

For a shift of paradigm in healthcare systems in sub-Saharan Africa: Moving from current unequal access to modern care to sustainable health systems encompassing African traditional medicine

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Abstract

Background: Health is one of the major challenges for the development of Africa, whether it is to improve the current state of health of Africans or to allow the emergence of a healthy workforce able to contribute to the economic growth of Africa.

Objectives: This paper aims to highlighting gaps in access to modern care, to identify attraction factors for traditional African medicine helping with the current health crisis due to Covid-19, to propose ways of uilding synergies and to encourage more efficient and consistent health systems.

Methods: We conducted a systematic review using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. We evaluated sources of heterogeneity by keywords (health system, health care providers, Africa, diseases), and pooled heterogeneity analysis addressed by authors, using meta-analysis methods.

Results: With Covid-19, African health systems have been less overwhelmed and health consequences less dramatic than those of European and American countries, but the pandemic has exposed the flaws of health systems that have reached their limits.

Conclusion: Because health is one of the relatively neglected challenges in development policies in Africa and because health will become a strategic development issue in the coming years, it is therefore becoming increasingly important to re-think the organization and functioning of health systems in Africa.

Keywords: Health systems; Healthcare inequalities; Modern health care; Traditional African medicine; Health policies; Africa

1. Introduction

Presently, health is considered as a public good [1]. Therefore, serious attention must be paid to the management of health system. It is increasingly recognized that, in order to maintain and improve the health of the world's populations, governments must design strong and effective health systems capable of preventing disease and providing treatment to all segments of the population [2]. In many developed countries, a high portion of the population have access to health care because social protection systems are equitable. However, in many developing countries, poor health systems are one of the main obstacles to accessing essential health care. Hence, health system embodies and poses questions of access, equity, justice and sustainability that need to be properly addressed. With regard to the African context, issues

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of access, equity and sustainability in the health system are more pressing today because of the various systemic failures since independence [3]. Indeed, as has been widely noted by UNICEF and WHO, even some of the historic advances recorded in post-independence in domains such as infant mortality have declined [4]. In the midst of the crisis that gripped the health sector, decline in the general health status of many Africans, reduction in public health expenditure, issues of access, equity and sustainability are fundamental elements for the sustainability of health systems. In addition, changes in health behaviors across the continent, alongside the emergence and/or revitalization of new private and popular forms of health provision, have resulted in new management challenges that deserve to be studied more closely. This change poses new decision-making, management and regulatory challenges to which, governments must respond. In addition, the changes in the care structure brought about by the Covid-19 pandemic, persistence of malaria as a big killer, and resurgence of diseases such as tuberculosis that were until then, under control, have implications on the management of health systems. This reduced capacity is common to all spheres of the health system, ranging from the drain of talent to the collapse of training and personnel management structures. Therefore, the role of the state as provider, facilitator and regulator in the health sector in Africa is a role that we are constantly called to question. Because health constitutes one of the relatively neglected challenges in development policies in Africa and that health will become more of a strategic development issue in the coming years, it seemed important to examine the functioning of health systems health in Africa. This review will highlight the failures of the health system and suggest potential solutions to improve its running.

2. Methodology

This study is based on a systematic literature review. The review was carried out in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines [5]. All studies included papers published in English and French, covered the subject of health care and health policies, published between 1960 and 2020. Only studies conducted in African countries were taken into consideration. Initially, we limited our search to refereed journals and conferences but later realized that the grey literature was relevant in terms of governmental reports and data, the world health organization, and other references of relevance. We also integrated an expert judgment approach, in which experts were consulted to help filter result sets and add a few additional important references the initial pool. Searches were performed in the databases Researchgate, Google Scholars, Documentation française, Érudit, Medline, Global Health and Web of science. The initial search was conducted in Google Scholars and Documentation Française, and consisted of free text terms with truncations (*) and health Care Headings. The search terms were then connected with the Boolean operators AND and OR. Additionally, the two concepts 'Africa' and 'health policies' and their synonyms were connected with the adjacent operators with a distance space of 10 (adj10) to cover more search results. The search was then spread out to the Érudit and Global Health databases. All retrieved references were imported into Endnote, after which, duplicates were deleted. A first selection of articles, based on titles and abstracts, was undertaken. When agreed that inclusion criteria were met, studies were included in the next step. The second selection was based on full-text screening and checking the reference lists of included studies. The method of qualitative content analysis was applied to extract and summarize all relevant data in Excel. Moreover, the quality of quantitative studies was assessed using the Quality Assessment Tool for Observation and Cross-sectional Studies [6]. This tool encompasses 14 questions, according to which studies were rated as 'good', 'fair', or 'poor'. For qualitative studies, the Critical Appraisal Skills Programme was used, consisting of a 10-item questionnaire [7]. We applied the same rating as for the quantitative study assessment tool to ensure comparability. To assess the quality of mixed-methods studies, both tools were used.

3. Results and discussion

A total of 1401 articles were retrieved from the literature search, with 1742 articles remaining after deletion of duplicates. After title and abstract screening, 241 references remained and were included in full-text screening. After this step, 80 English-language and French-language publications in Sub saharan Africa countries qualified for full review, as presented in Figure 1.

