Vol. 10 No. 2 (2026): Journal of Contemporary Social Research
*Journal Link*: https://aa.unij.co.uk/index.php/jcsr / *Pub. Link*: https://aa.unij.co.uk/index.php/jcsr/issue/view/12

# Health Facility Distribution and Residents' Attitude Towards Immunization in Ibeju-Lekki LGA, Lagos State, Nigeria

**Daramola A. O*[1],** and **Odunlami A.I.K.[2]**

[1,2]Department of Geography, University of Lagos, Lagos, Nigeria
Correspondence: [1]*adedaramola@unilag.edu.ng* / 234-8023658272

**DOI: https://doi.org/10.5281/zenodo.23192840**

**Abstract**

Nigeria continues to experience a significant burden of under-immunized and unvaccinated children despite sustained efforts by governments and development partners to improve vaccine coverage. This challenge is particularly important in rapidly developing areas such as Ibeju-Lekki Local Government Area (LGA), where industrialization, population growth, and migration are reshaping the demand for healthcare services. This study examined the spatial distribution and accessibility of health facilities, residents' attitudes towards immunization, and the influence of selected socio-economic factors on vaccine uptake. A cross-sectional design was adopted, combining field-based measurement of health facility locations with a social survey of residents across the study area. Using stratified sampling, 200 respondents were selected from eight communities. A total of 47 health facilities were identified, comprising 15 government-owned and 32 private facilities. Primary Health Centres (PHCs) were the most accessible facilities, as reported by 64% of respondents, and were the major providers of immunization services, accounting for 62% of utilization. Overall, 61% of respondents reported having received immunization at some point. Government-led community campaigns emerged as the principal source of immunization information and a major factor influencing vaccine uptake. Uptake declined with increasing distance from health facilities and with respondents' age. The findings highlight the importance of spatial accessibility and sustained community engagement in improving immunization coverage. Strengthening community-based campaigns alongside improved access to primary healthcare services is recommended to sustain immunization uptake in rapidly developing and demographically dynamic regions such as Ibeju-Lekki LGA.

**Keywords:** Immunization; Health facilities; Accessibility; Community campaigns; Ibeju-Lekki; Nigeria

## Introduction

Immunization is one of the most important public health interventions globally, significantly reducing morbidity and mortality from vaccine-preventable diseases. It remains one of the most cost-effective and impactful public health interventions for preventing infectious diseases and reducing child mortality worldwide. The World Health Organization suggests that immunization prevents between 3–5 million deaths annually from diseases such as measles, diphtheria, tetanus,

and pertussis (WHO, 2026). Many developing countries however, continue to experience poor immunization coverage due to barriers such as poverty, poor healthcare infrastructure, inadequate awareness, geographical challenges, and negative public perception of immunization services (UNICEF, 2023). In developing countries like Nigeria, immunization plays a crucial role in improving child survival and achieving sustainable development goals.

Immunization refers to the process through which an individual becomes protected against infectious diseases through vaccination. Vaccines stimulate the body's immune system to recognize and resist infections caused by viruses or bacteria. The World Health Organization describes immunization as a simple, safe, and effective means of protecting individuals from harmful diseases before they come into contact with them.

Vaccination attitudes and behaviours are generally shaped by a complex interplay of psychological, social, cultural, and systemic factors that vary across populations and contexts (Baumgaertner et al., 2018; Tandy & Tree, 2020; Balgovind & Mohammadnezhad, 2022). Vaccine hesitancy is regarded as a top global health challenge, which has prompted extensive research into the determinants of immunization decisions in various climes (Xiao & Wong, 2020; Lin & Wang, 2020).

On one hand, positive attitudes—including beliefs that vaccines are important, useful, and protective—are consistently and significantly associated with higher vaccination uptake across multiple studies (Smith et al., 2017; Choucair et al., 2020). On the other hand, four distinct anti-vaccination attitude dimensions have been identified: mistrust of vaccine benefit, worries about unforeseen future effects, concerns about commercial profiteering, and preference for natural immunity (Martin & Petrie, 2017).

Vaccine acceptance in low- and middle-income countries (LMICs) is generally high but shaped by distinct socio-cultural, systemic, and informational factors that differ from patterns in high-income settings (Larson et al., 2016; Solís-Arce et al., 2021; Irakoze, 2026). The relationship between socioeconomic status and vaccine hesitancy in LMICs does not follow the patterns observed in wealthier countries, where hesitancy is typically concentrated in more affluent groups (Larson et al., 2016; Wagner et al., 2019).

Studies around several African nations revealed the importance of some of these socio-economic variables. Traditional remedies, alcohol use, and religious beliefs emerged as drivers of vaccine hesitancy in Zambian informal settlements, likely reinforced by underlying distrust of western medicine (Pugliese-Garcia et al., 2018). In South Africa, some hesitancy drivers included having an ancestral calling, medical pluralism, and local myths around treatment of infections, as well as a perceived depopulation agenda linked to mistrust of COVID-19 vaccine incentives and penalties (Orievulu et al., 2025). Misinformation, particularly through social media and informal networks, significantly undermines vaccine confidence in LMIC settings (Irakoze, 2026). In Malawi, believing rumours and misinformation was associated with lower confidence in vaccine safety and efficacy, while being a young adult or unemployed increased susceptibility to rumours (Adeyanju et al., 2021).

Nigeria accounts for one of the world's largest populations of unvaccinated children, with an estimated 2.1 to 3.1 million zero-dose children as of recent surveys while national full immunization coverage remains profoundly low, estimated between 31% and 36% (Mahachi et al., 2022; Williams et al., 2022; Mohammed et al., 2024; Ogunniyi, 2024; Etim et al., 2025). Akingbola et al. (2026) stated that despite decades of Expanded Programme on Immunization (EPI) implementation since 1979, no routine vaccine has achieved the WHO 90% national coverage target.

