Health Innovation East

Understanding the drivers and impacts of digital exclusion for children and young people's health: a rapid evidence review

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Executive Summary

Background

Health Innovation East was commissioned by NHS England East of England Children & Young People's Transformation Programme to complete a rapid evidence review. The aim of this review was to identify and analyse research into the drivers and impacts of digital exclusion on children and young people's health and health-seeking behaviours.

Methods

Searches for journal articles published since 2013 were carried out on the electronic database PubMed, along with a search for grey literature using Google. Search results deemed relevant to children and young people's digital exclusion and children and young people's health were reviewed using the abstract, and the most relevant 25 papers were thematically analysed for this review (15 journal articles and 10 reports).

Findings

Six key themes were identified from a detailed review of the 25 included papers.

1. Impact of the COVID-19 pandemic

The impact of COVID-19 on children's education is widely reported, not least how a lack of digital access has negatively affected children's learning, life chances and social development (18). There are important lessons to be learnt that apply to children's access to digital health technology, both in terms of the agility of systems to rapidly deploy free devices and internet access, and those children who are most likely to be left behind.

2. Access to devices and the internet

'Access' to laptops, tablets and mobile phones and connectivity to the internet is multifaceted. Children may be living in households with one shared device, rendering access for health reasons near impossible. Households may be connected to Wi-Fi, but poor infrastructure means that virtual appointments are constantly interrupted. A technology check is essential before digital health technologies are offered to children and young people (CYP) (24).

3. Social determinants of health

Education, employment status and geographical location each influence the opportunities and barriers that CYP encounter when accessing digital services. The cost-of-living crisis is putting an additional burden on families with the price of essentials like heating, food, and broadband costs rising (12). More than 1 in 5 people in the UK (22%) were living in poverty in 2021/22, including 4.2 million (or nearly 3 in 10) children.[1] Larger families, minority ethnic groups and those with disabilities face particularly high levels of poverty. Children in care and young people not in education or employment (NEET) are also at a higher risk of digital exclusion (19, 7).

4. Safety and privacy

For telehealth to be effective CYP need a safe space in which to speak (1), that allows for personal dignity and privacy (12). Around 62% of 5 to 15-year-olds share access to internet-enabled laptops, desktop computers or tablets with a family member (18). O'Connor et al. (2016) recommend that to assess digital engagement issues, security of children's data needs to be addressed before a digital health technology is introduced.

5. Accessibility and digital literacy

A 2022 study found that 16% of those aged over 15 in the UK did not have all the foundation skills as defined by the Consumer Digital Index[2], while around 24% of young adults (15-24) did not meet all 5 essential skills (7). Digital health technology may not be accessible to CYP with English as a second language, those with low digital or health literacy, or those with physical or learning disabilities (17). Conversely digital may be more adaptable than face-to-face services. The digital skills of parents, carers and health care professionals can also act as a barrier to CYP access (12, 6).

6. Beliefs and trust

CYP can be reluctant to accept digital health technologies because of uncertainties around its validity and reliability (11), as well as having concerns around their privacy online (24). Parents also have concerns around the security of their child's health data with online services (6).

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[1] https://www.jrf.org.uk/uk-poverty-2024-the-essential-guide-to-understanding-poverty-in-the-uk [accessed 02/02/24]

[2] https://www.lloydsbank.com/banking-with-us/whats-happening/consumer-digital-index.html [accessed 08.02.24].

Conclusion

The impact of digital exclusion as it relates to children and young people's health lacks research and policy guidance, particularly that which takes account of the views of children and young people (CYP) and their caregivers. Fundamental to the appropriate and equitable access to digital health technologies by CYP is an understanding of digital poverty, digital literacy and preference for digital vs. other ways of receiving healthcare. At each stage of the decision-making process about the adoption of digital health technologies for CYP, there needs to be full consideration of who will be able to benefit, who will be excluded and how to mitigate against this. The journey might begin with the technology provider, ensuring their user research and analysis is as broad as possible to account for CYP in different circumstances across geographies. Guidance is then required for an individual clinician, commissioner, service provider or integrated care system, to ensure that all children and young people who could benefit from digital health technologies, are enabled to when it is introduced to a care pathway. Income inequality appears to be the most significant driver of digital exclusion, and one that exacerbates all other factors that might stand in the way of CYP and their caregivers accessing digital health technologies.

