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Artificial intelligence:
Human rights, social justice and development

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CAMEROON

AT A SNAIL'S PACE: THE INTRODUCTION OF ARTIFICIAL INTELLIGENCE IN HEALTH CARE IN CAMEROON
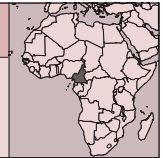
PROTEGE QV
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https://www.protegeqv.org

Introduction

Cameroon is a country located in west-central Africa, and is bordered by six countries, Nigeria, Chad, Gabon, the Central African Republic, the Republic of Congo and Equatorial Guinea. It has 25,869,160 inhabitants,[1] the bulk of whom still live under the poverty line, with uneven access to health care services between rural and urban areas.[2]

While artificial intelligence (AI) offers the potential to enhance health care throughout the country and to overcome an acute shortage of medical personnel in rural areas, Cameroon has been slow in its adoption.

This report discusses some of the challenges to the use of AI at the Bonassama district hospital, a governmental hospital in Douala, one of two health care facilities in the country that are experimenting with AI in health care.[3]

Policy and political background

Unlike other fundamental rights such as those of freedom of expression, communication, or the right to security, the Cameroonian constitution does not provide for the right to health as a fundamental right. The health sector in our country is also rather poor when it comes to both legislation and regulation. However, several laws, strategies and plans are worth mentioning:

- Law No. 96/03 of 4 January 1996, which establishes the general framework for action by the state in the field of health, in particular through the national health policy which focuses on universal access to quality basic health care services through the development of district hospitals, the promotion and protection of the health of vulnerable and underserved populations, and a needs-based priority agenda for health regarding the fight against great pandemics such as HIV.

- Decree No. 2013/093 of 3 April 2013, on the organisation of the Ministry of Public Health. The Ministry is responsible for the formulation and implementation of the government's public health policy.

- The National Health Development Plan (NHDP). Headed by the Ministry of Public Health, this plan was developed in 2015 by a national inter-sectoral technical committee. It is supposed to provide the country with a universal health care coverage scheme.[4]

- The Health Sector Strategy 2016-2027.[5] The goal of this document is to protect and improve on health care for Cameroonian citizens, based on measurable targets.

Marked by insufficient funding[6] by the state, the public health sector of the country has a centralised system of administration running from the Ministry, through the intermediary regional levels, and cumulating at the district levels.[7] Three different levels of

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1   www.worldpopulationreview.com

2   Dr Tetanye Ekwe, the vice-chairman of Cameroon's National Order of Doctors made it clear during an interview with the Voice of America: the doctor-patient ratio stands at one doctor per 50,000 inhabitants in rural areas, instead of the one doctor per 10,000 inhabitants recommended by the World Health Organization (WHO). In the country's two major cities, Douala and Yaounde, the doctor-patient ratio does meet the WHO standard. Kindzeka, M. E. (2018, 25 November). Cameroon Doctors Overwhelmed with Patients. *Voice of America*. https://www.voanews.com/africa/cameroon-doctors-overwhelmed-patients

3   The other hospital using AI in health care is the HSPC, a private facility located in Kumba. It uses a software application that is meant to help health care professionals at the hospital get a more complete picture of the health of their community as it pertains to non-communicable diseases. The laboratory at the Pasteur Centre in Yaounde also uses a mobile application based on AI to diagnose malaria.

4   The launch of the first phase of the Universal Health Coverage (UHC) scheme was announced in Yaounde on 5 June 2018.

5   The Health Sector Strategy (HSS) in Cameroon is a document serving as the roadmap for the Ministry of Public Health for the years 2016 to 2027. The HSS focuses on almost the whole health sector of the country, including the organisation of the sector, and deals with communicable and non-communicable diseases, maternal, neonatal and infant health, and health finance. Ministry of Public Health. (2016). *Health Sector Strategy 2016-2027*. https://www.minsante.cm/site/sites/default/files/HSS_english_0.pdf

6   The proportion of the national budget allocated to the Ministry of Public Health varies between 5% and 5.5%, far from the Abuja Declaration prescription. In April 2001, the African Union countries met in Abuja and pledged to set a target of allocating at least 15% of their budget to improve the health sector and urged donor countries to scale up support.

7   Each of the country's ten regions has at least one regional hospital and 189 district hospitals are registered in Cameroon.

health care delivery also exist in Cameroon: tertiary, secondary and primary services.[8]

According to the Health Sector Strategy (HSS), public health facilities are more accessible to the rich.[9] As a result, in this poverty-stricken country, universal health coverage is more than welcome and will introduce equity in the country's health system.