Regional inequities exist within the country with the North-West consistently recording the lowest coverage and the South-East the highest (Adedokun et al., 2017; Adeloye et al., 2017; Akwataghibe et al., 2019; Etim et al., 2025; Umar et al., 2025). Zero-dose prevalence in the North-West rose sharply to 47.4% in 2024, compared to approximately 4% in the South-East (Umar et al., 2025). In northern states, full immunization coverage was historically below 2% in Jigawa and Yobe (Ophori et al., 2014), and even within southern states like Enugu, stark urban-rural divides persist (94.5% urban vs. 55.5% rural full coverage) (Eze et al., 2021).

Some of the noted variables affecting vaccination uptake include: vaccine safety concerns and fear of side effects (Adeloye et al., 2017; Hamina et al., 2025); misconceptions and myths that vaccines are western tools for population control or cause infertility (Adedokun et al., 2017; Etim et al., 2025); religious beliefs which conflict with immunization (Eze et al., 2021); and distrust in health workers and negative staff attitudes (Attahiru et al., 2025). On the supply side, some of the challenges include: Health system weaknesses (Williams et al., 2022; Ogunniyi, 2024); frequent vaccine shortages, weak cold chain systems, and inadequate human resource capacity at health facilities (Oku et al., 2017; Etim et al., 2025); and indirect costs and illegal charges by health workers at the facility level, despite vaccines being supplied free to states (Akwataghibe et al., 2019).

In urban areas like Lagos, the pressure to survive especially for parents and caregivers who juggle multiple jobs and responsibilities means clinic hours can be inconvenient and accessing vaccination and other health services means setting priorities that have an impact on a family's financial bottom line (UNICEF, 2023). Ibeju-Lekki Local Government Area, Lagos State is a rapidly urbanizing region driven by significant industrial and infrastructural development, including the Lekki Free Trade Zone, Lekki Deep Sea Port, Dangote Refinery, and the Lagos-Calabar coastal road. This transformation has led to population growth and increased demand for healthcare services. Folorunsho et al. (2024) estimated that the population of Ibeju-Lekki experienced an average annual growth rate of 4.5% from 1991 to 2022 while over the same period, built up sections increased by an average of 10% annually. They further noted the role of migration from rural areas and other parts of Nigeria into the area in driving its urbanization. However, disparities in access to quality health services persist, especially in riverine and semi-rural communities within the LGA (Lagos State Primary Health Care Board, 2023).

In developing industrial zones such as the study area, immunization appears to play a central role in infection prevention, continuity of work, and community protection, but the literature is much stronger for workers and workplace systems than for all residents living nearby. Tran et al., (2020) noted that industrial-zone populations often face added vulnerability because factories are crowded, transport-linked, and socially connected to multiple regions, which increases both exposure and spill over risk beyond the worksite. Employers therefore use immunization not only for individual protection but also as part of occupational health governance, safe-work obligations, and corporate social responsibility (Fel'dblium, 2021).

Moola et al. (2021) suggested that local context is essential when developing programs to promote vaccines, as thoughts about different aspects of vaccination are not uniform across regions. This was also echoed by Mohammed et al. (2024) noting the need for region-specific interventions that address these unique barriers to improve immunization coverage across Nigeria.

Hence this study set out to analyse the dynamics of immunization services in Ibeju-Lekki LGA, Lagos in view of the changing demographic pattern of the area and the susceptibility of residents to the health effects of proximity to growing industrial activity. Specifically, the study mapped all the health facilities in the region, and analysed residents' attitude towards immunization services, and the role of specific socio-economic variables in vaccine uptake.

**Materials and Methods**

The study adopted a cross-sectional approach to investigate the dynamics of health facility distribution and residents' attitude and behavior towards immunization services in Ibeju-Lekki LGA. All the health facilities were identified with their coordinates acquired using a GARMIN Hand-held GPS. These were input into the ArcGIS 10.8 software to produce the facility distribution map. Respondents for the questionnaire administered were chosen using the stratified sampling method. Eight (8) major communities in the LGA were identified from which twenty five (25) households were chosen at random, giving a total of Two Hundred (200) (Table 1)

Table 1: Distribution of respondents across sampled communities

| **Community** | **Frequency** |
|---|---|
| Ibeju | 25 |
| Lekki | 25 |
| Akodo | 25 |
| Lakowe | 25 |
| Bogije | 25 |
| Orimedu | 25 |
| Okun-Imedu | 25 |
| Awoyaya | 25 |
| Total | 200 |

Issues such as income, age, accessibility to health facility, experience with immunization services and perceived significance of selected socio-economic variables in influencing vaccine uptake were raised in the questionnaire. Data was subsequently analyzed using measures of central tendency, percentages and cross tabulation.

**Results and Discussion**

Accessibility is a function of both availability and affordability, hence the first step was to determine if there were health facilities available to regularly administer vaccines to residents beyond the periodic community vaccination campaigns. Hence, the health care facilities in Ibeju-Lekki LGA were identified and mapped (Fig. 1). A total of 47 facilities were identified including 15 government/public, and 32 private facilities.

