THE DISABILITY DIGITAL DIVIDE AND ITS LINKS WITH WELLBEING IN EUROPE REPORT E-WELLBEING Project

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THE DISABILITY DIGITAL DIVIDE AND ITS LINKS WITH WELLBEING IN EUROPE

REPORT

April 2024

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E-WELLBEING Project

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Index

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1. Introduction

In the early 1990s, the rapid spread of Information and Communication Technologies (ICTs) generated significant academic interest in understanding the economic effects of these technologies. As ICTs, especially the internet, became essential to daily life, attention in both academic and public areas expanded to consider not only their potential economic impacts but also their social consequences, such as their effects on wellbeing.

The diffusion of ICTs has been accompanied by notable efforts to reduce digital divides, these are, the disparities that exist among individuals or groups of population in terms of digital access, usage, or skills. In this sense, special attention has been paid to people with disabilities.

Furthermore, literature on wellbeing identifies the condition of disability as a factor that general and negatively affects individuals' level of wellbeing. Empirical evidence shows that individuals with disabilities tend to report lower levels of subjective wellbeing (SWB henceforth) than the rest of the population.

The present report summarizes the main findings of the project "Internet use and wellbeing in Europe (E-WELLBEING)" (Ref: TED2021-129341B-I00) as regards the extent to which the digital and wellbeing gaps of people with disabilities might be related.

In this sense, this report provides cross-country evidence for the European area using data from the European Social Survey (ESS). It aims to contribute to the advancement of knowledge regarding to the European and Spanish development strategies that seek to make the digital transition fully inclusive, leaving no one behind and guaranteeing the wellbeing of individuals in a digital society.

2. What is the disability digital divide and why it matters?

The United Nations (UN) define the digital divide as *the gap between those who have access to and use ICTs, including internet connectivity, internet-enabled devices and digital literacy skills and those who do not* (United Nations Human Settlements Programme, 2021). The first two gaps (i.e. those that refer to connectivity and devices) would constitute the so-called first level of the digital divides, while digital literacy skills would define the second level. Additionally, there is a third level of digital divides which would involve those disparities in the benefits that people derive from the use of the internet.

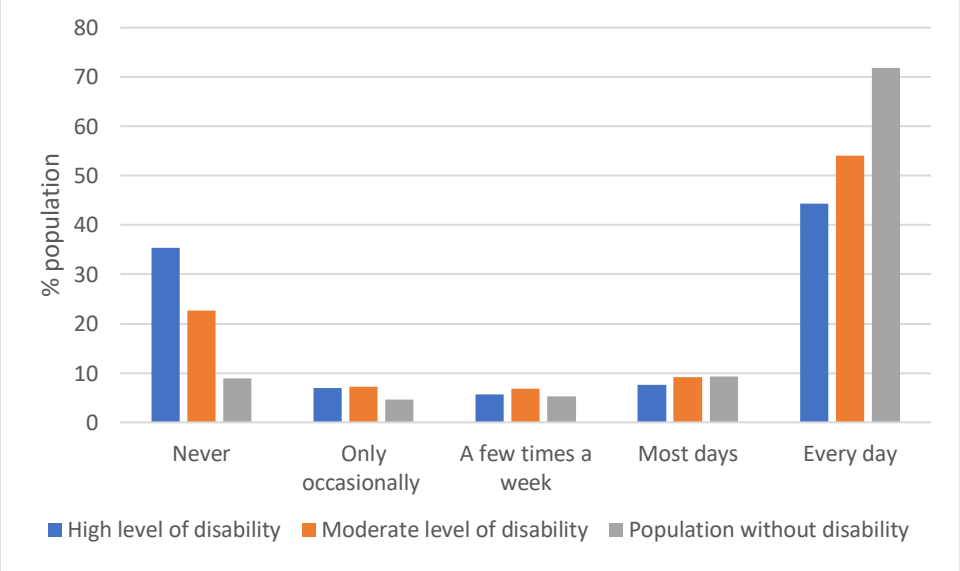
Then, digital divides refer to differences between different groups of population; accordingly, the "disability digital divide" highlights the differences that people with some form of disability - and in comparison, with the rest of the population- experience in terms of (i) the access to the internet, (ii) their level of digital skills, and (iii) the benefits they get from using the internet.

Over time the access to the internet under optimal conditions has become a prerequisite for full participation in society. Thus, digital divides are increasing the risk of exclusion of disadvantaged groups, such as people with disabilities. Hence, the importance to study the disability digital divides.

Based on data from the last three rounds of the European Social Survey (ESS ERIC, 2023a, b, c), Figures 1-4 plot some of the main figures of the disability digital divide over 21 countries[1]. People with disabilities are identified as those respondents who reported either high or moderate levels of disability when asked whether they were hampered in "daily activities in any way by any longstanding illness, disability, infirmity, or mental health problem". The overall sample includes 111,357 individuals, out of which 6,691 individuals report high levels of disability, 24,142 individuals moderate levels of disability, and the remaining 80,524 individuals no form of disability.

Figure 1 plots the frequency of internet usage by disability condition. It can be seen that, while the vast majority of people without disabilities use the internet on a daily basis (72%), about a half of people with disabilities use it daily (44.4% for high levels of disabilities and 54.1% for moderate levels). Among those who never use the internet, there are quite high percentages of people with high or moderate level of disabilities (35.3% and 22.7% respectively) compared to the rest of the population (8.9%).

Figure 1. Internet usage frequency by disability condition.

