Strengthening the Oral Health System in Nigeria: A Health Systems Building Block Approach

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Abstract

Aim: The present study aimed to describe the building blocks of the oral health system, including the role that the community plays in strengthening the oral health system in Nigeria. Methodology: This research was a scoping review of the existing literature retrieved from search engines and databases. Thus, we utilised grey literature, peer-reviewed literature, policy documents and websites. The oral health system was analysed using the World Health Organisation’s Health systems framework, and we adapted this framework by introducing a seventh block, community participation. We also inserted the links between the oral health service delivery and oral health workforce blocks of the framework to improve the oral health outcomes. Results: More dental clinics are required to improve the availability and accessibility of oral health services. Dental workforce expansion is imperative. This can be approached by training of junior cadre dental professionals and incorporating community health practitioners to deliver basic oral care. There is an unregulated access to medication to treat dental conditions; hence, oral disease treatments need to be included in the country’s treatment guidelines to improve standard of care. The government needs to improve on overall health spending and invariably increase oral health care allocation urgently. Furthermore, the country’s stewardship of oral health care is hindered on well disseminated and implemented national policies on oral health. The oral health system can achieve its overall goals with community participation, engagement and ownership. Conclusion: Strengthening the oral health system in Nigeria requires urgent attention on each building block and cross-cutting interventions across the system’s building blocks. The role of the community will need to be recognised because it is vital in sustaining any organisational change.

Keywords: Dental workforce, oral health outcomes, oral health system, the community, World Health Organisation health system building blocks

INTRODUCTION

Almost half of the world’s population is affected by untreated dental caries, edentulism or periodontitis, yet these oral diseases are largely ignored as a public health problem.[1] In low- and middle-income countries (LMICs) such as Nigeria, oral health awareness is low, and only about a quarter of the Nigerian population was estimated to have utilised dental services.[2] An updated nationally representative data on the burden of oral diseases is lacking; the available report states that between 8% and 15% of Nigerians suffer oral diseases.[3] The prevalence of dental caries ranges between 4% and 30%,[4] and it is untreated in up to 90% of these populations in Nigeria.[5] Similarly, the burden of periodontal diseases ranges between 15% and 58% in the adult population.[6] Pre-existing inequalities in oral health outcomes, utilisation of dental services (rural-urban disparities) and access to oral care have also deteriorated, owing to the COVID-19 outbreak and its impact on the overall health system.[6-10] A typical oral health system combines regulations, training, financial resources and organisation to improve the oral health of persons and whole populations.[11] Oral health care in Nigeria, like other developing countries, is essentially

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dependent on the overall health system, and oral health services are still sparsely rendered in most Primary Health Centres (PHCs) across the country. In appraising the oral health system in Nigeria, Adeniyi et al. noted the improvement over the years; however, the system still showed deficiencies in effectiveness, efficiency and precise definition. Moreover, the Nigerian oral health system is still plagued with a lack of resources and is significantly overstretched. Oral health care is generally expensive and is neither available nor accessible in rural communities. The integration of oral health care with existing PHCs, as promulgated in the National Oral Health Policy (NOHP), has been on a slow trajectory because, amongst other factors, the policy has not been backed with the requisite resources for its full implementation.

An integral aspect of policy direction is integrating of oral health care with national health programs, such as Universal Health Coverage (UHC). The target of UHC provides a timely opportunity to mitigate neglect of oral health care. While Nigeria scores low on the World Bank UHC indices, tackling oral health problems through a more expansive social determinants perspective will support the country’s movement towards the realisation of Sustainable Development Goal 3. The Lancet Series on oral health recommends reformation of oral health systems and incorporating oral health care with the broader health care, expanding human resources for oral health to deliver evidence-based and quality oral health services. In the context of achieving UHC, a robust oral health system will deal with the fragmentation of primary health care and address heightened out-of-pocket expenditure for oral health care. Primary oral health care in Nigeria suffers from underfunding, imbalance in the supply and demand of human resources for oral health, unavailability of dental materials and poor infrastructure. Nevertheless, the strategic position of PHC in the overall health system and its closeness with the community makes it exceedingly relevant and a strong determinant of oral health care strengthening in Nigeria.