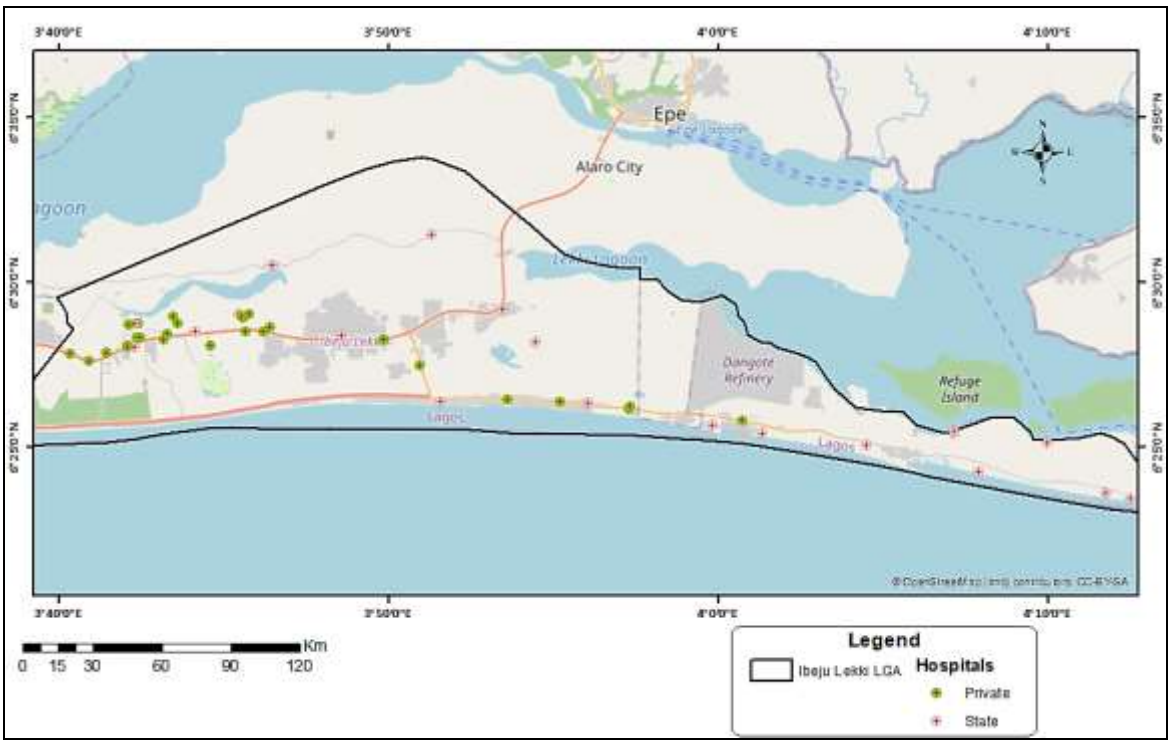



Fig. 1: Hospitals in Ibeju-Lekki Local Government Area.
*Source: Authors' Fieldwork (2026).*

Majority of the hospitals were along the Lekki-Epe Expressway in the western part of the area were privately owned, servicing the population concentration along that axis. Limited hospital presence was noticed at the central areas where residential developments are gradually extending towards. Along the Dangote refinery road, most facilities were public with few private hospitals springing up in response to the urbanization in that section of the LGA. Government hospitals dominate that section because of the establishment of primary health centres and health posts even in the rural areas to meet the basic needs of community members.

Most respondents (averagely over 50%) in seven of the eight communities surveyed, noted that primary health centres were the closest facilities to their residences where immunization services could be accessed (Fig. 2). The exception was in Bogije, where 46% claimed that the closest facilities to them were private hospitals.

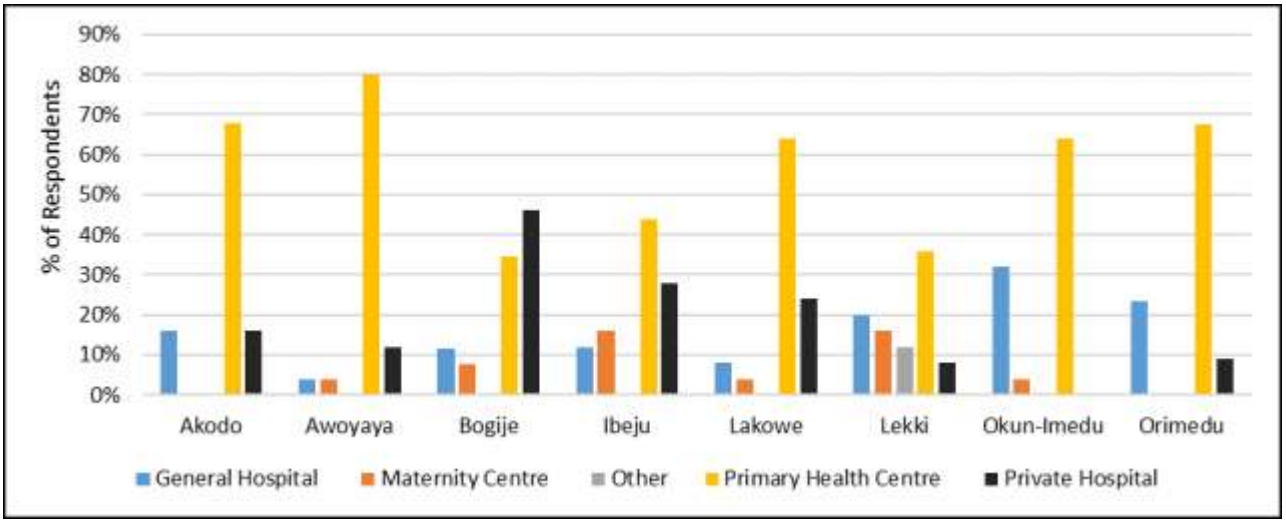



Fig. 2: Closest health facilities to respondents in Ibeju-Lekki Local Government Area.
*Source: Authors' Fieldwork (2026).*

Information is key towards vaccine uptake and residents' attitude towards immunization services starts from their knowledge base. Respondents first encounter with these services were mainly from community health workers (Fig. 3).