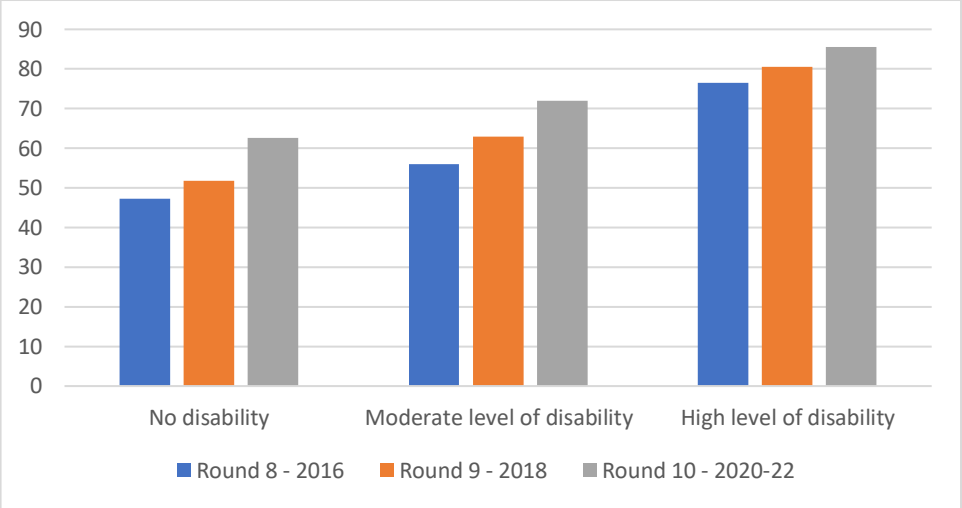


Base: All respondents. Source: Own elaboration based on the European Social Survey (2016, 2018 and 2020-22).

Figure 2 shows the evolution of the share of daily internet users by disability condition. Rates of use have increased across all groups of the population over the period 2016-2022; however, people with disabilities are still lagging behind.

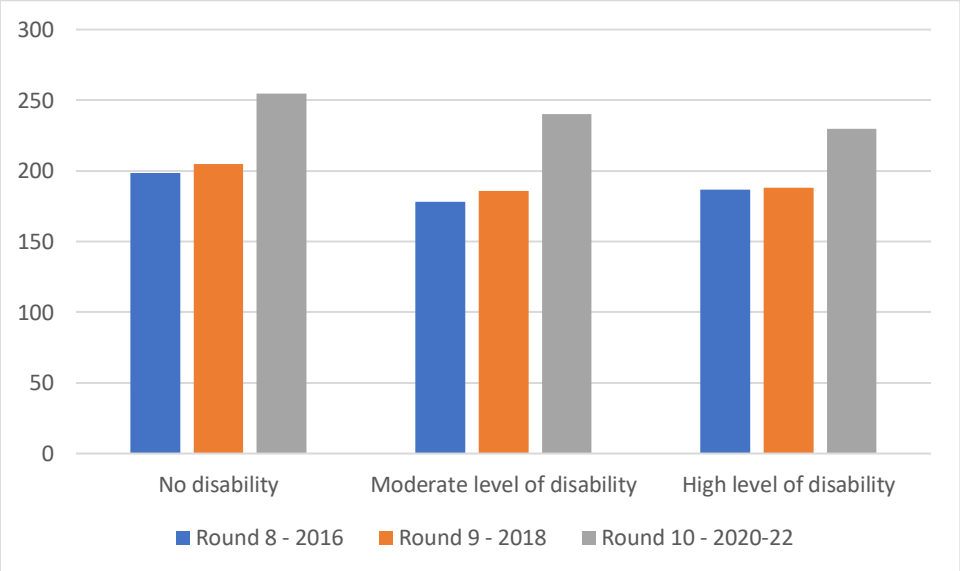
[1] The last three rounds of the ESS correspond to the 8th, 9th and 10th which refer to years 2016, 2018 and 2020-22, respectively. Countries analysed are those included in the three rounds, being: Austria (AT), Belgium (BE), Switzerland (CH), Czechia (CZ), Germany (DE), Estonia (EE), Spain (ES), Finland (FI), France (FR), Hungary (HU), Ireland (IE), Iceland (IS), Italy (IT), Lithuania (LT), the Netherlands (NL), Norway (NO), Poland (PL), Portugal (PT), Sweden (SE), Slovenia (SL), and the United Kingdom (GB).

Figure 2. Evolution of the percentages of daily internet users by disability condition.



Base: All respondents. Source: Own elaboration based on the European Social Survey (2016, 2018 and 2020-22).

Figure 3. Evolution of daily average time spent on the internet (in minutes) by disability condition.



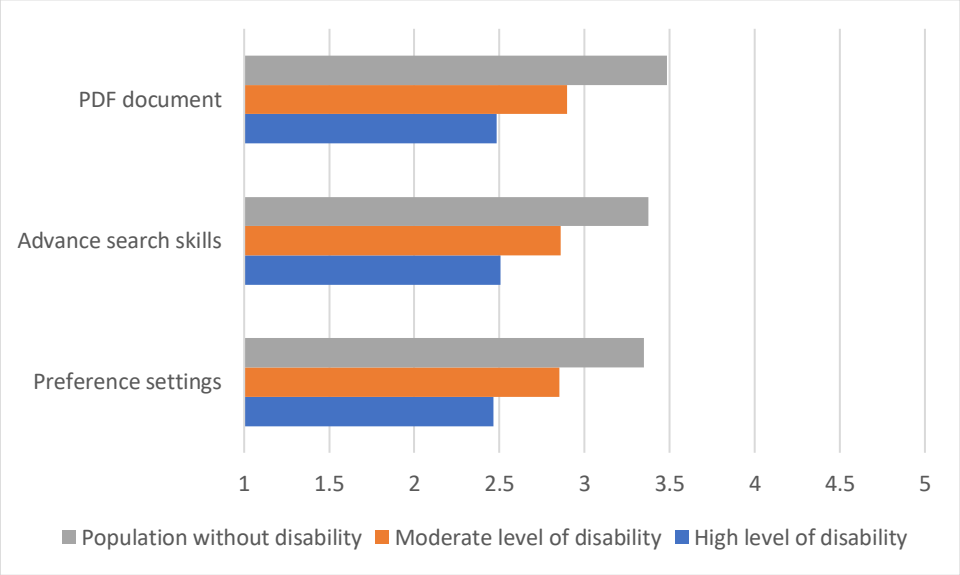
Base: Respondents using the internet on a daily basis. Source: Own elaboration based on the European Social Survey (2016, 2018 and 2020-22).

