

Childhood in a Digital World

Screen time, digital skills
and mental health

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Introduction

Thirty years ago, digital connectivity was limited to a few million people around the world. Since then, the digital revolution has swept the globe, and today, nearly five billion people are connected. In many countries, digital technologies have been rapidly adopted by children. The internet is no longer a luxury for children, but has become a necessity for playing, learning, keeping in touch with friends and family, and building skills for the future.

With the mainstreaming of the internet, the value of learning digital skills from an early age has become increasingly apparent. If children learn the right skills growing up, they can make the most of digital opportunities. Mastering digital skills also has potential implications for children's futures. The European Commission estimates that more than 90 per cent of professional roles in Europe already require basic digital skills.¹ By 2030, it has been estimated that over 230 million jobs in sub-Saharan Africa will require digital skills.² To develop capacities they will need in the future, children would benefit from cultivating digital skills today.

The first step to developing digital skills is to access the internet and use digital technologies. Though internet access has improved considerably around the world, enormous gaps persist. An estimated two thirds of the world's school-aged children – or 1.3 billion children of ages 3 to 17 years – do not have internet access at home.³ Most of these children live in parts of Africa and Asia. Children without connectivity are at a disadvantage in the global rush to acquire digital competencies. It takes time for a country to become digitalized, and children growing up in unconnected areas today may have to wait years before their lives become digitally integrated. Furthermore, countries with low connectivity are generally less wealthy and face additional challenges. They may have fundamental gaps in the education system leading to a lack of basic numeracy and literacy skills, which could undermine digital skills development and potentially compound inequalities.

And yet, children not having digital access and falling behind on digital skills is only one side of the coin. In high-connectivity countries where access has become nearly universal, children face other challenges. Reports of rising mental health issues among young people have drawn scrutiny about the impacts of frequent internet use and the spread of online games,

smartphones and social media. In these countries, the concern is that children spend too much time online rather than too little. Parents, advocates and even governments worry that this undermines children's safety and harms their mental health. These are legitimate concerns. As more and more children enter the digital world, the risks and harms must be properly understood and addressed.



An estimated **two thirds** of the world's school-aged children do not have internet access at home.

Despite the internet's potential to transform lives for the better, our collective understanding of how children's digital use and experiences impact their skills and mental health remains limited. With countries in varying stages of digital development, it has been difficult to establish a global picture of who is online and who is not, why some children possess digital skills while others do not, and how digital technology impact children's mental health. Too often the voices and lived experiences of children get lost in the mix when companies and other powerful stakeholders race to build a profitable and captivating digital world.

This report describes the evolving landscape of childhood in a digital world, documenting what we know about connectivity, digital skills and impacts on mental health. Presenting global and comparative data that have not been previously analysed together, it explores how lack of digital access can influence a child's digital skills development and highlights the potential for digital technology to exacerbate inequalities. The report also responds to ongoing debates about screen time by providing robust evidence on when and how digital technologies can undermine children's mental health.

We hope the report will contribute to a better balance in the current discourse on children's use of digital technologies by demonstrating how digital technology has the potential to impact children both positively and negatively, depending on how they use it and what kind of content and experiences they are exposed to. Finally, we suggest solutions to ensure that children in the future will be able to spend time online to play, build skills and explore the internet while staying safe.

We have a responsibility to ensure all children can benefit from the promises of digital technology while protecting them from its perils. Societies can only benefit when children have digital skills and are able to navigate online opportunities and risks. This is also in the best interests of children, who have a right to play, learn and be safe in a digital world.



Key messages

Connectivity

- Over the past two decades, home connectivity for children has increased substantially in many regions of the world. Among wealthier countries, most 15-year-olds now have internet access at home, but as many as one in five children still do not have access to the internet at home by age 10. Data on home connectivity that are globally comparable remain scarce, making it difficult to accurately estimate children's access.
- Socioeconomic status is a strong predictor of whether a child has internet connectivity at home in every part of the world, but more so in low- and middle-income countries. Children living in poorer households are more likely to be unconnected, irrespective of their age or the overall economic development of the country.
- Even in wealthy countries, where most schools are connected to the internet and have computers available, less than half of children report using the internet daily (48 per cent) in school, and only 30 per cent use desktops or laptops daily in school. This points to a missed opportunity to teach children how to use technology and build digital skills from an early age through formal education.

Digital skills

- Connectivity is a pre-requisite for developing digital skills, but not the only driver. The time children spend online and the activities they engage in all contribute positively to a child's digital skills development to a great extent. Conversely, children whose parents restrict their internet use tend to have lower skills.
- The most popular activities children engage in online – using social media, playing video games and watching videos – all contribute in positive and measurable ways to their digital skills development. For example, those who use social media regularly are up to twice as likely

to know how to change their privacy settings and at least 50 per cent more likely to know how to remove someone from their contacts list and identify the best keywords to use for online searches.

- Children who grew up in countries that had historically higher rates of connectivity demonstrate greater digital skills today. This suggests potential benefits of growing up in a digitalized society. Countries with low connectivity risk ending up with a generation of children growing up without opportunities to develop digital skills from a young age, which could undermine their opportunities and safety in the future.

Mental health

- Children who experience online sexual abuse or online bullying have significantly higher levels of anxiety, more suicidal thoughts and behaviours, and are more likely to self-harm. The strength of these associations is moderate to strong and fully consistent across 21 countries. Exposure to different forms of harmful content or hurtful experiences also affects children's mental health negatively, but the associations are somewhat weaker.
- We find no clear evidence that screen time directly harms children's mental health. Although increased screen time can sometimes be associated with a higher risk of exposure to harmful content and abusive experiences, the effect is weak. This suggests that the likelihood of encountering online harm is not primarily determined by the amount of time spent online.
- To protect children's mental health in a digital age, solutions need to focus on preventing online sexual abuse and online bullying and reducing exposure to harmful content. These solutions require much greater investment from companies who provide digital content and services to children, and stronger legislation by governments to hold these companies accountable. In comparison, solutions that focus on restricting screen time are less likely to be effective.