Background

Digital transformation is a significant priority for the NHS, which includes providing digital services and tools to give people more control over their health.[3] NHS England recently published a framework for action on inclusive digital healthcare.[4] This aims to ensure that no-one is left behind as NHS services increasingly provide digital health technology as part of routine care. However, as yet there has not been a specific focus (in policy or research) on digital exclusion as it relates to children and young people's health. Digital health technology for children and young people is wide-ranging and includes self-help apps such as medication reminders, at home monitoring devices for long-term conditions, and therapeutic support offered digitally, amongst other approaches. Little is known about which children might be excluded from using such technology, or how children respond to accessing health support digitally. Parents and carers are often the gatekeepers of both internet and device use, as well as access to digital health technologies, which adds a dimension that is not considered in relation to adult health.

To respond to this gap in understanding, Health Innovation East was commissioned by NHS England East of England Children & Young People's Transformation Programme team, to complete a rapid evidence review exploring the drivers and impacts of digital exclusion for children and young people's health. The intention is for the review to support local decision making around procurement of digital health technology for children and young people, and encourage consideration of digital inclusion at all stages of designing, implementing and evaluating digital healthcare pathways.

Objectives

The primary research question for this rapid evidence review was ***what are the drivers and impacts of digital exclusion for children and young people's health?***

[3] https://www.longtermplan.nhs.uk/online-version/chapter-5-digitally-enabled-care-will-go-mainstream-across-the-nhs/ [accessed 04/01/24]
[4] https://www.england.nhs.uk/long-read/inclusive-digital-healthcare-a-framework-for-nhs-action-on-digital-inclusion/ [accessed 04/01/24]

To support the identification and analysis of relevant literature, the following sub-questions were considered:

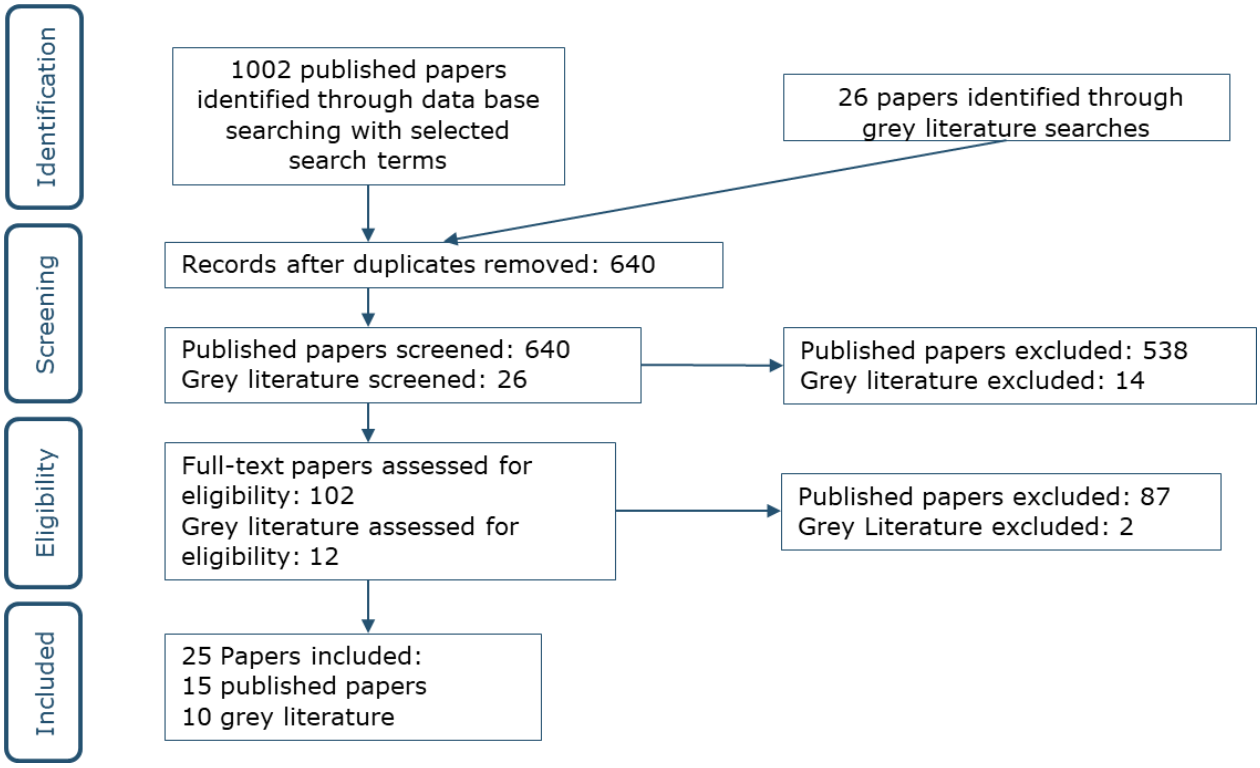
- *What factors contribute to the digital exclusion of children and young people?*
- *What is the impact of digital exclusion on children and young people?*
- *What works to address the digital exclusion of children and young people?*
- *What are the barriers to digital health technology for children and young people?*

