ARTIFICIAL INTELLIGENCE'S IMPACT ON PERSONS WITH DISABILITIES IN AFRICA

KNUST Kwame Nkrumah University of Science and Technology, Kumasi · Responsible Artificial Intelligence Lab · IDRC · CRDI Canada · University of Rwanda · Next Step Foundation · UK International Development · Assistive Technologies for Disability Trust

Contents

Chapter 5: Rationale for a Focus on Disability and AI

Chapter 6: Artificial Intelligence and the Future of Assistive Technology in Africa

Chapter 7: Use of AI Beyond Assistive Technologies

Chapter 8: GenAI-Enabled Mental Health Tools for Persons with Disabilities in Sub-Saharan Africa: Risks and Opportunities

Chapter 9: AI for Inclusive Learning: Improving Education for Youth with Disabilities in Africa

Chapter 10: AI and Disability-Inclusive Employment in sub-Saharan Africa

Chapter 11: Supporting Caregivers of Children with Disabilities in Sub-Saharan Africa: Challenges, Stigma, and the Promise of AI Tools

Chapter 12: Bridging the Data Gap: Disability Representation in AI Datasets

Chapter 13: National and Regional Artificial Intelligence Strategies

Chapter 14: Survey Findings and Implications

Chapter 15: Conclusion and Recommendations

Acknowledgement

This report, “Scoping Study, Stakeholder Mapping and Regional Consultation on the Intersection of Artificial Intelligence and Disability Innovation in Africa,” was made possible through the generous support of the International Development Research Centre (IDRC) and Foreign Commonwealth Development Office (FCDO).

We extend our sincere appreciation to the Responsible AI Lab (RAIL) at Kwame Nkrumah University of Science and Technology (KNUST) for providing overall leadership as the Principal Investigator (PI) institution. We also thank the Assistive Technologies for Disability Trust (AT4D) and the Next Step Foundation for their vital collaboration as Co-Principal Investigators (Co-PIs).

Our gratitude goes to Tangaza University College and the Kenya National Commission for Science, Technology, and Innovation (NACOSTI) for their valuable support in securing ethics approval and facilitating the study in Kenya.

We acknowledge the contributions of the research leadership team — Prof. Jerry John Kponyo, Mr. Bernard Chiira, Dr. Christopher Harrison, and Prof. Hanyurwimfura Damien — whose expertise, guidance, and dedication were instrumental in shaping the outcomes of this study.

Finally, we express our heartfelt appreciation to all research collaborators, institutional partners, and stakeholders across Africa who shared their time, insights, and experiences. Your voices and perspectives were central to this effort and have greatly enriched the findings presented in this report.

Lead Editors: Prof. Jerry John Kponyo, Mr. Bernard Chiira, Dr. Christopher Harrison, and Prof. Hanyurwimfura Damien.

List of Contributors (Kwame Nkrumah University of Science and Technology, Ghana): Dr Enoch Acheampong, Dr. Justice Owusu Agyemang, Rev. (Sr.) Vida Kasore, Mrs. Betty Agyei Kponyo, Miss. Elizabeth Owusu Ansah, Mr. Jeffrey Kwame Owusu Ansah, Mr. Ros Yaw Owusu-Ansah, Miss Juliet Arthur

Associations of Persons with Disabilities (PWDs) That Were Engaged

Ghana Federation of Disability Organizations (GFD) (Greater Accra Region, Ghana), Ghana Society for the Physically Disabled (GSPD)(Greater Accra Region, Ghana), Ghana National Association of the Deaf (GNAD)(Ashanti Region, Ghana) Ghana Blind Union (GBU)(Greater Accra Region, Ghana), GFD (Ashanti Region, Ghana), GSPD (Ashanti Region, Ghana) GNAD (Ashanti Region, Ghana) GBU (Greater Accra Region, Ghana), GFD (Northern Region, Ghana), GBU (Northern Region, Ghana), GNAD (Northern Region, Ghana).

Executives / Representatives of Associations of PWDs in Ghana That Were Engaged (2025): Mr. Alexander Gyimah (Regional President, GFD Ashanti Region, Ghana)
Mad. Gifty Afi Wetsi (Regional Vice President, GFD, Ashanti Region, Ghana), Mr. Stephen C. T Gyan (Chairman, GSPD, Ashanti Region, Ghana), Mr. Robert Ayi-Ansah (Chairman, GNAD, Ashanti Region, Ghana), Mr. Hamidan Baasit (Chairman, GBU, Ashanti Region, Ghana), (Mr. Charles Adi – Darko (Regional Representative, GNAD, Greater Accra Region, Ghana), Mad. Theodora Eduaqua (Regional Repres entative, GBU, Greater Accra Region, Ghana), Mr. Charles Bentum (Regional Vice President, GSPD, Greater Accra Region, Ghana), Mr. Mohammed Iddrisu (Regional Representative, GFD, Northern Region, Ghana), Mad. Abubakari Sahadatu Nima (Regional Representative, GFD, Northern Region, Ghana).

Executive Summary

Artificial intelligence has the potential to improve the daily lives of Persons with Disabilities (PWDs) in Africa in practical, cumulative ways—transcribing, translating, summarizing, personalizing, and predicting to reduce routine frictions in school, work, health, mobility, and access to public services. The study surveys this emerging landscape across Kenya, Ghana, Rwanda, and comparator contexts, mapping how AI augments assistive technologies (AT) and mainstream services while clarifying the policy, data, and delivery conditions that determine real-world impact.

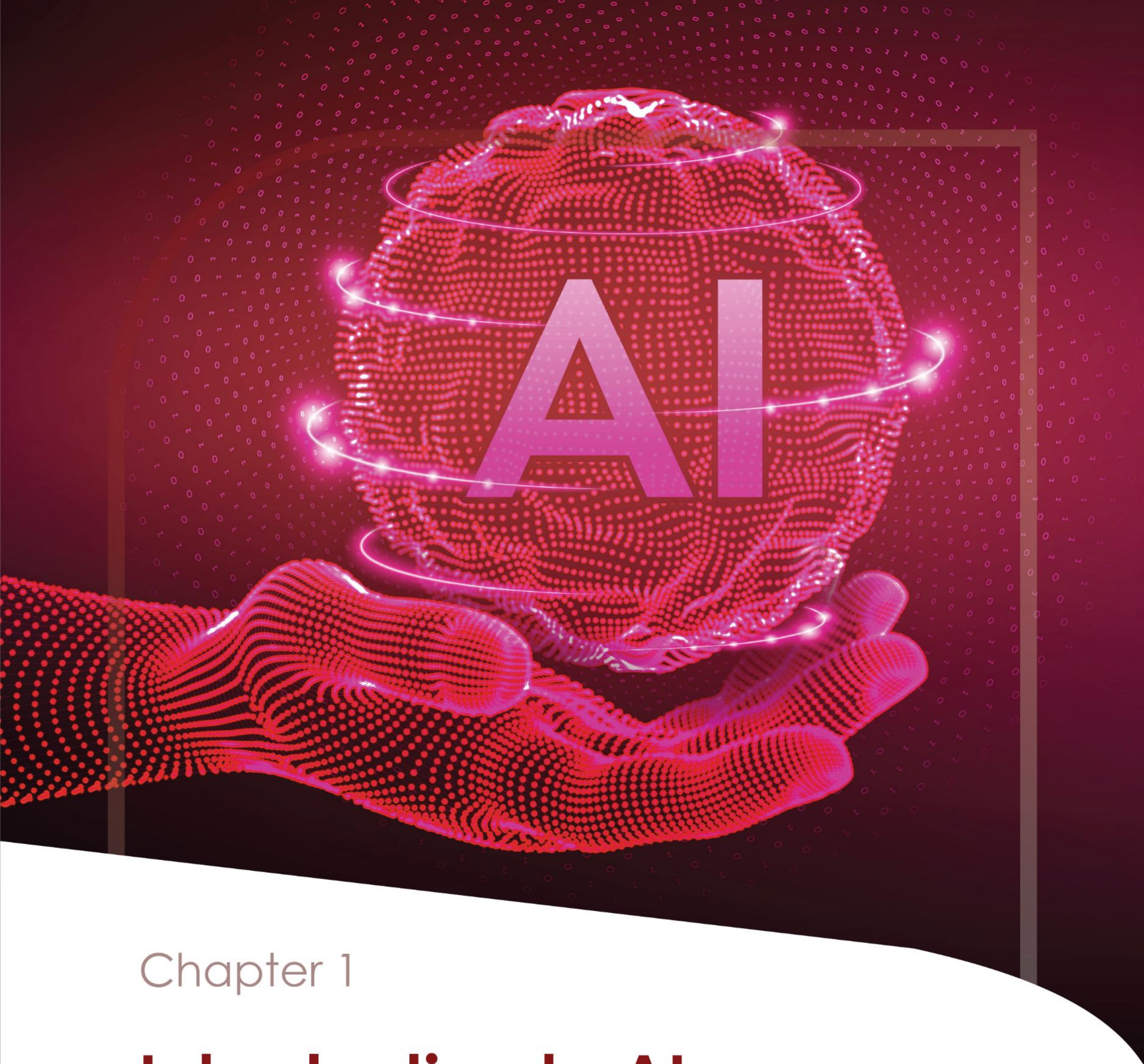
Across sectors, we find promising AI use cases beyond traditional AT. In education, adaptive tutors, captioning, and sign-language tools can widen access, though localized content and language coverage remain thin. In employment, AI can support job matching, accessible applications, task breakdown, and on-the-job accommodations, especially when paired with employer guidance and incentives. In mental health, chatbots can extend scarce services and offer stigma-free entry points to care; caregiver tools use voice, translation, and simple workflows to ease coordination and stress. Mobility and independent living benefit from computer vision, speech interfaces, and early robotics, with African innovators piloting sign-language avatars, personalized speech recognition, and lower-cost bionics. The potential of these advances is real but uneven—most remain pilots, and scale requires fit-for-purpose data, infrastructure, and financing.

One binding constraint is data. Disability is systematically under-counted in official statistics and under-represented or misrepresented in AI training sets, creating a "disability data desert" that limits accuracy for African contexts (from atypical speech and local sign languages to recognition of mobility aids). Without deliberate collection, curation, and governance that center PWDs, models will continue to miss or misread disabled users, with downstream harms in inclusion, safety, and opportunity. Building representative, ethical datasets—especially for African languages and disabilities—emerges as a first-order priority alongside affordable computing and connectivity.

Policy momentum is encouraging but incomplete. The African Union's Continental AI Strategy (2025–2030) explicitly names disability inclusion, calling for accessible datasets, skills, and governance. Ghana's and Kenya's AI strategies also advance infrastructure, data sharing, and public-sector adoption, although explicit disability provisions are still maturing. Convergence around rights-based, inclusive AI is visible; however, its delivery depends on procurement standards, budgeting for accessibility, and participation by Organizations of Persons with Disabilities (OPDs) in the design and oversight process.

The study's central conclusion is pragmatic: AI's near-term value for disability inclusion is unlocked where three conditions meet. First, inclusion by design—co-creation with PWDs and OPDs, localized languages, and multi-modal accessibility baked into products and datasets. Second, enabling rules and rails—national strategies that mandate accessibility in digital services, robust disability-relevant data, and align incentives for inclusive procurement. Third, sustainable delivery—hybrid human-AI service models, community channels, and financing that lower costs for users and caregivers while supporting innovators to move from pilots to scale. Where these conditions hold, AI can measurably widen access to learning, work, and care; where they do not, tools plateau as proofs-of-concept and risks of bias and exclusion grow.

Overall, the path to disability-inclusive AI in Africa is clear: invest in representative data and affordable infrastructure; mandate accessibility and accountability; and deliver through locally grounded, human-centered services. Done together, these steps turn today's pilots into equitable, reliable systems that expand agency and opportunity for millions of Africans with disabilities—and support the caregivers, educators, and employers who stand with the



Chapter 1

Introduction to AI and Disability

Introduction

Over the past decade, there has been growing recognition of the transformative potential of artificial intelligence (AI) to improve the lives of Persons with Disabilities (PWDs) in Africa. With over one billion people (about 16% of the global population) having a disability, a prevalence even higher in developing regions[1] – Inclusive AI solutions can help address long-standing gaps in accessibility, education, healthcare, and economic participation. In sub-Saharan Africa, an estimated 10–20% of the population has some form of disability. Yet PWDs often face disproportionate barriers, including stigmatization, limited access to assistive technologies, and underrepresentation in data and policy initiatives. This literature review examines advances in AI for disability inclusion in Africa, with a focus on Ghana, Kenya, and Rwanda, while drawing on broader continental and global insights. We survey peer-reviewed studies, grey literature (NGO reports, government publications), and key projects to identify thematic trends, available data sources, innovative AI applications beyond traditional assistive devices, as well as persistent data challenges (biases, "data deserts"), and opportunities for inclusive AI development. The findings are organized thematically and highlight data gaps, promising innovations, and priorities for policy and research.

AI and Disability Landscape in Africa: Assistive Technologies

AI applications targeting disability inclusion in Africa remain nascent but have accelerated in recent years. Many innovations are still at pilot or early stages, yet they span a wide range of needs – from communication aids and learning tools to mobility devices and health support. A recent report detailed the challenges and progress around AI-enabled assistive technologies ("AT").[2] It found several barriers impeding progress, such as inadequate datasets, insufficient funding, digital literacy gaps, and weak policy frameworks. It emphasized the need for national policies specific to AI-enabled AT, improved data infrastructure, and greater investment in technology to address the digital divide. The report also highlighted several promising emerging technologies, some of which are included in Annex 1.

Beyond Traditional Assistive Devices: New AI Applications

Historically, AI-enabled support for PWDs centered on improving existing assistive technologies (AT) like wheelchairs, hearing aids, and Braille tools. AI is now enabling a new generation of solutions beyond these traditional devices, often in areas previously

[1] https://www.worldbank.org/en/topic/disability

[2] Kaaniru, Josephine. "AI Assistive Technologies (ATs) for Persons with Disabilities (PWDs) in Africa." *Center for Intellectual Property and Technology Law (CIPIT)*, 2023. https://cipit.strathmore.edu/ai-assistive-technologies-ats-for-persons-with-disabilities-pwds-in-africa/

underexplored in disability support, including, as detailed in this report, mental health, education, employment, and caregiver assistance:

Mental Health and Cognitive Support (see Chapter x): AI offers novel ways to support the mental well-being of PWDs, who often experience higher rates of depression and isolation. Chatbots and AI-driven counseling platforms are being piloted in Africa to expand mental health access. For example, Next Step Foundation's Tumaini.ai chatbot delivers AI-enabled mental health support to Youth with Disabilities over WhatsApp.[3] Tumaini (which means "hope" in Swahili) was co-designed with Youth with Disabilities and local mental health professionals to help fill the treatment gap facing PWDs seeking human counselors. The integration of AI in mental health for PWDs is still at an early stage – calling for careful evaluation to ensure appropriateness and safety – but it represents a frontier where technology could complement scarce specialists.

Inclusive Education and Skill Development (see Chapter x): Education is a critical domain where AI can level the playing field for students with disabilities. In addition to the accessible digital textbook programs in East Africa, AI-driven learning tools are being developed to support students with visual, hearing, or learning impairments. For example, computer vision and natural language processing are used in apps that provide real-time captioning or sign-language interpretation of classroom instruction. Global companies are also adapting mainstream AI educational platforms to be more accessible – e.g., text-to-speech and speech-to-text functionalities built on AI have been deployed in Kenyan classrooms through partnerships with NGOs.[4] Despite these advances, a major gap is the scarcity of localized educational content in accessible formats – pointing to a need for AI to assist in converting curriculum materials (text, audio, video) into accessible versions at scale.

Employment (see Chapter x): AI is uniquely situated to either advance or restrain employment for PWDs. If implemented ethically, AI can help PWDs compete for work and thrive on the job by removing routine frictions in hiring and day-to-day tasks. On the jobseeker side, generative tools improve CVs and interview preparation, accessible job platforms lower application barriers, and localized guidance translates informal experience into marketable skills. Paired with AT such as speech recognition, captioning, vision-based reading, and emerging low-cost bionics, these tools expand the range of feasible roles and enable more independent, productive work. From the employer side, AI can flag ableist language, suggest inclusive phrasing, model task requirements with reasonable accommodations, and support inclusive collaboration. However, unless AI systems are audited for accessibility and fairness, deployed with transparency and human review, and governed under disability-rights and data-protection frameworks, they risk exacerbating exclusion of PWDs from the workforce. Policy context matters, too—quotas, incentives, and

[3] https://nextstepfdn.org/the-next-step-foundation-partners-with-26bitz-to-expand-tumaini-mental-health-support-platform/

[4] https://aphrc.org/blogarticle/embracing-ai-in-education/

accessible procurement can create demand for inclusive tools, but enforcement gaps mean progress hinges on operationalizing laws into budgets, guidance, and accountability.

Independent Living and Caregiver Assistance (see Chapter x): A critical area beyond traditional support is using AI to assist caregivers and enable more independent living for PWDs. Globally, caregivers face high rates of stress and burnout – about one in two reports significant emotional or physical strain.[5] – and in Africa, much caregiving falls on family members with limited external support. AI technologies are being designed to share this load. However, the affordability and accessibility of such AI-driven caregiving tools remain major concerns in African contexts, where resources are limited.

Challenges in AI for Disability

The Data Gap

A recurring theme in the literature is the *data gap* – the lack of robust, representative data on disability in Africa – which directly hinders the development of effective AI solutions. These challenges manifest in several ways:

Underrepresentation and Bias in Datasets: AI systems are only as good as the data they learn from, and PWDs are often underrepresented in those datasets. Globally, much attention has been paid to AI biases around race and gender, but bias related to disability has been comparatively neglected.[6] Many AI models simply do not account for disability variations: for instance, computer vision algorithms may misclassify or ignore mobility aids (like wheelchairs, white canes) or interpret atypical movements as anomalies. Jenny Lay-Flurrie, Microsoft's Chief Accessibility Officer, described this data problem as a "disability data desert." In an October 2024 report, she noted that disability-related objects were extremely scarce in popular image datasets, causing AI vision models to recognize items like a Braille display with ~30% less accuracy than common objects.[7] In other words, because images of tools used by blind people were infrequent in the training data, the AI often failed to identify them. Such biases can have real-world consequences: an AI-powered image captioning service might not describe important aspects of a scene to a blind user, or an autonomous vehicle's AI might not detect a wheelchair user at a crosswalk if its training data lacked examples. Bias and omission not only limit utility but can also "strengthen existing stereotypes" and exacerbate exclusion. The consensus in the literature is that without

[5] https://www.psychologytoday.com/us/blog/harnessing-hybrid-intelligence/202504/artificial-intelligence-in-disability-care-unlocking.

[6] Whittaker, Meredith, *et al*, "Disability, Bias, and AI." *AI Now Institute at NYU*, November 2019.

[7] https://blogs.microsoft.com/on-the-issues/2024/10/17/disability-data-improving-representation-to-drive-ai-innovation.

deliberate efforts to gather disability-representative data, AI will continue to mirror society's marginalization of PWDs in digital form.[8]

African "Data Deserts" and Localization Gaps: The data challenge is even more acute in Africa. Many regions face a paucity of comprehensive, labeled datasets relevant to disabilities – especially datasets in local languages or reflecting African socio-cultural contexts. This makes it difficult to train AI tools that cater to the needs of local PWD communities. For example, there are over 40 sign languages used in Africa, yet few large video datasets exist for any of them (Kenyan Sign Language and South African Sign Language have small corpora, but others like Rwandan Sign Language have virtually none publicly available). Similarly, speech recognition for African languages has progressed, but not for the diverse speech patterns of people with disabilities (e.g., someone with cerebral palsy speaking Swahili). The CIPIT report (2023) bluntly describes Africa's situation as one of "African Data Deserts*"* for AI in assistive tech.[9] It notes that AI models rely on large, diverse datasets, but "in many African regions, there is a lack of comprehensive and representative datasets for various disabilities (and in local languages)", which "makes it challenging to develop AI assistive tools that cater to the specific needs of local populations."

As a result, African startups attempting to build inclusive AI often depend on foreign, pre-existing datasets (e.g., using an American sign language dataset as a proxy). This not only introduces cultural mismatches but also reinforces dependency on big tech companies that control those data resources. Indeed, global tech giants (Google, Microsoft, Amazon, etc.) have far more data at their disposal – including disability-related data – than local African researchers or companies. African AI developers, lacking data, either have to partner with these corporations or limit their ambitions. The imbalance in data access can deepen digital inequality: without local data infrastructure and inclusive data governance, Africa risks perpetually importing AI solutions that may not fully fit local needs. On a positive note, initiatives are emerging to combat this. Microsoft's 2024 collaboration with Be My Eyes (a popular app connecting blind users with volunteers) is one example: they are curating a video dataset specifically reflecting blind users' perspectives (unique objects, camera angles, lighting conditions from blind users' phones) to improve AI vision models.[10] They emphasize transparency and consent in this data sharing. Such efforts, if replicated in Africa, could generate homegrown datasets – for instance, an "African Disability Data Partnership" where organizations crowdsource images, voice samples, and usage data from African PWDs for AI

[8] Aboulafia, Ariana, Miranda Bogen, and Bonnielin Swenor. "To Reduce Disability Bias in Technology, Start with Disability Data." *Center for Democracy & Technology*, July 2024, https://cdt.org. (emphasizing the importance of collecting inclusive and representative disability data to reduce bias in technology, particularly in AI and algorithmic systems to ensure equitable outcomes for Persons with Disabilities.).

[9] https://cipit.strathmore.edu/ai-assistive-technologies-ats-for-persons-with-disabilities-pwds-in-africa/

[10] https://blogs.microsoft.com/on-the-issues/2024/10/17/disability-data-improving-representation-to-drive-ai-innovation/

research (with proper ethics and compensation). Some universities have begun data drives (e.g., the University of Ghana's speech dataset project for Ghanaian languages, which explicitly includes speakers with speech impairments).[11] Bridging the data gap is not just a technical issue but a socio-political one: it requires recognizing the value of disability data and investing in its collection. Without this, many AI projects will remain prototypes that work in the lab but fail in the real world due to unseen data biases.

Systemic Underreporting and Demographic Gaps: A related data challenge is that basic demographic data on disability in African countries is often unreliable or underestimates true prevalence. For example, Kenya's 2019 census reported only 2.2% disability prevalence, far below the global estimate of ~15%. This discrepancy likely stems from narrow definitions and stigma, causing under-disclosure. Underrepresented in official statistics, PWDs become "invisible" in data ecosystems, meaning AI algorithms trained on population data (for healthcare, employment, etc.) might scarcely account for them. As the World Bank notes, disability is both a cause and consequence of poverty, and many African PWDs live in informal settings where they are not officially counted.[12] This lack of data trickles down to AI – for instance, an AI model for predicting school dropouts might not flag disabled children at risk because the training data didn't label who had a disability. Encouragingly, some African governments are revising data practices (Nigeria and Uganda have recently included Washington Group disability questions in surveys to capture functional difficulties.[13]). Also, high-quality grey literature (like reports by disability NGOs) often contains rich qualitative data (e.g., mapping of disability services, or case studies) that could inform AI development if digitized and used to augment training data. But making use of such non-traditional data for AI requires coordination and standards. One suggestion from experts is to establish data trusts or repositories where anonymized disability-related data (from multiple sources – NGOs, hospitals, DPOs) can be pooled and shared for research. This could mitigate the sparse data problem, provided privacy and consent are handled carefully. Overall, solving the data gap will involve both creating new data (through inclusive sensing, surveys, participatory data gathering by PWDs) and opening up existing data silos for broader use in AI research.[14]

---

[11] https://www.disabilityinnovation.com/news/google-university-of-ghana-and-gdi-hub-to-expand-ai-powered-speech-recognition-for-non-standard-speech-in-ghanaian-languages
[12] https://www.worldbank.org/en/topic/disability
[13] https://www.disabilitydatainitiative.org/ds-e-methods/
[14] https://at2030.org/ai-disability-inclusion-africa

Other Barriers to Inclusive AI Development in Africa

In addition to data issues, the literature identifies several interlocking barriers that have slowed the adoption of AI for disability support in Africa. These barriers are technological, economic, socio-cultural, and institutional:

Infrastructure Divide: Reliable electricity, internet connectivity, and device penetration form the backbone of any AI deployment – and these are unevenly distributed in Africa. Many rural or low-income areas (where a large share of PWDs reside) suffer from "unreliable Internet and electricity supplies that hinder the development and use of all digital technologies".[15] For example, an AI-powered app for blind users is of little use if mobile internet is slow or absent in their community, or if they cannot charge a smartphone regularly. The World Bank reports that only about 36% of Africans have internet access, and this digital divide is often worse for PWDs.[16] Persons with disabilities are less likely to own advanced devices: even in a tech-forward country like Kenya, over 70% of PWDs who have phones are using basic feature phones (not smartphones)[17], limiting access to modern AI-based apps. This device gap is due to cost and sometimes to a lack of awareness/training on smartphones. Improving basic infrastructure – expanding broadband to underserved areas, ensuring public facilities have backup power, and making assistive devices available at a lower cost – is fundamental. Encouragingly, Africa's overall digital infrastructure is improving (e.g., mobile broadband and cheaper smartphones are on the rise), and some governments (like Rwanda) explicitly include disability access in their ICT plans, but progress is uneven. Without infrastructure equality, AI solutions risk widening disparities (helping urban PWDs while rural PWDs lag further behind).

Digital Skills and Literacy: A shortage of AI expertise in Africa is well documented, but there's also a specific skills gap affecting disability inclusion. On one hand, there is a lack of local AI developers and researchers with specialization in accessibility – many talented Africans in AI may gravitate to finance or general tech sectors, with few focusing on disability needs. On the other hand, many PWDs lack digital literacy or training to use new technologies. A study by GSMA found that in countries like Kenya and Bangladesh, PWDs had significantly lower rates of internet use and smartphone adoption than the general population, often because they "do not know how to use them" or are not confident with digital interfaces.[18] This creates a vicious cycle: if PWDs aren't involved as tech users or creators, the tools that get built may be unusable or irrelevant to them. Sub-Saharan Africa has the lowest proportion of individuals with digital skills globally. Nigeria, Kenya, and South Africa

[15] https://at2030.org/ai-disability-inclusion-africa
[16] https://www.verivafrica.com/insights/the-state-of-digital-inclusion-in-africa-challenges-and-disability-inclusion-as-a-solution
[17] GSMA, Understanding the mobile disability gap (December 2019)
[18] GSMA, Understanding the mobile disability gap (December 2019)

have relatively better-skilled cohorts, which might explain why those countries host more AI assistive tech startups. Still, training opportunities remain limited. Some capacity-building efforts are emerging, such as coding bootcamps for youth with disabilities (e.g., InABLE's ICT training for blind students in Kenya[19]) and university programs that encourage accessible design projects. Bridging the skills gap requires integrating accessibility into mainstream tech education and providing targeted training for PWDs to engage with AI both as consumers and co-creators. Otherwise, even well-meaning AI interventions may fail. The literature frequently recommends collaborative design and training: partnerships where tech experts' team up with disability organizations to build solutions and concurrently train end-users. Such co-design not only yields more user-friendly products but also empowers PWDs with tech skills, addressing the literacy barrier.

Financial Constraints and Market Size: Developing AI solutions for a relatively small user base (PWDs are a minority group) in low-income settings can be financially challenging. At least 43% of assistive technology innovations in low- and middle-income countries are driven by startups.[20] – agile but often underfunded entities. In Africa, these startups struggle to find seed funding and venture capital; many rely initially on grants or competitions. However, sustaining and scaling a disability-focused AI product can be hard when investors perceive the market as too narrow or not immediately profitable. This leads to scenarios where promising prototypes (like a smart wheelchair project or an autism support AI tool) remain pilot-only because the team cannot secure follow-on funding, or they pivot to more lucrative markets (the so-called "brain drain" of talent and ideas to wealthier countries.[21] Additionally, mainstream tech companies in Africa may not prioritize accessibility features in their products due to perceived low ROI. Government procurement could be a game-changer here – if governments purchase accessible technologies for public institutions (schools, transit systems, etc.), that creates a stable demand. Yet, policies mandating accessible ICT or allocating funds for disability tech are weak in most African countries. NGOs and donors fill some gaps by funding innovation challenges and accelerators (for example, AT2030's Innovate Now accelerator program, funded by UK Aid and the Norwegian Agency for Development Cooperation (Norad), has funded dozens of disability-tech startups). Still, a systemic shift is needed to view AI-powered Assistive Tech in Africa not as a charity niche but as a viable market that can attract investment. The grey literature often calls for blended financing models – combining grants, impact investment, and government subsidies – to support early-stage development of inclusive AI until scale is achieved. The creation of Africa-specific assistive tech funds (such as the AT Impact Fund launched by GDI Hub in 2022) is a step in this direction, aiming to de-risk investment in disability innovation.

[19] https://borgenproject.org/ict-aids-education-for-visually-impaired-in-kenya/
[20] https://www.gsma.com/solutions-and-impact/connectivity-for-good/mobile-for-development/blog/enhancing-commercial-sustainability-of-assistive-tech-solutions-through-business-to-business-models/
[21] https://at2030.org/ai-disability-inclusion-africa/

Policy and Governance Gaps: Policy plays a dual role – setting requirements for inclusion and enabling a supportive environment for innovation. In Africa, disability rights laws exist (most countries have anti-discrimination provisions and some ICT accessibility standards), but specific policies on AI ethics and inclusion are only beginning to emerge. A 2023 survey by Paradigm Initiative found that only 13 out of 32 African countries studied had any sort of national AI policy or strategy.[22] Instead, many governments are relying on existing laws (like data protection or disability acts), which may not directly address AI's new challenges. Disability considerations are often missing in high-level AI strategies. Ghana and Rwanda's AI strategies are among the more forward-looking; Ghana's strategy explicitly mentions inclusive AI and leveraging AI for social good, influenced by inputs from disability advocates at public consultations.[23] Rwanda's policies focus on universal access to digital services, which indirectly benefit PWDs. The COVID-19 pandemic provided a lesson: as services went online, those countries lacking digital accessibility policies found PWDs left behind. Governments and telecom companies pushed digitalization, but often neglected to incorporate essential accessibility features. Another governance aspect is standards and procurement: very few African nations have enforced standards like WCAG (Web Content Accessibility Guidelines) for government websites, or require that AI systems used in the public sector are accessible. Kenya has an Accessibility Standard (for ICT) on paper, but compliance is low due to weak enforcement.

Social and Cultural Barriers: Technology alone cannot solve deep-rooted social challenges. Many Africans with disabilities face stigma and low expectations from society. If an AI assistive device is introduced in a community that does not believe in the capabilities of PWDs, it may not be adopted or allowed to make an impact. For instance, a child with a learning disability might get a great AI educational app on a tablet, but if her teacher is not convinced, she can learn; the teacher might not invest time in using the tool with her. Additionally, cultural beliefs (like viewing disability as a curse or a charity case) can influence whether families seek out technological assistance. Moreover, language diversity – Africa has thousands of languages and dialects – means that many PWDs, especially in rural areas, are not comfortable in English or French, which most AI tools currently support. The need for localization goes beyond technical aspects to cultural relevance: AI voice assistants, for example, might need to understand local idioms or accents, otherwise users will be frustrated. Encouragingly, participatory research is gaining ground to bridge cultural gaps. Projects like the aforementioned KNUST stakeholder workshop explicitly invited PWDs to voice their needs. Another social barrier is trust – users need to trust that an AI will help, not harm. Building trust can be difficult, given low digital literacy and some high-profile tech failures. This is where community engagement and inclusive design processes become crucial: when PWDs co-create a solution, they become its champions and help others understand it. This collaborative approach not only improves design but also tackles social

[22] Paradigm Initiative, Artificial Intelligence in Sub-Saharan Africa: Ensuring Inclusivity (2023)
[23] https://rail.knust.edu.gh/2024/12/09/rail-stakeholder-engagement-with-persons-with-disabilities-promotes-inclusion-through-artificial-intelligence

barriers through empowerment. As one RAIL participant said, "this opportunity can only succeed if we [the disability community] fully cooperate and ensure our inputs guide the project to meet our needs." Such ownership is key to overcoming skepticism and ensuring technologies are actually embraced on the ground.

Global Perspectives: Toward Inclusive and Ethical AI

The movement for inclusive AI is not limited to Africa – globally, researchers and organizations have been grappling with how to ensure AI does not exclude or harm people with disabilities. By situating Africa's experience within this global context, we can glean additional insights and best practices:

Bias and Fairness in AI: Internationally, disability advocates argue that AI fairness must explicitly include disability as a category, just as race or gender is included.[24] For example, facial recognition systems have been found to mis-identify people in wheelchairs or with facial differences at higher rates, because the algorithms were rarely trained on such faces. In 2019, the AI Now Institute released a report "Disability, Bias, and AI" highlighting how PWDs are uniquely at risk of algorithmic harm – from hiring algorithms that view disability as a negative, to health algorithms that assume all patients can perform certain tasks (like using a touchscreen).[25] They pointed out that disability often involves intersectional identities, compounding biases (e.g., a Black woman with a disability might be misclassified in more ways than one). One striking example from recent research showed that some sentiment analysis AI models treated sentences mentioning "disability" as more negative or "toxic" than similar sentences not mentioning it.[26] This shows how prejudice can be encoded in AI. In response, there are growing calls for inclusive datasets and bias audits. Tools are being developed to test AI models for disability bias – for instance, the University of Washington's CREATE center in 2022 analyzed GPT-style language models and found bias in how they handled text about disability, prompting recommendations for retraining with more diverse content.[27] Globally recognized principles like the OECD AI Principles (2019) and UNESCO's Recommendation on AI Ethics (2021) urge member states to consider inclusion and fairness for all, including persons with disabilities. In practice, big tech firms have started to evaluate products with disability scenarios: e.g., Google tests their voice assistants on speech from people with Down syndrome to improve recognition.[28] The key takeaway for Africa is that adopting such best practices (bias testing, involving disabled users in QA, etc.) is crucial as AI use grows. Otherwise, Africa might import AI systems that have known biases and end up amplifying discrimination.

---

[24] https://news.harvard.edu/gazette/story/2024/04/why-ai-fairness-conversations-must-include-disabled-people/

[25] https://cdt.org/insights/report-to-reduce-disability-bias-in-technology-start-with-disability-data/

[26] Meredith Whittaker, Disability, Bias, and AI, AI Now Institute at NYU (November 2019)

[27] https://create.uw.edu/access-boards-preliminary-findings-on-ai-and-people-with-disabilities/

[28] https://www.disabilityscoop.com/2019/12/03/google-seeks-help-from-people-with-down-syndrome/

Data Privacy and Consent: Another global concern is data privacy for vulnerable populations. Collecting detailed data about someone's disability status or health raises ethical issues. The Microsoft–Be My Eyes collaboration provides a positive example: they are removing personal metadata and giving users opt-out choices, showing transparency in how disability data is used. Similarly, the EU's General Data Protection Regulation (GDPR) classifies health and biometric data (often related to disability) as sensitive, requiring higher consent standards. As African countries enact data protection laws, they need to ensure that regulations protect PWDs' data while also enabling its responsible use for innovation. Striking this balance is tricky – overly strict laws might scare away research (for instance, collecting video of sign language use could be seen as biometric data processing), but too lax an environment could allow exploitation (like companies scraping wheelchair user forums without consent to train AI). Global dialogues, such as the World Economic Forum's initiatives, emphasize user agency over data.[29] One approach is community-based data governance: for example, a disability organization could act as a custodian for members' data and negotiate with tech companies on their behalf (ensuring mutual benefit and privacy). Africa can innovate in this space by leveraging strong community bonds – projects can establish advisory boards of PWDs to oversee data use, building trust that personal information will not be misused. In sum, aligning with global privacy norms but tailoring them to local context (where often informal data sharing is common) will be important as more AI systems that collect user data (speech recordings, health metrics, etc.) come online.

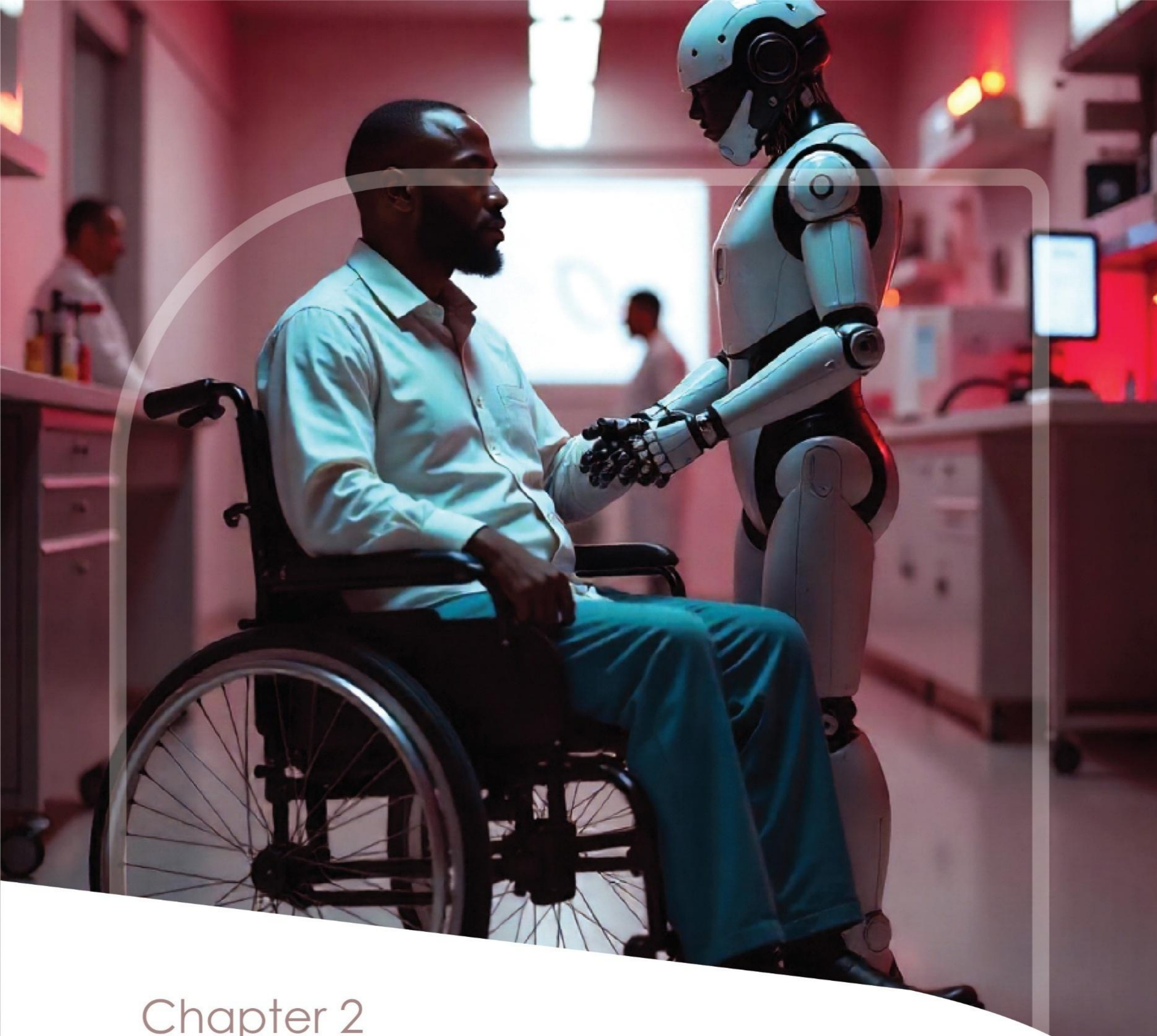
Inclusive Design and Co-Creation: A strong message from global disability research is "Nothing about us without us." The most impactful innovations often involve PWDs in design, testing, and implementation. One example is the development of the Seeing AI app by Microsoft – blind employees were heavily involved in its creation, making it more attuned to real user needs.[30] In Africa, this approach is echoed in projects like RAIL's participatory action research, where PWDs are co-investigators, and Kenya's Innovate Now accelerator live labs where persons with disabilities test and validate new AT innovations together with Innovators. To bolster this, global networks and challenges are encouraging inclusive innovation: the Microsoft AI for Accessibility grants[31], MIT Solve's Disability Challenge[32], Inclusive Africa Conference Innovator's Award and the Zero Project Awards[33] all fund or recognize solutions that demonstrate co-creation with the disability community. Africa has had several winners and grantees in these programs, indicating local innovators are gaining visibility. The literature suggests scaling this up by establishing and investing in living labs or innovation hubs focused on disability tech in Africa (Kenya's AT4D and Senses Hub are

[29] https://www.weforum.org/stories/2023/11/generative-ai-holds-potential-disabilities/
[30] https://www.microsoft.com/en-us/garage/wall-of-fame/seeing-ai/
[31] https://www.microsoft.com/en-us/accessibility/innovation
[32] https://solve.mit.edu/solutions/84755
[33] https://zeroproject.org/

examples). These hubs can serve as convening points for engineers, designers, and PWDs to work together, and also provide mentorship to ensure solutions are viable and user-centered. Ultimately, global experience shows that inclusive AI is achievable when diversity is embraced in the creation process; Africa stands to gain by continuing to break down silos between technologists and the disability community. Efforts like cross-training (teaching software developers sign language, and teaching sign language interpreters about AI basics) can create a common language and empathy, leading to better outcomes.

Conclusion

The past ten years have laid important groundwork for harnessing AI in support of PWDs in Africa, but the journey is only beginning. This review has shown that Africa is home to inspiring innovations – from sign language translation avatars in Kenya to local language voice assistants in Ghana – that demonstrate AI's potential to enhance accessibility and inclusion. At the same time, significant challenges persist, notably the lack of representative data, infrastructural and skill barriers, and limited integration of disability concerns into AI policy. The global context provides both cautionary tales (of bias and exclusion) and promising avenues (like generative AI and robust ethical frameworks) that African nations can draw upon.



Chapter 2

Disability, Assistive Technologies, AI

Introduction

Clarity in definitions is essential when exploring the intersection of disability and artificial intelligence, especially in a context as diverse and dynamic as Africa. The terms *disability*, *assistive technologies*, and *artificial intelligence* are often used across multiple disciplines—ranging from law and public health to engineering and education—with subtle but important variations in meaning. A shared understanding of these concepts is critical not only for academic and policy coherence but also for designing inclusive systems, developing effective technologies, and ensuring that programs meant to support PWDs are grounded in human rights and contextually appropriate frameworks.

In this section, we unpack each of these three foundational terms to provide a conceptual basis for the broader analysis. We begin with disability as understood in both global and African contexts, then examine assistive technologies through both a functional and rights-based lens, and finally turn to artificial intelligence, tracing its evolution and relevance to inclusive development.

What is Disability?

Disability is not merely a health condition or impairment. It is a complex, evolving concept shaped by medical, social, legal, and cultural perspectives. Historically, disability was viewed primarily through the medical model, which locates the "problem" within the individual and seeks to treat, cure, or manage impairments. Under this model, disability is defined in terms of deficits—what a person cannot do compared to a normative standard (Shakespeare, 2006).

However, this approach has been widely challenged by disability rights movements, which advocate for the social model of disability. This model emphasizes that disability arises not from impairment alone, but from the interaction between individuals with impairments and societal barriers—whether physical, attitudinal, institutional, or technological—that hinder full participation (Oliver, 1990). For example, a person who uses a wheelchair is not disabled by their inability to walk, but by inaccessible buildings or transportation systems.

The United Nations Convention on the Rights of Persons with Disabilities (CRPD), which has been ratified by most African Union member states, adopts a holistic and human-rights-based definition:

"Persons with disabilities include those who have long-term physical, mental, intellectual or sensory impairments which in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others" (United Nations, 2006, Article 1).

This framing aligns with the growing understanding that disability is context-dependent and multidimensional. It also highlights the importance of designing inclusive systems that anticipate and accommodate a wide range of human diversity—what some scholars refer to as universal design or design for all (Imrie, 2012).

Disability in African Contexts

While global frameworks such as the CRPD provide a foundational definition, local understandings of disability across African societies often reflect a mix of cultural beliefs, religious interpretations, and lived experience. In some communities, disability is still associated with stigma, shame, or supernatural causes. These perceptions can lead to the marginalization, isolation, or even abandonment of PWDs, particularly women and children (Ingstad & Whyte, 2007).

At the same time, African disability rights movements have made significant strides in reframing disability as a social justice and human rights issue. The African Disability Protocol (ADP)—adopted by the African Union in 2018—builds on the CRPD but also contextualizes disability rights within African cultural realities. It addresses harmful traditional practices, customary law, and intersectional discrimination, and affirms the right of PWDs to participate fully in all areas of life, including education, employment, health, and political participation (African Union, 2018).

It is also important to recognize disability as a dynamic category. Many people experience disability temporarily, episodically, or situationally—due to injury, illness, aging, or environmental barriers. As such, inclusive systems that benefit PWDs often benefit a much wider segment of the population.

What Are Assistive Technologies?

The World Health Organization (WHO) defines assistive technology as "the application of organized knowledge and skills related to assistive products, including systems and services, which are designed to maintain or improve an individual's functioning and independence and thereby promote their well-being" (WHO, 2022). Assistive technologies can range from low-tech tools such as crutches, hearing aids, and eyeglasses to high-tech solutions like screen readers, robotic prosthetics, or AI-powered communication devices.

What distinguishes assistive technologies from general-use technology is their purpose and function: they are explicitly designed to mitigate or eliminate barriers resulting from impairments or disabling environments. These tools are central to the realization of multiple human rights, including access to health care, education, information, and employment.

The Global Report on Assistive Technology (GReAT) notes that over one billion people worldwide need one or more assistive products, but only about 10% of them have access to the assistive technologies they require—often due to cost, supply chain issues, or lack of trained personnel (WHO & UNICEF, 2022). In many African countries, assistive technologies are either unavailable or prohibitively expensive, particularly for those in rural areas or informal settlements.

Importantly, assistive technologies are not static. They evolve alongside general technologies, and increasingly, mainstream tools are being enhanced or adapted to serve assistive functions. For example, smartphones can now function as magnifiers, speech generators, or navigation tools for blind users. This blurring of boundaries between assistive and mainstream technologies is one of the areas where AI holds immense promise.

What is Artificial Intelligence?

Artificial Intelligence (AI) refers to computer systems that perform tasks normally requiring human intelligence. These tasks may include recognizing patterns, making decisions, translating languages, processing speech, or generating content. AI is an umbrella term encompassing several subfields, including machine learning (ML), natural language processing (NLP), computer vision, and robotics (Russell & Norvig, 2021).

Machine learning—particularly deep learning—has enabled dramatic improvements in tasks like facial recognition, autonomous vehicles, and medical diagnostics. NLP allows machines to “understand” and respond to human language, which powers tools like virtual assistants and real-time translation. Computer vision, which enables machines to interpret visual information, underlies applications ranging from object detection to gesture recognition.

While the term AI has been around since the 1950s, the last decade has seen a massive leap in capabilities, due in large part to three converging factors: the availability of large datasets, increases in computing power, and advances in algorithmic design. Generative AI, exemplified by systems like ChatGPT, Llama, and Gemini, represents a new frontier in which AI can not only process but also *create* new content—text, images, code, and even music.

AI is not a monolithic technology—it is a tool that can be shaped by the values, assumptions, and data used to build it. As such, its impact on disability can be positive or negative depending on whether inclusion is embedded in design, deployment, and governance.

