



LETTER TO THE EDITOR

COVID-19 Vaccine Hesitancy: Maximising the Extending Roles of Community Pharmacists in Nigeria in Driving Behavioural Changes in Public Health Interventions

Oladapo Rasaq Kayode^{1*} , Oyetola Afeez Babatunde² , Olajide Adekunle³ , Monisola Igbalajobi⁴  and Adebayo Kudirat Abiodun⁵ 

¹Nigerian Red Cross Society, Cross River State, Calabar, Nigeria

²Howard University Global Initiative Nigeria, Cross River State, Calabar, Nigeria

³School of Pharmacy, Chapman University, Irvine California, USA

⁴Alpha Pharmacy Limited, Lagos, Nigeria

⁵Adeoyo State Maternity Hospital, Ibadan, Oyo State, Nigeria



*Corresponding authors: Oladapo Rasaq Kayode, Nigerian Red Cross Society, Cross River State, Calabar, Nigeria

Abstract

The Coronavirus Disease (COVID-19) pandemic caused by the novel virus, SARS-COV-2, has considerably increased awareness and discussions among the general populace - and scientists - regarding the important roles of vaccines. Despite the desperate need for interventions from vaccines, there is still considerable apathy and hesitancy around the acceptance and use of the available, approved vaccines in many places in Africa and Nigeria, especially. Community pharmacists are the most accessible and first points of health care for most clients. They are trusted, highly trained health care professionals. They should be incorporated and allowed to be at the forefront of reducing hesitancy in the population if the battle against COVID-19 is to be won. In this paper, we explored the extending roles of community pharmacists in building trust in the health system; proximity to the heart of deprived areas, where vaccine hesitancy predominates, and counseling education to promote the acceptance and wide coverage of COVID-19 vaccination. It is therefore recommended that the Nigerian government embrace community pharmacy-led COVID-19 vaccination initiative and embark on structured training programs for community pharmacists in addressing misconceptions about vaccinations and potentially prevent future outbreaks of vaccine-preventable diseases.

Vaccines are considered as one of the greatest achievements in attaining community and global health [1]. Vaccination represents basic public health interventions aimed to mitigate the severe epidemiological and economic burden generated by communicable disorders, [2] thus, recognized globally as a key strategy for improving health outcomes and life expectancy [3]. In Africa, vaccination programs have helped reducing mortality and morbidity due to vaccine-preventable diseases [4]. The novel Coronavirus disease (COVID-19) pandemic is a global threat with which the entire globe is faced [5]. Since its outbreak in Wuhan city, China in December 2019, 106,433,703 cases and 2,323,147 deaths have been recorded across 213 countries and five regions of the globe as of 16th February 2021 [6]. On the African continent, 3,673,181 COVID-19 cases and 95 128 deaths have been recorded, with South Africa, Morocco (8,394), Tunisia (7,214), Egypt, and Ethiopia (2 914) taking the lead [7].

Since the onset of the COVID-19 pandemic, strict standard operating procedure (SOP) has been imposed, such as increased emphasis on hand hygiene, social distancing, the donning of face masks and gloves by the general public, and government stay-at-home orders

have been used to reduce the spread of COVID-19 [8]. At the early period of the COVID-19 pandemic when there was no known COVID-19 vaccine or treatment, herd immunity was suggested as a possible remedy for tackling SARS-CoV-2, the COVID-19 virus [9]. Herd immunity is the indirect protection from an infectious disease that happens when a population is immune either through vaccination or immunity developed through a previous infection. WHO however supports achieving 'herd immunity' through vaccination, to prevent unnecessary cases and deaths [10]. The proportion of the population that must be vaccinated against COVID-19 to begin inducing herd immunity is not known. To stop the increasing morbidity and mortality due to COVID-19, researches have been conducted for the development of a COVID-19 vaccine, and COVID-19 vaccines are currently available in some countries [11]. Through the Accelerating COVID-19 Therapeutic Interventions and Vaccines (ACTIV) public-private partnership, numerous government agencies, including the National Institutes of Health (NIH), the Food and Drug Administration (FDA), and the Centers for Disease Control and Prevention (CDC), have partnered with representatives from academia, philanthropic organizations, and more than 15 biopharmaceutical companies to develop a safe and effective COVID-19 vaccine [12]. Following the discovery of the COVID-19 Vaccine, COVAX was established as a global initiative to accelerate the development, production, and equitable access to Covid-19 vaccines in 190 countries across the globe, irrespective of their developmental phase or level of income.