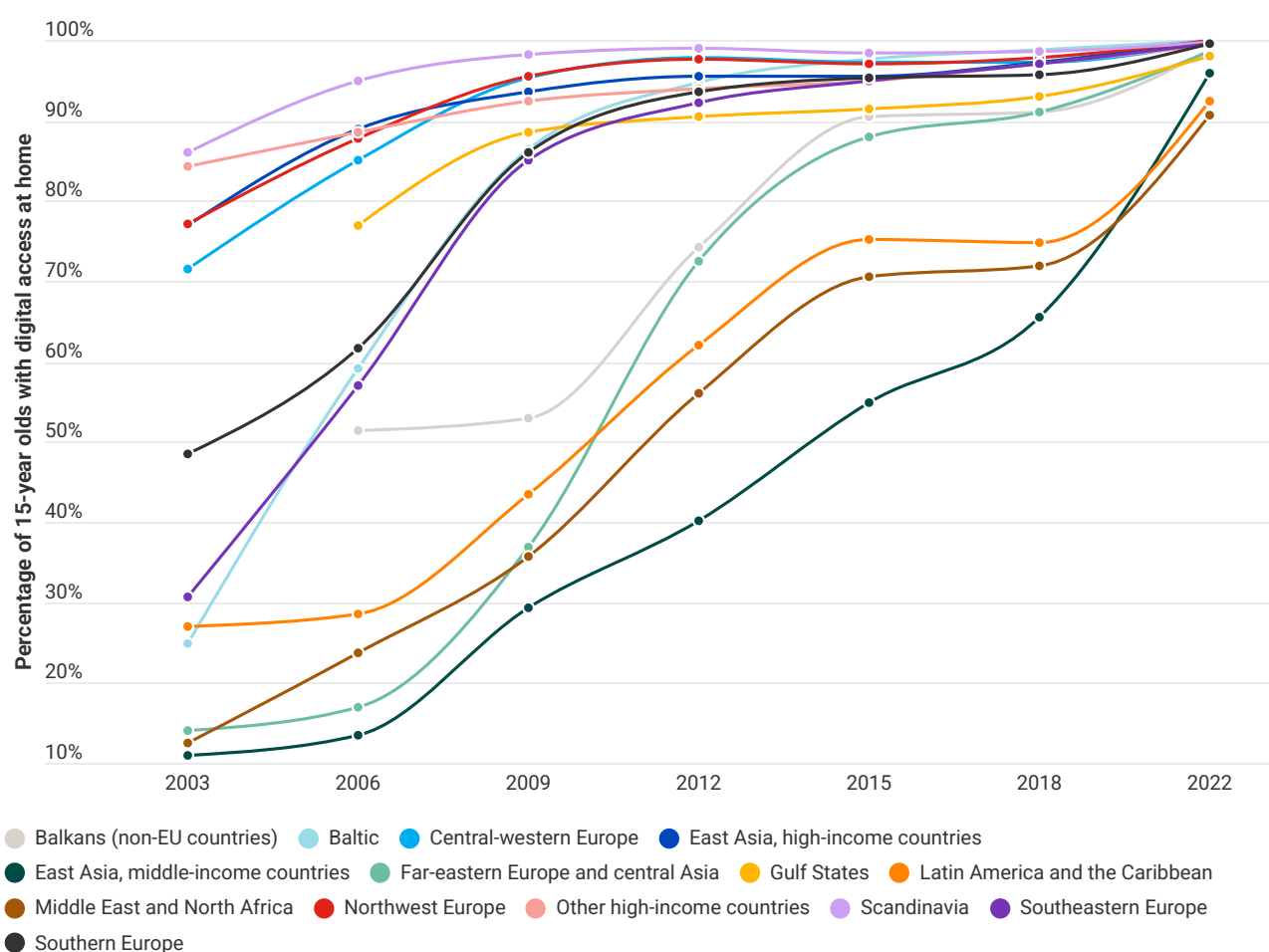


Connectivity: What we know

The number of children who access the internet from home has grown dramatically over the past 20 years. New data representing home connectivity rates in diverse regions of the world show that digital access at home among 15-year-olds surged from 2003 to 2022.

This finding is based on analysis of survey data from 78 countries, areas and territories participating in the Organisation for Economic Co-operation and Development (OECD) Programme for International Student Assessment (PISA). These countries, areas and territories are generally classified as high-income and upper-middle-income, and they stretch across five regions of the world. The data suggest that among these wealthier countries, areas and territories, most 15-year-olds are able to go online at home. In fact, only 3 per cent of surveyed 15-year-olds were unable to connect to the internet from home in 2022 (the most recent data available).

Figure 1: Regional averages of digital access at home among 15-year-olds, 2003–2022



Note: The regions are the authors' based on data trends.

Source: Authors' analysis on data from 78 countries, areas and territories participating in the OECD PISA study.

This increase in connectivity presents a striking contrast to how things looked shortly after the turn of the century. In 2003, for example, only 15 per cent of children surveyed in selected east Asian middle-income countries were able to be online at home. However, connectivity has gradually increased over the past two decades and now almost all 15-year-olds are online at home in these countries. Similarly, countries in southeastern Europe and the Baltics saw a rapid increase in connectivity between 2003 and 2009, effectively transforming the region into an early adopter of digital technology.

The data also show that 15-year-olds in some countries have historically been better connected than others. In Scandinavia, 15-year-olds were well connected even back in 2003, with more than 80 per cent being able to go online at home. Children growing up in these countries have been more

exposed to digital technologies over the course of their childhoods than their peers in countries with less developed digital infrastructure. This might have had implications for their development of digital skills, as the next section explores in more detail.



**In 2021,
approximately
one in five
10-year-olds did
not have access
to the internet
at home, even in
relatively wealthy
countries.**



This trend towards universal connectivity in the home, while currently limited to wealthier OECD countries, is apparent. While mobile devices enable more people to connect outside of the home, internet access at home offers an important metric for understanding the state of children's connectivity today.

These upward trends contain important exceptions as connectivity differs according to wealth variations within and across countries. Unsurprisingly, PISA data show that 15-year-olds in lower middle-income countries are less likely to have access to the internet at home than their peers in high-income countries. But even within wealthier countries, 15-year-olds living in the poorest households are almost nine times more likely not to have access at home than their peers living in wealthier households.

New analysis of the Progress in International Reading Literacy Study (PIRLS), which surveys 10-year-old children in 51 countries,⁴ reveals that in 2021, approximately one in five 10-year-olds did not have access to the internet at home in these relatively wealthy countries. The proportion of 10-year-olds who did not have access to the internet at home increased to two in five in the low- and middle-income countries in the study, and one third of the unconnected 10-year-olds lived in the most disadvantaged households. These findings demonstrate that wealth is a driver of access inequality among younger children too.

Irrespective of age or the overall economic development of the country, these data show that socioeconomic status of a household is a strong predictor of whether a child has internet access at home. This finding is in line with other research that estimates connectivity for the global youth population aged 15 to 24 years.⁵

The PIRLS data also signal to the point in a child's life at which they start being exposed to the risks and opportunities of the internet. Although there may be valid reasons for why children as young as 10 years are not going online, the next section will highlight missed opportunities in exposure to digital environments and development of digital skills.

Data from PISA and PIRLS used in this report show that boys and girls seem to access the internet in fairly equal proportions. This finding is similar to findings from other large-scale multi-country analyses in Europe.⁶ It is worth noting that much of these data are from wealthier countries and that gender differences in access may look different in other settings. For example, multi-country data from young people aged 15–24 years living in low-income countries suggest that more than twice as many boys and young men have access to the internet as girls and young women.⁷ There is a lack of globally comparable data on children's internet access that makes it difficult to accurately describe the proportion of children who are still unconnected, especially in less wealthy countries. Much of the global data currently available measures internet access at the level of the household, not at the level of the child, which in many cases prevents a deeper analyses of access inequalities for children.

Connectivity in schools



Even in the wealthiest countries in the world, **less than half** of children reported using the internet daily in school,

Countries have sought to connect schools to the internet to help address digital divides, especially in response to the COVID-19 pandemic. At a time when digital skills are increasingly important for children's development, schools have the potential to help alleviate inequalities by equipping children with the digital skills they will need in the future.



... and only **30 per cent** used desktops or laptops daily.

Encouragingly, PISA data showed that nearly 95 per cent of the 15-year-olds living in OECD countries reported having access to the internet and computers at school. But a revealing finding is that far fewer reported actually using these tools for learning. Even in the wealthiest countries in the world, less than half of children reported using the internet daily in school (48 per cent), and only 30 per cent used desktops or laptops daily in school. Relatedly, one fifth never or hardly ever used the internet at school, and one fourth never or hardly ever used desktops or laptops. So while infrastructure and devices exist, our analysis shows that many children do not use these tools regularly.