The Intersection of These Concepts

Understanding how disability, assistive technologies, and artificial intelligence interact is crucial for inclusive innovation. AI can enhance or even replace certain assistive technologies, such as using computer vision instead of a white cane, or NLP instead of traditional AAC devices. It can also introduce new forms of assistance—for example, AI systems that can adapt content in real time to suit a user's reading level, cognitive load, or preferred communication modality.

Yet without a clear understanding of disability—as a socio-political construct, not merely a biomedical condition—AI risks reproducing ableism at scale. Similarly, without grounding in the realities of assistive technology access and usability, AI tools may be ineffective or even harmful. For instance, speech recognition that fails to account for speech impairments can reinforce exclusion in education and employment.

By clearly defining these foundational terms, we can better identify the opportunities and responsibilities of using AI to support disability inclusion in Africa and beyond.

Endnotes

African Union. (2018). *Protocol to the African Charter on Human and Peoples' Rights on the Rights of Persons with Disabilities in Africa*. https://au.int/en/treaties/protocol-african-charter-human-and-peoples-rights-rights-persons-disabilities-africa

Imrie, R. (2012). Universalism, universal design, and equitable access to the built environment. *Disability & Rehabilitation*, *34*(10), 873–882. https://doi.org/10.3109/09638288.2011.624250

Ingstad, B., & Whyte, S. R. (Eds.). (2007). *Disability in local and global worlds*. University of California Press.

Oliver, M. (1990). *The politics of disablement*. Macmillan.

Russell, S., & Norvig, P. (2021). *Artificial intelligence: A modern approach* (4th ed.). Pearson.

Shakespeare, T. (2006). *Disability rights and wrongs*. Routledge.

United Nations. (2006). *Convention on the Rights of Persons with Disabilities (CRPD)*. https://www.un.org/development/desa/disabilities/convention-on-the-rights-of-persons-with-disabilities.html

World Health Organization. (2022). *What is assistive technology?* https://www.who.int/news-room/questions-and-answers/item/assistive-technology

World Health Organization & UNICEF. (2022). *Global report on assistive technology*. https://www.who.int/publications/i/item/9789240062883

Chapter 3

Background: Disability and Development in Africa

Introduction and Historical Context

While global efforts toward inclusive development have gained traction in recent decades, the African continent continues to face a wide array of structural and systemic barriers to disability inclusion. Historically, African societies have held diverse views on disability, ranging from reverence in some cultures—where disability was interpreted as a spiritual sign or a link to ancestors—to more widespread contemporary stigmatization and exclusion, particularly under the legacy of colonial and post-colonial governance systems that deprioritized social welfare (Miles, 2000).

Colonial and post-colonial policies across many African states failed to systematically account for or include PWDs in education, employment, and public life. The institutional frameworks created during that period often reinforced segregation, institutionalization, or invisibility, rather than integration into communities. Even after independence, disability remained peripheral in national policy agendas across most of Sub-Saharan Africa (Lang & Upah, 2008). It was not until the 2000s, with the emergence of the UN Convention on the Rights of Persons with Disabilities (CRPD) and the Disability Rights Movement in Africa, that more countries began to include disability as a cross-cutting issue within national development plans.

Demographic Landscape and Data Challenges

Reliable disability statistics in Africa are scarce, uneven, and often contested. The World Health Organization estimates that over one billion people globally live with some form of disability, with approximately 80% of them residing in developing countries (WHO, 2011). However, national prevalence rates in African countries vary dramatically, from under 2% in some census reports to over 15% in household surveys, largely due to inconsistencies in data collection methods, survey questions, and definitions of disability (UNICEF, 2021).

For instance, the Uganda National Household Survey (2016/17) estimated a disability prevalence rate of 12.4%, whereas Kenya's 2019 census reported just 2.2%, despite similar underlying population dynamics (UBOS, 2018; Kenya National Bureau of Statistics, 2019). These inconsistencies often reflect the use of outdated definitions or the exclusion of non-physical disabilities such as psychosocial, cognitive, and sensory impairments.

Children with disabilities are significantly undercounted. UNICEF estimates that nearly 29 million children in Eastern and Southern Africa live with some form of disability, although this number is likely a conservative estimate given stigma and reporting challenges (UNICEF, 2021). Moreover, many national data systems fail to disaggregate by gender, age, location, or type of disability—undermining targeted policy responses and inclusive program design (UN DESA, 2019).

Disability and Poverty: A Bidirectional Relationship

Disability is both a cause and a consequence of poverty. PWDs are more likely to experience material deprivation, limited education, poor health outcomes, and social exclusion. At the same time, poverty itself increases vulnerability to disabling conditions through malnutrition, lack of medical care, exposure to conflict and environmental hazards, and poor living conditions (World Bank, 2018). In Sub-Saharan Africa, over 70% of PWDs live in rural areas where health services, schools, transportation, and accessible infrastructure are often nonexistent or severely limited (Eide & Ingstad, 2011).

The economic impact is stark: a 2021 World Bank report estimated that excluding PWDs from the labor force costs African economies between 3% and 7% of GDP annually, due to lost productivity and additional costs of dependency and care (World Bank, 2021). Moreover, inaccessible workplaces, discriminatory hiring practices, and a lack of accommodations prevent many PWDs from participating in formal employment. This exclusion is not only unjust but economically irrational, especially in a continent with a youthful population and rising demand for inclusive growth strategies.

Education, Socialization, and Developmental Gaps

Access to education remains one of the most significant barriers to full inclusion for Children with Disabilities. Across Sub-Saharan Africa, less than 10% of children with disabilities complete primary school, and fewer than 5% make it to secondary school (Centre for African Justice, 2020). Inaccessible school infrastructure, lack of trained teachers, inadequate assistive learning technologies, and stigma from peers and teachers contribute to dropout and exclusion. The absence of sign language or Braille materials exacerbates these barriers for children with hearing or visual impairments.

Even when enrolled, Children with Disabilities are more likely to experience corporal punishment, social isolation, and lower academic expectations from educators and administrators. The long-term consequences of this educational neglect are profound: lower literacy, reduced employment prospects, and exclusion from civic participation.

Inclusive education frameworks such as the Salamanca Statement (1994) and the more recent African Union Continental Education Strategy (2016–2025) call for the integration of Learners with Disabilities into mainstream classrooms. Yet, implementation remains fragmented, and very few countries allocate sufficient funding for inclusive teacher training or accessible school materials (African Union, 2016).

Health Access and Assistive Technologies

Health outcomes for PWDs in Africa lag significantly behind the general population. In many countries, persons with disabilities report lower access to preventive care, maternal health services, and rehabilitation, and often face attitudinal barriers from healthcare providers who are inadequately trained in disability inclusion (WHO, 2011). Discriminatory practices and inaccessibility of clinics further dissuade PWDs from seeking care.

Assistive technologies such as wheelchairs, hearing aids, prosthetics, and communication devices can dramatically improve the quality of life and independence for PWDs. Yet access to these technologies is profoundly limited in most African countries, particularly for low-income users. Less than 10% of those in need globally have access to assistive devices—and the figure is even lower in Africa (WHO & UNICEF, 2022).

Efforts to localize production—such as 3D printing of prosthetics in Uganda or community-based fabrication of mobility aids in Kenya—have shown promise but remain small-scale. International aid programs often donate second-hand devices, many of which are ill-fitted or unsustainable for long-term use (MacLachlan et al., 2018).

Legal and Policy Frameworks

Over the past two decades, there has been increasing political and legal momentum across Africa toward the recognition of the rights of persons with disabilities. A major milestone was the adoption of the United Nations Convention on the Rights of Persons with Disabilities (CRPD) in 2006, which has since been ratified by a significant majority of African Union member states (UN Treaty Collection, 2024). The CRPD marked a shift from viewing disability as a medical issue to understanding it as a human rights and social justice issue, compelling governments to dismantle structural barriers and promote full participation and equality.

At the regional level, the African Union adopted the Protocol to the African Charter on Human and Peoples' Rights on the Rights of Persons with Disabilities in Africa in 2018. Commonly referred to as the African Disability Protocol (ADP), this instrument contextualizes global disability rights frameworks within African cultural, social, and legal environments (African Union, 2018). It explicitly addresses harmful cultural practices, intersectional discrimination, and the protection of persons with disabilities in humanitarian crises—issues often underexplored in global treaties.

However, translating these normative commitments into effective policy remains a formidable challenge. Many African countries still lack standalone national disability acts or comprehensive implementation plans. Where national disability policies exist, they are often underfunded, outdated, or poorly enforced. Disability rights are frequently absent from key areas such as public procurement policies, housing regulations, or digital service standards. Moreover, only a handful of countries, such as South Africa and Uganda, have developed disability-specific data strategies and institutional monitoring bodies (UNDESA, 2019; Republic of Uganda, 2022).

Barriers to implementation include limited financial resources, weak political prioritization, insufficient training of public officials, and fragmented governance between ministries responsible for disability and those overseeing cross-sectoral development programs. Civil society, especially organizations of Persons with Disabilities (OPDs), plays a critical role in bridging this gap, advocating for rights-based approaches, holding governments accountable, and co-designing inclusive policies. Yet, OPDs themselves often face funding shortages, limited technical capacity, and exclusion from policymaking forums (CBM Global, 2021).

Cultural Attitudes and Stigma

Cultural beliefs and social stigma play a central role in shaping the experience of disability in Africa. In many communities, disability is still seen through the lens of superstition, shame, or divine punishment. These beliefs often lead to the marginalization of PWDs, who may be hidden from public view, excluded from education and employment, or denied basic healthcare and nutrition (Ingstad & Whyte, 2007). In some extreme cases, Children with Disabilities are abandoned or subjected to harmful traditional practices, including rituals intended to “cure” their condition (Groce & Trani, 2009).

Stigmatization extends beyond the individual to their families. Parents—especially mothers—of Children with Disabilities are frequently blamed for causing the disability and may be ostracized by spouses or communities. This not only isolates caregivers but also discourages them from seeking support services or enrolling their children in school. The social cost of disability is thus shared across the household, reinforcing cycles of exclusion and emotional distress (UNICEF, 2021).

Language itself can reinforce stigma. In many African languages, terms used to describe disability carry derogatory or dehumanizing connotations. While some disability movements have successfully promoted the use of person-first language (e.g., “child with a disability” instead of “disabled child”), such shifts have not yet permeated most community-level interactions or public discourse (Howell, 2005). Public attitudes, especially in rural areas, remain shaped by inherited traditions rather than contemporary disability rights frameworks.

Changing these norms requires sustained, culturally grounded engagement. Awareness campaigns led by persons with disabilities, inclusive media programming, and education reform can challenge prejudices and promote more positive perceptions. Religious and traditional leaders—often powerful influencers in African societies—must be sensitized to promote inclusive messages and condemn discriminatory practices. Some progress has been made in this area: disability rights have increasingly been featured in national radio and television broadcasts, and public service announcements are being produced in local languages to expand reach (Leonard Cheshire, 2020).

Despite these efforts, transformation is slow and uneven. Until underlying cultural attitudes are addressed alongside policy and technological interventions, persons with disabilities in Africa will continue to face exclusion not only in systems and structures, but also in hearts and minds.

Endnotes

African Union. (2016). *Continental Education Strategy for Africa 2016–2025 (CESA 16–25).* https://au.int/en/documents/20160125/continental-education-strategy-africa-2016-2025-cesa

African Union. (2018). *Protocol to the African Charter on Human and Peoples' Rights on the Rights of Persons with Disabilities in Africa*. https://au.int/en/treaties/protocol-african-charter-human-and-peoples-rights-rights-persons-disabilities-africa

CBM Global. (2021). *Building the case for OPD participation*. https://www.cbm-global.org/blog/building-the-case-for-opd-participation/

Centre for African Justice. (2020). *The stigma of disabilities in Africa and the challenges it caused for children in education*. https://centreforafricanjustice.org/the-stigma-of-disabilities-in-africa-and-the-challenges-caused-for-children-in-education/

Eide, A. H., & Ingstad, B. (Eds.). (2011). *Disability and poverty: A global challenge*. Springer. https://link.springer.com/book/10.1007/978-94-007-0611-8

Groce, N. E., & Trani, J. F. (2009). Millennium Development Goals and people with disabilities. *The Lancet*, *374*(9704), 1800–1801. https://pubmed.ncbi.nlm.nih.gov/19513919/

Howell, C. (2005). *Disabled students and higher education in South Africa*. University of Johannesburg. https://www.uj.ac.za/wp-content/uploads/2021/11/howell-2005-disabled-students-and-higher-education.pdf

Ingstad, B., & Whyte, S. R. (Eds.). (2007). *Disability in local and global worlds*. University of California Press. https://www.ucpress.edu/book/9780520246161/disability-in-local-and-global-worlds

Kenya National Bureau of Statistics. (2019). *2019 Kenya Population and Housing Census: Volume IV – Distribution of Population by Socio-Economic Characteristics.*

https://www.knbs.or.ke/?wpdmpro=2019-kenya-population-and-housing-census-volume-iv-distribution-of-population-by-socio-economic-characteristics

Lang, R., & Upah, L. (2008). *Scoping study: Disability issues in Kenya*. Department for International Development. https://assets.publishing.service.gov.uk/media/57a08bc9ed915d3cfd000db8/60703_DisabilityKenya.pdf

Leonard Cheshire. (2020). *African media tackling disability awareness*. https://www.leonardcheshire.org/about-us/latest-news/african-media-disability-awareness

MacLachlan, M., Mannan, H., & McAuliffe, E. (2018). Access to assistive technology during humanitarian crises. *Journal of Disability Policy Studies*, *29*(1), 43–52. https://journals.sagepub.com/doi/10.1177/1044207318785358

Miles, M. (2000). *Disability and development in South Asia*. Center for International Rehabilitation Research Information and Exchange. https://cirrie-sphhp.webapps.buffalo.edu/encyclopedia/en/article/130/

Republic of Uganda. (2022). *Third periodic report on the implementation of the UN CRPD*. https://www.ohchr.org/en/treaty-bodies/crpd/uganda-crpd

UN Department of Economic and Social Affairs (UNDESA). (2019). *Factsheet on persons with disabilities*. https://www.un.org/development/desa/disabilities/resources/factsheet-on-persons-with-disabilities.html

UNICEF. (2021). *Children with disabilities in Eastern and Southern Africa: A statistical overview of their well-being*. https://data.unicef.org/resources/children-with-disabilities-in-eastern-and-southern-africa-a-statistical-overview-of-their-well-being/

United Nations Treaty Collection. (2024). *Convention on the Rights of Persons with Disabilities: Ratification status*. https://treaties.un.org/Pages/ViewDetails.aspx?src=IND&mtdsg_no=IV-15&chapter=4

Uganda Bureau of Statistics. (2018). *Uganda National Household Survey 2016/17*. https://www.ubos.org/

World Bank. (2018). *Disability inclusion overview*. https://www.worldbank.org/en/topic/disability

World Bank. (2021). *The economic costs of excluding people with disabilities*. (Summarized from various country-level briefs and reports.)

World Health Organization. (2011). *World report on disability*. https://www.who.int/publications/i/item/world-report-on-disability

World Health Organization & UNICEF. (2022). *Global report on assistive technology*. https://www.who.int/publications/i/item/9789240062883

Chapter 4

The Rise of AI in Global and African Contexts

Global Momentum and Technological Evolution

Over the past few decades, Artificial Intelligence (AI) has moved from a niche academic pursuit to a foundational technology influencing nearly every domain of human activity. Innovations in machine learning, natural language processing, computer vision, and robotics have enabled applications ranging from autonomous vehicles to real-time language translation. Much of this progress is attributed to the exponential growth in computational power, availability of large-scale datasets, and the development of advanced algorithms, particularly deep learning models (Russell & Norvig, 2021).

The release of large foundation models like OpenAI's ChatGPT series, Google's Gemini, and Meta's LLaMA has demonstrated the ability of AI to perform generalized tasks—summarizing complex documents, generating original code, translating languages, and even responding empathetically in conversation. These generative AI models have begun to alter how industries approach labor, education, health care, and creative expression (Bommasani et al., 2021). Simultaneously, AI ethics debates have intensified, focusing on algorithmic bias, surveillance risks, and the concentration of power within a few dominant tech companies.

The United Nations, OECD, and World Economic Forum have released guiding principles for ethical AI development, emphasizing transparency, accountability, and human-centered design (e.g., UNESCO, 2021). Notably, global discourse has increasingly called for AI systems to be inclusive—especially for marginalized populations, including persons with disabilities. However, very few AI tools to date have been designed with accessibility as a core requirement, and even fewer have considered disability across different languages and cultures.

Africa's Entry Point into the AI Ecosystem

Despite limited investment and infrastructure, Africa has been gradually establishing itself as a contributor to global AI development. Between 2013 and 2023, the number of AI-related research publications from Africa increased nearly fourfold, with hubs emerging in Kenya, Nigeria, Ghana, Rwanda, South Africa, and Tunisia (Mohamed et al., 2020). These countries have also seen a rise in AI startups, accelerator programs, and university-based labs that explore AI for agriculture, finance, health, and education.

Key pan-African initiatives such as the African Union's Continental Strategy on Artificial Intelligence and Digital Transformation have framed AI as central to achieving the Sustainable Development Goals (AU, 2022). The strategy urges member states to prioritize inclusive innovation, responsible data governance, and public investment in AI skills and infrastructure. Meanwhile, Rwanda, Kenya, Ghana, and South Africa have each published or drafted national AI strategies, all of which acknowledge the importance of equity and inclusion—though few provide detailed roadmaps for disability integration.

Africa's AI sector has also been energized by private sector investment and international partnerships. Google's AI Research Lab in Accra, the Mastercard Foundation's funding for AI education, and the launch of AI for Good accelerators by organizations like Zindi and Data Science Nigeria signal growing momentum. However, most tools are still developed using datasets that do not represent African environments, languages, or experiences—including the lived realities of PWDs on the continent (Birhane et al., 2022).

Challenges of Localization and Representation

One of the biggest barriers to AI adoption in Africa is the lack of locally relevant, high-quality data. Many models, including those used for medical diagnostics or voice recognition, are trained predominantly on data from the Global North, leading to decreased accuracy when applied in African contexts. This is especially problematic for marginalized groups like PWDs, whose experiences are often absent from national surveys, administrative records, or digital platforms (Abebe et al., 2021).

The problem of "data colonialism"—where African users generate data that fuels global AI systems without benefiting from their outcomes—has been widely discussed in academic and policy circles. It raises critical questions about consent, ownership, and the unequal distribution of AI-derived value. As AI systems are increasingly deployed in public services and humanitarian settings, the risk of exclusion or harm for underrepresented groups becomes more acute.

In the disability context, models that fail to include diverse physical abilities, languages, or communication methods can result in outputs that are biased, inaccessible, or outright discriminatory. For example, speech recognition tools trained without stuttered or dysarthric speech samples often fail to transcribe accurately for users with nonstandard speech conditions. Similarly, vision models may fail to detect sign language accurately unless trained on localized datasets. Addressing these issues requires participatory AI design, disability-inclusive dataset development, and collaboration with local OPDs.

Digital Infrastructure and Capacity Constraints

AI development requires not only data but also computational infrastructure, skilled labor, and policy frameworks. Africa continues to face significant constraints in each of these areas. For example, access to GPUs and cloud-based machine learning tools is limited by high costs, unreliable electricity, and underdeveloped digital backbones. As of 2023, only a handful of African countries have national data centers capable of supporting large-scale model training or storage (World Bank, 2023).

There is also a shortage of AI researchers and engineers, particularly those trained in inclusive or participatory design. While universities in Kenya, Nigeria, and South Africa are introducing AI curricula, most programs are concentrated in urban centers and do not prioritize disability inclusion as part of technical training. Bridging this gap will require investment in accessible STEM education, capacity building for OPDs, and partnerships between academic institutions and disability organizations.

From a policy standpoint, there is growing concern that national AI strategies remain too general, lacking actionable guidance on how AI can address social inequities or support vulnerable populations. While inclusion is frequently mentioned, few strategies explicitly reference disability rights frameworks such as the CRPD or the African Disability Protocol. This omission reflects a broader issue: the marginalization of PWDs in AI governance conversations at the national and regional levels (Gwagwa et al., 2021).

Opportunities for Disability-Inclusive AI Leadership

Despite these challenges, Africa is uniquely positioned to pioneer inclusive AI frameworks that center the rights and experiences of marginalized groups. The continent's diversity, creativity, and resilience offer fertile ground for innovation that is ethical, equitable, and locally grounded. For example, organizations like Masakhane are developing language models for African languages using participatory approaches that include community validators and contributors with disabilities.

The growing number of AI for Good challenges, hackathons, and policy forums presents opportunities to bring disability inclusion into mainstream AI conversations. Funding agencies such as IDRC, GIZ, and the Mastercard Foundation are increasingly supporting programs that include accessibility components or disability participation requirements. Moreover, regional platforms like the African Union Development Agency (AUDA-NEPAD) can play a convening role to harmonize inclusive AI standards across countries.

By embedding accessibility, representation, and disability rights into the foundation of Africa's AI journey, the continent can chart a new course that challenges global norms and demonstrates how emerging technologies can serve all citizens—not just the digitally privileged. This requires centering persons with disabilities not only as users, but also as co-creators, developers, data stewards, and policy architects of Africa's AI future.

Endnotes

Abebe, R., Barocas, S., Kleinberg, J., Levy, K., Raghavan, M., & Robinson, D. (2021). Roles for computing in social change. *Proceedings of the ACM on Human-Computer Interaction*, *5*(CSCW2), 1–26. https://doi.org/10.1145/3476058

African Union. (2022). *Continental's strategy on artificial intelligence and digital transformation*. https://au.int/en/documents/20221214/continental-strategy-artificial-intelligence-and-digital-transformation

Birhane, A., Prabhu, V., & Kahembwe, E. (2022). The values encoded in machine learning research. *Patterns*, *3*(5), 100493. https://doi.org/10.1016/j.patter.2022.100493

Bommasani, R., Hudson, D. A., Adeli, E., Altman, R., Arora, S., von Arx, S., ... & Liang, P. (2021). On the opportunities and risks of foundation models. *arXiv preprint*. https://arxiv.org/abs/2108.07258

Gwagwa, A., Kazim, E., Chiao, L., Aldo, F., & Taylor, L. (2021). The limits of AI in Africa: Policy, ethics, and research priorities. *Nature Machine Intelligence*, *3*, 103–107. https://doi.org/10.1038/s42256-021-00313-0

Mohamed, S., Png, M. T., & Isaac, W. (2020). Decolonial AI: Decolonial theory as sociotechnical foresight in artificial intelligence. *Philosophy & Technology*, *33*, 659–684. https://doi.org/10.1007/s13347-020-00405-8

Russell, S., & Norvig, P. (2021). *Artificial intelligence: A modern approach* (4th ed.). Pearson.

UNESCO. (2021). *Recommendation on the ethics of artificial intelligence*. https://unesdoc.unesco.org/ark:/48223/pf0000381137

World Bank. (2023). *Africa's digital infrastructure gap: Closing the divide*. https://www.worldbank.org/en/topic/digitaldevelopment/publication/africas-digital-infrastructure-gap

Chapter 5

Rationale for a Focus on Disability and AI

Introduction: Bridging Two Transformative Frontiers

Artificial Intelligence (AI) and disability rights represent two transformative forces shaping the 21st century. AI is redefining the possibilities of automation, communication, and personalization across all sectors of society, while the global disability rights movement is gradually reshaping systems to be more inclusive, participatory, and rights-based. Yet the intersection between these two domains remains underexplored and underfunded—especially in Africa.

Focusing on disability in the context of AI is not merely a question of ethics or equity. It is a necessary corrective to the structural exclusions that have historically marginalized PWDs from technological design, deployment, and governance. Moreover, it is a generative space for innovation: disability has often catalyzed advances in human-machine interaction, universal design, and adaptive systems. As AI becomes central to how public goods are distributed and decisions are made, failing to explicitly include PWDs risks deepening existing inequalities and entrenching digital exclusion.

Africa presents a particularly urgent context for this intersection. With one of the world's youngest and most rapidly urbanizing populations, the continent is in the midst of a digital transformation that will determine its development trajectory for decades to come. At the same time, over 80 million Africans—roughly 6% of the population—live with moderate to severe disabilities, and many more experience temporary or context-specific impairments (UNICEF, 2021). This figure is likely an undercount due to stigma, data gaps, and inconsistent definitions. Unless AI technologies are intentionally designed to be inclusive, the same systems that promise to reduce barriers could, paradoxically, reinforce them.

The Risk of Compounded Exclusion

One of the central reasons to prioritize disability in AI discourse is the risk of *compounded exclusion*. This refers to the way in which structural barriers multiply when technological development fails to include marginalized communities. PWDs already face exclusion from health services, employment, education, and civic participation. When AI systems mediate access to these domains—whether through biometric verification, online job applications, or digital education platforms—PWDs can find themselves locked out twice: first by inaccessible physical systems, and then by non-inclusive digital ones (Veale & Binns, 2017).

The design of AI systems often reflects the perspectives and priorities of their developers, who are typically non-disabled and located in the Global North. This lack of representation leads to what Ruha Benjamin calls *"the default user problem"*: systems are optimized for users who conform to normative assumptions around ability, literacy, and communication style (Benjamin, 2019). For example, AI-driven hiring tools that analyze facial expressions or voice intonation may unfairly penalize candidates with neurological or speech-related disabilities. Similarly, AI in education platforms may misclassify neurodivergent students as inattentive or low-performing based on biased behavioral benchmarks.

Unless PWDs are actively involved in AI research, dataset creation, and policy design, exclusion will be systematized at scale. The danger here is not merely technical—it is socio-political. As AI systems are increasingly deployed in public decision-making (e.g., for resource allocation or eligibility determination), algorithmic exclusion may become embedded in welfare systems, legal frameworks, and international development programming.

Disability as a Driver of Technological Innovation

Focusing on disability in AI is not just a moral imperative—it is also a source of innovation. Historically, the disability community has driven key developments in user-centered design, human-computer interaction, and accessibility standards. In this sense, inclusive AI design benefits everyone by expanding the range of use cases and contexts in which a tool can function effectively.

Many of today's widely used technologies were originally developed to assist PWDs, demonstrating how inclusive design often drives innovation that benefits everyone. For instance, text-to-speech (TTS) systems and screen readers, such as JAWS and later Apple's Voiceover, were designed for individuals who are blind or have low vision, but are now embedded in mainstream products like smartphones, navigation systems, and smart speakers (Wentz et al., 2016). Conversely, speech-to-text and voice dictation software, such as Dragon NaturallySpeaking, began as tools to help users with mobility impairments write or control devices and are now used broadly by professionals seeking hands-free computing (Cook & Polgar, 2014). Closed captioning, developed to make television accessible to people who are deaf or hard of hearing, is now widely used in public spaces, on social media, and by language learners (Downey, 2008). Likewise, predictive text and autocorrect originated from assistive communication tools to help users with motor or cognitive challenges write efficiently, and these features are now standard in messaging apps and search engines. While touchscreens were not invented specifically for accessibility, they were incorporated early into augmentative and alternative communication (AAC) devices like Dynavox to aid users with cerebral palsy and speech impairments, long before they became ubiquitous in smartphones and tablets (Shane et al., 2012). Innovations like eye-tracking and gaze control, first developed to support people with severe physical disabilities such as ALS, are now used in gaming, automotive technology, and UX design (Majaranta & Räihä, 2007). Similarly, custom keyboards, switch controls, and other adaptive input methods have influenced modern ergonomic device design. Voice assistants—originally informed by accessibility research in natural language processing—have become integral to digital life through platforms like Siri, Alexa, and Google Assistant (Harper, 2006). Smart home automation, pioneered to allow people with mobility impairments to control lights and appliances remotely, has since evolved into the Internet of Things (IoT) ecosystem found in millions of homes. Even vibration and haptic feedback, initially introduced to alert users who are deaf or hard of hearing, are now common in smartphones, wearables, and gaming consoles. These examples underscore that accessibility-focused innovation has often laid the groundwork for mainstream breakthroughs.

Moreover, disability prompts new paradigms for thinking about intelligence, autonomy, and human-technology relationships. AI systems designed with disability in mind often challenge conventional metrics of success—moving from efficiency and speed to flexibility, customizability, and relational support. For example, AI companions for persons with intellectual disabilities may prioritize routine-building and emotional resonance over task completion, thus reshaping what counts as "intelligent" assistance.

By foregrounding disability, AI developers can also challenge the assumption that users interact with technology in fixed, stable, or normative ways. This creates room for multi-modal interfaces, adaptive feedback loops, and participatory learning systems that are more robust, user-sensitive, and context-aware. In this sense, disability inclusion is not a constraint on AI innovation—it is a catalyst.

Intersectionality and Inclusive Development

A disability-focused approach to AI also complements broader commitments to inclusive and intersectional development. Disability intersects with gender, age, geography, language, and socioeconomic status in complex ways. For instance, Women with Disabilities in rural areas of Africa often face a triple exclusion—from patriarchal norms, ableist systems, and digital divides. Without careful design, AI may deepen these exclusions by requiring literacy, digital access, or language proficiency that such users may lack (Mutsvangwa & Lorenzo, 2021).

An intersectional approach also helps to uncover specific design and policy gaps. For example, voice assistants trained primarily on male English voices may fail to recognize the high-pitched or accented speech patterns of African women with speech impairments. Similarly, AI-based medical diagnostics may misclassify symptoms in PWDs who have comorbid or atypical presentations. Addressing these gaps requires not only diverse datasets, but also inclusive design teams and participatory testing environments.

Embedding disability into AI design also supports the realization of the Sustainable Development Goals (SDGs), particularly SDG 3 (good health and well-being), SDG 4 (quality education), SDG 8 (decent work), SDG 10 (reduced inequalities), and SDG 11 (inclusive cities). AI projects that do not center disability risk undermining these goals by creating systems that serve the digitally privileged while excluding those most in need.

Global Momentum Meets Local Urgency

Globally, there is growing recognition of the need for disability-inclusive AI. UNESCO's *Recommendation on the Ethics of AI* (2021) explicitly highlights accessibility and inclusion as core principles. The World Health Organization and UNICEF's *Global Report on Assistive Technology* (2022) calls for AI-enabled devices that are affordable, interoperable, and designed in partnership with users with disabilities. Likewise, the International Telecommunication Union has published guidelines for AI accessibility in digital public services (ITU, 2022).

However, these global frameworks often lack traction at national and local levels, particularly in African countries where resources are constrained and disability is still heavily stigmatized. While several African AI strategies mention inclusion, few offer concrete commitments to disability representation, data collection, or funding for assistive AI. Without localized action, the global momentum around inclusive AI risks bypassing the continent entirely.

Yet there are opportunities. Africa's growing AI research community—combined with its vibrant disability rights movements—can lead the way in forging a new model of AI development: one that is inclusive by default, participatory in practice, and attuned to local realities. By anchoring AI efforts in disability inclusion, African innovators can avoid the mistakes of digital systems elsewhere and build technologies that serve as instruments of liberation rather than exclusion.

A Call to Reframe

The central argument for focusing on disability and AI is that inclusion must not be retrofitted—it must be built in from the start. This requires a shift in both mindset and method. Disability must be seen not as a technical "problem to solve," but as a rich site of knowledge, creativity, and design potential. PWDs must be involved not only as testers or "beneficiaries," but as data stewards, engineers, designers, policy-makers, and strategists.

For AI to realize its promise in Africa—or anywhere—it must actively confront the historical and ongoing exclusions that structure our societies. Disability is not an edge case—it is a test case for whether AI will serve the many or the few. By starting with those most often left behind, AI has the potential to become not just smarter, but fairer, more humane, and more transformative.

Endnotes

Benjamin, R. (2019). *Race after technology: Abolitionist tools for the new Jim code*. Polity Press.

International Telecommunication Union. (2022). *Guidelines on inclusive ICTs for persons with disabilities*. https://www.itu.int/en/ITU-D/Digital-Inclusion/Persons-with-Disabilities/

ITU. (2022). *Accessibility of AI-based services*. https://www.itu.int/en/ITU-T/focusgroups/ai4ad

Mutsvangwa, T., & Lorenzo, T. (2021). The digital divide and disability in rural Africa. *African Journal of Disability*, *10*, 1–8. https://doi.org/10.4102/ajod.v10i0.896

UNESCO. (2021). *Recommendation on the ethics of artificial intelligence*. https://unesdoc.unesco.org/ark:/48223/pf0000381137

UNICEF. (2021). *Children with disabilities in Eastern and Southern Africa: A statistical overview*. https://data.unicef.org/resources/children-with-disabilities-in-eastern-and-southern-africa-a-statistical-overview-of-their-well-being/

Veale, M., & Binns, R. (2017). Fairer machine learning in the real world: Mitigating discrimination without collecting sensitive data. *Big Data & Society*, *4*(2), 1–17. https://doi.org/10.1177/2053951717743530

Wentz, B., Jaeger, P. T., & Lazar, J. (2016). Retrofitting accessibility: The legal inequality of after-the-fact online access for persons with disabilities in the United States. *First Monday*, *21*(7). https://doi.org/10.5210/fm.v21i7.6791

WHO & UNICEF. (2022). *Global report on assistive technology*. https://www.who.int/publications/i/item/9789240062883

Cook, A. M., & Polgar, J. M. (2014). *Assistive technologies: Principles and practice* (4th ed.). Elsevier.

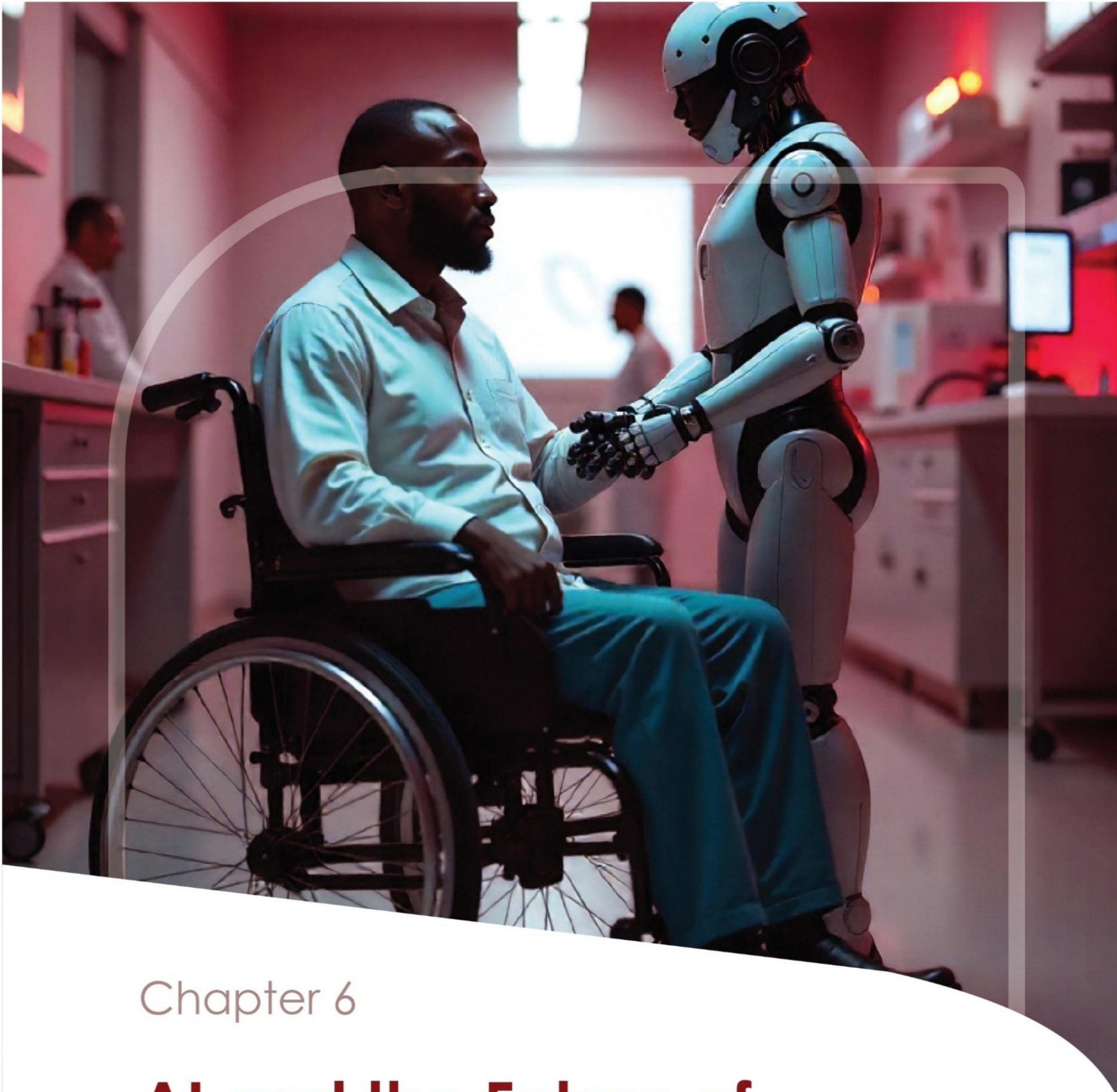
Downey, G. J. (2008). *Closed captioning: Subtitling, stenography, and the digital convergence of text with television*. Johns Hopkins University Press.

Harper, S. (2006). Voice interfaces and the Web: Access for all. *Universal Access in the Information Society*, *5*(2), 213–225. https://doi.org/10.1007/s10209-006-0040-2

Majaranta, P., & Räihä, K. J. (2007). Text entry by gaze: Utilizing eye-tracking. *Universal Access in the Information Society*, *5*(2), 199–208. https://doi.org/10.1007/s10209-006-0043-z

Shane, H. C., Laubscher, E., Schlosser, R. W., Flynn, S., Sorce, J., & Abramson, J. (2012). Applying technology to visually support language and communication in individuals with autism spectrum disorders. *Journal of Autism and Developmental Disorders*, *42*(6), 1228–1235. https://doi.org/10.1007/s10803-011-1304-z

Wentz, B., Jaeger, P. T., & Lazar, J. (2016). Retrofitting accessibility: The legal inequality of after-the-fact online access for persons with disabilities in the United States. *First Monday*, *21*(7). https://doi.org/10.5210/fm.v21i7.6791



Chapter 6

AI and the Future of Assistive Technology in Africa

Why artificial intelligence matters for assistive technology now

Across Africa, most PwDs still cannot get the assistive technology (AT) that would enable daily living and participation. In 2022 the World Health Organization (WHO) and UNICEF estimated that only a minority of people globally who need AT actually have it; in many low- and middle-income settings, the gap is stark, with Africa facing chronic shortages of trained personnel and affordable devices. [1] The urgency is not hypothetical. Fieldwork from Ghana and Kenya conducted for this study in 2025 repeatedly surfaced cost, awareness, and access as the top barriers to AI-enabled AT adoption, echoing what innovators and caregivers told us in interviews and focus groups. In those discussions, participants stressed that without affordability, localization to African languages and contexts, and explicit inclusion in national AI policies, AI-powered AT risks remaining a pilot rather than a lifeline.

AI can help close these gaps in two complementary ways. First, AI improves the performance and usability of existing AT (for example, hearing aids that separate speech from noise using deep learning, or screen-reader apps that describe images in richer detail). Second, AI enables new categories of AT altogether—such as real-time sign-language avatars, personalized speech models for people with atypical speech, or navigation wearables that sense and anticipate hazards. In both pathways, success depends on disability-inclusive datasets, ethical data governance, and participation by OPDs in design and evaluation—priorities our team has highlighted elsewhere in this project and that the AU has begun to articulate in its Continental AI Strategy.

Improving the tools we already have

Vision support: from seeing the scene to understanding it

For blind and low-vision users, AI has turned smartphones into pocket-sized assistants. Microsoft's Seeing AI, now on iOS and Android, uses computer vision to read documents, identify products, and generate richer, generative-AI image descriptions; in 2024, Microsoft expanded languages and added a chat interface for photos and documents.[2, 3] In parallel, Be My Eyes introduced "Be My AI," an AI-powered assistant that answers conversational questions about images, helping users read appliance displays, sort medications, or troubleshoot travel signage without waiting for a sighted volunteer.[4] These capabilities are spreading to wearable form factors: Envision's AI-enabled smart glasses offer hands-free reading and scene description, while Swiss start-up biped's chest-mounted device uses multimodal AI to detect obstacles, vehicles, and moving objects, offering anticipatory navigation cues [5, 6, 7]

These improvements matter in African contexts where print accessibility is low, ambient lighting is inconsistent, and data connectivity may be expensive. They also need localization—recognition of regional currencies, products, and scripts; support for African languages; and offline modes. Initiatives like Nigeria's Vinsighte point to a homegrown path: its Visis suite combines OCR, text-to-speech, and computer vision to help users read printed books and recognize objects, with school-based training to support adoption [8, 9]

Hearing support: noise-robust listening and accessible screening

Modern hearing aids increasingly embed trained neural networks to help users hear speech in noisy, real-world environments, a longstanding limitation of amplification alone. Oticon's "More" platform, for example, is built around a deep neural network trained on diverse sound scenes; Widex and Starkey similarly market AI-assisted personalization and noise handling.[10, 11, 12] While such premium devices remain costly, Africa's hearing-care innovators are redesigning access pathways. South Africa's hear Group (now part of LXE Hearing after a 2025 merger) built smartphone audiometry and over-the-counter hearing-aid models aimed at lowering costs and enabling remote fitting—an approach that has piloted in Kenya and could be scaled with public procurement and telecom partnerships [13, 14, 15, 16]

Communication support: making atypical speech intelligible to people and machines

A critical, often overlooked use case is atypical speech—common in cerebral palsy, after stroke, or with neuromuscular conditions. Google's Project Relate lets users train a personalized speech model that improves transcription and can "repeat" in a clearer voice, while Project Euphonia collects diverse voice samples to improve recognition for atypical speech.[17, 18] Personalized systems are seeding local collaborations: in 2024–2025 the University of Ghana, Google Research Africa, and the Global Disability Innovation Hub launched *tɛkyerɛma pa*, creating the first open-source dataset of non-standard speech in multiple Ghanaian languages to support inclusive automatic speech recognition (ASR).[19, 20, 21] These directions align closely with the data-inclusion gaps our team documented—voice systems trained mostly on "typical" English can lock PwDs out of a voice-first world unless we build representative data and evaluate disability bias explicitly. Commercial tools are also maturing. Violett offers recognition that adapts to non-standard speech and integrates with mainstream assistants, while Whipp uses real-time AI voice conversion to render whispered or impaired speech as a natural-sounding voice for phone calls and in-person conversation—named a TIME Best Invention in 2024.[22, 23, 24, 25, 26] Together, these pathways suggest a spectrum—from open data and research to turnkey apps—that African governments and funders can weave into rehabilitation and education programs.

Mobility and independent living: safer navigation and adaptive control

AI is improving mobility aids as well. Smart wheelchairs and add-ons use sensors and computer vision for collision avoidance, drop-off detection, and even autonomous indoor navigation, reducing caregiver strain and accidents in tight or crowded spaces. Devices such as LUCI (an accessory for power wheelchairs) and WHILL's autonomous service illustrate what is already feasible, even if price points and infrastructure remain hurdles for widespread African uptake.[27, 28, 29, 30] Research prototypes and commercial pilots show that on-chair AI can complement—not replace—human assistance in hospitals, airports, and malls, with potential spillovers to rehabilitation facilities across the continent.[27, 31]

Creating new categories of assistive technology

Sign-language avatars and translation.

Sign-language avatars and translation engines—long imagined, but newly practical—are emerging through advances in generative AI and motion capture. In Kenya, the AI4KSL consortium led by Maseno University has assembled a Kenyan Sign Language (KSL) dataset (approximately 20,000 signed videos, with HamNoSys annotations) and is prototyping an avatar that translates spoken English to KSL for use in classrooms.[32, 33, 34] Early posters presented at Deep Learning Indaba 2025 suggest a path to open resources and teacher-tested tools, with OPD involvement to evaluate linguistic fidelity and usability.[35] Outside Africa, companies like Signapse (UK) and Hand Talk (Brazil) are deploying AI-generated signers for British Sign Language (BSL), American Sign Language (ASL), and Libras in transport, media, and websites—models that could transfer to African contexts if adapted to local sign languages and dialects.[36, 37, 38, 39] A parallel crop of start-ups (e.g., Silence Speaks) is partnering with Deaf engineers to set quality bars and address interpreter shortages [40]

AI-adaptive prosthetics and low-cost fabrication

AI also enables smarter, cheaper prosthetics by combining myoelectric sensing with pattern-recognition control, on-device learning, and 3D printing. Tunisia's Cure Bionics develops lightweight upper-limb devices with myoelectric control and VR-based training, aiming to localize fitting and lower costs for children and youth—a demographic often priced out due to frequent resizing needs.[41, 42, 43, 44] While high-end neuroprosthetics and brain-computer interfaces (BCIs) grab global headlines, the African opportunity is likely in adaptive control and decentralized manufacturing: AI that tailors grip patterns to a user's residual muscle signals, sockets fit with AI-assisted scanning, and local 3D printing hubs to reduce import costs and repair delays.

Language technologies for African contexts

Language is both a barrier and a bridge. Beyond sign languages, the availability of open speech data in African languages has expanded thanks to community-driven efforts such as Mozilla Common Voice. Kinyarwanda, for instance, now boasts thousands of recorded hours—resources that can power offline text-to-speech (TTS), captioning, and voice interfaces in Rwanda's public services and educational tools.[45, 46, 47] These corpora are essential for AT localization, but—as our dataset-bias review underscores—must also include disability-representative data (for example, speech from people with atypical articulation) so that "inclusive by design" does not remain an aspiration.

Data, bias, and representation: the precondition for effective AI-AT

As documented in our companion chapter, AI models will reflect the data we feed them. Disability is often underrepresented or misrepresented, creating a "disability data desert" that produces captioning systems that ignore mobility aids, speech models that fail on dysarthria, and screening tools that mistake disability traits for performance problems. Our review calls for disability-inclusive datasets, participatory data collection with OPDs and Deaf communities, and explicit auditing for disability bias before deployment.

Policy levers and procurement: making AI-AT visible in national strategies

The AU's 2024 Continental AI Strategy names inclusion as a priority and calls for investment in data infrastructure and responsible governance—an opening to make AT explicit in national plans. Yet our scan of Ghana's and Kenya's AI strategies and survey results suggests that AT and disability-specific clauses are often thin or absent; innovators fear that without explicit recognition, the sector will remain invisible in budgets and standards. Concretely, disability-inclusive AI strategies should: require procurement to meet accessibility and localization benchmarks; fund OPD-led dataset creation; mandate evaluation for disability bias; and support local manufacturing or assembly for AT devices, with open standards that encourage competition and service ecosystems.

Practical constraints and how to design around them

Even the best AI-AT fails without electricity, connectivity, and training. Our Ghana–Kenya fieldwork shows that cost is the dominant barrier, followed by availability, infrastructure, and awareness. A realistic African deployment model pairs low-cost hardware with offline or edge AI (e.g., on-device OCR and TTS), leverages community-based rehabilitation networks for training, and uses financing mechanisms (vouchers, micro-leasing, mobile money) to spread costs. In procurement, governments can negotiate "access bundles" that include data subsidies and repair coverage. And throughout, OPDs and caregivers must have roles in specifying requirements, testing prototypes, and auditing outcomes.

Conclusion

AI can make today's assistive technologies more capable and create entirely new ones. For Africa, the path runs through localization (languages, sign languages, settings), affordability (procurement and financing), reliability (offline options and local repair), and dignity (participatory design with OPDs and Deaf communities). The evidence from Kenya's AI4KSL, Ghana's *tɛkyerɛma pa*, Nigeria's Vinsighte, Tunisia's Cure Bionics, and South Africa's hearX shows a continental talent base ready to lead if policy and finance show up.