Research in the field of oral health systems in Nigeria is limited and there is a paucity of data. There is, thus, a strong need to provide synthesized evidence on the issue, and this will require a scoping review of the subject to explore the broad objective of oral health system strengthening (OHSS) in Nigeria. The study, therefore, aimed to describe the building blocks of the oral health system in Nigeria and the role the community plays in strengthening the system. Evidence from this review will be useful in the NOHP review and in implementing and advancing the research agenda in oral health systems in Nigeria. Furthermore, this study will support and amplify the global advocacy on oral health reforms in the 21st century.

**Methodology**

This scoping review has adopted the methods described by Arksey and O’Malley for scoping reviews.

**Research question**

The research question developed in this review was: What oral health system building blocks contribute to strengthening oral health care in Nigeria and what role does the community play in this process?

**Search strategy**

A detailed search was conducted using search engines: Google, Google Scholar and the PubMed database (MEDLINE). The search duration was between November and December 2021, and we did not utilise any publication date limit for article selection. The search for the articles was guided by the World Health Organisation’s (WHO) Health systems framework, utilising the keywords in each building block. Key search terms included ‘oral health service delivery’, ‘dental clinics’, ‘dental professionals’, ‘dental workforce’, ‘oral health information’, ‘oral materials’, ‘dental medication’, ‘dental technology’, ‘oral health financing’, ‘leadership’, ‘governance’, ‘community’, ‘engagement’, ‘participation’, ‘ownership’, ‘oral health outcomes’, ‘efficiency’, ‘access’, ‘appropriate technology’ and ‘Nigeria’. Boolean terms ‘AND’ ‘OR’ were used to aid the search process. The search was limited to publications from Nigeria except for Mumghamba et al.’s review on Oral Health Financing in the African and Middle East Region. The titles and abstracts were carefully assessed for suitability by matching the keywords with the themes in the WHO Health Systems building blocks framework. Afterward, we obtained full texts, if available, and only the full text publications in the last 20 years were included in the study pool. This pool included peer-reviewed literature, grey literature, websites and policy documents. Furthermore, snowballing was conducted to increase the number of articles by searching through the bibliographies of key articles. We identified relevant articles and included them in the final pool. The search was conducted independently by two of the authors MIA and AA and differences in opinions were clarified before the inclusion of each relevant article(s). A more experienced academic independently validated the selection of the articles where doubts existed. Refer to Figure 1 for flow diagram for search strategy.

**Conceptual framework**

The WHO Health systems framework has been adopted for this study. The framework offers international acceptance and it’s the most popular framework for health systems research. This advantage provides a commonality in the understanding without ‘reinventing the wheel’. It serves to define attributes of the system, areas of WHO focus and gap identification. Although the framework is simple and allows a description of the effects of an intervention on an individual block, it fails to portray the interactions between the building blocks dynamically.

The six building blocks are

**Service delivery**

This was considered as oral health services which should be patient-centred, effective, safe, of good quality and available to all who need it when and wherever.

**Health workforce**

This was analysed as the dental workforce, which provides services responsive, efficient and fair. The even distribution
of a competent and productive dental workforce is crucial to OHSS.

**Medical products, vaccines and technologies**
This block was analysed as ensuring an equitable supply of dental materials, medications and equipment while maintaining cost-effectiveness, efficacy and safety.

**Health information**
This was analysed as the oral health information system, which provides information on the oral health status, oral health system performance and determinants of oral health in a timely manner with effective dissemination.

**Health financing**
This block was analysed to ensure adequate financial resources in the system so that oral health services can be accessed with protection and people do not suffer financial hardships because of their use.

**Leadership and governance**
An analysis of the regulation, accountability and strategic framework to provide oversight in oral health care.

The goal is to improve oral health status, responsiveness, financial protection and efficiency in the oral health system through improved access to safe and quality oral health care. We consider OHSS to include all activities aimed at improving the institution, organisation and resources resulting in improved oral health outcomes in the Nigerian population. We have introduced a seventh block, the community, to the building blocks for OHSS for this study’s methodology [Figure 2]. This is necessary to capture the role of the block in oral health system development.

