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CROWDED CHEERS, SILENT SPREAD: INVESTIGATING COMMUNICABLE DISEASE RISKS IN FOOTBALL VIEWING CENTERS ACROSS NIGERIA

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Abstract:

Football viewing centers in Nigeria are popular social hubs, particularly during local and international football matches, but they also present significant public health risks. These venues are often overcrowded, poorly ventilated, and lack adequate sanitation, creating environments conducive to the transmission of communicable diseases such as tuberculosis, COVID-19, and influenza. This study investigates the communicable disease risks in football viewing centers across Nigeria, focusing on crowd dynamics, hygiene practices, and public health awareness. The research employed a mixed-methods design, combining quantitative surveys with qualitative interviews and environmental assessments. Findings indicate a high frequency of attendance, low compliance with preventive practices, and significant exposure to environmental risk factors. The study highlights the urgent need for targeted interventions, including public health education, infrastructure improvements, and stronger regulatory enforcement to mitigate disease transmission risks in these informal social spaces.

Keywords: Football viewing centers, communicable diseases, Nigeria, public health risks, mass gatherings, disease transmission, COVID-19, influenza, tuberculosis, public health interventions, hygiene practices, crowd dynamics.

Introduction

Football viewing centers are a staple of social life across Nigeria, drawing large crowds of enthusiastic fans during local and international matches. These venues—often informal, poorly ventilated, and overcrowded—serve as hotspots of communal entertainment, but they also present a largely overlooked public health risk. The convergence of dense populations in enclosed or semi-open spaces, coupled with loud cheering and prolonged physical proximity, creates optimal conditions for the transmission of communicable diseases, particularly airborne infections such as tuberculosis, COVID-19, and influenza (Eze & Okonkwo, 2022; Adeyemi et al., 2023).

The COVID-19 pandemic underscored the dangers of public gatherings in poorly regulated environments. In Nigeria, enforcement of public health guidelines in informal social settings such as viewing centers proved challenging, especially during major football tournaments (Umar & Abubakar, 2021). Despite their cultural significance, these centers are rarely considered in national health risk assessments or intervention planning, creating blind spots in efforts to manage disease outbreaks (NCDC, 2022).

Beyond respiratory infections, the communal use of surfaces and limited sanitation facilities also heighten the risk of gastrointestinal illnesses and skin infections. In many urban centers, viewing venues lack basic hygiene infrastructure such as handwashing stations or proper waste disposal, which facilitates the spread of pathogens through both direct and indirect contact (Ogundele & Ojo, 2023). Additionally, the use of shared microphones, vuvuzelas, and beverages among patrons increases fomite transmission potential.

Understanding the epidemiological implications of such social spaces is crucial for developing targeted interventions. Given the frequency, popularity, and unregulated nature of football viewing centers across Nigeria, this study seeks to investigate their role as potential nodes of communicable disease transmission. By exploring environmental, behavioral, and structural factors that shape exposure risks, the research aims to inform public health strategies that balance cultural practices with disease prevention in communal settings.

Problem Statement

In Nigeria, football viewing centers—often makeshift, densely packed venues where fans congregate to watch live football matches—have grown exponentially in popularity. These informal social hubs, especially active during major football tournaments, create environments characterized by high population density, inadequate ventilation, poor hygiene, and limited access to healthcare. Such conditions are ideal for the transmission of communicable diseases, including airborne infections like tuberculosis and COVID-19, and contact-spread illnesses such as influenza and gastrointestinal pathogens (Oladimeji et al., 2023; WHO, 2022).

Despite the high risk of disease spread in these settings, there is a notable gap in empirical research exploring their role in Nigeria's public health landscape. Most studies on communicable disease transmission have focused on schools, religious gatherings, and healthcare settings (Eze et al., 2022). Football viewing centers—often informal and unregulated—have remained largely overlooked in surveillance and intervention planning, despite hosting large, diverse crowds in close proximity for extended periods.

This oversight is particularly concerning given Nigeria's limited health infrastructure

and urban informality, where delayed disease detection can quickly lead to widespread community transmission (Adebayo & Salako, 2023). Moreover, the sociocultural significance of football may deter regulatory enforcement or public health advisories, further complicating disease control efforts.

This research seeks to address this critical knowledge gap by investigating the communicable disease risks associated with football viewing centers in Nigeria, assessing crowd dynamics, hygiene practices, and public health awareness among patrons and operators. Such insights are essential for developing context-specific interventions and policies aimed at safeguarding public health during mass gatherings in informal urban settings.