Methods

Searches for journal articles published since 2013 were carried out on the electronic database PubMed. In addition, a search for grey literature was completed using Google to identify relevant reports and guidelines. The search terms used can be found at Appendix A. Definitions of terms used throughout the review are at Appendix B.

The search results were initially checked for potential relevance using the title. Those deemed relevant to children and young people's digital exclusion and children and young people's health were reviewed using the abstract. The most relevant 25 papers were then thematically analysed for this review (15 journal articles and 10 grey literature reports). Figure 1 shows the process by which journal articles and grey literature were reviewed for inclusion in the rapid evidence review.

FIGURE 1: DOCUMENT REVIEW PROCESS



Findings

Theme 1: Impact of the COVID-19 pandemic

The COVID-19 pandemic forced the NHS, local authorities, and the voluntary and community sector to rapidly adapt their CYP services to enable remote delivery (24, 1). Services had to swiftly expand their telehealth capabilities and convert to virtual appointments to limit the risk of infection while still providing patient care (14). Around 10 million more people in the UK used NHS websites or digital applications in 2021 compared with 2020, and NHS App registrations increased from 2 million people in 2021 to 30 million in 2023.[5] Despite the benefits of this transition to online delivery, the pandemic dramatically exposed both health and digital inequalities (12, 14).

COVID-19 had a monumental impact on all children, but this is particularly true of children who were digitally excluded (12, 18). During the pandemic, the majority of

[5] https://www.england.nhs.uk/long-read/inclusive-digital-healthcare-a-framework-for-nhs-action-on-digital-inclusion/ [accessed 05/01/24]

CYP were expected to learn virtually (13, 21), however, Ofcom found that one in five (20%) children did not have access to an appropriate device for home study (12, 24). Furthermore, 2% of school-aged children relied on smartphone-only internet access to get online (18). The pandemic highlighted the digital poverty that hinders some young people's access to digital technology, including for their healthcare (24). The UK government supported a device distribution scheme that gave out over 200,000 devices and over 50,000 routers, however this only accounted for 37% of disadvantaged children in need of connectivity or a device (12). A study in Germany found that while adolescents' use of technology for study-related purposes increased during the COVID-19 pandemic, those from disadvantaged families are still at risk of being left behind (21).

The pandemic also led to public spaces closing, meaning that families and CYP who rely on places like libraries for access to devices and Wi-Fi went from being digitally included to excluded (12, 13). This is one example of how digital inclusion is not static, and factors out of families' control can lead to them being excluded from crucial services and support (12).

Bowyer et al. (2021) point out that 'even before COVID-19, the myth of children as digital natives permeated media narratives, driving children without access and skills further out of the spotlight'. They recommend a thorough public review of the COVID-19 emergency initiatives related to digital access, to gather lessons learned and inform best practice for the future (18). Similarly, Kastorff et al. (2023) recommend further research on the impact of the rapid digitisation during the pandemic on socially disadvantaged students, to develop targeted interventions that address the digital divide.