**Results**
The results will be presented and organised under the following headings: Oral Health Services delivery, dental workforce, oral health information, essential drugs, dental supplies, oral health financing, and leadership and governance and community participation.

**Oral health service delivery**
Optimum oral health service delivery in Nigeria is necessary to achieve improved population oral health status. The provision of comprehensive, safe, and effective oral health to all Nigerians is thus highly expedient.

The delivery of oral health care in Nigeria is by the tertiary, secondary, and primary tiers of the Nigerian Health System (Public sector), with significant complementary services from the private sector. Moreover, these services are predominantly curative and rehabilitative.\(^ {12} \) State government-owned dental clinics account for the highest source of public dental service across Nigeria. The private sector has the largest number of dental clinics in all the six...
Although among Braimah’s [23] it was stated that a dental health service delivery in Nigeria, two important insights were highlighted regarding dental service delivery. First, the proximity of dental clinics within a local government attracts more utilization of dental services from adjacent local government areas. Second, larger settlement populations invariably demand more dental services. Furthermore, the location of dental clinics is hinged on public policy, population size, proximity to health facilities, wealthier communities and tarmac factors. Therefore, oral health services must be decentralised and made locally accessible for all Nigerians. Even though decentralisation may lead to increased government funding, it will reduce the attendant cost of private dental care. Dental clients will need to make shorter trips to uptake dental services and invariably spend less.[27]

Delivery of patient-centred dental care at the PHC is entrenched in integrating oral health care with the existing PHC system. The views of primary health care workers in Lagos revealed a favourable disposition toward its integration. This shifts the paradigm from a more curative and surgical approach to dental practice to promoting health and well-being.[28] Braimah’s study demonstrated that the Primary Health Care health workers were willing to participate. [28] Similarly, the delivery of safe and effective oral health care in Nigeria will improve general health, and opportunities such as World Oral Health Day must be leveraged to increase sensitization in the health community about the importance of oral health and the need for more integrated approaches in health-care delivery to achieve health and well-being.[29] In addition, Folayan et al.[29] proposed a one-stop shop approach for integrated delivery of oral health services with mental, sexual and reproductive healthcare to a target age group, adolescents, in order to reduce stigma-related limitations in access, acceptance, appropriateness and equity in service delivery to adolescents in Nigeria.

The oral health workforce

Engaging people with the primary intent of improving oral health is integral to the oral health system. For a growing population of Nigerians with over 206 million persons as of 2020,[30] a reasonable oral health workforce density is important. Available data suggest that the dentist per 10,000 population was approximately 0.21 in 2017, and the highest density of skill mix of dental professionals is predominantly in the South-western region of the country.[31,32] Although among dentists, the male gender has always been in the majority, more females, however, in the country are taking up the profession of dentistry.[33]

Training of dentists is a rigorous process spanning 6 years in the University as recommended by the Medical and Dental Council of Nigeria,[34] and seven out of the nine dental schools (which are all government-owned) are located in the southern part of the country.[35] Isiekwe reported dissatisfaction among dental students on the quality of training and recommended urgent government attention in terms of better funding for training.[35] Moreover, the yearly output of dentists is insufficient to meet the overall population oral health needs.[12,33] Kanmodi et al.[36] reported that the preferred specialty choice for post-graduate training among undergraduate dental students was maxillofacial surgery, while public health dentistry was among the least selected specialty choices. While these preferences were mainly related to personal interests, it also...
suggests that very little is being done to shift the paradigm from a surgical model of care to a more preventive and oral health promotive approach to attract more practitioners.[36]

The National Dental Therapist Board accredits dental therapists and hygienists, and they provide oral health advocacy and perform essential oral prophylaxis. Up to 70 dental therapists and hygienists are trained yearly.[32,37] Similarly, National Board for Technical Education regulates the dental nursing cadre to provide assistance to the dentist, and it trains an estimated number of 100 students yearly.[32,38]