Challenges of AI in health care in Cameroon

The district hospital in Bonassama[10] is a public health facility located in the city of Douala. It made a significant step in leveraging AI to improve analyses of patients and to provide them with more precise diagnoses in a shorter turn-around time. It is worth pointing out that the HSS, which is the Ministry of Public Health's roadmap for 12 years, does not even mention AI as part of its concerns. At most, a vague reference is made to "[a] more complex specialized care approach", linked to the implementation of the head of state's Triennial Emergency Plan 2015-2018.[11]

Far away from the uncertainty surrounding the government plans about AI, Sophia Genetics, based in Lausanne (Switzerland) and in Boston (United States), announced on 24 March 2017 the list of the seven African hospitals, including the district hospital of Bonassama, that will begin using Sophia. Sophia is an AI-based platform that helps hospitals to diagnose patients better and faster in five areas: oncology, metabolism, paediatrics, cardiology and hereditary cancers. It uses a technology that enables predictive analysis by feeding and training AI algorithms intended to enhance the reading and analysis of DNA sequencing. This software uses statistical inference pattern recognition and machine learning to analyse both genomics and radiomics (medical imagery) data.[12] Specific conditions and tests covered by the agreement[13] with Sophia Genetics include

BRCA1 and BRCA2,[14] HNPCC,[15] clinical exome sequencing[16] and HCS.[17]

The use of AI is expected to decrease medical costs as there will be more accuracy in diagnoses, better treatment plans, as well as more prevention of disease. However, several challenges with the Sophia system have been identified.

Although AI technologies are hailed for their innovative, infinite applications in medical care and in medical research, their real-life implementation is still facing obstacles. In Cameroon, the first hurdle involves regulations. As mentioned, current regulations governing the health sector are poor, a fact also outlined in the HSS,[18] which decries the absence of a public health code, which would establish a set of standards for health care, among other legal gaps.

Another major impediment in Cameroon concerns the country's poverty levels. According to the HSS, in 2010, 70% of the population was in a situation of global underemployment – that is, they involuntarily worked less than the minimum working week of 35 hours, or earned less than hourly minimum wage. Yet, citizens bear the brunt of the financial burden for health care here. Because of this, the more money you have, the more likely you are to have qualified professional assistance. AI in health care in our country is likely to perpetuate or even accentuate this divide between the rich and the poor, raising the issue of social justice in terms of the distribution of wealth, opportunities and privileges within our society.

During our meeting with Dr. Esther Dina Bell, the head manager of the Bonassama district hospital, she disclosed that 45% of the hospital patients were not wage earners, highlighting the relatively limited number of patients who have access to AI for their health care issues. While the average monthly wage in Cameroon is USD 173, Sophia services cost

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8 The difference lies with the technical facilities offered at each level, coupled with the distribution of the health personnel at each of the three levels. Generally, tertiary level services are delivered in the country's two big cities, Douala and Yaounde. The best medical doctors are also often found in these cities.

9 The share of the richest quintile that consulted a public medical doctor was close to 43% in 2007, and about 3% for the poorest. Ministry of Public Health. (2016). Op. cit.

10 The Bonassama district hospital is one of the Cameroon's 189 district hospitals and as such is ranked at the bottom level of the health care system in the country.

11 The Triennial Emergency Plan was meant to accelerate the country's economic growth. The plan (2015-2018) covered the entire national territory in the following sectors: health, urban development, animal industries, water, energy, roads, agriculture, regional development and security.

12 https://en.wikipedia.org/wiki/Sophia_Genetics

13 This is an agreement solely between the Bonassama district hospital and Sophia Genetics. The state is not in any way involved.

14 The name BRCA is an abbreviation for "BReast CAncer Gene". BRCA1 and BRCA2 are two different genes that have been found to impact a person's chances of developing breast cancer. https://www.nationalbreastcancer.org/what-is-brca

15 HNPCC stands for hereditary nonpolyposis colorectal cancer. It is a condition in which the tendency to develop colorectal cancer is inherited. https://www.hopkinsmedicine.org/gastroenterology_hepatology/diseases_conditions/small_large_intestine/hereditary_nonpolyposis_colorectal_cancer.html

16 Clinical exome sequencing is a highly complex molecular test that analyses the exons (or coding regions) of thousands of genes from a small sample of blood, by next generation sequencing techniques. The purpose of this test is to identify the underlying molecular cause of a genetic disorder in an affected individual. https://geneticscenter.com/test-menu/exome-sequencing

17 HCS stands for high content screening. It is a set of analytical methods using automated microscopy, multi-parameter image processing and visualisation tools to extract quantitative data from cell populations. https://www.thermofisher.com/uy/en/home/life-science/cell-analysis/cellular-imaging/high-content-screening.html

18 Ministry of Public Health. (2016). Op. cit.

between USD 499 and USD 1,288 for patients at the Bonassama hospital. This confirms the early warnings issued by Margaret Chan,[19] the World Health Organization (WHO) Director-General, who spoke of the need to ensure that medical AI applications work for the both poorest and the richest.