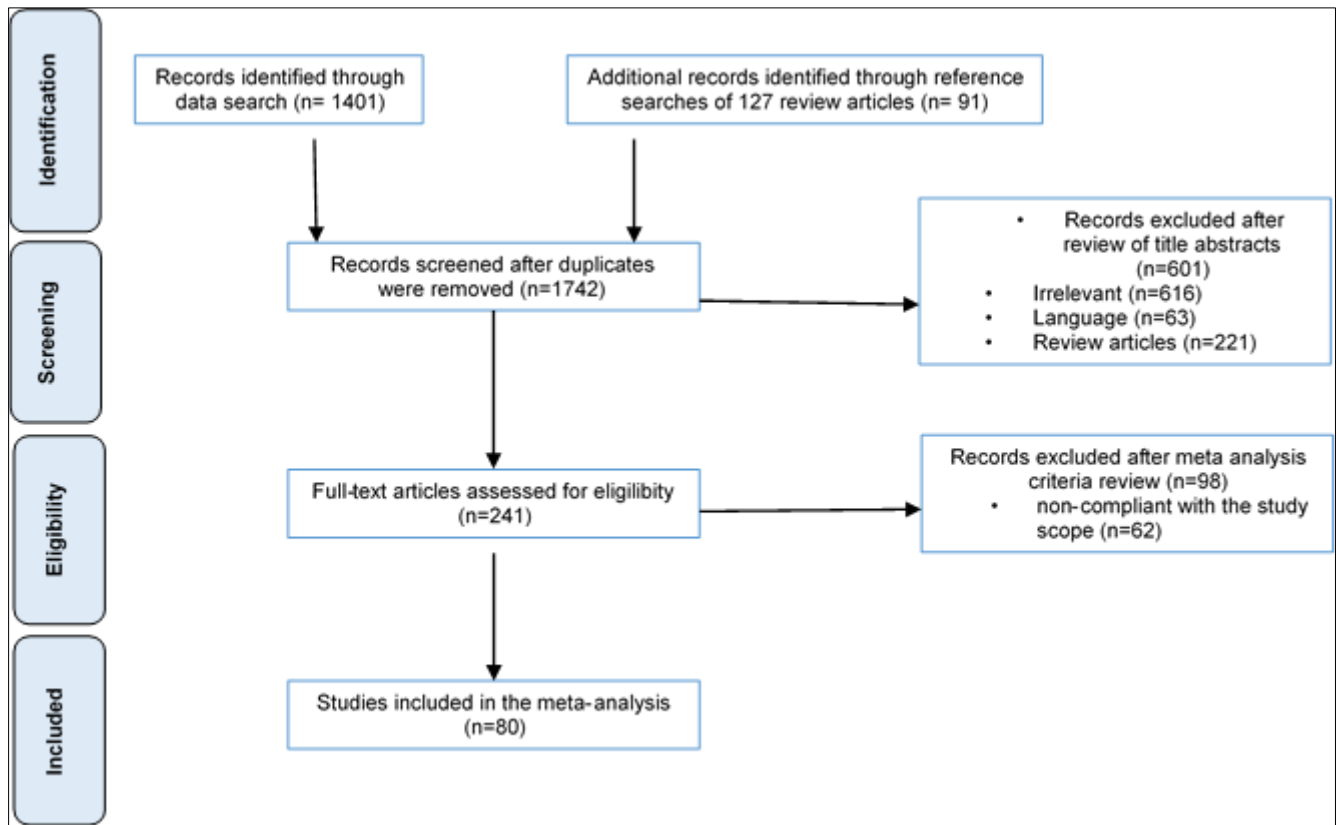


Figure 1 Systematic search and study selection

Table 1 shows the list of publications and the African regions included in the review. We screened and classified publications into the areas guided by the WHO framework on health system that fell within the scope of this review.

Table 1 List and origins of publications reviewed

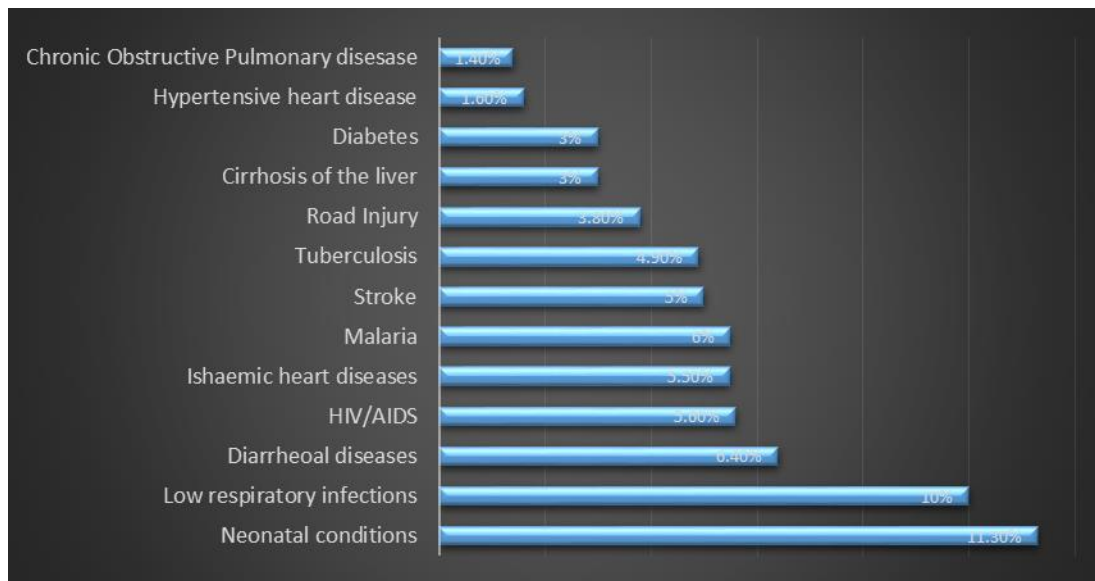
SSA Region	Number of publications
East Africa	9
Central Africa	31
West Africa	23
Southern Africa	7
Global perspective with focus on SSA	9
Total	79