Notably, about one in five of these dental professionals serve rural communities that host a significant proportion of the Nigerian population and have greater oral health needs.[33,39] Hakeem Ajao described the demand-supply gap as about 90% but could be reduced to 80% if there is an expansion of roles within the dental auxiliary staff.[22] Given the marked shortage, and the decreased trend of a higher dentist to population ratio compared to the dental auxiliary to population ratio. Ogunbodede[33] has advocated that dental auxiliary personnel should be given a stronger consideration to improve oral health outcomes, especially in underserved communities. Thus, this implies the need to train more junior cadre dental professionals and subsequent skill sharing to augment the uneven distribution of dentists in Nigeria. The Nigerian Government has developed a policy document on task shifting and task sharing.[40] Although oral health care delivery was not considered in the document, there is room for more advocacy in this aspect of human resources development for oral health.

While a complement of the dental workforce is sparingly represented at PHCs, other junior cadre health workers such as community health practitioners are widely represented across PHCs in Nigeria. Braimoh et al.[28] opined that there was a need to increase the oral health knowledge of these key health workers at the grassroots of health-care delivery in the country. They could play a vital role in expanding the dental workforce to deliver patient-centred and fair oral health services to target populations, especially in places where they reside.

**Oral health information**

National oral health surveys and census data in Nigeria are largely unavailable or out-of-date. Oral health was not mentioned in the 2018 edition of the Nigeria Demographic and Health Survey.[41] There is preponderant reliance on hospital-based research and a handful of small sized-population-based-surveys on oral health status in sub-regions, states or local governments. For a populous nation like Nigeria, the challenge is inherently immense and the cost of a national survey will be massive. The country is richly diverse and uniquely heterogeneous, and, expectedly, there will be wide variations in the oral health profile across the country.

A national oral health information system to generate representative data on oral health status, determinants of oral health and the oral health system performance is not yet available in Nigeria.[12] Without this information, weak-research-to-policy linkages result and the country may continue to lack tools for strategic planning for oral health.

The NOHP[25] identifies strategies to strengthen the oral health information system in the country. First, strategic research is needed and this should be conducted effectively. Oral health information system including Information and Communication Technology should receive more funding from national votes for oral health.[23] Similarly, government agencies including the National Bureaus of Statistics, the National Institute of Medical Research, National Population Commission (NPC) should have access to oral health data.[23] In addition, a high expectation should be placed on the Regional Centre for Oral Health Training Institute (RCORTI) to generate and disseminate valid research evidence. The centre was identified as an important fulcrum for the NOHP development.[23] A key strategy is to incorporate oral health data collection with subsequent National Demographic and Health surveys in the country. This implies a need to develop standardised indicators to measure the system performance. This may be achieved in collaboration with development partners who possess the technical expertise to help the system meet global standards. The Nigerian Oral Health Information System must strive to produce timely and well-disseminated information with cross-cutting links to general health.

**Dental products, drugs and technologies**

The oral health system should ensure that dental products are distributed equitably and all persons who need dental care obtain the care safely and cost-effectively. Equitable distribution of dental products and technologies facilitates the practice of dentistry without technological and economic barriers, especially at PHCs in remote communities.

The Federal Republic of Nigeria approved a policy document for the procurement of health and medical equipment,[42] including dental equipment. This dental equipment includes dental operators and orthodontic chairs, hand pieces and small instruments, dental laboratory, intra-oral X-ray, panoramic X-ray systems, intra-oral camera, film processors, dental instruments including burs, surgical instruments and autoclaves and ultrasonic cleaners. The Bureau of Public Procurement is expected to publish and disseminate the list of companies and suppliers that comply with basic standards in procurement. Dental equipment to be procured is also based on the WHO’s proposed generic list, specific functionality based on oral disease patterns and the presence of competent handlers of the equipment.[42] However, the policy was specifically focused on tertiary hospitals. The secondary and primary health tiers of the public oral health system need a similar legal guiding framework to procure essential dental equipment and materials or adopt this same framework.