These findings are in line with research suggesting that more than connectivity is required for children to use digital technologies in school. In fact, research on digital learning across 12 countries (ranging from low- and middle-income to high-income) found that beyond devices or connectivity, it was the preparation of teachers and school leadership, and how they managed the technology and utilized it within a learning process, that mattered for effective use of digital technology in schools.⁸

Connectivity in sub-Saharan Africa

Africa is the region of the world with lowest connectivity for the general population.⁹ Data on children's access remain limited. Survey research conducted with 5,020 children living in five countries in eastern and southern Africa shows that even when children have basic connectivity, they face additional barriers to using the internet.¹⁰

Some barriers are infrastructure-related, such as having a slow connection or poor signal, which affected 31 per cent of surveyed children. High cost of data is another impeding factor, affecting 30 per cent of children. Lack of electricity affected 13 per cent. These findings explain why children are less likely to use the internet when they live in rural settings or poor households or when their parents have less education.

Other barriers to access include having to share a device with other people (affecting 20 per cent of children) and not having an adult's permission to use the internet (affecting 23 per cent of children, especially younger children and girls).

Children who face multiple barriers to home internet access engage in fewer entertainment and educational activities online. Given the potential of such activities for contributing to children's digital skills development, barriers to access are an impediment to children's effective engagement with the digital environment. Such barriers could, over time, contribute to widening inequality gaps.



Digital skills: Who has skills and who does not

Whether to work, learn, play, connect with family and friends, or carry out everyday tasks like searching the news, the need for digital skills is increasingly important in contemporary life. Moreover, as automation and artificial intelligence become more advanced, digital skills are expected to feature prominently in the future of work that today's children will enter.¹¹

Broadly defined, digital skills refer to “the ability to use information and communication technologies in ways that help individuals to achieve beneficial, high-quality outcomes in everyday life for themselves and others” and that “reduce potential harm associated with more negative aspects of digital engagement”.¹² For children, digital skills have been associated with positive outcomes in taking advantage of online opportunities, information benefits, education, employment and online safety, according to a systematic review of the evidence.¹³

But despite their importance, we know little about how digital skills are distributed across the globe and how best to foster them. Many young people may be using the internet without being able to fully benefit from its opportunities or steer clear of its harms. Until recently, globally comparable data about skills acquisition have remained scant, and research on which online activities might be linked with gains in digital skills is lacking.¹⁴

Data and methods

This section uses data from two multi-country data sets covering a total of 31 countries in three regions of the world. The first is survey data from the EU Kids Online project, which spans 19 countries in Europe and reflects the responses of 20,348 children collected between 2017–2019. The second is survey data from the Disrupting Harm project, including 12 countries in eastern and southern Africa and southeast Asia and reflecting the responses of 12,000 children and 12,000 parents

collected between 2020–2021. All data are based on self-reported survey responses.

Linear regression models were used to analyse the relationship between children's internet use (screen time and online activities) and their digital skills (self-assessed ability to change privacy settings, choose the best keywords for online searches, remove people from a contact list and create video or music online). Logistic regression models were used to analyse the impact of specific online activities (social media use,

online gaming and watching videos) on specific digital skills.

All models controlled for children's age and gender. Where data were available, models controlled for area of residence, material deprivation, perceived socioeconomic status and parental education. All analyses were conducted on country-level samples; data were not pooled.

See the background paper [*Technical Analysis: Childhood in a Digital World*](#) for more detail on measurements, model specifications and results.

How are children's digital skills distributed globally?

In this section, we use survey data generated directly with children and parents to explore how digital skills are distributed across different countries and regions, and to analyse why some children have high digital skills while others do not. We also explore how three of the most popular activities children engage in online – social media, online gaming and watching videos – contribute to skills development in the course of these activities.

We use data from EU Kids Online project,¹⁵ which includes 19 countries in Europe, and data from the Disrupting Harm project, which for this analysis includes data from 12 countries.¹⁶ These data sets provide comprehensive information about the antecedents and outcomes of digital skills and have been designed to have comparable indicators for the key variables used in our analysis. The digital skills examined focus on social interaction, information seeking, online safety and creativity.

The analysis finds that across 31 countries in both data sets, children in the countries surveyed in Europe and Asia generally had more advanced digital skills than children in the countries surveyed in Africa.

In the countries surveyed as part of EU Kids Online, most children had a relatively high level of digital skills and the level was fairly similar across countries. Children with the highest digital skills were in Estonia, Norway and Finland. Why? These three countries were some of the earliest adopters of the internet, going back to the early 2000s, suggesting the possibility that consistent, long-term access and investment at a societal level could be an influential factor in shaping children's skills as they grow up.

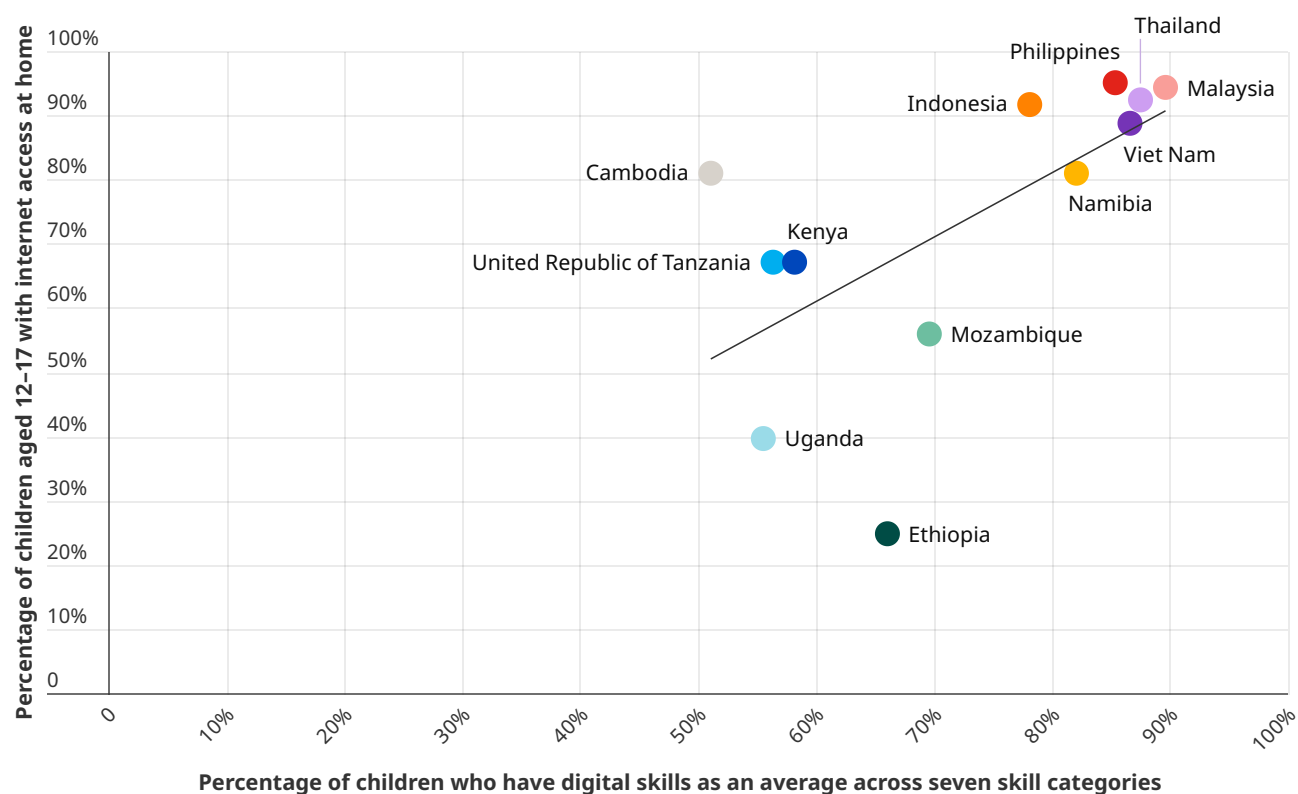


Many young people may be using the internet without being able to fully benefit from its opportunities or steer clear of its harms.