Currently, three vaccines are authorized and recommended to prevent COVID-19: Pfizer-BioNTech COVID-19 vaccine, Moderna's COVID-19 vaccine, and Janssen's COVID-19 vaccine. As of February 2021, large-scale (Phase 3), clinical trials are in progress two COVID-19 vaccines in the United States: AstraZeneca's COVID-19 vaccine and Novavax's COVID-19 vaccine [13]. According to the Centre for Disease Control, almost 63 million doses of the COVID-19 vaccine have been distributed in the U.S. So far, and more than 43.2 million doses have been administered [13]. In the UK, a total number of 12,844,193 people have been vaccinated since vaccination for COVID-19 began [14]. As the global rollout of COVAX vaccines accelerates, the first COVID-19 vaccination campaigns in Africa using COVAX doses began in Ghana and Côte d'Ivoire [15]. While Africa's most populous country - Nigeria- has received its first batch of COVID-19 vaccines, becoming the third country in Africa to get the shots through COVAX [16]. However, other African countries are still waiting to receive the vaccine [17].

Although the COVID-19 pandemic has increased awareness of the importance of vaccines for the vast majority of people who accept vaccines, research showed that newer vaccines generate more hesitancy [18]. A poll recently conducted in the United States reported that if

a vaccine against COVID-19 were to become available to the public, 49% of those surveyed plan to receive it, 31% were unsure, and 20% said they would not [19]. These results, combined with the fact that an increasing number of people are requesting alternative vaccination schedules or declining vaccination altogether, provide evidence that COVID-19 vaccine hesitancy has already become an issue that needs to be addressed [20]. WHO defines vaccine hesitancy as the delay in the acceptance of blunt refusal of vaccines, despite the availability of vaccine services, and has been identified as a growing trend in global health [21]. Vaccine hesitancy represents a threat that can seriously jeopardize the implementation and success of vaccination campaigns.

Causes of Vaccine Hesitancy

The determinants of vaccine refusal/hesitancy are complex and can be attributed to the confluence of several factors; doubts about the actual need for vaccines, concerns about vaccine safety, fear of possible adverse events, misconceptions about the safety and efficacy of vaccines, concerns over a possible "immune system overexposure," past negative experiences with vaccines, mistrust of the seriousness of the vaccine industry and the healthcare system, heuristic thinking, and philosophical and religious issues may be involved [22]. According to the SAGE Working Group on Vaccine Hesitancy, the determinants of this behavior can be characterized by the 3C model: Confidence (trust in healthcare professionals, vaccines, and their effectiveness), Complacency (low awareness of the risks of vaccine-preventable diseases and the importance of vaccines), and Convenience (availability of and accessibility to vaccines and healthcare services) [23,24]. Vaccine hesitancy is a global phenomenon and has been reported in different parts of the world - Canada, France, and the United Kingdom [25].

Regarding COVID-19 vaccine hesitancy, studies suggest that the rapid pace of vaccine development may undermine vaccination confidence and increase complacency about the vaccine [26]. COVID-19 vaccine hesitancy may be aggravated in African countries, as a result of many theories on social and traditional media that Africans are "immune" to COVID-19 due to the climatic conditions in the African continent [27].

Vaccine Hesitancy in Retrospect

Vaccine refusal in the past has been associated with outbreaks of many diseases in different countries, both developed and developing countries. Outbreaks of pertussis were reported in the United Kingdom and the United States in the past due to vaccine refusal [28]. Historically, Northern Nigeria has been plagued with challenges of vaccine hesitancy due to several reasons such as unmet needs, oral polio vaccine (OPV) safety, and political differences [29,30]. The polio vaccine refusal in Northern Nigeria in 2003/2004 did not only

quintuple polio incidence in Nigeria but also contributed to outbreaks across three continents. The rejection was driven by rumors and distrust which are rudiments of vaccine hesitancy [31]. Nigeria is multi-ethnic and multi-religious with diverse cultural beliefs and practices across various regions. This complex nature, no doubt, can allow vaccine hesitancy to thrive. Hidden influences such as cultural, social, demographic, and psychosocial contribute to the occurrence of vaccine hesitancy [32]. Hesitancy can thrive in the country because of various religions that see causation as coincidences rather than find answers to what appears like coincidences [33]. In certain religions, deaths either childhood or adults are seen as coincidences or ascribed to God who is supreme in all even if apparent causation like vaccine-preventable disease can be identified as a probable cause.