Self-medication for dental problems was reported in 41.5% of participants in Gombe State, in the North east geo-political zone in Nigeria.[43] A study in the South reported the prevalence of over 80% for self-medication.[44] The relative ease in accessing medication for self-help is attributable
to ignorance, political challenges and a shortage of dental professionals but also due to the lack of control and monitoring of over-the-counter drugs. The purchase of cheap and readily available medication such as acetaminophen from street hawkers and medicine stores as a quick solution for pain is common. Indeed, it is a public health challenge, but the practice is less commonly seen among persons who are covered by the National Health Insurance Scheme. Taiwo and Panas identified important roles community pharmacists play in tackling oral health problems. Self-medication is common because the pharmacies are available and closely located and do not require appointment scheduling. The study showed that community pharmacists were willing to participate in oral health promotion and in preventive services for oral health. It is therefore necessary to equip them with oral health knowledge required for effective delivery of these services. The authors also concluded that their active involvement will reduce oral health disparities through the delivery of cost-effective oral health services within their pharmacies. It is also noteworthy; however, that polypharmacy is a concern for dental professionals. Furthermore, Fadare et al. recommended the review of the standard treatment guidelines in Nigeria with the inclusion of more oral conditions. This improves the rational use of analgesics and antibiotics for dental conditions.

A national survey on amalgam phase-down in the country still reveals a low awareness about the Minamata convention and mercury hygiene and the training on using other alternatives to amalgam among dental practitioners. Moreover, wider dissemination of the contents of the Minamata convention recommendation is required especially in dental schools to minimise risks for environmental hazards. An earlier investigation into the disposal of dental clinical waste revealed inappropriate disposal of dental wastes by dentists leaving scavengers encountering these wastes. Consequently, this strengthened the call for government legislation and education of dental professionals on dental waste management.

Given the huge technological barriers faced at the Primary Oral Health Centres, Ibiyemi et al. recommended an improvised water coolant connected to an ultrasonic scaler for the efficacy of plaque and calculus removal at the PHCs. Due to the absence of adequate pipe-borne water needed for the functioning of the ultrasonic scaler, this can be adopted in other PHC in the country. This innovation is hinged on the principles guiding primary health care in which the use of appropriate technology is safe, effective and efficient for use, especially in underserved communities.

**Oral health financing**

Ensuring financial protection while meeting the oral health needs of its citizens is critical to Nigeria’s oral health system. Developing sound mechanisms that influence when and where people can obtain oral health care is essential. Oral health financing in Nigeria should be viewed within the framework of health financing in the country with respect to the indicators from the National Health Accounts. Sadly, almost no data exist on financing oral health in Nigeria. These figures for health financing in Nigeria are not very impressive and this portends limitations for oral health financing in the country. Government funding of health expenditure per capita is $12 which is far lower than the $86 benchmark. The domestic general government health expenditure (GGHE-D) as a percentage of the General Government Expenditure (National Budgetary Allocation) has hovered around 6.6% (similar to many LMICs) while the oral health allocation was as low as 0.41. Another indicator that reveals how poor the nation is in terms of meeting UHC targets is the GGHE-D as a percentage of the Gross Domestic Product which was as low as 0.7%. The UHC target is to move this percentage to 5%.

More so, government funding of the PHC was also <10% of the current health expenditure indicating the need for revamping of the PHCs. Therefore, the broader objective is to increase government spending on health and invariably increase allocations to oral health in the match towards UHC.

The public dental clinics receive funding from the Ministry of Health, the National Health Insurance, private insurance sources and out-of-pocket payments. While the federal government allocation does not directly affect the private sector, the sector relies heavily on direct user fees and private insurance.

Financial protection in seeking oral health is very minimal. This is due to the intrinsic faults in the design of the Social Health Insurance Scheme, which provides limited oral health services for Nigerians. Only a few procedures including simple dental extraction and amalgam fillings, as well as dental check-up, scaling and polishing, and not more than four dentures are covered. This plan is available mainly for workers in the formal sector and leaves out the majority in the low socio-economic strata who face poor access to quality oral health care. Because dental procedures are considered as secondary care in the Insurance package, this worsens the inequity in access to oral health care. Hence, Uguru et al. recommended a review of the benefit package. The package should include more oral health services and these services should be re-considered as primary care.

