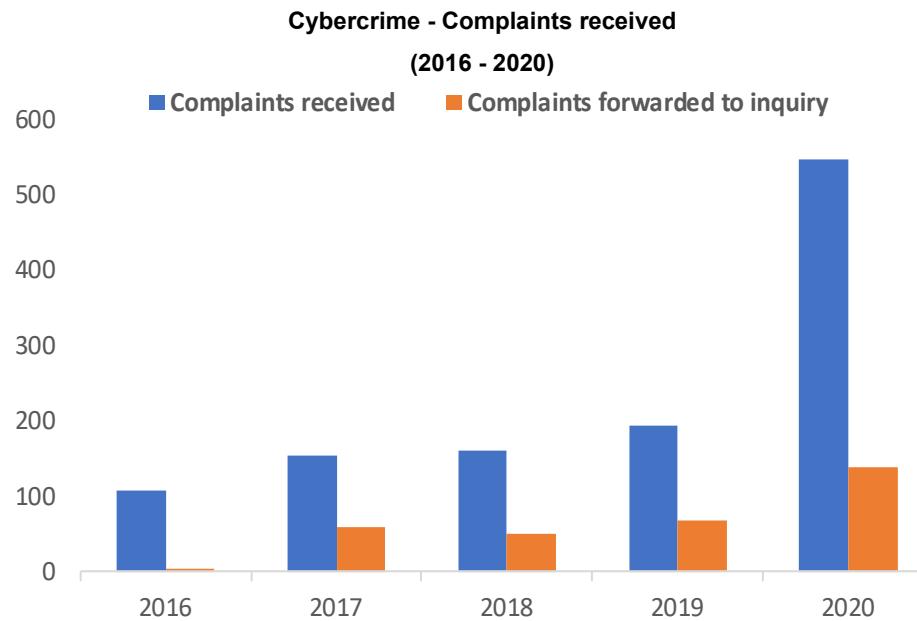
Source: Cibercrime - denúncias recebidas 2020, Gabinete de Cibercrime da Procuradoria-Geral da República, 2021

(https://cibercrime.ministeriopublico.pt/pagina/cibercrime-em-2020-denuncias-recebidas)

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Cibersegurança e Privacidade

Global Cybersecurity Index 2020 – Portugal

(Country profile)
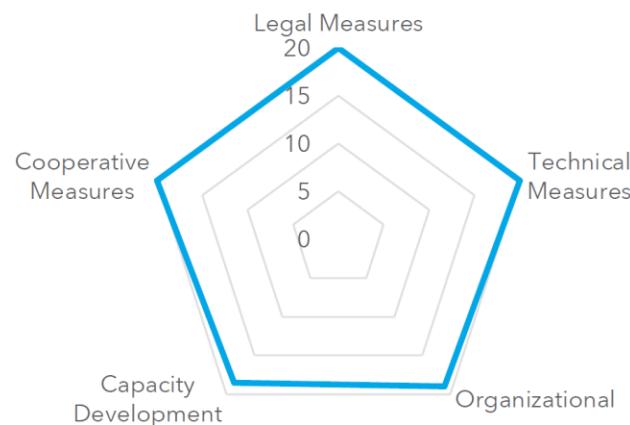
Development Level:
Developed Country

Area(s) of Relative Strength
Legal, Technical, Cooperative
Measures

Area(s) of Potential Growth
Organizational, Capacity
Development

Overall Score	Legal Measures	Technical Measures	Organizational Measures	Capacity Development	Cooperative Measures
97.32	20.00	20.00	18.98	18.34	20.00

Source: ITU Global Cybersecurity Index v4, 2021

Source: Global Cybersecurity Index 2020, International Telecommunication Union, 2021

Individuals who did not submit official forms online due to privacy and security concerns

(As a percentage of individuals having chosen not to submit official forms online, 2018)
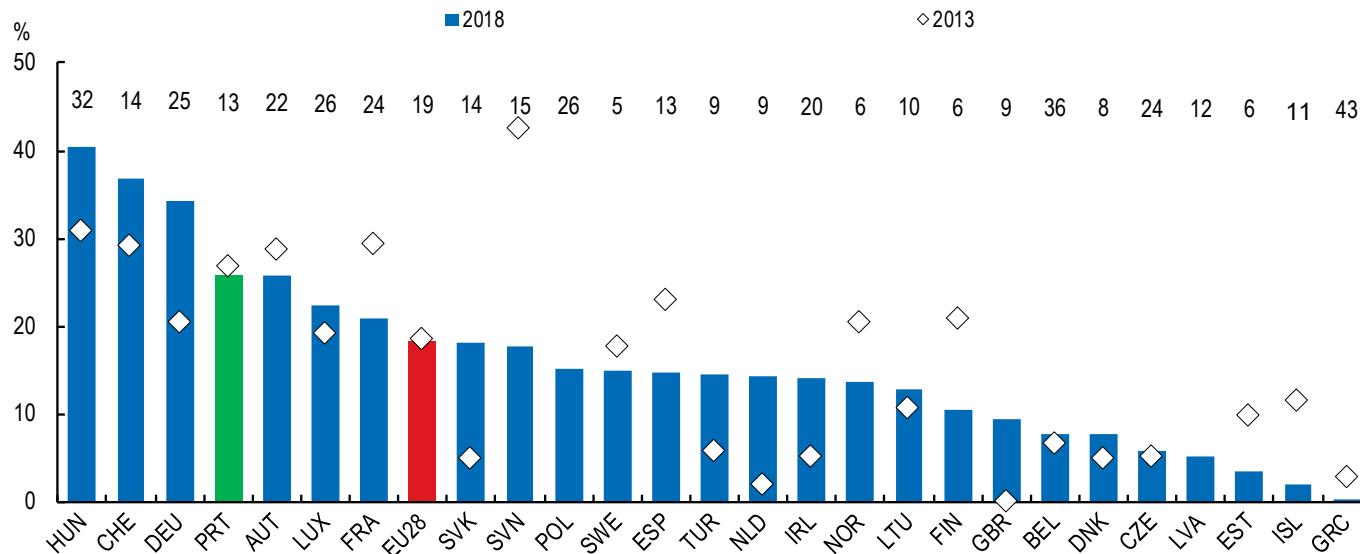
Source: Measuring the Digital Transformation - A Roadmap for the Future, OECD, 2019 [OECD, based on Eurostat, Digital Economy and Society Statistics, Comprehensive Database, December 2018.]

