



Opportunities and Gaps in the Governance of Artificial Intelligence for Global Health in Africa



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ScienceforAfricaFoundation

EXECUTIVE SUMMARY

The role and impacts of AI and data science in global health have far-reaching policy, research, economic, and political implications, driven by rapid advancements that transform individuals, industries, economies, and society at large. These technologies are particularly impactful in sectors such as agriculture, health, manufacturing, and finance. In global health, they revolutionise medical service delivery, the production of new medical devices and pharmaceuticals, and health research, especially in fields like genomics, pandemics, and clinical trials.

This report, prepared by the Science for Africa (SFA) Foundation, provides a comprehensive review of the governance of AI and data science for global health in Africa. It is based on a multifaceted methodology that includes academic and grey literature reviews, online surveys, six regional convenings, stakeholder interviews, bibliometric and policy analysis, and a bilingual survey. The integration of multiple research methods and extensive stakeholder engagement across 43 countries and involving over 300 stakeholders ensures a richer and more nuanced perspective compared to studies relying on a single methodology. Additionally, compared to other reports that primarily focus on technological and ethical considerations without delving deeply into regional specifics or stakeholder engagement, the SFA Foundation's report offers a granular, Africa-specific analysis backed by empirical data and stakeholder insights.

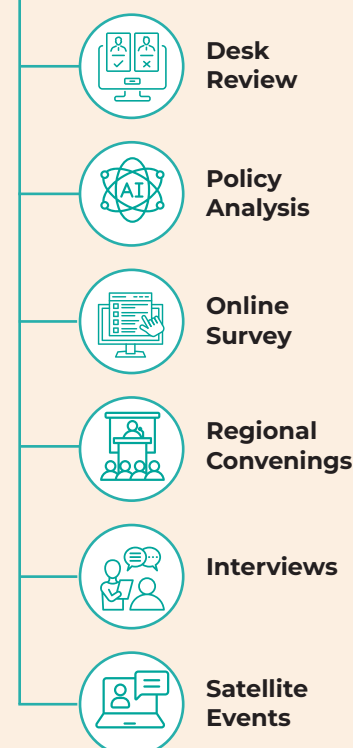
The findings emphasise the importance of local context, addressing urban-rural divides, gender considerations, and indigenous knowledge systems, ensuring that

the recommendations are both globally relevant and practically applicable within African contexts. The focus on gender and equity in AI policy frameworks, is an aspect often underrepresented in other reports, yet critical if AI governance is going to contribute to inclusive and equitable development.

Policy recommendations include the need for adaptive regulations and the strategic use of existing frameworks, such as the AU's Digital Transformation Strategy, to create a robust AI governance structure tailored to African global health needs. While underscoring the importance of capacity building and trust, providing practical recommendations for innovative funding and institutional support to strengthen AI governance. Furthermore, policy recommendations emphasise science diplomacy and the necessity of African representation in international forums to ensure that global AI policies are inclusive and reflective of African priorities.

In summary this report contains rich empirical information on the status of AI policy and regulations for responsible and ethical AI for health and includes discussion of the challenges and opportunities for African countries developing effective governance regimes for the adoption of AI for global health in Africa. While the combination of desk review, policy analysis, bibliometric studies, and stakeholder perspectives provides a more integrated and actionable framework for AI health governance in Africa, making the report a valuable resource for policymakers, researchers, and stakeholders navigating the complexities of AI governance in the African context.

METHODOLOGY



SUMMARY OF EMERGING TRENDS, GAPS, OPPORTUNITIES, AND RECOMMENDATIONS

Eight groups of findings emerge from this study's review of reports, survey results, policy analysis, bibliometric analysis, regional convenings, and interviews.



1 There is a growing constituency of co-funding investing in responsible AI for development - An increasing number of African countries, RECs, and the AU are recognising the critical importance of investing in responsible/ethical AI and data science. Examples include Mauritius, Nigeria, Malawi, Ethiopia Benin, Ghana, Rwanda, Senegal, and Tunisia, which have developed dedicated national AI programmes. In mid-2023, at least 39 African countries had AI R&D-related projects focusing on different areas, such as health genomics and the use of big data analysis in clinical trials.