Figure 3 shows the daily average time (in minutes) that individuals self-report that they spend on the internet[2]. This time experienced an important increase from round 9 to round 10, due to the COVID-19 pandemic. By disability condition, the average time is slightly higher among people without disabilities.

[2] The time variable is built on respondents' answers to the question: "on a typical day, about how much time do you spend using the internet on a computer, tablet, smartphone, or other device, whether for work or personal use?"

Figure 4 summarizes individuals' average levels of digital skills. These are data are only available in the ESS 10th Round and refer to the people's self-reported familiarity with tasks related to handling PDF files, advanced internet search, and the configuration of preferences. Respondents' answers score in a scale from 1 to 5, with 5 indicating the highest level of familiarity; hence, the higher the score in each skill, the higher the ability of the individual.

Figure 4. Average level of digital skills by disability condition.



Base: Respondents using the internet on a daily basis. Note: Respondents self-report to what extent they are familiar with the above tasks in a scale from 1-5, where 5 indicates the highest level of familiarity. Source: Own elaboration based on the European Social Survey, Round 10 (2020-22).

As can be seen in Figure 4, the difference in skills between the population with and without disabilities is noteworthy. In all the skills considered, the average is lower for the former: while the means for people without disabilities score over 3.3, for those with moderate level of disabilities are around 2.9 and for those with a high level of disability are approximately 2.5.

Then, compared to the rest of the population, people with disabilities use the internet less often, they spend less time on the internet, and they show lower levels of digital skills. In addition, the observed digital divide increases as the level of disability accentuates.

The question now arises as to whether these differences are equally pronounced in the 21 European countries analysed or, on the contrary, there are countries in which the digital disability divide is smaller than in others. Figures 5 and 6 show the share of individuals using internet daily and the time spent on it, respectively[3].

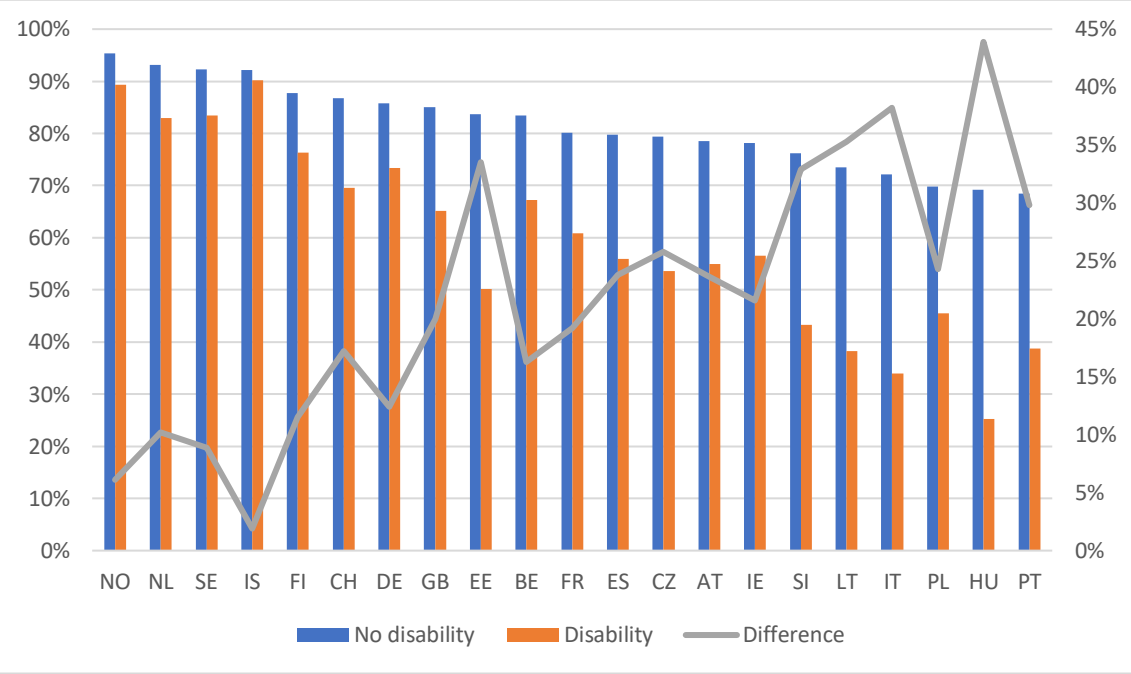
Specifically, Figure 5 indicates that Nordic countries have the highest percentage of daily internet users, while Eastern and Southern European countries tend to have the lowest. With regard to the differences between the population with and without disability, they vary greatly between

[3] For the simplicity of figures, we distinguish only between individuals with and without disability, without specifying the level of disability.

countries, ranging from a barely perceptible difference of 1.9 percentage points in Iceland to a difference of 44 percentage points in Hungary.