Concerns about online activities being recorded to provide tailored advertising

(As a percentage of individuals, 2016)
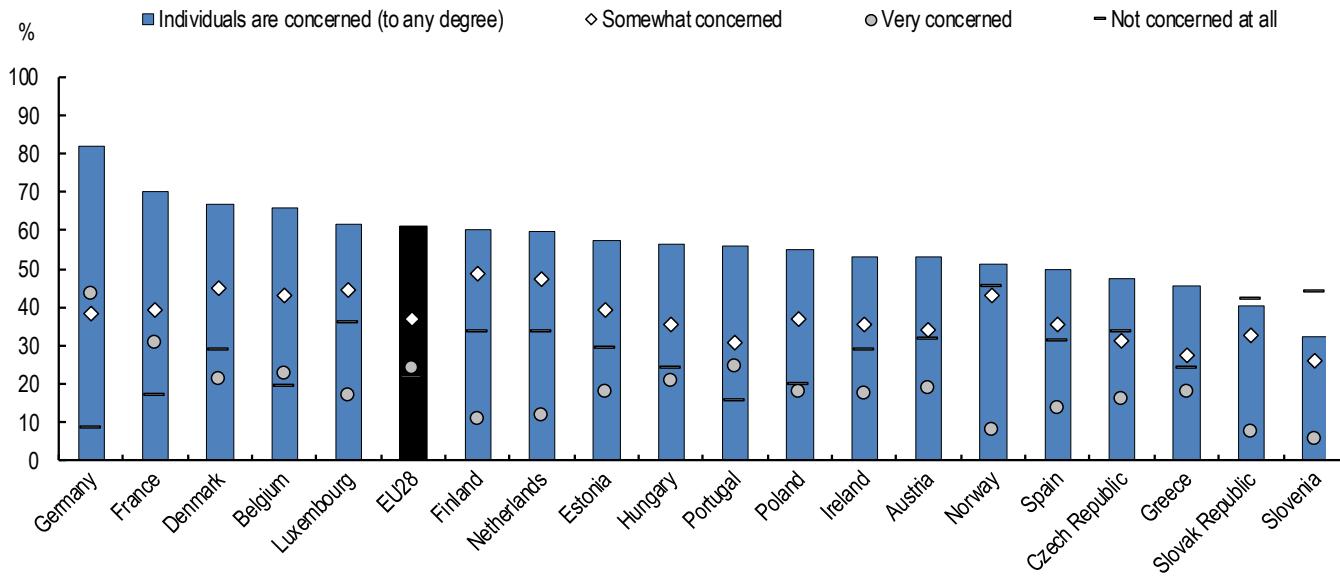
Source: OECD Digital Economy Outlook, OECD, 2017 [Eurostat, Digital Economy and Society (database),
http://ec.europa.eu/eurostat/web/digital-economy-and-society/data/comprehensive-database.]

Individuals who experienced phishing and pharming attacks

(As a percentage of all Internet users, 2019)
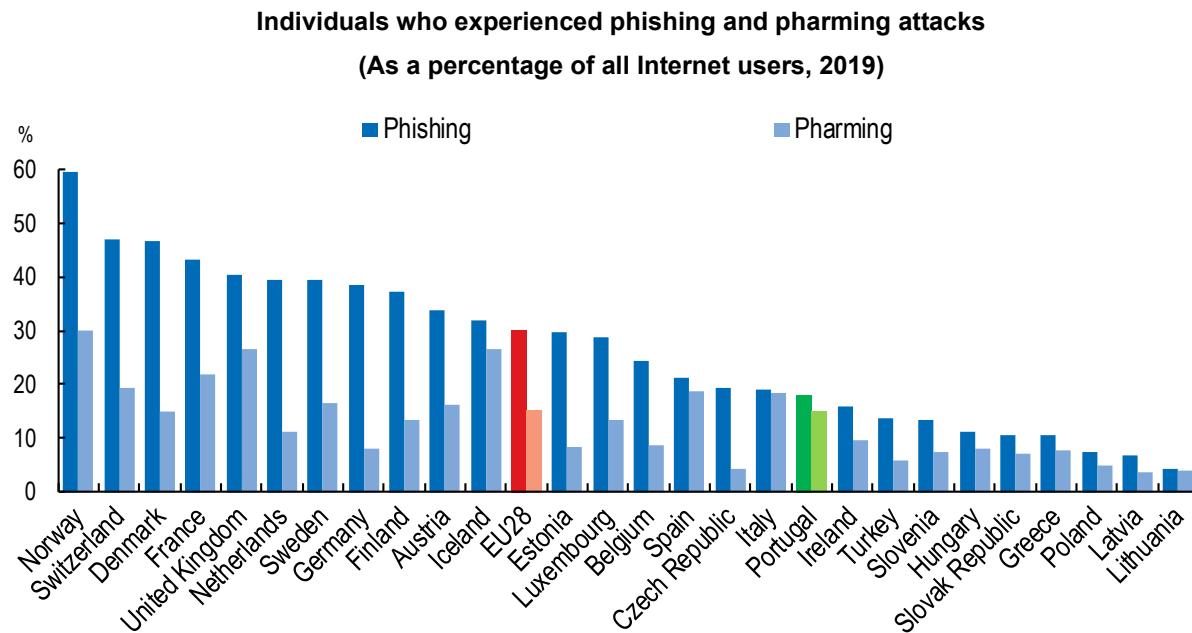
Notes: Phishing relates to receiving fraudulent messages. Pharming relates to being redirected to fake websites asking for personal information.

Source: OECD Digital Economy Outlook 2020, OECD, 2020 [OECD based on Eurostat, Digital Economy and Society Statistics, Comprehensive Database.]

Enterprises making ICT risk assessment, by size

(As a percentage of enterprises in each employment size class, 2019)
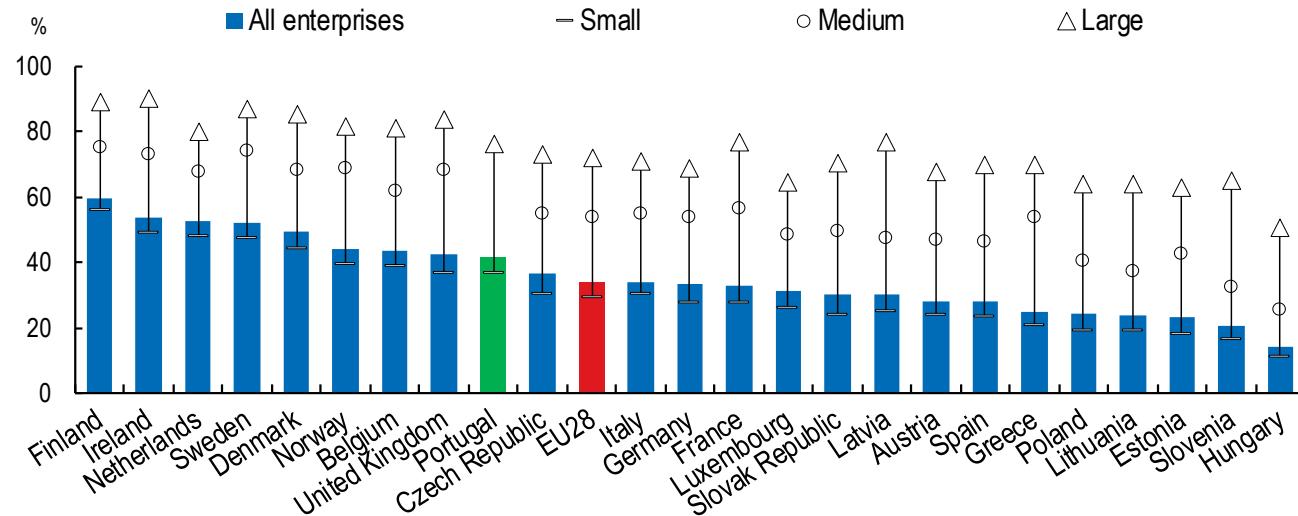
Note: Risk assessment: periodical assessment of probability and consequences of ICT security incidents.

Source: OECD Digital Economy Outlook 2020, OECD, 2020 [OECD based on Eurostat, Digital Economy and Society Statistics, Comprehensive Database.]

