

## **An African perspective on gender and artificial intelligence needs African data and research**

- ❖ **Big data is a key element of Artificial Intelligence (AI), but the effective use of AI simultaneously depends on the scope and quality of the available data used to train and test algorithms.**
- ❖ **Algorithms learn from real-world data and historically most traditional data sets are exclusionary and have left out women and other marginalised groups. Thus without careful consideration of the data that informs algorithms, AI can potentially perpetuate existing or even create new unconscious social biases.**
- ❖ **African policymakers contemplating the use of AI to accelerate social and economic development should in parallel:**
  - **(i) Enable the collection of gender-disaggregated data on the delivery, use and outcomes of AI and other technological systems;**
  - **(ii) Support gender research to anticipate the differential impacts of AI on men and women from different walks of life; and**
  - **(iii) Critically assess the local relevance of data and research from foreign or global sources.**

### **Introduction**

Research on the gender dimensions of Artificial Intelligence (AI) and other frontier technologies in Africa is still in its infancy. Compared to other world regions, Africa has little or no gender-disaggregated data on digital access, skills and participation in the digital economy. There is also limited quantitative and qualitative research on related issues such as: barriers to gender digital equality, the impact of social structures on women's career paths in innovation, science, technology, engineering, arts, and mathematics (African Union, 2020) and the effect of crosscutting demographic characteristics on people's experience of technology. Without representative data and research to drive evidence based policies, Africa cannot realise the full benefits of Fourth Industrial Revolution (4IR) technologies as

envisaged in the African Union’s Digital Transformation Strategy. The implications of these data deserts are becoming more dire as African countries are encouraged to swiftly attempt towards transitioning to 4IR technologies, such as AI for national development<sup>1</sup> and future post-Pandemic resilience<sup>2</sup>, without consideration of the unintended consequences. With their immense appetite for and dependence on big data for decision-making, AI systems have the potential to exacerbate existing gender inequalities or even create new disparities if the knowledge that informs AI design is not representative of African realities (Cowgill et al, 2020).

AI systems have the potential to exacerbate existing gender inequalities or even create new disparities if they are not designed with due consideration to local gender issues.

## Does AI in Africa have a gender problem?

The answer is, ‘we do not know’. At present, most global organisations, such as the International Telecommunications Union (ITU) and International Labor Organisation (ILO), do not systematically gather gender-disaggregated data on AI-related indicators. Some institutions have started compiling statistics—such as Stanford University’s [AI Index](#); Element AI’s [Global AI Talent Report](#) and the World Economic Forum’s (2020) [Global Gender Gap report](#). These and other policy and academic resources (e.g. Bergen, 2016; Collett & Dillon, 2019; West et al., 2019) generally agree that the AI sector has a gender problem. For example, the 2019 Global AI Talent Report found that only 18% of researchers publishing at the top AI conferences were women, the AI Index 2020 reported only 20% of new faculty hires in 2018 were women, and the 2020 Global Gender Gap report found that women made up 26% of workers in data and AI, while 74% are male. However, these findings mostly represent emerging and advanced economies in Asia, Europe and North America, and do not capture or represent the situation in Africa. Data limitations prevent us from understanding how similar or different these conditions are in the African context.

## Africa’s gender and AI data challenge

Although many private sector companies already analyse big data to improve their services and products as well as understand their customers in real time, from a developmental perspective, African countries lack gender data on two fronts — the availability of official national statistics to provide open source data, and the availability of quantitative and qualitative research on gender issues in relation to AI. In the absence of any sources on AI-related data in Africa, Table 1 represents an

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<sup>1</sup><https://www.dst.gov.za/index.php/media-room/latest-news/2776-government-welcomes-microsoft-initiative-for-artificial-intelligence-in-south-africa>

<sup>2</sup><https://blogs.worldbank.org/digital-development/how-ai-can-help-developing-countries-rebuild-after-pandemic>

analysis of the availability of data indicators on older technologies across different regions. It reveals that very few African countries have gender disaggregated data on any aspect of technology (Table 1).