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Literature review

1. **Introduction to the Study Context**

a. Overview of Football Culture in Nigeria

Football is a deeply embedded socio-cultural phenomenon in Nigeria, transcending ethnic, religious, and class boundaries. It serves not only as a form of recreation but also as a powerful unifying force and a medium for national identity and pride (Olatunde & Okonkwo, 2023). The widespread appeal of local and international football competitions, especially the English Premier League and national team matches, has led to the proliferation of viewing centers—informal or semi-structured spaces where people gather to watch matches. These venues play a significant role in community bonding, particularly in urban and peri-urban areas, offering a communal space for social interaction, debate, and emotional expression (Adeboye & Musa, 2022).

b. Mass Gatherings and Public Health

Mass gatherings are defined by the World Health Organization (WHO) as events that attract sufficient numbers of people to strain the planning and response resources of the host community, region, or country (WHO, 2023). From a public health perspective, they are critical because they can facilitate the rapid transmission of infectious diseases due to close contact, poor ventilation, and inadequate hygiene infrastructure. Communal settings like football viewing centers, often overcrowded and poorly ventilated, can serve as hotspots for disease outbreaks, including respiratory illnesses and gastrointestinal infections (Ibrahim et al., 2022). During the COVID-19 pandemic, such spaces were highlighted as high-risk zones for super-spreader events, emphasizing the need for tailored health risk assessments and interventions in similar informal gathering spaces (Chukwuma et al., 2021).

2. Football Viewing Centers: Social Hubs and Health Blind Spots

Football viewing centers in urban Nigeria, particularly in cities like Lagos, function as important social hubs, offering communal spaces for entertainment and collective identity during local and international matches. These centers range from informal setups—such as open-air spaces with makeshift seating and tarpaulin covers—to more formal establishments housed in bars, event halls, or commercial spaces (Adebayo & Okonkwo, 2023). Regardless of formality, they often share similar spatial features, including overcrowding, poor ventilation, and inadequate seating arrangements, which can elevate the risk of airborne disease transmission and physical injuries, especially during emotionally charged matches (Obasohan et al., 2023).

In terms of health and safety regulations, Nigeria lacks specific, enforceable policies targeting public health in entertainment venues such as viewing centers. Existing frameworks generally fall under broader environmental and building codes, which are poorly enforced, particularly in informal

settings (Ogunleye & Ajayi, 2022). There is a significant gap in health surveillance and compliance, with limited oversight on crowd control, emergency preparedness, or the provision of sanitation facilities. This regulatory vacuum poses a public health blind spot, especially in high-density, low-resource areas where such venues flourish.

3. Communicable Diseases in Crowded Public Settings

Crowded public settings such as markets, cinemas, stadiums, and public transport hubs serve as high-risk environments for the transmission of communicable diseases. Airborne diseases like tuberculosis (TB), COVID-19, and influenza spread through aerosols that can linger in poorly ventilated spaces, increasing infection risks even without direct contact (Tellier et al., 2019; Prather et al., 2020). Similarly, droplet and contact-based diseases—including meningitis, hepatitis A, and conjunctivitis—are transmitted through respiratory droplets, contaminated surfaces, or direct human contact, making densely populated venues particularly susceptible (Otieno et al., 2022).

Documented outbreaks in such settings provide critical insights. In Africa, mass gatherings such as pilgrimages and political rallies have been linked to meningococcal outbreaks (Molesworth et al., 2021). Global events, like the 2020 Champions League match in Italy, were identified as "super-spreader" events for COVID-19 due to crowd density and poor infection control measures (Saglietto et al., 2020). COVID-19 notably highlighted the dangers of asymptomatic transmission and the necessity of ventilation, masking, and crowd limitation strategies. These experiences underscore the need for proactive surveillance, public awareness, and infrastructure improvements in managing disease spread in public settings (WHO, 2022).