3.1. Comments

3.1.1. Current health situation in africa: the double burden of infectious and chronic diseases

Africa has not yet completed its epidemiological transition and has to take up a double challenge: on the one hand, eradicate endemic diseases such HIV/AIDS, malaria, tuberculosis and, on the other hand fight against the development of chronic diseases (diabetes, cancer) and diseases related to population ageing such as Alzheimer (Figure 1). They are also an aggravating factor of the development of diseases such as cancer [8] (Epidemiologic studies forecast 1.2 million new cases of cancer in Africa by 2030, and more than 970,000 deaths if appropriate preventive measures are not rapidly put in place. World Health Organization estimates show that, the progression rate of the number of deaths due to cancer will be significantly higher in sub-Saharan Africa than in Europe or the United States of America). In short, health situation in sub-Saharan Africa still holds the gloomy leadership of health indicators in the world [9][10]. A number of scourges including poverty, illiteracy, civil wars, bad governance, heavily influences this African context, which are

further, factors to consider for the improvement of the health situation of Africans [11][12]. With the present state of health and development indicators of Africa, it is impossible to state that SDGs will be achieved by 2035 [13][14]. A major explanation of the failure to improve health indicators is the fact that previous health interventions have been mainly centered on health systems and never on health determinants [15][16].



Source: WHO, 2020

Figure 2 Distribution of the leading causes of death in Africa in 2019

3.1.2. Unequal access to modern care

a. Sources of unequal access to modern care in Africa date back to the colonial period.

① Understanding health systems in Africa: the impact of colonization and neo-colonialism

In our opinion, talking about the present health situation in Africa leads to briefly consider this period of our history. In the 1960s, African countries entered the era of « independence ». They did it on the basis of a broad social contract between the nationalists who inherited State power from colonial authorities and the population [17]. At the heart of the contract, was the commitment of the nationalists to eliminate discriminatory restrictions⁽¹ The colonial health model was largely reproduced during the first decade of independence. Health care offer was developed for urban populations and the big hospital centers played a great role while mobilizing most of the resources. In Cameroon for example, during the two five year developments plans, the portion of investments devoted to hospitals was 45.8% and 52% of the public health budget. This discrepancy in favor of the hospital is found elsewhere and for a long period. The Republic of Congo, the running costs of the Brazzaville University Hospital Center were equivalent to the amount of expenses of primary health care), and to improve live and the well-being of the populations. During the 1970s, post-colonial governments rather continue with implementation of modern health care whereas demands were not met because of reduced capacity [18]. In addition, there were significant differences between the levels and quality of urban health services and those of the rural areas, which were less equipped. Public investments to develop « traditional » medicine to which a great majority of the population resort were practically absent since the necessary attention went to the development of a structured modern health sector according to the dominant institutional approach from the colonial era [19]. In the 1990s, while structural adjustment policies were seriously jeopardizing the public health sector, the gap between the private and public care offers was increasing; new investments in the health sector were predominantly going to private institutions that were mainly managed for business motives [20]. Social protection systems put in place in the early 2000s by most governments to mitigate the social consequences of different political reforms did not make a positive impact due to lack of resources, as they were accompanied by very severe eligibility criteria to dissuade the great majority. Consequently, the new local health services, private or commercial, do not attract the majority of the population, rather the richest who also had access to evacuation under medical care to better-equipped hospitals in Europe and North America.

② Major features of African health systems

Among the tens parameters characterizing health systems in Africa, we can mention the three below:

- **Hospital-centrism:** hospital-centrism is the vision of health system centered on the hospital that fulfill functions that could be provided by other institutions offering proximity health services [21]. Health systems in Africa are an outstanding example of hospital-centrism as hospitals offer only modern health services. Generally built in cities, those hospitals welcome patients from the hinterland. Dependent on scarce government financial resources, those hospitals were malfunctioning: poorly equipped, lack of maintenance, inadequate medical staffs, etc [22].
- **Health medicalization:** medicalization process started in Africa in the early 1970s and was encouraged by «post-colonial elites» having a high standard of living. Medicalization is based on the character that, only doctors, because they are endowed with knowledge or «natural powers», are allowed to handle health issues in/of the community [23]. Therefore, health is uniquely perceived as a status whose malfunctions deserve medical responses.
- **A pyramidal organization of health care:** Organization of health systems in Africa remains modeled on the one inherited from the colonial era, ie in a pyramidal manner according to Gobbers [24](Figure 3). From base to summit, we have:
 - Level one health care structures such as dispensaries and health care centers. They are traditionally oriented towards common infectious diseases, infant and maternal health, minor surgeries.
 - Regional health care centers, offering a range of external consultation care including general medicine, pediatrics, surgery, maternity, emergency services.
 - At the national level, we have Referral Health care structures offering specialized care (cancerology, diabetology, X-ray), and university hospital centers with specialists acting as hospital practitioners and as lecturers in the faculties of medicine.