Table 1 : Percentage of countries per region reporting gender-disaggregated data

	Africa	Americas	Asia	Europe	Oceania <sup>3</sup>
<b>Total number of countries</b>	<b>54</b>	<b>35</b>	<b>49</b>	<b>50</b>	<b>14</b>
Owning a mobile phone	11%	20%	39%	16%	7%
Using the internet	17%	46%	55%	74%	7%
Computer programming skills	6%	6%	22%	66%	0%
STEM graduates	33%	54%	57%	62%	7%
Engineering & Technology researchers	6%	17%	18%	62%	14%
Telecom industry employees	7%	29%	18%	68%	21%

Source: Sey & Hafkin (2019). Taking stock: Gender equality in digital access, skills and leadership.

On the research front, western literature has covered a wide range of topics demonstrating the reality and potential of AI for gender justice from historical and contemporary perspectives. This includes research on the potential for AI to enable the transcending of gender identities and mitigate gender discrimination (e.g. Bergen 2016; Haraway, 2016; Zhang, Feinzig, Raisbeck, McCombe, 2019); data bias (e.g. Buolamwini & Gebru, 2018; Niethammer, 2020; Cirillo et al, 2020; Leavy, Meaney, Wade & Greene, 2020); unequal application and outcomes of AI (Michelfelder et al, 2017) diversity in the AI workforce (e.g. Best & Modi, 2019; Murphy, 2019) gendered representations of AI (e.g. UNESCO, 2019 ; Zdenek, 2007); building theory, including feminist perspectives on AI (e.g. Adam, 1996; Wellner & Rothman 2020).

Very little of this type of research and reflection is emerging from African scholarship. Much of the available literature consists of commentaries on the potential of AI for national development in general.<sup>4</sup> Those that discuss pertinent issues, such as data bias and other risks, invariably draw on studies from the Global North—failing to fully capture the manner in which badly designed AI could

<sup>3</sup> <https://www.nationsonline.org/oneworld/oceania.htm>

<sup>4</sup> <https://www.mcit.gov.sa/sites/default/files/examples-of-ai-national-policies.pdf>

**Relying solely on non-African gender research to inform local policy could lead to erroneous decisions or misplaced priorities and actions**

exacerbate discrimination and exclusion in the context of developing countries with weak human rights law or institutional remedies (Arun, 2019). While some of the research conclusions from Europe, North America and Asia might be applicable in Africa, the configurations of gender and power in Africa are not necessarily the same. The issues may have different dimensions resulting from specific national contexts. Relying solely on non-African gender research to inform local policy could lead to erroneous decisions or misplaced priorities and actions.

## Filling the gaps

To lay a foundation for more research on gender and AI in Africa, Research ICT Africa (RIA) has included a crosscutting gender component in its ongoing study of AI and socio-economic development in Africa (AI4D).<sup>5</sup> The AI4D project is mapping the deployment of AI across Africa with particular attention to biometric identity systems, computer vision and surveillance systems, AI skills and governance capacity building, as well as AI workforce development. In each of these thematic areas, the study will seek to identify gender dimensions and implications grounded in the contexts of specific African countries.

## Recommendations to generate African perspectives on gender and AI

Beyond the privacy issues, capacity limitations, and the digital divide that pose challenges for big data collection in Africa—if new technologies such as AI are not developed and applied in a context-responsive way, they are likely to reproduce and reinforce existing gender stereotypes and discriminatory social norms. While data and research alone are not the answer, they are important components for gender-responsive policymaking. To generate African perspectives on gender and AI, governments should:

- Increase national statistics offices (NSO's) funding to develop strong, modern national statistical systems with capacity to deliver and use more and better data for longer-term prosperity and sustainable development.
- Enhance private-public partnerships to build bridges and catalyze adoption regarding using new digital data sources and analytics into institutional practice for the public good.
- Update capacity of NSOs to include collecting gender-disaggregated data on emerging technological trends, including at a sub-national level.
- Sensitise other relevant agencies (e.g. Science and Technology, Communications and Education Ministries) on the importance of mainstreaming gender into policies.

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<sup>5</sup> <https://researchictafrica.net/2020/01/01/ai-in-africa-policy-project-ai4d/>

- Support local initiatives that supplement supply-side data from mobile service providers with open source demand-side data directly from consumers (e.g. RIA's After Access surveys).
- Incentivise and support rigorous quantitative and qualitative research on gender, technology and society (by academics, non-profits, think tanks, etc.).

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