ICT security in enterprises, by country

(% of enterprises, 2019)

■ Enterprises make persons employed aware of their obligations in ICT security related issues
■ Enterprises have document(s) on measures, practices or procedures on ICT security
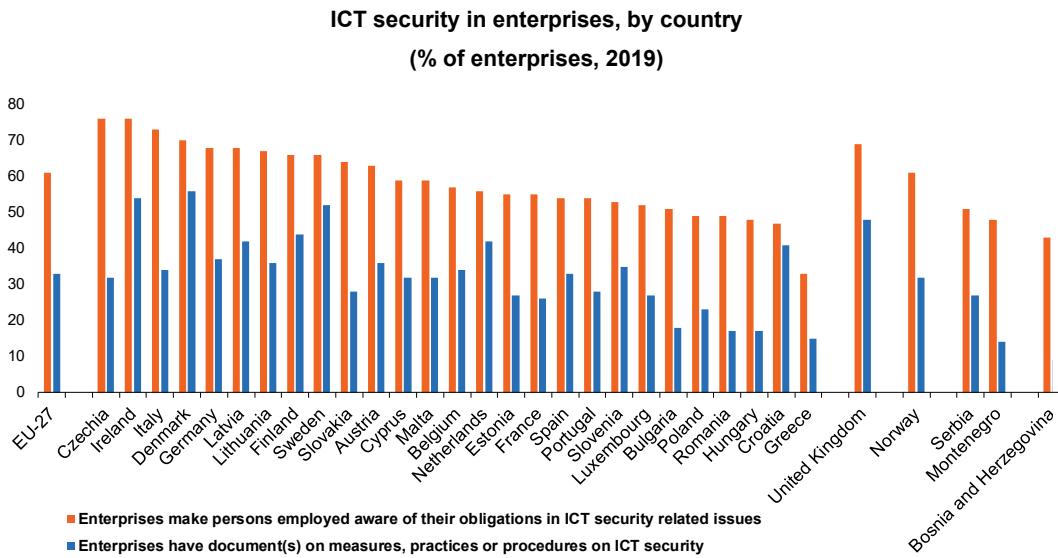
Source: Digital Economy and Society Statistics, Eurostat (online data code: isoc_cisce_ra)

Enterprises making persons employed aware of their obligations in issues related to ICT security, by size (As a percentage of enterprises in each employment size class, 2019)
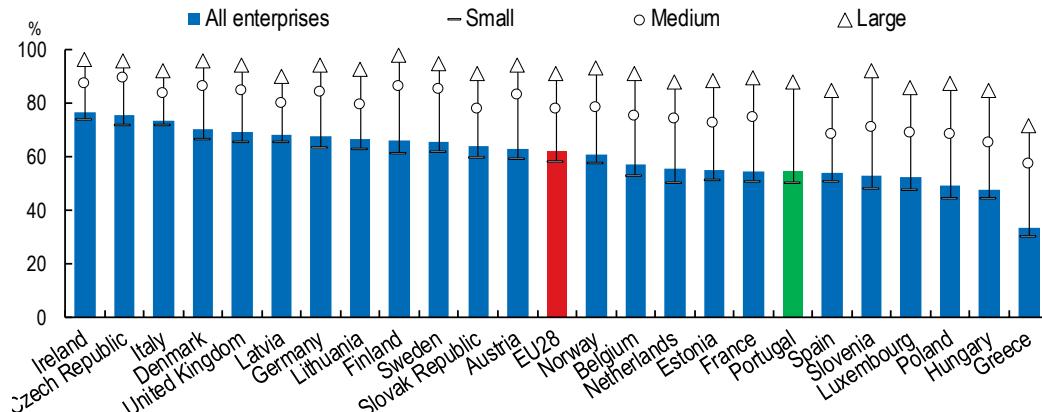
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Source: OECD Digital Economy Outlook 2020, OECD, 2020 [OECD based on Eurostat, Digital Economy and Society Statistics, Comprehensive Database.]

Enterprises with insurance against ICT security incidents, by size

(As a percentage of enterprises in each employment size class, 2019)
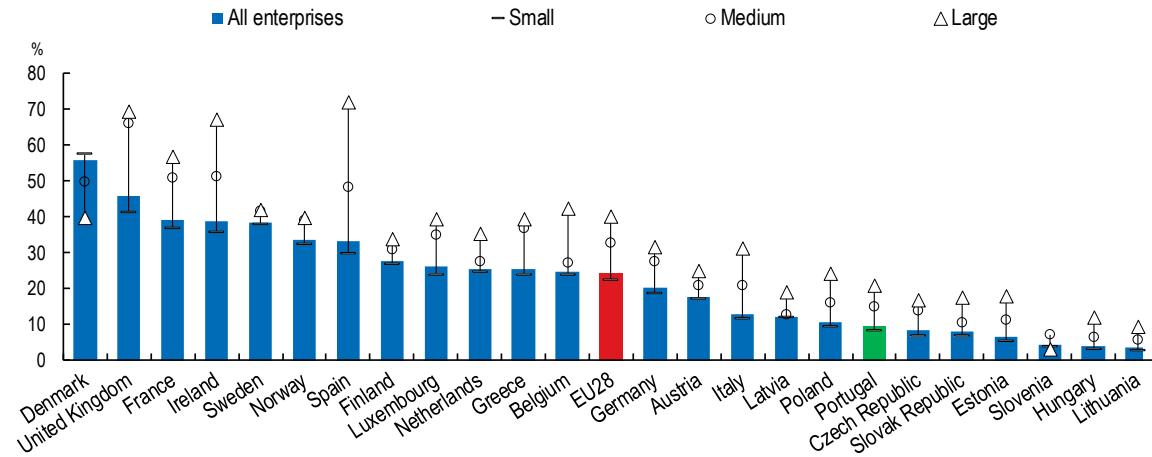
Source: OECD Digital Economy Outlook 2020, OECD, 2020 [OECD based on Eurostat, Digital Economy and Society Statistics, Comprehensive Database.]

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Data protection laws around the world
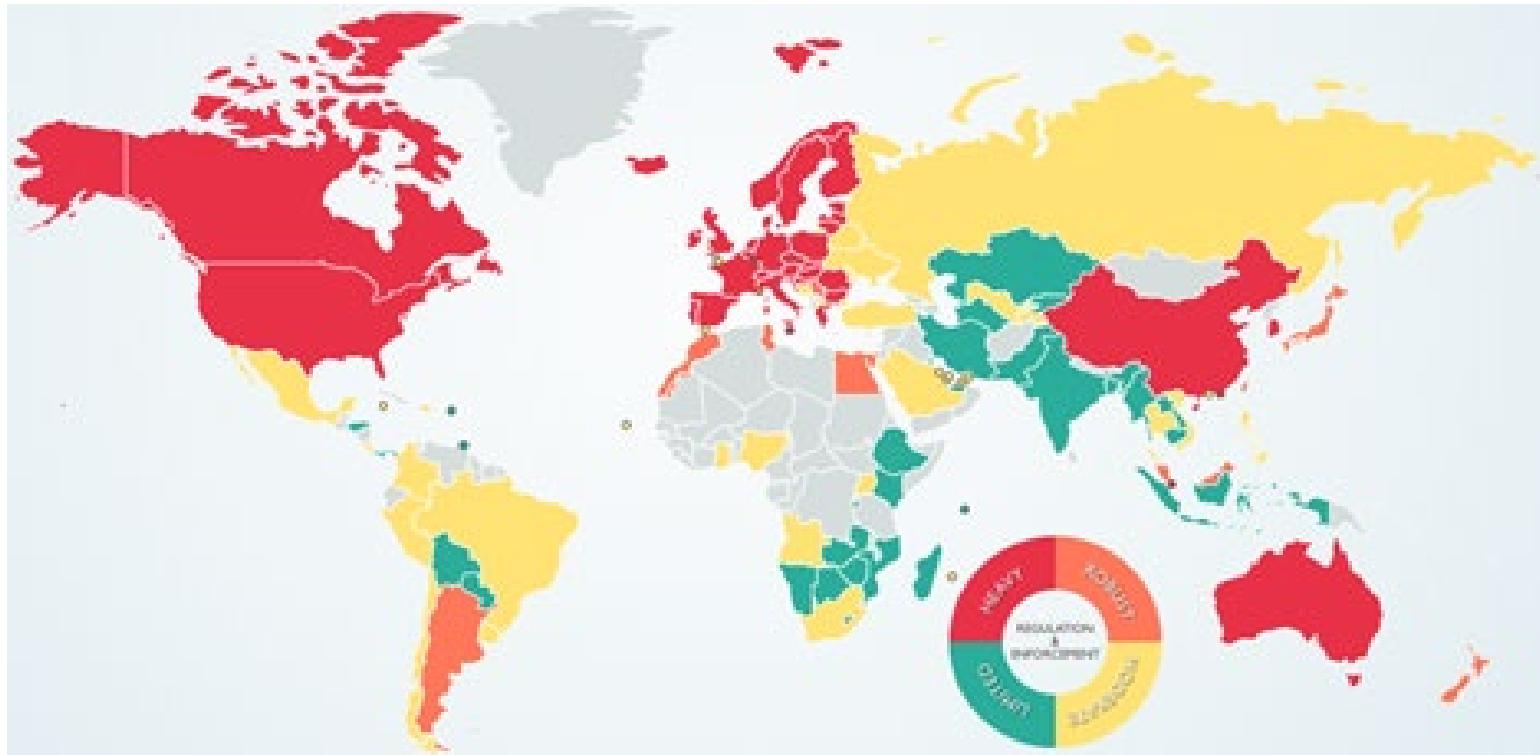
Source: DLA Piper Data Protection Laws of the World (information accessed June 26, 2021), 2021