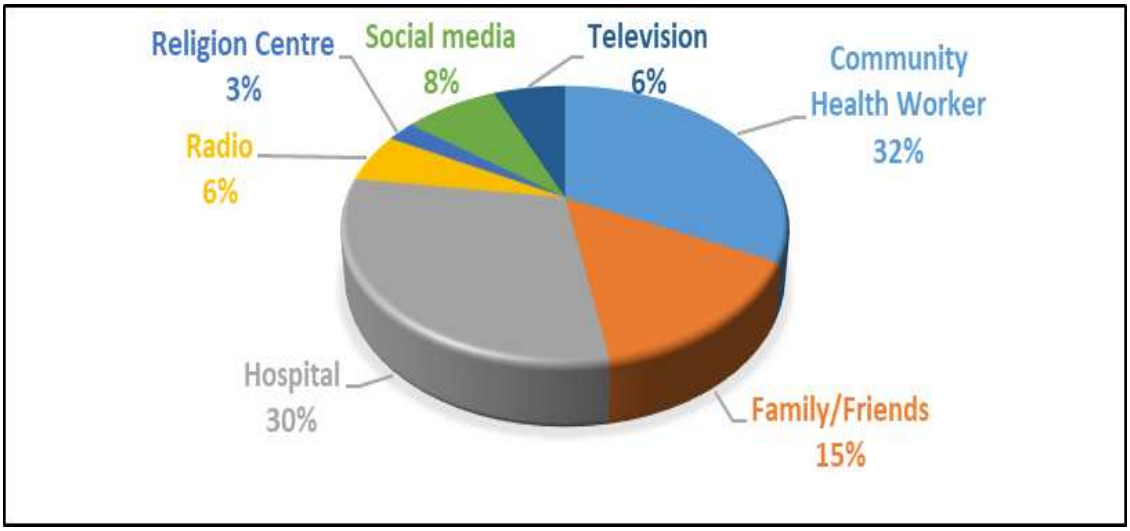



Fig. 3: Respondents' first source of knowledge of immunization services.
*Source: Authors' Fieldwork (2026).*

Balgovind and Mohammadnezhad (2022) stated that healthcare professionals such as those sent to communities for advocacy and child vaccine in the study area, are the most trusted source of vaccine information and a primary influence on parental vaccination decisions. Such strategies were echoed by Mahachi et al. (2022) as importance of community engagement approaches that drive successful uptake. The study thus noted the role of social media in driving advocacy especially among urban youths, yet with limited influence in the study region (8%). This aligns with assertion of Ullah et al. (2023) that reliance on verbal information from healthcare professionals predominates in low-resource settings like the study area.

In practice though, vaccination uptake at some point by respondents was relatively high (61%) while about 65% had their children immunized. Further analysis revealed that immunization was mostly against measles (19.5%), COVID-19 (12.4%) and Hepatitis B (10.1%). There was a general sense of the importance of immunization for vulnerable groups as seen in the respondents' description of who should be vaccinated (Fig. 4)

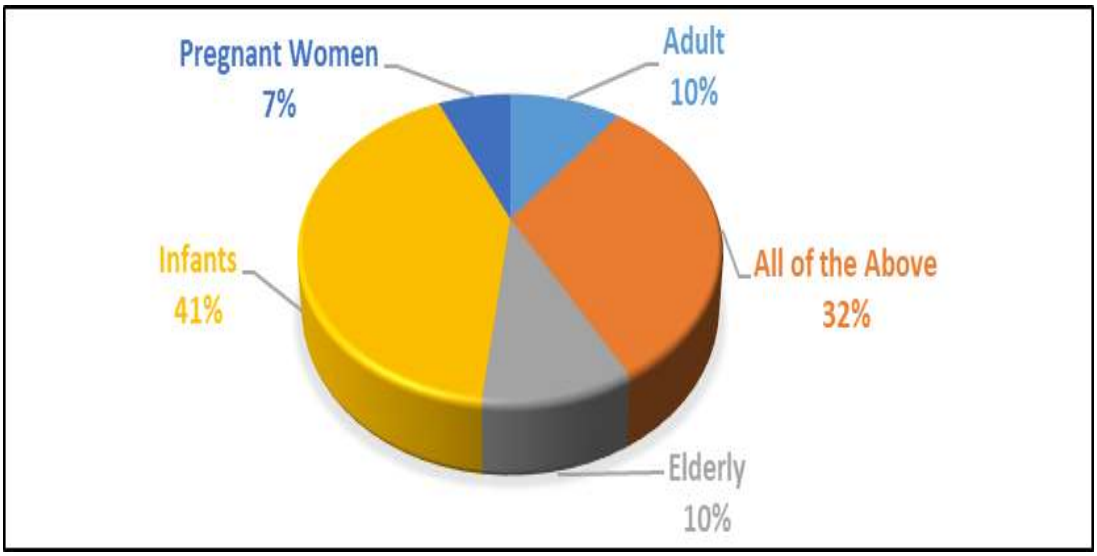



Fig. 3: Respondents' perception of who should be immunized.
*Source: Authors' Fieldwork (2026).*

The misconception that vaccines are mainly for infants was highlighted by the 41% who aligned with it. This can be attributed to community immunization campaigns which been have largely focused on infants in Nigeria. Ozisik et al. (2017) had noted that this misconception is responsible for low uptake among many adults who are unaware of which vaccinations they need and when they should receive them.

Immunization services were accessed mostly at Primary Health Centres by respondents (62%) followed by General Hospitals and Private hospitals (Table 2)

Table 2: Health facility immunization services are accessed.

| Health Facility | % of Respondents |
|---|---|
| General Hospital | 30 |
| Primary Healthcare Centre | 62 |
| Private Hospital | 8 |

*Source: Authors' Fieldwork (2026).*

As observed earlier, a significant proportion of respondents identified PHCs as the closest health facility to them where services are available hence the subscription there. Secondly, most vaccines are administered for free in PHCs with relatively lower patient volume unlike General Hospitals, and private hospitals mostly charge fees for vaccines.