Notwithstanding this organization, these structures are not really operational, because they lack professionals and logistics to optimally manage available resources. According to the Atlas of African Health Statistics 2012 of the WHO, Africa has one medical doctor for 5,000 inhabitants (while the world average is 14) and one pharmacist for 10,000 inhabitants (while the world average is 4). In any case, this pyramidal organization of care has generated inequality in health care because public health expenditure did benefit more to the rich than to the poor segment of the population.

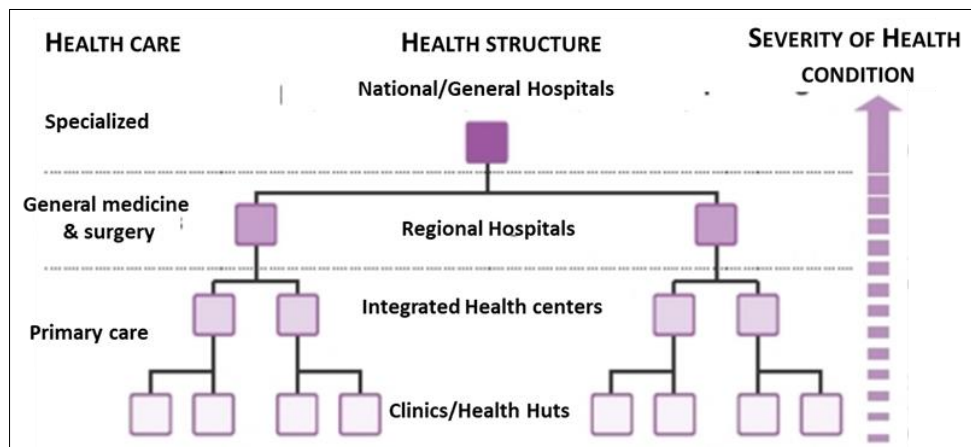
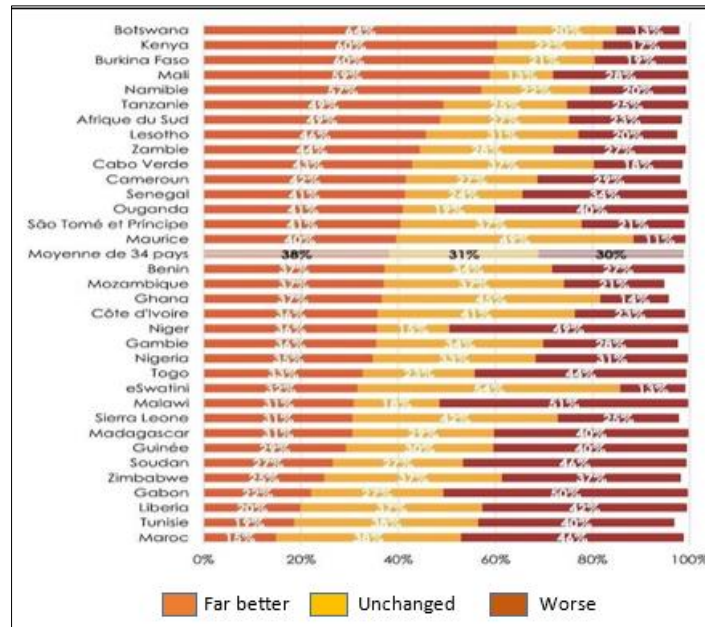


Figure 3 Typical organization of health systems in Africa

b. Explanatory factors of the weakness of health systems in Africa

Five bottlenecks have been identified in the functioning of health systems in Africa.