Nigeria solidified its commitment to achieving UHC through the National Health Act, 2014. Leveraging this act is the Basic Health Care Provision Fund (BHCPF) funded by a minimum of 1% of the Consolidated Revenue Fund, International donor funds and private donors. Fifty percent of this BHCPF funds the Basic Minimum Package of Health Services (BMPHS), and the National Health Insurance Scheme oversees the delivery of this package. The package includes services that offer prevention, protection, cure and rehabilitation to all Nigerians who get enrolled. The BMPHS covers oral health care, which is to be delivered at the Primary and Secondary tiers of the Health System. No <50% of Nigerians who are enrolled are expected to benefit from this package in obtaining primary oral health care according to the NOHP. The objective is to decrease out-of-pocket payments.
expedite by 30% and improve financial protection and this is also supported by a 25% counterpart funding from State Governments for its operationalisation.\textsuperscript{[25,55]} Notably, the basic package of oral care recommended for integrating oral health services with health care delivery at the PHC was not utilized to specify the oral health services to be covered by the BMPHS.\textsuperscript{[55]} Moreover, the extent of the financial protection by the package in terms of delivery of oral health services is also not yet reported in the literature.

Munghamba \textit{et al.}\textsuperscript{[22]} outlined priority areas for financing oral health care which are importantly a description of what the present financing models look like, followed by an international comparison of financing practices for oral health. In addition, there is a need for developing finance models for oral health care which should be evaluated for sustainability, effectiveness and efficiency.\textsuperscript{[22]} Notably, research into pragmatic and short-term solutions to poor access to oral health care showed the cost minimisation advantage of dental treatments carried out during dental outreach services over services at the primary oral health clinic. While this may not offer a sustainable means of tackling access problems, it may provide short-term solutions for target populations.\textsuperscript{[56]}

\textbf{Leadership and governance}

Governance in the oral health system represents cross-cutting themes around the other building blocks of the oral health system and is intimately linked with accountability mechanisms.

Stewardship of the oral health system in Nigeria is by the Dentistry Division of the Federal Ministry of Health.\textsuperscript{[57]} The division oversees research institutions such as the RCORTI\textsuperscript{[58]} and ensures the provision of quality oral health care that is affordable and effective, including school oral health care. Acting through the Ministry, it is chiefly responsible for providing advice to the Nigerian Government about the NOHP.\textsuperscript{[57]}

The NOHP was eventually adopted in 2012 after four previous failed attempts.\textsuperscript{[14]} The oral health policy targets optimum oral health in at least 50% of Nigerians and identified strategies for its actualization.\textsuperscript{[25]} These strategies include improving oral health awareness, early diagnosis and prompt treatment of dental conditions, developing and training human resources for health, conducting strategic research and institutionalizing oral health practice in Nigeria. It provides guidelines on oral health promotion especially using strategic platforms such as the schools while strongly making a case for the full integration of oral health care with existing Primary Health Care.\textsuperscript{[55]} Etiaba \textit{et al.}\textsuperscript{[14]} described the policy actors, context and process involved in the development of this policy and recommended the incorporation of a wider socio-political context in which key actors can facilitate the development of an oral health policy to strengthen the system. The policy was widely anticipated before its eventual enactment in 2012. Similarly, the 2020 edition is also being expected, however, the level of implementation of the former may not have matched the expectations of shaping oral health in Nigeria nor has it provided a strong framework for oral health practices.\textsuperscript{[32]} Considering the decentralised three-tier Nigerian health system, the NOHP formulated at the Federal level is expected to be adapted at the state level. Undesirably, the State governments are lagging in this process,\textsuperscript{[52]} and this may have contributed to the slow pace in the full integration of oral health care with PHC.