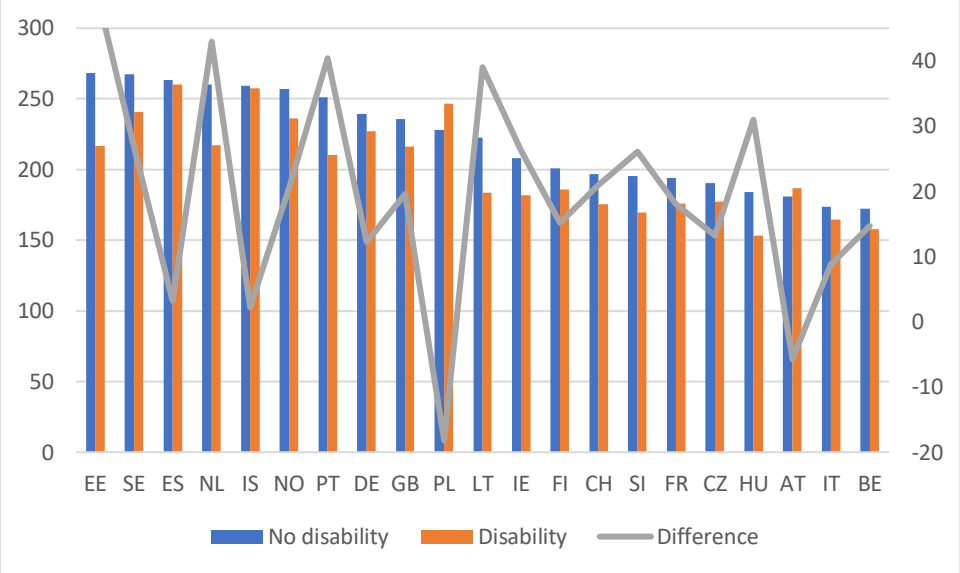
Finally, Figure 6 shows that there are also differences in the time spent on the internet between the two groups of population analysed. Except for Poland and Austria, individuals with some kind of disability use the internet less time than non-disabled people.

Figure 5. Share of individuals using internet daily by country and disability condition and magnitude of the disability gap



Base: All respondents. Note: Left axis indicates the percentage of individuals using the internet daily; right axis indicates the magnitude of the gap in penetration rates between people with and without disabilities in percentage points. Source: Own elaboration based on the European Social Survey (2016, 2018 and 2020-22).

Figure 6. Averages of daily time spent of the internet by country and disability condition and magnitude of the disability gap (in minutes).



Base: Respondents using the internet on a daily basis. Note: The units of left-right axes are minutes. In the right-axis the negative values indicate that people with disabilities spend more time on the internet than the rest of the population. Such situation happens in two cases: Poland and Austria. Source: Own elaboration based on the European Social Survey (2016, 2018 and 2020-22).

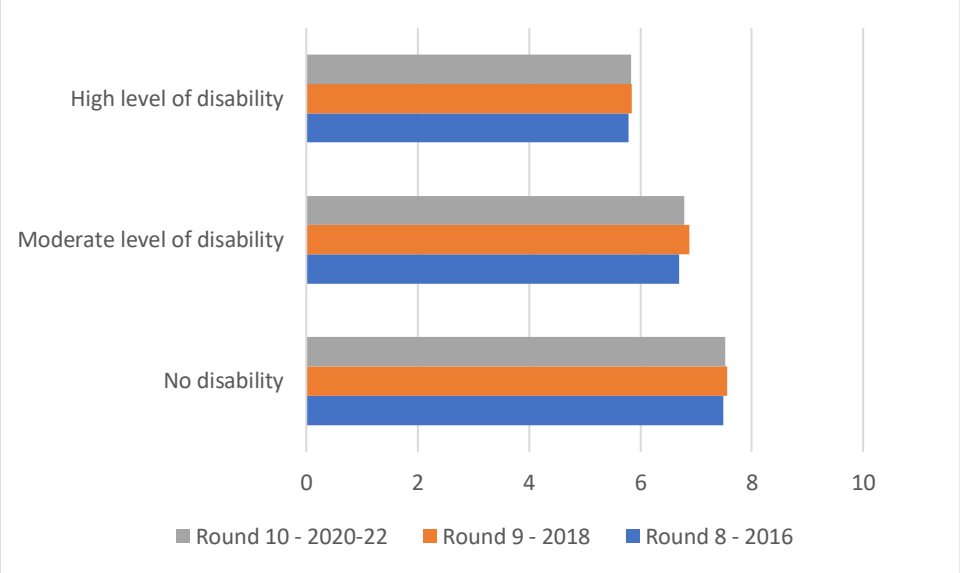
To sum up, the descriptive analysis carried out with ESS data shows that there is a clear disability digital divide with important differences across countries. Moreover, the higher the level of disability, the more pronounced the gap.

3. Internet use and wellbeing by the level of disability

This section provides some key figures in order to study whether internet use is related to individuals' self-reported levels of wellbeing, i.e., their subjective wellbeing (SWB). As a first approach, Figures 7 and 8 summarize information on the evolution of individuals' self-reported average levels of life satisfaction and happiness[4] over the period 2016-2022, by degree of disability.