Children in the countries surveyed in Asia and Africa as part of the Disrupting Harm project also demonstrated advanced digital skills. But there was a wide difference in skill level from country to country and skill to skill. In Kenya, for example, over 80 per cent of children know how to remove someone from their contacts, but only about 30 per cent know how to check whether a website can be trusted. In Cambodia, roughly 70 per cent of children know which images to share online, but fewer than half know how to change their privacy settings.

How do we explain the differences between countries? While the level of connectivity in a given country appears to be one important aspect, our analysis indicates additional factors at play. For example, in a comparison of Namibia and Cambodia, the digital skills of children in Namibia exceed those of children in Cambodia, even though 81 per cent of children in both countries use the internet (*see Figure 2*). Digging deeper into how much time children spend online and the activities they engage in seems to provide more nuanced answers.

Figure 2: Association between digital skills and internet access in 12 countries in Africa and Asia that were surveyed as part of the Disrupting Harm project



Source: Authors' analysis of data from the [Disrupting Harm](#) project.

What factors enhance children's digital skills development?

Even if a country achieves universal connectivity, children living there would not obtain high digital skills overnight. Rather, our findings suggest that digital skills take time to develop.

In theory, the more opportunities children have in their everyday lives to engage with digital technology, the more chances they would have to develop digital skills as they grow up. Children raised in Estonia, Norway and Finland, for example, have grown up surrounded by digital technology since they were born, including in the education system. They have had more opportunities to interact with digital tools, experiment with digital technology from a young age and witness their parents use devices. Our analyses show that across most countries, older children have higher digital skills.¹⁷ This finding suggests that a longer period of exposure to digital activities probably advances skills development to an extent.



The activities children engage in online, and the content and experiences to which they are exposed, matters a great deal for their digital skills development.

In 29 out of the 31 countries included in this analysis, children who spent more time online had significantly (meaning statistical significance at $p < 0.05$) higher digital skills. This finding is an important contribution of this report to ongoing debates around screen time, which tend to focus on how screen time may be harmful while omitting an analysis of its potential benefits.

In addition to spending time online, the range of different activities in which children engage, and the content and experiences to which they are exposed, also matters a great deal for their digital skills development.

Of the countries in the Disrupting Harm and the EU Kids Online projects, 25 countries had available data for more in-depth analyses. Using this data, regression analysis revealed that children who engaged in a greater number of different activities online had significantly higher digital skills. The number of activities a child engaged in explained between 2 per cent and 17 per cent of variance in digital skills when screen time, gender and age is controlled for. The number of activities appears especially important as a predictor for digital skills among children in the countries with data in Africa and Asia. Similar results have been demonstrated by other multi-country research with children, and here we corroborate those findings with information from more countries.¹⁸

How do online activities shape digital skill development?

To explore how specific activities are associated with digital skills development, we looked at three of the most popular activities online – using social media, playing video games and watching videos.

In 16 out of 25 countries, we found that children who use social media more had higher digital skills, irrespective of the number of other activities they engaged in. This finding suggests that social media use may be a beneficial activity for children's digital skills development across a range of skills, but especially those that are related to online safety. For example, children who use social media regularly are up to twice as likely to know how to change their privacy settings and at least 50 per cent more likely to know how to remove someone from their contacts list and identify the best keywords to use for online searches. This makes sense as these are skills that are relevant and potentially beneficial for social media users. While this finding might, on

the one hand, encourage greater social media use, this must be balanced with potential risks of exposure to harmful content and abusive experiences. To encourage greater social media use, companies need to invest more resources in age-appropriate design features, strong safety measures and effective reporting mechanisms.

Children who play video games and watch videos regularly have significantly higher digital skills than those who do so less often, but the positive effects are not as strong as for social media use. In most countries, playing video games and watching videos contribute more strongly to children's creative skills than those related to safety and information-seeking.

The relationship between age, screen time and the activities children engage in is complex. Our analysis confirms that the time children spend online and the number of online activities they engage in increase as children grow older. All three of these variables – age, screen time and number of online activities – are positively associated with digital skills. Prior research acknowledges that the relationship between digital skills and online activities may be positively reinforcing. Children who have higher skills may also engage in more and different activities online, which creates a positive cycle of skill development.¹⁹



In 21 of 22 countries in which analysis was possible, children whose parents limited their time online had lower digital skills.

What factors limit children's digital skills development?

If screen time is positively associated with digital skills, as we have found, the converse is also true. Consistent with previous research,²⁰ we find that when parents restrict children from using the internet, by limiting the time they spend online or the activities they are allowed to pursue, children have lower digital skills. This was the case in 21 out of 22 countries where this analysis was possible. While it is sometimes necessary for parents to limit the time children spend online or restrict the activities they engage in for safety or developmental reasons, careful consideration about when and why to do so is important to ensure children's digital skills development is not consistently undermined. Existing research has shown that restricting children's internet use does not seem to substantively protect them against online risks unless a child is not spending any time online at all,²¹ and this is also supported by our analysis in the next section.

Earlier in this report, we showed how socioeconomic status predicts internet connectivity, more so for children living in low- and middle-income countries than in high-income countries. Digital skills are similarly impacted by economic disadvantages. New analysis of data from six countries in Africa (Ethiopia, Kenya, Mozambique, Namibia, the United Republic of Tanzania and Uganda), shows that children living in poorer households have lower digital skills than those who live in wealthier households (except in Ethiopia, where results were not significant). Children are not able to access the internet as much or as frequently as their peers and thereby lose out on opportunities to develop digital skills. These effects are less pronounced in the countries analysed in Europe, where even children living in the poorest households have a moderate level of digital skills despite lacking connectivity. This could be because there are other opportunities to build digital skills in countries that are wealthier and more well-connected overall, or because even the poorest households in these European countries have relatively better connectivity than the poorest households in Africa.



Children who have access to the internet and can spend more time online and engage in a wider range of online activities, have higher digital skills.

New analysis of a sub-set of data from seven countries (Cambodia, Ethiopia, Kenya, Malaysia, Philippines, Thailand and Viet Nam) shows that in six out of seven countries, children of parents who are more digitally skilled are also more likely to be digitally skilled themselves. Parents with a higher level of education tend to be more digitally skilled than those who are less educated. However, while younger parents tend to have better digital skills, the children of older parents do not necessarily have lower digital skills. This suggests that older parents can contribute to children's digital skills development in other important ways that was not captured by our analysis.