(**https://www.dlapiperdataprotection.com/**)

Individuals who have basic or above basic overall digital skills

(Percentage of individuals, 2019)
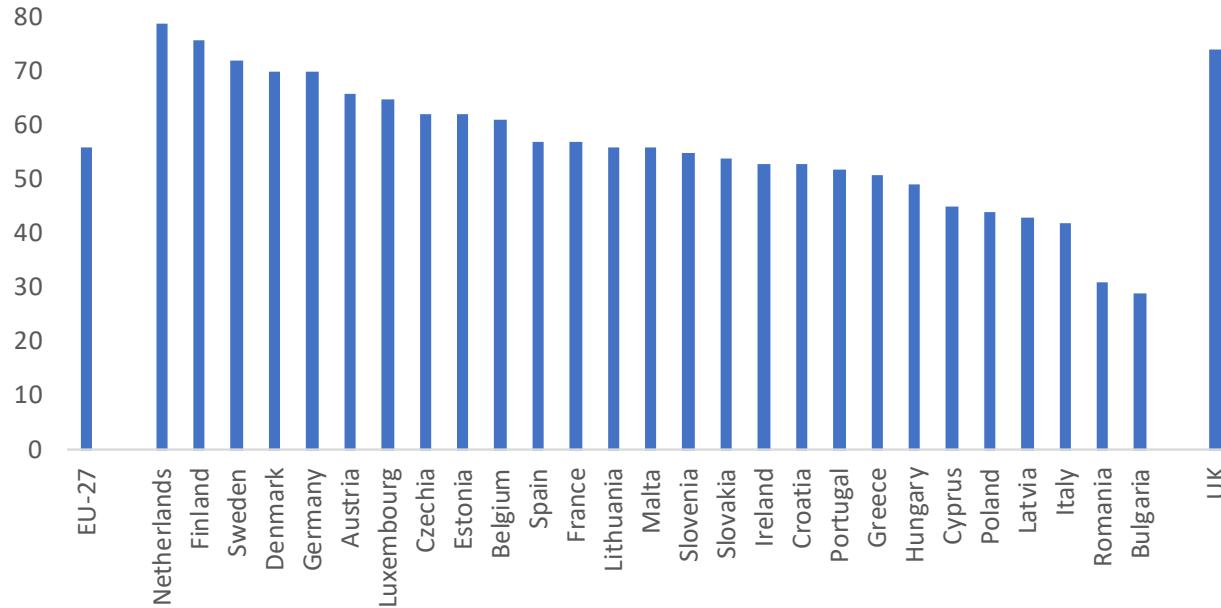
Source: Individuals' level of digital skills, Eurostat (online data code: isoc_sk_dskl_i)

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Access to digital learning

(Percentage of students that have access to a computer they can use for schoolwork, 2018)
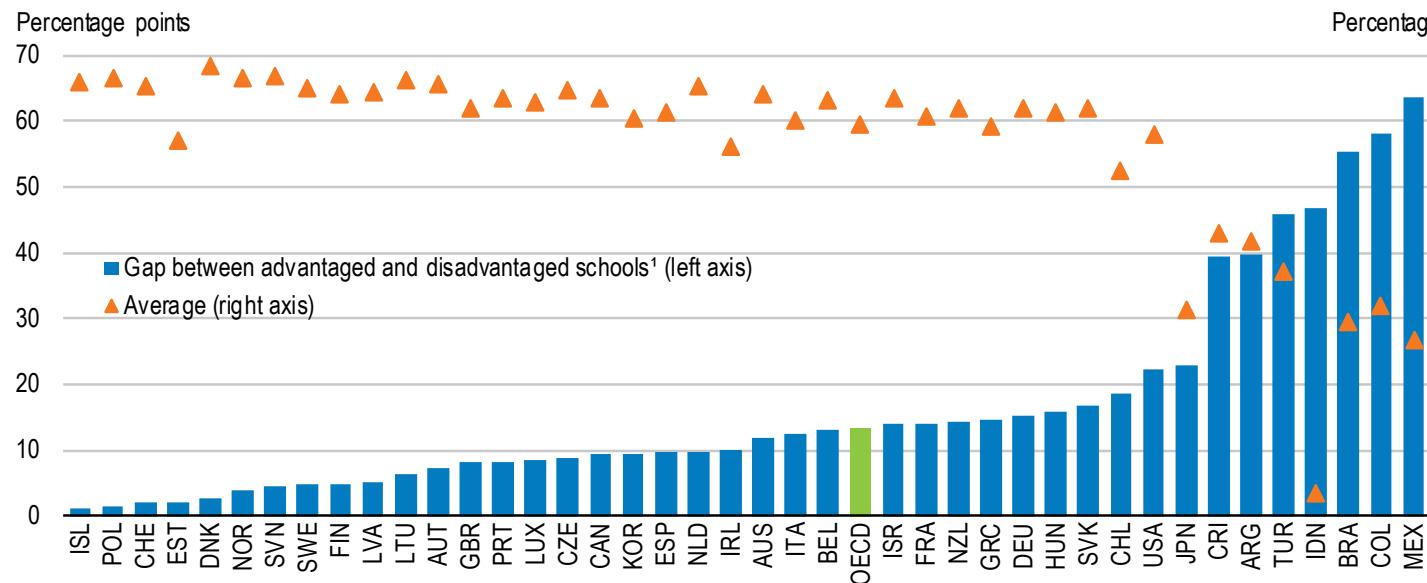
Source: OECD, Going for Growth 2021: Shaping A Vibrant Recovery (PISA Database)

Tertiary education (levels 5-8) in the field of Information and Communication Technologies

