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COMMENTARY

Preparing the next generation of African Healthcare Workers and Scientists: Lessons from Corona Virus Pandemic



Préparer la prochaine génération de travailleurs de la santé et de scientifiques africains: Leçons de la pandémie du virus Corona

M.I. Oraebosi^a, T. Chia^{b,*}, O.I. Oyeniran^c

^a Department of Pharmacology and Therapeutics, Nile University of Nigeria, Abuja, Nigeria

^b Department of Human Anatomy, Nile University of Nigeria, Abuja, Nigeria

^c Department of Human Physiology, Nile University of Nigeria, Abuja, Nigeria

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In recent months, the entire human race has been faced with the dilemma of fighting the novel coronavirus disease 2019 (COVID-19). The viral disease was first reported in Wuhan city, the capital of Hubei Province of China with

an estimated population of 11 million people, but has now spread to almost all parts of the world. The high incidence and prevalence of the disease are worrisome, and the associated mortalities and fatalities have become a global burden. Globally, there are 2,121,675 confirmed cases of COVID-19 with 142,299 deaths and 82,622 new reported cases as of 18 April 2020 [1]. Of this number, Africa has recorded 13,104 cases and 1000 deaths respectively [1]. Africa is at risk of a possible surge due to trade interactions between her and high-risk continents [2]. One of the greatest concerns is the ability of the African continent to contain the pandemic should there be a sudden spike as witnessed in other parts of the world [3]. This growing concern is as a result of the deplorable state of health care systems in the continent.

There is currently no cure for COVID-19, hence the best and most effective strategy for combating the dreaded disease is through proper diagnosis by massive laboratory and diagnostic testing. Followed by swift isolation of patients who test positive for the virus and providing adequate medical attention treatment. This will require the expansion of existing molecular laboratories and further equipping them with adequate testing kits, drugs, ventilators, personal protective equipment, and trained health care workers. Several countries are developing and implementing

* Corresponding author.

E-mail address: terkumachia@hotmail.com (T. Chia).

strategies to ensure the fight against COVID-19 is fruitful through a competent and well-structured health care workforce. For instance, the Eijkman Institute for Molecular Biology, Indonesia produced and distributed 20,000 Viral Transport Medium (VTM) to 95 health facilities across their country within days after it was named one of the reference laboratories for COVID-19 testing [4]. This was in response to the scarcity of VTM which are used for transporting swabs from patients to testing laboratories.

Additionally, vaccines are required to prevent the spread of the disease. In recent weeks, scientists in other continents are announcing plans to commence trials of vaccine [5]. In contrast, countries in Africa largely depend on other continents for solutions just as seen during previous outbreaks. This is majorly due to poor health and research facilities, with a limited number of healthcare workers and scientists trained in molecular biology techniques. Over the years, the African healthcare system has been plagued by quite a number of challenges such as funding, personnel and management [6,7]. Others include health legislation, involvement, and interference from the local community as well as research and information [8,9]. These factors are responsible for poor health services [10] thereby resulting in loss of confidence in the health sectors of many African nations [11].

The healthcare system has continuously been suggested as the basic framework for implementing measures for containing risks, disasters, and outbreaks such as the COVID-19 pandemic [12,13]. A typical and functional healthcare system is made up of interrelated building blocks which include; management and leadership, health information and technologies, health workforce, and health information managers. Other compositions are health finance and health delivery services all of which work together to ensure adequate health provision [14]. An efficient health care system has the tendency to efficiently prepare for and adequately respond to outbreaks and also recover appropriately after the outbreak [15]. Unfortunately, experience from recent international public health issues has revealed the weakness of the African healthcare system [16,17]. One of the core deficiencies is a shortage in the number of health care professionals. The shortfall of medical workers in sub-Saharan Africa has been previously reported to stand at about 1.8 million and is projected to reach 4.3 million by 2035 [18]. The World Health Organisation (WHO) data of 2015 after the Ebola outbreak shows that doctor to patient ratio in Liberia and Sierra Leone are 0.1: 1000 and 0.2: 1000 respectively [19]. A more recent report shows that there are less than 40,000 registered medical doctors practicing in Nigeria, with a doctor to patient ratio of 1: 2500 [20]. This implies that about 300,000 more doctors are required to meet the 1:600 ratio recommended by the WHO.