Rwanda's Seed Investment Fund was established to foster an environment for co-investment between the government, angel investors, and venture capital in AI startups. Nigeria has established the National Centre for AI and Robotics (NCAIR) under the National Information Technology Development Agency. Ethiopia has set up the Ethiopian Artificial Intelligence Institute, which has the mandate for the legislation and regulatory frameworks. Likewise, Malawi has established a Centre of Excellence for Artificial Intelligence at the Malawi University of Science and Technology (MUST). Egypt has initiatives such as the Egyptian AI Observatory and Tunisia has the Tunisian AI Academy.



2 Demand for AI policy and regulatory capacities is high in Africa but requires gender and equity considerations - Egypt, Mauritius and Rwanda have developed and adopted dedicated policies and/or strategies for AI. Egypt and Mauritius have national strategies with policy provisions, while Rwanda has a more explicit AI policy with an implementation plan being finalised. Egypt and Rwanda's policy frameworks only make passing reference to health. Only Mauritius has outlined specific health R&D and innovation priorities in its AI policy framework. Mauritius's National AI Strategy, adopted in 2018, puts emphasis on e-health, use of genomics to address various diseases and challenges of the aging population, and promote the development of personalised medicine and treatments of cancers. The Mauritius Artificial Intelligence Council (MAIC) was established to oversee the implementation of the strategy.

As much as these to some extent, are guided by or based on international guidelines or recommendations they have also been contextualised to the local context. Importantly, the process of development attempted engagement with varied stakeholders. Additionally, several other African countries are in the process of developing national AI polices e.g. Kenya, Nigeria. Likewise, several other African countries have varying levels of strategy documents. Unfortunately, within the existing policy documents very limited references to gender, women, and youths. Despite this there has been considerable progress in promoting the uptake of STEM disciplines and coding skills among women and youths. Addressing GEDI in AI polices is a critical gap if not addressed will exacerbate gender inequity and not allow Africa to harness AI for its developmental goals if all genders and at-risk populations cannot fully contribute to and benefit from the digital and technological advancements driving Africa's future.

Demand for AI policy and regulatory capacities is high in Africa. According to a survey by UNESCO (2021)⁵⁸ at least 21 African countries have identified the need to build policy capabilities as a priority for effective, good application of AI. This sentiment was echoed in this study with an emphasis by stakeholders on efforts being African lead anchored on trust and contextual understanding.



3 Health has been identified as a priority area for AI yet no health specific AI governance frameworks - This study has identified health as one of the priority sectors in which AI and data science are to be developed and deployed to address specific national and global challenges. Within health, mental health, pandemics, and one health were further identified as impost sub-topics. However, no health specific AI strategy or policy exists. In countries with AI policies and strategies, the focus is more on healthcare applications and supporting AI startups. This is a critical gap given that it is essential to include redlines for governance of AI in health since they promote responsible and ethical use of AI by balancing innovation with ethical, safety, and societal considerations.

Additionally, most of these AI polices and strategies are housed in line Ministries of ICT and the immediate risk of this is (a) challenges in understanding the nuanced requirements of healthcare systems, potentially affecting the design and implementation of AI solutions tailored to healthcare needs and (b) challenges with ensuring compliance with healthcare regulations, leading to potential

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legal and ethical concerns regarding patient safety and data protection.

4 There are existing policy frameworks on which to build and/or consolidate governing of responsible AI and data science - At least 35 African countries have national STI and ICT as well as health research and innovation policy frameworks that contain policies applicable to the development and deployment of AI and data science. Some STI policy frameworks (e.g., Namibia and South Africa) require governments to formulate regulatory regimes (policies, regulations and sometimes agencies) for responsible and ethical AI and to protect data in the era of data sharing, open science and open innovation. Kenya's country's Digital Master Plan (2022-2032) includes extensive references to AI. Furthermore, there are several regional strategies and frameworks that can be utilised for the development of AI policies. These include the African Union's Agenda 2063 and Digital Transformation Strategy, the Smart Africa Alliance, the African Data Protection and Privacy Framework, and UNECA's AI Ethics Guidelines. While AUDA-NEPAD is in the process of developing an AU-AI blueprint.