Respondents' perception of the accessibility of immunization services in terms of availability and affordability were quite high where a total of 69% rated it as above average (Fig. 4)

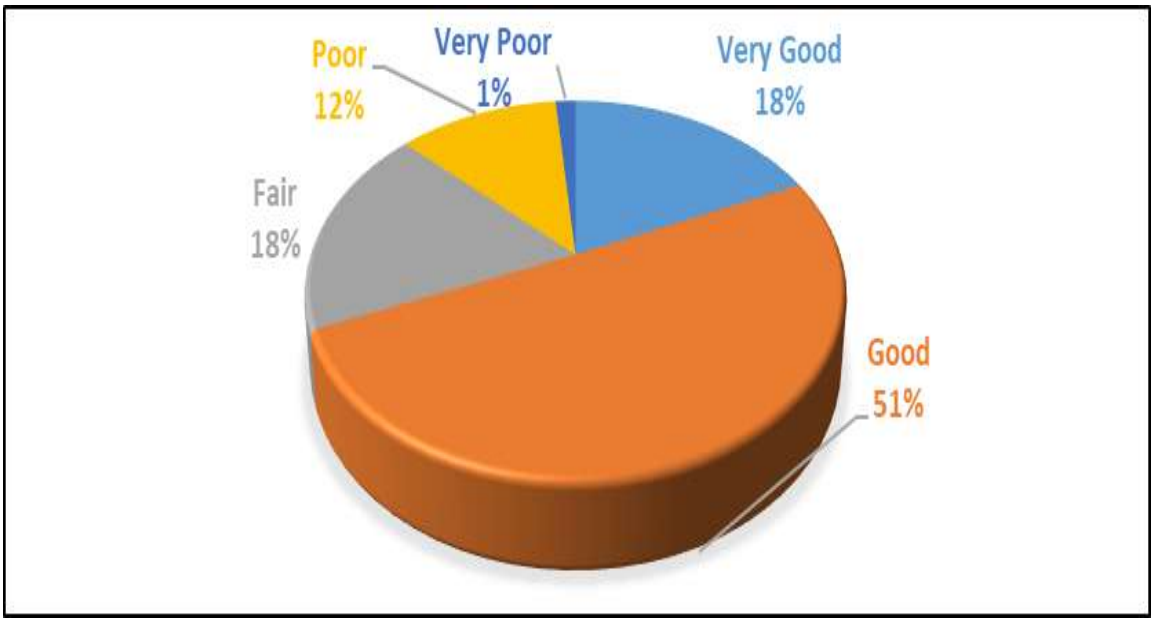



Fig. 4: Respondents' rating of accessibility to immunization services.
*Source: Authors' Fieldwork (2026).*

Such accessibility ratings could explain the moderately high level of vaccine uptake in the region. Immunizations services however did not come without challenges for parents as 19.5% noted some of these challenges to include swelling, pains, inaccurate administration and long waiting times. About 81% of these also claimed that the challenges affected further subscriptions for their children. Such issues were described by Irakoze (2026) as system-level barriers that further exacerbate hesitancy in low and medium income countries.

The study further analysed the distribution of vaccine subscribers in the region by age, income and distance (Fig. 5)

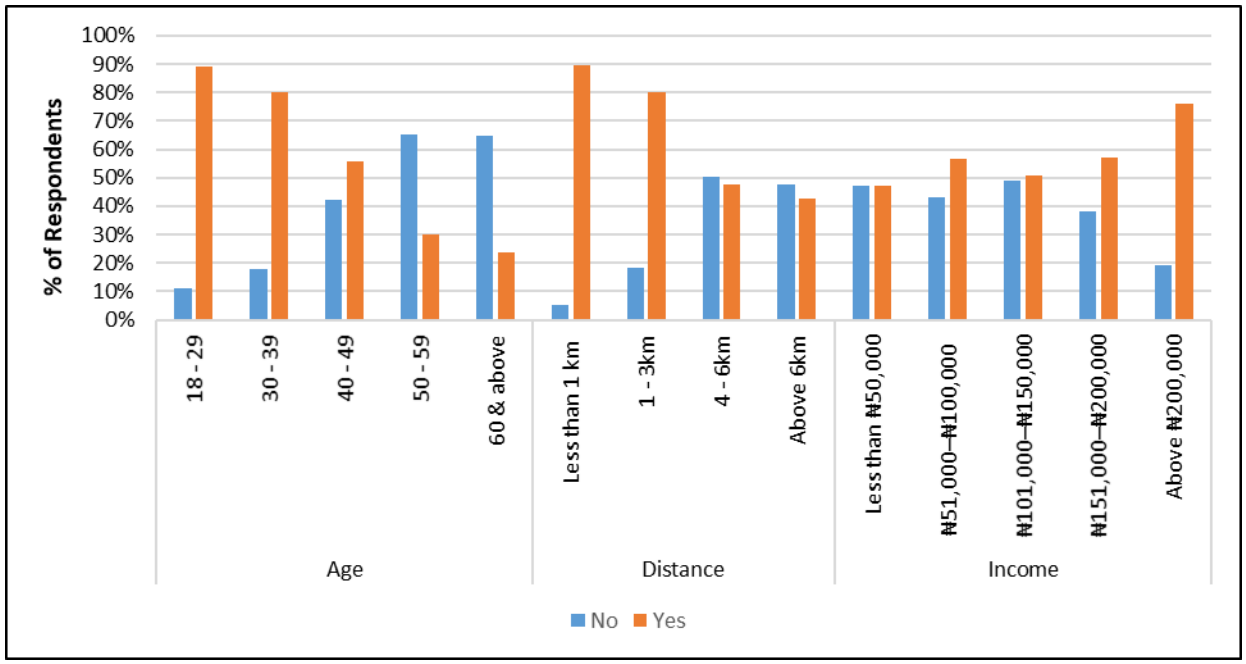



Fig. 5: Cross-tabulation of vaccine subscription and age, income, and distance.
*Source: Authors' Fieldwork (2026).*

The highest proportion of subscription was among the youngest group (18-29 years, 89%) with a flip only seen among respondents above 50 years old. Bono et al. (2021) reported higher vaccine acceptance among younger residents in their study while Orievulu et al. (2025) suggested that residents over 40 years were more positively inclined towards vaccination.

The distance respondents need to cover to access immunization services was quite evident as a factor influencing uptake as the proportion of subscribers reduced with increasing distance from 89% (< 1km) to 23% (> 6km). Eze et al. (2021) also noted in their study that those living farther 30 minutes from a vaccination facility face significantly higher odds of incomplete immunization.

The role of respondents' monthly income seemed to be positive as subscription increased from 49% (< N50,000) to 78% (>N200,000). This aligned with the findings of Williams et al. (2022) who suggested a strong relationship between household wealth and vaccine uptake.

