# GLOBAL INFORMATION SOCIETY WATCH 2019

## *Artificial intelligence:*
### *Human rights, social justice and development*

Association for Progressive Communications (APC),
Article 19, and Swedish International Development Cooperation Agency (Sida)

# Global Information Society Watch

## 2019



Global Information Society Watch 2019
Artificial intelligence: Human rights, social justice and development

**Operational team**
Valeria Betancourt (APC)
Alan Finlay (APC)
Mallory Knodel (ARTICLE 19)
Vidushi Marda (ARTICLE 19)
Maja Romano (APC)

**Project coordination team**
Valeria Betancourt (APC)
Cathy Chen (APC)
Flavia Fascendini (APC)
Alan Finlay (APC)
Mallory Knodel (ARTICLE 19)
Vidushi Marda (ARTICLE 19)
Leila Nachawati (APC)
Lori Nordstrom (APC)
Maja Romano (APC)

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**Editor**
Alan Finlay (APC)

**Assistant editor and proofreading**
Lori Nordstrom (APC)

**Publication production support**
Cathy Chen (APC)

**Graphic design**
Monocromo

**Cover illustration**
Matías Bervejillo

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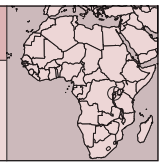
# RWANDA

## AI EYED TO TRANSFORM HEALTH CARE IN RWANDA



**Emmanuel Habumuremyi**
https://www.linkedin.com/in/emmanuel-habumuremyi-b808861a

### Introduction

Although artificial intelligence (AI) has started to raise human rights concerns at the global level, this is not yet the case in Rwanda, which still sees it mainly as an opportunity for meeting the country's development needs. On one side, the country is witnessing young innovators thriving to put in place AI solutions while waiting curiously for the time when they will benefit from its socioeconomic promise. On the other side, this has awakened policy makers' minds, who are now thinking about the necessary policy and regulation framework to be established in Rwanda to cater for the use of AI in various domains.

This report identifies existing policies and regulations in place governing the use of AI in service delivery, before considering how AI is being piloted in the health sector to bring the country closer to achieving the United Nations Sustainable Development Goals (SDGs) on issues to do with ending health care inequality. It ends by offering a set of first-base action steps to strengthen the use of AI in Rwanda.

### Country context

The presence of Sophia, a humanoid robot,[1] at the Transform Africa Summit held in Kigali on 9-11 May 2019 raised awareness in Rwanda of the existence of AI and its potential. The summit sparked a plethora of ideas in the area: "We were inspired by the technology the robotic company used to create Sofia."[2] However, a large number of students with dreams to become national and global leaders in software development face challenges ranging from a lack of facilities and exposure to competition from expatriate IT experts.[3]

Rwanda, as a small land-locked country located in eastern Africa's Great Lakes region, thrives despite the fundamental development constraints it faces following the 1994 genocide committed against Tutsis that left the country on the list of "failed states". Information and communications technology (ICT), at the centre of its economic transformation agenda, made the country one of the fastest growing economies – with a GDP growth of around 8% per year between 2001 and 2014.[4] In the 2019 Index of Economic Freedom published by the Heritage Foundation, Rwanda's economic freedom score is 71.1, making its economy the 32nd freest in the 2019 index.[5] In terms of connectivity, the highest 2G technologies cover 99.13% of the country and reach 99.92% of the population. Deployed 3G technologies cover 77.40% of the country and reach 93.37% of the population. 4G LTE technology has a 94.2% geographic coverage and reaches 96.6% of the population, as highlighted by the Rwanda Utilities and Regulatory Authority (RURA).[6]

The country's leadership believes that emerging technology can help it leapfrog the digital divide. With the world fast embracing the "Fourth Industrial Revolution", the president of Rwanda, Paul Kagame, said that Africa's challenge is to catch up in providing universal broadband:

> To succeed in making African homes, offices, schools and cities smart, we have to harness opportunities in exponential technologies. These technologies include Artificial Intelligence, Robotics, Drones, Big Data, Block chain, and 3D printing.[7]

For Rwanda, AI is an emerging technology to be embraced, not to be avoided. According to Antoine Sebera,[8] the government's chief innovation officer, most of the current computer applications being

1 Xinhua. (2019, 15 May). Humanoid robot Sophia addresses Africa technology summit in Rwanda. *Xinhua*. www.xinhuanet.com/english/africa/2019-05/15/c_138061183.htm

2 Buningwire, W. (2019, 1 July). Kigali High School Students Create A Robot, Calls It 'Sofia's Brother'. *KT Press*. https://ktpress.rw/2019/07/kigali-high-school-students-create-a-robot-calls-it-sofias-brother