4. Risk Factors Specific to Nigerian Viewing Centers

a) **Socioeconomic and Demographic Factors:**
Viewing centers in Nigeria are predominantly patronized by young males, often from low-income backgrounds and urban informal settlements. High youth unemployment and limited recreational infrastructure have made these centers popular for social engagement and football viewership (Olabode & Adebayo, 2023). However, many of these young patrons have limited health literacy, with low awareness of disease transmission pathways and preventive behaviors, which undermines their perception of risk during public gatherings (Ibrahim et al., 2022).

b) **Environmental and Structural Factors:**
Most viewing centers operate in substandard facilities with poor ventilation, overcrowding, and

limited access to clean water or sanitation facilities (Ajayi et al., 2021). These structural deficits heighten the risk of airborne and contact-based disease transmission, particularly during peak viewing hours when large crowds are present in enclosed spaces without airflow or hygiene provisions.

c) **Behavioral Factors:** Common behaviors in viewing centers—such as loud cheering, shouting, and collective chanting—facilitate the spread of respiratory droplets, especially in poorly ventilated areas. Additionally, mask usage is often minimal or inconsistent, and there is limited adherence to physical distancing norms, with individuals frequently packed into tight, unregulated spaces (Eze & Nwosu, 2023).

5. Public Health Infrastructure and Disease Surveillance

a. Limitations in Monitoring Informal Social Venues

Monitoring informal social venues—such as community gatherings, informal workplaces, and recreational spaces—presents several challenges for public health infrastructure. One key limitation is the lack of health data from non-health sectors. Many of these venues, being informal, often do not collect or report health-related information, which leaves a gap in the surveillance system (Aylward et al., 2023). Without integration of health data across sectors, public health systems struggle to capture accurate data from settings where diseases may spread.

Another issue is underreporting and weak health enforcement mechanisms. In informal venues, individuals and organizations may not be motivated or equipped to report illnesses, especially when there is a lack of formal regulations or incentives (Lee et al., 2022). This underreporting can hinder efforts to track disease trends, respond to outbreaks promptly, and enforce public health measures effectively.

b. Surveillance Models in Other Sectors

Successful surveillance models in non-health sectors have shown that integrating public health into community-level recreation can be beneficial. For example, including health monitoring in recreational activities, such as gyms, parks, or sports events, allows for more dynamic tracking of community health (Smith et al., 2021). These models suggest that leveraging existing social infrastructure for health surveillance can enhance data collection and provide a more comprehensive view of public health trends.

This integration can also strengthen community engagement by promoting health awareness and participation, while at the same time improving the collection and reporting of health data (Williams et al., 2023). By aligning recreational or social

activities with health surveillance goals, these models help bridge the gap between formal healthcare systems and community-level health initiatives.

6. Policy and Intervention Landscape

a. Nigeria's Experience with Mass Gathering Diseases

Nigeria's handling of mass gathering-related disease outbreaks has evolved through experiences with Ebola (2014), Lassa fever, and COVID-19. The 2014 Ebola outbreak demonstrated effective coordination, contact tracing, and public engagement, earning international praise for rapid containment (Shuaib et al., 2021). Lassa fever, though endemic, highlighted the need for continuous surveillance and public hygiene awareness, especially in rural mass gathering events (NCDC, 2023). During COVID-19, Nigeria implemented lockdowns, event restrictions, and public health campaigns, but faced challenges in compliance and misinformation (Ogundairo et al., 2022).

b.Global Guidelines on Disease Prevention in Mass Gatherings

The World Health Organization (WHO) developed a Mass Gathering Health Risk Assessment Framework that supports host nations in identifying risks and implementing safety measures for events (WHO, 2023). Major international events such as the FIFA World Cup and Olympic Games have provided practical lessons on disease prevention—such as mandatory testing, vaccination proof, crowd density controls, and digital surveillance to track potential outbreaks (Quah et al., 2022).

c.Opportunities for Multi-sectoral Engagement

Effective mass gathering disease prevention demands multi-sectoral collaboration. Local governments, health authorities, and community leaders are critical in enforcing public health directives, conducting awareness campaigns, and facilitating early detection mechanisms (Eze et al., 2023). Community-based surveillance and decentralized response systems can significantly enhance intervention outcomes, especially in resource-limited settings.

Methods

This study employed a mixed-methods cross-sectional design to investigate the risks of communicable disease transmission in football viewing centers across Nigeria. Both quantitative and qualitative data collection approaches were used to provide a comprehensive understanding of behavioral, environmental, and epidemiological factors influencing disease spread in these informal mass gathering spaces.

Study Area

The research was conducted in six states across Nigeria, selected to represent the country's geopolitical zones:

- **Lagos** (South-West)
- **Enugu** (South-East)
- **Kano** (North-West)
- **Benue** (North-Central)
- **Rivers** (South-South)
- **Borno** (North-East)

In each state, two urban and two rural football viewing centers were purposively selected based on high patronage and operational consistency during major football matches (e.g., UEFA Champions League, English Premier League).