Additionally, the SFA Foundation survey and regional consultations found that 22 countries have regulatory frameworks for (personal) data protection. Moreover, regional data protection laws and frameworks are also present that can be leveraged, including the African Union Convention on Cybersecurity and Personal Data Protection, and the African Data Governance Initiative. All these frameworks prioritise leveraging AI to drive sustainable development, digital transformation, and inclusive growth across the continent while promoting ethical AI practices and safeguarding individuals' privacy right. Furthermore, by focusing on these continental frameworks allows African Union Member states to develop comprehensive AI policies that address their unique socio-economic challenges and maximise the benefits of AI for their citizens. However, it is critical that these efforts integrate global health security considerations.



5 There is a surge in African research on health AI and data science (big data) raising the need for equitable North-South R&D partnerships - A preliminary bibliometric analysis shows that, though still a small portion of the global total, African (or Africa-based and/or -focused) international peer-reviewed journal articles on health AI and data science have increased considerably in the past decade or so, particularly in data science such as genomics and clinical trials research. However, like the survey findings illustrating that Western and Northern Africa have the highest level of self-identified experts there is a gap in the R&D output from across the African regions. This gap calls for intra-African collaboration and equitable north-south partnerships. South Africa's balanced approach to single- and multiple-country publications can serve as a model for other African nations, as can the consortium model used for grant-making by the SFA Foundation. Importantly, in the African context where published literature is not equally represented there is need to provide funding for open access initiatives in Africa, particularly for researchers conducting research on AI in global health. As is the need for establishing geo-fenced African research & data repositories that can be hosted by institutions or organisations and can provide a centralised platform for researchers to share their research papers and data.

Additionally, there is an increasing number of health AI research and innovation networks and partnerships of various kinds emerging in Africa, such as the Artificial Intelligence for Development (AI4D) and Africa-Canada Artificial Intelligence and Data Innovation Consortium. However, these initiatives are not sharply focused on strengthening national policy and regulatory capacities.



6 Generally, AI and data science R&D is moving faster than governance - This raises issues including whether ethical, social and technical impacts are being considered in the AI R&D being conducted in Africa. There is concern that, because most of the health AI and data science R&D in Africa is funded by foreign companies and international organisations, it may not be aligned with national health priorities of African countries. Nonetheless, this trend can be leveraged to translate AI research findings into actionable policy recommendations

This involves close collaboration between researchers and policymakers, facilitated through initiatives like the SFA Foundation's Science Policy Engagement for Africa programme (SPEAR). Also, this