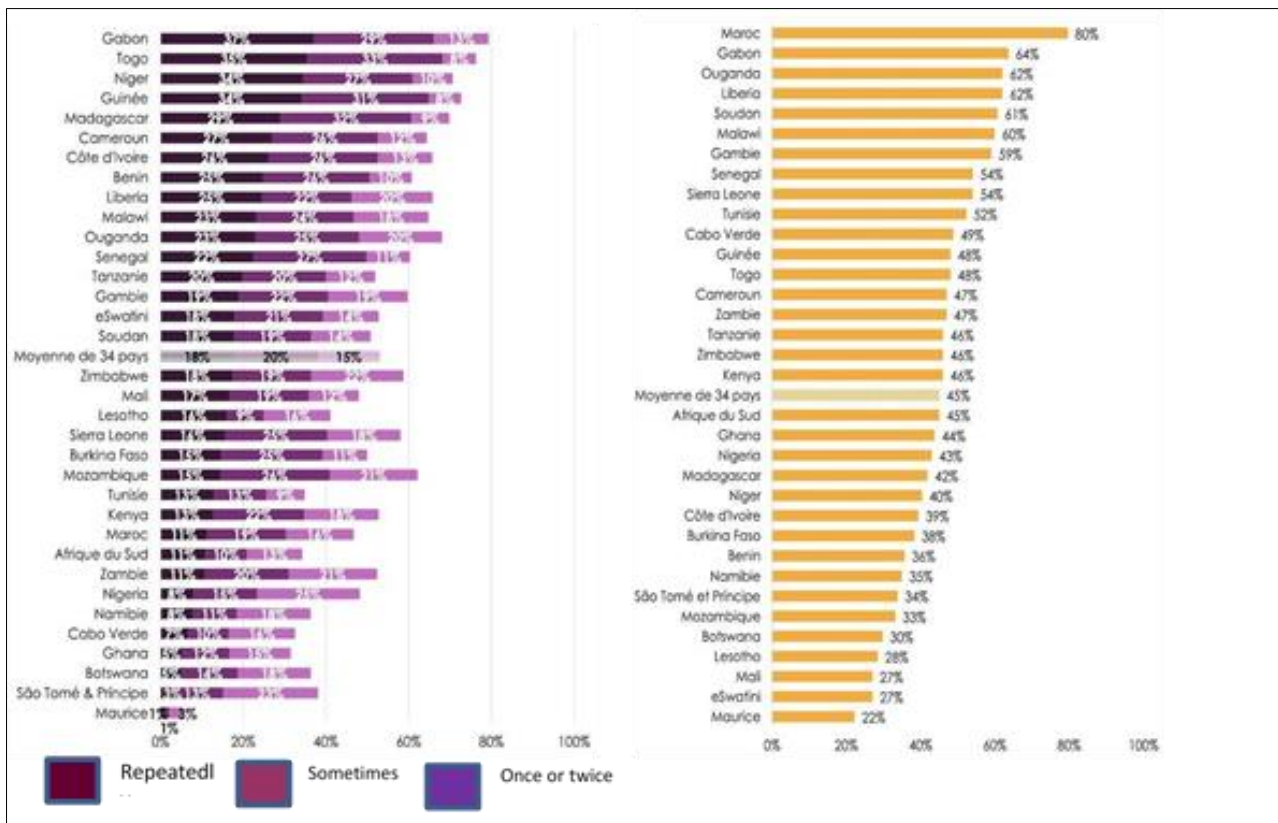
- The economic crisis of the 1980s: By the end of the 1980s, economic and political crises had further plunged African countries into the abyss. The health sector experienced setbacks from which it has not recovered. The sector suffered from a massive exodus of its skilled workforce, dilapidated buildings and facilities run-down, acute shortage of drugs and other supplies, wages reduction.
- Shortage of material and of financial resources: African health systems are suffering from chronic under-investment. Consequently, in many countries, people have and still encounter enormous difficulties in having access to care and getting medical care (Figure 4)



Source WHO, 2018

Figure 4 Ability of the population to get medical care in Africa

Combination of under-investment, poor planning and harmonization of infrastructure-human resource plunged the African health system into chronic difficulties. Public expenditure devoted to health declined in half of African countries between 2002 and 2014, which resulted in an unequitable health system, because only those who can afford could get access to care services [25]. Yet, even in countries with abundant infrastructure, service is not truly ensured since 45% of respondents having access to health centers declared that they had difficulties in obtaining care [26] (Figure 5).



Source: WHO 2018 [27]

Figure 5 Lack of medicine care in African countries

- **Corruption:** it is estimated that 20-30 % of financial resources are lost due to poor administrative and financial governance in Africa. With the hypothesis that these resources could have been allocated to public health expenditure, this amount could have enabled the provision of appropriate basic care to 86 million persons, and to 172 million persons when one considers the high range of these provisional estimates [28][29].
- **Insufficient and poorly trained staff:** *The shortage of health staff is one of the major obstacles that most States are facing.* WHO recalls that « the most serious obstacle in the implementation of national treatment plans [against HIV/AIDS] is no longer financial, but in the lack of human resources». Different estimates have been made to quantify the shortage of doctors, nurses and midwives in developing countries with respect to the numbers that will be necessary to have an 80% coverage in child birth under the supervision of qualified staff. On the basis of these criteria health personnel should be increased by 139% in Africa compared to 98% in Eastern Mediterranean and 50% in South-East Asia. This would require an increase of 2.8 dollars per person per year, ie a bit more than 10% of expenses [30]. It should be noted that the three countries mostly affected by the Ebola virus, that is, Guinea, Liberia and Sierra Leone, had only one or two doctors for 100,000 inhabitants at the outbreak of the crisis. In comparison, Canada has 220 doctors for a range of 100,000 persons.
- **Unwelcoming environment:** Health crisis in many African countries has weakened and jeopardized most government actions. Low salaries have led to poor individual performances. In the health sector, this has resulted in numerous defects remarkable on professional ethics: development of professional unconsciousness, corruption and extortion of patients, expeditious consultations [31]. Since health staff no longer respect the Hippocratic (460-377 before J.-C.) and the Gallien (129-201) oaths, people have lost confidence in formal medical action whose environment is considered unwelcoming [32].