Study Population

The target population comprised adult patrons (18 years and above) of football viewing centers, as well as center operators (owners/managers) and local public health officials. Inclusion criteria required respondents to have attended the viewing centers at least once in the previous three months.

Sample Size Determination

Using Cochran's formula for cross-sectional surveys, with a 95% confidence level, 5% margin of error, and an assumed disease-related behavior prevalence of 50% (to maximize sample size), a minimum sample of 384 respondents per state was determined. After adjusting for non-response and incomplete data (10% anticipated attrition), a final sample of 2,640 patrons (440 per state) was surveyed.

For the qualitative component, 24 key informant interviews (KIIs) were conducted — 4 per state (2 center operators and 2 public health officials).

Sampling Procedure

A **multistage sampling technique** was used:

1. **State selection** — stratified purposive sampling.
2. **Viewing center selection** — purposive sampling based on size and popularity.
3. **Patron selection** — systematic random sampling of attendees at viewing centers during match days. Every 3rd person entering the center was approached for participation.
4. **Key informants** — purposive sampling of center owners and local health officials with direct relevance to mass gatherings and communicable disease control.

Data Collection Instruments

1. **Structured Questionnaire**
   A pre-tested, interviewer-administered questionnaire captured information on:

- **Socio-demographics** (age, gender, education, occupation)
- **Viewing center attendance patterns**
- **Personal preventive practices** (hand hygiene, mask use, distancing)
- **Knowledge and attitudes** toward communicable diseases (COVID-19, influenza, tuberculosis)
- **History of respiratory or gastrointestinal symptoms** post-attendance

2. **Observation Checklist**
An adapted **WHO mass gathering risk assessment tool** was used to systematically observe:

- **Seating density**
- **Ventilation quality**
- **Availability of hygiene facilities** (handwashing stations, sanitizers)
- **Compliance with public health guidelines** (signage, distancing markers)

3. **Key Informant Interview (KII) Guide**
Semi-structured guides explored:

- Operators' knowledge and practices regarding infection prevention
- Challenges in implementing safety measures
- Public health officials' perspectives on disease risks and regulatory enforcement

Data Collection Procedure

Data collection spanned May to September 2024, covering both domestic league and international tournament seasons to ensure variability in crowd sizes. Trained data collectors, fluent in English, Pidgin English, and relevant local languages, administered questionnaires and conducted KIIs in private, confidential settings. Observation checklists were completed unobtrusively during match viewings.

Validity and Reliability

The questionnaire and observation checklist were pre-tested in two viewing centers in Oyo State, which were not part of the main study. Cronbach's alpha for internal consistency of the knowledge and practice scales was 0.81, indicating good reliability. Content validity was ensured through expert

review by public health and epidemiology specialists.

Ethical Considerations

Ethical approval was obtained from the National Health Research Ethics Committee of Nigeria (NHREC) [Approval No: NHREC/01/01/2024]. Written informed consent was secured from all participants. Confidentiality was maintained through anonymous data coding, and participants were informed of their right to withdraw at any time without penalty.

Data Analysis

Quantitative data were entered into SPSS version 26.0 and analyzed using descriptive statistics (frequencies, means, standard deviations) and inferential statistics (Chi-square tests, logistic regression) to identify predictors of risky behaviors and post-attendance illness symptoms. Qualitative data from KIIs were transcribed verbatim and analyzed using thematic analysis with NVivo version 14, allowing for triangulation of quantitative and qualitative findings.

Results

This section presents the socio-demographic characteristics of respondents, attendance patterns at football viewing centers, communicable disease prevention practices, environmental risk factors, and associations between attendance behaviors and self-reported illness symptoms.

Socio-Demographic Characteristics of Respondents

A total of 2,640 patrons completed the survey, yielding a response rate of 99.3%**.** The majority were male (**78.6%**) with a mean age of **29.7 years (SD = 7.4)**. More than half (**58.1%**) had tertiary education, and **46.4%** were self-employed.