Theme 2: Access to devices and the internet

Data from the Office for National Statistics released in 2020 showed that 96% of households in Great Britain had internet access, including 100% of households with children.[6] However, internet access alone is an insufficient marker of digital inclusion.

[6] https://www.ons.gov.uk/peoplepopulationandcommunity/householdcharacteristics/homeinternetandsocialmediausage/datasets/internetaccesshouseholdsandindividualsreferencetables [accessed 08.02.24]

4% of households in 2020 had access to mobile phone data, but no broadband internet. Factors such as quality of speed, connection and data limits affect accessibility and create barriers (7). Digital health technologies require a strong and secure internet connection, while 2% of properties in the UK are unable to access download and upload speeds equal to the Universal Service Obligation minimum (18).

Poor internet connection can affect audio and visual quality and consequently compromise the service or digital health technology being digitally delivered. Smith-East and Starks (2021) identified this as one of the main barriers in the building of relationships and communication between young patients and healthcare providers in online mental health care delivery. Lack of high-speed broadband is more common in rural areas of the country and is a major issue when it comes to video calling bandwidth (6). Around 50% of the properties in England that do not meet the Universal Service Obligation minimum are rural (12). It is in these rural areas where the need for digital health technologies might be higher, as public transport options (to travel to face-to-face appointments) may be limited, expensive and unreliable, and rural areas lack the local services that are available in towns and cities (19).

Nine out of ten 5- to 15-year-olds are accessing the internet, with access through smartphones and tablets on the rise (7). Yet a report by UNICEF UK and the Carnegie UK Trust (2021) showed that around 8% of the same age group do not have access to an internet enabled laptop, desktop computer or tablet at home. These children may already experience multiple disadvantage, and are at risk of being excluded from digital innovation that could benefit their health and care. Of those CYP that do have a device, 62% will be sharing with members of their household (18).

A review into the management of paediatric asthma using telehealth (10) identified several barriers in using telehealth via mobile devices, in addition to device and broadband access, and lack of knowledge around technology. For example, the practicalities of using a smartphone to record inhaler use and the time associated with uploading inhaler technique videos. CYP also found using desktop computers and emails challenging, as they are not necessarily part of their internet use in day-to-day life (10).

Several recommendations are made in the literature about access to devices and the internet. Firstly, to complete a technology check before an online appointment or

digital device is issued (24). If barriers are identified, to provide CYP with suitable hardware (laptops, computers, tablets), data allowance and connectivity (19). Finally, to create approaches that address disparities such as social prescribing of phone contracts; local schools loaning out devices to young people who are engaging in therapy; or partnerships with charities to distribute used devices (1).

Theme 3: Social determinants of health

Social determinants of health such as education and employment, housing, social networks and where someone lives influence the benefit that children and young people can derive from digital health services. Income and financial security are key drivers of health outcomes[7]. More than 1 in 5 people in the UK (22%) were living in poverty in 2021/22, including 4.2 million (or nearly 3 in 10) children. Larger families, minority ethnic groups and those with disabilities face particularly high levels of poverty.[8] UK income inequality has increased since 2017, driven by a reduction in mean disposable income in the fifth poorest households.[9] Rising income inequality has had a particular impact on CYP, limiting their life chances and making them more vulnerable to poorer outcomes.

Many young people rely on welfare benefits for financial support; during 2020, the number of young people aged 18-24 claiming Universal Credit doubled in three months. Currently young people under the age of 25 receive 20% less in Universal Credit payments in comparison to adults (20).
According to Citizen's Advice, 2.5 million people were behind on their broadband bills in 2021, with younger people (18-34 years old) being three times more likely to be behind, and households on Universal Credit nine times more likely to be behind on their bills[10]. The cost-of-living crisis is putting an additional burden on families with the price of essentials like heating, food, and broadband costs rising (12).