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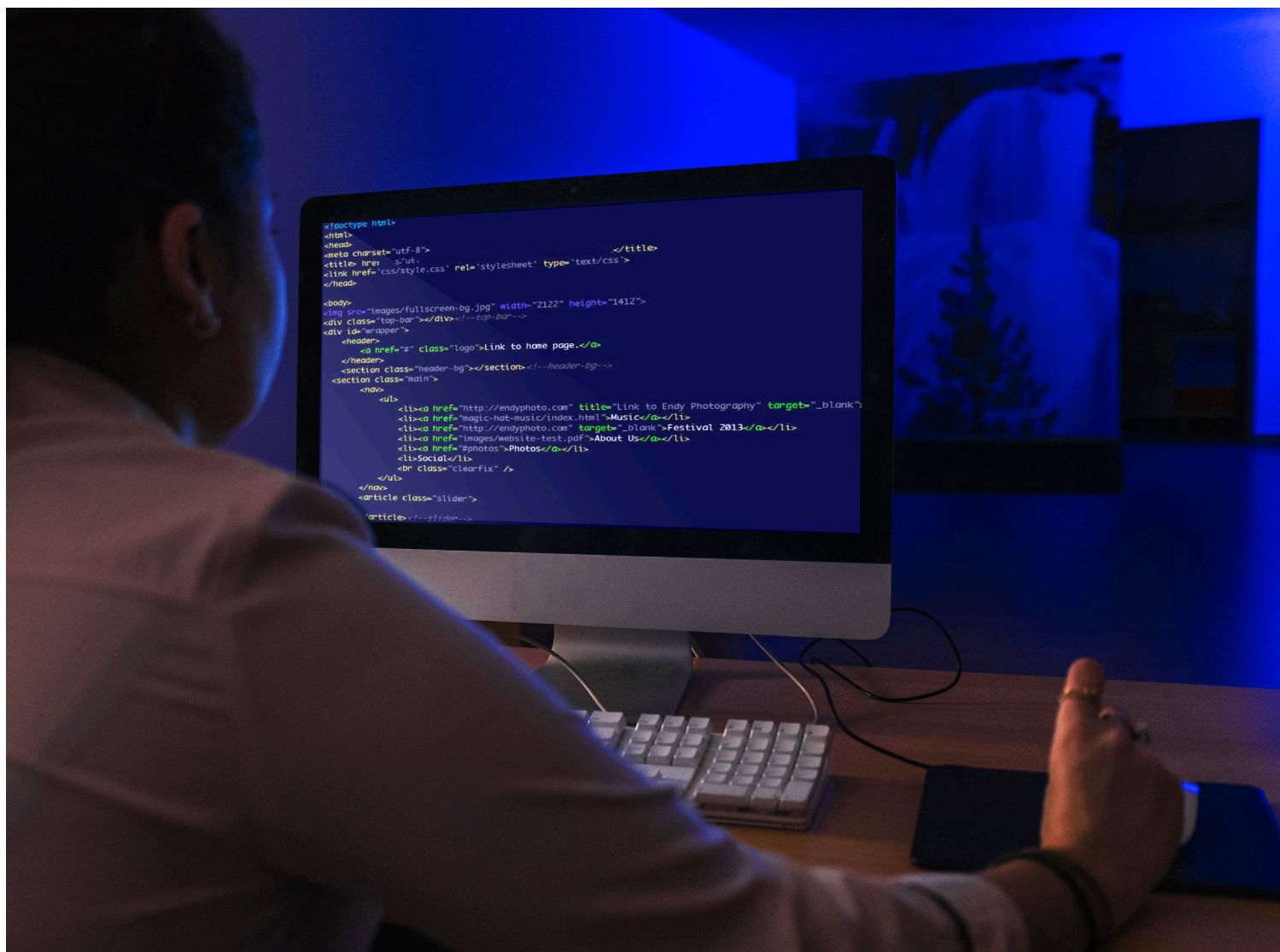
momentum can be accelerated by supporting and incentivizing research in AI in Africa

7 There is a growing number of local and international actors in AI and data science for global health in Africa - A mapping of actors in health AI and data science shows that there is an increasing number of small firms and start-ups in health AI in Africa, mostly concentrated in Kenya, South Africa, Nigeria, Ghana, Uganda and Senegal. Most of these are affiliated with big companies such as Microsoft and are mainly focused in the healthcare sector. Universities in Algeria, Egypt, South Africa, Uganda, Kenya and Mauritius are playing key roles in R&D focusing on AI applications in health genomics and clinical trials. This provides an opportunity for forming public-private-partnerships.



8 Low trust and literacy in AI - Our findings show that policy literacy levels are low. Most participants, including self-identified experts, have limited awareness and knowledge of external and international policy frameworks. This lack of trust and knowledge poses significant challenges to the adoption and regulation of AI in healthcare. This calls for raising public policy literacy through science-policy engagement and community-public engagement initiatives

Eke, et al (editors, 2023)⁵⁵, Owoyemi et al (2020)⁵⁶ and Gaffley et al (2022)⁵⁷ provide some indication of the effectiveness of different data protection policy frameworks, concluding however that most countries have weak enforcement mechanisms, low levels of public awareness of the regulations and limited judicial experience to deal with violations of data protection.



POLICY RECOMMENDATIONS FOR AI FOR HEALTH GOVERNANCE IN AFRICA



1. Focus on Health Governance

- **Integrate Global Health Security Considerations:** Ensure AI initiatives align with global health security measures to enhance resilience against pandemics and other health threats.
- **Leverage and Strengthen Existing Frameworks:** Strengthen Africa regional data sharing and collaboration frameworks e.g. ratification of the Malabo Convention.
- **Gender Considerations:** Incorporate gender-sensitive approaches in AI health governance to ensure inclusivity and equity.
- **Urban-Rural Considerations:** Governance frameworks must consider the urban-rural divide in Africa.
- **Adaptive Regulations:** Implement flexible regulatory approaches that can adapt to the fast-evolving nature of AI technologies and accommodate the unique characteristics of the informal sector while promoting innovation and formalisation e.g. temporary relaxations or modifications of existing regulations within the sandboxes.
- **Balance Innovation with Access:** Regulations must balance IP protection with the need for widespread access to AI technologies that can improve health outcomes.
- **Harnessing Endogenous Knowledge:** Integrate local and indigenous knowledge into AI health governance policies. Ensure that these perspectives are included in the development, implementation, and monitoring of AI health initiatives.