A number of factors that could influence residents' willingness to take up immunization were also analysed including government advocacy, social media, family history, religion, etc. (Fig. 6)

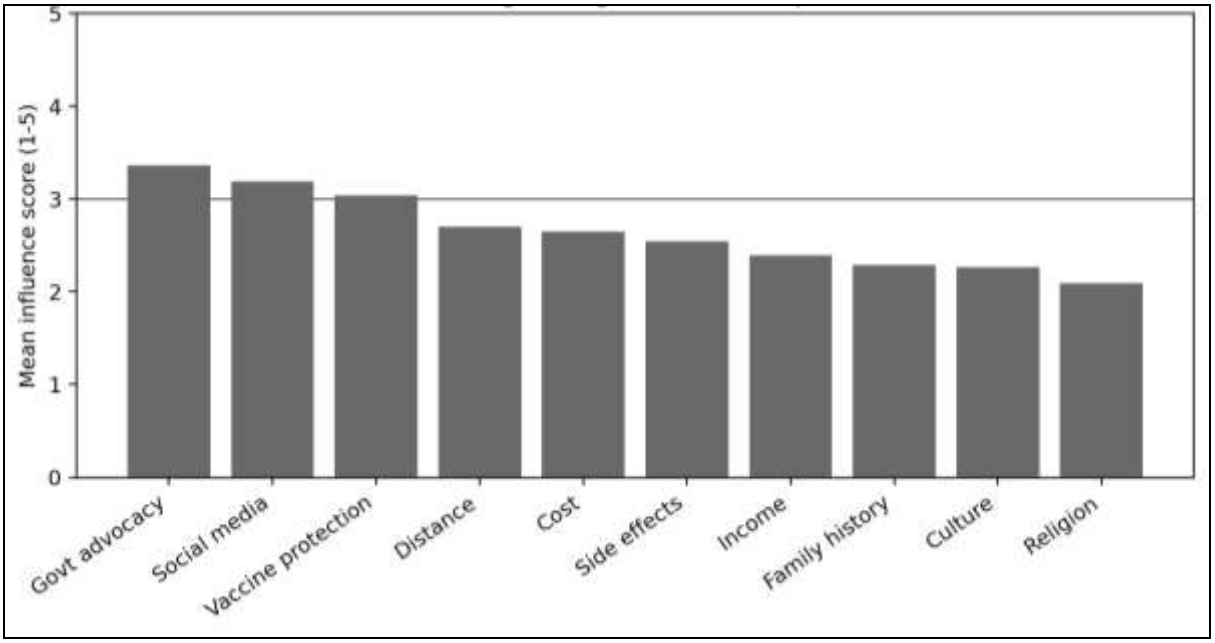



Fig. 5: Factors influencing willingness to take up immunization.
*Source: Authors' Fieldwork (2026).*

The factors were rated according to their influence in willingness to take up vaccination and results indicate that government advocacy through community outreach was rated highest (Mean = 3.34). This further reinforces an earlier established importance of these community campaigns. The emerging role of the social media in information dissemination was also noted in spite of the tendency to also come with some bits of misinformation. The influence of culture and religion were least significant in the area. This is in variance with some states in Northern Nigeria where religious beliefs were found to conflict with immunization (Etim et al. 2025).

**Conclusion**

Immunization remains a critical public health intervention for preventing and controlling vaccine-preventable diseases. In Ibeju-Lekki LGA, the rapid pace of industrialization and associated influx of migrants from diverse geographical and socio-cultural backgrounds have substantially altered the demographic and health-service landscape of the area. This transformation has been accompanied by the emergence of private health facilities, particularly in formerly rural communities, although Primary Health Centres (PHCs) continue to constitute the principal providers of immunization services.

The findings demonstrate that community-based campaigns play an important role in promoting awareness and facilitating vaccine uptake within the LGA. Overall, immunization services were positively received, with a substantial proportion of respondents reporting satisfactory levels of accessibility. These findings suggest that the existing immunization delivery structure provides

an important foundation for sustaining vaccine uptake amid the area's rapidly changing population and expanding urban environment. Continued investment in community engagement, accessible primary healthcare services, and context-sensitive immunization strategies will therefore be essential to sustaining and further improving immunization coverage in Ibeju-Lekki LGA.

## References

Adedokun, S. T., Uthman, O., Adekanmbi, V. T., & Wiysonge, C. (2017). Incomplete childhood immunization in Nigeria: a multilevel analysis of individual and contextual factors. *BMC Public Health,* 17(1), 236. https://doi.org/10.1186/s12889-017-4137-7

Adeloye, D., Jacobs, W., Amuta, A., Ogundipe, O. M., Mosaku, O., Gadanya, M., & Oni, G. (2017). Coverage and determinants of childhood immunization in Nigeria: A systematic review and meta-analysis. *Vaccine*, 35(22), 2871-2881. https://doi.org/10.1016/j.vaccine.2017.04.034

Adeyanju, G. C., Sprengholz, P., Betsch, C., & Essoh, T.A. (2021). Caregivers' willingness to vaccinate their children against childhood diseases and human papillomavirus: a cross-sectional study on vaccine hesitancy in Malawi. *Vaccines*, 9(11), 1231. https://doi.org/10.3390/vaccines9111231

Akingbola, A., Adegbesan, A., Adewole, O., Emmanuel, N., Alabi, O. J., & Mariaria, P. (2026). Descriptive analysis of routine childhood vaccination coverage of selected vaccines in Nigeria (1980–2023) using the Global Burden of Disease Study (2023). *Human Vaccines & Immunotherapeutics*, 22(1), 2684092. https://doi.org/10.1080/21645515.2026.2684092

Akwataghibe, N., Ogunsola, E., Broerse, J., Popoola, O., Agbo, A. I., & Dieleman, M. (2019). Exploring factors influencing immunization utilization in nigeria—a mixed methods study. *Frontiers in Public Health,* 7, 392. https://doi.org/10.3389/fpubh.2019.00392