From the foregoing, there is, therefore, an urgent need for additional training institutions in Africa. Such institutions must be adequately provided with state of the art facilities and highly skilled manpower especially experts with knowledge of the local context can be supported by international experts to provide learning. This way Africa can develop her own solutions to problems confronting the continent as well as address the brain-drain that currently persists on

the continent. Lessons from past events have shown that skilled health care workers are driving force in ensuring adequate support, planning, coordination, and supervision of an effective public health service delivery, as well as efficiency in managing risks and outbreaks as seen in the world today [21,22]. Hence, significant attention should be given to the health care workforce with proper investments in training, seminars, and workshops so as to effectively and efficiently prepare for, respond to, and recover from public health issues [23]. Health and safety are of utmost importance [24], therefore the training of workers and scientists in this area should receive the same precedence. This training could be categorized into the short, medium, and long term. This way, the most urgent training needs would be provided and sustained while making room for long term needs that would address the manpower need of the continent.

Different sectors of national economies have competing interests which presents the ethical challenge of allocating the scarce resources. This situation is even most applicable to sub-Saharan African nations where most are classed as low and middle income countries (LMICs) [25]. Unarguably, some sectors would have to be given priority over others. There are arguments that the health sector is supreme [24,26]. This alludes to the fact that it is a healthy citizenry that can participate in any form of economic activity. The implication is that even in the face of limited resources, health budgets should receive more allocation and by extension the training of the health workforce who work in the health sector. According to Cash, "...abundant resources make it possible to train doctors and other health-care workers to the full extent of their capabilities. In the developing world, this level of training is uncommon..."[27]. Therefore, authorities have an ethical obligation to allocate sufficient resources to healthcare delivery as well as determine the appropriate workforce for her health system and train them to the acceptable skill level that guarantees the provision of safe and suitable services. These actions come under the utilitarian theory where expediency is the goal and aims to produce maximal good.

A notable study by Olu et al., [28] identified some areas of core competencies in public health emergencies in which African health workers require training and developments. These areas include but not limited to the introduction of health care workers to risk and disaster management, operational effectiveness and effective management, and leadership skills. Others include preparedness of the workforce and risk reduction, adequate emergency response, and post-disaster health system recovery. Their findings suggest these competencies and other training could be used to advantage in enhancing quality healthcare workers and scientists in preparing and handling risks, before, during, and after outbreaks such as the current COVID-19 pandemic [28]. Consequently, health systems on the continent would be strengthened thereby disrupting the current abysmal health indices at the same time produce a competent workforce to handle any future spate of an epidemic or pandemic. These would gravitate to meeting their citizens' right to health.

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TC originated the concept for the paper and MIO drafted the manuscript. TC, MIO and OIO had critical review and input into the preparation of the manuscript. All authors approved the final version of the manuscript.