(Percentage of graduates, 2018)
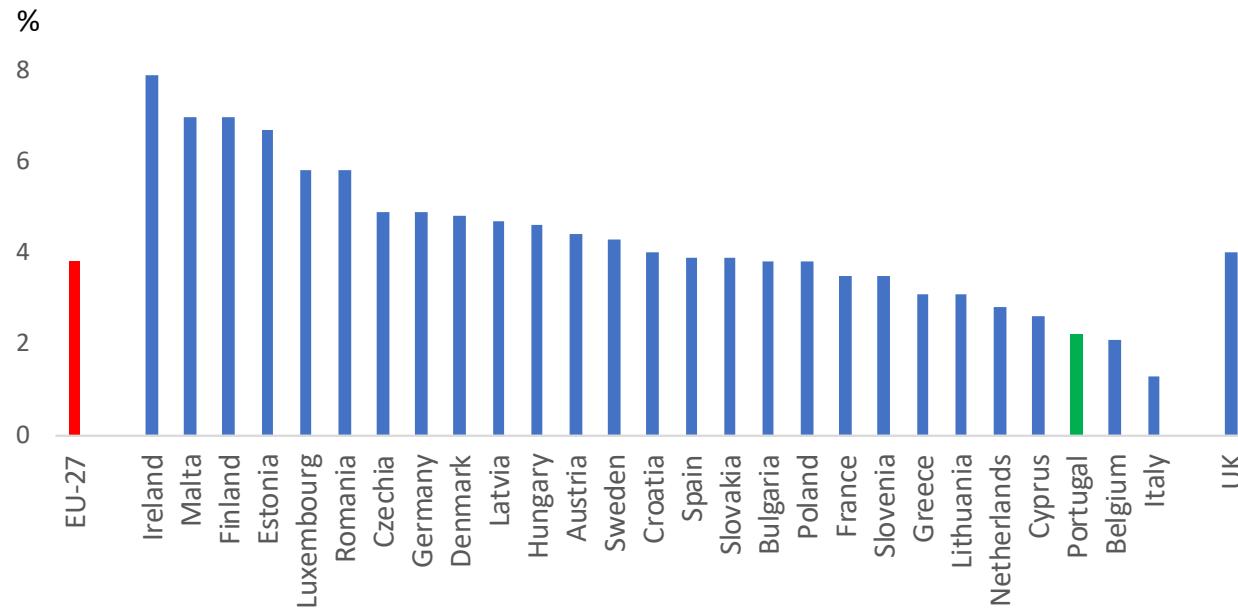
Source: Eurostat (online data code: educ_uoe_grad03)

Individuals holding master's (ISCED7) and doctorate (ISCED8) level degrees in ICT

(As a percentage of graduates in all fields, by sex and attainment level, 2016)
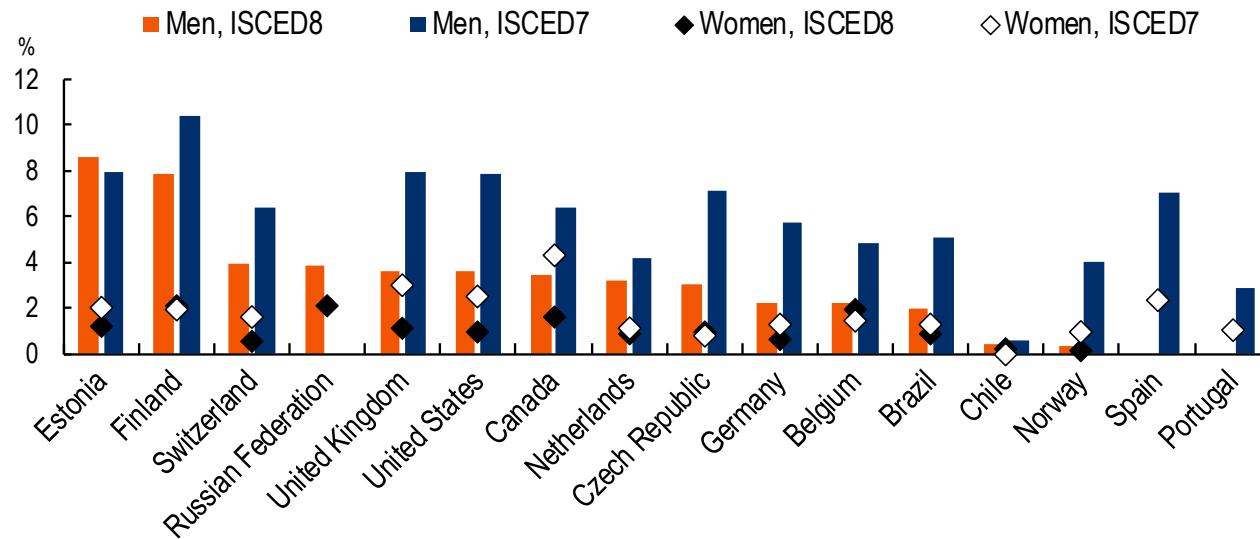
Note: ICT = information and communication technology.

Source: The Digitalisation of Science, Technology and Innovation: Key Developments and Policies, OECD, 2020 [OECD calculations based on OECD data collection on Careers of Doctorate Holders 2017 (database), http://oe.cd/cdh.]

Employed ICT specialists

(Percentage of total employment, 2019)

Source: Eurostat (online data code: isoc_sks_itspt)

Employed ICT specialists by sex
(Percentage, 2019)
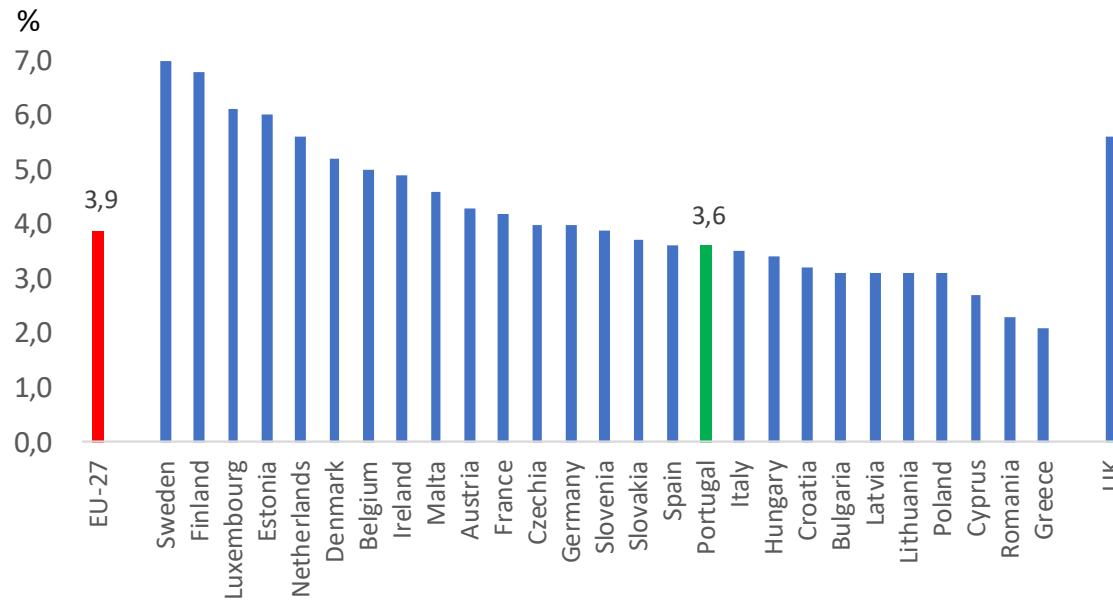
Source: Eurostat (online data code: isoc_sks_itsps)
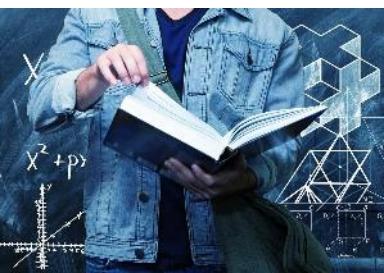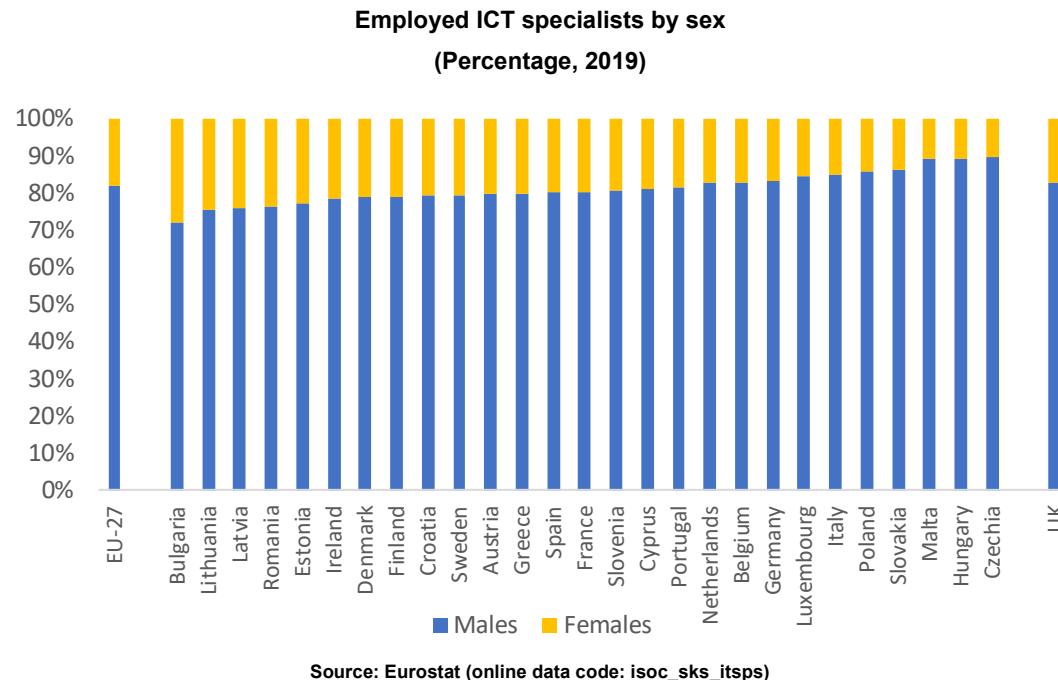
Participation in online courses