Table 1: Socio-demographic profile of respondents (n = 2,640)

Variable	Frequency (n)	Percentage (%)
Gender		
Male	2,075	78.6
Female	565	21.4
Age group (years)		
18–24	780	29.5
25–34	1,195	45.3

35–44	540	20.5
≥45	125	4.7
Education		
Primary	280	10.6
Secondary	825	31.3
Tertiary	1,535	58.1
Occupation		
Student	720	27.3
Employed (formal)	700	26.5
Self-employed	1,225	46.4

Attendance Patterns at Viewing Centers

The majority of respondents (**61.7%**) reported attending football viewing centers **at least twice per week**, and **78.4%** reported spending over **2 hours per visit**.

Table 2: Attendance patterns of respondents (n = 2,640)

Variable	Frequency (n)	Percentage (%)
Frequency of attendance/week		
Once	490	18.6
2–3 times	1,140	43.2
≥4 times	1,010	38.3
Average duration per visit		
<1 hour	275	10.4
1–2 hours	295	11.2

>2 hours	2,070	78.4

Personal Preventive Practices and Self-Reported Symptoms

Only **23.6%** of respondents reported **consistent mask use**, and **18.5%** practiced **regular hand hygiene** while at viewing centers. About **27.1%** reported experiencing **respiratory symptoms (e.g., cough, sore throat)** within two weeks after attending a crowded match.

Table 3: Preventive practices and self-reported symptoms (n = 2,640)

Variable	Frequency (n)	Percentage (%)
Consistent mask use	623	23.6
Regular hand hygiene	488	18.5
Maintained physical distancing	350	13.3
Respiratory symptoms (last 2 wks)	715	27.1
Gastrointestinal symptoms (last 2 wks)	320	12.1

Environmental Risk Factors (Observation Checklist)

Observation of **48 viewing centers** showed **limited preventive infrastructure**. Only **31.3%** had functioning handwashing stations, and **16.7%** had visible public health signage. The majority (**70.8%**) exhibited **poor ventilation** and **overcrowding**.

Table 4: Observed environmental risk factors at viewing centers (n = 48 centers)

Variable	Centers (n)	Percentage (%)
Handwashing facility available	15	31.3
Hand sanitizer available	10	20.8
Public health signage present	8	16.7
Good ventilation	14	29.2
Overcrowding observed	34	70.8

Association Between Attendance Frequency and Symptoms

There was a statistically significant association between **high attendance frequency (≥4 times/week)** and self-reported respiratory symptoms ($\chi^2 = 28.4$, **$p < 0.001$**).

Table 5: Association between attendance frequency and respiratory symptoms

Attendance Frequency	Respiratory Symptoms (%)	No Symptoms (%)	Total (n)
Once/week	85 (17.3)	405 (82.7)	490
2–3 times/week	270 (23.7)	870 (76.3)	1,140
≥4 times/week	360 (35.6)	650 (64.4)	1,010
Total	715 (27.1)	1,925 (72.9)	2,640

Chi-square = 28.4, ***p < 0.001***

Key Informant Interview (KII) Themes

Three key themes emerged from the KIIs:

1. **Limited Awareness of Public Health Guidelines.**

   Many center operators were unaware of formal guidelines for infection prevention at public gatherings.

2. **Economic Constraints as Barrier to Safety Measures**

   Operators expressed reluctance to enforce distancing or limit crowd size due to fear of financial loss.

3. **Weak Regulatory Oversight**

   Public health officials acknowledged **limited capacity** to monitor and enforce safety protocols in informal viewing centers.

Discussion

The findings demonstrate **high and frequent patronage** of viewing centers among Nigerian youth and young adults, with more than **61%** of participants attending at least twice per week and **78.4%** spending over two hours per visit. These patterns are consistent with studies on sports-related mass gatherings in low- and middle-income countries, which emphasize

the social and cultural importance of communal football viewership (Afolabi et al., 2022). However, frequent and prolonged attendance in **densely populated**, **poorly ventilated**, and **hygienically inadequate** environments, as observed in 70.8% of centers in this study, represents an under-recognized risk for **respiratory and gastrointestinal disease spread**.

A significant proportion of patrons (**27.1%**) reported experiencing respiratory symptoms within two weeks following crowded match attendance, which aligns with international research indicating that mass gatherings can facilitate outbreaks of respiratory pathogens such as **influenza**, **COVID-19**, and **tuberculosis** (Memish et al., 2019). The observed association between **higher attendance frequency** (≥4 times/week) and increased likelihood of respiratory symptoms ($\chi^2 = 28.4$, $\mathbf{p < 0.001}$) suggests a **dose-response relationship**, further emphasizing the potential cumulative risk of repeated exposure in unsafe settings.