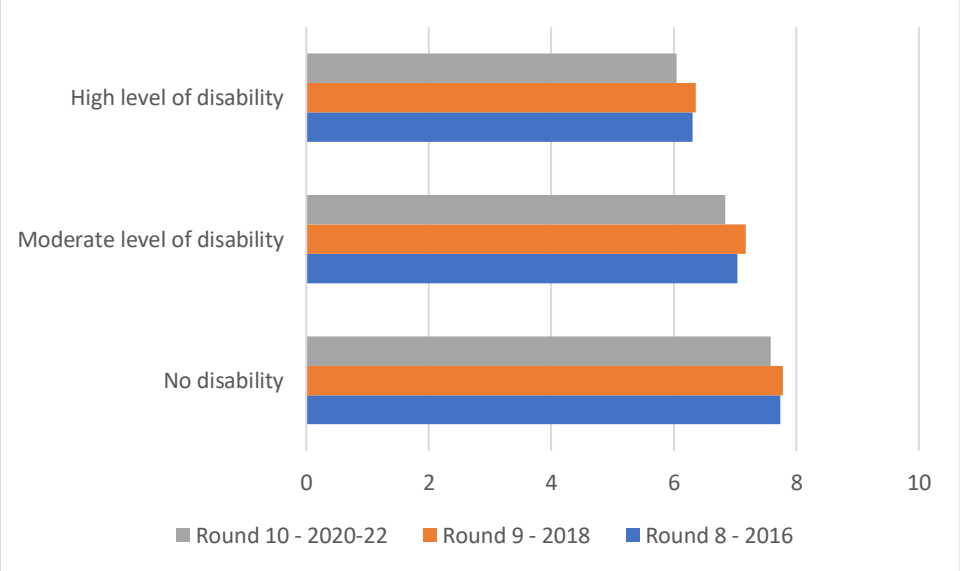
[4] The ESS assesses individuals' levels of happiness and life satisfaction based on the questions: "Taking all things together, how happy would you say you are?" and "All things considered, how satisfied are you with your life as a whole nowadays?", respectively. Responses are coded in 11 response categories which range from 0 (extremely unhappy/dissatisfied) to 10 (extremely happy/satisfied).

Figure 7. Evolution of individuals' self-reported average levels of life satisfaction by disability condition.



Base: All respondents. Source: Own elaboration based on the European Social Survey (2016, 2018 and 2020-22).

Figure 8. Evolution of individuals' self-reported average levels of happiness by disability condition.

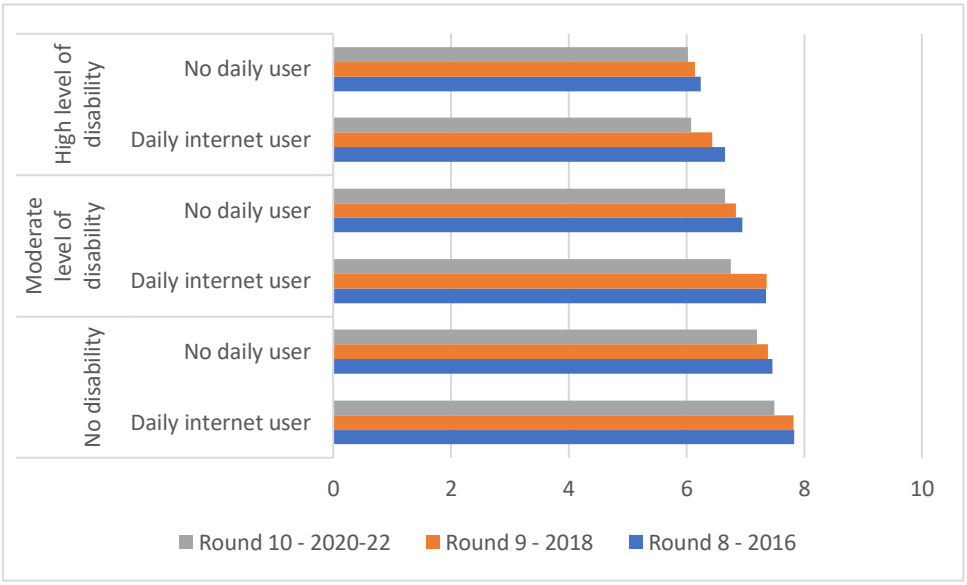


Base: All respondents. Source: Own elaboration based on the European Social Survey (2016, 2018 and 2020-22)

People without disabilities shows higher levels of happiness and life satisfaction on average compared to individuals with some kind of disability. Specifically, the more severe the disability, the lower the self-report levels. It is worth noticing the decrease in the average levels of happiness from 2018 to 2020-22, possibly due the pandemic, a feature that is not so pronounced as regards life satisfaction.

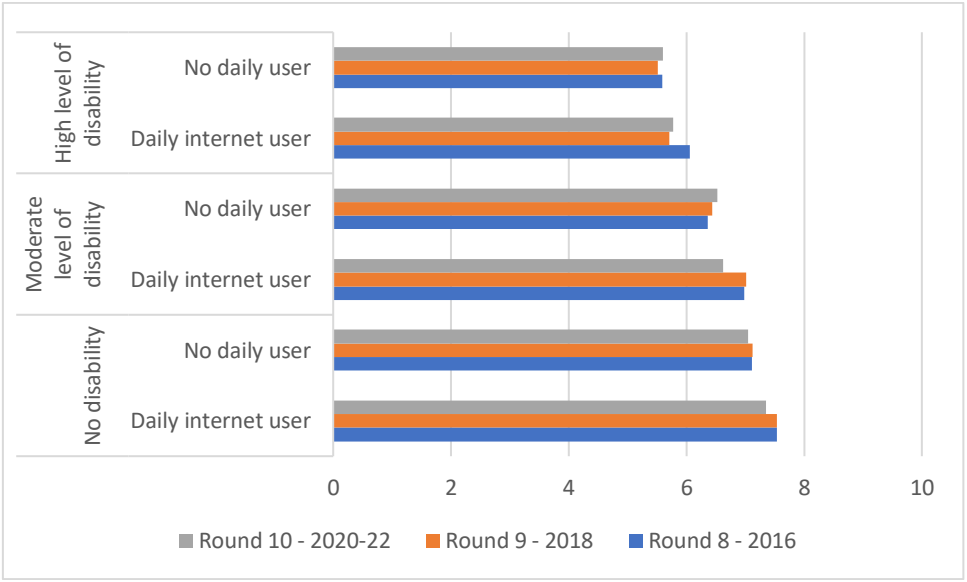
Figures 9 and 10 plot the levels of life satisfaction and happiness, respectively, distinguishing between daily internet users and non-users and disability condition. These figures indicate that people who use the internet on a daily basis self-report higher levels of happiness and life satisfaction than non-users.