3 Rwirahira, R. (2018, 20 December). AI experts seek government help. *Rwanda Today*. rwandatoday.africa/news/AI-experts-seek-government-help/4383214-4904052-4dpp28/index.html

4 Hutt, R. (2016, 7 April). 5 things to know about Rwanda's economy. *World Economic Forum*. https://www.weforum.org/agenda/2016/04/5-things-to-know-about-rwanda-s-economy

5 https://www.heritage.org/index/country/rwanda

6 https://rura.rw/fileadmin/Documents/ICT/statistics/Quarterly_Telecom_Statistics_report_as_of_March_2019_.pdf

7 paulkagame.com/?p=5257

8 Interview with the government's Chief Innovation Officer Antoine Sebera, May 2019.

manufactured have components that are AI-enabled. It is a global trend which raises ethical, social and cultural issues that necessitate the establishment of policies to grow the economic sector, but at the same time to protect people and promote ethics. The ongoing policy development to cater for AI is being supervised by the Ministry of ICT and Innovation, in partnership with RURA, the Rwanda Information Society Authority (RISA), and all relevant stakeholders from the public and private sectors and civil society.

In September 2018, AI officially entered the university curriculum, thanks to a master's degree launched by the Senegalese expert Moustapha Cissé, head of Google's AI research centre in Ghana, and by the African Institute of Mathematical Sciences (AIMS) in Kigali.[9]

Citizen awareness programmes specifically focusing on AI are not yet in place in the country. But community awareness on digital literacy is covered under the Rwanda Digital Ambassador Programme (Rwanda DAP). Started in 2017, the DAP initiative aims to transform the lives of five million citizens by bringing them online through training held in their respective communities.[10] The programme mobilises 5,000 young leaders who help Rwandans acquire digital skills and adopt e-services, driving inclusion and growth. In alignment with the Rwanda National Digital Talent Policy[11] and the World Economic Forum's Internet for All Initiative,[12] Rwanda's DAP is being implemented countrywide in partnership with Digital Opportunity Trust (DOT),[13] a civil society organisation. This initiative drives digital adoption, and helps bridge the ICT skills gap – exposed to digital devices, citizens are educated on opportunities, rights and security online.

## Securing the right to health using AI in Rwanda

Since 2010, Rwanda has been involved in various Broadband Commission for Sustainable Development[14] discussions on how digital tools can increase access to health, empower patients, and provide better health information, and how real-time data can ensure that monitoring systems are more action-oriented and prioritise limited resources.[15] Below is the current status of the use of IT, including AI, in the health system.

### *The health system in Rwanda[16]*

Rwanda believes in health care for all where health care coverage is ensured through a health insurance scheme called "Mutuelles de Santé", started in 1999. Citizens pay premiums into a local health fund via an online platform called Irembo,[17] and can draw from it when in need of medical services.

Rwanda's health care system is one of the most advanced in Africa.[18] In 1995, the country established a community health workers' framework (CHW), which was aimed at increasing the uptake of essential maternal and child clinical services through the education of pregnant women, the promotion of healthy behaviours, and encouraging follow-ups at health centres. Today CHW health workers treat malaria, diarrhea and other health challenges by visiting homes in the community, while also providing family planning, nutrition and hygiene advice, and consultations for expectant mothers. If a patient suffers a serious condition, they are transferred to a nearby health centre. When asked by *The Medical Futurist*,[19] Zuberi Muvunyi, director general of the Clinical and Public Health Services Department at the Rwanda Biomedical Centre, said that the CHW programme is one of the reasons Rwanda performed well in achieving the Millenium Development Goals (MDGs).[20]

However, as far as human resources are concerned in the health sector, Muvunyi said that Rwandans only have "one doctor for more than 10,000 [and] that is way below WHO recommendations. For nurses, maybe we have one nurse for 5,000, while the WHO recommendation is one for 3,000."

The most challenging obstacles to high quality health care in Rwanda are summarised in the Fourth Health Sector Strategic Plan 2018-2024:

- Critical shortage of skilled health workers
- Poor quality of health worker education

9 Nkusi, A. (2019, February). The Rwandan miracle. *UNESCO Courier*. https://en.unesco.org/courier/2019-2/rwandan-miracle

10 ITU News. (2017, 20 February). Digital Ambassadors Program kicks off in Kigali. *ITU News*. https://news.itu.int/digital-ambassadors-program-kicks-off-in-kigali

11 https://minict.gov.rw/fileadmin/Documents/Policies2019/National_Digital_Talent_Policy.pdf

12 http://www3.weforum.org/docs/White_Paper_Internet_for_All_Investment_Framework_Digital_Adoption_2017.pdf