3.1.3. Towards intergration of traditional medicine

a. African traditional medicine: From banishment to reconsideration

Traditional medicine, also known as parallel or alternative medicine « relates to practices, methods, knowledge and beliefs in the area of health which entail the use for medical reasons of plants, animal parts and minerals, spiritual therapies, techniques and manual exercises – separately or in association – to heal, diagnose and prevent diseases or safeguard health» [33]. More than 80% Africans resort to traditional medicine today [34], and has been the only care system available in Africa for centuries [35]. But, as soon as French administrators settled in Africa, they initiated a fierce struggle to suppress traditional medicine. Severe and repressive measures taken against traditional medicine contributed to make ineffective. According to Repiquet in his 24th April 1936 circular to chiefs of regions, practice of traditional medicine is a hindrance to the action of European doctors as well as the work undertaken in the territory by France [36]. Nevertheless, in the wake of independence, the whole African continent engaged in a struggle against cultural aggressions which it had suffered so far, leading to the creation of several organizations. UAO (former UA) for example was one of them, the first to voice the idea of integrating African traditional medicine into health systems [37][38]. Committed to give shape to their wishes to rehabilitate traditional medicine in Africa, post-colonial administrations in Senegal, Benin, Gabon, and Cameroon drafted a series of regulatory texts [39][40][41]. In Cameroon for example, the ministerial decision n°031/D/MSP/DS/BT of 31st July 1979, did authorize practice traditional medicine, and the circular note n°D26/NC/MSP/SG/DMPR/SDMR/SSCMT of 16th September 1991 instructed close collaboration between « traditional practitioners » and doctors for the treatment of infectious diseases [42]. Motivated by different normative frameworks and other regulatory texts, African traditional medicine once again attracts more and more attention within the context of plural health care offer and of reform of the health sector [43][44][45]. Accordingly, many Africans continue to use traditional medicine to satisfy their primary health care needs [46][47][48]. Notwithstanding a market of more than 500 million consumers, sellers of traditional plants have no share in the development of the industry and are not part of structures association [49]. Overall for these African countries, emergence of a real local pharmaceutical industry has remained very embryonic and only countries like Mali, Ghana, Guinea, Madagascar, Cameroon or Nigeria, have issued marketing authorizations for about four to seven improved traditional drugs [50][51][52][53]. Yet, those different initiatives generate a lot of hope in terms of the importance of traditional pharmacopoeia within the continent, and with regard to the emergence and re-emergence of pathogens responsible for pharmaceutical drug resistance along with the lack of new treatment in conventional medicine for emerging and developing diseases such as Covid-19.

b. Covid-19: in search of therapies from African pharmacopoeia

The present world pandemic originates from the SRAS-CoV-2 virus. Since SRAS-CoV-2 is new to humanity, it might take many years to develop new antiviral drugs specifically designed to attack the virus. Following the catastrophic nature of the pandemic, researchers are making efforts to assess medications approved for other infections (usually of viral nature) to determine if it is possible to reposition them for the treatment and prevention of SRAS-CoV-2. An eventual repositioned medication will not necessarily be more efficient or more powerful against SRAS-CoV-2. However, while

waiting for the approval of more powerful treatments, repositioned drugs will be the only option. While the world is searching for treatments and vaccines against Covid-19, the interest in traditional medicine as a potential treatment for the new coronavirus is increasing in Africa. Infusions, brews, spices, fruits or vegetables are types of natural medicines proposed by Traditional healers who assert they contain or treat Covid-19 [54]. The African pharmacopoeia proposes several plant-based treatments. Among them, we can mention the *Covid Organics* experimented in Madagascar, the *Fagaricine* in Gabon and *Antidote* of Bishop Kleda in Cameroon [55]. Valentin Agon in Benin has devised the *apivirine*, an antiretroviral therapy produced by the Benin pharmacopoeia, used against HIV, and which he proposes to treat Covid-19. He mentions the case of patients who having received the treatment tested Covid-19 negative [56]. In Togo, Professor Kouami Kokou, National Director of Scientific Research presides the committee in charge of finding an efficient treatment of the new coronavirus on the basis of three natural products capable to boost patients' immunity and help them to recovery. Such achievements have led WHO to recognize African traditional medicine as one of the essential elements of health care: «*Treatments [of Covid-19] may come from molecules already used for other diseases as well as from traditional medicine. Traditional medicine is the basis of several drugs used in therapy. It therefore produces a good number of drugs and one cannot exclude the possibility of having molecules from traditional medicine which can help fight Covid-19*». (Dr. Jean-Baptiste Nikiema, team leader, medicines, technologies and health equipment of WHO). Moreover, WHO recommends to countries whose health situation has been worsening since the beginning of the pandemic, to initiate programs concerning identification, exploitation, preparation, cultivation, conservation and validation of medicinal plants used in traditional recipes. Despite the controversy over the actual effectiveness of those natural medicines, they are reported to optimize the functioning of the immunity system and reinforces its responsiveness [57]. Phytotherapy as well as African traditional medicine are all endowed with an excellent recognition to stimulate the immunity system, and have been used at the first choice line treatment of infectious diseases including nasopharyngitis, bronchitis, sinusitis and influenza [58][59]. The heavy utilization by Africans of these plants well known for their immuno-stimulant and anti-infectious properties¹ As examples of those plants and leaves, let's mention : (1) Echinacea often used to reinforce the immunity system and to prevent respiratory tract infections, (2) Ginseng used to boost the immunity system against bacterial, viral infections and auto-immune diseases, (3) Garlic whose clinical tests have confirmed treatment against chronic respiratory infections, (4) fresh Ginger in the inhibition of the human syncytial respiratory virus (VRS or HRSV), (5) Essential eucalyptus oil rich in eucalyptol used to sanitize pulmonary tracks and to fluidize pulmonary mucus.) may partly explain the low prevalence of Covid-19 in Africa.