Attahiru, A., Mohammed, Y., Mikailu, F., Waziri, H., Waziri, N., Tukur, M., Sunusi, B., Mahmoud, M. N., Vollmer, N., Vargas, W., Yusufari, Y., Correa, G., Reynolds, H. W., Fisseha, T., Bello, T. B., Kamateeka, M., Adewole, A., Bello, M., Bello, I., . . . Nguku, P. (2025). Decentralized immunization monitoring: lessons learnt from a pilot implementation in Kumbotso LGA, Kano State, Nigeria. *Vaccines*, 13(7), 664 https://doi.org/10.3390/vaccines13070664

Balgovind, P., & Mohammadnezhad, M. (2022). Factors affecting childhood immunization: Thematic analysis of parents and healthcare workers' perceptions. *Human Vaccines & Immunotherapeutics,* 18(6), 1-15. https://doi.org/10.1080/21645515.2022.2137338

Baumgaertner, B., Carlisle, J. E., & Justwan, F. (2018). The influence of political ideology and trust on willingness to vaccinate. *PLoS ONE,* 13(1), e0191728. https://doi.org/10.1371/journal.pone.0191728

Bono, S., De Moura Villela, F. E., Siau, C. S., Chen, W., Pengpid, S., Hasan, M., Sessou, P., Ditekemena, J., Amodan, B. O., Hosseinipour, M., Dolo, H., Fodjo, J. S. S., Low, W., & Colebunders, R. (2021). Factors affecting COVID-19 vaccine acceptance: An international survey among low- and middle-income countries. *Vaccines,* 9(5), 515. https://doi.org/10.3390/vaccines9050515

Choucair, K., Sawda, J. E., Assaad, S., Chakhtoura, N. E. G., Hassouna, H., Sidani, N., Yasmin, M., Rteil, A., Kanj, S., & Kanafani, Z. (2020). Knowledge, perception, attitudes and behaviour on influenza immunization and the determinants of vaccination. *Journal of Epidemiology and Global Health,* 11, 34 - 41. https://doi.org/10.2991/jegh.k.200906.001

Etim, E.-O., Odiachi, A., Dougherty, L., Alabi, M., Adetunji, A., & Adedimeji, A. (2025). Understanding caregivers' and community influencers' perspectives on the barriers to childhood immunisation in Northern Nigerian States with public-private partnerships in routine immunisation programme. *BMC Public Health,* 25, 1-10. https://doi.org/10.1186/s12889-025-22710-7

Eze, P., Agu, U. J., Aniebo, C. L., Agu, S. A., Lawani, L., & Acharya, Y. (2021). Factors associated with incomplete immunisation in children aged 12–23 months at subnational level, Nigeria: a cross-sectional study. *BMJ Open,* 11(6), 1-11. https://doi.org/10.1136/bmjopen-2020-047445

Fel'dblium, I. V. (2021). Corporate immunizations schedule as a technology for managing of the workers' health. *Epidemiology and Vaccinal Prevention,* 19(6), 62-68. https://doi.org/10.31631/2073-3046-2020-19-6-62-68

Folorunsho, S.S., Muhammed, L., Adekunle, W., & Raheem, A. (2024) Assessment of population and urban growth using exponential growth model: A case study of Ibeju-Lekki Local Government Area, Lagos State. *International Journal of Environment and Geoinformatics,* 11(2), 10-17. doi:10.30897/ijegeo.1373666.

Hamina, D., Sharoni, S. A. K., Teriyla, K. R., & Joseph-Shehu, E. (2025). Barriers to childhood immunisation in Nigeria: a scoping review of recent empirical studies. *Malaysian Journal of Medicine and Health Sciences,* 21(2), 227–239. https://doi.org/10.47836/mjmhs.21.2.28

Irakoze, M. S. (2026). Vaccine hesitancy in low- and middle-income countries: Determinants and interventions. *Research Output Journal of Public Health and Medicine*, 6(1), 107-113. https://doi.org/10.59298/rojphm/2026/61107113

Lagos State Primary Health Care Board. (2023). *Primary health care services and immunization in Lagos State*. Lagos, Nigeria: LSPHCB. Lagos State Primary Health Care Board.

Larson, H., De Figueiredo, A., Zhao, X., Schulz, W., Verger, P., Johnston, I. G., Cook, A., & Jones, N. S. (2016). The state of vaccine confidence 2016: Global insights through a 67-country survey. *EBioMedicine*, 12, 295 - 301. https://doi.org/10.1016/j.ebiom.2016.08.042

Lin, F.-Y., & Wang, C.-H. (2020). Personality and individual attitudes toward vaccination: a nationally representative survey in the United States. *BMC Public Health*, 20, 1-8. https://doi.org/10.1186/s12889-020-09840-w

Mahachi, K. G., Kessels, J., Boateng, K. A., Achoribo, A. E. J. B., Mitula, P., Ekeman, E., Lochlainn, N. L., Rosewell, A., Sodha, S., Abela-Ridder, B., & Gabrielli, A. (2022). Zero- or missed-dose children in Nigeria: Contributing factors and interventions to overcome immunization service delivery challenges. *Vaccine*, 40(37), 5433 - 5444. https://doi.org/10.1016/j.vaccine.2022.07.058

Martin, L., & Petrie, K. (2017). Understanding the dimensions of anti-vaccination attitudes: the Vaccination Attitudes Examination (VAX) Scale. *Annals of Behavioural Medicine*, 51, 652-660. https://doi.org/10.1007/s12160-017-9888-y

Mohammed, Y., Reynolds, H. W., Waziri, H., Attahiru, A., Olowo-Okere, A., Kamateeka, M., Waziri, N., Garba, A., Correa, G., Garba, R., Vollmer, N., & Nguku, P. (2024). Exploring the landscape of routine immunization in Nigeria: A scoping review of barriers and facilitators. *Vaccine: X*, 20, 1-13. https://doi.org/10.1016/j.jvacx.2024.100563