13 https://www.dotrust.org

14 https://www.broadbandcommission.org/Pages/default.aspx

15 Broadband Commission for Sustainable Development. (2017). *Digital Health: A Call for Government Leadership and Cooperation between ICT and Health.* https://www.broadbandcommission.org/Documents/publications/WorkingGroupHealthReport-2017.pdf

16 https://dhsprogram.com/pubs/pdf/SPA3/02Chapter2.pdf

17 https://irembo.gov.rw/rolportal/en/web/rssb/cbhi

18 https://youtu.be/1ym_AnMzSrk

19 The Medical Futurist. (2018, 29 August). Rwanda and the Dreamers of Digital Health in Africa: Wakanda Is Real. *The Medical Futurist.* https://medicalfuturist.com/digital-health-in-rwanda

20 Ibid.

- Inadequate infrastructure and equipment in health facilities
- Inadequate management of health facilities.[21]

### *Digital health transformation*

Given the above context, there is a belief that telehealth solutions, phone-based platforms and medical drones are possible ways to continue to improve health care in Rwanda. Through the Smart Rwanda 2020 Master Plan,[22] the digitisation of the health sector plays a pivotal role in national development, along with a number of initiatives, including to do with policy, legislation and investment, that have been put in place to enable and promote the government's overall digital transformation agenda. Rwanda, together with its partners in the private sector and funders, are looking for ways to align the uptake of digital services in the health sector with the emerging ICT ecosystem. This includes looking at issues such as point-of-care, data security, cost and financing in the health sector.

Two start-ups, Zipline[23] and Babyl,[24] are among various innovation companies attracted by Rwanda's policy of being a "proof-of-concept" country where people who are thinking about setting up businesses are offered a place to build and test prototypes before scaling to other counties.[25] These start-ups are expanding and innovating with the full support of the Rwandan government. Zipline is deploying its second drone launching site, while Babyl is working on its AI solution for tablets used by community health workers.

Zipline, a California-based start-up, began talking to the Rwandan government in early 2015, when the company approached a number of African governments with the idea for the delivery of medicines and blood to those who need it most using drones. As for Babyl, it has started to use AI in a call centre as a method for triage, while its final goal is to use trained AI to support community-based health workers, essentially offering them access to the expertise of doctors.[26]

Another AI initiative is spearheaded by the Rwandan government in partnership with the World Economic Forum. It aims to increase the country's diagnostic capacity for detecting cancer. As examples such as the use of AI for screening breast cancer at the Massachusetts General Hospital and Harvard Medical School prove, AI can be used to accurately assess scans, make recommendations for treatment, and reduce unnecessary surgeries caused by false positives. With the right kind of policy and infrastructure in place, the potential benefits of AI-driven medicine would be enormous for Rwanda.[27]

### *The Babyl pilot in health service provision*

Babyl Rwanda is a digital health care provider, registered in Rwanda with its headquarters in London. Its main objective is "to put an accessible and affordable health service into the hands of everyone, by combining the computing power of machines with the best medical expertise of humans to create a comprehensive, immediate and personalised health service and make it universally available."

Babyl was launched in 2016. Since then, it has two million registered users in Rwanda and has conducted tens of thousands of consultations. For Babyl patients, this has meant minimising waiting time for consultations and also offers medical insurance to help patients pay for the service. Babyl has the doctors and nurses on its payroll, and meets its costs through the insurance coverage and the registration fees. Sixteen percent of the patients who belong to the poorest of the poor are exempted from paying the fees. In Rwanda, since 90% of Rwandans are covered by government health insurance, Babyl also entered into an agreement with Rwanda's Ministry of Health and Mutuelles de Santé, the government-subsidised community insurance scheme. This has allowed public health facilities to be used for lab tests and advanced consultations, and the costs are then covered by Mutuelles de Santé.

Babyl has taken further steps to revolutionalise the way health services are provided in the country through using AI. Its first steps in this area have aimed to offer a way of easing the burden on crowded hospitals.[28] An interview with a staff member from Babyl Rwanda confirmed that the company has already concluded its pilot phase that tested the use of an AI chatbot that uses machine learning to interact with patients using

21 https://moh.gov.rw/fileadmin/templates/Docs/FINALH_2-1.pdf

22 https://minict.gov.rw/fileadmin/Documents/Mitec2018/Policies___Publication/Strategy/SMART_RWANDA_MASTER_PLAN_FINAL.pdf

23 https://flyzipline.com

24 www.babyl.rw

25 Norbrook, N. (2019, 8 March). Clare Akamanzi: 'We have made it easier to do business'. *The Africa Report*. https://www.theafricareport.com/9722/clare-akamanzi-we-have-made-it-easier-to-do-business