Most care experienced young people survive on a limited income and many are living in poverty (8), consequently often lacking the funds for laptops, tablets and

[7] https://ukdataservice.ac.uk/case-study/the-health-case-for-basic-income/ [accessed 08.02.24]
[8] https://www.jrf.org.uk/uk-poverty-2024-the-essential-guide-to-understanding-poverty-in-the-uk [accessed 02/02/24]
[9] https://www.ons.gov.uk/peoplepopulationandcommunity/personalandhouseholdfinances/incomeandwealth/bulletins/householdincomeinequalityfinancial/financialyearending2022 [accessed 08.02.24]
[10] https://www.citizensadvice.org.uk/cymraeg/amdanom-ni/about-us1/media/press-releases/25-million-people-are-behind-on-their-broadband-bills/ [accessed 01/02/24]

smartphones as well as reliable and strong internet access (19). Young people not in education, employment or training (NEET) are also at high risk of digital exclusion (7). Helsper and Smirnova (2016) found that 90% of young people had a smartphone, but using the internet was more restricted for those who were NEET because of device capabilities, device availability and fewer locations for internet access.

Data from the Office for National Statistics (2020) has provided evidence that ethnicity and poverty are correlated in the UK, with children in Bangladeshi and Pakistani households the most likely to live in low income and material deprivation out of all ethnic groups, and children in Indian households the least likely.[11] Aisbitt et al. (2022) estimate that around 25,400 children with mental health issues from Pakistani, Black and Bangladeshi ethnic backgrounds miss out on remote therapy due to living in poverty (1). Choo et al. (2021) documented that children in the US from ethnic backgrounds other than non-Hispanic white were less likely to have had an experience in using telemedicine. They also found that communities from lower SES were less likely to use telemedicine due to barriers in technology access, digital literacy, and distrust in healthcare (14).

Raws and Moore (2022) report that socioeconomic status is an important factor influencing confidence in using the internet, with 9% of adults from households in lower socioeconomic groups stating they were 'not at all confident', in comparison to 6% of all adult internet users. Kastorff et al. (2023) note that 'the digital divide could particularly affect adolescents who attend schools with lower educational tracks, as their parents often have lower levels of education'.

Recommendations made in the literature related to this theme include providing additional support and alternative access to online services for CYP experiencing digital poverty (24) and for care-experienced young people (19). Curfman et al. (2022) recommend ensuring the implementation of digital services is equitable through specific attention to at risk populations, support for digital literacy and dedicated funding to enable equitable care (23). Aisbitt et al. (2023) also recommend that services prioritise CYP in low socioeconomic groups for face to face appointments, over CYP who readily have digital access. Finally, Piers et al. (2023) recommend that

[11] https://www.ons.gov.uk/economy/nationalaccounts/uksectoraccounts/compendium/economicreview/february2020/childpovertyandeducationoutcomesbyethnicity [accessed 08/02/24]

there is more research involving marginalised CYP to determine whether digital health interventions can help to close the digital divide (2).

Theme 4: Safety and privacy

The space in which CYP access online services and digital health technologies is often overlooked yet crucial; for telehealth to be effective it is vital that CYP have a safe space in their home that allows for privacy (1, 12). CYP with lower SES are less likely than their peers to have access to a private space, particularly for video appointments, leading to distraction, lack of engagement, or holding back from speaking openly (12, 23, 14, 1). Conversely during an in-person visit there may be an emphasis on confidentiality with parents or carers asked to step outside of the room, particularly in the case of mental health treatment (14). With two thirds of children sharing access to devices in the home (18), privacy and safeguarding are key considerations when offering digital health technologies to CYP. At the same time, some CYP may find the private nature of online services (specifically for mental health) helpful in overcoming stigma and reluctancy to seek help in person (2). O'Connor et al. (2016) recommend that to assess digital engagement issues, security of children's data needs to be addressed before a digital health technology is introduced.