Endnotes

1. World Health Organization & UNICEF. (2022). *Global report on assistive technology*. https://www.who.int/publications/i/item/9789240049451
2. Microsoft. (2023, July 10). *Seeing AI app launches on Android—new features and languages*. https://blogs.microsoft.com/accessibility/seeing-ai-app-launches-on-android-including-new-and-updated-features-and-new-languages/
3. Microsoft. (2024, March 7). *Ability Summit 2024: Advancing accessibility with AI*. https://blogs.microsoft.com/blog/2024/03/07/ability-summit-2024-advancing-accessibility-with-ai-technology-and-innovation/
4. Be My Eyes. (2023, March 14). *Introducing Be My AI (formerly Virtual Volunteer), powered by GPT-4*. https://www.bemyeyes.com/news/introducing-be-my-ai-formerly-virtual-volunteer-for-people-who-are-blind-or-have-low-vision-powered-by-openais-gpt-4/
5. Envision. (2024). *Envision Glasses*. https://www.letsenvision.com/glasses
6. biped. (2025). *biped—AI wearable for blind & low-vision*. https://www.biped.ai/
7. Waymap. (2025). *Waymap—turn-by-turn audio navigation*. https://www.waymapnav.com/
8. Vinsighte. (2025). *About Vinsighte*. https://www.vinsighte.com.ng/about
9. United Nations DESA. (2025). *The Visis App Initiative (Vinsighte)*. https://sdgs.un.org/partnerships/visis-app-initiative
10. Oticon. (2024). *Oticon More: A hearing aid designed to support how the brain works*. https://www.oticon.com/solutions/more-hearing-aids
11. Widex. (2024). *MySound—AI-driven personalization*. https://global.widex.com
12. Starkey. (2024). *Edge Mode & AI hearing technology*. https://www.starkey.com/blog
13. *Financial Times*. (2024, June 6). Africa healthcare start-ups focus on sight and sound. https://www.ft.com/content/9e3d3b63-8bf4-40e7-bc66-2edc847df12b
14. Yahoo Finance. (2025, March 18). *Eargo and hearX close merger—LXE Hearing*. https://finance.yahoo.com/news/eargo-hearx-close-merger-announce-171500706.html
15. Futuregrowth Asset Management. (2025, April 9). *SA's hearX joins forces with US-based Eargo*. https://www.futuregrowth.co.za/insights/sa-s-hearx-joins-forces-with-us-based-eargo
16. hearX Group. (2025). *hearScreen® and hearTest Occ Health*. https://hearxgroup.com/products/hearscreen ; https://hearxgroup.com/products/heartest-occupational-health-solution
17. Google Research. (2025). *Project Relate*. https://sites.research.google/relate/
18. Google Research. (2025). *Project Euphonia*. https://sites.research.google/euphonia/about/
19. Global Disability Innovation Hub. (2024, Nov 7). *Google, University of Ghana and GDI Hub to expand AI-powered speech recognition for non-standard speech in Ghanaian languages*. https://www.disabilityinnovation.com/news/google-university-

of-ghana-and-gdi-hub-to-expand-ai-powered-speech-recognition-for-non-standard-speech-in-ghanaian-languages
20. AT2030. (2024). *Ghanaian languages—tɛkyerɛma pa*. https://at2030.org/ghanaian-languages/
21. Ghana News Agency. (2024, Nov 5). *UG, Google, and UCL develop speech recognition technology for Ghanaian languages*. https://gna.org.gh/2024/11/ug-google-and-ucl-develop-speech-recognition-technology-for-ghanaian-languages-2/
22. Voiceitt. (2025). *Inclusive Voice AI*. https://www.voiceitt.com/
23. RAZ Mobility. (2023, Aug 17). *Voiceitt2 launched*. https://www.razmobility.com/news/voiceitt2-launched-first-of-its-kind-stand-alone-voice-application-for-people-with-speech-disabilities-now-available-to-customers/
24. Whispp. (2025). *Assistive voice technology*. https://whispp.com/
25. TechCrunch. (2024, Jan 11). *Whispp's AI app for speech impairments*. https://techcrunch.com/2024/01/11/whispp-voice-app/
26. LUMO Labs. (2024, Oct 30). *Whispp was named a TIME Best Invention of 2024*. https://lumolabs.io/whispp-honored-as-times-best-invention-of-2024-in-accessibility-for-innovative-real-time-assistive-voice-technology/
27. LUCI Mobility. (2025). *Wheelchair Smarter (product brochure)*. https://luci.com/wp-content/uploads/2025/04/Wheelchair-Smarter-April2025.pdf
28. WHILL. (2024–2025). *Autonomous mobility services at LAX/MIA and Munich*. https://whill.inc/us/news/whill-and-envoy-air-announce-first-commercial-deployments-of-autonomous-mobility-services-at-major-u-s-airports/ ; https://www.whill.inc/us/news/whill-launches-autonomous-services-at-munich-airport
29. AARP. (2024, Aug 1). *Robotic airport wheelchairs*. https://www.aarp.org/travel/travel-tips/transportation/robotic-airport-wheelchairs-guide/
30. Runway Girl Network. (2024, Dec 30). *WHILL autonomous wheelchairs see growing adoption at airports*. https://runwaygirlnetwork.com/2024/12/whill-autonomous-wheelchairs-see-growing-adoption-at-airports/
31. Sahoo, S. K., & Choudhury, B. B. (2024). *Autonomous navigation and obstacle avoidance in smart robotic wheelchairs*. *Journal of Decision Analytics and Intelligent Computing*, 1. https://doi.org/10.31181/jdaic10019022024s
32. Maseno University. (2025). *AI4KSL—Bridging language barriers using AI for Kenyan Sign Language*. https://www.maseno.ac.ke/ai4ksl-bridging-language-barrier-using-artificial-intelligence-kenyan-sign-language-among-deaf
33. Wanzare, L., Okutoyi, J., Kang'ahi, M., & Ayere, M. (2024, Oct 23). *Kenyan Sign Language (KSL) dataset: Using AI to bridge communication barriers among Deaf learners* (arXiv:2410.18295). https://arxiv.org/abs/2410.18295
34. Ayere, M., et al. (2024). *Leveraging AI for KSL production to support Deaf learners* (preprint). https://www.researchgate.net/publication/385937123

35. Data Science Africa. (2023). *Collaboration with Maseno University—AI4KSL*. https://www.datascienceafrica.org/centres/dsa-collaboration-with-mu
36. Signapse. (2025). *AI sign language translation*. https://www.signapse.ai/
37. Signapse. (2025, June). *Roadmap to human-level BSL translation*. https://www.signapse.ai/post/the-signapse-ai-roadmap-our-journey-to-human-level-sign-language-translation
38. Hand Talk. (2025). *About*. https://www.handtalk.me/en/about
39. Lenovo StoryHub. (2023, Oct 24). *AI-powered Libras translation in Brazil*. https://news.lenovo.com/ai-powered-sign-language-translation-solution-hearing-brazil/
40. *WIRED*. (2025, May 7). *This startup has created AI-powered signing avatars for the Deaf*. https://www.wired.com/story/silence-speaks-deaf-ai-signing
41. Cure Bionics. (2025). *Hannibal hand & company overview*. https://curebionics.com/
42. Reuters. (2021). *Tunisian startup develops AI-powered prosthetics for amputees* (video). https://www.youtube.com/watch?v=f9SticX449E
43. ESGX. (2025). *Cure Bionics profile*. https://www.esgx.global/curebionics
44. Arab News Japan. (2020, Nov 4). *Tunisian startup 3D-prints solar-powered bionic hands*. https://www.arabnews.jp/en/middle-east/article_30555/
45. Mozilla Data Collective. (2025). *Common Voice Scripted Speech 23.0—Kinyarwanda datasheet*. https://datacollective.mozillafoundation.org/datasets/cmflnuzw7yb3onxnoza7an49s
46. Mozilla Foundation. (2022, Apr 5). *Lessons from building for Kinyarwanda on Common Voice*. https://www.mozillafoundation.org/en/blog/lessons-from-building-for-kinyarwanda-on-common-voice/
47. Common Voice. (2025). *Datasets archive*. https://commonvoice.mozilla.org/en/datasets

Chapter 7

Use of AI Beyond Assistive Technologies

Introduction

While assistive technologies remain critical for enabling persons with disabilities to navigate their environments, the scope of AI is far broader. AI is increasingly embedded into mainstream systems that determine access to health care, education, employment, transportation, and social services—systems that shape the opportunities and quality of life for PWDs, including children and youth. When AI is deployed with disability inclusion in mind, it can go beyond assistive devices to transform entire ecosystems, addressing not just individual impairments but the broader social and institutional barriers that exclude PWDs.

This section frames AI as a systemic enabler—a tool that, when designed inclusively, can optimize the delivery of services, improve outcomes, and enhance dignity for both PWDs and the caregivers, families, teachers, and support networks who surround them. The discussion is organized according to the domains of intervention that follow in the main report, ensuring conceptual alignment and laying a foundation for deeper analysis in each sector.

AI for Mental Health and Psychosocial Support

Mental health remains one of the most under-resourced sectors in Africa, particularly for persons with disabilities who often face stigma, trauma, and social isolation. AI offers scalable tools to bridge this service gap. Chatbots and virtual agents, such as Woebot and Wysa, have shown promise in delivering cognitive behavioral therapy (CBT), mood tracking, and emotional coaching via mobile devices (Fitzpatrick et al., 2017). In regions where mental health professionals are scarce, these tools offer low-cost, always-on support—a crucial feature for youth with disabilities who may feel excluded from in-person services.

For example, South Africa's "Big Sister" chatbot, developed by Jiki, is being adapted to deliver psychosocial support to adolescents using culturally resonant language and content. Similar models could be trained on disability-specific contexts to better serve young people dealing with ableism, depression, or anxiety. AI tools can also flag early warning signs of mental distress based on communication patterns or engagement levels, prompting timely referrals to human professionals.

Importantly, these systems can also support caregivers, who often experience burnout and emotional fatigue. AI-driven wellbeing check-ins and self-care nudges could be integrated into mobile apps or social media to promote caregiver resilience.

AI for Inclusive Employment and Economic Empowerment

The labor market remains structurally exclusionary for PWDs across much of Africa. Barriers range from discriminatory hiring practices to inaccessible job postings and workplace environments. AI can help level the playing field in multiple ways. First, generative AI tools like ChatGPT can assist jobseekers with disabilities in crafting compelling CVs, preparing for interviews, or translating skills into job descriptions tailored to local markets (Lundsgaard-Hansen & Denzler, 2023). These tools can be adapted to local dialects, literacy levels, and job sectors—offering personalized guidance that traditional employment services may lack.

From the employer side, AI-powered human resource platforms can detect ableist language in job descriptions, recommend inclusive phrasing, and assess physical or cognitive demands that may unnecessarily exclude PWDs. In Rwanda and Kenya, early-stage start-ups are piloting job-matching algorithms that connect employers to PWDs based on task breakdowns and identified accommodations.

AI can also support entrepreneurship for PWDs by generating business plans, tracking sales patterns through computer vision (e.g., for duka operators), and recommending microcredit or grant opportunities. For persons with limited mobility, digital work—such as AI-augmented customer service or transcription—offers new income streams when paired with accessible platforms.

AI for Education and Learning

In African classrooms, teachers often face overcrowded classrooms and limited resources, making it difficult to personalize instruction for children with disabilities. AI has the potential to support inclusive education by adapting content to diverse learning styles and cognitive profiles. Adaptive learning platforms, like M-Shule in Kenya, already personalize SMS-based lessons based on learner performance, although disability-specific adaptations are still rare.

AI can also power real-time translation and captioning, enabling deaf and hard-of-hearing students to follow classroom instruction. Machine learning models trained to recognize African sign languages could support inclusive communication tools. In addition, AI-driven text simplification or image-supported reading tools can help learners with intellectual or learning disabilities access grade-level content more independently (Al-Mamun et al., 2021).

Teachers themselves can benefit from AI by receiving automated suggestions for differentiated instruction, accessible assignments, and classroom layout strategies based on student needs. These tools can also facilitate universal design for learning (UDL) by offering multiple means of representation, engagement, and expression.

AI for Caregiver Support

Caregivers—especially those supporting children with disabilities—play a central role in African communities, yet are often under-supported and emotionally overburdened. AI tools can help alleviate these burdens by providing personalized planning, behavioral insights, and just-in-time assistance. Mobile apps powered by AI can help caregivers track routines, manage medication schedules, and log behavioral changes—functioning as lightweight, accessible care coordination platforms (Topol, 2019).

Generative AI can also offer emotional and logistical support by simplifying medical documents, generating follow-up questions for doctors, or translating information into local languages. In rural areas where professional support is unavailable, AI can act as a 24/7 resource to help caregivers navigate decision-making, crisis moments, or routine challenges.

Social support is equally important. AI-powered platforms can recommend peer support networks based on caregiver profiles, connecting them with others who share similar challenges. Moderated forums, informed by sentiment analysis and chatbot moderation, can foster safe spaces for dialogue, resource exchange, and encouragement.

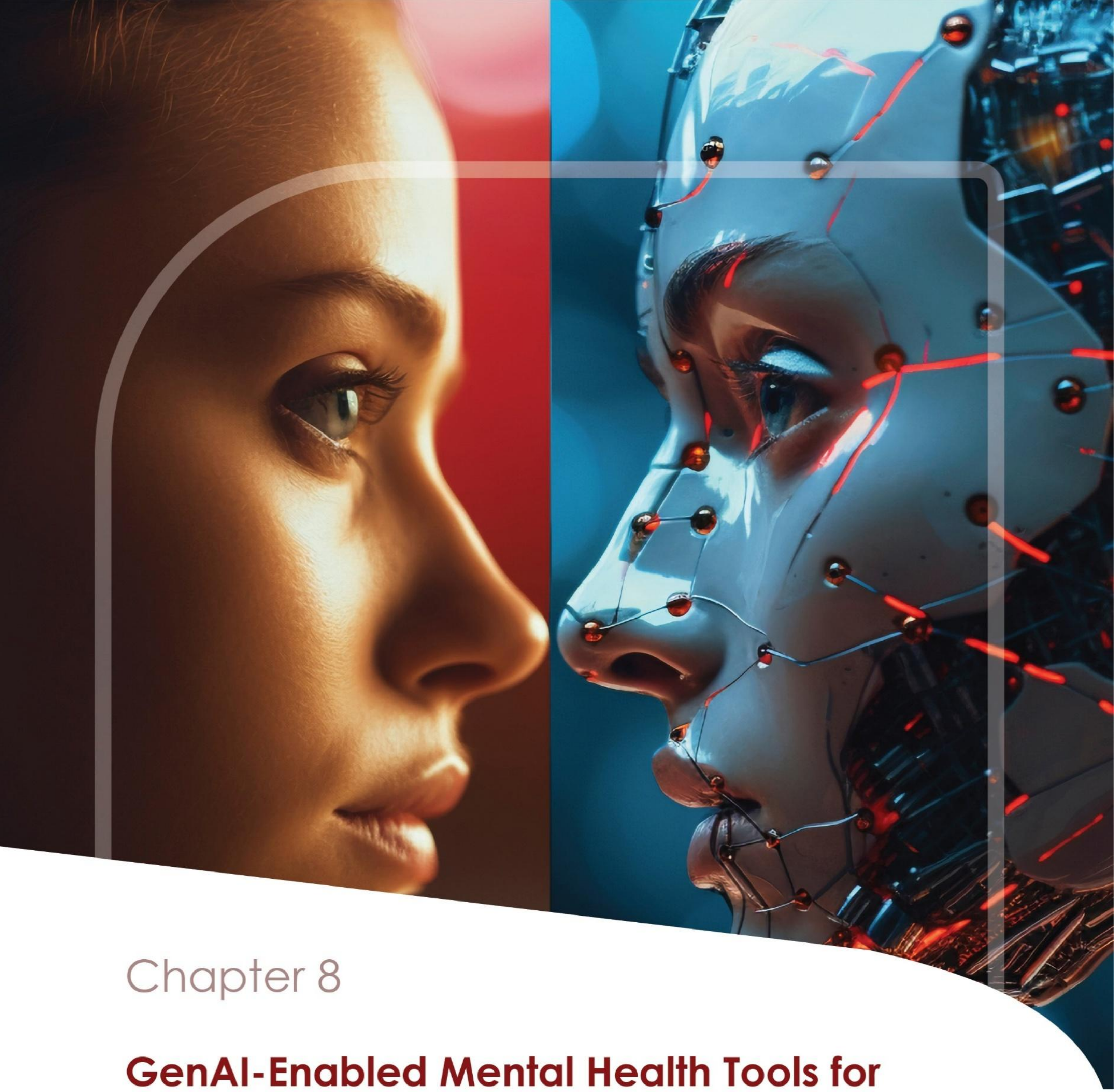
Endnotes

Al-Mamun, M., Hoque, M. R., & Sharif, M. I. (2021). Smart education with artificial intelligence-based learning analytics. *Education and Information Technologies*, *26*, 2655–2674. https://doi.org/10.1007/s10639-020-10305-7

Fitzpatrick, K. K., Darcy, A., & Vierhile, M. (2017). Delivering cognitive behavior therapy to young adults with symptoms of depression and anxiety using a fully automated conversational agent (Woebot): A randomized controlled trial. *JMIR Mental Health*, *4*(2), e19. https://doi.org/10.2196/mental.7785

Lundsgaard-Hansen, L., & Denzler, M. (2023). Unlocking potential with generative AI: Implications for future labor markets. *Harvard Business Review*. https://hbr.org

Topol, E. (2019). *Deep medicine: How artificial intelligence can make healthcare human again*. Basic Books.



Chapter 8

GenAI-Enabled Mental Health Tools for Persons with Disabilities in Sub-Saharan Africa: Risks and Opportunities

Introduction

Generative AI (GenAI) technologies are increasingly being applied in mental health care, offering new ways to deliver support through chatbots, virtual agents, and personalized content generation. For PWDs, who often face added barriers in accessing mental health services, GenAI tools present both promising opportunities and notable risks. This chapter provides a structured review of the landscape of GenAI-enabled mental health tools as it relates to PWDs in Sub-Saharan Africa, drawing on global examples. We examine how stigma, marginalization, and poverty affect the mental well-being of PWDs and their caregivers, and how AI-based interventions have been used to bridge gaps in mental health support. We highlight successful deployments (especially those benefiting PWDs or other marginalized groups), cautionary tales of failed or problematic deployments, and specific risks for Youth with Disabilities in the African context. Finally, we discuss concrete strategies to mitigate these risks – including community engagement, regulatory measures, localization of technology, and hybrid human-AI models – to ensure these innovations are safe, equitable, and effective. Throughout, all major disability categories (physical, visual, hearing, intellectual, psychosocial, and neurodevelopmental) are considered in the analysis.

Mental Health Challenges for PWDs in Sub-Saharan Africa

PWDs in Sub-Saharan Africa experience a range of mental health challenges linked to pervasive stigma, marginalization, and poverty. Social stigma surrounding disability can lead to discrimination, social exclusion, and internalized shame, which in turn negatively impact mental health. A study in South Africa found that stigma significantly mediates the association between disability and depression, contributing to higher rates of depressive symptoms and lower self-esteem among PWDs.[34] The exclusion of PWDs from education, employment, and community life – common in many low-income African settings – often results in poverty and isolation, further aggravating stress and mental health issues. Indeed, PWDs face heightened risks of poverty and poor nutrition, and these socioeconomic factors correlate with worse mental health outcomes.[35]

Caregivers of PWDs (such as family members of Children with Disabilities) also experience substantial mental health burdens. In communities where disability carries stigma or is poorly understood, caregivers may face social ostracism and a lack of support. Qualitative research in South Africa reported that caregivers sometimes conceal a family member's mental illness or disability from the community for fear of being stigmatized, and this secrecy

---

[34] Trani, Jean-Francois, Jacqueline Moodley, Paul Anand, Lauren Graham, and May Thu Thu Maw. "Stigma of Persons with Disabilities in South Africa: Uncovering Pathways from Discrimination to Depression and Low Self-Esteem." *Social Science & Medicine* 265 (2020): 113449. https://doi.org/10.1016/j.socscimed.2020.113449.
[35] *Id.*

can delay help-seeking and add psychological strain.[36] Caregivers of children with conditions like cerebral palsy or developmental disabilities often experience chronic stress, depression, and burnout due to the burden of care, financial strain, and lack of respite. One meta-analysis in Africa found the prevalence of caregiver "burden of care" to be extremely high (on the order of 60% or more), reflecting the toll on mental well-being.[37] In summary, PWDs and their caregivers in Sub-Saharan Africa often face a "triple jeopardy" of disability, stigma, and poverty that predisposes them to mental health challenges. This context underscores the urgent need for accessible mental health support tailored to these populations.

The Promise of AI for Mental Health Support in Low-Resource Settings

Advances in AI are increasingly being leveraged to address gaps in mental health care worldwide. In particular, AI-driven chatbots and digital apps have shown promise in expanding access to psychological support and therapy. These tools – often powered by GenAI language models capable of human-like conversation – can engage users in therapeutic dialogues, provide coping exercises, and monitor mood or risk factors. Globally, such AI mental health apps have been deployed to deliver evidence-based interventions like cognitive behavioral therapy (CBT) in a scalable manner. For example, the UK's National Health Service has integrated AI chatbots into its mental health triage process, using them to screen patients and deliver guided self-help exercises for lower-risk cases, while flagging high-risk responses for human clinicians.[38] This approach helps handle the overwhelming volume of referrals by offering immediate support to those who might otherwise languish on waitlists.

In low-resource and Global South contexts, AI tools are being explored to bridge severe gaps in mental health services. Many countries in Sub-Saharan Africa have critically low numbers of mental health professionals – for instance, Kenya has only about 100 psychiatrists for a population of ~50 million[39] – and per capita spending on mental health is often under $0.50 (far below international recommendations).[40] Digital platforms, accessible via mobile phones, are seen as a way to extend support to underserved communities. AI chatbots offer several

[36] Monnapula-Mazabane, P., Petersen, I. Mental health stigma experiences among caregivers and service users in South Africa: a qualitative investigation. *Curr Psychol* **42**, 9427–9439 (2023). https://doi.org/10.1007/s12144-021-02236-y.
[37] Andualem, F., Melkam, M., Tadesse, G. *et al.* Burden of care among caregivers of people with mental illness in Africa: a systematic review and meta-analysis. *BMC Psychiatry* **24**, 778 (2024). https://doi.org/10.1186/s12888-024-06227-8.
[38] "AI Chatbots Break Down Barriers to Much-Needed Mental Health Treatments," *RGA*, accessed May 2, 2025, https://www.rgare.com/knowledge-center/article/ai-chatbots-break-down-barriers-to-much-needed-mental-health-treatments.
[39] "Kenya Red Cross Expands Access to Mental Health Support with Azure AI-Powered Chatbot," *Microsoft*, last modified May 2, 2025, https://www.microsoft.com/en/customers/story/19682-kenya-red-cross-society-azure-ai-services.
[40] "Barriers to Mental Health Care in Africa," *World Health Organization Regional Office for Africa*, last modified May 2, 2025, https://www.afro.who.int/news/barriers-mental-health-care-africa.

advantages in these settings: they operate 24/7, require no appointment, and can simultaneously assist many users, overcoming issues of distance and provider scarcity. They also come at a fraction of the cost of traditional therapy, making mental health support more affordable. Crucially, interacting with a non-judgmental virtual agent can reduce the stigma or embarrassment some feel in opening up about mental health problems – an important consideration in cultures where mental illness and disability are heavily stigmatized. Early experiences with AI therapy show that users can find these chats surprisingly engaging and even form a "therapeutic alliance" with bot personas.[41]

Notably, GenAI has accelerated the capabilities of these tools. Modern large language models enable chatbots to respond with more nuance, empathy, and context-specific advice than earlier rule-based systems. This opens possibilities for more personalized and interactive mental health dialogues, including in local languages and dialects. However, GenAI also introduces new risks (like producing incorrect or biased advice) which we will discuss later. Overall, the global trend indicates a cautiously optimistic view: AI-powered mental health tools could be "invaluable assets" to augment overburdened systems by breaking down barriers of cost, access, and stigma.[42] In the Global South, where these barriers are most acute, the appeal of AI solutions is driving numerous pilot projects and innovations in digital mental health care.

Opportunities: How GenAI Tools Can Benefit PWDs' Mental Health

GenAI-enabled mental health tools hold particular promise for PWDs, provided they are designed with accessibility and inclusion in mind. All types of disabilities stand to gain from appropriately tailored AI support:

Physical disabilities (mobility impairments): For individuals with limited mobility or chronic physical illnesses, traveling to see a counselor can be difficult or impossible. AI chatbots and therapy apps allow PWDs to receive support from home, eliminating the need for travel or inaccessible clinic facilities. This can reduce feelings of isolation and empower users to seek help on their own schedule. By being available on smartphones or computers, these tools enable people with physical disabilities to engage in mental health exercises and coaching despite barriers in the physical environment. In low-income settings, this is vital as accessible transportation is often lacking. A stigma-free virtual setting can also encourage those who might avoid in-person therapy due to embarrassment about their disability to open up to a bot without fear of judgment.

Visual impairments (blind or low vision): GenAI mental health applications can be made accessible via screen reader compatibility, voice assistants, and text-to-speech output. A blind

[41] "AI Chatbots Break Down Barriers to Much-Needed Mental Health Treatments," note 5.
[42] *Id.*

user could talk to a voice-based AI "counselor" or listen to the chatbot's responses read aloud. Conversely, speech-to-text can let the user speak their problems and have the AI interpret them. Such multimodal interfaces mean that visual impairment need not be a barrier to receiving therapeutic dialogue. With GenAI's natural language capabilities, the conversation can feel fluid and supportive even through an audio interface. This is an opportunity to provide mental health support to blind individuals who are often excluded from written self-help materials.

Hearing impairments (deaf or hard-of-hearing): For those with hearing loss, text-based AI chat interfaces are naturally suited, as they rely on reading and writing. A chatbot delivered through a messaging app can be an ideal medium for a deaf individual to discuss mental health, avoiding the need for an interpreter that an in-person session might require. Additionally, experimental GenAI-driven avatars could potentially use sign language to converse with a deaf user (this involves generative video or animation, an area of active research). While such sign-language bots are still nascent, even current text chatbots already offer a private, stigma-free space for deaf youth to talk about issues without involving a third-party interpreter. For example, in Kenya's Red Cross chatbot project, deaf or hard-of-hearing users were able to use video calls and messaging for communication.[43] Ensuring the language used is simple and clear can help those who primarily use sign language and might have different proficiencies in written language.

Intellectual or developmental disabilities and Neurodiversity (e.g. autism, ADHD): People with intellectual disabilities (including certain learning disabilities) often benefit from repetition, simplicity, and visual supports in learning coping skills. AI tools can be programmed to adapt their language level to the user's cognitive ability – for instance, simplifying explanations or using more visual icons and prompts if text is challenging. A GenAI system could personalize its responses based on the user's understanding, repeating or rephrasing concepts patiently (something human counselors may not always have time to do extensively).
There is also exploration of AI companions that help coach life skills or emotional regulation in individuals with autism or developmental delays.[44] For example, researchers have used AI-driven coaches on wearable devices to help autistic individuals recognize and manage emotions in real time. In mental health contexts, a predictable, non-judgmental chatbot might feel safer for some neurodivergent individuals (such as those on the autism spectrum) to practice social interaction or discuss feelings, as it removes the pressure of human social cues. However, care must be taken to ensure the AI's suggestions are appropriate and that the individual has support from caregivers as needed.

---

[43] "Kenya Red Cross Expands Access to Mental Health Support with Azure AI-Powered Chatbot," note 6.

[44] Ronit Molko, "How AI Can Transform the Autism Services Industry," *RonitMolko.com*, accessed May 2, 2025, https://ronitmolko.com/how-ai-can-transform-the-autism-services-industry/.

Psychosocial disabilities (mental health conditions): Many PWDs have psychosocial disabilities like chronic depression, anxiety disorders, bipolar disorder, or schizophrenia. GenAI tools can assist these users by providing round-the-clock monitoring and intervention. For example, a user with chronic depression might use a chatbot to log their mood daily and receive CBT-based exercises or affirmations when feeling low. The AI can help track early warning signs of relapse (through analysis of the user's language or engagement patterns) and alert the user or caregivers to concerning changes. Because it is available 24/7, the AI can offer instant support during moments of crisis or insomnia, which is when traditional services are often unavailable. Additionally, individuals with severe mental health conditions often face intense stigma; an anonymous AI platform can feel like a safer place to seek help without fear of labeling. For youth or adults hesitant to see a psychiatrist due to stigma, an AI could be a gateway to care, providing psychoeducation and gently encouraging professional help when needed.

Beyond these specific examples, a general opportunity of GenAI in mental health for all PWDs is personalization. AI can theoretically tailor content to each user's disability context – for instance, acknowledging the unique stressors that a wheelchair user might face (like architectural barriers or chronic pain) and providing empathy and coping strategies relevant to that context. If trained on diverse datasets, a GenAI could recognize when a user mentions their disability and respond in a validating and informed way (e.g., a user says *"I feel down because as a blind person I struggle to connect with others"* – an ideal AI response would acknowledge this and perhaps suggest solutions for social connection, showing awareness rather than a generic reply). By co-creating content with users, GenAI might even help PWDs generate self-advocacy letters, coping journals, or creative expressions as therapeutic activities, giving them a voice. The UNICEF Office of Innovation has noted that generative AI systems can enhance accessibility and allow Children with Disabilities to *"co-create with digital systems"* in new ways[45] – this principle extends to co-creating one's mental health journey with AI assistance.

In summary, when thoughtfully implemented, GenAI mental health tools can increase access, convenience, personalization, and comfort of mental health support for PWDs. They can overcome many physical and social barriers that currently limit PWDs from obtaining care. The next sections will illustrate some real-world deployments tapping into these opportunities, as well as the pitfalls and challenges that must be navigated.

[45] UNICEF Innocenti, "Generative AI: Risks and Opportunities for Children," *UNICEF*, accessed May 2, 2025, https://www.unicef.org/innocenti/generative-ai-risks-and-opportunities-children.

Case Studies: Successful Deployments of GenAI Mental Health Tools

Several AI-enabled mental health tools from around the world illustrate the potential benefits—and design strategies—that could be adapted for supporting PWDs, particularly youth, in Sub-Saharan Africa.

Among the most cited is Woebot, a friendly, CBT-based chatbot that engages users in daily conversations about their mood and coping mechanisms. Originally launched on Facebook Messenger, Woebot now employs AI to enable more natural dialogue and has expanded to include specialized modules, such as those for postpartum depression and support for teenagers. Clinical trials in the United States and Europe found that users quickly formed a "therapeutic alliance" with the chatbot.[46]And studies showed that Woebot could effectively reduce symptoms of depression and anxiety.[47] Woebot Health, the creator of Woebot, recently announced that it is discontinuing the app effective June 30, 2025.[48]

Another example is Wysa, which uses an avatar to deliver CBT-based coaching, resilience training, and mood tracking. It operates on a hybrid model: the AI handles routine conversational support while users can escalate to human therapists when needed. Wysa, which was developed in India, has gained particular traction in low- and middle-income countries, where it reaches rural populations with little access to mental health professionals.[49] The platform has more than five million users globally and has demonstrated

[46] Darcy, A.; Daniels, J.; Salinger, D.; Wicks, P.; Robinson, A. "Evidence of Human-Level Bonds Established with a Digital Conversational Agent: Cross-sectional, Retrospective Observational Study." *JMIR Form. Res.* 2021, 5, e27868. https://formative.jmir.org/2021/5/e27868. ("the study's qualitative data suggested that users seemed to relate to [Woebot] in a manner that was analogous to therapeutic rapport").

[47] "First Randomized Controlled Trial Comparing Woebot to Clinician-Led Psychotherapy Reveals Digital Mental Health Intervention Is Non-Inferior in Reducing Depressive Symptoms Among Teens," *BioSpace*, October 26, 2023; Fitzpatrick K, Darcy A, Vierhile M. "Delivering Cognitive Behavior Therapy to Young Adults with Symptoms of Depression and Anxiety Using a Fully Automated Conversational Agent (Woebot): A Randomized Controlled Trial." JMIR Ment Health 2017;4(2):e19. https://mental.jmir.org/2017/2/e19. ("The study confirmed that after 2 weeks, those in the Woebot group experienced a significant reduction in depression.").

[48] https://woebothealth.com/faq/

[49] https://blogs.wysa.io/blog/company-news/wysa-to-develop-hindi-version-of-worlds-most-popular-mental-health-app (noting 528,000 Indians have used the app).

effectiveness in reducing anxiety and depression symptoms.[50] Users of Wysa report feeling similar therapeutic connections with the bot, similar to face-to-face, in-person therapy.[51]

On a broader youth scale, UNICEF's U-Report Mental Health and Psychosocial Support (MHPSS) Chatbot operates in East Africa, including Kenya, Tanzania, and Uganda.[52] Accessible via SMS and WhatsApp, the chatbot provides self-care advice and refers high-risk users to human counselors. By using simple, mobile-based communication, it reaches adolescents and young women—many from vulnerable groups—across urban and rural settings. The initiative has successfully combined AI for instant support with human referral systems, breaking down cost and stigma barriers.

In Kenya, the Kenya Red Cross "ChatCare" chatbot stands out. Built in partnership with Microsoft Azure AI and local stakeholders, ChatCare offers psychoeducation, mood check-ins, and coping exercises in both English and Swahili.[53] Its design incorporated feedback from mental health professionals, government agencies, and individuals with lived experience. Deaf users can interact with the chatbot via text, and the interface employs simple language and emojis to accommodate diverse literacy levels and cognitive abilities. Early feedback suggests that ChatCare has enabled users to engage with mental health topics previously shrouded in stigma and provided an accessible, culturally relevant entry point into care.

Next Step Foundation's Tumaini.ai is a WhatsApp-based, AI mental-health companion designed to expand equitable, culturally relevant, and stigma-free psychosocial support for Youth with Disabilities. Co-designed with Youth with Disabilities and local mental health professionals, users converse in Swahili or English without downloading a new app or incurring data costs, and receive brief, evidence-informed interventions (CBT exercises, mindfulness, behavioral prompts) adapted to local idioms and stressors. Accessibility is built-in (screen-reader compatibility, voice-to-text, simplified menus), and the system runs on UlizaLlama—an open-source, Swahili-tuned language model developed in Kenya—to ensure linguistic fidelity and inclusion. Safety guardrails combine automated risk detection (e.g., self-harm cues), escalation scripts, and warm hand-offs to human counselors, yielding a hybrid human-AI model that provides immediate support while embedding referral pathways into existing services.

---

[50] Sinha, Chaitali, Meheli Saha, and Madhura Kadaba. "Understanding Digital Mental Health Needs and Usage with an Artificial Intelligence–Led Mental Health App (Wysa) During the COVID-19 Pandemic: Retrospective Analysis." *JMIR Formative Research* 7 (2023): e41913. https://formative.jmir.org/2023/1/e41913.

[51] Beatty, C.; Malik, T.; Meheli, S.; Sinha, C. Evaluating the Therapeutic Alliance with a Free-Text CBT Conversational Agent (Wysa): A Mixed-Methods Study. Front. Digit. Health 2022, 4, 847991. https://pubmed.ncbi.nlm.nih.gov/35480848/.

[52] https://www.unicef.org/uganda/stories/young-children-adolescents-find-buddy-psychosocial-support.

[53] "Kenya Red Cross Expands Access to Mental Health Support with Azure AI-Powered Chatbot," note 6.

What unites these successful tools is a set of shared design principles: localization, hybrid human-AI models, accessibility, cultural adaptation, and community engagement. While most were not developed for PWDs, their features—such as multiple language options, multimodal access (text, voice, simple interfaces), and non-judgmental anonymity—make them adaptable for disability inclusion. Moreover, projects like ChatCare and U-Report exemplify how partnerships between NGOs, governments, tech companies, and local communities can build trust and encourage uptake among marginalized populations.

In summary, the global and African experiences so far show that GenAI mental health tools can be successfully deployed to increase access and reduce stigma, but they require thoughtful design: cultural and linguistic adaptation, involvement of stakeholders (including PWDs and youth themselves), and safeguards to ensure they complement rather than replace human care. We now turn to the flip side – cautionary tales and risks – which are crucial to understand before scaling these innovations further.

Cautionary Tales and Risks of GenAI Mental Health Tools

While the potential of AI in mental health is exciting, there have been several cautionary examples and documented risks that highlight ethical, technical, and social pitfalls. GenAI tools, if misused or poorly designed, can harm, especially to vulnerable users like those with disabilities or youth. Key risks and failed deployments include:

Lack of Crisis Intervention and Inappropriate Responses: One of the starkest limitations of current AI chatbots is their difficulty in recognizing and properly responding to serious crises (such as suicidal ideation or abuse disclosures). Early-generation mental health bots infamously failed in this regard. For example, an evaluation of Woebot around 2018 found that it responded to a simulated 12-year-old user reporting sexual abuse with a generic positive statement, failing to flag or appropriately address the gravity of the situation.[54] Vulnerable users in crisis might receive no help – or even potentially harmful advice – if the AI cannot understand context. A recent overview confirmed that many AI chatbots are *"incapable of identifying crises"*, largely due to limited understanding of nuanced language, leading to either ineffective or no responses in those critical moments.[55] This is a serious safety risk: an individual could hint at suicidal thoughts, and the bot might not catch it, delaying urgent help.

Ethical Breaches and Non-Consent: A controversial experiment by the mental health platform Koko demonstrated how not to deploy AI. In 2023, Koko's founder admitted they

[54] https://www.telegraph.co.uk/technology/2018/12/11/chatbot-used-nhs-treat-depression-failed-act-users-reported/.
[55] Balcombe L. "AI Chatbots in Digital Mental Health." *Informatics*. 2023; 10(4):82. https://doi.org/10.3390/informatics10040082.

had secretly used GPT-3 to generate responses to users seeking mental health support, without obtaining informed consent from those users.[56] Over 4,000 people received AI-composed counseling messages believing they were from human volunteers. When this came to light, the backlash was severe – experts and the public denounced it as a gross ethical violation and a betrayal of trust. Even though no immediate physical harm was reported, this incident harmed the credibility of AI in mental health and highlighted the importance of transparency.

Bias and Cultural Insensitivity: AI systems carry the biases present in their training data. For GenAI mental health tools, this can manifest as subtle prejudices or one-size-fits-all advice that doesn't suit the user's background. For instance, if a chatbot's knowledge base is primarily Euro-American, it may not understand the cultural context in Africa or may inadvertently propagate Western norms. A user in a Kenyan village might be advised to "talk to your therapist or take a meditation retreat," which is tone-deaf in a context with few therapists and different spiritual coping mechanisms. In worst cases, the AI might reflect stigmatizing attitudes – e.g., downplaying a person's experience of disability discrimination or assuming incompetence. Bias can also exclude: many AI tools only converse in English or other major languages, effectively sidelining those who speak local African languages or have low literacy. Without localization, PWDs in rural Africa (who often have less education due to historic marginalization) may find the AI's language incomprehensible or irrelevant, thus excluding them from the benefits. This "algorithmic bias" and cultural mismatch a documented risks; experts note that AI in health care could either bridge or widen inequalities depending on how inclusive its design and data are.

Privacy and Data Security Concerns: Mental health dialogues inevitably involve highly sensitive personal information – from one's emotions to experiences of trauma, sexuality, substance use, etc. If PWD youth use a GenAI tool to confide in about abuse or discrimination they face, that data becomes part of the system's logs. Privacy breaches or misuse of data are a critical risk. Users may not fully understand what data is being stored or who can access it. In regions without strong data protection enforcement, there is fear that such information could be leaked or used inappropriately (for example, a data breach could expose a user's disability status or mental health condition, leading to stigma or even job discrimination). Moreover, children and youth may not realize that AI tools might share anonymized data with developers to improve the model. Any hint of compromised confidentiality can quickly destroy user trust. Stakeholders have raised concerns that AI mental health systems must safeguard privacy on par with (or exceeding) traditional medical ethics standards. This includes protecting data from hackers and ensuring compliance with privacy laws.

[56] https://www.psychiatrist.com/news/hidden-use-of-chatgpt-in-online-mental-health-counseling-raises-ethical-concerns.

Over-reliance and Misinformation: There is a risk that vulnerable individuals might place too much trust in AI advice that is not always accurate or validated. Generative models can produce convincing-sounding answers that are factually incorrect or reflect misinformation. For example, if asked about a medical aspect ("Are antidepressants bad?"), An AI might generate an answer based on forum posts rather than medical consensus, potentially misleading the user. Youth might take AI advice as authoritative in lieu of seeking professional help. Another facet is that some users may develop an emotional over-reliance on chatbot "friends" (as seen with AI companion apps in other contexts), which can complicate real-life relationships or discourage them from building human support networks.

Technical Failures and Lack of Human Touch: From a user experience perspective, chatbots can sometimes misunderstand input or give formulaic responses that frustrate users. Someone with a cognitive disability might type a jumbled sentence that the AI doesn't parse correctly, leading to irrelevant output. Such experiences could cause disengagement – the user might feel the bot "doesn't get it" and withdraw, possibly reinforcing feelings of alienation. Additionally, purely automated support lacks the empathy, warmth, and adaptive judgment that human counselors provide. For some PWDs, especially those who have experienced complex trauma, the absence of human empathy can even be triggering (a very neutral or robotic response might make them feel unheard or dehumanized). Over time, a poor implementation that fails to connect emotionally could lead to worse outcomes, with users feeling even more discouraged from seeking help. This is why many experts stress that AI tools, at least in their current state, should remain "complementary tools rather than replacements" for human professionals.

Each of these risks has been highlighted by researchers and ethicists as AI enters the mental health arena. A narrative review in 2023 pointed out the need to address issues of accuracy, reliability of information, ethical and privacy considerations, misdiagnosis, and limited understanding of context in current chatbots.[57] If unchecked, these challenges can lead to real harm – misdiagnosed conditions, people in crisis not getting timely help, or entire communities (like non-English speakers or those without smartphones) being left out.

In summary, the lessons learned from cautionary tales are: transparency and consent are non-negotiable; AI must be rigorously evaluated for safety (especially in handling crises); cultural context and bias mitigation are crucial for global deployments; and maintaining user privacy is paramount. GenAI for mental health sits at a sensitive intersection of technology and human vulnerability – a misstep can have serious consequences for individuals and can erode public confidence.

[57] "AI Chatbots in Digital Mental Health." note 26.

Having outlined these risks generally, we will now focus on how they specifically pertain to PWDs in Sub-Saharan Africa, who face a unique mix of challenges and vulnerabilities when interacting with AI mental health tools.

Risks for Youth with Disabilities in Sub-Saharan Africa

Young people with disabilities in Sub-Saharan Africa stand to benefit greatly from innovative mental health technologies, but they also face heightened risks when using GenAI-enabled tools. Their age, disability status, and socio-cultural context intersect to create specific considerations:

Digital Divide and Exclusion: Many Youths with Disabilities in Africa are on the wrong side of the digital divide. They may live in poverty, without reliable internet or smartphone access, or in rural areas with limited connectivity. If GenAI mental health supports are only available as smartphone apps or require constant internet, these youths could be left out. There is a risk that well-intentioned AI projects end up primarily serving urban, connected populations, widening the gap for marginalized rural disabled youth. Moreover, even when devices are available, accessibility features are essential – a blind teenager needs screen-reader-friendly apps and a deaf teenager needs text or visual interfaces. Without inclusive design, AI tools might inadvertently exclude those with visual, hearing, or cognitive impairments, thus aggravating inequity. For example, if a chatbot is only in English and assumes a certain reading level, a 16-year-old with an intellectual disability or one who uses a local sign language at home may find it unusable. Ensuring multi-language support (including local languages) and alternative input/output modes is critical to prevent this form of exclusion.

Bias and Representation in AI Training Data: Most GenAI models have been trained predominantly on Western text data (like websites, books, and social media) with relatively little content from African youth or about disability experiences. As a result, when an African youth with a disability interacts with a general AI model, the responses may not resonate with their reality. The AI might not understand local idioms or the nuances of living with disability in a traditional community setting. In worst cases, the AI might reflect ableist biases – for instance, dismissing their experiences of stigma or giving advice that implies the problem lies in the person rather than societal barriers. Youth with psychosocial disabilities (e.g., mental health conditions) might encounter an AI that doesn't recognize culturally specific expressions of distress. This can lead to alienation or even harmful advice. There is also the risk of bias in how the AI treats different users: if not properly tested, the AI might respond more patiently to a fluent English-speaking user than to someone typing in imperfect English or local slang, which often correlates with less privileged backgrounds. For a disabled youth already facing marginalization, perceiving bias or misunderstanding from a mental health tool could reinforce feelings of otherness or lower their self-esteem.

Misinformation and Dangerous Content: Adolescents are in a developmental stage where they may be more impressionable and prone to risky behaviors. If a GenAI tool is not carefully moderated, it could expose them to or even generate inappropriate content. There is also the issue of self-harm or suicide-related content: AI systems have to carefully handle such topics. If a youth expresses suicidal thoughts, a good system would recognize this and guide them to emergency help. But a poorly configured one might inadvertently provide instructions or not respond appropriately. Given that Youths with Disabilities have higher rates of depression (due to bullying or isolation, for example), this is a very pertinent risk. Therefore, content filtering and accuracy are paramount to protect impressionable youth from misinformation or harmful suggestions.

Privacy, Trust, and Autonomy: Young people with disabilities often have parts of their lives overseen by parents, teachers, or caregivers. Using a mental health AI tool might be one of the few private outlets they have to express themselves. However, this privacy can be a double-edged sword. On one hand, it's good they have a confidential space; on the other, if something goes wrong (like the AI detects the youth is in danger), how is that information handled? Many African countries lack robust legal frameworks for minors' data. A disabled youth might not fully comprehend the terms of service and could share identifiable details (for example, "My name is X, I'm 14, I have HIV, and I'm feeling hopeless"), not realizing who might see it. There's a risk of breach of confidentiality or misuse of data, which could be devastating if, say, such data were exposed. Additionally, if parents are not aware their child is using an AI mental health app, it could cause conflict, or the youth might be encouraged to rely solely on the app without the family's support. Striking the balance between respecting a youth's privacy and ensuring they are safe is tricky. A related point is trust: if at any point the AI violates the youth's trust (for example, by sharing something with authorities without clear cause or if the youth discovers the AI gave them wrong info), it could not only turn them away from that tool but also from seeking help in general. Youth with Disabilities might already be less trusting due to past experiences of stigma; a betrayal by an AI tool could reinforce a narrative that "no one understands me" or "systems will hurt me."

Overdependence and Social Isolation: Some Youth with Disabilities, especially those who struggle socially (perhaps due to autism or hearing impairment communication barriers), might find an AI friend much easier to interact with than peers. While initially beneficial to have a source of support, there's a risk they could become overdependent on the AI chatbot for social interaction, potentially worsening real-world isolation. For instance, a deaf teen who is shy about speaking with hearing peers might prefer talking to the chatbot every day. If that goes on without any integration into real social support, their human social skills might stagnate or their isolation deepen. This is not a fault of the youth – it indicates the tool should be designed to encourage healthy real-life connections (e.g., suggest joining supportive communities or talking to trusted individuals, rather than becoming the sole companion). The AI ideally should act as a bridge to human help, not a permanent substitute.

Overdependence is especially concerning for youth, as their social development is still in progress.