Figure 9. Evolution of individuals' self-reported average levels of life satisfaction by disability condition and usage of the internet.



Base: All respondents. Source: Own elaboration based on the European Social Survey (2016, 2018 and 2020-22).

Figure 10. Evolution of individuals' self-reported average levels of happiness by disability condition and usage of the internet.



Base: All respondents. Source: Own elaboration based on the European Social Survey (2016, 2018 and 2020-22).

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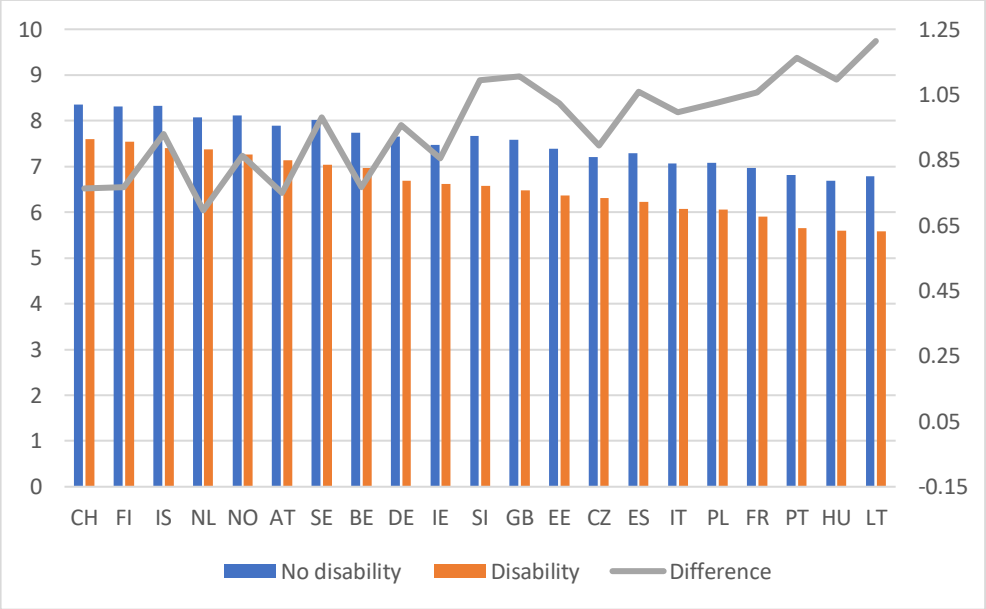
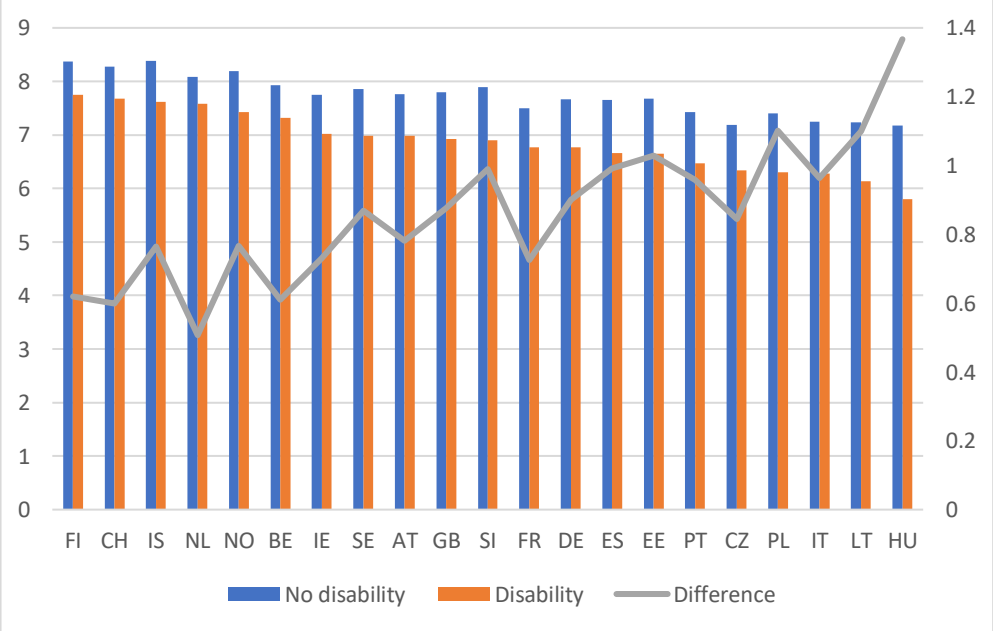
To complement previous analysis, Figures 11-12 summarize the average levels of life satisfaction and happiness, respectively, by country and disability condition. These figures show that there are differences in the average levels of life satisfaction and happiness by country. Nordic countries show in general higher average levels of SWB while Eastern and Southern European countries show lower levels. As for the differential between the average SWB levels of disabled and non-disabled people, it ranges between 0.7 and 1.2 points, with the difference being slightly higher in countries with lower average SWB levels.

Figure 11. Average life satisfaction by country.



Base: All respondents. Source: Own elaboration based on the European Social Survey (2016, 2018 and 2020-22).

Figure 12. Average happiness by country.



Base: All respondents. Source: Own elaboration based on the European Social Survey (2016, 2018 and 2020-22).