26 Ito, A. (2018, 16 August). This 27-Year-Old Launches Drones That Deliver Blood to Rwanda's Hospitals. *Bloomberg*. https://www.bloomberg.com/news/articles/2018-08-16/this-27-year-old-launches-drones-that-deliver-blood-to-rwanda-s-hospitals

27 Schwartz, P. (2019, 14 March). Why AI will make healthcare personal. *World Economic Forum*. https://www.weforum.org/agenda/2019/03/why-ai-will-make-healthcare-personal

28 https://www.youtube.com/watch?v=O50XldWo5I8

voice or free text. This is a computer programme specialised in medical triage that can provide medical diagnoses.[29] The idea is to provide easy, affordable, AI-enabled primary public health care. Babyl's system is an integrated AI platform for patients, including an AI triage symptom checker, a health assessment, and virtual consultations with a doctor when referral is needed.[30]

In the future, Babyl hopes that with increased smartphone penetration and a better internet network, more processes will be supported by AI. With its growing database of patient history, it hopes to be able to predict outbreaks, detect epidemics and even enable better diagnosis based on regional health trends.

### *Issue of health data management*

In using AI, the data management issue is raised. A report called *GDPR – Not Just an EU Concern: The implications for Africa* states that outside of constitutional references to data protection, Rwanda and other countries appear to have very limited focus on data protection in their legal systems.[31] In an interview with Antoine Sebera on data collection, he said that Rwanda has considered the European Union's General Data Protection Regulation (GDPR) to protect the privacy rights of Rwandans. As AI relies on data, a data protection policy in the pipeline will be in place by 2020. At the moment, permission to collect the data of citizens to do with their health status is provided by the Ministry of Health and collected data is hosted in data centres within the country's borders.

## Conclusion and action steps

The potential of AI to transform the health sector in Rwanda is at its early stage in the country. It is expected to dramatically strengthen all aspects of the health system and expedite the achievement of universal health coverage and better disease surveillance and response. However, the use of digital health solutions and technologies is not yet at the required level that fully satisfies the seeker of health services.

To mitigate challenges and deal with existing gaps, the following steps are needed:

- A specific department coordinating innovations and emerging technology in the health sector should be established under the Ministry of Health.
- Policy frameworks need to be in place that determine AI governance structures and set roles for stakeholders for better monitoring and evaluation of the benefits, and to mitigate the challenges that may emerge through the use of AI.
- Financial and capacity-building support is needed for young innovators to establish and grow a start-up, including health tech start-ups.
- Human capacity needs to be strengthened: most African countries, among them Rwanda, rely on foreign human resources. This is a call for more effort to be put into developing local capacity.
- A large number of citizens are not at all familiar with AI. Public awareness is needed in order to enable them to understand the opportunities and challenges associated with AI.
- In the same way that there is a code of conduct for the use of citizen data (despite the absence of strong legislation), custodians of data collected through AI should have a known code of ethics on what is allowed or not while using collected data.

29 Bizimungu, J. (2018, 11 January). Babyl's chatbot to enhance digital healthcare platform. *The New Times*. https://www.newtimes.co.rw/section/read/227369

30 USAID Center for Innovation and Impact. (2019). *Artificial Intelligence in Global Health: Defining a Collective Path Forward*. https://www.usaid.gov/sites/default/files/documents/1864/AI-in-Global-Health_webFinal_508.pdf

31 Miller, R, et. al. (2018). *General Data Protection Regulation (GDPR) – Not Just an EU Concern: The implications for Africa*. Dalberg Advisors. https://www.dalberg.com/system/files/2018-05/GDPR_Implications%20for%20Africa_EMAIL%20PDF-vFinal%20March2018.pdf

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# Artificial intelligence:
## Human rights, social justice and development

Artificial intelligence (AI) is now receiving unprecedented global attention as it finds widespread practical application in multiple spheres of activity. But what are the human rights, social justice and development implications of AI when used in areas such as health, education and social services, or in building "smart cities"? How does algorithmic decision making impact on marginalised people and the poor?

This edition of Global Information Society Watch (GISWatch) provides a perspective from the global South on the application of AI to our everyday lives. It includes 40 country reports from countries as diverse as Benin, Argentina, India, Russia and Ukraine, as well as three regional reports. These are framed by eight thematic reports dealing with topics such as data governance, food sovereignty, AI in the workplace, and so-called "killer robots".

While pointing to the positive use of AI to enable rights in ways that were not easily possible before, this edition of GISWatch highlights the real threats that we need to pay attention to if we are going to build an AI-embedded future that enables human dignity.

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