In highlighting these risks, it's important to note that they are mitigable with proper strategies. Youth with Disabilities in Africa are a vulnerable group, but with the right approach, AI tools can be adapted to serve them safely. In fact, when designed with inclusivity, these tools could empower disabled youth by giving them information and coping skills that they can use independently. The key is to anticipate and address the unique vulnerabilities: low digital literacy, risk of bias, need for local language content, safeguarding privacy, and integration with community support.

The next section focuses on exactly those strategies – how to mitigate the risks we've outlined and enhance the positive impact of GenAI mental health tools for PWDs, especially disabled youth in Sub-Saharan Africa.

Strategies for Mitigating Risks and Ensuring Inclusive, Safe AI Tools

To harness the benefits of GenAI mental health tools for PWDs while minimizing the dangers, a multi-pronged approach is needed. This involves technical fixes, participatory design, policy interventions, and ongoing oversight. Below are concrete strategies and best practices that have emerged from research and field experiences:

Community Engagement and Co-Design: Engaging PWDs, including youth, and their caregivers in the design and testing of AI mental health tools is crucial. Nothing about us without us – this disability rights motto applies to AI development as well. By involving target users from the start, developers can learn what language is respectful, what features are needed (e.g., text-to-speech), and what cultural nuances to include. For instance, youth participants can tell developers if a certain prompt comes off as condescending or if translations into local dialects are accurate. Community buy-in also helps reduce stigma – if local disability advocacy groups endorse the tool, other PWDs will trust it more. In practice, this might involve workshops with disabled users to demo prototypes, getting input from Deaf communities on sign language avatars, or partnering with organizations for the blind to ensure screen reader compliance.

Accessibility and Inclusive Design: To avoid excluding PWDs, AI mental health platforms must adhere to accessibility standards (WCAG for apps/websites) and offer multiple modes of interaction. This means: provide voice and text options; ensure compatibility with assistive tech; use simple language or an "easy read" mode for those with intellectual disabilities; include local languages (potentially even text-based local dialect or slang that youth use); and consider offline access (SMS or USSD) for those without internet.

By designing for the most marginalized user (e.g., a rural disabled teen with a basic phone), the tool will inevitably become more usable for everyone.

Localized Content and Cultural Adaptation: Mitigating cultural bias involves training and tuning AI models on localized datasets and knowledge. This could mean curating a dataset of African proverbs, local mental health support resources, and PWD experiences in the region for the AI to learn from. It also means programming culturally relevant responses – for example, acknowledging spiritual or community coping methods if appropriate (some users might find comfort in faith or talking to an elder; the AI could encourage any positive coping that aligns with their values). One strategy is to involve local experts to "localize" the content database of the chatbot. A recent study on the use of LLMs for the mental health community suggests evaluating AI responses against local cultural values to identify misalignment.[58] As a concrete step, developers can use human-in-the-loop training where African mental health professionals review AI outputs and correct them during development. This helps the AI learn the preferred style and avoid insensitive remarks. Over time, this yields a more culturally competent AI.

Bias Auditing and Evaluation: Regularly audit the AI for biased behavior or unequal performance. This means testing how the AI responds to a variety of users: different disabilities, genders, ages, and languages. If discrepancies are found (e.g., it's very verbose with adult men but terse with young women, or it misunderstands blindness-related statements often), those need to be addressed via further training or rule adjustments. Including disability scenarios in the AI's training prompts can help – for instance, developers can train the model with conversations where the user mentions "being in a wheelchair and anxious about it" and ensure the model learns an appropriate, empathetic answer. There should also be ethical oversight in place: an ethics review board or similar should vet the tool (much like a clinical trial) for potential harms, especially since youth and disabled individuals are involved. Academic and independent evaluations (perhaps by NGOs or researchers) can provide an objective check on efficacy and fairness. Publications and guidelines (like the UNICEF Policy Guidance on AI for Children and similar frameworks[59]) emphasize that AI systems should not discriminate on any basis, including disability, and that inclusivity must be a core requirement.

Hybrid Models: AI + Human Support: One of the strongest safeguards is not leaving AI to operate in isolation for high-stakes situations. A hybrid model uses AI for what it does best – scalability, 24/7 availability, triage – but keeps humans in the loop for complex or crisis cases. For example, many chatbots will escalate to a human counselor if the user's responses indicate severe distress or if they explicitly request a human. Additionally, human

---

[58] Malgaroli, Matteo et al. "Large language models for the mental health community: framework for translating code to care." Lancet Digital Health, Volume 7, Issue 4, e282 - e285. https://www.thelancet.com/journals/landig/article/PIIS2589-7500(24)00255-3.
[59] UNICEF, "Policy Guidance on AI for Children." November 2021.

moderators can periodically review anonymous transcripts (with consent and privacy protections) to ensure quality and safety. Continuous supervision helps catch any missteps the AI makes before they scale. In a "copilot" style approach, AI might draft a response and a human caregiver or counselor approves or edits it for certain sensitive conversations – this can maintain efficiency while adding a layer of judgment. Importantly, hybrid models also help build trust: users know there's accountability and that the AI is part of a larger care system, not a lone black box.

Clear Ethical Guidelines and Regulatory Frameworks: Governments and professional bodies in Africa should start treating mental health AI tools with an appropriate regulatory lens. This could mean requiring that any app that claims to provide mental health support be registered or certified by a relevant authority (as is done in the UK with the NHS app library, for instance). Regulations could enforce truth-in-advertising (no overclaiming what the AI can do), data protection compliance (adhering to laws like Kenya's Data Protection Act), and minimum standards of efficacy. Globally, initiatives like the EU's AI Act classify health-related AI as "high risk" requiring strict oversight. African policymakers can draw on these frameworks to develop local guidelines. At the very least, ethical principles – transparency, accountability, non-discrimination, privacy, and child protection – should be codified for any AI in health. For example, requiring parental consent for minors under a certain age, or mandating that AI systems have a disclaimer that they are not a human and not a medical professional. Independent audits and certification (perhaps by a digital health authority or an AI ethics committee) can ensure compliance. These steps mitigate systemic risks and signal to users that the tool has been vetted for safety.

User Education and Digital Literacy: Empowering users (and caregivers) with knowledge about what the AI tool can and cannot do is another layer of risk mitigation. When a youth or PWD begins using the app, there should be a clear onboarding that explains confidentiality limits (e.g., "if you mention wanting to harm yourself, we will alert emergency responders"), the fact that it's an AI and not a doctor, and advice to seek human help if certain serious symptoms occur. The more users understand the tool's role (a support, not a cure-all), the more effectively they can use it and the less likely they are to be led astray.

Continuous Improvement and Adaptation: Finally, mitigation is not a one-off task but an ongoing process. Developers and sponsors should treat these AI tools as evolving services. Collecting feedback continuously, monitoring usage data (ethically), and updating the AI's knowledge base can help address new issues as they arise. For example, if it's noticed that many users ask about a topic the AI isn't well-equipped to handle (say, a local herbal remedy or a regional conflict causing stress), the team can add content or scripted responses to cover that. In essence, dynamic refinement ensures the tool stays relevant and safe in changing conditions. This is especially true as new GenAI models come out – teams might choose to upgrade to a more advanced model if it's proven to handle language or reasoning better, but they should do so carefully and re-test all the safeguards.

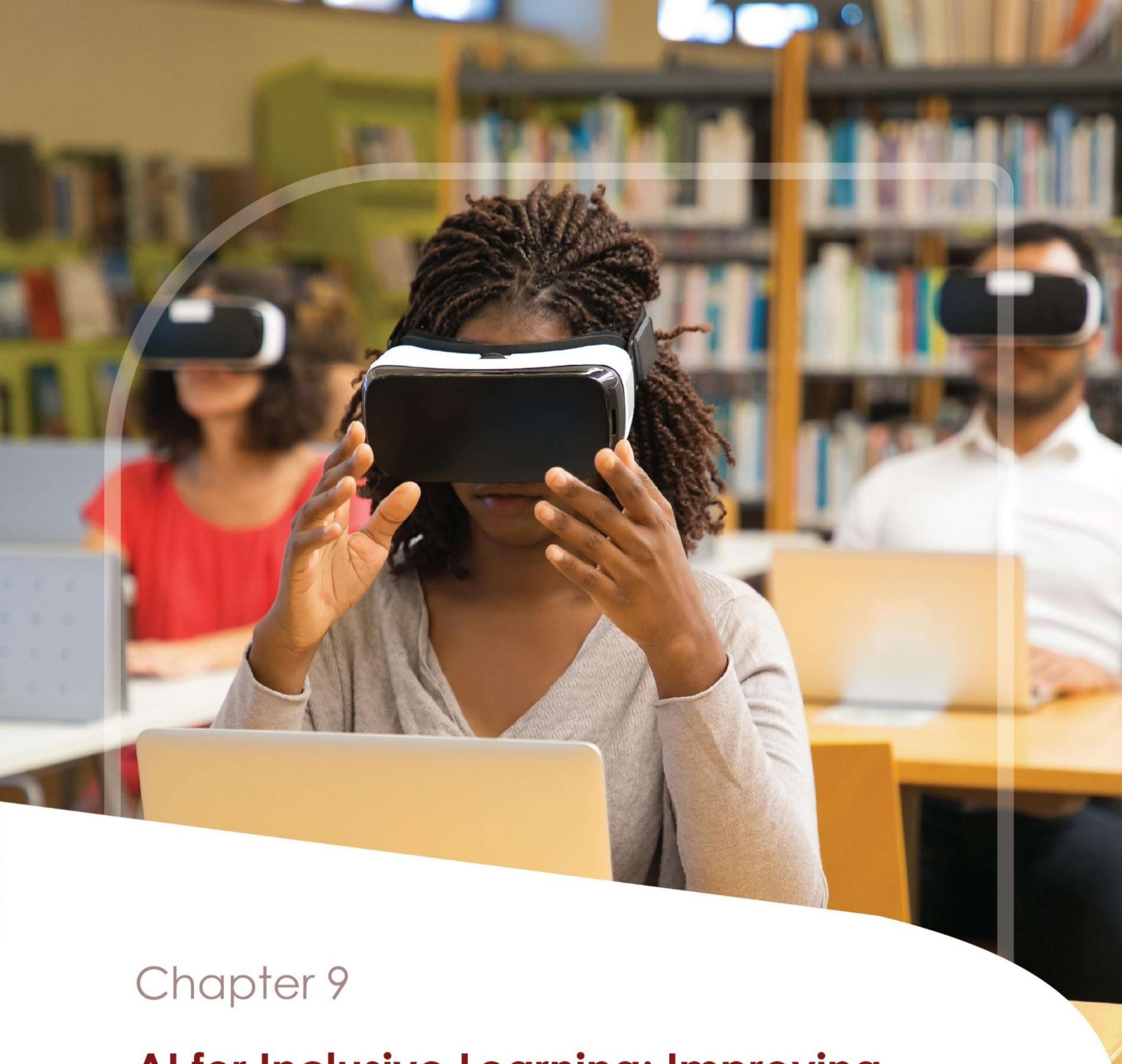
Conclusion

GenAI-enabled mental health tools offer a transformative opportunity to support Persons with Disabilities in Sub-Saharan Africa, a region where mental health services are scarce and social barriers to care are high. These tools, from AI chatbots delivering therapy techniques to accessible mobile apps, have demonstrated potential to reduce stigma, bridge distances, and personalize support for diverse needs. PWDs – whether facing physical barriers, sensory impairments, or the psychosocial weight of stigma – could greatly benefit from the 24/7, stigma-free, and adaptive support that well-designed AI can provide. Global examples like Woebot, Wysa, and local innovations like Tumaini illuminate a path forward, showing that with careful design, AI companions can augment human mental health services and reach those who have long been overlooked.

However, realizing this potential requires vigilance and responsibility. The risks are real: unethical deployments can erode trust, technical flaws can put lives at risk, and bias can further marginalize the very people we aim to help. Especially for young people with disabilities in Africa, who may approach these tools with hope and vulnerability, it is our duty to ensure the tools are safe, equitable, and effective. That means building systems that are culturally grounded, inclusively designed, and transparently operated. It means setting up safety nets – ethical guardrails, human oversight, and regulatory standards – so that innovation never trumps well-being.

In essence, the challenge is to balance innovation with inclusion. With community co-creation, robust ethical practices, and supportive policies, GenAI mental health tools can be developed as a force for good – amplifying the voices of PWDs and their caregivers, rather than speaking over them. They can help break the vicious cycle of stigma, marginalization, and mental distress by providing a new avenue for connection and care. Moving forward, stakeholders in Sub-Saharan Africa – governments, NGOs, tech companies, and disability rights groups – should collaborate to pilot and scale GenAI mental health initiatives, rigorously evaluate their impact, and share lessons learned. The goal should be not only to deploy fancy algorithms, but to genuinely empower persons with all types of disabilities to live healthier, fuller lives. By addressing mental health needs, we also support PWDs in accessing education, employment, and social participation, since mental wellbeing is foundational to all aspects of life. In the broader scope, this aligns with the Sustainable Development Goals' call for universal health coverage and inclusive societies.

In conclusion, GenAI is not a silver bullet for the mental health challenges of PWDs in Sub-Saharan Africa, but it is a promising tool in the toolkit. When used wisely, it can augment human capacity and help fill gaps where traditional systems fall short. The risks can be managed through foresight and inclusion, turning potential pitfalls into learning opportunities. Ultimately, by prioritizing the voices and rights of persons with disabilities, we can ensure that the evolution of AI in mental health remains a story of opportunity – one where technology contributes to dignity, healing, and hope for some of the world's most resilient yet underserved people.



Chapter 9

AI for Inclusive Learning: Improving Education for Youth with Disabilities in Africa

Introduction

Education is the foundation for economic participation, health, and civic life. Yet in Sub-Saharan Africa, many Children with Disabilities never enroll in school or drop out early, and those who do enroll often face low expectations, inaccessible materials, and under-prepared teachers. In parts of Africa, fewer than one in ten Children with Disabilities complete primary school, with even fewer progressing to secondary school—an exclusion that depresses life chances and national productivity.[4] The promise of artificial intelligence (AI) in this context is not hype about replacing teachers; it is the practical potential to make content readable, audible, signable, and learnable in local languages at low cost, to personalize practice without stigma, and to extend high-quality support through devices many families already own. In 2023–2025, UNESCO and UNICEF called for human-centered, rights-respecting approaches to generative AI (GenAI) in education, emphasizing teacher agency, children's data protection, and equity.[56] (UNESCO Documents) The African Union's 2024 Continental AI Strategy likewise frames AI as an enabler for inclusive development, naming education as a priority and urging Member States to adopt coordinated, ethics-anchored approaches.[7] (African Union)

Education Challenges for Youth with Disabilities in Sub-Saharan Africa

Barriers cluster in predictable ways across Kenya, Ghana, and Rwanda. Schools are still catching up on accessible infrastructure and materials; teacher preparation rarely includes practical, disability-inclusive pedagogy; and learning resources often ignore African languages and sign languages. Families routinely struggle to secure accommodations, with stigma and low expectations compounding material constraints.[8] Rwanda's inclusive-education push and accessible digital textbook initiatives show policy traction, yet gaps persist in localization and specialist teacher supply.[9] (KT PRESS) This is the baseline against which the value of AI must be judged: not whether tools are perfect, but whether they measurably remove barriers without creating new risks.

The promise of AI for inclusive learning in low-resource settings

When designed with universal learning design (UDL) and co-created with OPDs, AI can translate or simplify text, generate read-aloud or sign-supported versions, adapt practice to a learner's pace, and interface through voice, chat, or SMS for those without broadband.[5, 12] (UDL Guidelines) What distinguishes the current moment is not only model capability, but localization momentum: African language speech datasets and sign-language corpora are finally expanding, enabling tools that "speak" to learners where they are, but this shift depends on representative datasets and privacy-by-design [10, 11]

Opportunities: how GenAI and AI-enabled tools can support diverse learners

For Deaf learners and learners who sign. Two complementary pathways are advancing quickly: high-accuracy captioning in local languages and sign-language interfaces that turn speech or text into avatars. In Kenya, researchers behind the AI4KSL initiative documented creation of a Kenyan Sign Language dataset to bridge school communication barriers; Nairobi startup Signvrse is piloting a two-way KSL avatar translator now being trialed with teachers.[13, 14, 15] (arXiv) Such tools can render announcements, instructions, and safety messages into sign in real time, promoting inclusion without relying exclusively on scarce human interpreters.

For blind and low-vision learners. Read-aloud with synchronized highlighting, OCR for printed handouts, math and image description, and dialog-based tutoring can transform access to text-heavy subjects. Microsoft's Immersive Reader and allied tools, widely studied for improving decoding and comprehension, are available across low-cost devices and are increasingly used in African schools and teacher training.[16, 17] (Microsoft Learn) With appropriate procurement standards and offline access, these features become part of the mainstream classroom rather than segregated "special" supports.

For learners with speech or language impairments. Ghana's *tɛkyerɛma pa* initiative with Google Research and the University of Ghana is building open speech datasets for non-standard speech in Akan, Ewe, Dagbani, and other languages. When integrated into classroom devices, this work can enable accurate dictation, participation in oral exercises, and fairer assessment for students whose speech patterns were previously "invisible" to ASR.[18, 19] (Global Disability Innovation Hub)

For dyslexia and other learning differences. AI-assisted reading tutors such as Google's Read Along offer immediate, low-stakes feedback through speech recognition and can operate offline on entry-level Android phones, a crucial feature for rural households. Early studies outside Africa show gains in reading fluency, and the tool is being promoted across African markets [20, 21] (Sattva Consulting). Screening innovations like eye-tracking-based AI assessments are emerging, but any deployment in Africa should be piloted carefully to avoid misclassification and to ensure affordability.[22] (HundrED Foundation)

For multilingual learners. Automatic translation and text simplification can support transitions between home languages and the language-of-instruction. Rwanda's Common Voice Kinyarwanda corpus and related voice-tech efforts show how open datasets seed ASR/TTS that make content navigable in learners' strongest language [23, 24] (BMZ Digital.Global)

Cautionary tales and risks of AI in education

There is now a consensus that edtech can expose children to surveillance and discrimination if unregulated. UNESCO's 2023 Global Education Monitoring Report found that only a minority of countries explicitly protect student data in law, and analysis of pandemic-era products revealed widespread tracking.[27] (UNESCO Documents) Human Rights Watch similarly documented that most government-endorsed tools surveilled or had the capacity to surveil children.[28] (Human Rights Watch) For PwDs, certain risks are acute. Automated proctoring has flagged disabled students as "suspicious" for behaviors linked to their disabilities or for using screen readers.[29, 30] (GovTech) AI-generated-text detectors mislabel simple, direct writing—often the style taught to learners with dyslexia or ADHD—producing harmful false positives.[31, 32] (CITL) Ableist training data can encode stereotypes into educational AI, undermining dignity and accuracy.[11]

Risks for Youth with Disabilities in Sub-Saharan Africa

First, the digital divide remains stark: devices, data bundles, and electricity are uneven, with rural learners disadvantaged. Second, language and modality gaps mean many tools still fail to support African languages, local sign languages, or non-standard speech. Third, teacher capacity is often the constraining factor; deploying AI without time, training, and support can widen inequities. Fourth, privacy regimes and procurement standards are catching up; without them, classrooms risk becoming data-extraction sites. Fifth, stigma and low expectations can warp deployments so that AI becomes a sorting tool rather than a support. The results of our survey report echo these concerns, with respondents flagging cost, availability, internet access, and maintenance capacity as persistent barriers. [33]

Safeguards and mitigation strategies

Similar to the safeguards required for GenAI mental-health tools, including multichannel access, offline options, localization by default, bias auditing, and hybrid models that keep humans in the loop for high-stakes tasks. In education, this means five practical commitments.

First, co-design with OPDs and alignment to the CRPD. Article 24 obliges inclusive education; Article 4.3 requires close consultation with PWDs and their organizations [33, 34, 35] (UN DESA). Every ministry or district AI-for-learning project should document how OPDs and youth were involved in defining needs, testing prototypes, and setting success metrics.

Second, UDL-anchored pedagogy and WCAG-compliant technology. Specify UDL principles in teacher guidance and require WCAG 2.2 conformance in procurement, including support for screen readers, captions, transcripts, keyboard navigation, and adjustable reading levels [2, 12] (UDL Guidelines)

Third, localization and data justice. Build or adopt African language and sign-language datasets with privacy-by-design and community governance.[10, 11, 23] (BMZ Digital.Global)

Fourth, child-rights-based privacy and safety. Adopt UNICEF's policy guidance on AI for children to govern data minimization, transparency, and redress; prohibit surveillance-heavy tools in classrooms; and publish Data Protection Impact Assessments (DPIAs) for any AI procurement [6, 23] (UNICEF)

Fifth, teacher capacity and human-in-the-loop. Train teachers to use AI as scaffolding—not as grading police—and provide rapid-response support when tools fail or learners need human help. Avoid AI-only assessment in high-stakes contexts; when generative tools are allowed, use reflective oral defenses, portfolios, and process logs to value learning over detection.[27, 31] (UNESCO Documents)

Policy alignment and the African governance context

The AU strategy creates an umbrella under which ministries of education can specify disability-inclusive clauses in national AI and digital education plans: UDL-based standards; WCAG 2.2 compliance for all platforms procured with public funds; mandatory OPD consultation; and localization targets tied to budget lines and partnerships with local universities, hubs, and OPDs.[2, 7] (African Union)

Tangaza University Student Focus Group

To help us ground our analysis in this chapter, we worked with Brenda Betty Kiema, Disability Inclusion Officer at Tangaza University in Nairobi, Kenya. Ms. Kiema conducted an informal focus group among fourteen Students with Disabilities at Tangaza to investigate their views on how AI can improve the educational opportunities and outcomes of Students with Disabilities in Africa. Consistent with our findings, these students stressed that many institutions of higher learning in Africa lack accessibility and accommodations for Students with Disabilities and that AI, when appropriately deployed, can mitigate or alleviate many of their challenges.

It is common in African universities for classroom lectures to run as long as three hours. According to the students in the focus group, students with physical disabilities, such as cerebral palsy, spinal cord injuries, and muscular dystrophy have limited postural endurance that result in pain or fatigue with prolonged lectures. Students with neurological disorders, such as attention deficit hyperactivity disorder (ADHD) and traumatic brain injury, and students with sensory disabilities, such as visual and hearing impairments, may also become fatigued during long lectures due to the sustained cognitive and sensory processing needs. Similarly, students with hidden disabilities like multiple sclerosis, lupus, epilepsy and learning disabilities also suffer through fatigue, medication effects, or episodic flares that may disrupt steady class attendance. All these highlight the requirements for adaptive pedagogical techniques and reasonable accommodations at the higher education level. Yet few universities offer any accommodations to physical attendance at these prolonged lectures to Students with Disabilities.

In addition to long lectures, Students with Disabilities are rarely given accommodations for assignments or assessments. Extensive reading assignments and tight deadlines may be challenging for students with neurological disorders, learning disabilities, or visual impairment. Likewise, requiring all students to take written exams while physically present in a classroom may likewise disadvantage Students with Disabilities. Yet few African universities provide such accommodations.

In addition to a lack of a lack of accommodation, Students with Disabilities also face a lack of accessibility. These students reported that too many materials are scanned PDFs, slide shows, or videos with no captions. These formats are not inherently inaccessible, but attention must be paid to ensure that their accessibility features are utilized. Again, few African universities ensure that student materials are available in accessible formats.

These students believe AI can address many of their daily challenges. For example, AI can address the issue of inaccessible documents by adding headings and ALT-text, extracting tables and translating into a readable and understandable structure, and output versions that work with screen readers, Braille displays, or audio software. AI-generated speech-to-text gives students with limited hand use due to disability or dysgraphia a way to write clearly, and text-to-speech enables faster processing through listening as a reader. The students noted that an AI "study assistant" can break down long reading assignments into smaller, manageable chunks, automatically create flashcards from notes, suggest short study sessions with built-in breaks, and send reminders about upcoming deadlines.

The students also offered suggestions for how colleges and universities can implement AI to support Students with Disabilities. The students urged universities to treat AI like university infrastructure, not a pilot test. Consistent with our own analysis, procurement is a key driver; everything digital that the university buys, such as Learning Management Systems, proctoring software, and chatbot software, must meet accessibility standards, including screen readers and keyboard navigation compatibility.

The students also urged administrators to co-design with Students with Disability. For example, a university can utilize a small, diverse cohort of Students with Disabilities to test everything from caption accuracy on local accents to the rationality of login flows. Students with Disabilities can help design courses so accessibility is the default, not an extra step; e.g., ensuring every video has captions, every image has ALT-text, and slides and PDFs are readable without a mouse. Lecturers get a simple tool that fixes common issues in one click and a short-paid training that shows exactly how to do it. Attendance should measure engagement, not chair time like quizzes, reflections, posted summaries, and short viva options can stand in for a body in a seat.

Finally, the students stressed the need to implement AI ethically. Universities must guard student privacy; e.g., keeping accommodation data separate from general AI tools. Students should have a clear way to opt out of analytics and the AI should be transparent about what data is retained and how it is secured. Clear AI-use policies are also important. For example, spell out which AI tools count as accommodations for Students with Disabilities, and which tools cross the line for academic integrity, so students are not punished for using the aids they are not entitled to as accommodations.

Conclusion

In Africa's classrooms, the question is not whether AI will arrive but whether it will lower barriers or harden them. The answer depends on the choices governments, schools, and vendors make now. If we ground deployments in UDL and CRPD obligations, co-create with OPDs, invest in African language and sign-language data, and enforce privacy and accessibility by design, AI can become the quiet infrastructure of inclusion: captions that simply appear, sign that simply flows, text that simply reads itself, practice that simply adapts—so every learner belongs.

Endnotes

1. United Nations. (2006). *Convention on the Rights of Persons with Disabilities (CRPD).* https://www.ohchr.org/en/instruments-mechanisms/instruments/convention-rights-persons-disabilities. (OHCHR)
2. W3C. (2023). *Web Content Accessibility Guidelines (WCAG) 2.2.* https://www.w3.org/TR/WCAG22/ . (W3C)
3. UN Committee on the Rights of Persons with Disabilities. (2018). *General Comment No. 7 on Articles 4.3 and 33.3: Participation of persons with disabilities.* https://www.ohchr.org/en/documents/general-comments-and-recommendations/general-comment-no7-article-43-and-333-participation . (OHCHR)
4. AI & Disability in Africa Project. (2025). *Report—Draft* (unpublished working paper).
5. UNESCO. (2023). *Guidance for generative AI in education and research.* https://unesdoc.unesco.org/ark:/48223/pf0000386693 . (UNESCO Documents)
6. UNICEF. (2021). *Policy guidance on AI for children (v2.0).* https://www.unicef.org/innocenti/reports/policy-guidance-ai-children . (UNICEF)
7. African Union. (2024). *Continental Artificial Intelligence Strategy.* https://au.int/sites/default/files/documents/44004-doc-EN-_Continental_AI_Strategy_July_2024.pdf . (African Union)
8. AI & Disability in Africa Project. (2025). *Supporting Caregivers of Children with Disabilities in Sub-Saharan Africa* (unpublished working paper).
9. KT Press. (2025, Mar.). Rwanda prioritizes inclusive education for children with disabilities. https://www.ktpress.rw/2025/03/rwanda-prioritizes-inclusive-education-for-children-with-disabilities/ . (KT PRESS)
10. AI & Disability in Africa Project. (2025). *Bridging the Data Gap—Disability Representation in AI Datasets* (unpublished working paper).
11. AI & Disability in Africa Project. (2025). *Bridging the Data Gap—Disability Representation in AI Datasets* (bias and stereotypes section; unpublished working paper).

12. CAST. (2024–2025). *Universal Design for Learning Guidelines 3.0.* https://udlguidelines.cast.org/ . (UDL Guidelines)
13. Wanzare, L., Okutoyi, J., Kang'ahi, M., & Ayere, M. (2024). *Kenyan Sign Language (KSL) Dataset: Using AI in bridging communication barriers among Deaf learners* (preprint). arXiv:2410.18295. (arXiv)
14. Africanews. (2025, Aug.). Kenyan startup Signvrse pioneers AI-powered sign language translation. https://www.africanews.com/2025/08/11/kenyan-startup-signvrse-pioneers-ai-powered-sign-language-translation/ . (Africanews)
15. TechJournal Kenya. (2025, Apr.). *Signvrse uses AI to break barriers for Deaf community in Kenya.* https://techjournal.co.ke/2025/04/22/signvrse-uses-ai-to-break-barriers-for-deaf-community-eyes-global-expansion/ . (Tech Journal)
16. Microsoft. (2022). *How Immersive Reader helped a student succeed in school and life.* https://www.microsoft.com/en-us/education/blog/2022/06/how-immersive-reader-helped-a-student-succeed-in-school-and-life/ . (Microsoft)
17. Microsoft Educator Center. (2023). *Immersive Reader research and case studies.* https://learn.microsoft.com/en-us/training/educator-center/product-guides/immersive-reader/research . (Microsoft Learn)
18. GDI Hub. (2024, Nov.). *Google, University of Ghana and GDI Hub to expand AI-powered speech recognition for non-standard speech.* https://www.disabilityinnovation.com/news/google-university-of-ghana-and-gdi-hub-to-expand-ai-powered-speech-recognition-for-non-standard-speech-in-ghanaian-languages . (Global Disability Innovation Hub)
19. MyJoyOnline. (2024, Nov.). *Google & University of Ghana partner on Project Euphonia.* https://www.myjoyonline.com/google-university-of-ghana-partner-on-project-euphonia-for-improved-speech-recognition/ . (MyJoyOnline)
20. Sattva Consulting. (2020). *Google Read Along: Impact Assessment Report.* https://www.sattva.co.in/wp-content/uploads/2020/09/Sattva_Google_Read-Along-IA-Report.pdf . (Sattva Consulting)
21. Google. (2025). *Read Along—Impact and reports (Africa region page).* https://readalong.google/intl/en_AF/impact/ . (Read Along)
22. HundrED. (2024). *Lexplore—AI-based literacy screening.* https://foundation.hundred.org/en/innovations/lexplore . (HundrED Foundation)
23. BMZ Digital Centres. (n.d.). *Voice technology infrastructure for Kinyarwanda (Common Voice—>2,000 validated hours).* https://www.bmz-digital.global/en/digitalzentren/voice-technology-infrastructure-for-artificial-intelligence-engine-in-rwandas-local-language-kinyarwanda/ . (BMZ Digital.Global)

24. Mozilla Foundation. (2020). *How Rwanda is making voice tech more open.* https://www.mozillafoundation.org/en/blog/how-rwanda-making-voice-tech-more-open/ . (Mozilla Foundation)

25. Tanzania AI Community. (2025). *Twiga: A WhatsApp bot for teachers (open-source).* https://github.com/Tanzania-AI-Community/twiga . (GitHub)

26. Shule Direct. (2025). *AI teachers and digital learning platforms.* https://shuledirect.org/ai-teachers/ . (Shule Direct)

27. UNESCO. (2023). *Global Education Monitoring Report—Technology in education: A tool on whose terms?* https://gem-report-2023.unesco.org/ . (2023 GEM Report)

28. Human Rights Watch. (2022). *"How Dare They Peep into My Private Life?" Children's rights violations by governments that endorsed online learning during COVID-19.* https://www.hrw.org/report/2022/05/25/how-dare-they-peep-my-private-life/childrens-rights-violations-governments . (Human Rights Watch)

29. Government Technology. (2022). *Virtual testing puts disabled students at a disadvantage.* https://www.govtech.com/education/k-12/virtual-testing-puts-disabled-students-at-a-disadvantage . (GovTech)

30. Auraria Library News. (2021). *Why online test proctoring is biased.* https://www.library.auraria.edu/news/2021/why-online-test-proctoring-biased-expert . (Auraria Library)

31. NIU Center for Innovative Teaching & Learning. (2024). *AI detectors: An ethical minefield.* https://citl.news.niu.edu/2024/12/12/ai-detectors-an-ethical-minefield/ . (CITL)

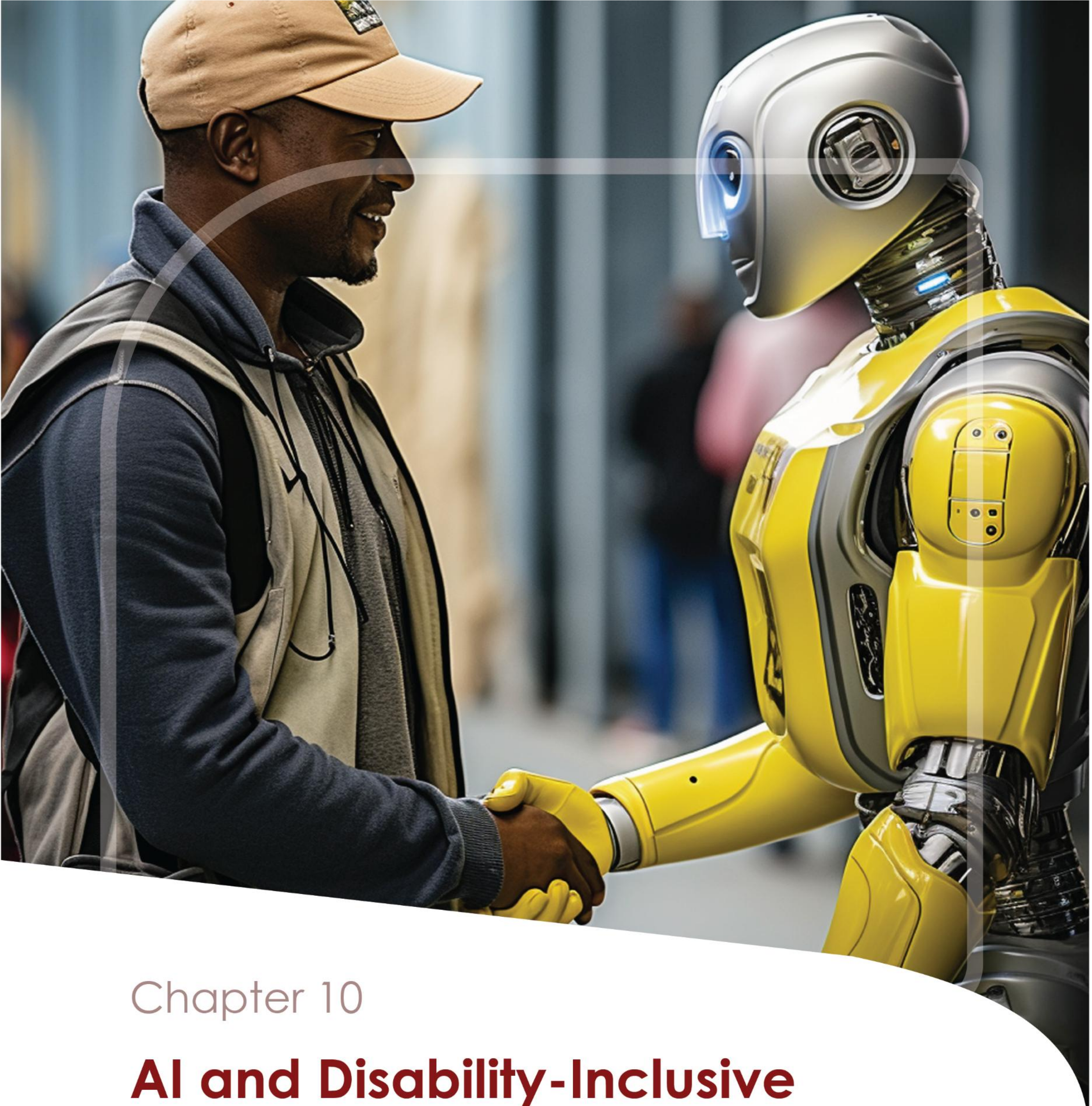
32. The Guardian. (2024, Dec. 15). *Inside the university AI cheating crisis.* https://www.theguardian.com/technology/2024/dec/15/i-received-a-first-but-it-felt-tainted-and-undeserved-inside-the-university-ai-cheating-crisis . (The Guardian)

33. AI & Disability in Africa Project. (2025). *Integrated report on AI and Assistive Technologies (survey findings)* (unpublished working paper).

34. UN DESA (DISD). (n.d.). *CRPD Article 24—Education.* https://social.desa.un.org/issues/disability/crpd/article-24-education . (UN DESA)

35. UNICEF. (2017). *Understanding the right to inclusive education under Article 24 of the CRPD.* https://www.unicef.org/eca/sites/unicef.org.eca/files/IE_summary_accessible_220917_0.pdf . (UNICEF)

36. AI & Disability in Africa Project. (2025). *Artificial Intelligence Policies* (Kenya and Rwanda extracts; unpublished working paper).

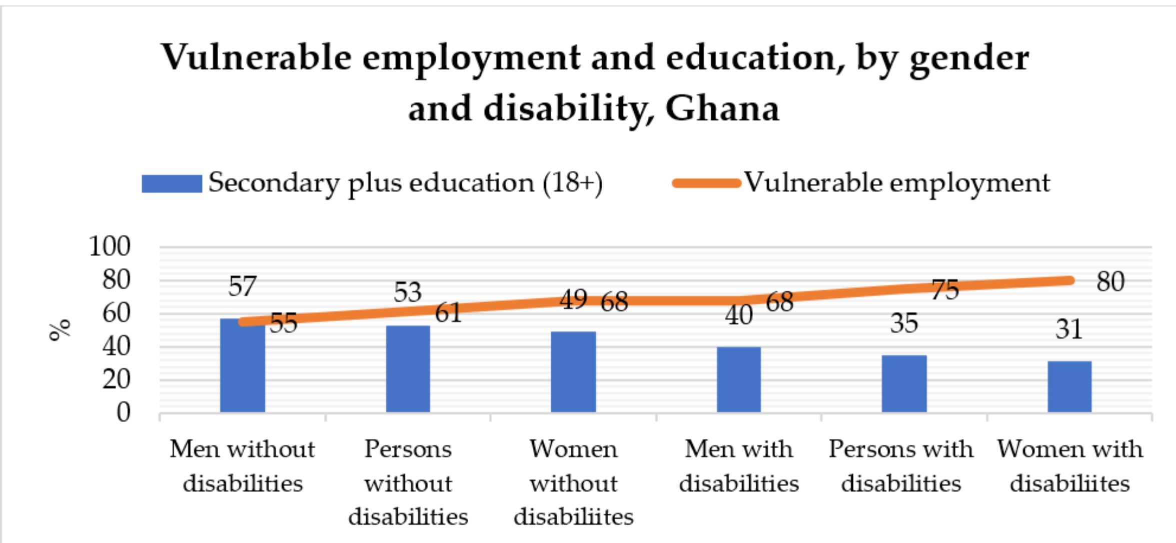


Chapter 10

AI and Disability-Inclusive Employment in sub-Saharan Africa

Introduction

PWDs in sub-Saharan Africa face significant employment gaps, remaining underrepresented in both formal and informal work. Globally, around 15% of people live with a disability, and in Africa, the share is estimated between 10–20%. Yet, disability is both a cause and consequence of poverty, as exclusion from education and jobs creates a vicious cycle. In countries like Kenya, Rwanda, and Ghana, unemployment and vulnerable employment are dramatically higher for PWDs than for others. For example, in Ghana (see figure below), women with disabilities have an 80% rate of vulnerable employment (informal, precarious work) – much higher than both non-disabled peers and even men with disabilities.[60] This chapter examines the barriers PWDs face in finding work, the challenges employers encounter in inclusion, and how artificial intelligence (AI) and generative AI (GenAI) can help bridge the gap. We also highlight real-world AI tools making a difference, potential risks to guard against, and the policy frameworks shaping disability-inclusive employment.



***Source**: 2021 Ghana Population and Housing Survey*

Barriers Faced by PWDs in Accessing Employment

Systemic Exclusion: Across sub-Saharan Africa, PWDs have markedly lower employment rates than the general population due to systemic barriers. In Kenya, it is estimated that

[60] Nkechi Owoo, "Give Women with Disabilities a Chance." March 15, 2024. https://www.project-syndicate.org/commentary/helping-women-with-disabilities-escape-poverty-and-achieve-social-inclusion-by-nkechi-s-owoo-2024-03

only 3.5% of PWDs are employed.[61] This remains true despite Kenya's government mandating a 5% employment quota for PWDs, a largely unmet target. Similar trends are seen elsewhere – in Ghana and Rwanda, PWDs are less likely to work in formal jobs and more likely to be underemployed or in poverty.[62] Many PWDs turn to self-employment in the informal sector: in Kenya, four out of five working PWDs are self-employed informally, with only one in five in wage employment.[63] This overreliance on the informal sector often means low income and job insecurity.

Education and Skills Gaps: Limited access to education and training is a foundational barrier that ultimately limits employment. PWDs often have lower educational attainment due to inaccessible schools, high costs, or a lack of accommodations. In Ghana, only 31% of women with disabilities and 40% of men with disabilities have secondary or higher education, compared to much higher rates among non-disabled peers.[64] Participants in a 2023 Ghana study described difficulties finding accessible schools and affording fees; many schools lacked inclusive teaching practices or physical accessibility, leaving students with disabilities without necessary accommodations.[65] As a result, Youth with Disabilities graduate with skill gaps, narrowing the jobs for which they can compete. Vocational training opportunities exist, but may exclude those with disabilities – for instance, some training centers would not accept persons with intellectual or communication disabilities.[66] These education barriers translate into limited qualifications and skills mismatch in the labor market.

Information and Communication Barriers: Even when jobs are available, PWDs often struggle to access information about opportunities.[67] Job postings, application forms, and training materials may not be provided in accessible formats (e.g., no braille or screen-reader-compatible text). In Kenya, inaccessible employment information has been identified as a key factor in high unemployment among PWDs.[68] A visually impaired jobseeker may find

---

[61] Nusrat Jahan and Catherine Holloway, "Barries to Access and Retain Formal Employment of Persons with Disabilities in Bangladesh and Kenya." Global Disability Innovation Hub, Working Paper Series 5 Jan. 2021.

[62] "Give Women with Disabilities a Chance."; International Centre for Evidence in Disability, Lifetime Consulting, Umbrella of Organizations of Persons with Disabilities in the fight against HIV & Aids and for Health Promotion, Mastercard Foundation. "Disability-inclusive education and employment: understanding the context in Rwanda." London, UK: ICED, 2022.

[63] "Barries to Access and Retain Formal Employment of Persons with Disabilities in Bangladesh and Kenya."

[64] "Give Women with Disabilities a Chance."

[65] International Centre for Evidence in Disability, University of Ghana, and the Mastercard Foundation. "Disability-inclusive education and employment: understanding the experiences of young men and women with disabilities in Ghana." London, UK: ICED, 2023.

[66] "Disability-inclusive education and employment: understanding the experiences of young men and women with disabilities in Ghana."

[67] Maxwell Peprah Opoku, *et al*,. "Access to Employment in Kenya: the Voices of Persons with Disabilities," International Journal on Disability and Human Development, Vol. 16, No. 1, 2016. https://doi.org/10.1515/IJDHD-2015-0029.

[68] "Barries to Access and Retain Formal Employment of Persons with Disabilities in Bangladesh and Kenya."

application websites incompatible with screen readers, or a deaf individual may find no sign language or captioned version of job announcements. Communication barriers persist into the workplace as well – without adaptive communication tools, employees with hearing, visual, or speech impairments can be excluded from meetings, training, or daily interactions.

Physical and Transportation Barriers: The physical environment presents daily obstacles for PWDs. Workplaces and transportation in many African cities are not built with universal design, making it hard for people with mobility impairments to commute or navigate job sites. Lack of reasonable accommodations at work and inaccessible public transport are commonly cited barriers for employed PWDs.[69] For example, a wheelchair user in an urban center might find that public buses are not wheelchair-friendly or that an office has no elevator or ramps. In countries such as Ghana, Kenya, and Rwanda, despite strong disability-rights laws, many public buildings and campuses remain inaccessible, reflecting a gap between policy and practice. These physical barriers effectively limit PWDs' job choices to those environments they can access.

Discrimination and Stigma: Perhaps the most pervasive barriers are attitudinal. Negative stereotypes and low expectations of PWDs lead to discrimination at every stage – from hiring to workplace interactions. PWDs frequently report that employers assume they are less competent or see them as a "burden," leading to reluctance in hiring. In a Kenyan study, widespread misconceptions among employers, coworkers, and the public cause PWDs to be regarded as less capable than others. This stigma is compounded for certain groups: those with intellectual, cognitive, or psychosocial disabilities face particularly strong prejudice in employment contexts. Women with disabilities encounter double discrimination – biases related to both gender and disability mean they are even more likely to be passed over for jobs or paid less. Such attitudes also influence families: as noted in Kenya, some families feel "shame" and invest only in basic needs (food, shelter) for a disabled member, rather than education or skill development. Overcoming these deep-seated social biases is crucial, as they often deter employers from even considering qualified PWD candidates.

Policy Implementation Gaps: While many African countries have progressive laws on disability inclusion, enforcement is often weak. Legal frameworks (discussed later) guarantee equal rights and even set employment quotas or incentives, but compliance is low. In Kenya, poor monitoring and enforcement of the 5% hiring quota contribute to continued exclusion. Awareness of these laws is low among employers, and there are few repercussions for non-compliance. Similarly, in Rwanda and Ghana, strong policies on paper have not fully translated to better outcomes due to limited budgets, lack of clear accountability, and insufficient data to track progress. The result is that PWDs remain excluded from many mainstream employment programs and social protections.

[69] "Barries to Access and Retain Formal Employment of Persons with Disabilities in Bangladesh and Kenya."

In summary, PWDs in Kenya, Rwanda, Ghana, and similar contexts face a matrix of barriers – from inaccessible infrastructure and information to skills gaps and stigmas – that severely limit their employment opportunities in both formal and informal sectors. Any intervention, including AI-based solutions, must be designed to tackle these multifaceted challenges.

Challenges Employers Face in Disability Inclusion

Employers in sub-Saharan Africa (and beyond) often struggle to hire and support PWDs, even when willing, due to several practical and perceptual challenges:

Lack of Awareness and Training: Many employers simply do not know how to include PWDs or are unaware of best practices and legal obligations. Studies find that awareness of inclusive employment legislation is low among companies. Human resource policies often fail to actively encourage hiring PWDs – for instance, job postings might not state that the company is an equal opportunity employer or might list unnecessary physical requirements. Employers and HR managers may not have training on disability etiquette or accommodation, leaving them uncertain how to act. This knowledge gap means that even companies with diversity goals may hesitate to recruit disabled candidates out of fear of doing or saying the wrong thing.

Assumed Costs of Accommodation: There is a common perception that accommodating an employee with a disability will be expensive or complicated. Employers worry about the costs of modifying workplaces or purchasing assistive devices. In reality, accommodations are often inexpensive (or one-time costs), and many PWDs develop their own low-cost adaptations. But without awareness of available assistive technology or external support, companies perceive a financial barrier. In Kenya, many firms felt a lack of technical support from disability organizations and experts on how to accommodate workers, which made them less confident about hiring PWDs. This indicates that better guidance and partnership could ease employers' concerns.

Stereotypes and Bias in the Workplace: As noted, societal stigma carries into the workplace. Unconscious bias may lead hiring managers to favor non-disabled candidates, assuming they will be more productive. Those PWDs who are hired can face biased attitudes from supervisors or colleagues who underestimate their abilities. For example, a blind office worker might take slightly longer to perform tasks due to accessibility hurdles, but coworkers might misinterpret this as lower productivity. Ingrained biases – often unconscious – can result in PWDs being passed over for promotions or excluded from team activities, creating a non-inclusive environment even when they are employed. It takes deliberate effort and training to root out these prejudices.