Concerning the attitudes of nurses working at the Bonassama district hospital toward the adoption of AI in their workplace, most of the nurses we spoke to are not even aware of its existence. And if AI is a threat to their job security, they have little to fear. The slow pace of the introduction of AI in hospitals in Cameroon, and the relatively high cost of services, means that nurses are unlikely to be replaced by machines in the foreseeable future.

One pressing issue that requires more investigation is the issue of privacy.[20] While patients' data is collected by the Bonassama hospital and transferred to Sophia Genetics using a secured platform, we could not determine how long this data is stored by Sophia Genetics – we believe at least a year or two. The analysis of data using AI systems may reveal private information about individuals, and should be treated as sensitive. Is the confidentiality of Bonassama hospital patients a priority to Sophia Genetics? Hard to answer. Nor have we been able to find out whether or not the patients' informed consent was requested prior to the data gathering process (the nurses we interviewed could not say). It was, for us, also impossible to find out if patients have access to their personal data or the right to amend or delete any information they have previously provided.

Conclusion

AI is gradually gaining ground and even superseding human ability in accurately diagnosing diseases, and many countries are leveraging this potential to improve their health care systems. Nevertheless, in Cameroon, the adoption of new technologies in health care is surprisingly slow – a situation that is not only a question of finance, but also of a lack of awareness (for example, AI does not feature in the health ministry's roadmap for 2016-2027). This does not only relate to illnesses such as heart disease – cardiovascular diseases were the second cause of mortality in Cameroon in 2013[21] – or breast cancer. As a tropical nation, Cameroon is afflicted by common diseases such as malaria that countries like Uganda[22] are tackling using AI.

As we learned at the Bonassama district hospital, the cost for accessing AI-driven health services is very high for the average Cameroonian citizen. It is also disturbing to notice that the Ministry of Public Health does not even mention AI in its 12-year strategic plan. In a country classified by the WHO as having a critical shortage of health personnel,[23] mainly in rural areas, the country could have taken advantage of AI in these understaffed and under-resourced areas to enhance health care, given the ability of AI to be trained to recognise and diagnose certain medical conditions in the absence of doctors.

Action steps

Since any major technological innovation brings potential to advance or damage society, we suggest the following recommendations:

- Cameroon should increase the health budget so that it meets the Abuja Declaration requirement of 15% being allocated yearly to the health sector.
- The government should subsidise citizens' access to AI, and fund its use nationwide.
- Citizens should be informed of the existence of AI and its capacities to perform early diagnosis of various health conditions.
- Citizens should also be made aware of their right to give informed consent for their personal data to be gathered for use in AI services.
- The private sector should be encouraged to create affordable AI for the health care sector, with a specific focus on cancers,[24] cardiovascular diseases,[25] as well as malaria,[26] which is a widespread disease in Cameroon.

19 Margaret Chan was speaking at the AI for Good Global Summit, 2017, in Geneva. AI for Good is the leading UN platform for global and inclusive dialogue on AI. https://www.who.int/dg/speeches/2017/artificial-intelligence-summit/en

20 In Cameroon, privacy violations are crimes prohibited and punishable under articles 43 and 44 of the December 2010 Law on Cybersecurity.

21 Ministry of Public Health. (2016). Op. cit.

22 Uganda's first AI lab, at Makerere University, has developed a way to diagnose blood samples for diseases like malaria using a cell phone. Lewton, T., & McCool, A. (2018, 14 December). This app tells your doctor if you have malaria. *CNN*. https://edition.cnn.com/2018/12/14/health/ugandas-first-ai-lab-develops-malaria-detection-app-intl/index.html

23 Tandi, T. E., et al. (2015). Cameroon public health sector: shortage and inequalities in geographical distribution of health personnel. *International Journal for Equity in Health, 14*. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4440287

24 In 2012, 14,000 new cases of cancer were diagnosed and about 25,000 persons lived with cancer in Cameroon. More than 80% of persons affected were tested at a very late stage of the disease and the majority died within 12 months after they had been diagnosed. Ministry of Public Health. (2016). Op. cit.

25 There are still many inadequacies in the capacity of the health system to effectively control cardiovascular diseases (low-skilled human resources and insufficient equipment for quality management of the cases). Ibid.

26 Generally, out of 19,727 deaths recorded in health facilities in 2013, 22.4% were related to malaria. Ibid.

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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.

APC   ARTICLE¹⁹   Sida