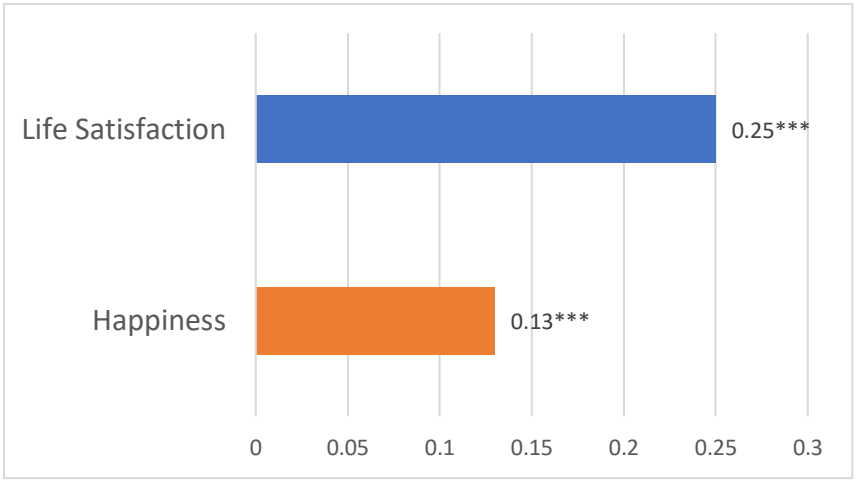
Overall, all these figures suggest that, in addition to a disability digital divide (Section 2), there is also a gap in the levels of individuals' SWB related to disability. Additionally, SWB also differs by the level of internet usage, with individuals who use the internet on a daily basis exhibiting, on average, higher levels of happiness and life satisfaction.

4. Correlation and regression analysis

To further explore to what extent the disability digital divide and the wellbeing gap of this group of population might be related, this section presents the results of a regression analysis in which people with disabilities' self-reported levels of happiness and life satisfaction have been regressed on internet use-related variables, those being: on the one hand, daily internet usage, and on the other hand, the time spent on the internet, for those being daily users. Our modelling approach relies on a system of two SUR equations, which allow us to consider that life satisfaction and happiness might be related to some extent, which is in line with the literature in the field (Kahneman & Riis, 2005) (see Annex).

Figure 13 presents the estimated coefficients for the variable on daily internet use on happiness and life satisfaction among people with disabilities. The positive signs suggest that daily Internet use is related to higher levels of happiness and life satisfaction, i.e., there is a positive correlation between daily Internet use and the well-being variables used.

Figure 13. Summary of regressions' results: coefficient of daily internet usage on SWB.



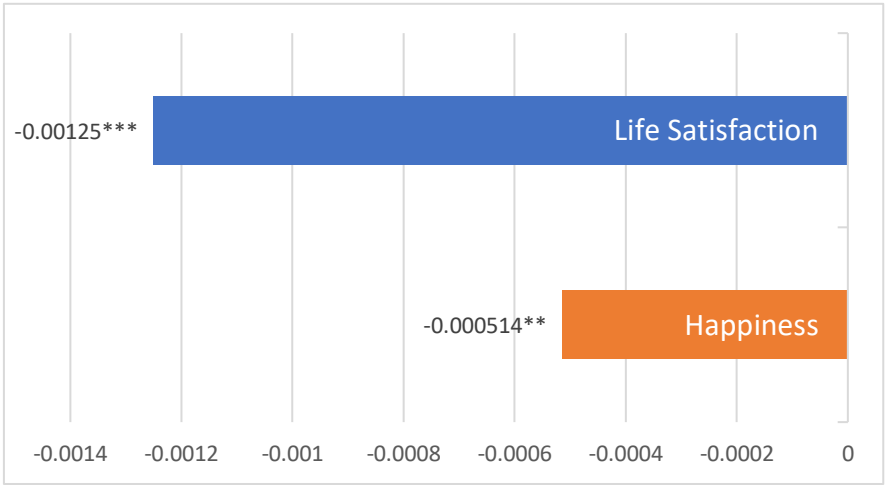
Base: Respondents who self-report some disability. Source: Own elaboration with data from the European Social Survey (Round 8, 9 and 10). Levels of significance: *** p<0.01, ** p<0.05, * p<0.1.

Then, for internet users with some disability, Figure 14 plots the estimated coefficients of the time spent online on happiness and life satisfaction. The coefficients are negative, suggesting that spending more time on the Internet is associated with lower levels of well-being, both as measured by the Happiness variable and the Life Satisfaction variable. Consequently, there is a negative correlation between the well-being variables and time spent on the Internet.

However, it is not possible to identify a causal relationship between the variables, since our data are cross-sectional. Nevertheless, we would expect that there is a double causality, so that more

time spent on the Internet leads to lower levels of subjective well-being and, in turn, lower levels of subjective well-being would lead to more time spent on the Internet. On the other hand, using the Internet daily would increase levels of subjective well-being and, in turn, people who use the Internet daily would be more likely to report higher levels of well-being.

Figure 14. Effect of internet usage time on SWB.



Base: Respondents who self-report some disability and use the internet daily. Source: Own elaboration with data from the European Social Survey (Round 8, 9 and 10). Levels of significance: *** p<0.01, ** p<0.05, * p<0.1

5. Summary of results and implications for the European and Spanish strategies for recovery and digital transition

The analysis of the data from the ESS supports the idea of a disability digital divide. While the 72% of the non-disabled population are daily internet users, this percentage is 54% among people with moderate level of disabilities and 44% for the population with a high level of disabilities. Similarly, the mean number of minutes spent using the internet is 221, 208 and 205 respectively.