Limited Exposure and Comfort Level: Many employers have never worked with a person with a disability, leading to fear of the unknown. In some cases, companies only hire PWDs whom someone in the organization personally knows or as an act of charity, rather than as a talent strategy. This ad-hoc approach means PWD hires are rare and not integrated into mainstream recruitment pipelines. Without direct experience, myths persist – for example, an employer might think a deaf employee cannot use the phone (ignoring solutions like relay services) or that a wheelchair user cannot travel for work (ignoring that accessible transport can be arranged). Lack of exposure fosters these misconceptions, whereas employers who have positive experiences with disabled employees become far more likely to hire others, having seen their capabilities firsthand.

Unclear Responsibilities and Support Systems: Employers often find the ecosystem around disability inclusion to be fragmented. While laws exist, there may be no clear guidelines or incentives for implementation. Companies may ask: *Who will pay for accommodations? What government support or tax benefits are available? How do we find qualified disabled candidates?* In Rwanda, for example, gaps in resourcing and enforcing policy, and a lack of clarity on roles, have contributed to continued exclusion.[70] In Kenya, the absence of a monitoring system for the quota and minimal budget allocation for disability employment programs means employers receive little guidance or encouragement to change practices.[71] This can leave well-intentioned employers feeling on their own.

Retention and Accommodation Challenges: After hiring, ensuring the workplace is truly inclusive can be challenging. PWD employees may require some adjustments in work routines or tools. When those are not provided, it falls on the employee to cope. A recent study highlighted that even where accommodations existed, disabled employees often had to devise their own workarounds and seek peer support, since many aspects of the office remained inaccessible. For instance, an office might provide an accessible restroom but still hold all-hands meetings in an upstairs room with no elevator. The extra effort PWDs expend to adapt is frequently "invisible" to managers, leading to underestimation of the barriers they still face. Employers may not realize the need for continuous dialogue and flexibility to support PWD staff, beyond initial hiring.

In summary, employers face a mix of informational, attitudinal, and institutional challenges in disability inclusion. They may lack knowledge of how to accommodate, hold unfounded assumptions about costs and performance, and receive little external support or incentive. Overcoming these employer-side challenges is as important as empowering PWD job seekers. The advent of new AI and GenAI tools presents opportunities to address some of these issues – by reducing bias, improving accessibility, and guiding inclusive practices – as we explore next.

[70] "Disability-inclusive education and employment: understanding the context in Rwanda."
[71] "Barries to Access and Retain Formal Employment of Persons with Disabilities in Bangladesh and Kenya."

AI and GenAI to Empower PWD Job Seekers

AI and generative AI have the potential to level the playing field for people with disabilities seeking employment. By providing personalized assistance and reducing barriers, AI can help PWDs better compete for jobs in several ways:

Accessible Job Search Platforms: AI can make online job portals and application systems more accessible to users with various disabilities. For example, AI-driven interfaces can offer alternative input/output modes – a voice-activated assistant for someone with limited mobility, or a chatbot that answers questions in sign language for a deaf user. New AI systems can automatically generate image descriptions, captions, or convert text to speech, ensuring that visually or hearing-impaired candidates can navigate job listings. An inclusive platform might allow a blind jobseeker to voice-command a search and have postings read aloud, or let a dyslexic applicant listen to job descriptions instead of reading. By offering multiple formats for applications (text, voice, video), AI helps remove digital barriers in the job search. For instance, an AI-powered recruitment site could accept a video resume or an audio application from a candidate who finds traditional forms challenging. These adaptations widen access to opportunities that PWDs might otherwise miss due to inaccessible websites or forms.

Intelligent Job Matching: AI can act as a smart employment agent, matching PWD candidates to suitable jobs based on their skills, experience, and accommodation needs. Machine learning algorithms are adept at pattern matching – given a candidate's profile, an AI system can scan thousands of postings to find roles that fit their qualifications and flag workplaces known to be disability-friendly. Crucially, AI can account for transferable skills that a human recruiter might overlook. For example, a person with a spinal injury might have excellent problem-solving skills developed from navigating daily accessibility challenges – an AI could identify such soft skills or volunteer experiences (like advocacy work) and map them to job requirements. In this way, AI can highlight a candidate's strengths beyond the conventional resume, potentially surfacing non-obvious matches. Already, specialized platforms are emerging: the UNDP notes startups like *Specialisterne*[72] and *Mentra*[73] use AI to pair neurodiverse individuals (such as those on the autism spectrum) with jobs suited to their unique talents, focusing on tech roles that leverage their strengths. Such AI-driven matching could be extended in Africa to connect PWDs with remote work or gig opportunities, for instance, linking a physically disabled youth skilled in coding with freelance software projects globally.

Resume and Cover Letter Generation: Crafting a compelling resume or cover letter can be a hurdle for any jobseeker, and PWDs may face additional challenges if they have had limited schooling or breaks in employment history due to health issues. Generative AI tools

[72] https://us.specialisterne.com/
[73] https://www.mentra.com/

(like large language models) can assist by generating well-structured resumes, cover letters, or personal statements tailored to a user's experiences. A jobseeker can input their raw information, and the AI will produce a polished CV highlighting relevant skills and achievements. This is especially helpful for those who struggle with writing or self-promotion. For example, a young woman in Rwanda with partial hearing loss might have volunteer work and informal skills that she doesn't know how to frame professionally; a GenAI resume builder could organize her experiences and even suggest phrasing that emphasizes her strengths rather than gaps. Likewise, someone with dyslexia could use AI to ensure their written application is free of spelling/grammar errors. By removing technical writing barriers, AI lets PWD candidates present themselves on paper as effectively as any other candidate, so they are judged on merit, not on the quality of formatting or language. (It's worth noting that candidates should review and truth-check AI-generated content, but it provides a strong starting point.)

Assistive Technologies for Daily Work: AI-based assistive tech can help PWDs perform effectively in a job, thus expanding the range of jobs they can take. This includes smart tools that PWDs can use on their own to overcome functional limitations. For instance, AI-powered speech recognition and dictation allow someone with limited hand mobility to type documents and emails by voice, or control computer functions hands-free. A good example is an AI virtual assistant on a smartphone that obeys voice commands to schedule appointments, send messages, or retrieve information – enabling a user with quadriplegia to handle office tasks independently. For those with communication disorders, AI can translate typed text into spoken words (and vice versa), giving non-verbal individuals a voice in meetings. Cutting-edge AI prosthetics and exoskeletons are also emerging: projects in Africa like the Walk Again Project (Nigeria) and Cure Bionics (Tunisia) leverage AI and 3D-printing to create affordable bionic limbs that respond intuitively to the user.[74] Such devices can restore mobility or arm function, enabling persons with physical disabilities to take on jobs they couldn't before (for example, a factory job using an AI-enhanced prosthetic arm). While these are still nascent, they illustrate how AI can augment a person's capabilities. The bottom line is that with the right assistive tech, a disability that once limited one's job options may no longer be a barrier – AI can help PWDs perform on par with colleagues, whether through better access to information, automated assistance in tasks, or even physical augmentation.

By empowering PWD job seekers through accessible platforms, smarter matching, training, and assistive tools, AI can help address the inequities that have kept many out of the workforce. Importantly, these AI solutions must be designed with input from PWDs to truly meet their needs. When done right, however, AI can be a powerful equalizer – turning what were once systemic disadvantages into surmountable challenges and allowing PWDs to showcase their true potential in the job market.

[74] "AI Assistive Technologies for Persons with Disabilities in Africa."

AI and GenAI Tools for Inclusive Hiring and Workplaces (Employer Support)

AI and GenAI can also assist employers in creating more inclusive recruitment processes and work environments for PWDs. From reducing human bias in hiring to enabling better workplace accommodations, here's how technology can support employers:

Inclusive & Unbiased Recruitment Tools: AI-driven recruitment systems, if carefully designed, can help minimize biases that often creep in during hiring. For instance, AI-powered Applicant Tracking Systems (ATS) can be configured to focus on skills and experience and ignore demographic or personal details, which helps counteract unconscious bias.[75] Some hiring platforms use algorithms to anonymize resumes, hiding names or disability status, so candidates are evaluated first on qualifications. Additionally, AI can flag potentially biased language in job postings – for example, identifying phrases that might deter candidates with disabilities – and suggest neutral, inclusive phrasing. This ensures job descriptions don't inadvertently exclude PWDs. Companies must be cautious (since AI can also inherit bias from data, addressed later), but when tuned properly, AI can standardize screening and prevent individual prejudices from filtering out capable PWD applicants. Moreover, AI can help meet diversity goals: South African firms, for example, are exploring AI to identify diverse talent and meet equity targets, provided it's used genuinely to promote inclusion and not just tick boxes.[76] In practice, tools like *Mentra* (mentioned earlier) not only empower job seekers but give employers a pool of pre-matched, qualified neurodiverse candidates using AI – effectively making inclusion easier by doing the legwork of finding talent that might be overlooked via traditional recruiting.

AI Screening with Accommodations: Traditional recruitment methods can unintentionally screen out PWDs – consider automated resume scanners that discard atypical career paths, or video interview algorithms that expect "normal" eye contact and speech patterns. New AI tools are being developed to adjust screening criteria to be disability-inclusive. For example, an AI interview system could be programmed to not penalize a candidate for lack of eye contact (as this might be due to autism or cultural differences), or to allow extra time for responses, knowing the candidate uses a speech-generating device. An AI video interview platform could provide real-time captioning or a sign-language avatar for deaf candidates during an interview, ensuring they can understand and respond to questions. In early screening, AI could detect gaps in a resume and, rather than discard the candidate, automatically send a follow-up questionnaire that gives the person a chance to explain (e.g., "I had a medical treatment break during these 2 years"). These kinds of AI adjustments move the process from *"screening out"* to *"screening in"* PWD candidates. There is evidence that AI

[75] https://www.linkedin.com/pulse/ai-changing-recruitment-game-south-africa-gizelle-hutchinson-76ffc/
[76] https://www.linkedin.com/pulse/ai-changing-recruitment-game-south-africa-gizelle-hutchinson-76ffc/

can identify transferable skills in non-traditional experiences – something especially useful for PWDs who may have volunteer or life experiences (like advocacy or navigating healthcare) that showcase resilience and problem-solving. By highlighting these, AI gives employers a more holistic view of PWD candidates, countering the biases of conventional screening.

AI-Assisted Interviews and Assessment: For employers worried about how to evaluate PWD candidates fairly, AI can offer alternative assessment formats. For example, instead of a purely oral interview (which might disadvantage someone with a speech impairment), an employer could use an AI platform that poses situational judgment questions via text, allowing the candidate to type or speak answers, which are then transcribed. The AI could evaluate the content of the answers while ignoring irrelevant aspects like speech clarity, focusing hiring decisions on relevant criteria. Some companies use AI-driven chatbots for initial candidate engagement; these could be programmed to be accessible (working with screen readers, allowing voice input, etc.), ensuring PWDs aren't disqualified at the first interaction. By handling routine Q&A, such bots also free up recruiters' time to spend on more in-depth, personalized interactions later. Importantly, AI assessment tools can be monitored to ensure they don't exhibit disability bias – for instance, testing whether a coding test AI gives equal recommendations for a blind user using assistive coding software as for a sighted user. When done right, AI assessments can be a great equalizer, allowing candidates to demonstrate their abilities in a format that works for them.

Workplace Accessibility & Accommodations: AI technologies are increasingly available to help employers make the work environment more accessible for employees with disabilities. A prime example is real-time translation and transcription. Employers can deploy AI-powered captioning in meetings (through platforms like Microsoft Teams or Zoom, which use AI to transcribe speech to text live) so that an employee with hearing loss can read what colleagues are saying. Similarly, AI language models can provide instantaneous translation to sign language avatars on a screen, as pioneered by projects like AI4KSL in Kenya, which converts spoken English to Kenyan Sign Language using virtual signing avatars.[77] In the workplace, such a tool could allow a deaf Kenyan employee to follow spoken discussions or videos in their native sign language in real time. AI can also help visually impaired staff: tools like Microsoft's Seeing AI or Google's Lookout (though developed outside Africa) can be used on smartphones to read printed text, identify objects, or even recognize colleagues' faces and expressions. This means a blind employee can independently read office memos, navigate unfamiliar environments, or gauge reaction in a room with AI narrating the visual context.

Adaptive Work Tools: Beyond communication, there are AI-driven applications to support various needs. For employees with cognitive or neurodevelopmental disabilities, AI scheduling and reminder systems can be a game-changer. An AI assistant can remind the employee about tasks, break down complex projects into step-by-step checklists, or even coach

[77] "AI Assistive Technologies (ATs) for Persons with Disabilities (PWDs) in Africa"

them through stressful situations with prompts – effectively serving as a digital job coach. For example, an autistic employee could use an AI app that recognizes when they are overwhelmed (maybe via wearables tracking stress) and then suggests a break or coping exercise, helping them manage and stay productive. Robotics and IoT combined with AI can assist those with physical disabilities: consider a smart robotic arm that helps a worker with a missing limb to perform assembly tasks, or an AI-powered forklift that a wheelchair user can operate through voice commands. Some of these are still experimental, but even simple automation can reassign the physical parts of a job to a machine under the worker's control. Environmental control is another area – an AI-based smart office system could allow a mobility-impaired employee to control doors, lights, or thermostats via voice or smartphone, increasing their independence at work (echoing Amnesty Kenya's note that AI can enable PWDs to control their environment for greater independence[78]).

Inclusive Team Collaboration: AI can also facilitate inclusion in day-to-day teamwork. For instance, if an employee is remote (as is often the case for some PWDs who might prefer work-from-home), AI collaboration tools can ensure they're not left out. AI can summarize meeting discussions and share notes, so an employee who could not attend (due to a medical appointment, for example) stays in the loop. ChatGPT-style assistants integrated in email or chat can rephrase messages in simpler language on request, helping colleagues communicate clearly with a coworker who has an intellectual disability. Conversely, AI can augment the communication of a PWD employee – e.g. if someone has trouble typing, they might use speech-to-text, and an AI could automatically correct any errors or even adjust tone if requested (to ensure an email sounds appropriately formal, for example). All these tools help reduce the "friction" that might otherwise exist in integrating a PWD employee into a fast-paced work environment.

Data Insights for Diversity: On a management level, AI analytics can help employers track and improve their inclusion efforts. AI can analyze hiring and workforce data to identify where PWDs drop out of the pipeline or what the retention rates are compared to others. By spotting patterns (say, if PWD hires tend to leave after 1 year), employers can investigate and address underlying causes. Some advanced AI HR platforms can even simulate the impact of policy changes – for example, modeling how instituting a workplace accommodation fund might increase retention. While primarily a back-end use, these insights guide employers in allocating resources effectively (perhaps establishing a centralized budget for accommodations or targeted training programs).

In sum, AI and GenAI offer practical tools for employers to become more inclusive: from recruiting fairly to ensuring employees with disabilities have what they need to thrive. By automating accessibility and checking human biases, AI can complement human HR managers and supervisors. It is important, however, that employers implement these tools thoughtfully – AI should assist, not replace, human judgment, and must be configured with

[78] https://www.amnestykenya.org/design-ai-for-persons-living-with-disabilities.

inclusion in mind. When paired with genuine commitment from leadership, AI-assisted inclusion can significantly lower the barriers that have historically kept PWDs out of workplaces.

Risks and Challenges of AI Solutions

While AI and GenAI offer exciting opportunities, they also carry significant risks and challenges that must be managed to truly benefit PWDs without causing harm. Key concerns include:

Algorithmic Bias and Discrimination: AI systems are only as good as the data and design behind them. If not carefully checked, AI can inadvertently perpetuate or amplify biases against PWDs. For instance, an AI hiring tool trained on past hiring data might learn to favor candidates without employment gaps – thereby discriminating against PWDs who may have gaps due to medical reasons. Similarly, if an AI resume screener has not seen many successful PWD applicants in its training, it might rank new PWD applicants lower, reinforcing a cycle of exclusion. Biased training data is a well-documented issue: "if AI systems are trained on biased historical data, they might unintentionally perpetuate discrimination against disabled candidates."[79] This applies to all marginalized groups, but some disability-specific biases are subtle – for example, an AI image recognition algorithm might label a person in a wheelchair as "sitting" and not recognize them as a professional in a stock photo, reflecting limited disability representation in training images. Without intervention, AI could reinforce negative assumptions (like equating disability with lower productivity) rather than countering them. Mitigating this requires rigorous testing of AI models for fairness and inclusion, using representative data that includes PWDs. Developers need to introduce fairness constraints and involve PWDs in evaluating AI outputs. The stakes are high: if left unchecked, AI could "lock out" PWDs from opportunities by automating the very biases we're trying to overcome.

Lack of Accessibility in AI Systems: It is ironic but possible that an AI tool meant to help could itself be inaccessible to those with disabilities. For example, an AI recruitment chatbot might not work with screen readers, or an online AI assessment might have a timeout that is too short for someone using alternative input methods. As noted, "not all AI recruitment tools are designed with accessibility in mind, which could exclude candidates who rely on assistive tech."[80] If a video interview AI requires a webcam and audio without providing captioning, a deaf candidate is at a disadvantage. If a training AI is only in written form, someone with a visual impairment might struggle if it's not properly coded for screen reading. Voice recognition AI can fail for those with speech impairments, regional accents, or cognitive

[79] https://www.linkedin.com/pulse/ai-changing-recruitment-game-south-africa-gizelle-hutchinson-76ffc/

[80] https://www.linkedin.com/pulse/ai-changing-recruitment-game-south-africa-gizelle-hutchinson-76ffc/

speech differences – a UNDP piece pointed out that many voice-based AIs have trouble understanding atypical speech, effectively creating a barrier for those users. This challenge means developers must adopt universal design principles in AI: providing multiple ways to interact (text, voice, visual) and ensuring compatibility with assistive devices. If they don't, we risk creating a new "digital divide" where PWDs cannot benefit from the latest tools because those tools don't consider their needs.

Privacy and Data Security Concerns: AI systems often rely on large amounts of personal data. When it comes to disability, much of that data (health records, assistive device usage, etc.) is sensitive personal information. There are valid concerns about how AI platforms store and use disability-related data. For instance, a job-matching AI might ask a user to input their disability and accommodation needs to find suitable jobs. While that can be helpful, it raises questions: Will this data be kept confidential? Who can access it? Could it be misused to discriminate? The principle of "privacy by design" is crucial – AI solutions should collect only what is needed and protect it strongly. In many African countries, data protection laws (like Kenya's Data Protection Act 2019 or Ghana's Data Protection Act 2012) classify disability status as sensitive personal data, meaning employers or services must handle it with extra care. AI designers must ensure compliance – e.g., not sharing an individual's disability status with employers without consent. Additionally, GenAI tools like GPT are often cloud-based, meaning any info a user provides (say, to get a resume written) might be stored on servers. PWD users need to be informed not to share overly identifying details unless necessary. Companies using AI hiring tools should be transparent about any automated decisions made and allow candidates to opt out or contest decisions – aligning with emerging AI ethics guidelines globally.

Overdependence and the Human Touch: While AI can streamline processes, there's a risk of over-reliance on automated systems to solve human problems. Hiring and inclusion have strong human dimensions – empathy, understanding, and individualized judgment – which AI cannot fully replicate. If employers lean too heavily on AI, they might neglect the human engagement that PWDs often cite as important. For example, an AI might score candidates and reject someone who doesn't fit the algorithm's mold, whereas a human manager might have seen potential and made an accommodation. As the LinkedIn analysis noted, AI can't (yet) assess personal qualities or culture fit as well as humans. It can also feel impersonal: some PWD candidates might prefer explaining a situation to a human rather than an online form or bot. The challenge is ensuring AI is used to assist decision-making, not completely replace it. A balanced approach ("human-in-the-loop") is recommended – for instance, AI can shortlist candidates, but final hiring decisions involve human review, with an eye towards context that the AI might miss.

Exacerbating the Digital Divide: There is a concern that advanced AI solutions will primarily help those PWDs who already have access to technology, potentially widening inequalities. Many PWDs in rural or low-income communities in Africa lack smartphones, reliable internet, or even electricity.[81] About only 37% of Africans have Internet access, and PWDs are often among the poorest, meaning even fewer of them can get online. If we introduce AI job platforms or training apps, those without connectivity or devices can't benefit, possibly leaving them further behind. There's also an urban-rural divide: rural PWDs (especially women) might have very low tech exposure. We risk a scenario where educated, urban PWDs get great AI tools and see improvements, while rural PWDs see little change or even relatively worse outcomes. To mitigate this, AI solutions need to be paired with efforts to improve digital access – e.g., community centers with assistive tech, mobile text-based AI interfaces that can work on basic phones, and affordable internet initiatives. Inclusion means no one is left behind: AI projects should explicitly consider the least connected users, perhaps by offering offline functionality or working with telecom providers to subsidize data for certain services.

Contextual and Cultural Limitations: AI systems developed in Western contexts might not transfer neatly to African cultures and languages. Lack of representative data is a barrier – many AI models don't include African languages or local dialects, and even fewer include sign languages or text in braille. If an AI speech recognition system doesn't understand Kiswahili or Kinyarwanda well, PWDs in Kenya or Rwanda can't use voice interfaces effectively. Cultural context matters too: perceptions of disability differ by culture, and AI moderation systems might not catch subtle forms of disability discrimination in non-English languages. There's also the risk of Western technology dominance – currently, most AI assistive tech in Africa is imported, which can mean poor localization and higher costs. The challenge is to build or adapt AI to African contexts, something initiatives like KNUST's Responsible AI Lab in Ghana are aiming to do. Without local context, AI solutions may simply not fit users' needs or could misinterpret inputs (for example, voice AI trained on American accents struggling with African English speakers, let alone those with speech impairments). Addressing this means investing in local AI data (inclusive of PWD data) and talent to ensure solutions are culturally and linguistically relevant.

Ethical and Legal Grey Areas: The use of AI in employment for PWDs sits at an intersection of multiple ethical domains. There's a risk of paternalism – designing solutions for PWDs without their input, which might result in tools that are intrusive or mis-targeted. For example, AI "monitoring" of an employee's health or emotional state could cross privacy lines if not handled sensitively. Some algorithms might inadvertently label or "score" disability in ways that feel like ranking a person's impairment (echoing a eugenics concern). And legally, if an AI tool discriminates, it's unclear who is liable – the employer using it, or the vendor who made it? Most labor laws and anti-discrimination frameworks did not anticipate AI. This lack of clarity could delay justice for affected PWDs. On the flip side, without explicit legal guidance, companies might shy away from using beneficial AI for fear of unknown liabilities. Governments and regulators are beginning to consider these issues

[81] Cathy Holloway (2024) "Report on three roundtable discussions exploring the challenges of AI for Inclusive Development in Africa," GDI Hub.

(for example, discussions about requiring AI audits for bias, or mandating human review of automated decisions), but the landscape is still evolving. PWDs and disability advocates must be part of these ethical and policy conversations to ensure that AI is developed and deployed in line with human rights principles.

In light of these risks, several safeguards are recommended: involve PWDs at every stage of AI design (co-design and user testing); conduct bias and accessibility audits of AI systems regularly; ensure transparency (candidates should know when AI is being used in hiring and how) and recourse (ability to request accommodation or human alternatives); enforce data protection laws strictly for AI services; and invest in digital access so no group is left out. With these measures, we can maximize AI's benefits while minimizing harm, aligning technology use with the goal of genuine inclusion.

Policy and Legal Frameworks for Disability Inclusion and AI

Effective deployment of AI for improving employment of PWDs in Africa must align with – and inform – the existing policy and legal landscape on disability rights and technology. Below, we outline relevant frameworks in Kenya, Rwanda, and Ghana, as well as international standards, and discuss how AI intersects with them:

International and Regional Commitments: All three focus countries have committed to disability rights through international treaties. Notably, the United Nations Convention on the Rights of Persons with Disabilities (CRPD) – Kenya (2008), Rwanda (2008), and Ghana (2012) are parties. CRPD Article 27 guarantees the right of PWDs to work on an equal basis with others, which includes non-discrimination in hiring and employment, reasonable accommodation at work, and promotion of self-employment and entrepreneurship. Article 9 on accessibility also covers access to information and communication technologies, implicitly encouraging states to promote accessible ICT (including AI-based tools). These commitments mean that governments are obliged to ensure AI technologies used in employment do not discriminate and are accessible, and that PWDs have access to assistive tech. Regionally, the African Union's Protocol on the Rights of Persons with Disabilities in Africa (2018) (often called the African Disability Protocol) further reinforces these rights, though it is pending wider ratification. It explicitly urges state parties to promote research and the availability of appropriate technology and assistive devices at an affordable cost. This regional direction supports investments in AI assistive technologies as part of fulfilling rights. Additionally, broad agendas like the Sustainable Development Goals (SDGs) – especially SDG 8 (decent work for all) and SDG 10 (reducing inequalities) – provide a framework for inclusive innovation. The SDGs call for increasing access to enabling technology for persons with disabilities (SDG 9.c), which can be interpreted to include AI solutions.

Ghana: Ghana has a solid legal foundation in the Persons with Disability Act, 2006 (Act 715). This law prohibits discrimination in employment, mandates that public buildings and transport be made accessible (with a 10-year deadline, which was unfortunately not fully met by 2016), and requires that PWDs have equal rights to education and training. Ghana has no formal quota, but the Act directs that "special incentive" schemes be provided to employers who hire PWDs, and that the state could reserve a percentage of jobs in certain sectors for PWDs where feasible. Ghana's Labor Act also prohibits discrimination on the grounds of disability. The challenge has been enforcement – as noted by Nkechi Owoo, Ghana's disability protections have been "insufficient to counteract entrenched biases."[82] A National Accessibility Standards document was developed to guide physical accessibility. For employment, the government at times has run skills programs for PWDs (e.g., through the Ministry of Employment or Youth Employment Agency). The Ghana Federation of Disability Organizations (GFD) actively advocates for better implementation. On the tech front, Ghana's involvement in AI is growing. The country hosts the Kofi Annan Centre of Excellence in ICT, which has looked at assistive tech solutions. Also, Ghana's Kwame Nkrumah University of Science and Technology (KNUST) launched the Responsible AI Lab (RAIL). Ghana also has the Data Protection Act 2012 and a Data Protection Commission that enforce privacy standards. Ghana's ICT for Accelerated Development (ICT4AD) policy (from early 2000s) recognized the need for ICT to benefit vulnerable groups. Legally, one interesting aspect is Ghana's commitment to data for disability: at the Global Disability Summit 2018, Ghana pledged to improve data collection on disability – which aligns with the issue Owoo raised about lack of data hindering policy. Better data would also help AI development by providing "ground truth" for models. The Ghanaian government can encourage AI inclusion by, for example, incentivizing local startups to develop accessibility solutions (maybe through grants or tech hub support) and by ensuring any AI tools it adopts in civil service hiring or public services are user-tested for accessibility by PWDs. Ghana's legal commitment to PWD rights means that if an AI system used by an employer were to systematically disadvantage PWDs, it could be challenged under the law – but proactively, it's about updating guidelines to employers: e.g., the National Council on Persons with Disability could issue an advisory on fair use of AI in hiring.

Kenya: Kenya's legal framework strongly affirms disability inclusion, though implementation is evolving. The Constitution of Kenya 2010 prohibits discrimination on the basis of disability and, under Article 54, entitles PWDs to reasonable access to all places, public transport, and information. Article 21 commits the state to take measures (including affirmative action) to address the needs of PWDs. A key law is the Persons with Disabilities Act, 2003 (revised 2012&2025), which established the National Council for Persons with Disabilities (NCPWD) and laid out rights and privileges including employment. This Act introduced a 5% reservation in employment for PWDs in both public and private sectors (often interpreted as a target/quota), and provided tax incentives to employers who hire

[82] https://www.project-syndicate.org/commentary/helping-women-with-disabilities-escape-poverty-and-achieve-social-inclusion-by-nkechi-s-owoo-2024-03.

PWDs (such as deducting part of salary costs of PWD employees from taxable income). However, as noted earlier, compliance has been low – PWD employment in the public sector is only ~1%, and enforcement mechanisms have been weak. Recognizing the gaps, Kenya has taken recent steps: the National Disability Policy 2019 and an implementation plan aim to strengthen enforcement and mainstream disability in all ministries. Additionally, Kenya is forward-looking on technology governance. The government formed an AI and Blockchain Taskforce in 2018 and recently released its National AI Strategy. Disability inclusion in AI was highlighted at forums like the 2024 Inclusive Africa Conference (organized by inABLE). On the data side, Kenya's Data Protection Act 2019 aligns with GDPR principles and requires consent for processing sensitive personal data, including health and disability status. This means any AI platform handling such data in Kenya must ensure compliance. Kenya also has provisions for ICT accessibility; the Communications Authority has published ICT accessibility guidelines, and public agencies are expected to procure accessible ICT systems – which would extend to AI systems used by government for services or hiring. In sum, Kenya's laws provide a strong mandate for inclusion, and the emergence of AI policy presents a chance to operationalize that mandate in new tech deployments. Conversely, failure to consider PWDs in the AI strategy could lead to conflicts with constitutional rights if, say, AI in public services disadvantages PWDs.

Rwanda: Rwanda is often cited for its progressive stance on disability inclusion in policy. It has a comprehensive framework: the Law on the Protection of Persons with Disabilities (2007) and subsequent orders outline rights to education, health, and employment. Rwanda's Constitution (as amended in 2015) also prohibits discrimination against PWDs and upholds their right to welfare. The country has a National Council of Persons with Disabilities (NCPD) that advises on policies and ensures PWD voices are heard. According to a 2023 review, Rwanda's policies reflect a rights-based agenda and supportive framework for disability inclusion in education and employment. For example, a Prime Minister's Order in 2009 set a target for public institutions to employ at least 5% PWDs (similar to Kenya's quota). The government has also promoted inclusive technical and vocational education and training (TVET) programs for youth with disabilities, and there are initiatives for accessible infrastructure (Universal Access Program). Despite this, implementation challenges exist: stigma and discrimination persist, and not all employers follow the guidelines. Another issue is clarity of roles – some local officials and employers are unclear on their responsibilities under the law, leading to patchy enforcement. Regarding technology, Rwanda is keen on ICT as a development pillar (often called "the Singapore of Africa" for its tech ambitions). The Smart Rwanda Masterplan emphasizes technology for socio-economic transformation, and within that, there have been drives to make government e-services accessible. Rwanda's Center for the Fourth Industrial Revolution (C4IR) established in 2022 is working on AI and data governance in partnership with the World Economic Forum. Disability inclusion should be a part of this conversation. Rwanda also has a data privacy law (enacted in 2021) that would cover AI data use. In short, Rwanda's policy environment is enabling, but the key is resourcing and awareness – ensuring that as AI solutions roll out, they are matched by training, budget, and accountability so that the fine intentions translate to reality.

In conclusion, Kenya, Rwanda, and Ghana have laid a strong rights foundation that AI solutions must uphold. The intersection of AI and policy is two-way: policy guides ethical AI use, and AI's rise also necessitates that policies be updated (or better implemented) to address new realities. Embracing AI for inclusion should go hand-in-hand with reinforcing legal protections – for example, explicitly covering algorithmic discrimination in equal opportunity laws, or adding requirements that government and corporate AI tools undergo accessibility testing. Policymakers are urged to treat AI not as a silver bullet, but as a tool that, if guided by robust inclusion policies, can accelerate progress toward the long-standing goal of equal employment opportunity for PWDs.

Conclusion

The past decade has seen growing recognition in sub-Saharan Africa that inclusive employment for persons with disabilities is both a rights issue and an economic imperative. AI and generative AI arrive as potent new tools that – if wielded correctly – can help dismantle some of the longstanding barriers that PWDs in Kenya, Rwanda, Ghana and beyond face in the world of work. From making job information accessible at the click of a button, to matching candidates with jobs they never knew existed, to serving as always-available personal assistants or interpreters, AI can empower PWDs to navigate and compete in the labor market with greater ease and confidence. Likewise, employers stand to benefit by tapping a wider talent pool and creating diverse teams, aided by AI systems that help eliminate bias and automate accommodations.

However, realizing this potential requires a deliberate and inclusive approach to AI innovation. As Prof. Jerry Kponyo, lead of the Ghana-based RAIL initiative, noted, "meaningful impact can only be achieved when [PWDs] are actively involved in the innovation process… AI solutions should not merely be designed for them but in collaboration with them."[83] This participatory ethos is vital. PWDs must have a say in what tools are built, how they function, and how they are deployed – whether as co-designers, beta testers, or decision-makers in tech companies and policy bodies. Their lived experience is an irreplaceable guide to ensure AI actually addresses relevant problems and is user-friendly.

Secondly, stakeholders must be vigilant about the ethical implementation of AI. The very technologies that can help can also harm if poorly implemented. Thus, governments, tech developers, and employers need to institute checks: bias audits, accessibility compliance, transparency to users, and avenues for redress. It is encouraging that frameworks for responsible AI are being discussed in Africa. Initiatives like the Inclusive Africa Conference

[83] https://nextstepfdn.org/pioneering-ai-for-disability-inclusion-new-study-to-transform-access-across-africa.

are bringing the topics of disability, ethics, and AI into national conversations. These dialogues should translate into action – for example, national AI strategies that prioritize inclusive design, or capacity-building programs that train PWDs in AI and data science (empowering them to be creators of solutions, not just consumers).

Furthermore, bridging the resource and infrastructure gap is essential. AI solutions will mean little if PWDs cannot access them due to cost or connectivity. Stakeholders should consider subsidizing assistive tech (perhaps through public-private partnerships or development grants) and expanding internet access, especially to rural and marginalized communities. International support can play a role here: development organizations and tech companies could invest in Africa-specific datasets (such as local language corpora for speech AI, or diverse image datasets including PWDs), as well as in local entrepreneurs working on assistive AI. This would "shrink the data desert" and ensure Africans are not merely consumers of imported tech but innovators in their own right.

On the policy front, better enforcement of existing laws and possibly new regulations tackling AI-specific issues will create a safer environment for innovation. For instance, labor regulators might issue guidelines on AI-driven hiring to ensure they comply with anti-discrimination laws, and data protection authorities should scrutinize AI recruiting platforms for how they handle sensitive data. Ensuring alignment between tech innovation and legal protections will build trust – both among PWDs who may be wary of new technologies, and among employers who might fear legal uncertainties.

Finally, it's important to situate AI as one part of the solution in improving PWD employment. Traditional efforts – like employer sensitization, inclusive education, disability-friendly infrastructure, and strong advocacy – remain as critical as ever. AI should augment these efforts, not replace them. For example, an AI tool might identify ten great candidates with disabilities for a role, but an enlightened hiring manager still needs to make the decision to hire and then nurture that employee's growth. In the same vein, AI can automate captions, but workplaces must also cultivate a culture where diversity is valued, so that a captioned meeting is not seen as a nuisance but as a normal aspect of operations.

The convergence of AI and disability inclusion in Africa is a promising frontier. With thoughtful application, AI and GenAI can act as accelerators towards inclusive employment – helping to finally equalize opportunities and unleash the untapped talents of millions of Africans with disabilities. The path forward calls for collaboration across sectors: technologists, disability communities, governments, educators, and businesses all have a role to ensure that AI is developed *for* and *with* everyone. If we succeed, the impact will be transformative – not only will PWDs in Kenya, Rwanda, Ghana and beyond secure better livelihoods, but societies at large will benefit from the diversity, innovation, and productivity that inclusion brings. The journey is just beginning, but with the right policies, safeguards, and inclusive mindset, AI can truly help rewrite the narrative on disability and work in Africa from one of exclusion to one of empowerment.

Chapter 11

Supporting Caregivers of Children with Disabilities in Sub-Saharan Africa: Challenges, Stigma, and the Promise of AI Tools

Introduction

Parents and caregivers of children with disabilities in Sub-Saharan Africa face multifaceted challenges that affect their families' well-being and their children's development. These challenges range from deep-rooted social stigma and discrimination to heavy mental health burdens and practical caregiving difficulties. Globally, over 1 billion people live with a disability, and they experience disproportionately poorer health, lower employment, and higher poverty rates.[84] Children with disabilities (estimated 230 million worldwide, including about 28.9 million in Eastern and Southern Africa) often encounter barriers to education and social inclusion.[85] This section examines the situation in Sub-Saharan Africa – where cultural, economic, and infrastructural factors can intensify these issues – while incorporating relevant global examples. It also explores how artificial intelligence (AI), including emerging generative AI (GenAI) tools, can support caregivers in three key areas: (1) addressing their own mental health needs; (2) enhancing their skills and resilience as caregivers; and (3) helping them promote their children's inclusion, education, and psychosocial development. Throughout, we highlight successful case studies and promising innovations from research literature, NGOs, governments, and news sources.

Challenges Faced by Caregivers in Sub-Saharan Africa

Social Stigma and Discrimination

Stigma surrounding disability is a pervasive problem that profoundly impacts families. In many African communities, disability may be viewed through the lens of superstition or moral judgment. Caregivers of Children with Disabilities commonly report being ostracized and shamed due to negative cultural beliefs.[86] For example, a review of studies across Africa found parents were often called derogatory names and even accused of causing their child's condition through witchcraft or as a means to gain wealth. Some communities perceive a child's disability as a curse or punishment from God, prompting extreme reactions – there are harrowing reports of community members advising parents to kill their disabled children to lift the "curse." Living under such stigma leads many families to hide their child's condition: caregivers worry about taking the child out in public, feel ashamed, or try to keep the disability secret to avoid being treated differently. This social exclusion extends to fears about the future – for instance, parents' express anxiety that their other children may face marriage prospects being harmed due to the stigma attached to having a disabled sibling.

This stigma is not unique to Africa, though local beliefs can amplify it. A global review noted that in many low- and middle-income countries (LMICs), including those in Africa, children and adults with intellectual disabilities continue to experience high levels of stigma and are

---

[84] https://blogs.worldbank.org/en/education/price-exclusion-disability-and-education-africa.

[85] Samia P, Oyieke K, Kigen B and Wamithi S (2022) Education for children and adolescents living with disabilities in sub–Saharan Africa—The gaps and opportunities. Front. Public Health 10:979351. https://doi.org/10.3389/fpubh.2022.979351.

[86] Mkabile, S., Garrun, K.L., Shelton, M. & Swartz, L., 2021, 'African families' and caregivers' experiences of raising a child with intellectual disability: A narrative synthesis of qualitative studies', *African Journal of Disability* 10(0), a827. https://doi.org/10.4102/ajod.v10i0.827

denied many basic rights and freedoms enjoyed by others.[87] The stigma affects not only the child but the entire family; researchers describe "courtesy stigma" or "affiliate stigma," where parents feel socially tainted by association with their child's disability.[88] Some caregivers internalize these public attitudes, leading to shame and self-isolation, while others fortunately find pockets of support and positive reactions from informed community members. Overall, stigma and discrimination form a heavy backdrop for caregivers in Sub-Saharan Africa, complicating every aspect of care and integration.

Psychological and Mental Health Burdens

Confronted with constant social pressures and the demands of care, many caregivers experience significant mental health strains.[89] Studies have documented that parents of Children with Disabilities often have elevated levels of stress, anxiety, and depression. In low-income settings, these mental health burdens can be even more severe: caregivers report extreme stress and profound sadness, sometimes even symptoms of trauma, upon learning of and managing their child's condition. One systematic review noted that parents in African contexts frequently endure "severe levels of stress, severe sadness, family difficulties, financial difficulties, [and] stigma, shame and discrimination" while caring for a child with intellectual disability.[90] The chronic worry about the child's health, safety, and future is a source of ongoing anxiety. For example, many parents fear what will happen to their child if they (the parents) die or become unable to care – a concern repeatedly voiced in interviews.[91] Lack of societal acceptance adds to this mental burden: caregivers' distress is often "rooted in their perceived treatment by society" and constant vigilance against negative reactions.

Critically, stigma and mental health are intertwined. Research from Ethiopia found that internalized stigma (when caregivers begin to believe and internalize the negative attitudes) is strongly associated with poor mental health outcomes like anxiety and depression in parents.[92] Simply put, when a parent feels blamed or shamed by society, it can erode their own psychological well-being. Conversely, those who manage to resist internalizing stigma – often thanks to supportive family or increased disability awareness in the community – tend to have better mental health. Unfortunately, formal mental health services are scarce in

---

[87] 'African families' and caregivers' experiences of raising a child with intellectual disability: A narrative synthesis of qualitative studies'
[88] Tekola B, Kinfe M, Girma F, Hanlon C, Hoekstra RA. "Perceptions and experiences of stigma among parents of children with developmental disorders in Ethiopia: A qualitative study." Soc Sci Med. 2020 Jul;256:113034. https://doi.org/10.1016/j.socscimed.2020.113034.
[89] 'African families' and caregivers' experiences of raising a child with intellectual disability: A narrative synthesis of qualitative studies'
[90] 'African families' and caregivers' experiences of raising a child with intellectual disability: A narrative synthesis of qualitative studies'
[91] 'African families' and caregivers' experiences of raising a child with intellectual disability: A narrative synthesis of qualitative studies'
[92] "Perceptions and experiences of stigma among parents of children with developmental disorders in Ethiopia: A qualitative study."

much of Sub-Saharan Africa (with <1% of health budgets on mental health in many countries[93]), and cultural stigma around mental illness itself is common. This leaves many caregivers without professional help, relying on personal resilience. Some do find solace in faith or peer support, but many others suffer in silence, leading to high rates of burnout and depression. A UNICEF report on caregiver mental health globally emphasized that caregivers' well-being is often overlooked and needs far more attention.[94] In sum, the psychological toll of caregiving in a stigmatizing environment is a serious concern, manifesting in mental health struggles that, if unaddressed, can impair both the caregiver's and the child's quality of life.

Caregiving Challenges and Access to Services

Beyond stigma and emotional stress, day-to-day caregiving for a child with a disability in Sub-Saharan Africa can be extraordinarily challenging. Many families face financial hardship due to added expenses (medical appointments, therapies, assistive devices) and lost income (if a parent must reduce work to provide full-time care). Physical exhaustion is common, especially for caregivers of children with high-support needs or mobility impairments – tasks like lifting, feeding, or constant supervision can take a toll on the caregiver's own health. Indeed, caregivers in Africa have reported various physical and psychological morbidities related to their role.[95] One scoping review focusing on cerebral palsy caregivers in Sub-Saharan Africa noted that caregiving frequently led to negative health outcomes for the caregivers themselves, highlighting that they often lack adequate support to manage these impacts.[96]

A major issue is the lack of support services and infrastructure. Basic services that families in high-income countries might use – such as respite care, in-home therapy, or inclusive daycare – are often scarce or non-existent in many African settings.[97] Parents commonly report being left on their own to figure out daily care. Extended family networks, which are traditionally strong in African communities, do provide help in some cases; however, stigma can undermine this, as some relatives withdraw support due to shame or misunderstanding of the disability. High rates of single parenthood (often mothers raising a disabled child alone after fathers abandon the family) and poverty exacerbate the burden. Caregivers therefore must rely on their personal resilience and coping strategies to fill the gaps that formal

---

[93] https://medium.com/@esstar100/the-first-ai-mental-health-app-in-africa-friendnpal-619d13eb9909
[94] United Nations Children's Fund, The State of the World's Children 2021: On My Mind – Promoting, protecting and caring for children's mental health, UNICEF, New York, October 2021.
[95] Melak M, Fakolade A, Mekonnen S, Baraki A, Ross-White A, Batorowicz B. "The state of evidence on the health outcomes and support needs of family caregivers of children with Cerebral Palsy in Sub-Saharan Africa: a scoping review." Disabil Rehabil. 2025 Mar 7:1-16. https://doi.org/10.1080/09638288.2025.2472984.
[96] "The state of evidence on the health outcomes and support needs of family caregivers of children with Cerebral Palsy in Sub-Saharan Africa: a scoping review."
[97] 'African families' and caregivers' experiences of raising a child with intellectual disability: A narrative synthesis of qualitative studies'

systems do not address. This can include seeking informal advice, relying on faith or spiritual practices, or connecting with other parents in similar situations for mutual support.

Accessing healthcare and rehabilitation services for the child is another critical challenge. Transportation barriers loom large – simply traveling to a distant clinic or specialist can be prohibitively expensive or physically impossible, especially from rural areas.[98] Essential equipment like wheelchairs, hearing aids, or prosthetics may be unavailable or unaffordable; one review found that a "lack of assistive devices" is a common barrier that directly hampers caregivers, as they have no tools to aid the child.[99] When assistive devices are provided, they can significantly ease the physical and emotional effort of caregiving.[100] Unfortunately, such provisions are the exception rather than the norm. Caregivers also describe inaccessible healthcare facilities – clinics may not be equipped to accommodate a child with mobility or sensory needs, and healthcare workers might not be trained in disability care. As a result, routine medical needs or therapies are often unmet. A scoping review of several Sub-Saharan African countries identified stigma, poverty, transportation, and lack of trained providers as major barriers preventing caregivers of Children with Disabilities from obtaining their child's needed healthcare.[101]

The living environment can add further strain. Homes in low-resource settings might not have running water, electricity, or accessible layouts, making daily care (bathing, toileting, moving around the house) more difficult for a child with a disability. A review of caregivers of children with CP pointed out that the lack of accessible housing is a factor negatively influencing caregiver health.[102] In summary, caregivers contend with a constellation of practical challenges: financial strain, physical exhaustion, minimal external support, and logistical hurdles in obtaining care and equipment. These challenges not only affect the caregiver's capacity to support their child but can also deepen the family's poverty and isolation, creating a vicious cycle.

---

[98] "The state of evidence on the health outcomes and support needs of family caregivers of children with Cerebral Palsy in Sub-Saharan Africa: a scoping review."
[99] "The state of evidence on the health outcomes and support needs of family caregivers of children with Cerebral Palsy in Sub-Saharan Africa: a scoping review."
[100] Mortenson, William & Demers, Louise & Fuhrer, Marcus & Jutai, Jeffrey & Lenker, James & Deruyter, Frank. (2012). "How Assistive Technology Use by Individuals with Disabilities Impacts Their Caregivers A Systematic Review of the Research Evidence." American Journal of Physical Medicine & Rehabilitation / Association of Academic Physiatrists. 91(11):984-998. https://doi.org/10.1097/PHM.0b013e318269eceb.
[101] Adugna, M.B., Nabbouh, F., Shehata, S. *et al.* Barriers and facilitators to healthcare access for children with disabilities in low and middle income sub-Saharan African countries: a scoping review. *BMC Health Serv Res* **20**, 15 (2020). https://doi.org/10.1186/s12913-019-4822-6.
[102] "The state of evidence on the health outcomes and support needs of family caregivers of children with Cerebral Palsy in Sub-Saharan Africa: a scoping review."

Barriers in Education and Social Integration

Navigating a child's education and social life is often one of the greatest struggles for parents in the region. Schools in Sub-Saharan Africa are frequently ill-prepared to include children with disabilities. Many such children remain out of school entirely. Statistics paint a stark picture: in Eastern and Southern Africa, only about one-third of Children with Disabilities attend primary school, meaning the majority never receive even basic education.[103] By comparison, enrollment rates for non-disabled children are far higher, illustrating a significant inclusion gap. Even across a broader set of African countries, Children with Disabilities are much more likely to never enroll or to drop out early. According to World Bank analyses, only half of Children with Disabilities of primary school completion age can read and write, and merely one in four youth with disabilities completes secondary school.[104] These gaps have been widening over the past two decades. The reasons are manifold: schools may refuse admission to a child with an obvious disability; parents may be hesitant to send the child due to fear of bullying or the child's safety; and physical or communication barriers in school can make attendance futile without accommodations.