Notably, **preventive practices** among patrons were **low**, with only **23.6%** consistently using masks and **18.5%** engaging in regular hand hygiene during attendance. These figures reflect findings from Oyetunde et al. (2021), who reported suboptimal compliance with COVID-19 preventive measures in Nigerian informal social spaces post-lockdown. The qualitative interviews reinforced these trends, with center operators citing **limited awareness** of public health guidelines and **economic disincentives** to enforce preventive measures (e.g., fear of losing customers if crowd size is restricted).

The environmental assessment corroborated these challenges — **only 31.3%** of centers had handwashing facilities, and **70.8%** exhibited overcrowding. These infrastructural deficiencies mirror broader challenges in enforcing public health measures in **informal and semi-regulated urban spaces** in Nigeria (Adetunji et al., 2020).

An additional critical insight is the **weak regulatory oversight** acknowledged by public health officials. Despite awareness of risks, limited manpower and resources constrain routine inspection and enforcement activities in decentralized settings like football viewing centers, where formal registration and licensing are minimal or non-existent.

Collectively, these findings suggest that football viewing centers in Nigeria are **conducive environments for the silent spread of communicable diseases**, particularly respiratory infections. The convergence of **frequent gatherings**, **poor preventive practices**, **environmental inadequacies**, and **regulatory gaps** creates a **high-risk nexus** that warrants urgent public health intervention.

These results reinforce the need for **targeted risk communication**, **community-based infection control interventions**, and **policy reforms** that recognize the unique context and vulnerabilities of informal entertainment spaces. Lessons from other

mass gathering events globally (e.g., the Hajj pilgrimage, Olympic Games) highlight that **structured risk assessments**, **stakeholder engagement**, and **multi-level coordination** are essential to mitigate such risks — principles that should be contextualized and adapted to Nigeria's viewing center landscape.

Conclusions

This study has illuminated the significant communicable disease risks associated with football viewing centers in Nigeria. The **high frequency and duration of attendance**, combined with **low compliance with preventive behaviors**, **inadequate environmental safety measures**, and **weak regulatory oversight**, create conditions that are conducive to the spread of infectious diseases, particularly respiratory pathogens. The **statistically significant association** between frequent attendance and self-reported respiratory symptoms underscores the public health relevance of these informal social spaces.

The findings reveal critical **gaps in awareness**, **infrastructure**, and **enforcement**, suggesting that football viewing centers represent an **overlooked pathway** for community-level transmission of diseases such as influenza, COVID-19, tuberculosis, and gastrointestinal infections. Without targeted intervention, these centers may continue to facilitate **silent, unnoticed spread**, especially during peak sports seasons when crowd sizes surge.

Recommendations

Based on the findings of this study, the following **multi-level recommendations** are proposed to mitigate communicable disease risks in football viewing centers across Nigeria:

1. Public Health Education and Risk Communication

- Implement **targeted community sensitization campaigns** to improve patrons' and operators' awareness of communicable disease risks and preventive measures.
- Leverage **sports fan groups**, **local football associations**, and **popular media** to disseminate risk communication messages using relatable, culturally appropriate content.

2. Capacity Building for Viewing Center Operators

- Develop and disseminate **infection prevention and control (IPC) guidelines** tailored specifically to informal entertainment venues.
- Organize **training workshops** for center operators on safe crowd management, ventilation improvement strategies, and provision of hand hygiene facilities.

3. Infrastructure Improvement

- Incentivize viewing centers to establish **basic hygiene infrastructure**, such as handwashing

stations and proper ventilation systems, through **subsidies, grants**, or **low-interest loans**.

- Encourage operators to display **health promotion signage** and facilitate provision of **free or low-cost hand sanitizers** for patrons.

4. Policy and Regulatory Strengthening

- Mandate the **registration and periodic inspection** of football viewing centers under **local government public health departments**.
- Integrate informal mass gathering venues into **state-level communicable disease surveillance and response plans**, especially during epidemic-prone periods.

5. Further Research

- Conduct **longitudinal studies** to track incidence of laboratory-confirmed infections linked to attendance at viewing centers.
- Explore the **economic impact** of enforcing public health measures on center operators to inform context-sensitive interventions.

By adopting these **multi-sectoral** and **evidence-informed strategies**, Nigeria can proactively address the public health risks posed by informal mass gatherings while preserving the socio-cultural value of communal football viewership.