(Percentage of individuals participating in online courses, in 2019 or latest available year)
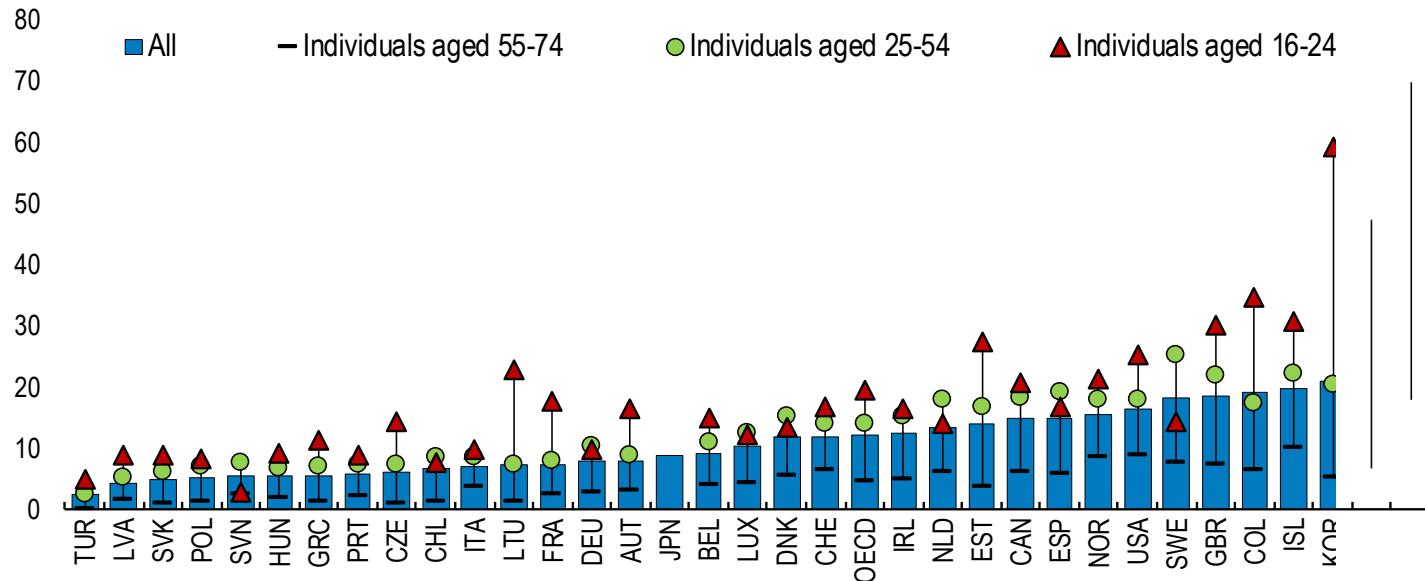
Note: Data refer to 2018 for Canada, Columbia, Japan and Mexico, 2017 for United States.

Source: OECD ICT Access and Usage by Individuals Database

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Cross-country AI skills penetration (2015-19)
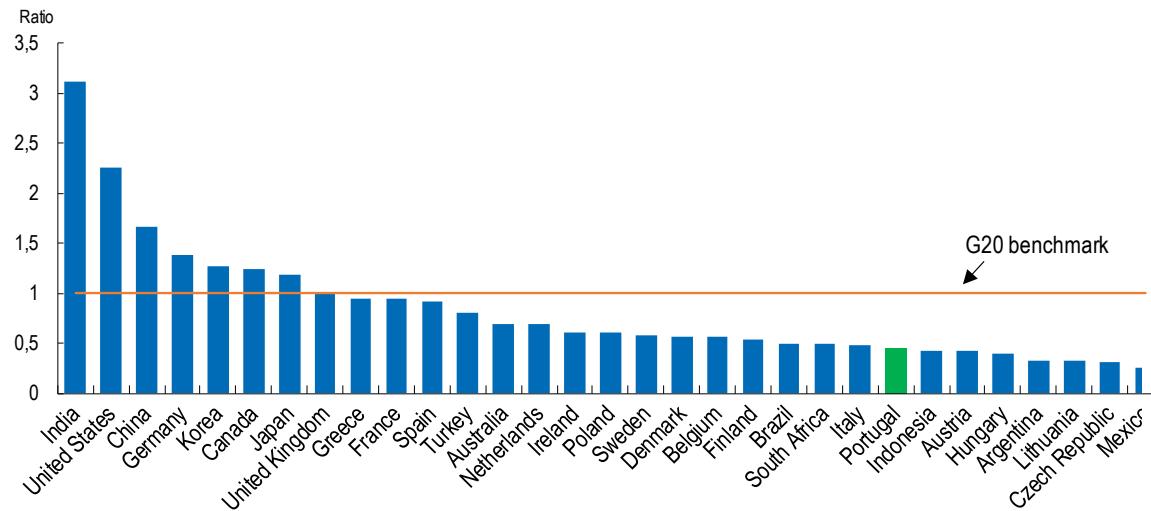
Notes: Average from 2015 to 2019 for a selection of countries with 100 000 LinkedIn members or more. The value represents the ratio between a country's AI skill penetrations and the benchmark, controlling for occupations. For more information, please see the methodological note at www.oecd.ai. [https://oecd.ai/methodology]

Source: OECD Digital Economy Outlook 2020, OECD, 2020 [OECD AI Policy Observatory, www.oecd.ai]

Prevalence of telework across EU Member States (% of Employed persons usually working from home as a percentage of the total employment, 2010, 2018 and 2019)

Source : Eurostat (online data code: lfsa_ehomp)