COVID-19 Vaccine Hesitancy versus Trust in Healthcare Professional

Despite the potential benefits presented by the COVID-19 vaccine, the reluctance of many to accept the proposed COVID-19 vaccine would limit the effectiveness of the COVID-19 outbreak response, particularly in Africa. It has been suggested that to improve population adoption of COVID-19 vaccination, it is imperative to draw on the implementation of multi-level, evidence-based strategies to address vaccine hesitancy. Such include evidence-based efforts from social, behavioral, communication, and implementation science that can inform clinical efforts at the interpersonal, individual, and organization levels to address COVID-19 vaccine hesitancy [34]. Since vaccination confidence is influenced by trust in the safety and effectiveness of vaccines, trust in healthcare professionals, and public health and healthcare delivery systems [35], healthcare providers' recommendations will be a key driver of COVID-19 vaccine acceptance. In a recently conducted survey, respondents indicate a greater likelihood of accepting the COVID-19 vaccine if recommended by their healthcare provider [36]. It has been suggested that effective collaboration among healthcare workers with members of their respective communities to create population-specific strategies will go a long way in overcoming vaccine hesitancy [37].

How Community Pharmacist Finds Its Place in the Fight

Pharmacists are one of the most trusted professions worldwide [38]. A study has it that the search for useful tools and techniques to promote a layered and widespread information network capable of restoring a climate of trust and confidence towards vaccination led to already adopted in numerous countries, of enlisting community pharmacies in immunization campaigns in numerous countries [39]. While pharmacists play an important role in educating patients and are central to promoting this public health measure, they also work

in countering vaccine myths and concerns which is an important public service that pharmacists are well-suited to performing [40]. A study shows that community pharmacists are widely accessible to the public, knowledgeable, and very capable vaccination providers, and therefore they would play a key role in the COVID-19 vaccination program [41]. Research also shows that community pharmacists can help in providing educational and counseling activities, with evidence-based facts, addressing common misconceptions about vaccinations, and potentially preventing future outbreaks of vaccine-preventable diseases [42]. A very recent experiment launched in 2020 in Italy, showed that community pharmacies' involvement in strengthening the health network has led to an increase by 5.2% of the vaccination coverage rate, the best increase in the region [43]. In the USA, community pharmacists have been involved in the offer of "pharmacy-based immunization services" (PBIS) since 1984. This involvement has been fully implemented in 2009 for all 50 states in the USA [44].

Recommendations

Training and capacity building

Several studies have demonstrated the importance of health professionals' knowledge and attitudes about vaccines, particularly their intention to recommend the vaccinations to their patients, in the decision-making process regarding vaccination [45]. A study conducted to ascertain the involvement of community pharmacies in immunization services in Lagos State, Nigeria revealed that 96.2% of the community pharmacists assessed were willing to undergo training to administer vaccines [46]. It is therefore recommended that capacity-building strategies through a structured training programme, which have been demonstrated to increase healthcare providers' adoption and implementation of evidence-based interventions will assist the community pharmacists to be better prepared in addressing COVID-19 vaccine hesitancy and improve public health efforts [47].