Where Children with Disabilities attend mainstream schools, they often face inadequate support. Teacher training in inclusive education is very limited – surveys indicate that among various in-service training topics, training on inclusive education is the least commonly provided to teachers in Africa.[105] Many teachers simply do not know how to adapt lessons or behavior management for a child with special needs, despite evidence that inclusive education benefits all learners when done properly. Moreover, lack of infrastructure (like ramps, accessible toilets, and appropriate class materials) is a major issue. In some countries, policies still favor segregated special schools (about 23% of African countries have laws calling for separate schooling for disabled children[106]), yet the capacity of special schools is nowhere near the need. Consequently, parents often have to advocate fiercely to get their child into any school, and once in, they may need to provide additional support (e.g., accompanying the child to assist in class or hiring aides if they can afford to) to keep them there. Without such advocacy, many children with disabilities simply stay at home.

Social integration outside of school is equally challenging. Peer interactions can be limited; Children with Disabilities may be left out of play and community activities due to prejudice or lack of understanding among other children. Cases of bullying and abuse have been

---

[103] "Education for children and adolescents living with disabilities in sub–Saharan Africa—The gaps and opportunities."
[104] Quentin Wodon, *et al.*, The Challenge of Inclusive Education in Sub-Saharan Africa. World Bank. 2018.
[105] The Challenge of Inclusive Education in Sub-Saharan Africa.
[106] Disabilities and Education – Sub-Saharan Africa. United Nations Education, Scientific and Cultural Organization. 2020

reported, further alienating these children. For instance, Human Rights Watch documented thousands of children with disabilities in South Africa being denied admission or left sitting at home, and those in school often faced stigma from both teachers and peers.[107] Some parents thus opt to keep the child at home to protect them from harm, though this unfortunately also limits the child's social development. Community stigma, as described earlier, means families might not bring the child to public events, religious services, or family gatherings, leading to social isolation for both the child and the caregiver. As one study noted, caregivers worried "often" about being treated differently in public, and many "felt a need to hide the problem from people in the community."[108] This isolation deprives children of valuable social learning and also cuts off caregivers from community support networks.

Another layer of social challenge comes from cultural beliefs and misconceptions. In some cases, neighbors may attribute a child's disability to bad omens or fear that it is contagious or will bring misfortune. This can result in the family being shunned. Caregivers not only have to cope with their child's condition but also attempt to educate others or dispel myths – a role for which they may feel unprepared. The cumulative effect of these educational and social barriers is that Children with Disabilities in Sub-Saharan Africa frequently lead segregated lives, with limited opportunities to learn, play, and integrate with their peers. This is in stark contrast to the vision of inclusive education and society set out by global frameworks like the UN's Sustainable Development Goals and the principle of "Leave No One Behind." It underscores why supporting caregivers is so crucial: these parents are often the primary (and sometimes only) advocates for their child's right to education and inclusion. They navigate complex systems and attitudinal barriers daily in hopes of securing a better life for their children.

The challenges outlined above are deeply interrelated. Social stigma worsens mental health, which in turn can sap the energy caregivers need to navigate services or advocate for education. Financial and service barriers amplify stress and keep children out of school, which then reinforces societal ignorance and stigma. Despite these hardships, caregivers display remarkable resilience and adaptability, often developing creative coping strategies to support their children. There is growing recognition that caregivers need support – both to preserve their own mental health and to better care for and include their children. In recent years, innovative solutions have started to emerge, leveraging technology and community-based approaches to address some of these gaps. The next sections explore how artificial intelligence (AI) tools, including generative AI, are being applied (or could be applied) to support caregivers in the areas of mental health, caregiver training, and facilitating child development and inclusion.

[107] https://www.hrw.org/news/2019/05/24/south-africa-children-disabilities-shortchanged.

[108] 'African families' and caregivers' experiences of raising a child with intellectual disability: A narrative synthesis of qualitative studies'

AI-Enabled Support for Caregivers

AI for Caregiver Mental Health Support

Advances in AI are opening new avenues to provide accessible mental health support for caregivers who may otherwise have none. One of the most promising developments is the use of AI-powered chatbots and digital therapy apps to deliver psychological support. These tools leverage natural language processing to engage users in text or voice conversations, simulating aspects of therapy or counseling. For caregivers who face stigma or logistical barriers in seeking mental health care, an anonymous, on-demand chatbot can be a vital "friendly ear." Such AI mental health assistants are available 24/7, require only a smartphone, and importantly, are stigma-free – many users feel less judged talking to a bot than to a human therapist.[109] The privacy and non-judgmental nature of AI chat platforms can encourage caregivers to open up about feelings of guilt, exhaustion, or despair that they might hide from others.

Several AI mental health initiatives have targeted low-resource settings and marginalized communities, including in Africa. FriendnPal is a notable example – launched in 2023, it is hailed as "Africa's FIRST AI mental health app," developed by a team of young Africans.[110] FriendnPal provides a conversational agent (chatbot) that users can talk to at any time for emotional support. It has integrated African language options, allowing caregivers to speak in their local dialect and still be understood by the AI. This breaks both language and cultural barriers, making mental health support more inclusive. As its founder describes, FriendnPal acts like a "trusted friend you could speak with anytime, any day, 24/7," offering a safe space free from the fear of gossip or breach of confidentiality. Early feedback indicates such tools can help reduce loneliness and anxiety, though they are not a replacement for professional care when that is available.

On a larger scale, global tech companies and healthcare providers have rolled out AI mental health apps that caregivers in Africa are beginning to access. The Wysa and Woebot chatbots, for instance, use evidence-based techniques like cognitive behavioral therapy (CBT) to guide users through managing anxiety or negative thoughts. Woebot, which markets itself as a "relational agent for mental health," has even developed specialized versions of its chatbot for specific populations – including adolescents and new mothers facing postpartum depression. Studies on Woebot and similar bots have shown that users can form a therapeutic alliance with an AI, feeling heard and supported, and that these tools can effectively reduce symptoms of depression and anxiety in many cases. For example, new mothers (a group analogous in some ways to caregivers of special-needs children, given stress and risk of

[109] Peter Farvolden, "Chatbots Break Down Barriers to Much Needed Mental Health Treatments." RGA. February 2024. https://www.rgare.com/knowledge-center/article/ai-chatbots-break-down-barriers-to-much-needed-mental-health-treatments.

[110] Esther Eruchie, October 10, 2023. https://medium.com/@esstar100/the-first-ai-mental-health-app-in-africa-friendnpal-619d13eb9909.

isolation) using Woebot reported improvements in mood and felt the bot was a helpful supplement to limited healthcare resources.

Another innovation is Vimbo, a South African app offering self-guided digital therapy for depression and anxiety. Recognizing that mental health treatment gaps in Africa far exceed global averages, Vimbo delivers interactive CBT-based modules without any human intervention. Users progress through exercises to learn coping skills, relaxation techniques, and problem-solving, all via their phone. For employers, Vimbo has been a way to support employee mental health; for caregivers, such an app could be a lifeline after a stressful day of caregiving when they need to decompress. One user of Vimbo noted, "I learned how to cope, learned how to relax and deal with issues so they did not affect me the way they did before," highlighting the empowerment that comes from accessible e-therapy.[111] Importantly, these apps can triage users – if someone indicates high distress or suicidal ideation, the AI can flag this and prompt immediate human intervention, blending tech with necessary human care.

Generative AI (GenAI) models like GPT-4 have also shown potential to aid caregiver mental health in less formal ways. ChatGPT, for example, can engage in empathetic dialogue and provide advice or information. A recent study evaluated ChatGPT-4 as a tool for parents seeking information about autism and found that its answers were largely correct, concise, and clear.[112] While the study noted the lack of actionable detail in some responses, it demonstrated the viability of such AI in answering caregivers' questions and potentially reducing the overwhelming task of sifting through online information. This indicates that large language models could be tuned to deliver psychoeducation – for instance, explaining a child's diagnosis, or offering tips for stress management – in a conversational manner that might feel more supportive than reading a pamphlet. In fact, caregivers are already informally using GenAI chatbots to vent about their day or seek words of encouragement. The ability to receive an immediate response at any hour (when a human therapist or friend might not be available) is particularly valuable. AI can also proactively check in: some systems use sentiment analysis on a user's messages to gauge their emotional state and can prompt coping strategies or alert the user if they seem to be in crisis.[113] This real-time feedback loop can help caregivers become more aware of their own mental health needs, something they often neglect while focusing on their child.

Of course, AI mental health tools come with caveats. They are not a substitute for professional counseling in severe cases, and they must safeguard user privacy and data. Additionally, cultural relevance is key: bots need to understand local expressions of distress

[111] "Chatbots Break Down Barriers to Much Needed Mental Health Treatments."
[112] McFayden TC, Bristol S, Putnam O, Harrop C. ChatGPT: "Artificial Intelligence as a Potential Tool for Parents Seeking Information About Autism." Cyberpsychol Behav Soc Netw. 2024 Feb;27(2):135-148. https://doi.org/10.1089/cyber.2023.0202.
[113] Cornelia Walther, "Artificial Intelligence in Disability Care: Unlocking Agency." Psychology Today. April 25, 2025. https://www.psychologytoday.com/us/blog/harnessing-hybrid-intelligence/202504/artificial-intelligence-in-disability-care-unlocking.

and the context of caregivers' lives to avoid misunderstandings. Despite these challenges, the emergence of AI in mental health offers a scalable, cost-effective means to support caregiver well-being. It lowers barriers of cost (many apps are low-cost or free), distance (help is available in one's home), and stigma (private and judgment-free). As these technologies improve in local language support and intelligence, they could become an integral part of mental health support networks. In settings where human resources are scarce – e.g. Malawi has only one psychiatrist for the whole country – such AI companions might be the only form of "talk therapy" feasible for many caregivers. The goal is not to replace human care, but to augment it: AI can act as a first line of support and a bridge to further help, ensuring that caregivers do not have to carry their psychological burden alone.

AI for Enhancing Caregiver Skills and Resilience

In addition to emotional support, AI tools are being used to educate and empower caregivers with skills and knowledge to better care for their children. Parenting a child with special needs often requires learning specialized techniques – whether it's managing challenging behaviors, conducting at-home therapy exercises, or using assistive equipment. Yet, formal training programs and professional guidance are limited in Sub-Saharan Africa. Here, AI can function as a personal coach or tutor, available on demand to guide caregivers through best practices and build their confidence (their *resilience*) in the caregiving role.

One groundbreaking example is Forta, a platform that combines AI with caregiver training to deliver therapy for children with autism.[114] Forta, based in the United States, offers a comprehensive 50-hour training program for parents and uses AI (including large language models) to personalize the experience. The idea is to turn parents into effective co-therapists for their own child. Through the app, parents learn principles of Applied Behavior Analysis (ABA) – a common evidence-based therapy for autism – and the AI provides real-time feedback and suggestions as they practice with their child. In effect, Forta "empowers caregivers with AI-based tools and education to deliver earlier and more effective interventions", addressing the care gap when professionals are not available. This family-powered therapy model has yielded impressive results: a peer-reviewed study reported that 76% of children in Forta's program showed improvement in achieving their therapy goals, significantly higher than those receiving traditional approaches.[115] This case illustrates how AI can amplify the reach of clinical expertise – by guiding caregivers step-by-step, the system ensures fidelity to therapy techniques, and by analyzing each child's progress data, it can adjust the strategies to what works best (a level of personalization hard to achieve in overburdened clinic settings). Forta has recently secured major funding to expand this model, indicating confidence in scaling AI-assisted caregiver training.

[114] https://www.fortahealth.com/

[115] Garikipati A, Ciobanu M, Singh N, et al. (March 27, 2023) Clinical Outcomes of a Hybrid Model Approach to Applied Behavioral Analysis Treatment. Cureus 15(3): e36727. https://doi.org/doi:10.7759/cureus.36727.

In a similar vein, Social Mind Autism is a platform (founded by an Israeli pediatrician and autism mom) that leverages AI to coach parents in improving their child's social communication skills.[116] Social Mind uses natural language processing to analyze interactions between the parent and child – for example, it might monitor a parent's language complexity or responsiveness, and the child's initiations – and then provides tailored tips to enhance those interactions. The AI essentially personalizes social skills training for each parent–child dyad, adapting to their specific needs and learning styles. By collecting data on what the caregiver and child are doing in real life, it can highlight strengths and suggest tweaks in approach (e.g., encouraging a parent to pause longer to let the child respond, or to use certain words to elicit communication). This data-driven coaching helps build parents' skills over time. Early implementations have shown promise in boosting children's social engagement and giving parents a greater sense of agency in their child's progress.

Beyond autism-specific tools, more general AI-driven educational resources are emerging. Large language model assistants like ChatGPT can function as on-call advisors for caregivers, providing quick answers to "How do I handle X situation?" For instance, a parent concerned about their child's aggressive behavior could ask an AI for strategies and get a list of evidence-based tips in seconds. The aforementioned study on ChatGPT's responses about autism found the information to be mostly accurate and clear. Imagine extending that to a wide range of topics – from how to teach a non-verbal child to use picture cards, to toilet-training a child with developmental delays. AI could democratize access to the vast body of parenting and therapy knowledge that is otherwise locked away in professional circles or dense manuals. However, these AI systems must be well-curated to provide actionable and safe advice. In the study, ChatGPT was less strong on actionable next steps, possibly because it avoids giving specific guidance. Efforts are underway to improve this, for example, by integrating AI with databases of proven parenting programs.

Another area where AI can bolster caregiver capacity is through simulation and scenario-based training. Virtual Reality (VR) or augmented reality tools enhanced by AI can let caregivers practice challenging scenarios in a safe environment. For example, a VR program might simulate a public outing with an autistic child who starts having a meltdown; the caregiver can try different calming techniques, and the AI provides feedback on what seemed to work best. While still experimental, such approaches could build caregiver confidence and preparedness. In regions where formal training workshops are rare, an AI-based interactive training delivered via a smartphone (possibly using simple gamified simulations instead of fancy VR hardware) could be a practical solution.

AI can also help monitor caregiver well-being and skills over time. Some apps use voice analysis or questionnaires to check a caregiver's stress levels or detect signs of burnout, then proactively offer resources. For instance, a system might notice from a caregiver's input (text or spoken) that they are feeling hopeless or frustrated; it could then suggest a brief

[116] https://socialmindautism.com/

mindfulness exercise or connect them to an online support group. In one concept described by researchers, an AI could even alert a trusted family member or community health worker if a caregiver shows signs of severe distress, ensuring human follow-up.[117] Additionally, AI can remind caregivers of important routines for resilience – such as encouraging them to take short breaks or guiding them through breathing exercises, essentially acting like a "coach" for the caregiver's own self-care.

While these innovations are promising, it is important to consider accessibility in the African context. Many caregivers have basic mobile phones and limited internet. Thus, AI solutions must be delivered in lightweight formats – for example, via SMS or audio calls for text-based bots, or offline-first apps that don't require constant data connectivity. Encouragingly, some AI solutions (like certain chatbots) have been integrated with popular platforms like WhatsApp, which can work on low bandwidth and are familiar to users. Additionally, content must be in local languages and reflect local realities (e.g., suggesting solutions that don't assume expensive materials or services). Efforts like FriendnPal's multi-language support are steps in the right direction.

Finally, an often-overlooked aspect is ethical AI usage and data privacy. Caregivers learning or seeking help via AI should be protected from misuse of their data and from biased or harmful advice. Transparent design, community co-creation, and oversight by healthcare professionals are needed to ensure these AI tools truly help rather than inadvertently harm. Assuming these considerations are addressed, AI has the potential to massively scale caregiver training and support, creating a future where no parent feels ill-equipped to help their special-needs child due to a lack of knowledge or guidance.

AI Aiding Children's Inclusion, Education, and Psychosocial Development

The ultimate goal of supporting caregivers is to improve the lives of Children with Disabilities. AI technologies can directly assist in the inclusion, education, and psychosocial growth of these children, often by equipping caregivers (and teachers) with new tools to support the child. In Sub-Saharan Africa, where resources for special education and therapy are limited, AI-powered assistive technologies can help bridge gaps and create opportunities for children to learn and socialize in ways that were not previously possible.

One key area is communication and social interaction, especially for children who are non-verbal, deaf, or have social-communication difficulties (like autism). AI-driven Augmentative and Alternative Communication (AAC) systems have become transformative. These range from mobile apps that use symbols and text-to-speech to help a non-verbal child "talk," to more sophisticated AI that can recognize what a child is trying to convey. A recent UNESCO report on inclusive education highlighted how AAC tools (such as specialized communication

[117] https://www.psychologytoday.com/us/blog/harnessing-hybrid-intelligence/202504/artificial-intelligence-in-disability-care-unlocking.

software) can "enhance engagement and social participation for students with severe disabilities."[118] For example, if a child has cerebral palsy and cannot speak, an eye-tracking AAC device lets them select icons on a screen and converts them to spoken words. Modern versions of these devices use AI to predict the user's intended words or phrases, speeding up communication and making conversations more natural. Caregivers play a role in programming and modeling the use of AAC, and when they have access to such technology, it significantly improves the child's ability to express needs and interact with others, both at home and in school.

Another domain where AI is making a difference is educational content adaptation. Children with disabilities often need individualized instruction or materials (for instance, simplified text for a child with intellectual disability, or auditory content for one who is blind). AI systems can automate parts of this adaptation. For example, text simplification algorithms can rephrase reading passages in simpler language for a child with cognitive challenges. Text-to-speech and speech-to-text technologies, powered by AI, allow children with visual or reading impairments to access written content and participate in written activities. Mainstream devices and apps now incorporate these: Apple and Android devices have screen readers (Voiceover, Talkback) that use AI to describe what's on screen, and apps like Seeing AI (by Microsoft) can narrate the environment, read documents aloud, and even describe scenes and objects to a blind or low-vision user. For a child in a rural African school with limited Braille materials, being able to use a smartphone camera and have printed text read out can be revolutionary. Similarly, AI-based transcription tools (like Google's Live Transcribe or Otter.ai) can turn a teacher's spoken lesson into real-time text captions for a student with hearing impairment, or even translate it to another language if needed. These assistive tools are increasingly available via smartphones, which are becoming more common even in low-resource areas – meaning a caregiver or teacher can fairly easily acquire them and teach the child to use them. They effectively act as digital assistive companions that help the child overcome accessibility barriers in the classroom and beyond.

AI is also enabling personalized and remote learning for children who cannot attend regular school or need supplemental tutoring. Intelligent tutoring systems and educational games can adjust to a child's pace and learning style. For instance, an AI math tutor can present problems in different ways or give more practice on certain types of problems where the child struggles. In the context of disability, an AI tutor might incorporate multi-sensory approaches (visual, auditory, interactive) to suit a child's needs. During the COVID-19 pandemic, the value of such tools became apparent globally, and they remain crucial for children who might be home-bound due to disability or lack of inclusive schools. In Africa, initiatives to use radio, TV, and basic phones for education have been augmented by AI that can provide interactive features (for example, an SMS-based quiz system that tailors

[118] UNESCO IITE. 2024. Innovative Technologies for Inclusive Education: A Review of Best Practices from Global Resource Centers

questions to the student's level). Though still nascent, these approaches hold promise for reaching children with disabilities in remote areas.

One particularly exciting field is the use of socially assistive robots and AI toys for psychosocial development. Research worldwide has shown that children on the autism spectrum often respond well to robotic playmates – robots can engage them in repetitive practice of eye contact, turn-taking, or emotion recognition in a way that is engaging and non-threatening. A systematic review and meta-analysis in 2022 concluded that robot-mediated interventions significantly improve the social functioning of autistic children and youth (with a moderate effect size), especially in younger children.[119] Improvements were noted in skills like imitation, joint attention, and social engagement. In practice, this might involve a child interacting with a humanoid robot that can display simple facial expressions or play games that reward social behaviors. For example, a robot might only continue a game when the child looks at it (thus encouraging eye contact), or it might model appropriate greetings and prompt the child to try. In South Africa, engineers have worked on affordable robots that dance, play soccer, or mimic children's behaviors to build rapport and help kids practice social skills. One engineer explained that *"robotics may not be the cure, but it can help them practice their social skills... and gain more confidence in their human interactions."*. While these robots are still expensive and mostly in research pilots, the costs are gradually coming down. Even simpler AI toys (like AI-enhanced dolls or smart speakers) can serve as interactive partners for children to practice communication. Caregivers who have access to such tools can use them as part of home-based therapy and play, augmenting what few therapists there are.

AI can further help children's inclusion by enhancing mobility and independence. For children with physical disabilities, AI-powered prosthetics and wheelchairs are being developed that can adapt to the user's movements and environment. In Nigeria, for instance, the "Walk Again Project" is using AI and 3D printing to create affordable prosthetic limbs that integrate with the user's neural signals. As these become available, a child who might have been home-bound could potentially move around more freely and even participate in school or play. Even more immediately, navigation apps like Google Maps now include accessibility information (like wheelchair-accessible routes), and projects like Wheel map crowdsource the locations of ramps and accessible facilities. AI plays a role in analyzing and updating this data in real-time. A caregiver can use such an app to plan an outing knowing which paths or public transport are accessible for their child's wheelchair, reducing the hassle and risk of venturing out.

It's worth mentioning the role of policy and systemic efforts where AI can assist. Governments and NGOs are starting to collect better data on Children with Disabilities,

---

[119] Kouroupa A, Laws KR, Irvine K, Mengoni SE, Baird A, Sharma S (2022) The use of social robots with children and young people on the autism spectrum: A systematic review and meta-analysis. PLoS ONE 17(6): e0269800. https://doi.org/10.1371/journal.pone.0269800.

using AI analytics to identify gaps – for example, analyzing where clusters of out-of-school disabled children are, so they can target interventions. AI can help simulate the impact of different policies (like where to deploy itinerant special educators or how a cash assistance program might improve outcomes for families). Though less direct, these applications contribute to creating an environment where inclusion is feasible.

The above examples show that AI can be a powerful enabler for children's development, but scaling them in Sub-Saharan Africa will require addressing the digital divide. Many of these technologies assume electricity, internet, and a certain level of infrastructure. Thus, a parallel effort to provide schools and communities with the necessary technology (solar chargers, internet access, devices) is needed. Encouragingly, there are initiatives like the UNICEF Innovation Fund and NGO programs that pilot assistive tech in African countries, demonstrating local feasibility. For example, in classrooms in Uganda, simple tablet-based AI tutors have been used for children with learning difficulties, with some success in improving literacy. In Kenya, as noted, AI for sign language is being actively explored in schools. And across several African countries, inclusive education resource centers (often supported by NGOs) are introducing teachers to AI-based assistive tools and sharing best practices (many of which were documented in the 2025 UNESCO report).

In terms of psychosocial development, it's crucial that technology doesn't replace human interaction but supplements it. AI can help a child practice, but children still need human relationships for deeper emotional growth. Caregivers, freed a bit from the drudgery by AI aids, can ideally spend more quality time bonding with their child. For instance, if an app helps a child learn basic literacy, the parent might have more time to play and socialize with the child rather than act as a full-time teacher. In communities where disability previously meant exclusion, seeing children using tablets, apps, or talking through a voice device can also slowly change attitudes – technology can act as a social ice-breaker that draws curiosity and engagement from peers.

To illustrate how these pieces can come together, imagine a rural African mother with a child who has a developmental disability. With emerging technology, she might have a mobile chatbot counselor to talk to when she feels overwhelmed (supporting her mental health), an AI-powered guide on her phone that teaches her therapy activities and caregiving skills (building her capacity), and an assistive app or device for her child that allows him to communicate his needs and learn (enhancing the child's development). She could connect with other parents in a moderated online group to share experiences, and use a local language AI assistant to get information on her child's condition and rights. While this scenario might currently be enjoyed by only a small fraction of caregivers (likely those in urban areas or involved with pilot projects), it represents a plausible and attainable future as AI tools become more widespread and affordable.

Conclusion

Parents and caregivers of children with disabilities in Sub-Saharan Africa confront significant hurdles – from combating social stigma and safeguarding their own mental health, to mastering specialized caregiving skills and fighting for their child's right to education and inclusion. These challenges, as we have seen, are intertwined and exacerbated by factors like poverty, limited services, and cultural misconceptions. Yet, amid these difficulties, caregivers show extraordinary resilience and dedication. Supporting them is not just an act of compassion but a smart investment in the well-being and potential of millions of children.

Artificial Intelligence, despite being a cutting-edge technology often associated with high-tech settings, is proving to be a surprisingly versatile ally in this context. AI tools, when thoughtfully designed and deployed, can help *chip away at longstanding barriers*: they provide private counseling to a mother who has no one to talk to, coaching to a father learning how to help his child walk or speak, and a voice to a child who otherwise couldn't effectively communicate or learn. From the AI chatbots easing mental burdens by offering emotional support and reliable information, to the AI tutors and assistive devices building skills and autonomy, technology is empowering caregivers and children to transcend some limitations imposed by their environment.

Of course, AI is not a silver bullet. Technology alone cannot erase social stigma or fully replace the need for human professionals. There are valid concerns about unequal access – we must ensure that rural or poor communities are not left behind by a new "digital divide." Moreover, ethical use of AI (privacy, consent, avoiding bias) is paramount, especially when dealing with vulnerable populations. Any AI interventions should be user-centered, developed with input from the caregivers and children themselves to truly meet their needs and gain trust. Capacity-building is also key: caregivers need training to use these tools, and local tech support should be available when things break or need updating.

Despite these caveats, the case studies and innovations highlighted in this report demonstrate tangible progress. A decade ago, it would have been hard to imagine an African mother in a village using a smartphone app to get therapy tips, or a deaf child in a public school following the lesson through an AI interpreter. Today, these are happening on a pilot scale, and tomorrow they can be a common reality. It is a testament to human ingenuity and the universal desire of parents to do the best for their children. One promising aspect of AI solutions is their scalability – with the right investments, an app developed in one country can be adapted and rolled out in many others at relatively low cost.

Looking ahead, multi-sector collaboration will be essential. Governments need to incorporate these technologies into their national disability and education strategies (for instance, by adopting AI-assisted inclusive education tools as part of standard practice, or by regulating and endorsing mental health chatbots for wider use). NGOs and community organizations, which often have the closest relationships with caregivers on the ground, can help with training and trust-building, ensuring that AI tools are used effectively and ethically. Tech companies and research institutions should continue to innovate while focusing on affordability and localization – the solutions must function in local languages, and ideally work offline or with minimal connectivity, given Africa's infrastructure challenges. Encouragingly, we see more hackathons, innovation challenges, and research funding aimed at assistive tech and AI for good in Africa, signaling a growing ecosystem.

In conclusion, the journey of a caregiver of a child with a disability in Sub-Saharan Africa is fraught with obstacles, but it is not one they need to travel alone. Society is beginning to recognize these caregivers not as objects of pity or blame, but as heroes who deserve support. Combating social stigma will require continuous community education and advocacy – including leveraging media and success stories to change narratives. Improving mental health will require both high-tech (AI and telehealth) and low-tech (peer groups, lay counselor programs) interventions to reach all who need help. Enhancing caregiving skills and children's inclusion will require reimagining service delivery, with AI serving as a force multiplier for limited human expertise.

Chapter 12

Bridging the Data Gap: Disability Representation in AI Datasets

Introduction

Artificial Intelligence (AI) systems are only as good as the data they learn from. For the one billion people worldwide living with disabilities (roughly 15% of the global population, including 10–20% in Africa), inclusive data is critical.[120] Yet too often, PWDs are invisible in the datasets used to train AI models. This lack of representation has serious consequences: AI-enabled tools may not recognize adaptive equipment, misunderstand disabled users, or unfairly exclude them from opportunities.[121] This section examines how bias regarding disability is reflected in datasets, the forms this bias takes, and how it affects AI tool development. It also surveys current efforts by companies and NGOs to create disability-inclusive data, with a focus on challenges and initiatives in sub-Saharan Africa (notably Ghana, Kenya, and Rwanda). Finally, it offers recommendations to improve data inclusion and mitigate bias, drawing on recent research and industry practice from the past decade.

Bias in AI Datasets and Persons with Disabilities

AI datasets frequently suffer from disability bias – systemic underrepresentation or misrepresentation of PWDs. Several patterns of bias have been identified in the literature:

Exclusion and Underrepresentation: Many datasets simply omit disability data. In some cases, data collectors choose not to record disability status at all, treating it as too sensitive or not relevant.[122] This non-inclusive approach means PWDs in the data are not labeled as such, effectively rendering disability invisible. Even when disability is recorded, datasets may undersample this population – failing to include a sufficient number of disabled individuals or examples of assistive technology in use.[123] For instance, a recent Microsoft study found that "disability objects" like braille devices appeared far less frequently in popular image datasets, causing image-recognition AI to identify them about 30% less accurately than common objects.[124] When disability is captured in AI datasets, bias in the data—or in the model's parameters—can lead to negative sterotypes. For example, a recent study on text-to-image generative AI models found that these models frequently produce narrow, reductive images that reinforce negative stereotypes, particularly by over-associating disability with wheelchair use and portraying disabled people as helpless, isolated, or emotionally burdened.[125] In short, people with disabilities often fall outside the

[120] Kaaniru, Josephine. "AI Assistive Technologies (ATs) for Persons with Disabilities (PWDs) in Africa." *Center for Intellectual Property and Technology Law (CIPIT)*, 2023. https://www.cipit.strathmore.edu.
[121] Abiykafia, Ariana, Bogen, Miranda, and Swenor, Bonnielin, "To Reduce Disability Bias in Technology, Start with Disability Data." *Center for Democracy and Technology (CDT)*, July 2024.
[122] To Reduce Disability Bias in Technology, Start with Disability Data."
[123] https://blogs.microsoft.com/on-the-issues/2024/10/17/disability-data-improving-representation-to-drive-ai-innovation.
[124] *Id.*
[125] Kelly Avery Mack, Rida Qadri, Remi Denton, Shaun K. Kane, and Cynthia L. Bennett. 2024. "'They only care to show us the wheelchair': Disability Representation in Text-to-Image AI Models."

AI's "norm," becoming statistical outliers who are poorly served by models optimized for the majority.[126]

Inaccurate Data and Mislabeling: Even when disability data is collected, it may be inaccurate or inconsistent. How disability is defined varies widely – legal, medical, and social definitions differ – and these inconsistencies can lead to erroneous or non-comparable data.[127] For example, one system might count only mobility impairments while another includes chronic illnesses, yielding conflicting results. Data about a person's disability can be recorded incorrectly, or other personal data may be wrong (e.g. a person's assistive device noted as an "anomaly" rather than a tool). Such errors are compounded when datasets are aggregated. Mistakes in surveys or misclassification during data processing will skew the training data, leading AI models to learn false associations about disability. The Center for Democracy & Technology warns that these faulty data points produce algorithms "more likely to work poorly, result in errors, or lead to inequity for both disabled and nondisabled people".[128]

Stereotypes and Negative Associations: Bias can also take the form of harmful ableist stereotypes encoded in data. AI systems trained on internet images and text often inherit society's stigmas about disability. As noted above, an analysis of popular text-to-image generation models found significant bias in how they portray PWDs – most generated images showed disabled individuals as elderly, sad, and in manual wheelchairs, reflecting a narrow, pity-oriented trope.[129] In language data, researchers have found that sentiment analysis and toxicity detection models treat content about disability more negatively. One study showed that statements mentioning people with disabilities were rated as significantly more "negative" or "toxic" by AI models compared to similar statements not mentioning disability.[130] This suggests models picked up implicit ableist biases from their training corpora, associating terms like "disabled" with negative sentiment. Such learned biases can lead AI to flag neutral disability-related posts as harmful or to generate disrespectful

In Proceedings of the CHI Conference on Human Factors in Computing Systems (CHI '24), May 11–16, 2024, Honolulu, HI, USA. https://doi.org/10.1145/3613904.3642166.

[126] Whittaker, Meredith, *et al*., "Disability, Bias, and AI." *AI Now Institute at NYU*, November 2019.

[127] Newman-Griffis, D., Rauchberg, J. S., Alharbi, R., Hickman, L., & Hochheiser, H. (2023). "Definition drives design: Disability models and mechanisms of bias in AI technologies." *First Monday*, *28*(1). https://doi.org/10.5210/fm.v28i1.12903.

[128] "To Reduce Disability Bias in Technology, Start with Disability Data."

[129] "'They only care to show us the wheelchair': Disability Representation in Text-to-Image AI Models."

[130] Pranav Narayanan, Venkit Mukund, Srinath Shomir Wilson. "Automated Ableism: An Exploration of Explicit Disability Biases in Sentiment and Toxicity Analysis Models." Proceedings at the Third Workshop on Trustworthy Natural Language Processing collocated at the 61st Annual Meeting of the Association for Computational Linguistics. 2023. https://doi.org/10.48550/arXiv.2307.09209

outputs. Without intervention, AI will mirror and even amplify societal stigmas present in the data.[131]

Data Collection Barriers: The way data is collected often excludes people with disabilities by design, further biasing datasets. Traditional data gathering methods may not accommodate disabled participants – surveys might be in print or online formats incompatible with screen readers, telephone poles miss people who are Deaf, and researchers may avoid institutions like group homes or clinics where many disabled people live.[132] In many communities, heavy stigma causes individuals to avoid identifying as disabled on forms or censuses. This underreporting due to social pressure or fear skews the data that governments and companies collect, painting a misleading picture that marginalizes disability. As the Next Step Foundation observes, "the stigma surrounding disability can…result in significant underreporting in data collection efforts, further skewing the representation of disabled individuals in technology systems".[133] All these gaps mean AI developers often don't even realize their training data is missing parts of the disability community. The end result is AI models with a "blind spot" for disability – systems that fail to account for the unique experiences and needs of disabled individuals.

Impact on AI-Enabled Tools and Services

When disability bias permeates training data, the effects ripple through AI-enabled tools in critical domains. Biased datasets produce models that underserve or even harm people with disabilities:

1. In employment and education, AI screening tools may unfairly filter out disabled candidates. Resume algorithms trained on biased history data might down-rank applicants with gaps due to illness. Video interview AIs that analyze facial expression and eye contact have flagged blind or low-vision candidates for "lack of focus," mistaking a disability trait for a performance issue.[134] Such systems reflect the data they learned from – data which likely had few (or unlabeled) disabled examples – and thus carry implicit norms about behavior. The result is qualified disabled people being removed from job and school applicant pools by an algorithmic gatekeeper.
2. In healthcare, machine learning models can reproduce ableist assumptions from clinical data. Diagnostic algorithms may be less accurate for disabled subpopulations if those groups were underrepresented in training studies. Notably, biases in healthcare AI have led to lower-quality care or denial of services: algorithms used in Medicaid allocation underestimated needs of people with disabilities, cutting their

131 https://afb.org/research-and-initiatives/empowering-or-excluding/guiding-principles-more-disability-inclusive-ai
132 "To Reduce Disability Bias in Technology, Start with Disability Data."
133 https://nextstepfdn.org/ensuring-fair-representation-in-disability-data/.
134 "To Reduce Disability Bias in Technology, Start with Disability Data."

home care hours based on biased cost data.[135] Likewise, a hospital discharge AI showed bias in deciding who "should" stay or go, which could disproportionately push out patients with disabilities if the training data treated their extended recoveries as anomalies.[136] These examples underline how data-driven bias translates to life-altering consequences, from loss of benefits to poorer health outcomes.

3. For everyday technologies, lack of disability-inclusive data limits usefulness and can reinforce marginalization. Voice assistants and speech recognition often struggle with non-standard speech (e.g. slurred or dysarthric speech common in cerebral palsy or after a stroke) because training datasets contain mostly "typical" voices. As a result, users with speech impairments are misunderstood by smart home devices or dictation software, effectively locking them out of an increasingly voice-activated world.[137] Similarly, computer vision systems have mislabeled or ignored mobility aids – a cane or wheelchair might be misidentified as "miscellaneous object" because so few images in the training set included them. In one case, an automated image captioning model failed to describe the presence of a guide dog next to a blind person, focusing only on the sighted people in the photo.[138] Such omissions perpetuate the erasure of disability in digital content. Even web accessibility tools can backfire if not trained on inclusive data: AI auto-captions that garble sign language or screen reader voiceovers that skip complex images can frustrate users. In short, biased data yields biased AI, which in turn can deepen the digital divide for persons with disabilities.

AI ethicists note that these problems are not simply technical glitches but rooted in a normative view that treats the "average" non-disabled user as the default. Adding more data without changing collection practices won't fix the issue if that data continues to ignore or mislabel disability. As disability scholars have pointed out, many AI tools implicitly position disability as a deviation to be corrected – for example, apps that train autistic people to mimic neurotypical eye contact.[139] Such designs, arising from biased assumptions, risk encoding ableism into technology. The first step to breaking this cycle is to confront bias at its source: the data. Several organizations, from tech companies to advocacy groups, are now working to fill the disability data gap and make AI more inclusive.

Initiatives for Disability-Inclusive Datasets in AI

Recognizing the data gap, companies and NGOs have launched efforts to collect better data and ensure AI is inclusive of disabled people. Over the past decade, these initiatives have

---

[135] "To Reduce Disability Bias in Technology, Start with Disability Data."
[136] *Id.*
[137] https://www.disabilityinnovation.com/news/google-university-of-ghana-and-gdi-hub-to-expand-ai-powered-speech-recognition-for-non-standard-speech-in-ghanaian-languages.
[138] https://blogs.microsoft.com/on-the-issues/2024/10/17/disability-data-improving-representation-to-drive-ai-innovation/.
[139] "Disability, Bias and AI."

focused on creating representative datasets, forging cross-sector partnerships, and developing guidelines for inclusive AI. Below are some notable examples:

Microsoft – "AI for Accessibility" and Data Collaborations: Microsoft has invested in improving disability representation in AI through its AI for Accessibility program and research collaborations. In 2024, Microsoft announced a partnership with the visual assistance app Be My Eyes[140] to gather high-quality, disability-representative video data for training AI vision models. By leveraging Be My Eyes' network (which connects blind users to volunteers via video), Microsoft can obtain diverse imagery of real-world scenarios from the perspective of blind and low-vision people. This collaboration aims to enrich training datasets with more instances of assistive devices, varied lighting conditions, and contexts that reflect blind users' daily lives.[141] The goal is to boost the accuracy of image-captioning and scene description AI, making them more useful for the 340 million people worldwide who are blind or have low vision. Microsoft's Chief Accessibility Officer notes that too often "disability is underrepresented or incorrectly categorized in datasets," leading to a "disability data desert" that limits AI utility and perpetuates stereotypes.[142] By filling this desert with inclusive data (while upholding privacy and transparency), Microsoft hopes to set a precedent for responsible AI development. In addition to data collection, Microsoft and others have published best-practice guides urging AI teams to evaluate their training data for disability diversity and to involve people with disabilities in dataset curation and testing.[143]

Disabilities in these languages have been virtually absent in global AI datasets. The outcome will be AI speech models that understand a Ghanaian with cerebral palsy speaking Twi, for example, something at which standard English-trained models would likely fail. Google's collaboration in Ghana exemplifies a broader trend of tech companies teaming up with academic and non-profit organizations to produce inclusive datasets. By focusing on local languages and leveraging community engagement, such projects ensure AI solutions are developed "by Africa, for Africa," and benefit global AI progress as well. Similar efforts are underway in other regions: in 2022 Google open-sourced a multilingual speech corpus from Euphonia to assist researchers worldwide in building accessible voice interfaces.[144]

Global Disability Innovation Hub (GDI Hub) and AT2030: On the NGO side, the London-based GDI Hub has been a leader in fostering disability-inclusive innovation, particularly in developing countries. Through the UK Aid-funded AT2030 program, GDI Hub supports projects that collect data and create tech solutions for disability inclusion. The

140 https://www.bemyeyes.com/
141 https://blogs.microsoft.com/on-the-issues/2024/10/17/disability-data-improving-representation-to-drive-ai-innovation.
142 *Id.*
143 https://afb.org/research-and-initiatives/empowering-or-excluding/guiding-principles-more-disability-inclusive-ai.
144 https://research.google/blog/personalized-asr-models-from-a-large-and-diverse-disordered-speech-dataset/.

Ghana speech-recognition project above was backed by AT2030, and GDI Hub provided expertise and grant management. GDI Hub also helped organize a series of African forums on AI and assistive technology (including research led by Strathmore University in Kenya) to map current tools and gaps. A 2024 report from these efforts, "AI Assistive Technologies for Persons with Disabilities in Africa," highlighted the lack of representative datasets as a major barrier and laid out a roadmap for improvement.[145] By publishing data on existing projects (like Kenya's AI4KSL sign-language translation system and Nigeria's "Walk Again" low-cost prosthetics project), the report draws attention to successes while advocating for stronger data infrastructure. Other NGOs are focusing on inclusive data, such as Sightsavers' Inclusive Data Charter Action Plan[146], and CBM's Inclusive Data Charter[147], which are pushing for more inclusive data principles. These Inclusive Data Charters are a commitment by organizations and governments to improve disaggregated data on marginalized groups, including persons with disabilities. These initiatives emphasize that without better data on disability – from national statistics to AI datasets – efforts to "leave no one behind" in technology will falter.[148]

Research Communities and Open Data Platforms: Academic researchers in AI and accessibility are contributing by surfacing and sharing datasets. For example, the University of Maryland's Inclusive Dataset project created IncluSet, a repository where developers can discover and contribute accessibility-related datasets.[149] Datasets in IncluSet cover a range of needs (e.g. sign language video corpora, screen reader user web interaction logs, wheelchair navigation maps), helping to make these resources more widely available for training and testing AI models. The intent is to break down silos so that a dataset collected for one assistive technology can be reused to spur others – all while respecting privacy and consent. Additionally, organizations like the American Foundation for the Blind (AFB) have convened expert panels to issue guiding principles on AI and disability. In 2022, AFB's inclusion white paper urged that "data used to train AI models should include sufficiently diverse data to be representative of people with a range of disability types," and that dataset creators should evaluate and disclose how well their data captures disability diversity or if it encodes stigma.[150] These community-driven efforts underscore that achieving fairness for PWDs in AI is a shared responsibility – requiring action from those who collect data, build models, and deploy solutions alike.

[145] "AI Assistive Technologies (ATs) for Persons with Disabilities (PWDs) in Africa."
[146]
[147] https://cbm-global.org/news/inclusive-data-charter-action-plan.
[148] https://unstats.un.org/unsd/undataforum/blog/the-inclusive-data-charter-whats-it-all-about.
[149] https://mida.umd.edu/exploring-the-role-of-datasets-sourced-from-people-with-disabilities/.
[150] https://afb.org/research-and-initiatives/empowering-or-excluding/guiding-principles-more-disability-inclusive-ai.

Challenges in Sub-Saharan Africa: Focus on Ghana, Kenya, and Rwanda

Countries in sub-Saharan Africa confront unique hurdles in building disability-inclusive AI, often due to scarce data and resources. Ghana, Kenya, and Rwanda illustrate both the challenges and the nascent progress in the region:

Data Scarcity and Localization Gaps: A consistent challenge is the lack of comprehensive, local datasets that include people with disabilities. African AI developers struggle to find large, high-quality data in African languages or reflecting African contexts. Most readily available AI training data (from image collections to speech corpora) is drawn from Western settings – meaning it over-represents Western populations and languages and under-represents African people and PWDs in those societies. The result is AI tools that don't understand local needs. For example, a Kenyan sign-language translation model needs video data of Kenyan Sign Language (KSL) in use, but such data is extremely limited compared to American Sign Language datasets. Likewise, voice assistants to serve Rwandans with disabilities would require Kinyarwanda voice data, including examples of speech impairments – a niche almost non-existent in current global corpora. The AT2030 African report confirms that "many AI models…rely on large volumes of data for training. However, African developers struggle to access such datasets, particularly those in local languages, resulting in technologies often unable to address the specific needs of African PWDs."[151] This data desert is further exacerbated by the dominance of big tech companies: Western firms like Amazon, Google, Meta, Microsoft, and OpenAI have amassed extensive datasets (including some disability data), but this data is not readily accessible to local African startups or researchers. Thus, African innovators face an uphill battle to create inclusive AI with limited training fuel.

Stigma and Underreporting: Social factors also affect disability data in Africa.[152] In many communities, disability carries stigma or is viewed through a charitable/medical lens rather than a rights-based lens. Families may hide disabled members, and individuals may be reluctant to self-identify as disabled in surveys or censuses. Consequently, national statistics undercount people with disabilities, and the data that does exist may emphasize medical conditions over functional needs. Ghana, Kenya, and Rwanda have all conducted disability surveys in recent years (often using the Washington Group question sets to improve identification), but underreporting remains an issue, especially for intellectual and psychosocial disabilities that are less visible. For example, Kenya's 2019 census determined that 2.2% of Kenyans live with some form of disability.[153] This is significantly lower than the

[151] "AI Assistive Technologies (ATs) for Persons with Disabilities (PWDs) in Africa"
[152] "To Reduce Disability Bias in Technology, Start with Disability Data."
[153] "Status Report on Disability Inclusion in Kenya, 2021: Implementation of the Global Disability Summit Commitments of 2018." November 2021.

16% that the WHO calculates as the global average.[154] This societal undercount means that training data drawn from public records or services will likewise underrepresent the true population of PWDs. Additionally, if AI developers are not attuned to local cultural nuances – for instance, varying attitudes toward albinism or epilepsy – the data they collect and the models they build could inadvertently reinforce local biases or superstitions. In short, data quality issues (gaps, biases, inaccuracies) are often even more pronounced in low-resource settings, making inclusive AI development in Africa especially challenging.

Resource Constraints and Policy Gaps: Limited funding, infrastructure, and policy support further complicate matters. A significant portion (around 43%) of assistive technology innovations in Africa are driven by small startups or research groups.[155] These local innovators often lack resources to collect large datasets from scratch – tasks like annotating thousands of images or recording hours of speech require time and money that might be in short supply. Internet access and smartphone ownership are also lower among Africans with disabilities, meaning there is less user-generated data (like social media or search data) representing their experiences. On the policy side, while many African nations have disability rights laws and have ratified the UN Convention on the Rights of Persons with Disabilities, technology-specific inclusion policies are lagging. [As noted in Section X], while aiming for ethical, inclusive AI, Kenya, Ghana or Rwanda's national AI policies do not specifically refer to or address disability. However, these policies (or lack thereof) are just beginning to grapple with data inclusion. Often the focus is on high-level principles like "avoid bias" or "ensure fairness," without concrete provisions for collecting disability-disaggregated data or investing in assistive tech datasets. Implementation is a concern too – policies tend to emphasize biomedical interventions for disability (e.g. healthcare access) rather than data and technology infrastructure. The lack of dedicated funding and institutions for disability data means progress relies heavily on ad-hoc projects and external grants (such as those from international NGOs or companies).

Despite these challenges, there are promising developments in Ghana, Kenya, and Rwanda showing how the situation can improve. In Ghana, the government has worked with academics and international partners to address data gaps – the "tɛkyerɛma pa" speech project with Google and University of Ghana is one example of proactive local data creation. In Kenya, a vibrant tech ecosystem has produced efforts like AI4KSL, which uses AI to translate between English and Kenyan Sign Language, and local universities (e.g. Strathmore, University of Nairobi) are researching accessible AI solutions. Rwanda has positioned itself as an ICT hub and is investing in data centers and AI research capacity with attention to data sovereignty and local capacity building – a stance that could benefit disability data if aligned with inclusion goals.