Theme 5: Accessibility and digital literacy

The Consumer Digital Index has created a set of skills that can be used to measure digital literacy.[12] These include seven 'foundation digital skills' (such as connecting to Wi-Fi, opening apps, and changing a password). The 2023 Index revealed that 6% of 18–24-year-olds did not achieve the foundation level, along with 9% of households with children.[13] Despite the importance of digital skills, a fifth of young people do not feel that they have had basic training on digital skills (8). This is higher in marginalised groups including LGBTQ+ (31%), those with mobility disabilities (30%), those with mental health challenges (30%), and those who are NEET (34%) (8). CYP

[12] https://www.lloydsbank.com/banking-with-us/whats-happening/consumer-digital-index.html [accessed 08.02.24].
[13] Ibid

with mental health problems may face difficulties in recognising digital information, and may not be able to gain access to e-health services without the help of others (4).

Research has shown that language barriers are associated with lower digital literacy and limited health literacy (17). Language barriers impact the usefulness of telehealth services for CYP (23), with CYP who speak languages other than English less likely to access digital services, and at higher risk of digital exclusion than their peers (10, 17). Portal-based telehealth processes may marginalise certain ethnic groups due to factors such as communicating in LOE, internet access and digital skills (17,18). Translation services and interpreters may be introduced to mitigate this, but not without challenges. These include long wait times for interpreters, difficulty communicating through others, a reduction in the quality of communication between patient and clinician, and not least providing adequately trained medical interpreters in a virtual setting (14).

Children and young people's ability to benefit from digital access and develop digital skills is influenced by their social circumstances, such as where they live and their parents' education (12). CYP may rely on the digital literacy of their parents or carers (including older people) to access health technology, however 16% of adults in the UK are unable to use their device and the internet by themselves (18). Research has found that in order to reduce digital inequalities in CYP there is a clear need for a focus on training parents and carers in digital skills (12, 21).

Similarly, the digital literacy and confidence of health care professionals (HCPs) who interact with CYP are key. HCPs have cited a lack of comfort with technology, technical difficulties and scheduling challenges as impacting staff satisfaction with telehealth (10). When reviewing uptake of the eRedBook for child health, O'Connor et al. (2016) identified poor digital skills of public health nurses as a barrier, who found enrolling parents on the platform and engaging with them digitally challenging, combined with a lack of NHS IT system integration (6). Mcghee and Roesch-Marsh (2020) note that staff in residential units for children in care may also lack digital skills and digital literacy, with low confidence to support CYP.

The following recommendations are made in the literature:

- To make digital content for CYP more accessible through the use of images, videos, interactive elements, age-appropriate language, layout and languages other than English (24).
- To work with schools and colleges to improve the digital health literacy of CYP including how to access health content, information search strategies and skills for self-management (5).
- To ensure that digital health support is freely available to enable access and build confidence (19). This could include creating a digital guide and checklist to help both services and CYP to prepare for accessing digital services (24).

Theme 5: Beliefs and trust

Trust in digital health technology is important to both CYP and their caregivers. This can relate to the online rapport between clinician and patient, trust in the use of personal data, or trust that the digital health technology will be effective. Research has found that the use of telehealth can lead to an erosion of existing relationships with clinicians and CYP (10).

CYP can be reluctant to accept digital health technology because of uncertainties around validity and reliability (11), as well as their online privacy in relation to personal data (24). Parents also have concerns about online services when it comes to the security of their child's health data (6). CYP are more inclined to use digital interventions if there is transparency or evidence provided to support their credibility (11). The wide array of choice when it comes to online services and digital health technologies can be overwhelming for CYP, and can lead to feelings of distrust (24). Two studies in the US found that patients in certain minority ethnic groups were less likely to participate in video visits compared to audio visits (14, 23). One study found that Black patients reported being less satisfied with telehealth services, less likely to use telehealth than their White peers, and more likely to express concerns related to the physical absence of their clinicians (22). A second US study found that Latin Americans and African American adults were 43% and 32% less likely to choose video consultations compared with face-to-face appointments (15).

Conclusion

The impact of digital exclusion as it relates to children and young people's health lacks research and policy guidance, particularly that which takes account of the views of CYP and their caregivers. Fundamental to the appropriate and equitable access to digital health technologies by CYP is an understanding of digital poverty, digital literacy and preference for digital verses other ways of receiving healthcare. National initiatives to tackle digital literacy, access to devices, or broadband access should prioritise households with children, those with languages other than English and those with lower socioeconomic status.