In line with other multi-country research, there are no clear gender differences in digital skills across the 31 countries included here.²² In some countries, boys have higher skills, in other countries girls have higher skills, but the pattern is inconsistent and gender explains only a very small part of differences in children's digital skills (less than 2 per cent of variance in all countries). This could be because our data only include children who have some form of internet access already. In countries with clear gender gaps in internet access, there would likely be gender differences in digital skills too, but this is not captured by our analysis.

In summary, this research demonstrates that children who have access to the internet and can spend more time online and engage in a wider range



of online activities, have higher digital skills. The combined body of evidence that exists on digital skills offers solid empirical support for the intentional promotion of digital skills by policy programmes, education curricula and by parents.²³ Children with limited exposure to digital technologies and fewer opportunities to use them are at risk of being left behind in the labour market, and may be exposed to more online risks in the future because they lack basic safety skills.

It takes time for countries to get online, just as it takes time for children to develop digital skills. Countries that are slow to transition digitally may see their children grow up without the fundamental skills necessary to thrive in a digital age. Therefore, countries at the lower end of the connectivity spectrum today should work towards universal connectivity with great urgency. Schools can be an equalizer of access opportunities for children but need to be supported to effectively integrate digital technologies in the classroom.



Mental health: Screen time, harmful online content and abusive experiences

While ensuring greater access to digital technology is important for children, growing evidence shows that children experience risks of harm in digital environments.²⁴ This realization has led an increasing number of countries to consider restricting access to online platforms for children under certain ages, particularly access to social media platforms. The potential harm to children's mental health is often put forward as an important justification for such restrictions.

However, the evidence around **how** the use of online technologies can harm children's mental health and the severity of it has, so far, been insufficient.²⁵ The U.S. Surgeon General noted in an influential advisory from 2024 that

there is a gap in evidence of the pathways through which social media may cause harm to children's mental health.²⁶ Specifically, the advisory asks us to consider: "What type of content, and at what frequency and intensity, generates the most harm?"

A recurring challenge is that most research to date has stopped short of measuring the mental health outcomes of exposure to specific online content or experiences, leaving our understanding incomplete.²⁷ Much of the existing research has focused on screen time as the driving factor behind negative mental health impacts.²⁸ However, by focusing primarily on the time element, these studies fail to account for what children are actually doing and experiencing in digital spaces.²⁹ This limitation could be one reason for why several large-scale studies find only small effects when analysing the impact of screen time on mental health. By focusing on time as the key indicator, positive and negative content and experiences get mixed up, which dilutes the analysis and fails to capture any effects.



Understanding the pathways through which digital technology use can impact children's mental health is critical to allocate responsibilities, prioritize interventions and develop regulation where needed.

In the absence of better data, worries have proliferated that spending time online is actively harming the mental health of users, especially children. Rather than accounting for what children are actually experiencing in digital spaces, studies and policy responses that reduce everything to screen time become riddled with assumptions. As one recent study noted, "assumptions of harm, and the likelihood and severity of harm, remain largely that, assumptions [...]".³⁰

Restricting children's access to digital technologies like social media without fully understanding when and why these platforms cause harm carries a certain level of risk. Not only do we risk undermining children's rights and their digital skills development, as this report has demonstrated, but we might also misplace responsibilities to address the issue or intervene in suboptimal ways.

For instance, if screen time is the main cause behind negative mental health impacts, one way to address it would be for parents and children to be more diligent about limiting the time they spend in digital spaces. However, if the main cause behind negative mental health impacts is being exposed to harmful content,³¹ or abusive experiences on digital platforms, the main responsibility lies with the companies who provide digital products and services to make sure they are safe for its users. Therefore, understanding

the potential pathways through which digital technology use can impact children’s mental health is critical to allocate responsibilities, prioritize interventions and develop regulation where needed.

To move towards a more nuanced understanding of when and how digital technologies affect different aspect of children’s mental health, this report explores the impact of screen time, exposure to harmful content and abusive experiences on emotional well-being, anxiety, suicidal thoughts and behaviours, and self-harm. The data sets used allow us to analyse the associations between screen time, content exposure, negative online experiences and these mental health outcomes in children at an unprecedented level of granularity.

Data and methods

This section uses data from two multi-country data sets covering a total of 40 countries in different parts of the world. The first is survey data from the EU Kids Online project, which spans 19 countries in Europe and reflects the responses of 20,348 internet-using children aged 9–16, collected between 2017–2019. The second is survey data from the Disrupting Harm project, including 21 countries in Latin America, eastern Europe, eastern and southern Africa, north Africa, and southeast Asia and reflects the responses of 21,000 internet-using children aged 12–17,

collected between 2020–2024. All data are based on self-reported survey responses.

Linear regression models were used on the EU Kids Online data to explore associations between screen time, being subjected to hurtful experiences online, and the impact on emotional well-being. The models controlled for gender and age.

Structural equation modelling was used on the Disrupting Harm data to explore the associations between screen time, harmful online content (exposure to hateful, violent, gory and unwanted sexual content),

abusive online experiences (online sexual abuse and online bullying) and mental health outcomes (anxiety, self-harm and suicidal thoughts and behaviours).

Models were designed to calculate the direct, indirect and total effects of screen time on mental health outcomes, mediated by harmful content and abusive experiences. The models controlled for gender, age and area of residence.

See the background paper [*Technical Analysis: Childhood in a Digital World*](#) for more detail on measurements, model specifications and results.

How does screen time, exposure to harmful content and abusive online experiences impact children’s mental health?

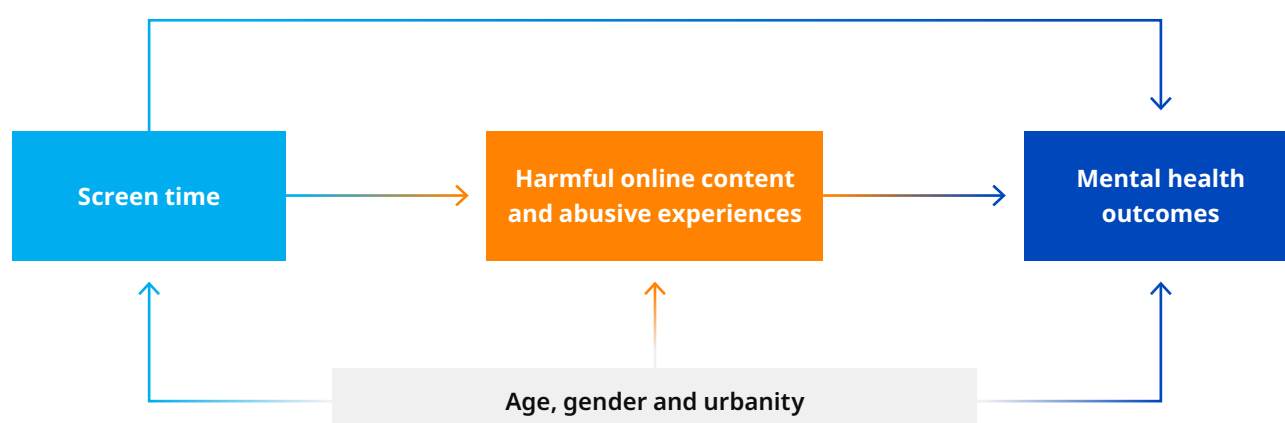
To understand the pathways through which digital technology use impacts children’s mental health we need to consider the effects of screen time, content exposure and abusive online experiences together. We also need to keep in mind that different online experiences likely influence different

aspects of mental health, depending on a combination of the experience itself, individual differences, and the broader context of a child's life.³² In this report we focus on four aspects of children's mental health: emotional well-being, anxiety, self-harm and suicidal thoughts or behaviours.