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References

- [1] World Health Organisation. Coronavirus disease 2019 (Covid-19) Situation Report - 84.
- [2] Nkengasong J. China's response to a novel coronavirus stands in stark contrast to the 2002 SARS outbreak response. *Nat Med* 2020;1–2:310–1, <http://dx.doi.org/10.1038/s41591-020-0771-1>.
- [3] Chia T, Oyeniran OI. Will Africa experience a spike in COVID-19 cases? *Asian Pac J Trop Med* 2020;13, <http://dx.doi.org/10.4103/1995-7645.282560>.
- [4] New Zealand Ministry of Foreign Affairs and Trade. New Zealand Government supports Indonesia to detect COVID-19; 2020 [cited 25 April 2020]. Available from: <https://www.mfat.govt.nz/en/media-and-resources/news/new-zealand-government-supports-indonesia-to-detect-covid-19/>.
- [5] Cascella M, Rajinik M, Cuomo A, Dulebohn SC, Di Napoli R. Features evaluation and treatment of corona virus (Covid-19) [updated 2020 March 20]. In: *StatPearls* [internet]. Treasure Island (FL): StatPearls publishing; 2020.
- [6] Oleribe OO, Momoh J, Uzochukwu BS, Mbofana F, Adebisi A, Barbera T. Identifying key challenges facing healthcare systems in Africa and potential solutions. *Int J Gen Med* 2019;12:395–403, <http://dx.doi.org/10.2147/IJGM.S223882>.
- [7] Malakoane B, Heunis JC, Chikobvu P, Kigozi NG, Kruger WH. Public health system challenges in the Free State, South Africa: a situation appraisal to inform health system strengthening. *BMC Health Serv Res* 2020;20:58, <http://dx.doi.org/10.1186/s12913-019-4862>.
- [8] Kirigia JM, Wambebe C. Status of national health research systems in ten countries of the WHO African Region. *BMC Health Serv Res* 2006;6:135, <http://dx.doi.org/10.1186/1472-6963-6-135>.
- [9] McIntyre D, Mooney G, editors. *The economics of health equity*. Cambridge: Cambridge University Press; 2007.
- [10] WHO. The African regional health report: The health of the people; 2006 [Online]. Available from: <https://www.who.int/bulletin/africanhealth/en/> [Accessed on 8th April 2020].
- [11] Abubakar M, Basiru S, Oluyemi J, Abdulateef R, Atolagbe E, Adejoke J. Medical tourism in Nigeria: Challenges and remedies to health care system development. *Int J Dev Manag Rev* 2018;13:223–8.
- [12] Bayntun C. A health system approach to all-hazards disaster management: A systematic review. *PLoS Curr* 2012, <http://dx.doi.org/10.1371/50081cad5861d>.
- [13] Bayntun C, Rockenschaub G, Murray V. Developing a health system approach to disaster management: A qualitative analysis of the core literature to complement the WHO Toolkit for assessing health-system capacity for crisis management. *PLoS Curr* 2012, <http://dx.doi.org/10.1371/5028b6037259a>.
- [14] WHO. Everybody's business. Strengthening health systems to improve health outcomes; WHO's framework for action. Geneva: World Health Organization; 2007 [http://www.who.int/healthsystems/strategy/everybodys_business.pdf. Accessed 28 Sept 2016].
- [15] Kruk ME, Myers M, Varpilah ST, Dahn BT. What is a resilient health system? Lessons from Ebola. *Lancet* 2015;385:1910–2, [http://dx.doi.org/10.1016/S0140-6736\(15\)60755-3](http://dx.doi.org/10.1016/S0140-6736(15)60755-3).
- [16] Kiény MP, Dovlo D. Beyond Ebola: a new agenda for resilient health systems. *Lancet* 2015;385:91–2, [http://dx.doi.org/10.1016/S0140-6736\(14\)62479-X](http://dx.doi.org/10.1016/S0140-6736(14)62479-X).
- [17] Regmi K, Gilbert R, Thunhurst C. How can health systems be strengthened to control and prevent an Ebola outbreak? A narrative review. *Infect Ecol Epidemiol* 2015;5:28877, <http://dx.doi.org/10.3402/iee.v5.28877>.
- [18] Diagnosing Africa's medical brain drain retrieved online on 15th April, 2020 <https://www.un.org/africarenewable/magazine/december-2016-march-2017/diagnosing-africa%E2%80%99s-medical-brain-drain>.
- [19] Ighobor K. Diagnosing Africa's medical brain drain. *Africa Renewal* [Internet] Un.org 2020 [cited 25 April 2020]. Available from: <https://www.un.org/africarenewable/magazine/december-2016-march-2017/diagnosing-africa%E2%80%99s-medical-brain-drain>.
- [20] Igoni D. Nigeria's doctor-patient ratio is 1:3,500–NUC [Internet]. *Punch Newspapers* 2020 [cited 25 April 2020]. Available from: <https://punchng.com/nigerias-doctor-patient-ratio-is-13500-nuc/>.
- [21] Savage C, Kub J. Public health and nursing: a natural partnership. *Int J Environ Res Public Health* 2009;6:2843–8, <http://dx.doi.org/10.3390/ijerph6112843>.
- [22] Van Devanter N, Levis P, Abramson D, Howard JM, Honoré PA. Emergency response and public health in hurricane Katrina: what does it mean to be a public health emergency responder? *J Public Health Manag Pract* 2010;16:E16–25, <http://dx.doi.org/10.1097/PHH.0b013e3181d8bbb2>.
- [23] Editorial. Human resources for health—investing in action. *Lancet* 2016;387:1591, [http://dx.doi.org/10.1016/S0140-6736\(16\)30246-X](http://dx.doi.org/10.1016/S0140-6736(16)30246-X).
- [24] Chia T, Oyeniran OI. Human health versus human rights: An emerging ethical dilemma arising from coronavirus disease pandemic. *Ethics Med Public Health* 2020, <http://dx.doi.org/10.1016/j.jemep.2020.100511>.
- [25] World Bank. World Bank Country And Lending Groups—World Bank Data Help Desk; 2020 [online] Available at: <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups> [Accessed 6 May 2020].

- [26] Nicola M, Alsafi Z, Sohrabi C, Kerwan A, Al-Jabir A, Iosifidis C, et al. The Socio-Economic Implications of the Coronavirus and COVID-19 Pandemic: A Review. *Int J Surg* 2020, <http://dx.doi.org/10.1016/j.ijsu.2020.04.018> [S1743-9191(20)30316-2].
- [27] Richard Cash. Ethical issues in health workforce development. *Bull World Health Org* 2005;83:280–4.
- [28] Olu O, Usman A, Kalambay K, Anyangwe S, Vayi K, Orach CG, et al. What should the African health workforce know about disasters? Proposed competencies for strengthening public health disaster risk management education in Africa. *BMC Med Educ* 2018;18:60, <http://dx.doi.org/10.1186/s12909-018-1163-9>.