At each stage of the decision-making process concerning the adoption of digital health technologies for CYP, there needs to be full consideration of who will be able to benefit, who will be excluded and how to mitigate against this. Assumptions may be made about CYP being equipped with both the skills and the devices to access digital health technology, however the literature highlights a range of barriers. Specific local action plans are needed that account for privacy, safety and data sharing, parents and carers as gatekeepers, income inequality, and the role of schools and colleges.

Capturing the different voices of CYP and their caregivers is paramount, whether moving from face-to-face to digital services or implementing a new digital health technology. The journey begins with the technology provider, ensuring their user research and analysis is as broad as possible to account for CYP in different circumstances across the country. Guidance is then required for an individual clinician, commissioner, service provider or integrated care system, to ensure that all children and young people who could benefit from a digital health technology, have the opportunity to do so when it is introduced to a care pathway.

A common theme running through this review is child poverty. Practical considerations around the cost of digital access, the quality of home internet connection, and access to household devices, should form part of the conversation with CYP, parents and carers. Income inequality appears to be the most significant driver of digital exclusion, and one that exacerbates all other factors that might stand in the way of CYP and their caregivers accessing digital health technologies.

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Appendix A: PubMed search terms

First Search Term	Secondary Search Term	Full Search Term
Adolescents	"Digital Disparities"	Adolescents "Digital Disparities"
Children	"Digital Disparities"	Children "Digital Disparities"
Children and Young People	"Digital Disparities"	Children and Young People "Digital Disparities"
CYP	"Digital Disparities"	CYP "Digital Disparities"
Paediatrics	"Digital Disparities"	Paediatrics "Digital Disparities"
Adolescents	"Digital Divide"	Adolescents "Digital Divide"
Children	"Digital Divide"	Children "Digital Divide"
Children and Young People	"Digital Divide"	Children and Young People "Digital Divide"
CYP	"Digital Divide"	CYP "Digital Divide"
Paediatrics	"Digital Divide"	Paediatrics "Digital Divide"
Adolescents	"Digital Exclusion"	Adolescents "Digital Exclusion"
Children	"Digital Exclusion"	Children "Digital Exclusion"
Children and Young People	"Digital Exclusion"	Children and Young People "Digital Exclusion"
CYP	"Digital Exclusion"	CYP "Digital Exclusion"
Paediatrics	"Digital Exclusion"	Paediatrics "Digital Exclusion"
Adolescents	"Digital health technology"	Adolescents "Digital health technology"
Children	"Digital health technology"	Children "Digital health technology"
Children and Young People	"Digital health technology"	Children and Young People "Digital health technology"
CYP	"Digital health technology"	CYP "Digital health technology"
Paediatrics	"Digital health technology"	Paediatrics "Digital health technology"
Adolescents	"Digital Inequalities"	Adolescents "Digital Inequalities"
Children	"Digital Inequalities"	Children "Digital Inequalities"
Children and Young People	"Digital Inequalities"	Children and Young People "Digital Inequalities"
CYP	"Digital Inequalities"	CYP "Digital Inequalities"
Paediatrics	"Digital Inequalities"	Paediatrics "Digital Inequalities"
Adolescents	"Digital Literacy"	Adolescents "Digital Literacy"
Children	"Digital Literacy"	Children "Digital Literacy"
Children and Young People	"Digital Literacy"	Children and Young People "Digital Literacy"
CYP	"Digital Literacy"	CYP "Digital Literacy"
Paediatrics	"Digital Literacy"	Paediatrics "Digital Literacy"
Adolescents	"Technology Access"	Adolescents "Technology Access"
Children	"Technology Access"	Children "Technology Access"
Children and Young People	"Technology Access"	Children and Young People "Technology Access"