---

[154] Global report on health equity for persons with disabilities. Geneva: World Health Organization; 2022.
[155] "AI Assistive Technologies (ATs) for Persons with Disabilities (PWDs) in Africa"

Recommendations for Inclusive Data and Bias Mitigation

Addressing disability bias in AI requires systemic changes in how we collect data, build datasets, and design algorithms. The following recommendations emerge from recent research and expert consensus to improve access to disability-inclusive data and mitigate bias:

Integrate Disability in All Data Collection: Treat disability status as a standard demographic variable in data initiatives, on par with age, gender, or race. Wherever organizations collect data – be it censuses, customer surveys, health records, or educational assessments – they should include questions to identify persons with disabilities. Using standardized, inclusive measures (like the Washington Group short set of disability questions) helps ensure consistency. By normalizing the collection of disability data (with appropriate consent), we can begin to fill the enormous gaps in datasets. Importantly, data on disability should cover not just the presence/absence of disability, but relevant context (use of assistive devices, environmental barriers faced, etc.) to enrich AI training. Inclusive design starts with inclusive data – if an AI dataset captures the full spectrum of human diversity, the model is far more likely to perform equitably.

Improve Data Accuracy and Representation: It's not enough to collect disability data – the data must also be accurate, detailed, and representative. Governments and researchers should refine definitions to expand beyond narrow medical models. This means recognizing psychosocial and cognitive disabilities, temporary impairments, and the role of societal barriers in disabling people. New and more inclusive methods of defining disability (e.g. allowing self-identification and multiple response options) and of gathering data (e.g. via accessible online platforms, community-led surveys, etc.) are needed. To combat underreporting, outreach in partnership with disability organizations can encourage participation and trust. Where certain groups are hard to reach (such as people in remote or institutional settings), special efforts or sampling techniques should be used so they are not overlooked. The goal is to under-sample less – ensuring sufficient data from people with disabilities is present so that AI models can learn meaningful patterns rather than treating disabled users as outliers. Furthermore, dataset curators should proactively check for and correct biases: for instance, if image data mostly shows wheelchair users as elderly, add images of younger wheelchair users to balance the set. As one set of guidelines states, data providers should "evaluate whether their datasets represent a sufficiently diverse representation of people with disabilities or incorporate stigmas, [and] modify the datasets as needed" before model training.[156]

[156] https://afb.org/research-and-initiatives/empowering-or-excluding/guiding-principles-more-disability-inclusive-ai.

Respect Privacy and Agency: Collecting disability-related data must be done ethically, with respect for personal privacy and data security. Given the sensitivity, organizations should adopt privacy-by-design approaches – for example, using informed consent, anonymization/pseudonymization, and allowing individuals to opt out. Transparency about how disability data will be used can build trust and encourage participation. It's also important to store data in ways that are accessible to the community itself: PWDs (and disability advocates) should be able to access and analyze data about them, which means providing data in accessible formats and interfaces. Initiatives like open data portals for disability stats or shared repositories (e.g. the IncluSet platform) can empower communities to leverage data for advocacy while safeguarding identities. Essentially, we must balance the need for more data with the imperative to not harm – ethical guidelines and possibly legal standards (like strengthening disability aspects in data protection laws) can ensure data is collected with dignity and used for the benefit of the disability community.

Involve People with Disabilities in Data and AI Development: A recurring mantra is "Nothing about us without us." To mitigate bias, PWDs should be actively involved at every stage: from designing what data to collect, to labeling datasets, to auditing AI outputs. Their lived experience is invaluable for spotting flaws that others might miss (e.g. offensive labels or important variables omitted). Companies and research teams should hire and consult individuals with disabilities in data curation roles and as testers of AI systems. Participatory approaches lead to more culturally and contextually appropriate solutions. This inclusion also extends to policymaking: disabled persons' organizations (DPOs) and disability experts should be at the table when AI ethics standards or data strategies are drafted. By centering those most impacted, we ensure that definitions of fairness encompass disability and that datasets are collected in ways that truly measure what matters to disabled communities (not just what outsiders assume is important).

Audit Algorithms and Models for Disability Bias: Just as AI models are tested for racial or gender bias, they should be evaluated for disability bias before deployment. This requires developing benchmarks and test datasets that include scenarios with disabled users. For instance, an image captioning AI can be tested on a set of images featuring people with visible disabilities to see if it appropriately mentions relevant details (wheelchairs, hearing aids, etc.) or falls into problematic descriptions. Language models and chatbots should be assessed on prompts about disability to ensure they respond without prejudice or derogatory assumptions. Performance metrics should be disaggregated: does accuracy drop for inputs from disabled users? Are error rates higher for those with certain assistive devices? If so, retraining or data augmentation is needed to close the gap. Regulators and industry groups can establish standards for algorithmic fairness audits that include disability as a category, alongside other protected characteristics. Moreover, results of such audits should be transparent. A model that is known to have limitations in serving (say) blind users should come with that disclosure so it's not mistakenly applied in high-stakes settings. The commitment to auditing forces developers to reckon with disability bias and iterate towards improvement, rather than assuming their model is universal.

Build Data Infrastructure and Partnerships (especially in Low-Resource Contexts): To improve disability data in regions like sub-Saharan Africa, investment in data infrastructure is key. Governments, development agencies, and the private sector should collaborate to fund targeted data collection efforts – for example, creating open datasets for local sign languages, or multilingual speech databases that include speakers with disabilities. National statistical offices could partner with tech firms to include disability modules in household surveys and make the anonymized data publicly available for research. International donors can support the creation of data trusts or hubs that aggregate disability data from various sources (NGOs, hospitals, schools) in a country, ensuring it's centrally available for AI developers under proper governance. Public-private partnerships are a promising model: as seen with Google and the University of Ghana's speech project, or Microsoft and Be My Eyes, combining expertise and resources can yield rich, representative datasets that neither party could build alone. In Africa, initiatives like GIZ's "FAIR Forward" (focused on AI capacity building) and IDRC's sponsorship of accessibility research have started to provide funding and technical support for local data creation. Scaling these up – perhaps via an African AI for Accessibility fund – would help level the playing field. Additionally, governments should implement national strategies for assistive technology and AI that include specific commitments on data (the AT2030 report suggests establishing national bodies to oversee data and tech for disability inclusion). By treating inclusive data as critical infrastructure, countries can enable innovation that serves all citizens.

Foster a Culture of Disability Data Justice: Finally, the approach to data must be grounded in respect and justice for PWDs. This means acknowledging past harms (such as exclusionary data practices or unethical research) and working to rectify them. Adopting a "disability data justice" lens entails continuously asking who is counted and who is missing, and shifting power to PWDs in data decisions. Training and awareness are part of this cultural change: AI practitioners should be educated on disability rights and the social model of disability, so they understand that fairness isn't just a technical issue but a societal one. When teams have a growth mindset around disability data – viewing each project as an opportunity to learn and include more people – innovation follows. For example, rather than seeing data on disability as "too hard to get," teams can pilot new methods like participatory sensing (where disabled users contribute data via accessible apps) or synthetic data generation to supplement real data carefully. Moreover, celebrating positive use cases where inclusive datasets led to better outcomes can reinforce the value of this work. Over time, prioritizing disability inclusion in data will help AI move from inadvertently excluding people with disabilities to actively empowering them.

Conclusion

AI holds great promise to assist and empower persons with disabilities – but that promise will fall short unless the data driving these systems reflects the diversity of human ability. The current lack of disability-inclusive datasets has created biased tools that can marginalize the very people who could benefit most from AI. As this section has detailed, bias in datasets takes many forms (omission, mislabeling, stereotype reinforcement) and has tangible impacts on everything from hiring algorithms to everyday apps. The encouraging news is that awareness of these issues is growing, and a range of stakeholders are taking action. Tech companies are partnering with disability communities to gather better data, NGOs and researchers are mapping the gaps and developing solutions, and some governments (including in Africa) are beginning to embed inclusion into AI strategies. These efforts need to be expanded and accelerated. By implementing the recommendations – collecting disability data ethically, involving disabled voices, auditing algorithms, and investing in data infrastructure – we can work toward AI systems that are inclusive by design. In doing so, we move closer to an AI that truly "leaves no one behind," harnessing technological innovation to enhance the lives of people with disabilities rather than unintentionally hindering them. The path to equitable AI is through equitable data: it is time to ensure Persons with Disabilities are fully represented in the datasets that shape our digital future.

Chapter 13

National and Regional AI Strategies

African Union

The African Union (AU) has introduced a comprehensive policy document titled the Continental Artificial Intelligence Strategy, formally endorsed during the AU Executive Council's 45th Ordinary Session held in Accra, Ghana, on July 18–19, 2024.

Overview of the AU Continental AI Strategy

This strategy provides a coordinated roadmap for all 55 AU member states, aiming to harness the power of artificial intelligence (AI) to drive inclusive development while mitigating associated risks. It is closely aligned with both the AU's Agenda 2063 and the United Nations Sustainable Development Goals (SDGs), and it underscores the importance of ethical, transparent, and equitable use of AI across the continent.

Strategic Priorities

The strategy is built around five key focus areas:

1. Maximizing AI Benefits: Leveraging AI to drive innovation, create quality jobs, and improve service delivery across sectors, including healthcare, agriculture, education, finance, and public administration.
2. Mitigating AI Risks: Proactively addressing risks such as data bias, algorithmic discrimination, job displacement, and privacy violations to ensure AI systems remain fair and inclusive.
3. Strengthening Infrastructure: Investing in the digital infrastructure required to support AI innovation, including open data repositories and high-performance computing platforms.
4. Enhancing Regional and Global Cooperation: Promoting collaboration between AU member states and international partners to share knowledge, resources, and best practices.
5. Stimulating AI Investment: Creating an enabling environment for AI-related enterprises through favorable policies, targeted funding, and public-private partnerships.

Implementation Plan

To guide execution, the strategy includes a five-year Implementation Plan (2025–2030), which outlines the following priorities:

1. Support for member states in developing harmonized national AI policies;
2. Promotion of AI adoption in key sectors such as agriculture, education, health, culture, and climate resilience;
3. Expansion of AI-related education and skills development across the continent;
4. Establishment of governance frameworks to ensure the responsible use of AI;

5. Development of foundational infrastructure, including accessible datasets and computational resources.

Disability Inclusion

The African Union's Continental Artificial Intelligence Strategy explicitly affirms the need to include Persons with Disabilities (PWDs) in AI development and deployment. It emphasizes the importance of ensuring AI models reflect the needs and perspectives of all segments of society—including women, migrants, and PWDs—so that AI technologies contribute to inclusive progress across the continent.

The strategy highlights both risks and opportunities related to AI and disability inclusion:

- **Risks of Bias and Exclusion**: The strategy cautions that the benefits of AI are accompanied by risks such as data-driven bias, which can lead to the exclusion or discrimination of vulnerable populations—including PWDs, women, migrants, and children. It notes that these risks can extend to job displacement, the erosion of indigenous knowledge, and complex liability issues stemming from the automation of human functions.
- **Risks of Reinforcing Inequity**: AI systems may unintentionally widen existing disparities—particularly the gender digital divide—and compound discrimination already experienced by women, youth, and PWDs.

At the same time, the AU identifies several areas where AI can improve accessibility and empower PWDs:

- **Public Sector Services**: AI-powered language translation and assistance tools could enhance access to public services for PWDs and those who are illiterate.
- **Healthcare**: AI-enabled robotics hold the potential to promote autonomy and enhance the quality of life for elderly individuals and PWDs.
- **Education**: AI technologies can be harnessed to support Students with Disabilities—though the strategy stresses the need to incentivize the design of assistive tools tailored to their needs.
- **Training and Capacity Building**: The strategy calls for inclusive AI education programs that engage women, girls, PWDs, migrants, and individuals from low-income and rural backgrounds, ensuring that no one is left behind in the digital age.
- **Inclusive Innovation**: Opportunities exist to develop AI applications that enable the full participation of PWDs in economic and social life. This includes supporting research and development of AI tools that interact in local languages and provide accessible, user-friendly experiences.
- **Policy Commitment**: The strategy urges AU member states to prioritize research and innovation that serve the needs of PWDs and expand equitable access to AI resources.

Data Ecosystem

The AU strategy recognizes that Africa's capacity to compete in the global AI arena is hindered by a persistent digital divide. This gap is most acutely felt in three key areas:

- The lack of large, high-quality, and contextually relevant datasets;
- Insufficient access to high-performance computing infrastructure;
- A shortage of AI-literate professionals and skilled data practitioners.

If left unaddressed, these gaps could leave Africa behind in the race to benefit from AI's transformative potential.

Key Data Challenges

The strategy offers a clear-eyed assessment of data ecosystem barriers:

- Much of Africa's public and private sector data is either inaccessible, poorly structured, or not machine-readable.
- Valuable datasets are often siloed or monopolized by a few private actors, raising concerns about equitable access and data sovereignty.
- Government-led efforts to build open datasets—such as those related to climate, health, and geospatial mapping—are uneven in both quality and implementation.

Policy Recommendations

To close the data gap and foster inclusive AI innovation, the AU recommends several strategic actions:

- **National and Regional Data Strategies**: Encourage the development of harmonized policies for data sharing, cross-border transfers, and open access to non-personal data. This includes investment in green data centers and Internet of Things (IoT) infrastructure.
- **Ethical Data Governance**: Build legal and ethical frameworks based on the AU Data Policy Framework to ensure responsible data stewardship and privacy protections.
- **Public and Continental Data Pools**: Promote the creation of interoperable, open-access repositories to store development-relevant datasets, including those related to agriculture, health, and education.
- **Compute Infrastructure Investment**: The AU calls attention to Africa's limited presence in global data infrastructure—hosting less than 2% of the world's major data centers. Strategic investment is needed in cloud services and supercomputing capacity to overcome this imbalance.

- **Capacity Building and Data Literacy**: The strategy emphasizes the importance of public engagement, training, and education in data skills to develop a more inclusive and capable AI workforce across the continent.

Ghana

In October 2023, Ghana officially launched its National Artificial Intelligence Strategy (2023–2033), developed by the Ministry of Communications and Digitalization with support from international partners including Smart Africa, GIZ FAIR Forward, and The Future Society. The strategy marks a significant step toward positioning Ghana as a leader in AI development and deployment within Africa.

Vision and Mission

Ghana's AI strategy envisions the country as an AI-powered society by 2033, where artificial intelligence is used to enhance public services, drive economic development, and improve the quality of life for all citizens. The mission centers on leveraging AI for inclusive and sustainable growth, supported by robust digital infrastructure, ethical governance, skilled talent, and accessible data ecosystems.

Strategic Pillars

The strategy is built around eight foundational pillars:

1. **Expand AI Education and Training**
    - Integrate AI into national curricula, train educators, and scale initiatives like "AI Ready Ghana" to develop a future-ready workforce.
2. **Empower Youth for AI Careers**
    - Create pathways into the AI job market through internships, fellowships, and incentives for youth-led startups.
3. **Enhance Digital Infrastructure and Inclusion**
    - Improve national broadband coverage, expand access to cloud services, and establish localized data centers to support AI growth.
4. **Facilitate Data Access and Governance**
    - Strengthen laws and platforms governing data privacy and sharing, and build a national open data infrastructure accessible to innovators and researchers.
5. **Coordinate a Strong AI Ecosystem**
    - Support AI hubs and foster collaboration among academia, startups, government, and civil society.
6. **Accelerate AI in Key Sectors**
    - Prioritize the integration of AI into sectors like healthcare, agriculture, transportation, energy, and finance through pilot programs and regulatory reforms.

7. **Invest in Applied AI Research**
    - Establish national centers of excellence focused on priority areas such as natural language processing (NLP) and climate-smart technologies.
8. **Promote AI in the Public Sector**
    - Modernize procurement systems, train public servants, and embed AI into the design and delivery of government services.

Implementation and Oversight

A dedicated Responsible AI (RAI) Office will oversee the rollout of the strategy. This office will be responsible for coordinating implementation across sectors, engaging stakeholders, monitoring progress, and ensuring compliance with ethical and development standards.

Disability Inclusion

While Ghana's AI strategy emphasizes inclusive growth and digital equity, it falls short of explicitly addressing the unique needs of PWDs. There are no specific policy measures or programs targeting accessibility, assistive technologies, or inclusion of PWDs in AI-related education or employment.

Though the broader themes of digital inclusion and responsible AI governance are present, the absence of tailored strategies for disability inclusion suggests an important area for future enhancement—especially given Ghana's broader commitments to inclusive development and human rights.

Kenya

In March 2025, the Government of Kenya released its National Artificial Intelligence Strategy (2025–2030), marking a significant step toward establishing the country as a continental leader in AI research, innovation, and ethical governance. The strategy reflects Kenya's view of artificial intelligence as a transformative tool for economic development, social inclusion, and improved governance.

Vision and Priorities

Kenya's AI strategy is driven by the belief that the country can transition from being a consumer of global technologies to a producer of homegrown, contextually relevant AI solutions. The strategy identifies key sectors for AI application—including agriculture, healthcare, education, public administration, and financial services—where technology can help address systemic challenges and unlock new opportunities.

Strategic Pillars

The strategy is structured around three core pillars:

1. **AI Digital Infrastructure**
    - Emphasizes investment in computing capacity, cloud services, and connectivity to ensure AI systems are supported by reliable, accessible infrastructure.
2. **Inclusive Data Ecosystem**
    - Highlights the need to digitize government records, improve interoperability across agencies, and develop accessible, machine-readable datasets that reflect Kenya's linguistic and cultural diversity.
3. **Research and Innovation**
    - Calls for the development of national AI research hubs, promotion of academic and industry collaboration, and investment in applied research aligned with local development needs.

Cross-Cutting Enablers

In addition to these pillars, the strategy identifies four enabling areas that cut across all objectives:

1. **Governance**:
    - Advocates for agile, forward-looking regulations that ensure transparency, ethical compliance, and accountability in AI deployment.
2. **Talent Development**:
    - Promotes the integration of AI education into school curricula and adult learning programs, with a focus on building a skilled workforce for the AI era.
3. **Investment Mobilization**:
    - Encourages both public and private sector financing of AI initiatives, from infrastructure and education to innovation support.
4. **Ethics, Equity, and Inclusion**:
    - Serves as a foundational principle of the strategy, aiming to ensure that AI contributes to reducing inequalities rather than reinforcing them.

Policy Implementation

Kenya's strategy outlines a phased approach to implementation:

1. **Short term**: Launch pilot projects, invest in infrastructure, and draft enabling legal frameworks.
2. **Medium term**: Establish AI research hubs, refine regulatory structures, and scale public-private partnerships.
3. **Long term**: Monitor and evaluate outcomes, expand inclusive education programs, and support AI commercialization.

Disability Inclusion

While the strategy includes broad references to equity and inclusion, it does not contain dedicated policy measures that address the specific needs of PWDs. United Disabled Persons of Kenya participated in stakeholder consultations during the strategy's development, but the final document lacks explicit commitments to assistive technologies, accessibility standards, or AI-driven inclusion initiatives.

Instead, the inclusion of PWDs is implied within general discussions about supporting marginalized communities, reducing digital divides, and embedding fairness into AI systems. This represents a significant opportunity for future policy enhancement.

Data Ecosystem

Kenya's AI strategy addresses data-related barriers through a multi-pronged approach:

1. **Data Governance Framework**:
   - Emphasizes the development of national guidelines for secure, ethical, and transparent data sharing between public and private sectors.
2. **Digitization of Public Data**:
   - Prioritizes converting paper-based records into digital formats to improve data usability and availability for AI training.
3. **Development of Representative Datasets**:
   - Encourages the creation of localized datasets that reflect Kenya's unique demographics, environment, and socioeconomic context.
4. **Reducing Dependence on Foreign Infrastructure**:
   - Recognizes the risks of relying on foreign-owned data centers and advocates for building domestic storage and computing infrastructure, leveraging Kenya's renewable energy potential.
5. **Stakeholder Engagement**:
   - Promotes interdisciplinary collaboration to ensure AI systems are designed with representative, inclusive data, and aligned with public interest values.

Rwanda

In 2023, the Government of Rwanda officially launched its National Artificial Intelligence Policy, a forward-looking strategy designed to position Rwanda as a regional hub for responsible and inclusive AI innovation. This policy reflects the government's vision of artificial intelligence as a catalyst for inclusive economic growth, improved public service delivery, and sustainable development.

Vision and Objectives

Rwanda's AI policy aims to leverage artificial intelligence to improve the quality of life for all citizens, create meaningful employment opportunities, and enhance national competitiveness in the digital economy. The policy places strong emphasis on ethical deployment, inclusive innovation, and the integration of AI into national priorities such as healthcare, education, and governance.

Strategic Pillars

The strategy is organized around six priority areas:

1. **AI Literacy and Skills Development**
    - Rwanda aims to cultivate a technically proficient workforce by integrating AI into educational curricula, supporting AI research, and training professionals and civil servants in AI-related disciplines.
2. **Infrastructure and Compute Capacity**
    - The policy highlights the need for enhanced digital infrastructure, including cloud services, national data centers, and high-performance computing resources to support AI innovation.
3. **Robust Data Strategy**
    - Recognizing that quality data is essential to effective AI systems, Rwanda's strategy promotes responsible data governance, improved access to datasets, and greater use of public-sector data for AI development.
4. **Trustworthy AI in the Public Sector**
    - The government plans to deploy AI tools to enhance the transparency, efficiency, and accessibility of public services, with a particular focus on inclusive digital governance.
5. **Private Sector Innovation**
    - The policy supports the development of AI-driven enterprises, encourages investment in AI startups, and calls for an enabling environment that promotes private sector innovation.
6. **Practical AI Ethics Guidelines**

- Rwanda is committed to developing a national AI ethics framework to ensure that AI is deployed safely, transparently, and in alignment with human rights principles.

Governance and Implementation

To coordinate implementation, the policy calls for the establishment of a Responsible AI Office within the Ministry of ICT and Innovation. This office will guide AI policy execution, develop standards, engage with stakeholders, and ensure alignment with ethical and development goals. The strategy also includes measurable indicators to track progress, such as increased AI literacy, investment flows, and accessibility of AI-ready data.

Disability Inclusion

Although Rwanda's AI policy underscores the importance of equity and ethical AI deployment, it does not contain specific provisions or commitments related to PWDs. There is no mention of assistive AI technologies, inclusive design principles, or programs to ensure digital accessibility for people with disabilities.

This omission is notable, especially given Rwanda's broader disability inclusion policies in other areas of governance. The country has adopted frameworks aligned with the UN Convention on the Rights of Persons with Disabilities (UNCRPD). However, these efforts are not directly embedded within the national AI strategy.

Data Ecosystem

Rwanda's National AI Policy directly addresses one of the most critical barriers to AI development on the continent: the limited availability and accessibility of high-quality, representative data. Recognizing that "data is the energy that will fuel Rwanda as Africa's AI Hub," the policy introduces a multifaceted approach to strengthen the national data ecosystem.

Key Strategies for Enhancing Data Availability

1. **Establishing a Multi-Sectoral Data Task Force**
   A joint public-private task force will be created to develop standards for secure, ethical, and interoperable data sharing across sectors.
2. **Digitizing Public Sector Data**
   Acknowledging that much of Rwanda's valuable data is still non-digitized, the strategy calls for the migration of public records into machine-readable formats to support AI training.
3. **Developing Local Data Value Chains**
   The strategy encourages the development of domestic data value chains, including

support for data labeling and annotation services, to promote the creation of AI-ready, contextually relevant datasets.

4. **Multi-Year AI Readiness Program**
   Under the guidance of the Ministry of ICT and Innovation, the policy introduces a national program aimed at enhancing the quality, accessibility, and interoperability of public datasets over several years.
5. **Monitoring Progress Through Data Metrics**
   Rwanda will track the number and size of publicly accessible datasets, as well as their usage, to ensure ongoing improvements in data availability for AI innovation.

Overview of Other African Countries with National AI Strategies

Several African countries have formalized or are in the process of finalizing national AI strategies. These policies reflect a growing recognition of the importance of artificial intelligence in shaping the continent's digital and economic future. Below are brief summaries of selected countries with active AI strategies:

1. **Benin**: Adopted a National Strategy for Artificial Intelligence and Big Data in 2023, aiming to foster digital transformation and sustainable innovation.
2. **Egypt**: Developed a comprehensive AI strategy with a strong focus on AI research, industry applications, infrastructure, and regional leadership.
3. **Mauritius**: One of the continent's early adopters, Mauritius launched its AI strategy in 2018, focusing on regulatory frameworks and ecosystem development.
4. **Morocco**: Currently developing a national AI strategy with initiatives geared toward using AI to boost productivity and economic growth.
5. **Nigeria**: Actively drafting a national AI policy to guide the ethical development and deployment of AI technologies across the country.
6. **Senegal**: Published its AI strategy in 2023 with support from the African Union and European partners. The policy targets broad sectoral integration of AI tools.
7. **South Africa**: Finalized its National Policy Framework on Artificial Intelligence in August 2024, with detailed provisions for ethics, governance, and skills development.
8. **Tunisia**: Developed a national strategy focused on promoting AI research and building the country's innovation capacity.

Framework for Inclusive AI Strategies

As African governments are moving quickly to operationalize artificial intelligence for public value, disability inclusion must become an explicit design requirement. A disability-inclusive AI strategy begins by naming its purpose clearly: to ensure PWDs can access, shape, and benefit from AI across public services, education, health, and work—guided by the UN Convention on the Rights of Persons with Disabilities (CRPD) and continental priorities on data, compute, skills, and cooperation. In practice, this means investing in national capacity while hard-wiring accessibility, representation, and accountability into every stage of AI policy and delivery. Recent African strategies emphasize data ecosystems, compute infrastructure, research hubs, and responsible governance; the task now is to thread disability inclusion through these pillars with concrete commitments, budgets, and metrics.

Governance is the anchor. Countries establishing Responsible AI (RAI) offices to coordinate strategy implementation should assign these bodies an explicit accessibility remit and publish an annual inclusion report. This is consistent with emerging policy structures in Rwanda and Ghana, where central coordination, standards, and stakeholder engagement sit within government, but where disability often remains a gap to be closed by design rather than assumption. Embedding a permanent advisory council on AI and disability—led by OPDs and caregivers—ensures "nothing about us without us" is realized in procurement, testing, and oversight.

Data is the fuel for both performance and fairness, and today it is the weakest link. Many AI systems deployed in Africa underperform for PWDs because disability is under-represented or mis-labeled in training data, and because national statistics undercount disability due to stigma and narrow definitions. An inclusive data plan should normalize disability-disaggregated data collection (e.g., Washington Group question sets) across censuses, registries, and sectoral systems; fund representative datasets in local languages (including sign languages and atypical speech); and make privacy-preserving, machine-readable datasets openly available to spur research and local innovation. Partnerships with universities, OPDs, and initiatives like AT2030 show how community-led collection can localize datasets for African contexts.

Infrastructure and research ecosystems should be planned with inclusion from the outset. Strategies across Kenya and Rwanda already call for national data centers, cloud capacity, and applied AI hubs; these investments should reserve budget lines for accessibility testing, developer training in universal design, and multi-modal human-AI interfaces (screen reader compatibility, captioning, voice and text fallbacks, and sign-language options). Public sector AI programs are natural testbeds: if ministries standardize accessibility requirements and publish model documentation that discloses disability representation in training data, they can move markets toward inclusive defaults.

Procurement is the fastest lever for change. "No accessibility, no contract" is an actionable rule: every AI purchase should require conformance with recognized accessibility standards, inclusive user testing with PWDs, and clear provisions for human-in-the-loop support in high-risk settings (such as benefits eligibility, health triage, and education placement). Kenya's broader ICT accessibility obligations and similar provisions across the region can be extended to AI systems so that interfaces, documentation, and support channels are usable by diverse disability groups—backed by redress mechanisms if systems exclude or discriminate.

Sector playbooks make participation tangible. In education, governments can scale accessible digital materials, captions, and localized sign-language tools while ensuring that learning platforms interoperate with assistive technologies and offer plain-language modes. In health, conversational agents that support psychosocial needs must include privacy controls and human escalation pathways. For employment, governments should bar inaccessible AI hiring tools, guarantee alternative assessment options as a reasonable accommodation, and publish guidance to prevent algorithmic discrimination. Each sector playbook should specify data improvements, procurement rules, frontline training, and measurable outcomes tied to inclusion.

Innovation funding can bridge the gap between pilots and national scale. Blended finance vehicles—grant windows paired with impact capital—can underwrite localization costs while de-risking procurement for ministries. Evidence from African disability-tech ecosystems shows strong entrepreneurial energy but chronic under-capitalization; national AT and inclusive-AI funds can set scale targets and require open data contributions, creating positive spillovers for local research and startups.

Finally, monitoring and accountability close the loop. Governments should publish an annual accessibility and equity report tied to their AI strategy, with a small set of outcome metrics: the share of government AI services that pass independent accessibility testing; the number of open, disability-representative datasets released; uptake of accessible AI in schools and clinics (disaggregated by gender and geography); employment outcomes for PWDs in AI-enabled programs; and budget execution for inclusive data, compute, and innovation. This turns inclusion from a statement of principle into a trackable public commitment.

Chapter 14

Survey Findings and Implications

Why We Ran These Surveys

To ground this report in lived realities—not only expert opinion—we conducted primary research in Ghana and Kenya in 2025 to understand how Persons with Disabilities (PwDs) experience artificial intelligence (AI) and AI-enabled assistive technologies (AT) today. We focused on awareness and use, accessibility and effectiveness, barriers to adoption, interface and design preferences, and what respondents want from policy and financing. The chapter synthesizes those findings and reads them against the wider evidence based on data bias, mental health, employment, caregiver needs, and national AI strategies presented elsewhere in the report.

A Brief Note on Methods and Samples

In Ghana, a convergent mixed-methods study surveyed 385 PwDs across Accra, Kumasi, and Tamale and complemented the survey with 28 one-on-one interviews (PWDs and AI/AT developers) and four focus group discussions (FGDs) with 22 caregivers. Stratified sampling balanced hearing, visual, and mobility impairments; quantitative analyses used descriptive statistics and chi-square/Fisher's tests; qualitative analysis followed Braun & Clarke. In Kenya, an integrated study engaged 169 respondents—predominantly PWDs—supplemented by FGDs with PWDs, caregivers, and innovators; the sample skewed urban and tertiary-educated, with unemployment above half.

Awareness, Use, and Perceived Value

Across both countries, awareness of AI-enabled AT is now mainstream among respondents. In 2025, two-thirds of Ghanaian participants reported awareness (65 percent) and more than four in five judged AI-enabled AT effective for their needs (84 percent). In Kenya, roughly the same share had encountered or used AI-enabled AT (64.9 percent). Among users, just over half rated these tools "very effective" in improving daily life, especially for communication, navigation, and study or work tasks. Taken together, these data say two things at once: information about AI-AT is reaching people, and when PWDs do get access, they tend to experience meaningful benefits—echoing patterns in the wider literature.

Accessibility is Uneven—and Context Matters

Perceived accessibility diverged by location and infrastructure. In Kenya, 48.2 percent called AI-AT "accessible" and 11 percent "very accessible," yet over a quarter found these tools inaccessible—most commonly in rural settings with limited connectivity and repair services. Ghanaian participants flagged the same underlying drivers: the recurring costs of data and devices and the brittleness of internet-dependent tools in low-bandwidth environments. As one hearing-impaired participant from Tamale put it, "Many AI devices depend on the internet. In Ghana, internet connectivity is a big challenge."

The Barrier That Dominates: Cost

Cost outstripped every other barrier in both countries. In the Kenyan study, "high cost" was the single most cited obstacle, followed by limited availability, inadequate awareness, weak connectivity, and the difficulty of maintenance without trained technicians. Ghana's survey showed the same profile: cost led individual-level barriers (133 mentions), and at community level, cost again dominated, ahead of availability and infrastructure constraints. The economic signal is reinforced by perception of investment levels: nearly 70 percent of Ghanaian respondents rated current investment in disability-focused AI as low or only moderate. These findings map onto our employment analysis, where exclusion and low incomes make even one-off purchases or subscription costs prohibitive for many households.

Localization, Language, and Design fit

Respondents in both countries praised AI-AT for the independence it can bring, but they were equally clear about localization gaps. Kenyan participants described voice typing that struggles with African accents, screen readers that ignore images, and the absence of Swahili or local-language support—problems that make "access" feel partial. One PWD summarized the paradox: "Screen readers do not describe images… ChatGPT can only transcribe five papers unless you have premium." Ghana's data add fine-grained evidence on design preferences: voice command was the most desired interaction overall, but preferences split by impairment, with visually impaired users strongly favoring voice (93 percent), hearing-impaired users favoring touch interfaces (50 percent), and mobility-impaired users expressing the highest preference for multi-functional features; these differences were statistically significant ($p<0.001$). The pattern is consistent with our broader analysis of data and model bias: when local languages, disability modalities, and everyday artifacts are underrepresented in training data, accuracy and usability degrade for PwDs.

What Caregivers and Innovators Told Us

Caregivers in Kenya described tangible gains from basic and AI-enabled tools—mobility, fine motor skills, and communication—but stressed that many apps are built for "regular kids" and do not meet the needs of children with disabilities. "We wish we could have an app that a parent can use to train the child for speech therapy," one caregiver said. Innovators, for their part, pointed to promising African pilots—communication avatars, early autism detection tools, sign-language learning platforms—while emphasizing structural brakes: high hardware costs, expensive imports, thin local datasets, and policies that rarely name assistive technologies. These voices resonate with our sections on mental health and caregiver support, where the absence of localized, affordable tools and services deepens stress for families and pushes them toward workarounds.

Policy And Financing: What Respondents Want

Across both studies, respondents called for explicit, disability-aware public policy and money on the table. In Kenya, nearly four in five participants said governments should adopt laws and regulations tailored to the needs of PWDs in AI—and more than a third judged current frameworks inadequate. In Ghana, participants overwhelmingly preferred government-led funding, with public-private partnerships a distant second; when asked where regulators should focus, "access" and "funding" topped the list, ahead of privacy and testing.[1] These priorities dovetail with regional momentum: the African Union's Continental AI Strategy affirms inclusion but will require member states to hard-wire disability into data, standards, procurement, and workforce plans to make it real at the ground level.

How These Findings Fit the Wider Picture

Three cross-country signals emerge when we triangulate surveys with the literature. First, affordability is the linchpin. Without subsidies, smart procurement, tax/duty relief, and pooled financing, the most effective tools will remain out of reach, especially for those already in vulnerable employment or outside wage work altogether. Second, localization is not a "nice-to-have"; it is the difference between independence and exclusion. That means datasets that include African languages and disability modalities, offline or low-bandwidth modes, solar-ready devices, and repair ecosystems that do not assume proximity to a service center. Third, policy specificity matters. Strategies that gesture at "inclusion" but do not name PwDs, set procurement and testing requirements, or assign budgets and accountability will miss the mark.

Two Brief Vignettes from The Field

A Kenyan university student with low vision described the difference live captioning and a screen reader made in feeling "present" in class—until images and graphs appeared, when, as he put it, "the lecture goes quiet for me." His workaround was to message classmates for descriptions, an accommodation that depends on goodwill rather than rights, and one that collapses during exams.

In Tamale, a caregiver of a deaf adolescent explained why they rarely tried new apps: "Data is expensive, and when the network is down, nothing works." The family asked for tools that function offline, and for service points within reach so that a broken device does not end months of progress.

Implications For Practice and Policy

For implementers, the surveys point to immediate design moves: build voice-forward interfaces for visually impaired users and touch-optimized flows for deaf users; keep models small or hybrid so core functions work offline; and budget for training, repair, and replacement, not just the first install. For policymakers, "disability-inclusive AI" must become a set of clauses and line items: require accessibility and bias testing in public tenders; mandate local-language and low-bandwidth modes for government-funded tools; create accommodation funds and repair networks; and co-design all of the above with Organizations of Persons with Disabilities (OPDs). Finally, mental health and caregiver modules should be bundled with education and employment tools, because the same connectivity and stigma barriers that block school or work also block care.

Limitations

Both country samples skew urban and connected; Ghana's team notes this explicitly. The Kenyan sample, though diverse by disability type, also over-represents tertiary-educated respondents. These biases likely underestimate the severity of access barriers in rural and low-income settings. Even so, the consistency of patterns across methods and countries strengthens confidence in the main signals.

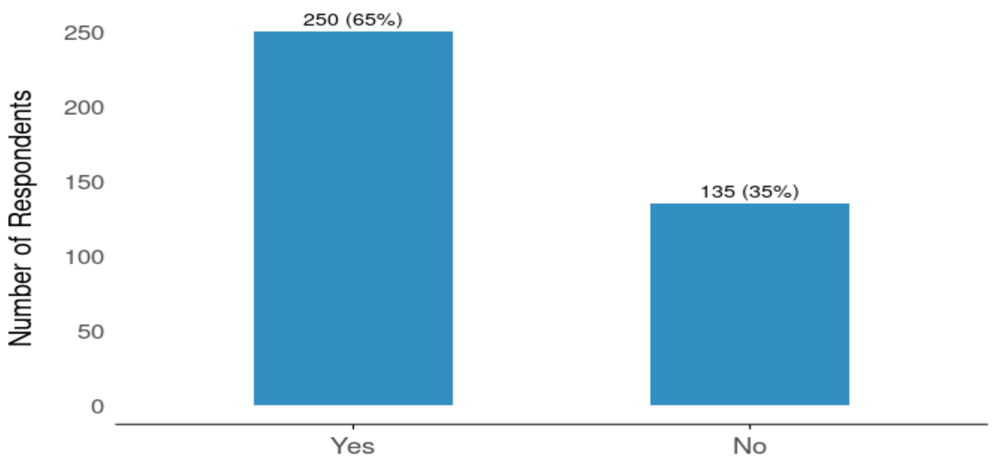
Data Analysis from Ghana's Survey

Table 1: Demographic Profile of Survey Respondents (N=385)

Participants Characteristics	Frequency (N = 385)	Percentage
Location		
Accra	141	36.60%
Kumasi	180	46.80%
Tamale	64	16.60%
Total	**385**	**100%**
Age Group in Years		
Below 20	1	0.30%
20 - 29	44	11.40%
30 - 39	106	27.50%
40 and above	234	60.80%
Total	**385**	**100%**
Sex		
Female	163	42%
Male	222	58%
Total	**385**	**100%**
Disability Type		
Hearing Impaired	128	33%
Mobility Impaired	128	33%

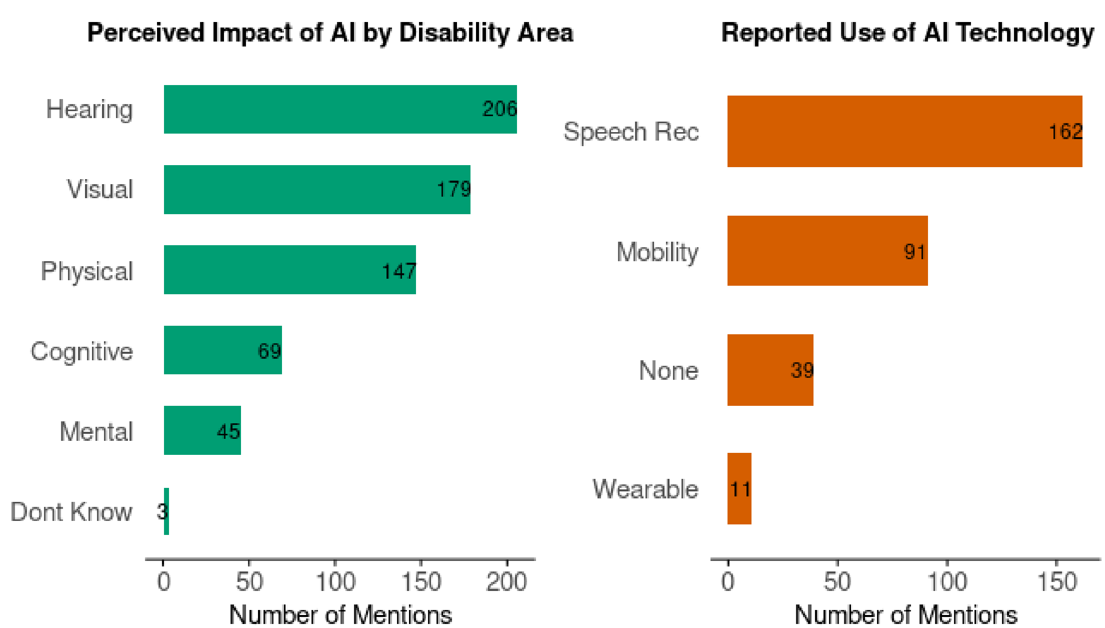
Visually Impaired	129	34%
Total	**385**	**100%**
Total	**385**	**100%**

Figure 1: Awareness and Usage of Artificial Intelligence and Assistive Technologies

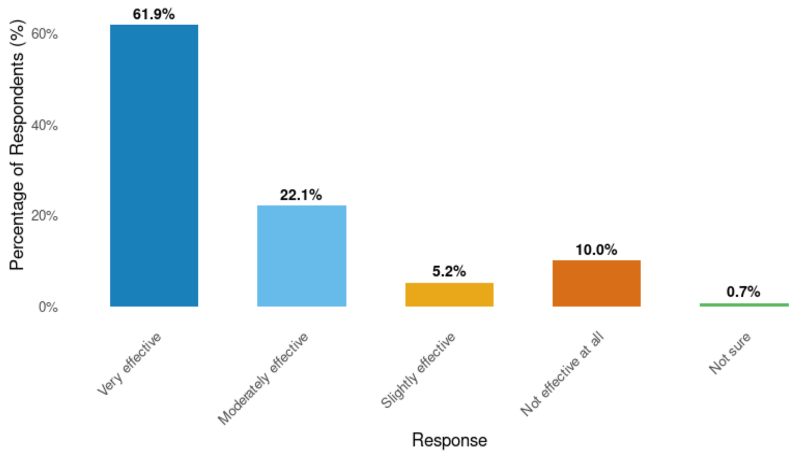


Source: Field Work, 2025

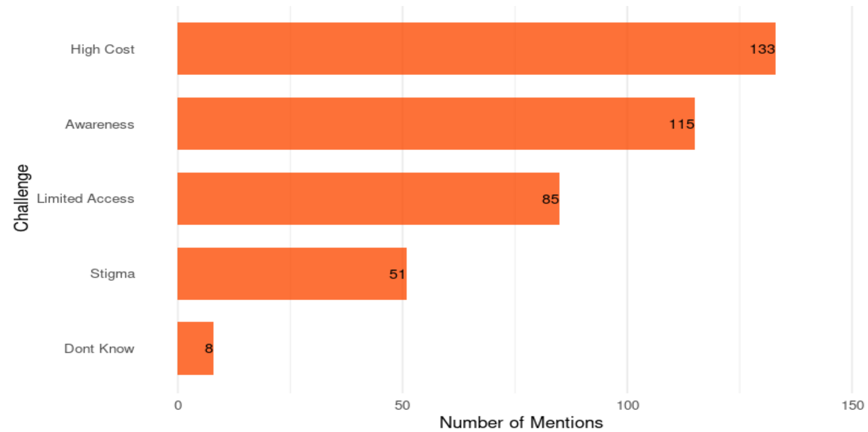
Figure 2: Perceived Impact of Artificial Intelligence use by Impairment Type



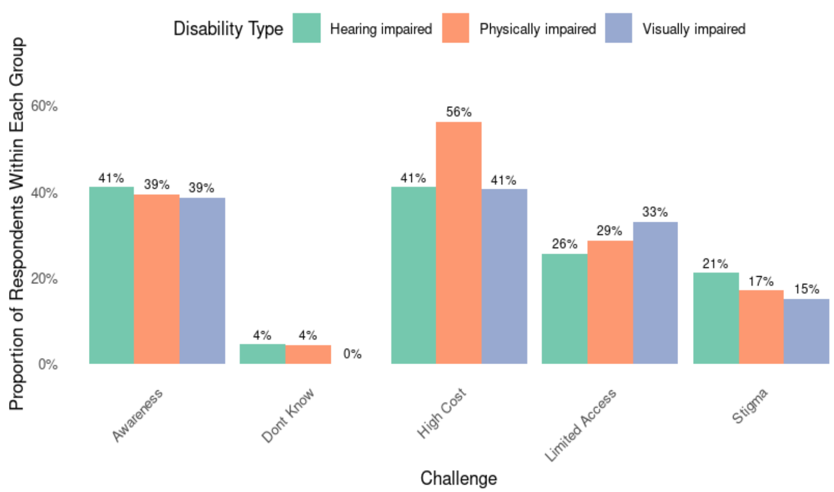
Perceived Effectiveness of Artificial Intelligence and Assistive Technologie



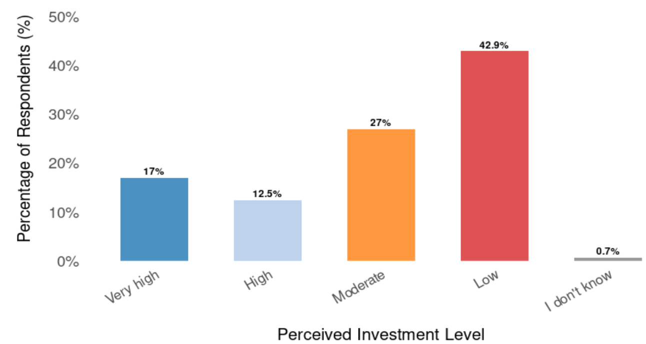
Challenges to the Adoption of Artificial Intelligence-Technologies



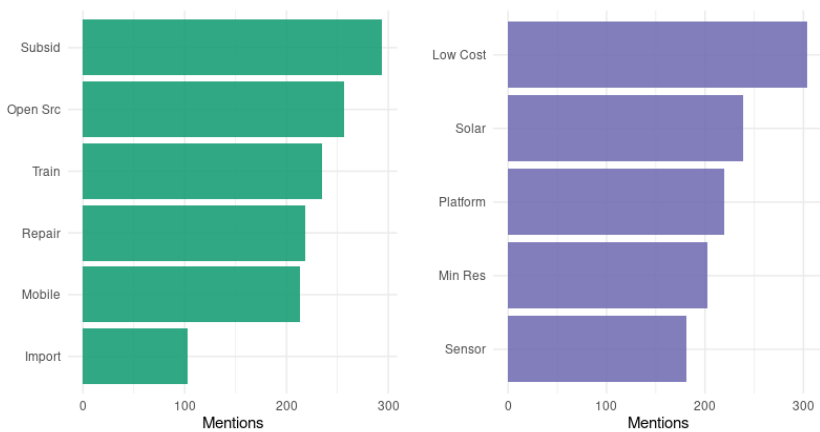
Adoption of Artificial Intelligence Innovation by Disability Type



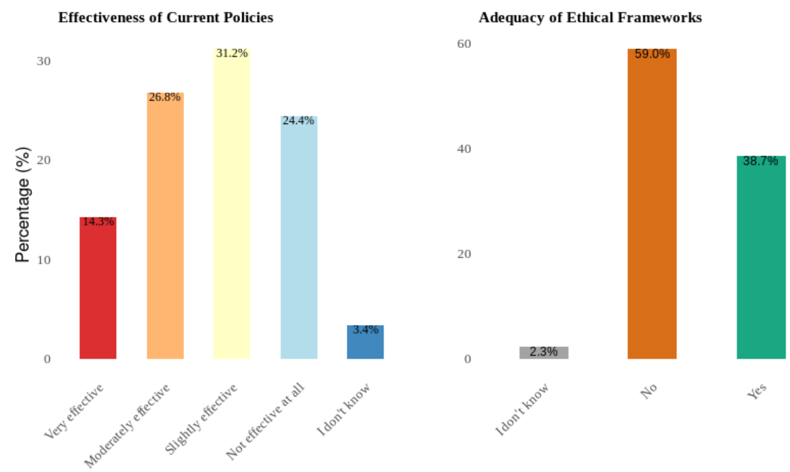
Investment Level of Artificial Intelligence-Powered Technologies