2. Address Trust Concerns

- **Raise Policy Literacy:** Raise public policy literacy through initiatives to educate both the public and policymakers about the benefits and applications of AI and data science in health governance.
- **Community Public Engagement and co-creation:** Promote engagement between science policymakers and the community to build trust and ensure public involvement in AI initiatives and policy development.
- **Leverage Social Sciences and Arts:** Engage through local languages and communication mediums e.g. plays, local language radio.
- **Dialogue and Impact Assessments:** Facilitate regular dialogue and conduct impact assessments to promote evidence-based governance approaches.
- **Cross Ministry Approach:** Collaboration among different line ministries e.g. ICT, health, finance, gender etc.
- **Cross-Learning Initiatives:** Support initiatives to promote cross-learning among African nations e.g. SPEAR programme at the SFA Foundation.



3. Innovative Funding For R&D and Governance

- **Centers of Excellence for AI Governance:** Establish dedicated centres and networks for AI in global health policy and connect them with AI R&D hubs.
- **AI Funding Mechanisms:** Create innovative funding instruments to support AI research and development. Examples include:
 - » Social bonds can be used to raise funds for projects with clear social outcomes
 - » Equity instruments which can be pooled into an AI for Global Health R&D fund
 - » Blended finance public private partnerships
 - » Leverage financial instruments at the nexus of global health such for climate change
 - » African AI governance fund established by AU to support low-income countries in developing technical and policy capabilities for AI governance.
- **Leverage Innovation Hubs to Create Regulator Sandboxes:** Kenya, South Africa and Nigeria's ecosystem to be linked and supported in AI regulation to create regional regulator sandboxes.
- **Recognise and Integrate Informal Sector Contributions:** by providing market linkages, infrastructure support etc to encourage innovation that leverages local knowledge, practices, and networks.



4. Science Policy and Science Diplomacy

- **Strengthen Science Policy Capacity:** fund science-policy engagement programmes to ensure that AI technologies for global health are developed and deployed in ways that maximise benefits while minimising risks, are contextualised to Africa priorities and context and to ensure that Africa is represented in the development of international standards and agreements on AI governance.
- **Reinforce Science Diplomacy:** Enhance efforts to use science diplomacy for socio-economic development through AI. Ensure African representation in bilateral and multilateral agreements such as international data sharing agreements, IP, equitable access etc. Also to build cooperation around AI governance and R&D in global health.
- **Promote Open Access:** Advocate for open access to data repositories for AI research, following models that prioritise community over commercialisation, such as those in Latin America.
- **Science Envoys:** Appoint science envoys who can represent countries in international forums, advocate for global health priorities, and facilitate cross-border collaboration on AI initiatives.
- **Science-Policy Platforms:** Create platforms for AI researchers and practitioners to interact with policymakers and legislators. Platforms to also include local knowledge.



5. AI Policy Analysis and Evidence Gathering

- **Support Think Tanks:** Strengthen African think tanks in developing evidence-gathering and analysis programmes.
- **Inform Governments:** Ensure that national governments have access to accurate information about AI for health governance, utilising local languages and knowledge systems.
- **Evidenced Based Decision-making Training Workshops:** Provide training for policymakers, parliamentarians, and regulators on African data sets to enhance their ability to use evidenced based decision making.



Lillian Mutengu, Programme Manager, Public Engagement with Science at the SFA Foundation speaks at the Science Policy Engagement with Africa's Research (SPEAR) programme, Artificial Intelligence and Data Science Policy Convening held in Pretoria, South Africa from 28-29 June 2023. PHOTO | SFA Foundation

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Transforming Lives

Insp

AI Data in Health
Southern African Dialogue

Date
28-29 June 2023

Venue
NRF, Pretoria (Albert Luthuli Auditorium)

SCAN ME

AFRICA NRF MRC Cochrane South Africa

The slide features a large graphic of a human head profile composed of a wireframe mesh, with the letters 'AI' prominently displayed inside the head. The background is a solid teal color.



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FOUNDATION

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