Accessibility of vaccination

Nigeria plans to fully vaccinate 40% of its citizens against COVID-19 before the end of 2021, and 70% by the end of 2022 [48]. Nigerian government uses the Astrazeneca vaccine. A full vaccination constitutes two doses given two weeks apart. Currently, Nigeria has been able to vaccinate 9.5% of the target population at the first dose which constitutes about 5% of the target [49]. Although the data on the number of designated health facilities for receiving the vaccine in the country is not available, data from Lagos state shows that only 88 sites are available to cater for about 10 million Lagosians (based on 70% target of the Nigerian government) [50]. For emphasis, Lagos is the epicenter of the pandemic having recorded 56,804 positive cases (50% of the total cases in the country) [51]. Additionally, Lagos

State has the most proactive health care in the country with emphasis on primary health care and insurance for Lagosians. Besides, there are a total of 3768 registered community pharmacies in the country with a disproportionately higher number situated in Lagos State (1096; 29%) [52]. If the current proportion of people vaccinated (5%) is to be increased, COVID-19 vaccines need to be made accessible to the population through the community pharmacies in the communities. Ease of accessibility is a potentially modifiable determinant, and thus will likely increase the number of available opportunities for vaccination, thus improving vaccine coverage rates [53].

For the community pharmacists to be effective in the fight against COVID-19 vaccine hesitancy there is a need for adequate provision of approved COVID-19 vaccines and the safe administration of the COVID-19 vaccine [54-56]. As being done in the US, the government should partner with the community pharmacists to be part of the vaccine program to increase access to the vaccine [57,58]. Also, the approved COVID-19 vaccines may present with some unique logistics challenges such as the management of receiving, storing, and properly handling a vaccine at potentially ultra-cold temperatures, a dedicated space to ensure the vaccine is prepared and administered in a safe manner [59,60]. It will be essential to equip community pharmacists with accessible and tailored information on the different COVID vaccines to support their discussion with their patients as the Africa continent continues to receive the COVID-19 vaccines.

Conclusions

Pharmacists are the most accessible health care providers whose training and certifications prepare them for full participation in all aspects of community vaccination delivery. Most importantly, community pharmacists can readily connect the dots for patients; they offer medical counseling and advice and guide medication and vaccines' safety to other healthcare providers. Community pharmacies can serve as additional vaccination sites for the use of the general populace and help ramp up vaccination quickly. They should be incorporated and allowed to be at the forefront of reducing hesitancy in the population if the battle against COVID-19 is to be won. It is therefore imperative to ensure that the public better understands the need for COVID-19 vaccination across the lifespan, and trust-building interventions are critical to promoting information acceptance. Second, the Nigeria government should embark on a community pharmacy-led vaccination sites program by harnessing the potentials in community pharmacists in administering COVID-19 vaccines as being done in countries like the U.K [61]. This initiative would help the government reach the heart of deprived areas, where there are higher levels of health challenges and vaccine hesitancy predominate. With the appropriate training/education, accessibility, and effective provision of COVID-19

vaccine in community pharmacies, community pharmacists will be uniquely positioned to improve COVID-19 vaccine coverage rates and public-health efforts in reducing vaccine hesitancy.

References

1. Olson O, Berry C, Kumar N (2020) Addressing parental vaccine hesitancy towards childhood vaccines in the United States: A systematic literature review of communication interventions and strategies. *Vaccines (Basel)* 8: 590.
2. Bärnighausen T, Bloom DE, Cafiero-Fonseca ET, O'Brien JC (2014) Valuing vaccination. *Proc Natl Acad Sci USA* 111: 12313-12319.
3. World Health Organization (2014) Global vaccine action plan 2011-2020.
4. Cooper S, Betsch C, Sambala EZ, Mchiza N, Wiysonge CS (2018) Vaccine hesitancy-a potential threat to the achievements of vaccination programmes in Africa. *Hum Vaccin Immunother* 14: 2355-2357.
5. Ilesanmi OS, Olubumuyi OO, Afolabi AA (2020) Mobilizing medical students for improved COVID-19 response in Nigeria: A stop-gap in human resources for health. *Global Biosecurity*, 2.
6. NHS (2020) Coronavirus (COVID-19) vaccine (Accessed 11th December 2020).
7. European Centres for Disease Control (2021) COVID-19 situation update worldwide, as of week 52 2020.
8. Centers for Disease Control and Prevention (2021) How to protect yourself & others.
9. World Health Organization (2020) Coronavirus disease (COVID-19): Herd immunity, lockdowns and COVID-19.
10. NHS (2021) Coronavirus (COVID-19) vaccine (Accessed on 11th February 2021).
11. World Health Organization (2021) COVAX announces additional deals to access promising COVID-19 vaccine candidates; plans global rollout starting Q1 2021.
12. Corey L, Mascola JR, Fauci AS, Collins FS (2020) A strategic approach to COVID-19 vaccine R&D. *Science* 368: 948-950.
13. Centers for Disease Control and Prevention (2021) Different COVID-19 Vaccines.
14. Centers for Disease Control and Prevention (2021) COVID-19 vaccination in the United States.
15. (2021) UK COVID-19 vaccination uptake plan.
16. UNICEF (2021) First COVID-19 COVAX vaccine doses administered in Africa.
17. <https://www.aljazeera.com/news/2021/3/2/millions-of-free-covax-jabs-arrive-in-nigeria>
18. World Health Organization Regional Office for Africa (2021) COVAX expects to start sending millions of COVID-19 vaccines to Africa in February.
19. Brunson EK, Schoch-Spana M (2020) A social and behavioral research agenda to facilitate COVID-19 vaccine uptake in the United States. *Health Secur* 18: 338-344.
20. <http://www.apnorc.org/projects/Pages/Expectations-for-a-COVID-19-Vaccine.aspx>
21. Dubé E, Laberge C, Guay M, Bramadat P, Roy R, et al. (2013) Vaccine hesitancy: An overview. *Hum Vaccin Immun*