CYP	"Technology Access"	CYP "Technology Access"
Paediatrics	"Technology Access"	Paediatrics "Technology Access"
Children	"mHealth" "inequalities"	Children "mHealth" "inequalities"
Children and Young People	"mHealth" "inequalities"	Children and Young People "mHealth" "inequalities"
CYP	"mHealth" "inequalities"	CYP "mHealth" "inequalities"
Paediatrics	"mHealth" "inequalities"	Paediatrics "mHealth" "inequalities"
Adolescents	"mHealth" "inequalities"	Adolescents "mHealth" "inequalities"
Children and Young People	"mHealth" "disparities"	Children and Young People "mHealth" "disparities"
CYP	"mHealth" "disparities"	CYP "mHealth" "disparities"
Paediatrics	"mHealth" "disparities"	Paediatrics "mHealth" "disparities"
Adolescents	"mHealth" "disparities"	Adolescents "mHealth" "disparities"
Children	"mHealth" "disparities"	Children "mHealth" "disparities"
Children	"Digital Health" "inequalities"	Children "Digital Health" "inequalities"
Children and Young People	"Digital Health" "inequalities"	Children and Young People "Digital Health" "inequalities"
CYP	"Digital Health" "inequalities"	CYP "Digital Health" "inequalities"
Paediatrics	"Digital Health" "inequalities"	Paediatrics "Digital Health" "inequalities"
Adolescents	"Digital Health" "inequalities"	Adolescents "Digital Health" "inequalities"
Children	"Digital Health" "disparities"	Children "Digital Health" "disparities"
Children and Young People	"Digital Health" "disparities"	Children and Young People "Digital Health" "disparities"
CYP	"Digital Health" "disparities"	CYP "Digital Health" "disparities"
Paediatrics	"Digital Health" "disparities"	Paediatrics "Digital Health" "disparities"
Adolescents	"Digital Health" "disparities"	Adolescents "Digital Health" "disparities"

Appendix B: Definitions

Children and young people (CYP)

For the purposes of this review, we have included evidence that relates to children and young people aged five to twenty-five years old. We recognise that digital health technology use and digital exclusion will vary by age group, and that parent and carer gatekeeping of both internet access, device use and digital health technology use will also vary depending on the child's age. However, we found very little nuance in the literature to point to children and young people's different experiences depending on their age group.

Digital exclusion

'*Digital exclusion occurs when people and groups in society are unable to exploit the benefits from technologies including the internet or devices. The gap between those who are excluded and those who are able to benefit from technology is known as the digital divide*'.[14]

Digital health technologies

'*Digital health technologies are digital products intended to benefit people or the wider health and social care system. This may include; smartphone apps, standalone software, online tools for treating or diagnosing conditions, preventing ill health, or for improving system efficiencies; and programmes that can be used to analyse data from medical devices such as scanners, sensors or monitors*'.[15]

Minimum Digital Standard of Living

'A minimum digital standard of living includes, but is more than, having accessible internet, adequate equipment, and the skills, knowledge, and support people need. It is about being able to communicate, connect, and engage with opportunities safely and with confidence'.[16]

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[14] https://phw.nhs.wales/publications/publications1/digital-technology-and-health-inequalities-a-scoping-review/ [accessed 05/01/24]
[15] https://www.nice.org.uk/corporate/ecd7/chapter/section-a-technologies-suitable-for-evaluation-using-the-evidence-standards-framework [accessed 05/01/24]
[16] https://www.lboro.ac.uk/media/wwwlboroacuk/content/crsp/downloads/reports/MDLS%20UK%20report_Final.pdf [accessed 04/01/24]

Telehealth

'Telehealth is defined as the delivery and facilitation of health and health-related services including medical care, provider and patient education, health information services, and self-care via telecommunications and digital communication technologies. Live video conferencing, mobile health apps, "store and forward" electronic transmission, and remote patient monitoring (RPM) are examples of technologies used in telehealth'.[17]

Socioeconomic Status (SES)

'Refers to an individual's position in a society which is determined by wealth, occupation, and social class and is a measure of an individual's or group's standing in the community. It usually relates to the income, occupation, educational attainment, and wealth of either an individual or a group'.[18]

[17] https://catalyst.nejm.org/doi/full/10.1056/CAT.18.0268 [accessed 24/01/24]
[18] https://www.sciencedirect.com/topics/psychology/socioeconomic-status [accessed 24/01/24]