For the analysis, we first use the EU Kids Online data set to explore the linkages between screen time, being subjected to hurtful experiences online, and the impact on emotional well-being. We then go one step further and use the Disrupting Harm data set to break down our analysis into how screen time, exposure to specific forms of potentially harmful content (hateful, gory, violent and unwanted sexual content), and particularly severe experiences like online sexual abuse and online bullying, together impact on children's anxiety, self-harm and suicidal thoughts or behaviours.

We conduct mediation analyses to be able to determine which factors carry the greatest level of risk to children's mental health.³³ Additionally, we analyse if more screen time increases the likelihood of being exposed to harmful content or abusive experiences online. This is necessary because, in theory, the more time a child spends online the more likely they could be to be subjected to hurtful experiences, exposed to potentially harmful content, or fall victim to online sexual abuse or online bullying, which could in turn drive negative impacts on mental health. We test for all these relationships in our analysis.

Figure 3: Analysis of the association between screen time, exposure to harmful content and abusive online experiences and their effect on children's mental health



Source: Author's conceptual framework for the analysis in this chapter.

Insights

From this extensive analysis, we arrive at four important insights.³⁴

1

Analysis of data shows that in 16 out of 19 countries that were part of EU Kids Online, children who spent more time online had significantly lower emotional well-being. However, consistent with prior research, the association was significant but weak (adds ~3 per cent adjusted R2 when hurtful experiences are controlled for), indicating that other factors are more important.

Data from 21 countries in the Disrupting Harm project showed similar results: Spending more time online was inconsistently and weakly associated with anxiety, suicidal thoughts or behaviours and self-harm.

Overall, analysis of both data sets shows that the direct effects of screen time on emotional well-being, anxiety, self-harm, and suicidal thoughts and behaviours were generally weak and only significant in very few countries. **This largely matches other research that has shown weak and inconsistent associations between screen time and various mental health outcomes.**³⁵

2

In 9 out of 19 countries in the EU Kids Online data set, more screen time was *indirectly* associated with lower emotional well-being, as more screen time increases the risk of being subjected to hurtful experiences online. However, the effect was once again weak, **suggesting that screen time is not a main driver of children's exposure to hurtful experiences online.**

Similarly, data from the Disrupting Harm project showed that more screen time was *indirectly* associated with higher anxiety, self-harm and suicidal thoughts or behaviours, as more screen time increases the likelihood of exposure to harmful content and abusive experiences. As with the EU Kids Online data set, these indirect effects are generally weak and do not seem to constitute a main driver of children's exposure to harmful content or abusive experiences.

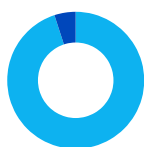


In 18 out of 19 countries in the EU Kids Online data set, children who had been subjected to hurtful experiences online had significantly lower emotional well-being. The strength of the effects ranged from weak to moderate.

Relatedly, in all of the countries in the Disrupting Harm data set, **children who had been exposed to online sexual abuse or online bullying had significantly higher levels of anxiety, were more likely to self-harm and had more suicidal thoughts or behaviours.**³⁶ The strength of these negative associations were moderate to strong (*see Figure 4*).



In a large majority of countries in the Disrupting Harm data set, **children who had been exposed to different types of harmful content had significantly higher levels of anxiety, were more likely to self-harm, and had more suicidal thoughts and behaviours.** The strength of these associations was generally a bit weaker than for online bullying and online sexual abuse, but strong enough to take seriously (*see Figure 4*).



In 18 out of 19 countries in the EU Kids Online data set, children subjected to hurtful online experiences had significantly lower emotional well-being.

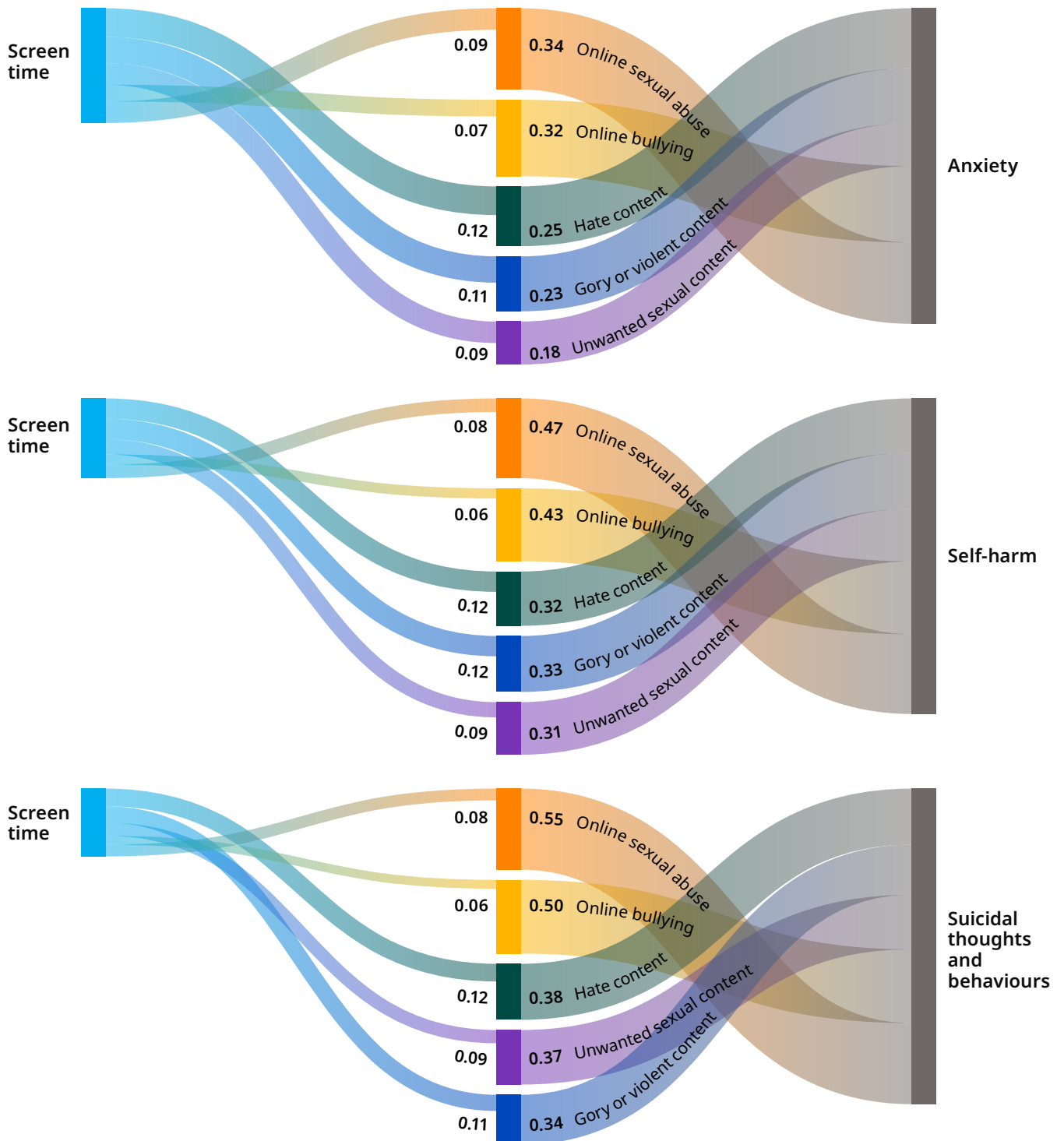
Taken together, these results show that exposure to harmful content and abusive online experiences are consistently associated with mental ill health in children, with moderate to strong effects. It suggests that these negative online experiences constitute a key pathway through which digital technologies may harm children's mental health.