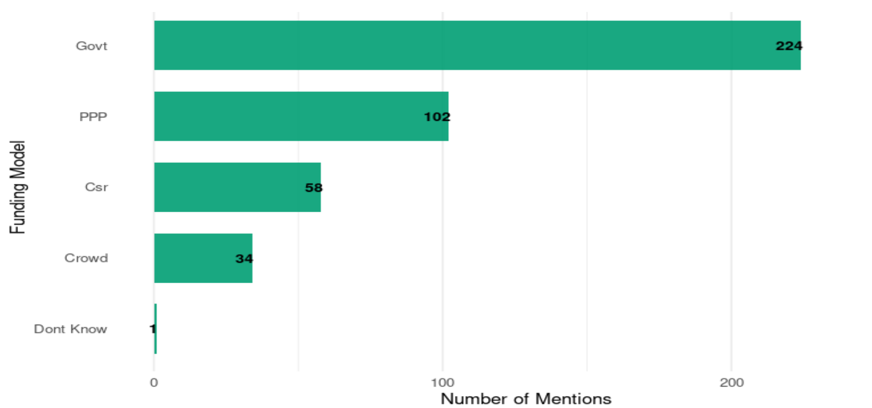
Impactful Innovations and Solutions



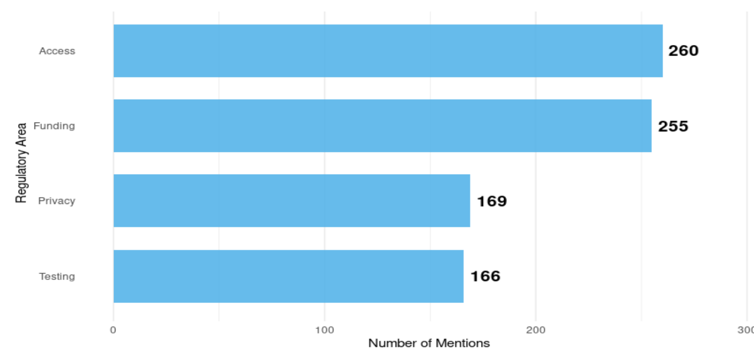
Perceived Effectiveness of the Current Framework



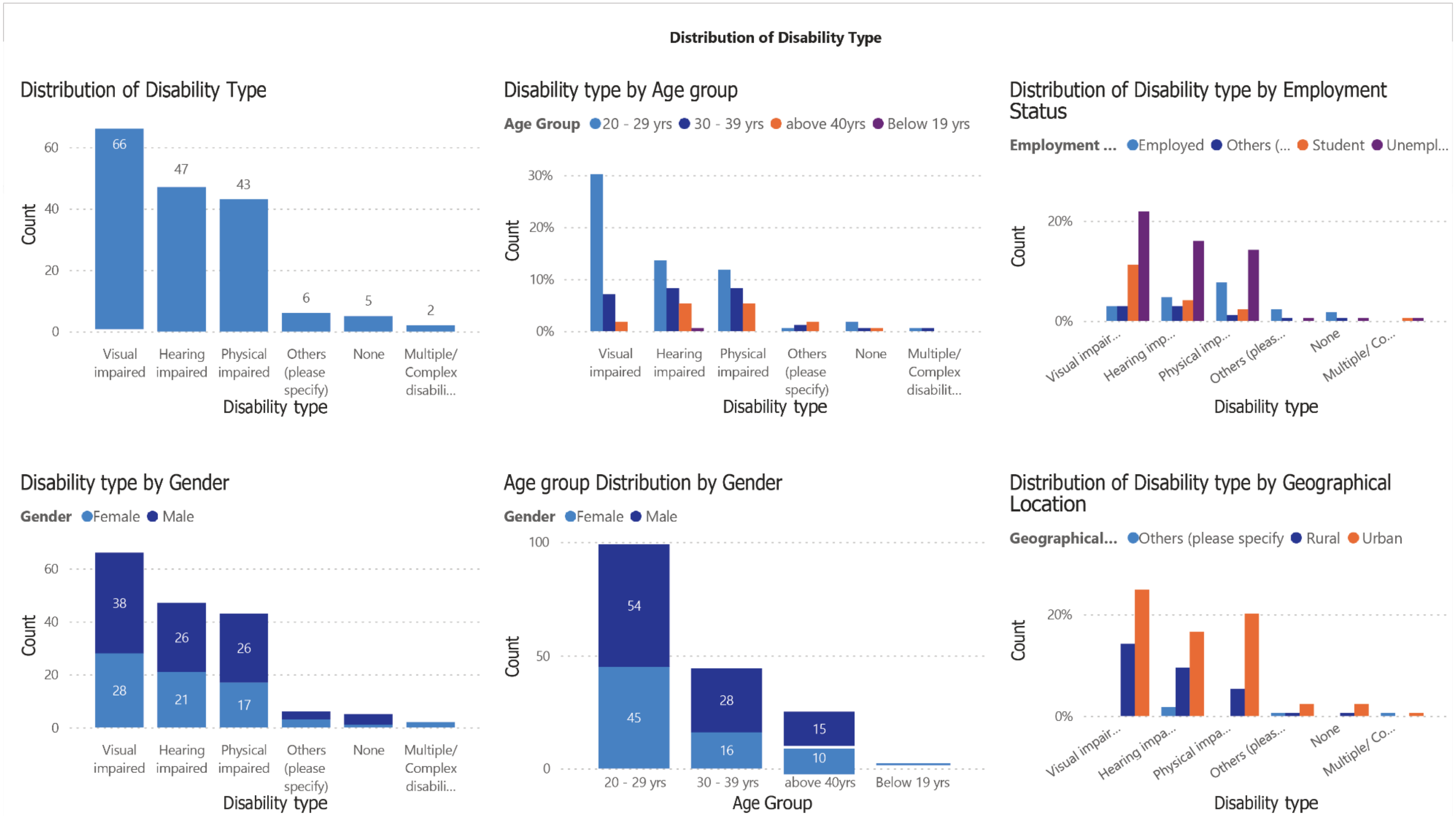
Funding and Investment Models



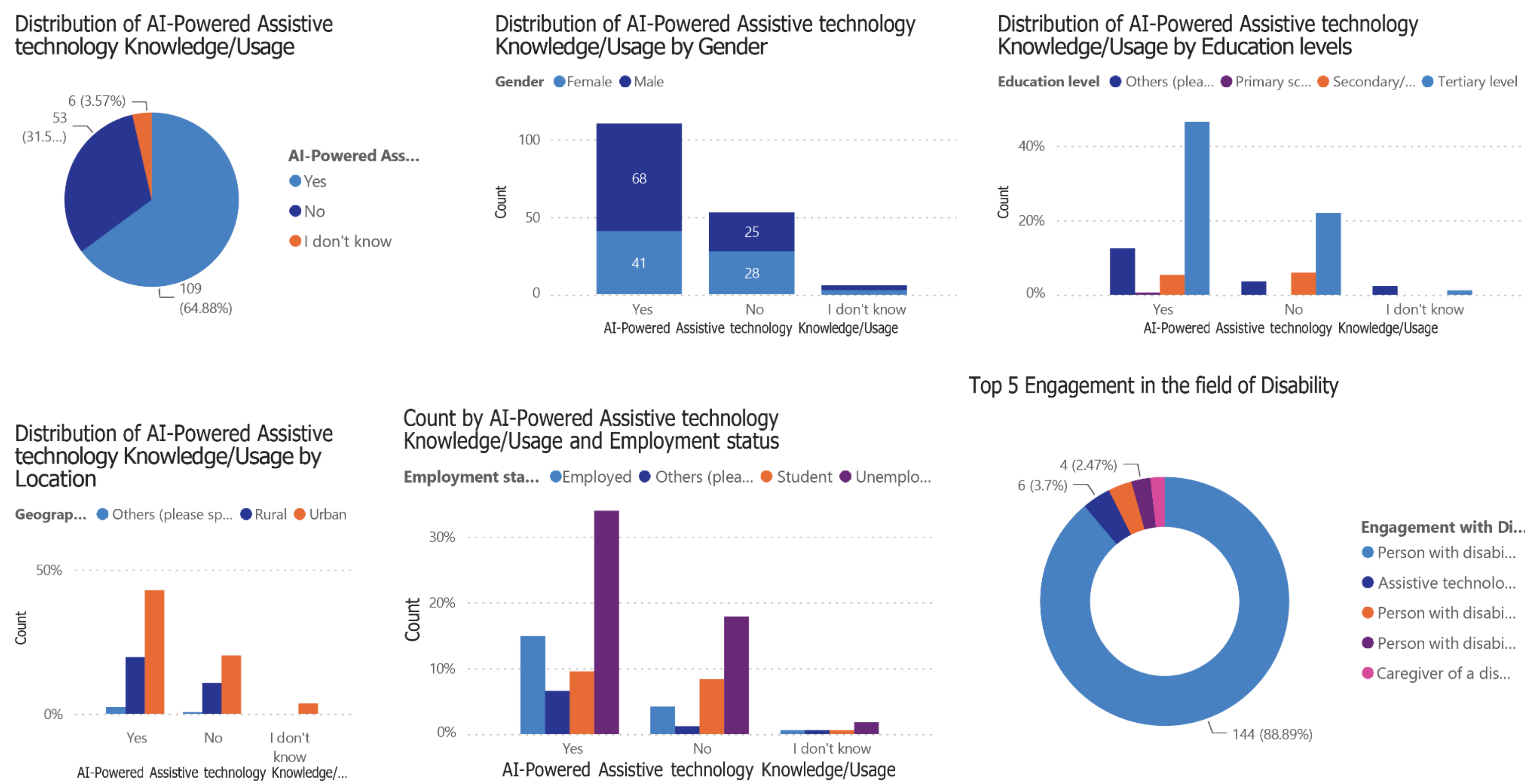
Priorities for Regulatory Focus



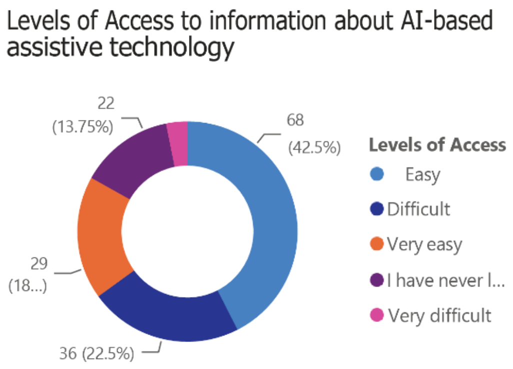
Data Analysis from Kenya's Survey

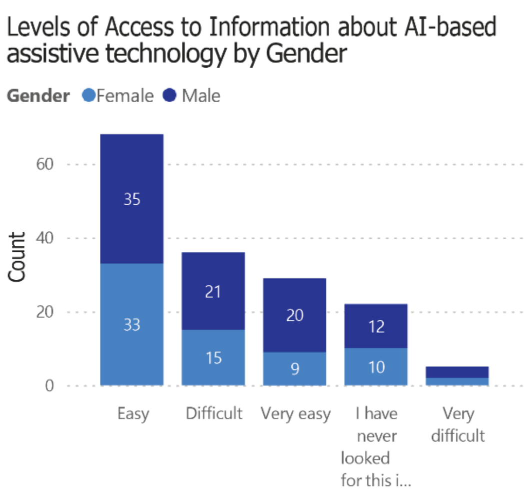


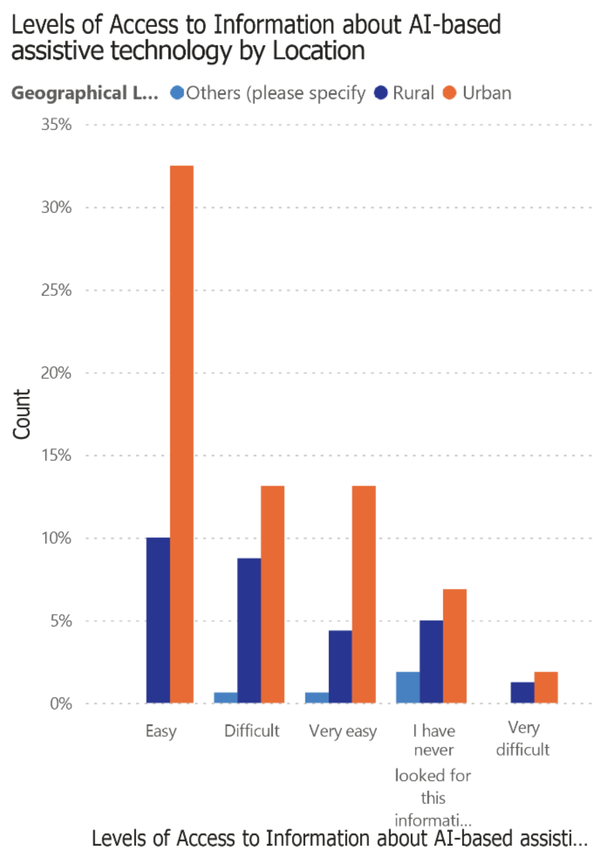
AI-Powered Assistive Technology Knowledge/Usage and Engagement in the Disability Field

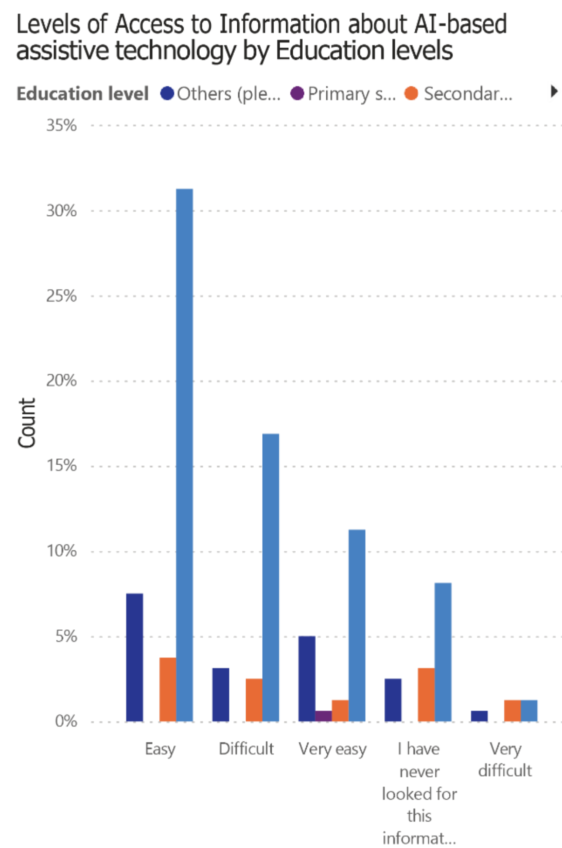


Level of Access of Information about AI-based assistive technology



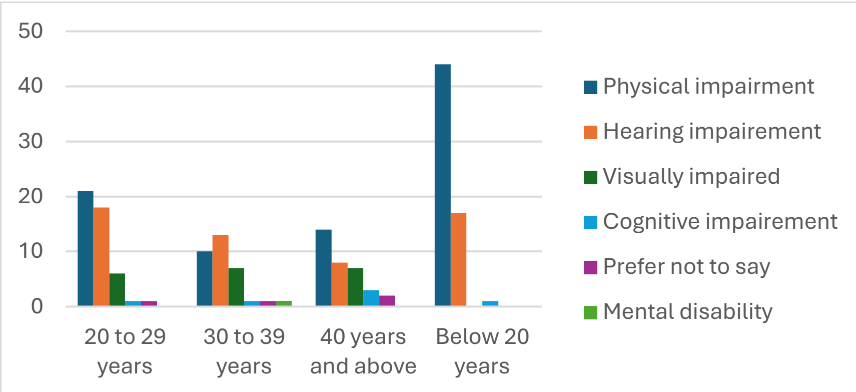




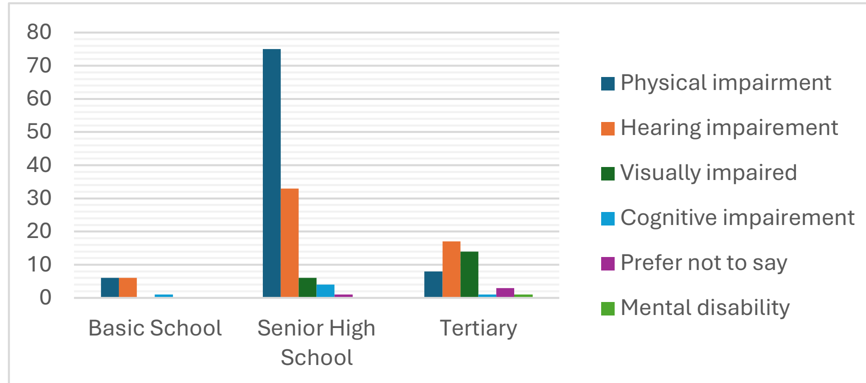


Data Analysis from Rwanda's Survey

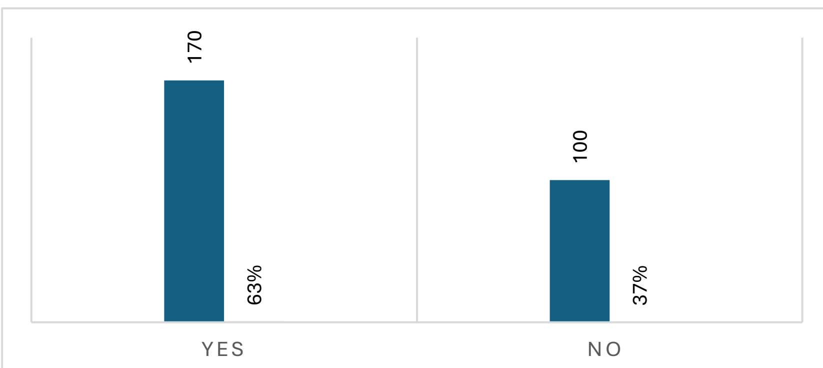
Disability type by Age Group



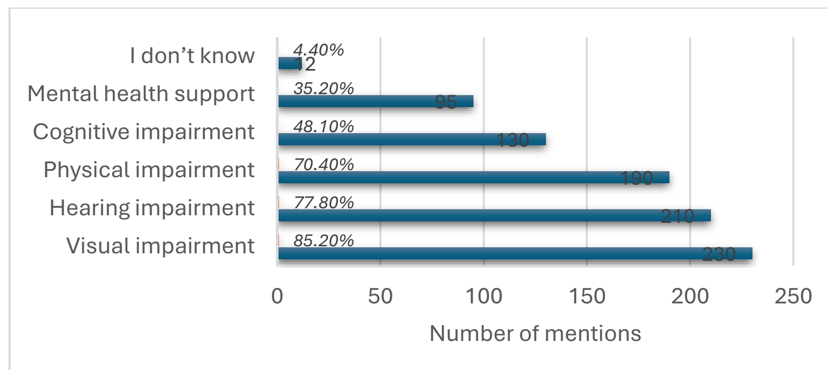
Disability by level of education



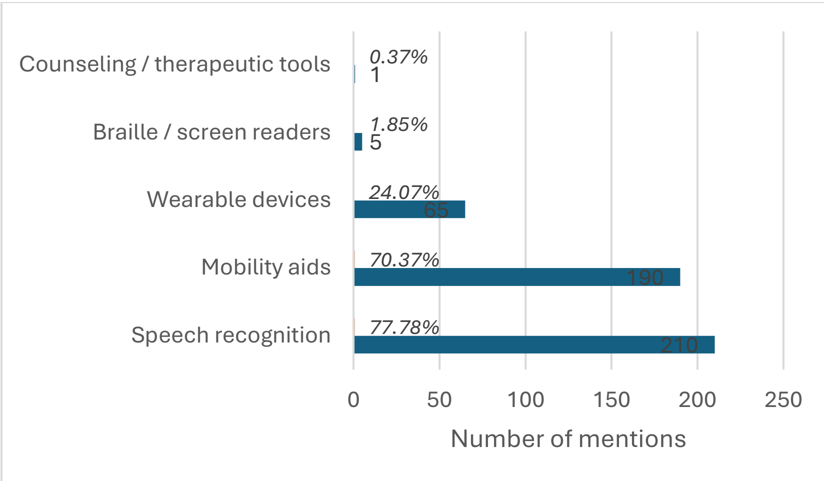
Respondent Awareness and Usage of AI Assistive Technologies



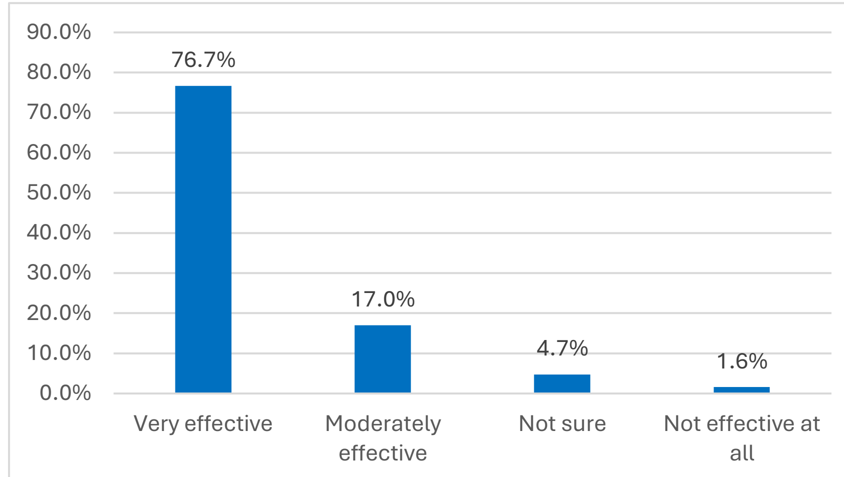
Disability Area Affected by AI-Powered Assistive Technologies



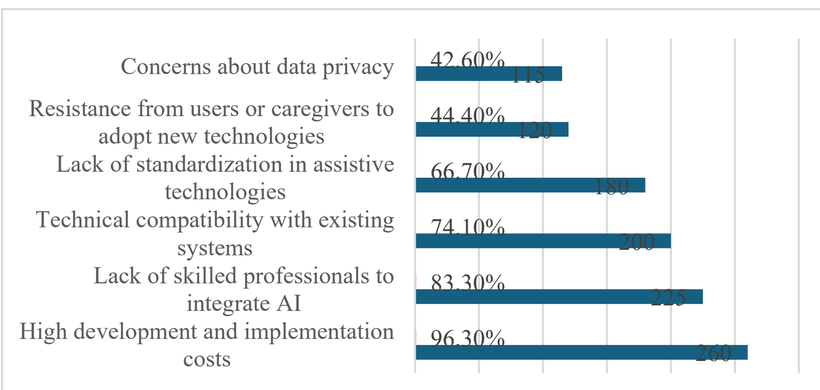
Use of AI-ATs



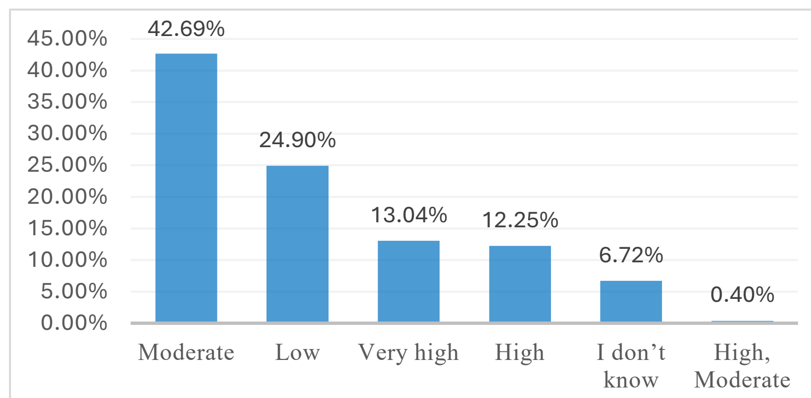
Effectiveness of Artificial Intelligence and Assistive Technologies



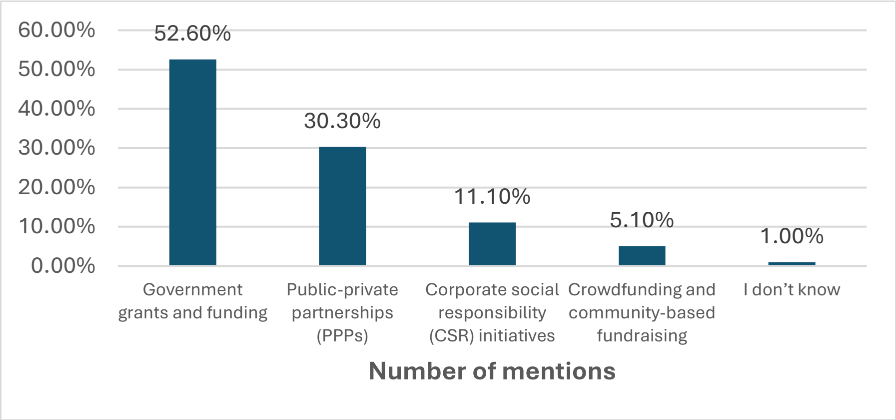
Challenges to the Adoption of Artificial Intelligence-powered Technologies



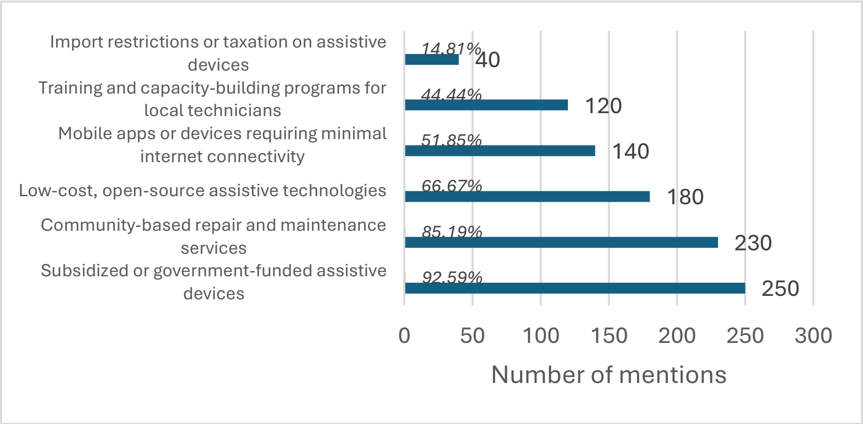
Current Investment Level of Artificial Intelligence-Powered Technologies



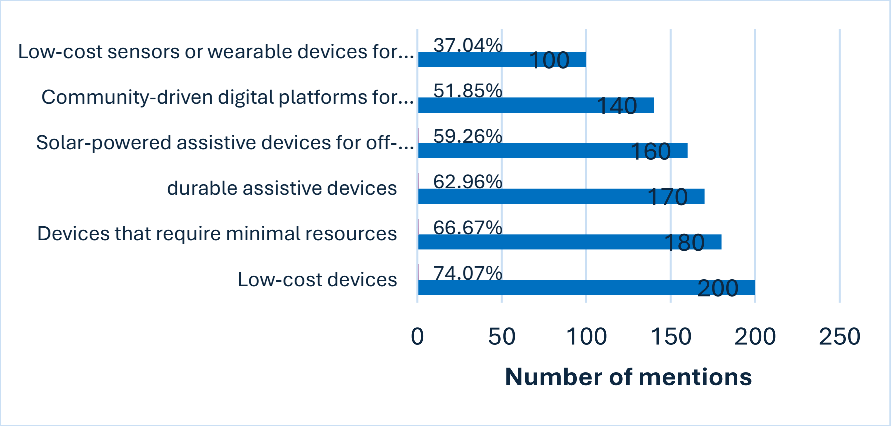
Funding and investment models



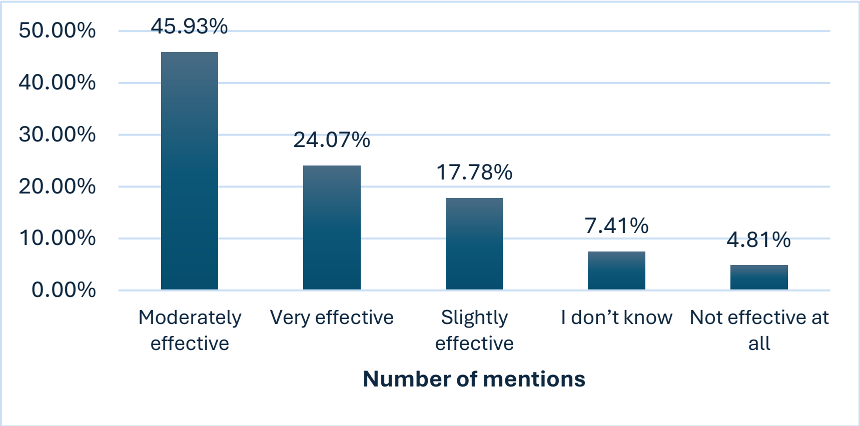
Advised ways to ensure accessibility of AI-ATs to communities



Most Impactful Innovations and Solutions



Effectiveness of current policies and regulations



Conclusion

In 2025, PwDs in Ghana and Kenya told us that AI can be life-changing—when they can afford it, when it speaks their language, and when systems around them recognize their rights. The way forward is plain: finance what works and who needs it most; localize relentlessly; and translate policy intent into enforceable, budgeted rules. If we do, the independence, learning, work, and dignity that respondents already glimpse will become the baseline, not the exception.

Chapter 15

Conclusion and Recommendations

Opportunities and Priorities for the Next Decade

The convergence of disability inclusion and AI in Africa is still in its infancy, but the next decade holds significant promise if identified gaps are addressed. Here, we distill the key opportunities for innovation and the priorities for policy and research that emerge from the literature:

Investing in Inclusive Data Ecosystems: Addressing the "data desert" problem is a top priority. Opportunities exist to create Africa-centric datasets: for example, compiling sign language video banks for different countries, building open-source speech datasets featuring PWDs (various accents, speech disorders), and gathering health data that captures disability indicators. Governments, research institutions, and companies should collaborate on data collection initiatives that prioritize representation of PWDs. Policy can incentivize this by funding data trusts or requiring that any publicly funded AI research includes an inclusive data plan. There is also an opportunity to leverage mobile penetration – many PWDs do have mobile phones now, so apps could be designed to crowdsource certain data with consent (for instance, a gamified app for wheelchair users to map accessibility of city streets, feeding into training data for navigation AIs). Microsoft's partnership with Be My Eyes is a model that could be replicated with local organizations to gather data in a way that empowers the community. In sum, "public investment in generating representative datasets" is seen as an important enabler of inclusive AI. This will also help mitigate biases, as more diverse data makes AI models more robust.

Scaling What Works (AI for AT and Services): Many AI solutions highlighted in pilots need support to scale up and reach more users. For example, proven sign language avatar technologies in one country could be expanded regionally to cover other sign languages, perhaps through a continental initiative (akin to how African countries united to produce COVID-19 innovations). Educational AI tools that showed success in special schools could be integrated into national education systems with government backing. The opportunity lies in mainstreaming assistive AI – making it part of standard offerings. One strategy is integration into existing platforms: e.g., incorporate local African sign languages into global services like Zoom for meeting interpretation, or ensure that e-learning platforms used by ministries of education have AI captioning and text simplification features built in. Another area to scale is AI in healthcare triage for PWDs; for instance, AI-driven SMS health advisories tailored for PWDs (on issues like HIV prevention or maternal health for women with disabilities) could be deployed via national health systems after learning from smaller NGO trials. To do this effectively, cross-country knowledge sharing is key – what works in one country can often be adapted to another. In essence, Africa can create a "scaling framework" so that successful pilots don't remain siloed. This could include innovation challenge funds, accelerators, or policy endorsements (like if the African Union endorses a particular AI tool for adoption by member states).

Strengthening Multi-Stakeholder Collaboration: Collaboration – between tech companies, governments, Disabled Persons' Organizations (DPOs), academia, and caregivers – is crucial. AI development typically falls in the tech domain, but disability issues cut across health, education, social welfare. Therefore, a multi-sector approach is needed. One recommendation is to establish national committees or forums on AI and disability, which Rwanda has effectively begun with a Research Advisory Committee on inclusive early learning.[157] Such bodies can ensure that initiatives are aligned and not duplicative. Another idea is co-funding schemes: for instance, a government could partner with an NGO and a private AI firm to develop a local language assistant for the blind – sharing costs and expertise. The roundtable series by GDI Hub in 2024 concluded that important enablers for inclusive AI include "appropriate governance of AI developed with involvement of all legitimate actors, including citizens" (here citizens imply end-users, i.e., PWDs) and "policy alignment across domains".[158] This points to creating inclusive governance models. The opportunity here is also to tap into global support – many international agencies are keen to fund digital inclusion. African countries can leverage this by proposing coordinated programs (for example, a pan-African AI for Accessibility Taskforce). In research, fostering collaboration means interdisciplinary work: computer scientists' team up with rehabilitation experts, or economists study the market impact of assistive AI. Such collaboration will widen the knowledge base and ensure AI solutions are practical and evidence-backed.

Focusing on Affordability and Accessibility: Innovation must go hand in hand with considerations of cost and usability, otherwise technologies will not reach those who need them most. A policy priority is to make assistive devices and AI tools financially accessible. This might involve subsidizing the cost of smart devices for PWDs (some countries have schemes providing free white canes or wheelchairs; this could extend to smart canes or phone apps). Governments could remove import taxes for specialized equipment like braille displays or eye-tracking devices to lower prices. There's also a role for open-source development – if African developers create open-source AI models for, say, speech-to-text in Zulu for people with speech impairments, that can be freely adopted and localized further, avoiding expensive licensing. Communities of practice (like Mozilla's Common Voice project which included Kiswahili data collection[159]) can be mobilized for disability-related AI as well. In terms of design accessibility, it's important that AI solutions consider the varied contexts of African PWDs: low literacy (hence more voice interfaces or pictorial interfaces), multilingual environments (AI should handle code-switching), and intermittent connectivity (apps should have offline modes when possible). Many opportunities exist to innovate on these fronts. For example, developing ultra-light AI models that can run on low-end smartphones would dramatically increase reach. Also, integrating AI with widely available technologies – like

[157] https://www.gpekix.org/news/promoting-disability-inclusive-education-through-accessible-digital-textbooks-sub-saharan
[158] https://at2030.org/ai-disability-inclusion-africa/
[159] https://www.mozillafoundation.org/en/what-we-fund/programs/common-voice-kiswahili-awards/awards/

using basic mobile SMS with AI on the backend to provide info services – could extend benefits to those without smartphones. Essentially, appropriate technology principles apply: the fanciest solution is not always the best if it can't be widely deployed. Making AI count for everyone will require these kinds of frugal, user-centered innovations.

Policy and Ethical AI Leadership: African policymakers have an opportunity to embed inclusion from the start as they craft AI frameworks. Rather than retrofitting accessibility later (as many Western countries have had to do), African AI policies could lead with inclusion. Africa brings important perspectives, especially around community values and ubuntu (shared humanity), which could enrich global AI ethics discourse that has so far been dominated by Western individualistic perspectives. By prioritizing equity, African regulators might, for example, insist on impact assessments for any AI system deployed in public services, checking how it affects marginalized groups including PWDs. The literature highlights some immediate policy actions: update public procurement rules to demand accessible technology, enforce disability rights laws in digital spaces (like ensuring national ID or payment systems have accommodations), and include disability status as a protected category in any algorithms used for public decision-making (so that, say, an AI system cannot unfairly deprioritize someone from a service because they are disabled). Another critical policy area is education and R&D: governments and universities should earmark funding specifically for AI-for-disability research and for scholarships to train PWDs in tech fields. Given the youthful population in Africa, engaging the next generation via programs (like inclusive AI hackathons or summer schools for students with and without disabilities to learn AI) can build a pipeline of innovators who are conscious of accessibility. Essentially, policy can nurture an ecosystem where inclusive AI is the norm, not the exception.

Research Gaps and Evaluation: As AI for disability is a new field in Africa, there are many research gaps. Academic and applied research should prioritize: effectiveness studies (does a given AI intervention actually improve quality of life or learning outcomes for PWDs, and under what conditions?), contextual adaptation (how to modify AI tools developed elsewhere to local African contexts in terms of language, culture, infrastructure), and long-term impacts (monitoring if any unintended harms emerge, such as dependency or privacy issues). For example, while several sign language apps exist, research could compare their accuracy and user satisfaction across different user groups, feeding results back to developers. Another gap is in disaggregated data on usage – very few projects publish data on how PWDs are actually using the AI solutions (daily active users, retention, etc.), making it hard to judge success. Funding bodies should demand strong monitoring and evaluation components in pilot projects. There is also room for participatory research where PWDs document their experiences with AI (perhaps through diaries or videos) to provide qualitative insights that numbers alone won't. Finally, research should inform standards: African experts can help develop technical standards for things like sign language datasets or evaluation benchmarks for assistive AI (similar to how there are standard vision datasets, there could be standard African accessibility datasets). In summary, a research priority list might include: (1) accessible dataset creation and benchmarking, (2) usability studies of assistive AI in low-resource settings, (3) socio-economic impact analysis of inclusive AI interventions, and (4) frameworks for inclusive innovation (what models of co-design work best in African contexts?). By filling these knowledge gaps, stakeholders can make evidence-based decisions and avoid repeating mistakes.

Appendix A: Disability-Inclusive AI Strategies

Checklist for Ministers and Permanent Secretaries

Governance & Participation

— Establish a Responsible AI Office with an explicit accessibility mandate and publish an annual inclusion report.
— Constitute a national advisory council on AI and disability with majority OPD representation; require co-design for flagship AI projects.

Inclusive Data & Privacy

— Issue a national "Inclusive AI Data Plan" that standardizes disability-disaggregated data collection (Washington Group) across public systems.
— Fund representative datasets in local languages, sign languages, and atypical speech; publish privacy-preserving, machine-readable releases.
— Adopt privacy-by-design for disability data, with consent, minimization, and access for the disability community.

Infrastructure & Research

— Ring-fence budget for accessibility testing, universal-design training, and multi-modal interfaces in all compute and cloud investments.
— Charter applied AI hubs with an accessibility remit and open-data obligations.

Procurement & Service Delivery

— "No accessibility, no contract": include accessibility clauses, inclusive user testing, and human-in-the-loop safeguards in all AI RFPs.
— Require vendors to publish model cards disclosing disability representation in training data.

Sector Playbooks (adopt at least three in Year 1)

— Education: accessible materials, captions, localized sign-language tools; LMS compatibility with assistive tech and plain-language modes.
— Health: privacy-preserving chat and triage with crisis escalation and human backup.
— Employment: bar inaccessible hiring AI; mandate reasonable alternatives and anti-discrimination guidance.

Financing & Scale

— Launch a National AT & Inclusive-AI Fund (blended finance) tied to open-data and scale targets.

Monitoring & KPIs (publish annually)

— % of government AI services passing independent accessibility tests.
— Number of open, disability-representative datasets released and reused.
— Inclusive uptake in schools/clinics (urban/rural, gender-disaggregated).

— Employment outcomes for PWDs in AI-enabled programs; share of complaints resolved within SLA.
— Budget execution for inclusive data, compute, and innovation lines.

Annex 1. Examples of AI Applications Supporting PWDs in Africa (2015–2025)

Illustrative AI innovations for disability inclusion in Africa (2015–2025). These span multiple domains – communication, education, mobility, sensory assistance, and health – and highlight efforts in Kenya, Ghana, Rwanda, and beyond. Many are early-stage prototypes or pilot programs, reflecting an emerging landscape with significant growth potential.

Country	Initiative / Project	Description & Domain
Kenya	**AI4KSL**[160] (Maseno Univ.)	Assistive AI tool for Kenyan Sign Language – translates spoken English to KSL using virtual signing avatars (Communication/Education).
Kenya	**Signvrse**[161] *(startup)*	AI-powered app translating text to sign language (and vice versa) via a 3D avatar.
Ghana	**Abena AI**[162] *(TechCabal, 2022)*	Offline voice assistant in local Twi language – provides hands-free audio assistance, e.g. reading text aloud.
Ghana	**DeafCanTalk**[163] *(startup)*	Smartphone app enabling real-time communication between deaf and hearing individuals; connects users with certified sign language interpreters.
Ghana	**Google Project Relate**[164] **(pilot)**	Personalized speech recognition app for people with non-standard speech – 500-sample training to improve live transcription and voice assist; trialed in Ghana to test feasibility beyond the Global North.
Rwanda	**Accessible Digital Textbooks (ADT)**[165]	Government-backed initiative to produce *Accessible Digital Textbooks* for schools, using assistive tech to adapt content for learners with disabilities. A regional project won 2024 Zero Project Award for innovation and scalability.
South Africa	**ShazaCin**[166]	Visual assistance mobile app providing audio descriptions of media for blind or cognitively impaired users.
South Africa	**Senso** *(wearable)*	Smart bracelet that alerts deaf users to specific sounds (e.g. a baby crying) using AI-based sound identification and vibrations.

160 https://www.maseno.ac.ke/stakeholder-workshop-ai4ksl-bridging-language-barrier-using-artificial-intelligence-kenyan-sign
161 https://www.signvrse.com/
162 https://abena.mobobi.com/playground/
163 https://deafcantalk.com/
164 https://sites.research.google/relate/
165 https://www.unicef.org/digitaleducation/stories/unicefs-accessible-digital-textbooks-initiative-wins-zero-project-award-2024
166 https://shazacin.com/

Country	Initiative / Project	Description & Domain
Egypt	**e3rafli[167] Magnifier/Reader**	Assistive app connected to an AI image recognition database to identify objects and text for blind users.
Tunisia	**Cure Bionics[168]** *(startup)*	Development of bionic arms and exoskeletons using 3D printing and AI, increasing mobility and independence for persons with physical disabilities.

167 https://www.egyptindependent.com/vodafone-egypt-launches-new-app-blind-and-visually-impaired-customers/
168 https://curebionics.com/

Action Brief: Scaling Disability-Inclusive Artificial Intelligence in Africa

Purpose

Artificial Intelligence (AI) holds immense potential to transform accessibility, employment, education, mental health, and caregiving for more than 200 million Africans with disabilities. However, realizing these potential demands intentional action — across research, policy, investment, and innovation — to make AI inclusive by design, not by accident. Drawing on findings from Kenya, Ghana, and Rwanda, this chapter outlines evidence-based actions for policymakers, funders, entrepreneurs, and academics to accelerate Disability-Inclusive AI across the continent.

For Policymakers: Build Enabling and Inclusive AI Ecosystems

Goal: Integrate disability inclusion into every facet of Africa's AI strategies and national digital transformations.

Key Actions:

1. **Mandate Inclusion:** Embed accessibility standards in national AI strategies, ensuring alignment with the African Disability Protocol, CRPD, and AU Continental AI Strategy.
2. **Invest in Local Data Ecosystems:** Develop national disability datasets, open data repositories, and shared frameworks that represent Africa's diversity in disability, language, and context.
3. **Procure for Inclusion:** Require all government-funded digital tools and AI services to meet accessibility standards.
4. **Incentivize Inclusive Innovation:** Offer tax incentives and challenge grants for companies developing assistive or accessible AI applications.
5. **Regional Coordination:** Harmonize standards through the African Union and regional bodies to support scalable, cross-border innovation.

Outcome: Policy coherence and resource alignment that make disability inclusion the default in Africa's AI future.

For Funders and Development Partners: Finance Inclusion at Scale

Goal: Build a sustainable financing pipeline for Disability-Inclusive AI ventures and research.

Key Actions:

1. **Invest in Early-Stage Ventures:** Provide blended finance and catalytic grants to startups creating accessible technologies such as AI4KSL (sign language), Cure Bionics (prosthetics), or Tumaini (mental health chatbots).
2. **Support Inclusive Research Networks:** Fund multidisciplinary hubs linking universities, OPDs, tech incubators, and mental health organizations.
3. **Tie Funding to Co-Design:** Require projects to include PWDs as co-researchers and testers, ensuring participatory innovation.
4. **Prioritize Localization:** Invest in African-language datasets and regional AI talent pipelines.
5. **De-Risk Innovation:** Establish challenge funds and outcome-based grants to move pilots to market-ready solutions.

Outcome: A robust investment ecosystem fueling locally owned, scalable Disability-Inclusive AI solutions.

For Entrepreneurs and Startups: Champion Disability-Inclusive Innovation

Goal: Position African innovators as global leaders in accessible design and ethical AI.

Key Actions:

- **Co-Create with Lived Experience:** Partner with OPDs and caregivers to ensure products meet real-world needs.
- **Design for Low-Resource Contexts:** Use mobile-first and offline-accessible technologies (e.g., USSD, WhatsApp, SMS) to reach rural users.
- **Serve Multiple Disabilities:** Incorporate multimodal interfaces (voice, text, sign language avatars, gesture recognition).
- **Integrate Ethics and Accessibility:** Adopt inclusive-by-design checklists aligned with WCAG and ISO accessibility standards.
- **Measure Impact:** Track accessibility metrics and share learnings publicly.

Outcome: Inclusive innovation becomes a competitive advantage, creating both social impact and business opportunity.

For Academics and Researchers: Build Evidence and Capacity

Goal: Generate Africa-centered knowledge to inform global AI-for-Disability discourse.

Key Actions:

- **Identify Research Frontiers:** Study gaps such as data ethics, generative AI for low-literacy users, and economics of assistive tech adoption.
- **Create Interdisciplinary Curricula:** Integrate disability studies, ethics, and accessible design into computer science and engineering programs.
- **Develop Open Repositories:** Curate datasets for African sign languages, local speech diversity, and assistive contexts.
- **Use Participatory Action Research:** Engage PWDs and caregivers as co-researchers in AI development and evaluation.
- **Translate Findings:** Produce policy briefs and practical guides accessible to non-specialists.

Outcome: A vibrant research and talent pipeline driving inclusive AI grounded in African realities.

Cross-Sector Priorities for All Stakeholders

Priority Area	Action Imperatives
Localization	Build African-language AI models, culturally attuned interfaces, and community-driven design.
Data Justice	Ensure ethical disability data governance — balancing privacy, consent, and openness.
Accessibility as Default	Require every public AI service, app, and chatbot to meet accessibility standards from inception.
Sustainability	Foster public-private partnerships to ensure affordability, maintenance, and scale.
Accountability	Embed inclusion metrics in all AI strategies, funding, and evaluation frameworks.

Invest and Scale Emerging Use Cases for Disability-Inclusive AI

- **Education:** AI-powered accessible textbooks, adaptive learning platforms, and sign-language translation tools.
- **Employment:** AI-driven job matching, resume builders, and workplace assistive technologies to bridge inclusion gaps.
- **Mental Health:** GenAI chatbots offering accessible counseling in local languages via WhatsApp or SMS.
- **Caregiving:** AI assistants that provide stress support, schedule management, and peer networking for caregivers.
- **Mobility:** AI prosthetics, navigation aids, and smart mobility devices tailored to African terrain.

Pathways to Scale: Insights from Kenya, Ghana, and Rwanda

- **Kenya:** Leverage existing innovation hubs and partnerships to build disability-focused AI ecosystems.
- **Ghana:** Integrate accessibility into national open data platforms and invest in inclusive AI education under the "AI Ready Ghana" initiative.
- **Rwanda:** Embed disability data in Smart City initiatives and digital public service delivery.
- **Regional Action:** Create an African Disability AI Innovation Network — linking universities, startups, OPDs, and governments to co-develop scalable, inclusive AI solutions.

Call to Action

Inclusive AI is not a niche issue — it is the foundation for equitable digital transformation. Governments must legislate for inclusion, funders must invest in participatory innovation, entrepreneurs must design for accessibility, and academics must generate local evidence.

Gallery

Greater Accra Region, Ghana

Northern Region, Ghana

Ashanti Region, Ghana

Stakeholder Engagement, Rwanda