- nother 9: 1763-1773.
22. MacDonald NE, SAGE Working Group on Vaccine Hesitancy (2015) Vaccine hesitancy: Definition, scope and determinants. *Vaccine* 33: 4161-4164.
 23. (2014) SAGE working group on vaccine hesitancy final report.
 24. Salmon DA, Dudley MZ, Glanz JM, Omer SB (2015) Vaccine hesitancy: Causes, consequences, and a call to action. *Am J Prev Med* 49: S391-S398.
 25. Dubé E, Gagnon D, Ouakki M, Bettinger JA, Guay M, et al. (2016) Understanding vaccine hesitancy in Canada: Results of a consultation study by the Canadian immunization research network. *PLoS One* 11: e0156118.
 26. Rutten LJF, Zhu X, Leppin AL, Ridgeway JL, Swift MD, et al. (2021) Evidence-based strategies for clinical organizations to address COVID-19 vaccine hesitancy. *Mayo Clin Proc* 96: 699-707.
 27. Dubé E, Vivion M, MacDonald NE (2015) Vaccine hesitancy, vaccine refusal and the anti-vaccine movement: Influence, impact and implications. *Expert Rev Vaccines* 14: 99-117.
 28. Kaufmann JR, Feldbaum H (2009) Diplomacy and the polio immunization boycott in Northern Nigeria. *Health Aff (Millwood)* 28: 1091-1101.
 29. Warigon C, Mkanda P, Muhammed A, Etsano A, Korir C, et al. (2016) Demand creation for polio vaccine in persistently poor-performing communities of Northern Nigeria: 2013-2014. *J Infect Dis* 213: S79-S85.
 30. Ghinai I, Willott C, Dadari I, Larson HJ (2013) Listening to the rumors: What the northern Nigeria polio vaccine boycott can tell us ten years on. *Glob Public Health* 8: 1138-1150.
 31. Dubé E, MacDonald NE (2016) Managing the risks of vaccine hesitancy and refusals. *Lancet Infect Dis* 16: 518-519.
 32. National Demographic Health Survey (2008) National Demographic Health Survey Key Findings.
 33. Deml MJ, BuhIA, NotterJ, Kliem P, Huber BM, et al. (2020) 'Problem patients and physicians' failures': What it means for doctors to counsel vaccine-hesitant patients in Switzerland. *Soc Sci Med* 255: 112946.
 34. Bogart LM, Ojikutu BO, Tyagi K, Klein DJ, Mutchler MG, et al. (2020) COVID-19 related medical mistrust, health impacts, and potential vaccine hesitancy among Black Americans living with HIV. *J Acquir Immun Defic Syndr* 86: 200-207.
 35. Jacobson RM, St Sauver JL, Griffin JM, MacLaughlin KL, Finney Rutten LJ (2020) How health care providers should address vaccine hesitancy in the clinical setting: Evidence for presumptive language in making a strong recommendation. *Human Vaccin Immunother* 16: 2131-2135.
 36. Ward PR (2017) Improving access to, use of, and outcomes from public health programs: The importance of building and maintaining trust with patients/clients. *Front Public Health* 5: 22.
 37. Brewster S, Holt R, Portlock J, Price H (2020) The role of community pharmacists and their position in the delivery of diabetes care: An update for medical professionals. *Postgrad Med J* 96: 473-479.
 38. Bragazzi NL (2019) Pharmacists as immunizers: The role of pharmacies in promoting immunization campaigns and counteracting vaccine hesitancy. *Pharmacy (Basel)* 7: 166.
 39. Vyas D, Galal SM, Rogan EL, Boyce EG (2018) Training students to address vaccine hesitancy and/or refusal. *Am J Pharm Educ* 82: 6338.