Comparing the effects of screen time, harmful content and abusive experiences, our analysis finds that online sexual abuse and online bullying have the strongest and most consistent negative associations with anxiety, self-harm, and suicidal thoughts or behaviours. Exposure to hateful, gory or violent content, as well as unwanted sexual content, are less consistent in their effects and somewhat weaker on average, but still significant in most countries and worth taking seriously.

We find no substantial evidence that screen time directly harms these aspects of children's mental health. It appears that while higher screen time may in some cases contribute to the exposure to harmful content and abusive experiences, the overall effect is weak. It suggests that exposure to harmful content or abusive experiences is not primarily a result of spending more time online. Other factors seem to be at play that require further

investigation, including what platforms children use and the kind of activities and communities they engage in online. For example, prior research by UNICEF has shown that many children subjected to online sexual abuse are victimized on social media platforms.³⁷

Figure 4: The effects of screen time, harmful content and abusive experiences on children's mental health



Note: Numbers in the figure represent standardized beta coefficients averaged across countries. See Appendix B for median and range values.
Source: Authors' new analysis conducted for this report, based on the Disrupting Harm data set.

The results presented here are robust and remarkably consistent across 40 countries from multiple regions of the world, reflecting the lived experience of more than 40,000 children. The implications of these findings are many. To protect children's mental health in a digital age, we should concentrate our collective action on preventing children from being exposed to harmful content and abusive experiences online. Restricting the time they spend in digital spaces appears less useful to address issues like low emotional well-being, anxiety, suicidal thoughts and behaviours, and self-harm. In fact, given the established importance of being online for children to acquire digital skills, coupled with growing evidence of how online communities can offer an important source of support for children who experience mental health difficulties,³⁸ reducing screen time could even be detrimental for some.

However, too much screen time may still undermine other aspects of children's mental or physical health that are not measured in this report.³⁹ There are valid concerns around risks related to worsening eyesight and disturbed sleep as the use of technology becomes more integrated in children's lives. There are also many potential benefits of spending time outside the digital environment that children might miss out if they spend too much time online, including benefits to physical health, especially for younger children. All these aspects require further study. Ultimately, both parents and children growing up in highly digitalized societies need to find a healthy life balance that works for them. To support them in these efforts, we need nuanced research that does not look at screen time in isolation from children's online experiences and life circumstances.



We find no substantial evidence that screen time directly harms these aspects of children's mental health.

To address concerns around low emotional well-being, increased anxiety, suicidal thoughts and behaviours, and self-harm issues, our results suggest that prioritizing the prevention of online sexual abuse and online bullying will be the most effective pathway. Sexual abuse and bullying are complex issues shaped by dynamics such as power imbalances, social vulnerabilities, norms and values around violence in society, and gender roles. A range of solutions need to be put in place, some of which are preventative and focus on changing norms that enable or normalize violence, coupled with age-appropriate sexuality education that help children recognize abusive behaviours online and in person. At the same time, companies that provide digital products and services need to take a safety-by-design approach that minimizes the risk that children come into contact with perpetrators and provide effective reporting and redress mechanisms when they do.⁴⁰

These efforts should be complemented by stronger content moderation that reduces children's exposure to hateful content, gory or violent content, and unwanted sexual content. This responsibility falls to the technology industry, which urgently needs to reaffirm its commitments to protecting children and institute robust measures to prevent and mitigate online harms.



However, too much screen time may still undermine other aspects of children's mental or physical health that are not measured in this report.

If the wide spread of harmful content and abusive experiences online are not curbed, parents and even states may be left with no choice but to completely restrict children's access to certain platforms that are not keeping up with their responsibilities. Governments may consider implementing stronger legislation in this respect, to hold technology companies accountable. Alongside these actions, governments would benefit from training their social service workforce, educators and health professionals to better understand the nature of children's digital engagement and exposure to online harms to support children in their everyday life and contribute to better prevention and response.

While these findings provide a strong foundation for understanding how certain aspects of children's mental health might be affected by harmful online content and abusive experiences, there is now a need to explore the pathways outlined here through longitudinal research that can trace changes in children's mental health over time, as well as qualitative research to add more depth and nuance. Some of this work is already underway in specific countries and will be important to extend elsewhere to progress towards a global picture.⁴¹



Conclusions and recommendations

Connectivity

Countries where a majority of the population is not yet connected should prioritize accelerating progress towards universal connectivity. Failing to do so risks leaving another generation of children without the opportunity to develop digital skills from a young age, which will deepen existing inequalities. Even where connectivity and devices are available, many children are not utilizing digital technologies in school as effectively as we might hope. Children could achieve real improvements in digital skills development by using digital technology in both formal education and extracurricular activities.

To address connectivity gaps for children:

- **Governments** should invest in electricity and digital infrastructure, ideally using sustainable energy sources, particularly in underserved urban communities and rural areas. This should include providing internet access and affordable devices to schools as well as ensuring families have access to affordable devices, for example, through connectivity subsidies for low-income households. Efforts to increase access should be implemented in tandem with those that address existing social, cultural and economic inequalities that limit the opportunities of being connected.
- **Schools and teachers** can serve as equalizers by ensuring that students have access to devices and connectivity. However, even well-connected schools require better support to integrate digital technologies into classrooms effectively. **Governments** should create policies and programmes to aid in this integration, for example, by investing in teachers' professional development and providing evidence-informed guidance on the use of digital technologies for learning.
- **The technology industry** (e.g., telecom providers, mobile operators and hardware manufacturers) should explore models to provide lower-cost services and products for schools and families with children, with a focus

on benefiting poorer communities. This would help address gaps in meaningful connectivity. **Governments** can enable this through subsidizing market creation costs and incentivize private sector investment.⁴²

Digital skills

Children who engage more with digital technologies and spend more time online tend to develop stronger digital skills. This highlights the importance of access and usage in fostering skill development. While restrictions are sometimes necessary to promote safe, balanced usage, it's essential that these restrictions are carefully considered to avoid hindering children's skills development.

To ensure all children have a chance to build digital skills:

- **Parents** should encourage and support children to actively use the internet and digital technologies in diverse ways to enhance their skills outside of school, potentially from a young age, but always in a balanced way that allows time for other activities. These activities should take place on safe, age-appropriate platforms. Additional guidance from governments and experts may be needed to help parents identify platforms suitable for their children.
- **Governments and experts**, in consultation with children, should determine what digital skills children will need to thrive in the future and identify the most effective ways to teach these skills, combining formal and informal learning methods. In the long term, digital skills education should be revised, evaluated and, once proven effective, be included in school curricula for all children. Too many digital skills programmes used today have not been evaluated, which impedes effective learning and scale-up through the formal education system. With a rapidly changing digital landscape and influx of tools powered by artificial intelligence, it is important to take a forward-looking approach to anticipate the digital skills needed for future generations.
- **Schools and teachers** should integrate digital technologies into students' learning activities, ensuring this is done without overburdening teachers. To achieve this, teacher training programmes must be updated based on research into how digital skills can be effectively taught in formal education.