The oral health system will be strengthened with more policies for specific oral diseases such as NOMA,\textsuperscript{[58]} and this gives an opportunity for political and wider sector participation in its control through integrated services. Furthermore, oral health was captured in Nigeria’s National Policy and Strategic Action for the Prevention and Control Of Non-Communicable Diseases.\textsuperscript{[59]} The document clearly identified strategies for tackling dental caries, periodontitis, NOMA and oral cancer and set targets that were expected to have been accomplished by 2017. However, the effectiveness and coordination of this plan is not reported. The implementation partners and the Division of Dentistry at the Ministry of Health need to provide monitoring and evaluation reports to guide the development of robust strategic plans in the future.

Instructively, Osazuwa-Peters\textsuperscript{[58]} in a review of the Primary Oral Health Care in Nigeria after three decades, suggests that a Government that delays passage of its country’s National Health Bill at the National Assembly without a mention of oral health in its content is likely to neglect Primary Oral Health Care.

\textbf{Community participation}

Given the existing rural and urban disparities in the provision of oral health services in Nigeria,\textsuperscript{[24,25,39]} some communities do not have any dental care services accessible to them because there are no dental facilities and no qualified dental professionals in these underserved communities. Even when oral health services are established in a locality, it may not guarantee the appropriate utilisation of these services. This occurs when the communities have not been recognized at the outset in the oral health program planning and their role in driving demand for oral health care has not been appreciated. Community participation was identified along with other principles over four decades ago\textsuperscript{[15]} to play a fundamental role in the delivery of primary health care at the Alma Ata declaration. For a successful community participation, there must be effective community engagements which allow stakeholders to develop meaningful relationships. This will assist in addressing issues about health in order to achieve overall positive health outcomes.\textsuperscript{[60]} These positive outcomes occur through a process of shared responsibility until no external influence is required for its sustenance and an ensuing community ownership ensures a strengthened oral health system. The Community Oral Health Project in Ipetumodu, Osun State Nigeria,\textsuperscript{[61]} is a good case for community participation, engagement and ownership. The project is co-managed by the Obafemi Awolowo University,
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Furthermore, a 13-year retrospective chart review at Esan building block for OHSS. Recognising the need to provide a legal framework for OHSS in Nigeria is vital in ensuring sustainability in any organisational change. Performance measurement, improving processes and teamwork are necessary ingredients for organisational change. The goal of strengthening the oral health system in Nigeria should focus on interventions that are applicable across the building blocks of the system. The effects must be cross-cutting, contextualised and offer long-term solutions. The WHO Health systems building block lacks dynamism, and there is a lack of consideration for the involvement of the community in strengthening health systems; thus, we have introduced a 7th building block for OHSS. Recognising the role the community plays through effective engagements and untoward ownership of oral health programs such as the shared ownership of the Ipetumodu oral health project and school oral health programs administration by school authorities can engender sustained progress in oral health behaviour and access to oral health on the long term.

The Primary Health Care Centres across the country remain vital to OHSS in Nigeria. Moreover, with proper dissemination, the NOHP will be instrumental to this process. However, beyond the formulation, development and review plans, its full implementation is more important especially at the PHCs. Actualisation of its goals for human resource for health development, financing of oral health care, integrated delivery of services, oral health promotion and research, monitoring and evaluation are crucial to OHSS in Nigeria. In the context of UHC, similar upstream approaches were highly contributory to the success stories in Brazil and Thailand. These countries serve as a model for effective organisation and delivery of oral health care, by incorporating basic oral care within the primary health structure.

The COVID-19 outbreak had much impact upon health systems and oral health care delivery globally and in Nigeria, and this should be viewed as a great opportunity to pursue the integration of oral health care with national health programs in UHC aspiration. The Nigerian Dental Association recommended reinventing dentistry in a changing world and its guest speaker at its 2021 Annual General Meeting and Scientific Conference opined that performance measurement, improving processes and teamwork are necessary ingredients for organizational change. These strategies involve a systemic mapping and evaluation of the oral health system, because as earlier pointed out in the findings of this study, the Nigerian oral health system is not clearly defined and it is overstrained. The absence of a strong information system has contributed to this situation.

The gap in effectiveness in all the building blocks of the oral health system in Nigeria calls for urgent attention. While cross-cutting and contextualised interventions across the blocks are necessary, recognising the role the community plays in OHSS in Nigeria is vital in ensuring sustainability in any organisational change.