 40. Zikry G, Hess K (2020) Pharmacy as a destination for receiving vaccines during the COVID-19 pandemic.
 41. Ciliberti R, Bragazzi NL, Bonsignore A (2020) The implementation of the professional role of the community pharmacist in the immunization practices in Italy to counteract vaccine hesitancy. *Pharmacy (Basel)* 8: 155.
 42. Ecartot F, Crepaldi G, Juvin P, Grabenstein J, Del Giudice G, et al. (2019) Pharmacy-based interventions to increase vaccine uptake: Report of a multidisciplinary stakeholders meeting. *BMC Public Health* 19: 1698.
 43. Katz-Sidlow RJ, Sidlow R (2003) A look at the pediatrician as a parent: Experiences with the introduction of varicella vaccine. *Clin Pediatr (Phila)* 42: 635-640.
 44. Oluwadamilola F, Bolajoko A (2016) Immunization services: Involvement of community pharmacies in Lagos State, Nigeria. *Journal of Pharmaceutical Research International* 12: 1-12.
 45. Paterson P, Meurice F, Stanberry LR, Glismann S, Rosenthal SL, et al. (2016) Vaccine hesitancy and healthcare providers. *Vaccine* 34: 6700-6706.
 46. Burson RC, Buttenheim AM, Armstrong A, Feemster KA (2016) Community pharmacies as sites of adult vaccination: A systematic review. *Hum Vaccine Immunother* 12: 3146-3159.
 47. Leeman J, Birken SA, Powell BJ, Rohweder C, Shea CM (2017) Beyond "implementation strategies": Classifying the full range of strategies used in implementation science and practice. *Implementation science* 12: 125.
 48. National Primary Health Care Development Agency (2021) COVID-19: Nigeria unveils strategy for effective, equitable vaccination.
 49. National Primary Health Care Development Agency (2021) COVID-19 vaccination.
 50. The Guardian (2021) Lagos releases list of centers for COVID-19 vaccination.
 51. World Health Organisation (2021) Lagos state flags-off COVID-19 vaccination, warns citizens against lowering guard against the virus.
 52. Ekpenyong A, Udoh A, Kpokiri E, Bates I (2018) An analysis of pharmacy workforce capacity in Nigeria. *J Pharm Policy Pract* 11: 20.
 53. Jaca A, Mathebula L, Iweze A, Pienaar E, Wiysonge CS (2018) A systematic review of strategies for reducing missed opportunities for vaccination.
 54. Centers for Disease Control and Prevention (2020) Summary for healthcare facilities: Strategies for optimizing the supply of ppe during shortages.
 55. Won K, Hess K (2020) Vaccinating adults amid crisis poses challenges 1: 8.
 56. World Health Organization (2020) The use of non-steroidal anti-inflammatory drugs (NSAIDs) in patients with COVID-19.
 57. U.S. Department of Health and Human Services (2020) Trump administration partners with chain and independent community pharmacies to increase access to future COVID-19 vaccines.
 58. American Pharmacist Association (2020) Reimbursement for the administration of COVID-19 vaccine(s)-What we

- know.
59. Centers for Disease Control and Prevention (2021) Frequently asked questions about COVID-19 vaccination.
60. American Pharmacists Association (2020) Guiding principles for safe and efficacious COVID-19 vaccine development, distribution, allocation, and mass immunization.
61. Robinson J (2021) Ten things pharmacists should know about COVID-19 vaccines. The Pharmaceutical Journal.