c. African traditional pharmacopoeia in the era of Covid-19: towards an attempt to reposition Africa in global health geopolitics

Africa has a long history of traditional medicine and practitioners who play an important role in the provision of care. Africa has a proven pharmacopoeia with more than 89 medicines produced by the traditional pharmacopoeia in 14 countries for which WHO is currently supporting research and development [60][61][62]. Nearly forty of those medicines are considered essential drugs used to treat patients suffering from HIV, diabetes, sickle cell anemia and hypertension (We can name natural products like «*Niprisan*» in Nigeria and «*Faca*» in Burkina Faso, used to treat sickle cell anemia, «*Hépatosor*» in Cameroon, a syrup used against hepatitis (A, B, C, D and E)) This is to say that African traditional medicine is an opportunity to fight Covid-19. Its contribution in dealing with Covid-19 can be done both in prevention and care. Experiences in the use of improved traditional medicines in Mali, Cameroon, Benin, and Madagascar have successfully contribute to reduce the viral activity of Covid-19 patients. Others have even treated fever, dry cough, respiratory difficulties and acting on the immune system of patients having Covid-19 [63]. Consequently, there is presently a great mobilization across Africa to propose traditional plant-base treatments to fight Covid-19. However, given that rigorous clinical tests to assess security and efficiency are required, WHO and African Centers for Disease Control and Prevention have launched a Consultative committee of experts in charge of supporting and providing independent scientific advice to countries on the security, efficiency and quality of traditional medical therapies to face Covid-19. As can be seen, interest in traditional medicine as a potential treatment of Covid-19 is increasing in Africa, this in respect of its several benefits including diversity, flexibility, availability, affordable prices, general acceptance by African communities and the low cost compared to modern medicine [64]. The processing and marketing on a large scale of medicines produced from the traditional pharmacopoeia present advantages in terms of socioeconomic development [65]. A socioeconomic development which could in turn contribute to the achievements of SDG 1 and 2 (poverty reduction and hunger alleviation), SDG3 (improvement of health and wellbeing), and SDG 4 (quality of education of targeted local communities). Therefore, Africa could reposition herself again within the world health geopolitics.

3.1.4. Implementing effective and sustainable health systems in Africa

The issue of health in African countries is of paramount importance. In fact, without adequate and effective health systems, it is difficult for individuals to attain an optimal level of development. Strengthening health systems is therefore one of the main challenges that African government have to resolve. Therefore, it is imperative to develop a strategic

framework that reflects a clear vision, well-defined goals, and practical outcomes. Since the first case of Covid-19 was confirmed on the continent in February 2020, African responses have been outstanding [66]. Health measures have been taken throughout the continent to stop the spread of Covid-19. However, more needs to be done to ensure that Africa takes advantage of the present emergency to develop more robust, equitable, and sustainable health systems equipped to resist future threats and to protect individuals, mostly the more vulnerable and marginalized. However, the question to be asked is how Africa can reinvent a sustainable health system? Here are some possible ways:

- An efficient health system requires huge financial investments to develop modern health infrastructure, which should be managed through a decentralized management or through a public-private partnership [67]. To ensure an effective running of those hospitals and an optimal management, governments could entrust management to the private sector through performance contracts. Subsidies awarded to hospitals could depend on the achievement of objectives predetermined by the government.
- A reason for existing weakness or chronic dysfunctioning of health system being corruption, a change of mindset is required and a climate of trust must be established through the establishment of a clear, transparent and efficient governance [68].
- Communities have to co-create solutions: If all stakeholders have to be involved in the development and implementation of policies, community commitment is essential to define needs and unfold people-focused approaches [69]. In making communities and health forefront workers key stakeholders at the onset, African health systems will have better chances to deliver quality and sustainable primary health care services [70][71].
- Health planning: The formulation of a health policy adapted to the context of public resource scarcity assumes the identification of priorities, the setting of goals and the choice of instruments to serve defined policy [72]. This planning approach raises three major and closely related questions: what is the respective part of available resources which should be devoted to preventive actions (education, hygiene, immunization) and to medical curative actions? What is the compared efficiency of centralized systems and decentralized systems? What will be the result for the pyramidal health organization? How will the health system be funded: indirectly by taxes or health insurance or directly in exchange for services, and in that case, in what proportion? Answer to one of those three questions greatly influences answer given to the others. Thus, option in favor of the national hospital will lead to a priority in favor of medicalization and a budgetary type funding. In contrast, the decentralized option will grant privileges to prevention while requesting for direct participation of beneficiaries.
- It will be pioneering to develop public health insurance systems, mutual benefit or free coverage for the destitute to ensure people have access to care. Togo, by the way has already adopted an insurance system for civil servants which funds up to 80% of care costs [73] (Kerouedan 2011). It provides genuine satisfaction. Other African countries should expand this system to their populations.
- New information and communication technologies, an opportunity for African health systems: Digital technology and artificial intelligence help to unfold efficient and less costly solutions to fight against disparities in access to health care. Meanwhile, the number of African subscribers to mobile telephone has increased by 70% since 2010, and 80% of the continent is covered by mobile telephone networks [74]. Thus, many mobile solutions can be developed in the area of health. For example, the Ubenwa application (Nigeria) aims to prevent suffocation of newborn children (900,000 deaths every year according to WHO) thanks to artificial intelligence. In a continent where most of births did not occur in a safe environment, this application would help warn women, family and staff during childbirth if there is a problem [75]. Another application, Vula (South Africa), stands on tele-consultation to enable specialists and paramedical professionals practicing in remote areas to send photographs of patients to colleagues and exchange on line with a specialist. Initially designed for ophthalmologists, such a software could be used in other fields. The objective is double: train paramedical professionals and help practitioners in their diagnosis while constituting an important database. By their large scale utilization and their presence in remote areas, new information and communication technologies will contribute to a better answer to epidemics [76]. They will also help patients and health professionals to improve care and prevention in a context of limited resources.
- Strengthen the quality and use of inclusive data, to guide decision-making: Health systems must improve quality and use of inclusive data to guide policies, investments and improvements in service delivery, while minimizing inequalities in access to services. Covid-19 has highlighted the need to have solid health information systems that collect and use quality, timely and reliable data disaggregated by gender and other criteria so as to identify shortfalls and highlight the critical situation of vulnerable populations.
- Besides, it is necessary to lay particular emphasis on research and training of health staff. Also, vital to develop a salary system enabling skilled-workforce to practice on the continent. On the other hand, promotion and research should help conventional medicine to benefit from local traditional medicine of which little is known of its huge knowledge. This will certainly enable cost reduction and prompt rural populations to adhere to the health system.

- Reinforce provision chains and harmonize regulatory systems: at this moment that efforts are made to develop and expand innovations in health matters, it is essential to remove barriers to equitable and timely access to essential health products [77]. Africa must ensure harmonization of regulatory systems between countries, speedup regulation and availability of quality health products, in particular vaccines, diagnoses, drugs and digital solutions. Equitable access to health solutions should be integrated in the systems of forecasting, provision chains and of expansion of innovative models of service delivery to reach out persons in need. The rapid spread of Covid-19 recalls the need for equitable policies that institutionalize access and availability of health for all the segments of the population. It is time for African leaders to rise up to the challenge, and address structural health inequalities.

4. Conclusion

The deterioration of the public health system across Africa has had consequences that have already caught the attention of researchers and policy makers. These consequences include the loss of many social gains after independence, particularly in the health and nutrition sector, and the inability of the public health system to prevent and manage disease. Most of these difficulties are both the symptom and the cause of growing inequalities in access to health services in Africa, inequalities that have grown along with the gap between the rich and the poor, the growing number of working poor, the shrinking middle class, and the growing disaggregation of the working poor category. At a time when many questions of equity and access have been raised on the continent, the North-South gap in health and well-being has also grown, Africa being the continent that presents the worst indicators in this area. The skills drain from the health sector to northern countries has exacerbated this gap. As a place and carrier of power relations in society, the health system represents and conveys at the same time issues of access, equity, justice and sustainability that must be considered for a better understanding of the functioning and the system functionality. It is thus essential to investigate the different dimensions of historical and contemporary inequity of the African health system, the intellectual stakes of their resolution and the alternative policies which could be explored with the aim of reforming the health system and rendering it integrated and effective. The number and variety of questions associated with the search for equitable access to health services are endless and different multidisciplinary entry points are necessary for a holistic and balanced understanding. We are therefore requested to use these different entry points and other aspects linked to research on health system management in Africa. One of these entry points is the issue of funding. Indeed, resources devoted to health are often insufficient, poorly managed, misallocated, and also poorly coordinated. Solution to remedy this must pass through a strong political will to implement stringent management rules. Policy makers must also act in human resource matters. Indeed, to operate efficiently, health systems must be able to count on a substantial mass of human resources, which constitute the foundation on which the organization of health policy is based. These human resources must be optimally trained, have sufficient financial means and, above all, have easy access to the pharmaceutical products necessary for the performance of their duties, be it drugs or advanced medical equipment. The issue of research (which is of course correlated with that of training) should not be left aside, because here again, it is by having health professionals capable of innovating that African countries will be able to develop efficient health systems whose progress can be measured. To succeed in setting up an efficient health system that meets the expectations of the population, it is essential that the political class be mobilized. An exceedingly strong sign could be sent by political leaders in not to systematically go abroad for treatment, but on the contrary, to invest in health infrastructure in their countries. The field of e-health could also constitute an opportunity for the development of African health systems. The applications would not necessarily be the same as what we can see for example, in Europe, but given the penetration rate of mobile devices in Africa and the use being made of them, it could be helpful to inquire and reflect on specific applications that could take advantage of information technologies.

Compliance with ethical standards

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Disclosure of conflict of interest

The Author declares no conflict of interests.

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