Poor oral health awareness has been identified as one of the major reasons for poor uptake of oral health services in Nigeria and for the poor oral health outcomes as well. In an interventional study to demonstrate community participation to evaluate demand for dental prophylaxis in Enugu State, it was shown that following oral health education uptake for this oral health service improved. Pragmatic approaches to oral health service delivery involve approaches such as community health outreach services and mobile dental clinics which usually yield short-term measurable impacts. In strengthening the oral health systems, it is necessary to ensure that these outreach services reach target age groups. The NOHP identifies the School Oral Health as viable platforms for promoting oral health. Esan reported the long term effect of a school-based oral health education program, which produced an increase in the use of fluoridated toothpaste and improved oral hygiene practices. Schools can be harnessed for behavioural change communication because active learning and development take place in these settings. In addition, a well-structured program in a community may improve oral health behaviour and access to oral health care.

Another major connection between the two building blocks (Oral health service delivery and dental workforce) is the role of Community Health Practitioners. While a complement of the dental workforce is sparingly represented at PHCs, other junior cadre health workers such as Community Health Practitioners are widely represented across PHCs in Nigeria. Braimoh et al. opined that there was a need to increase the oral health knowledge of these key health workers dominant at the grassroots of healthcare delivery in the country. They could play a vital role in expanding the dental workforce to deliver patient-centred, accessible and affordable oral health services at PHCs to target populations, especially in communities where they reside. Primary Health Care Workers also deliver basic services. Existing government policy on task shifting and task sharing provide a legal framework and support for the training of Primary Health Care workers, including Community Health Practitioners. They are familiar with the communities they belong to including their customs and social practices that can influence oral health. These health care workers can be trained to deliver basic oral health services such as oral health education, identification of common oral diseases and referral of patients with oral health conditions. This will expand the oral health workforce.

**Discussion**

The Primary Health Care Centres across the country remain vital to OHSS in Nigeria. Moreover, with proper dissemination, the NOHP will be instrumental to this process. However, beyond the formulation, development and review plans, its full implementation is more important especially at the PHCs. Actualisation of its goals for human resource for health development, financing of oral health care, integrated delivery of services, oral health promotion and research, monitoring and evaluation are crucial to OHSS in Nigeria. In the context of UHC, similar upstream approaches were highly contributory to the success stories in Brazil and Thailand. These countries serve as a model for effective organisation and delivery of oral health care, by incorporating basic oral care within the primary health structure.

The COVID-19 outbreak had much impact upon health systems and oral health care delivery globally and in Nigeria, and this should be viewed as a great opportunity to pursue the integration of oral health care with national health programs in UHC aspiration. The Nigerian Dental Association recommended reinventing dentistry in a changing world and its guest speaker at its 2021 Annual General Meeting and Scientific Conference opined that performance measurement, improving processes and teamwork are necessary ingredients for organizational change. These strategies involve a systemic mapping and evaluation of the oral health system, because as earlier pointed out in the findings of this study, the Nigerian oral health system is not clearly defined and it is overstrained. The absence of a strong information system has contributed to this situation.

**Conclusion**

The gap in effectiveness in all the building blocks of the oral health system in Nigeria calls for urgent attention. While cross-cutting and contextualised interventions across the blocks are necessary, recognising the role the community plays in OHSS in Nigeria is vital in ensuring sustainability in any organisational change.
We recommend the following:

To improve the availability, accessibility and affordability of oral health care, new workforce models that include the training and utilisation of community health practitioners at PHCs to render basic oral health services should be explored.

The BHCPF must be leveraged as an opportunity to fund a minimum package of health services that include oral health services at the PHCs.

A strong oral health information system is needed because performance measurement and process improvement are hinged on the availability of reliable and representative data. Data on oral health status, risk factor surveillance, including common risk factors for NCDs, administration of oral health care, quality of care and empirical evidence on oral health financing are needed to enhance organisational change in the Nigerian oral health system.

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Conflicts of interest

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