Moola, S., Gudi, N., Nambiar, D., Dumka, N., Ahmed, T., Sonawane, I. R., & Kotwal, A. (2021). A rapid review of evidence on the determinants of and strategies for COVID-19 vaccine acceptance in low- and middle-income countries. *Journal of Global Health*, 11, 05027 https://doi.org/10.7189/jogh.11.05027

Ogunniyi, T. J. (2024). Revealing the challenges and efforts of routine immunization coverage in Nigeria. *Health Science Reports*, 7(8), 1-4. https://doi.org/10.1002/hsr2.70000

Oku, A. O., Oyo-Ita, A., Glenton, C., Fretheim, A., Eteng, G., Ames, H., Muloliwa, A., Kaufman, J., Hill, S., Cliff, J., Cartier, Y., Bosch-Capblanch, X., Rada, G., & Lewin, S. (2017). Factors affecting the implementation of childhood vaccination communication strategies in Nigeria: a qualitative study. *BMC Public Health*, 17(1), 200. https://doi.org/10.1186/s12889-017-4020-6

Ophori, E., Tula, M., Azih, A., Okojie, R., & Ikpo, P. E. (2014). Current trends of immunization in Nigeria: Prospect and challenges. *Tropical Medicine and Health*, 42, 67 - 75. https://doi.org/10.2149/tmh.2013-13

Orievulu, K., Frampton, S., Matthews, P., Mpanza, N., Mjilo, T., Nxumalo, S., Hordern, J., & Seeley, J. (2025). Infecting minds: socio-contextual drivers of vaccine perceptions and

attitudes among young and older adults living in urban and rural areas in KwaZulu-Natal, South Africa. *BMC Public Health,* 25, 1-13. https://doi.org/10.1186/s12889-025-22181-w

Ozisik, L., Calik Basaran, N., Oz, S. G., Sain Guven, G., & Durusu Tanriover, M. (2017). Perceptions and attitudes of patients about adult vaccination and their vaccination status: still a long way to go? *Medical Science Monitor: International Medical Journal of Experimental and Clinical Research,* 23, 3178–3184. https://doi.org/10.12659/msm.901856

Pugliese-Garcia, M., Heyerdahl, L. W., Mwamba, C., Nkwemu, S., Chilengi, R., Demolis, R., Guillermet, É., & Sharma, A. (2018). Factors influencing vaccine acceptance and hesitancy in three informal settlements in Lusaka, Zambia. *Vaccine,* 36(37), 5617–5624. https://doi.org/10.1016/j.vaccine.2018.07.042

Smith, L. E., Amlôt, R., Weinman, J., Yiend, J., & Rubin, G. (2017). A systematic review of factors affecting vaccine uptake in young children. *Vaccine,* 35(45), 6059–6069. https://doi.org/10.1016/j.vaccine.2017.09.046

Solís Arce, J. S., Warren, S. S., Meriggi, N., Scacco, A., McMurry, N., Voors, M., Syunyaev, G., Malik, A., Aboutajdine, S., Adeojo, O., Anigo, D., Armand, A., Asad, S., Atyera, M., Augsburg, B., Awasthi, M., Ayesiga, G. E., Bancalari, A., Nyqvist, M. B., . . . Omer, S. (2021). COVID-19 vaccine acceptance and hesitancy in low- and middle-income countries. *Nature Medicine,* 27(8), 1385 - 1394. https://doi.org/10.1038/s41591-021-01454-y

Tandy, C. B., & Tree, J. J. M. (2020). Attitudes of East Tennessee residents towards general and pertussis vaccination: a qualitative study. *BMC Public Health,* 21, 1-11. https://doi.org/10.1186/s12889-021-10465-w

Tran, B., Vu, G., Latkin, C., Pham, H., Phan, H., Le, H., & Ho, R. (2020). Characterize health and economic vulnerabilities of workers to control the emergence of COVID-19 in an industrial zone in Vietnam. *Safety Science,* 129, 1-5. https://doi.org/10.1016/j.ssci.2020.104811

Ullah, N., Bugti, M. A., Kayani, J. A., Ullah, F., Ahmed, M., & Ullah, H. (2023). Perceived knowledge, attitude, and behaviour of parents/caregivers towards routine immunization in district Pishin, Balochistan Pakistan: a cross-sectional survey. *Infectious Diseases Journal of Pakistan,* 32(3), 78-82. https://doi.org/10.61529/idjp.v32i3.90

Umar, H. J., Onah, S. I., Popoola, O., Jibril, H., & Oyewole, F. (2025). Widening geographical inequities in DTP vaccination coverage and zero-dose prevalence across Nigeria: An ecological trend analysis (2018–2024). *Vaccines,* 13(11), 1135. https://doi.org/10.3390/vaccines13111135

United Nations Children's Fund. (2023). *The State of the World's Children 2023: For every child, vaccination*, UNICEF Innocenti – Global Office of Research and Foresight, Florence.

Wagner, A., Masters, N., Domek, G., Mathew, J., Sun, X., Asturias, E., Ren, J., Huang, Z., Contreras-Roldan, I., Gebremeskel, B., & Boulton, M. L. (2019). Comparisons of vaccine hesitancy across five low- and middle-income countries. *Vaccines, 7*(4), 155. https://doi.org/10.3390/vaccines7040155

Williams, S. V., Akande, T., & Abbas, K. (2022). Systematic review of social determinants of childhood immunisation in low- and middle-income countries and equity impact analysis of childhood vaccination coverage in Nigeria. *PLoS ONE*, 19, e0297326. https://doi.org/10.1371/journal.pone.0297326

World Health Organisation (2026). *Vaccines and Immunization.* Retrieved from https://www.who.int/health-topics/vaccines-and-immunization#tab=tab_1 (Accessed 15th July, 2026).

Xiao, X., & Wong, R. (2020). Vaccine hesitancy and perceived behavioural control: A meta-analysis. *Vaccine*. 38(33), 5131-5138. https://doi.org/10.1016/j.vaccine.2020.04.076