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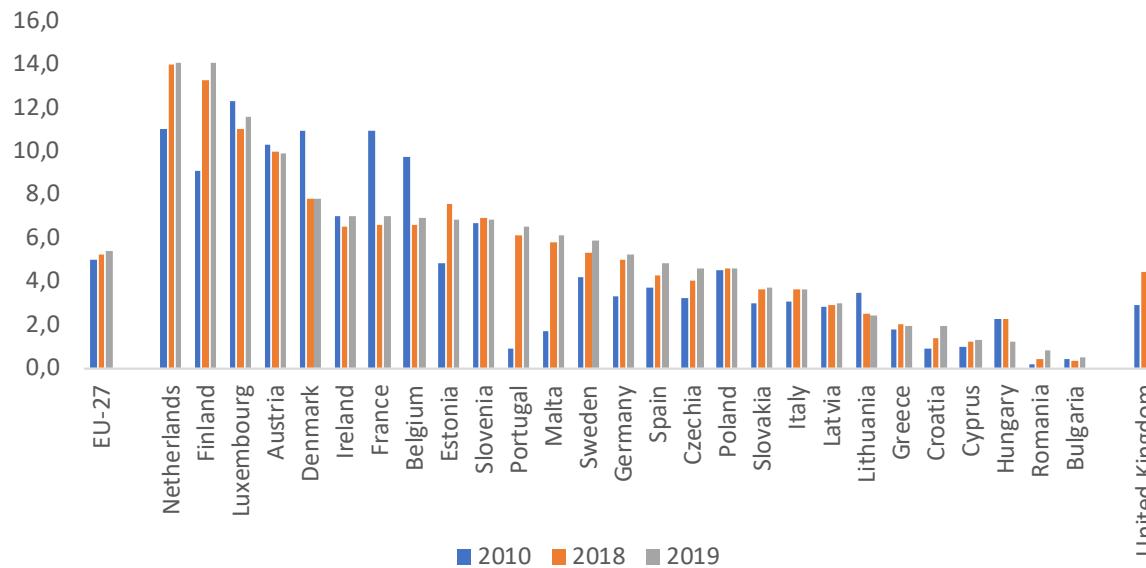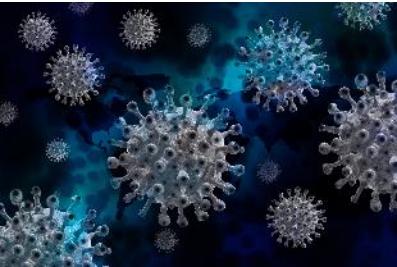
Impact of Covid-19 on mobile internet speeds (Month-on-month change in the average download speed of mobile internet connections from February to March 2020)
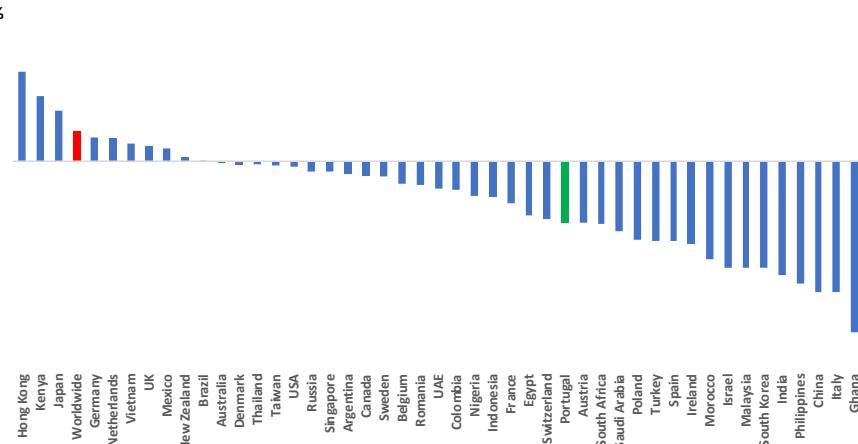
Note: Figures compare average download speeds for mobile internet connections in March 2020 to February 2020, except for China where figures compare average download speeds in February 2020 to January 2020 due to the earlier lockdown in mainland China.

Source: Digital 2020 – Ookla (April 2020), We Are Social/Hootsuit, 2020

Impact of Covid-19 on fixed internet speeds (Month-on-month change in the average download speed of fixed internet connections from February to March 2020)
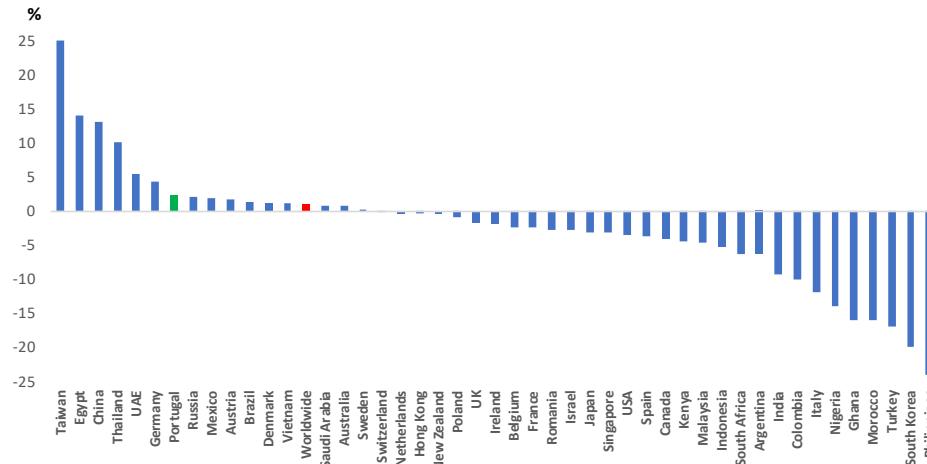

Note: Figures compare average download speeds for fixed internet connections in March 2020 to February 2020, except for China where figures compare average download speeds in February 2020 to January 2020 due to the earlier lockdown in mainland China.

Source: Digital 2020 – Ookla (April 2020), We Are Social/Hootsuit, 2020

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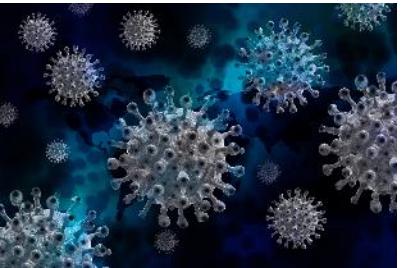
Employed Population in Portugal in Teleworking

**(% of employed population)**
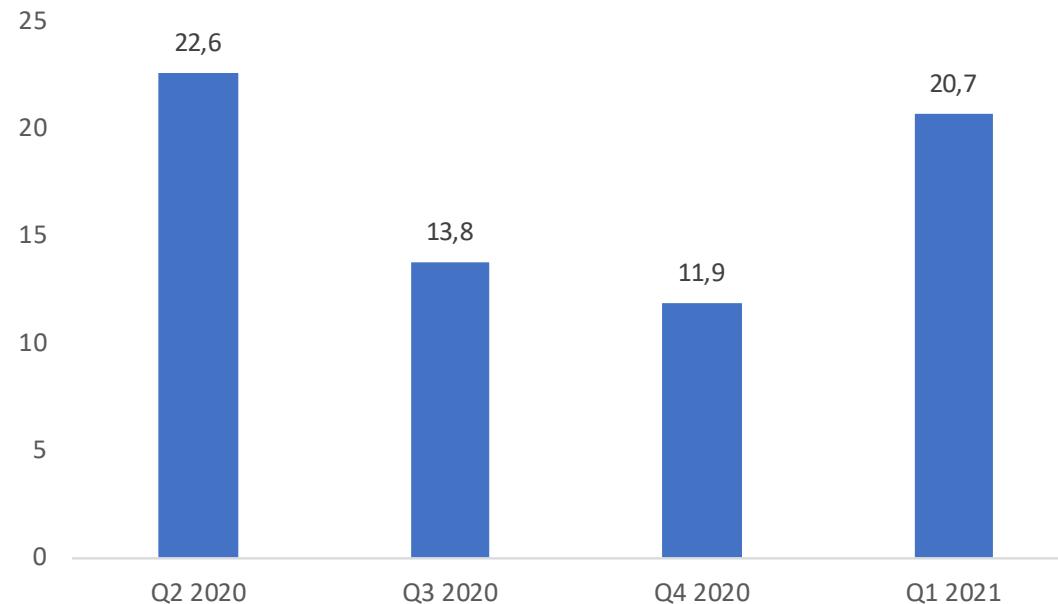
Source: Labour Force Survey, Instituto Nacional de Estatística - Statistics Portugal, 2021
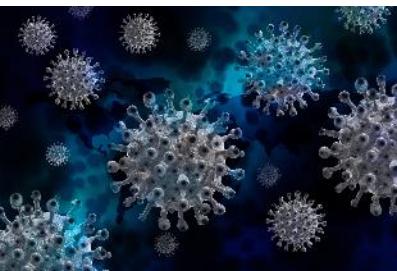
Levels of telework