- **Governments, schools and parents** should ensure children acquire the skills necessary to recognize and respond to online harm. While it is never children's responsibility to protect themselves, it is important that they can recognize harm and know what to do about it or where to seek help. Better online safety education should be a priority for all states, but most countries do not yet have high-quality, evidence-informed and evaluated online safety education that can be scaled through the school system. This should be urgently developed and evaluated for effectiveness.

Mental health

Addressing platform safety and the harmful use of digital technologies is crucial to protecting children's mental health. Our results suggest that preventing children from going online may undermine their skills development, while doing little in the way of protecting their mental health in the areas covered by this report. Legislative and policy interventions should focus on areas with clear impacts on mental health, such as preventing online sexual abuse and online bullying. The technology sector needs to step up its efforts and must be held accountable for exposing children to harmful or illegal content and behaviours. Evidence is clear that current actions have been insufficient, as children continue to be harmed online.

However, these issues extend beyond the digital environment and require broader societal action to address the social and gender norms that enable violence against children, online and in person.

To protect children's mental health in a digital age:

- **The technology industry**, and in particular online platforms, must adopt a zero-tolerance approach to online sexual abuse and online bullying, coupled with tangible actions to address it. Our research shows that online sexual abuse and online bullying have the strongest associations with risks to mental health as measured here. While the companies that manage technology platforms are not solely responsible for these issues, they can and must institute robust measures to identify, prevent and mitigate child rights violations on their platforms, including online sexual abuse and online bullying.

- **Social media platforms** must allocate sufficient resources (both financial and non-financial) to ensure these spaces are safe for all children. Since social media use contributes to digital skills development, restricting children from these spaces can undermine their learning opportunities. However, making these spaces viable for children will require significant investment in safety-by-design and content moderation across the technology industry, and continuous child rights due diligence, including impact assessments, to determine how children are affected.
- **Governments and legislators** should strengthen efforts to hold the technology industry accountable for exposing children to harmful content and experiences, requiring them to step up their online safety and harm prevention efforts. Special attention must be given to illegal content and conduct, such as certain forms of hate speech and sexual abuse, which come with additional legal obligations. Although legislation varies by jurisdiction, platforms must comply with national laws and be held accountable for any breaches.
- **Governments and schools** should provide age-appropriate sexuality education that help children recognize abusive behaviours,⁴³ understand consent and boundaries, and navigate these issues both online and in person. This could be integrated into evidence-informed online safety education, which should be developed, evaluated and taught in schools.
- **Governments** should train professionals working in education, child protection, justice, law enforcement and health sectors to better understand children's experiences in the digital environment to improve both prevention and response to online sexual abuse and online bullying. In-depth evidence to support such efforts is forthcoming from the Disrupting Harm project.
- **Parents** can play a role by doing their best to ensure children do not use online services or products from companies that are not able to keep children safe on their platforms. Parents should monitor the digital use of younger children to make sure the content is age-appropriate and balanced. Monitoring content is often more difficult with older children who want greater independence, and other educational efforts (for example through school) need to take over. Having an open and ongoing



dialogue with children about online harms can aid parents' efforts to make sure children engage with safe content, but success requires parents to have access to reliable information.

- **Government, civil society and independent experts** can assist parents by providing information about different platforms and their relative risks or benefits, including identifying platforms that expose children to too much risk. They can also promote alternative content that is well designed, respects children's rights and supports their well-being.

Appendix A – Limitations

The findings in this report are primarily descriptive and correlational because of the cross-sectional nature of the data. This comes with limitations that are important to acknowledge. For analysis on digital skills, our interpretation is assuming a direction of causality where greater engagement in online activities leads to greater digital skills, not the other way around. This is in line with existing evidence on the topic and suitable for the skills included in this analysis. However, in some cases this relationship might be mutually reinforcing, and greater digital skills may also change the nature of the engagement itself. This is not accounted for in our analysis and would require longitudinal data to explore further.

For analysis on mental health, our interpretation is assuming a direction of causality where screen time and online experiences lead to mental health outcomes. While this is theoretically sound, it is also possible that children who are suffering from mental health issues are more vulnerable to harmful online experiences, which could explain the associations found here. This is a plausible hypothesis, with some support in existing literature, and probably depends on the individual experience of the child. Longitudinal data will be important in the future to untangle these relationships. Irrespective of the direction of association, however, the conclusions are still valid and the recommendations for governments and industry are just as critical to implement, to ensure a safer online environment for all children. It is also worth noting that there are many additional predictors and outcomes related to the use of digital technology that need to be considered, in addition to those analysed here. More research is needed to unpack the many different pathways through which digital technology can support or undermine children's mental health. Additionally, this report has not covered risks to children's physical health, which constitutes an evidence gap. Better data is urgently needed to inform guidance around screen time and physical health, primarily for younger children.

Finally, we want to acknowledge that it is sometimes complex to draw broad and uniform conclusions from results of many different analyses across many different countries. While we have tried to stay as true to the data as possible, results sometimes differ markedly for individual countries and we recommend anyone interested in country-level effects to read our technical report.

Appendix B – Structural equation model result details

Table 1: Beta-coefficients from structural equation models; direct effects between abusive experiences and children's mental health outcomes. Averaged effect sizes are found in Figure 4.

Abusive experiences/ mental health	Anxiety	Suicidal thoughts and behaviours	Self-harm
Online bullying	β median = 0.31 β range = 0.08 to 1.02	β median = 0.50 β range = 0.32 to 0.78	β median = 0.45 β range = -0.24 to 0.73
Online sexual abuse	β median = 0.27 β range = -0.03 to 1.24	β median = 0.54 β range = 0.3 to 0.74	β median = 0.40 β range = 0.26 to 0.77

Table 2: Beta-coefficients from structural equation models; direct effects between harmful online content and children's mental health outcomes. Averaged effect sizes are found in Figure 4.

Harmful content/ mental health	Anxiety	Suicidal thoughts and behaviours	Self-harm
Exposure to hate content	β median = 0.20 β range = 0.02 to 1.02	β median = 0.35 β range = 0.20 to 0.76	β median = 0.28 β range = 0.03 to 0.80
Exposure to gory or violent content	β median = 0.24 β range = 0.08 to 0.42	β median = 0.34 β range = 0.15 to 0.60	β median = 0.33 β range = 0.04 to 0.80
Exposure to unwanted sexual content	β median = 0.19 β range = -0.1 to 0.40	β median = 0.35 β range = 0.02 to 0.70	β median = 0.32 β range = -0.17 to 0.69

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UNICEF Innocenti equips thought leaders and decision-makers with the evidence they need to build a better, safer world for children. The office undertakes research on unresolved and emerging issues, using primary and secondary data that represent the voices of children and families themselves. It uses foresight to set the agenda for children, including horizon scanning, trends analysis and scenario development. The office produces a diverse and dynamic library of high-level reports, analyses and policy papers, and provides a platform for debate and advocacy on a wide range of child rights issues.

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