Focusing on the particular group of people with disabilities, our analysis finds that:

- Those who use the internet daily tend to report higher levels of SWB than those who are not users. The gap between users and non-users is about 0.25-0.3 points in the levels of SWB.
- Once online, the time spent is negatively related to SWB, i.e, larger times on the internet come along with lower levels of SWB, especially, as regards life satisfaction

The results presented in this report highlight that to be successful, both the European Recovery and Resilience Strategies require to carefully address the disability gaps. Both strategies have proposed a process of digitalization, fully inclusive, that leaves no one behind. Findings here reveal that this has not been achieved yet.

In this sense, it would be necessary to strengthen the position of the population with disabilities as a reference group when addressing the various digital gaps. The closure of gaps becomes even

more crucial since daily internet usage is linked to an improvement in the SWB of people with disabilities, a population that, in turn, experiences a deficient state in their SWB when compared to the non-disabled population. Furthermore, with the bridge of the disability digital gap, some reduction of inequalities in terms of employment, income, or social participation for this group of population might be achieved (Björquist & Tryggvason, 2023; Jamwal et al., 2022; Olney, 2019). All the efforts on closing the digital gap should also focused on providing people with disabilities with the appropriate skills to manage themselves in the online environment and mitigate possible negative consequences derived from large exposures to the internet.

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Annex

Description of the database, variables and methodological approach

This report uses data from the last three rounds of the European Social Survey (ESS), Rounds 8-10.

The population with disabilities has been identified based on the response to the question, "Are you hampered in your daily activities in any way by any longstanding illness, or disability, infirmity, or mental health problem?" Thus, those who had responded "Yes a lot" or "Yes to some extent" have been identified as such. In total, the sample encompasses 30,833 disabled people.

To measure internet usage, two variables have been used. Firstly, a dichotomous one identifies those people who use the internet every day or almost every day. Secondly, the total time measured in minutes that these everyday internet users self-report that they spend online.

Finally, subjective wellbeing (SWB) has been measured using the variables happiness and life satisfaction. The ESS assesses the level of happiness based on the question “Taking all things together, how happy would you say you are?” Responses are recorded on a scale from 0 to 10, where 0 represents extremely unhappy and 10 represents extremely happy. Similarly, life satisfaction in the ESS is obtained through the question “All things considered, how satisfied are you with your life as a whole nowadays?”. Responses range from 0, indicating extremely dissatisfied, to 10, indicating extremely satisfied.

Apart from internet usage, the rest of the variables included in the regression analysis performed in Section 4 are individuals’ reported health status, whether the individual is living with a partner or not, the location of the individual's residence, gender, age, employment status, individual's feelings about their current income, educational level, level of trust in the political system, religiosity, frequency of socializing with friends, the total number of people with whom the individual can discuss personal issues, and the round of the ESS. Table A1 provides a description of the main variables involved in the analysis.

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Table A1. Variables included in the regression analysis

Variable	Description
Happiness (dependent variable)	Self-reported level of happiness from 0 (extremely unhappy) to 10 (extremely happy)
Life satisfaction (dependent variable)	Self-reported level of life satisfaction from 0 (extremely dissatisfied) to 10 (extremely satisfied)
Daily usage of internet	1 if the person uses internet every day or almost every day; 0 otherwise
Internet time	How much time on a typical day, in minutes (only observed when Daily usage of internet = 1). Continuous variable
Bad health	1 if the persons reported bad health; 0 otherwise
Partner	1 if the person is living with their partner; 0 otherwise
Domicile	1 if the person is living in a big city; 2 if the persons is living in a suburbs or outskirts of a big city; 3 if the persons is living in a town or small city; 4 if the persons is living in a country village; 5 if the persons is living in a farm or home in countryside
Gender	1 in the persons is a woman; 0 otherwise
Age	Respondent's age
Age squared	Square of respondent's age
Labour situation (employed)	1 if the person is employed; 0 otherwise
Labour situation (retired)	1 if the person is retired; 0 otherwise
Labour occupation group	1 if the person has a low-skilled job; 2 if the person has a medium skilled job; 3 if the person has a high skilled job
Feeling about household income	1 if the person is living comfortable with his/her present income; 2 if the person is coping with his/her present income; 3 if the person finding it difficult on present income; 4 if the persons finding it very difficult on present income
Level of education	1 if the person has lower level than secondary school; 2 if the person has secondary school; 3 if the person has lower level than upper secondary school; 4 if the person has upper secondary school; 5 if the person has advanced vocational level; 6 if the person has lower level than tertiary education; 7 if the person has tertiary education
Level of trust in the legal system, in politicians and in the police	Continuous variable from 0 to 30, where the maximum score indicates the maximum confidence
Religiosity	Self-reported level of religiosity from 0 (not at all religious) to 10 (very religious)
Frequency of meeting with friends	1 if the person never meets friends; 2 if the person meets with their friends less than once a month; 3 if the person meets with their friends once a month; 4 if the person meets with their friends several times a month; 5 if the person meets with their friends once a week; 6 if the person meets with their friends several times a week; 7 if the person meets with their friends every day
Number of people with whom the person can talk about personal matters	0 if the persons do not have any person to talk; 1 if the person has from one to three people; 2 if the person has from four to six people; 3 if the person has from seven to nine people; 4 if the person has ten or more people
Round of the ESS	1 if the person belongs to 2016 ESS (Round 8); 2 if the person belongs to 2018 ESS (Round 9); 3 if the person belongs to 2020-22 ESS (Round 10)
Country	Country of residence

Source: own elaboration based on the information of the European Social Survey.

The analysis presented in this report relies on a system of two simultaneous equations, with happiness and life satisfaction as dependent variables in each equation. The key independent variables are related to Internet usage. Following the approach of the seemingly unrelated regression model (Zellner, 1962), the correlation between the errors of both equations allows to assess the extent to which the SWB variables are related to each other. Results indicate that these correlations are a bit over 60%.