(Share of respondents who started to work from home before the pandemic and because of it, as compared to the share of respondents who worked from home several times a month before)
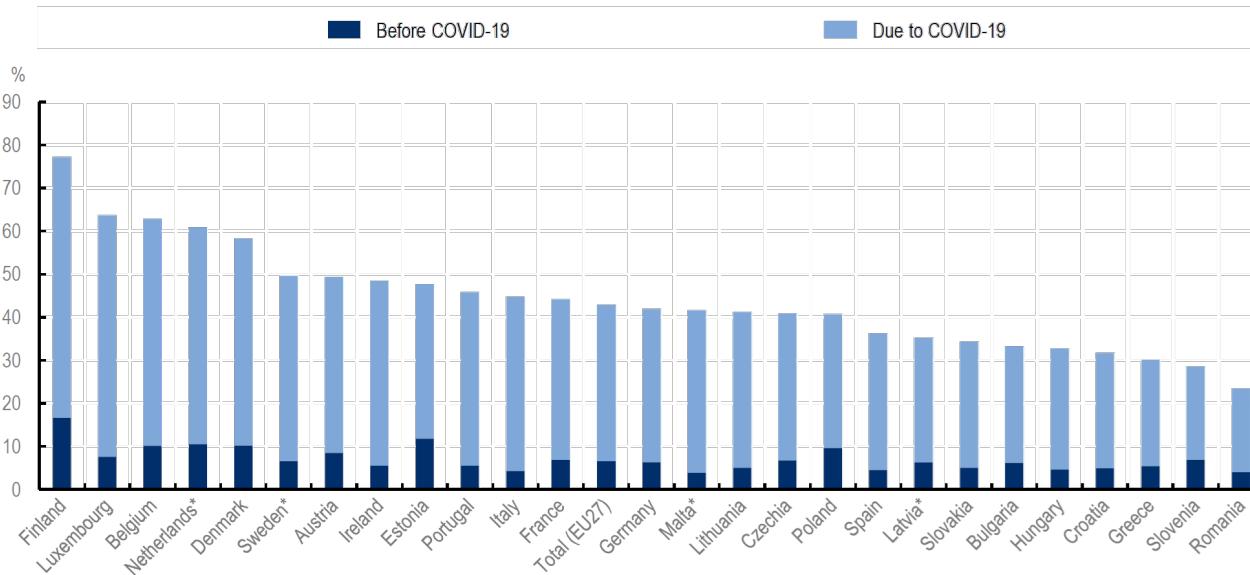

Note: The data show the share of EU27 respondents answering "yes" when asked "Have you started to work from home as a result of the COVID-19 situation?" and the share of respondents answering "several times a month" when asked "How frequently did you work from home before the outbreak of COVID-19?". * : Lower reliability.

Source: Eurofound (2020), "Living, working and COVID-19 dataset, Dublin", http://eurofound.link/covid19data.
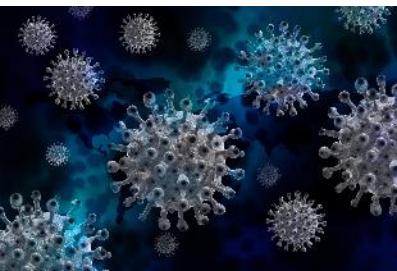
SMEs that increased digitalisation due to containment measures (Share of SMEs that increased digitalisation in 2020 (%) vs. the stringency of containment measures (index))
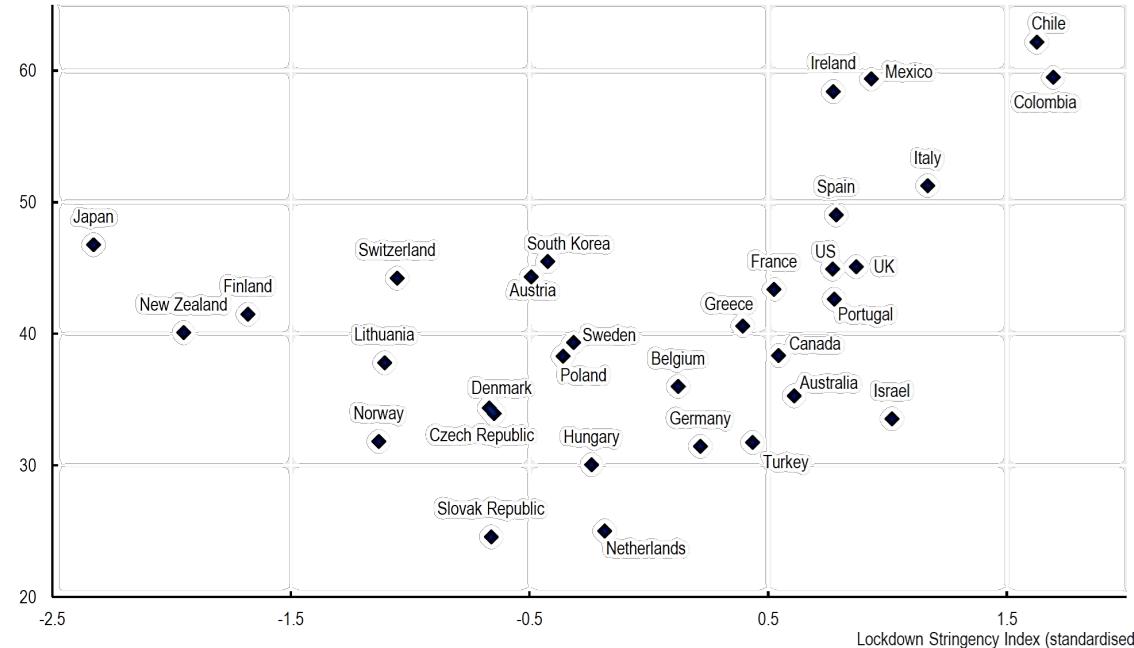
73
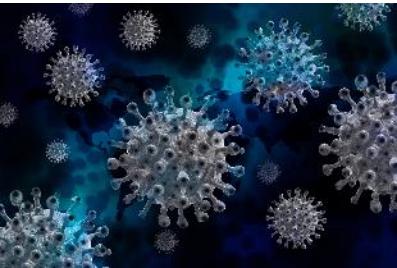
- ➢ EU's Digital Strategy

- ➢ EU's Digital Decade

- ➢ National Strategy for Digital Transition

- ➢ AI Portugal 2030 national strategy

- ➢ Recovery and Resilience Plan

- ➢ Strategy and Transversal Action Plan for the Digital Transformation of Public Administration

- ➤ Adoção digital pelos cidadãos

- ➤ Adoção digital pelas empresas

- ➤ Teletrabalho

- ➤ Educação/Ensino

- ➤ Qualificações

- ➤ Desigualdade digital

- ➤ Administração Pública

- ➤ Comércio Eletrónico

- ➤ Infraestrutura tecnológica

- ➤ Barreiras ao comércio

- ➤ Cibersegurança

- ➤ Inteligência Artificial e Blockchain

- ➤ 5G

➢ Impactos imediatos

➢ PRR como resposta no curto prazo

➢ Importância de acelerar a transição digital

➢ Soberania digital e redução de dependências estratégicas

➢ Guerra digital

➢ Ciberdefesa

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Muito obrigado.

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