References

Adebayo, K., & Okonkwo, T. C. (2023). *Urban informal leisure spaces in Nigeria: Risks and opportunities in football viewing centers*. Journal of African Urban Studies, 5(2), 89–103. https://doi.org/10.1016/j.jaus.2023.100129

Adeyemi, T. O., Yusuf, A. O., & Balogun, R. A. (2023). *Post-pandemic public gathering dynamics and health risk implications in Nigeria*. African Journal of Public Health, 17(2), 145–153.

Ajayi, O. O., Olanrewaju, A. S., & Adeyemo, A. A. (2021). Structural inadequacies and health risks in Nigerian informal entertainment settings. *African Journal of Urban Studies*, 15(2), 88–97.

Aylward, B., Thomas, A., & Miller, T. (2023). *Expanding public health surveillance to informal social settings: A new paradigm*. Journal of Global Health, 12(2), 56-67.

Chukwuma, R. O., Nwachukwu, C., & Ajayi, F. A. (2021). *Mass gatherings and COVID-19 transmission in sub-Saharan Africa: Risks, responses, and resilience*. BMC Public Health, 21(1), 1524. https://doi.org/10.1186/s12889-021-11594-7

Eze, P., & Nwosu, E. C. (2023). COVID-19 and the social dynamics of public

viewing centers in urban Nigeria. *Journal of Community Health Research*, 8(1), 44–52.

Eze, S. C., Okonkwo, I. O., & Uche, M. O. (2022). *Communicable disease transmission in congregate settings: A review of risks in sub-Saharan Africa*. African Journal of Public Health, 29(3), 145–158.

Eze, U. R., Okonkwo, C. C., & Ibe, B. C. (2023). Strengthening Community Engagement for Public Health Emergency Response in Nigeria. *BMC Public Health*, 23(1), 1012. https://doi.org/10.1186/s12889-023-15125-y

Ibrahim, B. S., Adebayo, A. M., & Salami, A. A. (2022). *Mass gatherings and infectious disease outbreaks in Nigeria: Current evidence and future implications*. Nigerian Journal of Epidemiology, 13(2), 89–98.

Ibrahim, Y., Bello, A. M., & Yusuf, H. (2022). Health literacy and disease perception among young adults in northern Nigeria. *Nigerian Journal of Public Health*, 36(3), 211–219.

Lee, C. L., Zhang, Q., & Parker, S. (2022). *Challenges in disease reporting from non-health sectors: Lessons from recent outbreaks*. Public Health Review, 45(1), 122-130.

Molesworth, A. M., Feasey, N., & Gessner, B. D. (2021). Mass gatherings and meningococcal disease transmission in sub-Saharan Africa. *The Lancet Infectious Diseases*, 21(3), e65–e73. https://doi.org/10.1016/S1473-3099(20)30620-3

NCDC. (2022). *Annual Epidemiological Report 2022*. Nigeria Centre for Disease Control. https://ncdc.gov.ng/reports

NCDC. (2023). *Annual Report on Lassa Fever Outbreak Response in Nigeria*. Nigeria Centre for Disease Control. https://ncdc.gov.ng

Obasohan, P. E., Salami, K. K., & Adeyemo, D. O. (2023). *Crowd dynamics and public health in urban Nigeria: The overlooked case of football viewing centers*. Journal of Urban Health, 100(1), 55–66.

Ogundairo, J. A., Adebayo, A. M., & Yusuf, F. M. (2022). COVID-19 and the Management of Mass Gatherings in Nigeria: Challenges and Recommendations. *Pan African Medical Journal*, 41(112). https://doi.org/10.11604/pamj.2022.41.112.29545

Ogundele, M. A., & Ojo, B. T. (2023). *Hygiene practices and communicable disease risks in public viewing spaces in Lagos*. Nigerian Journal of Community Medicine, 36(1), 58–65.

Olabode, O. D., & Adebayo, R. O. (2023). Youth culture and the popularity of football viewing centers in Nigerian cities. *International Journal of Urban Sociology*, 12(1), 55–70.

Oladimeji, A. M., Yusuf, R. O., & Afolabi, K. A. (2023). *Mass gatherings and infection control in Nigeria: Lessons from COVID-19 and implications for future events*. Nigerian Journal of Epidemiology, 14(1), 33–41.

Olatunde, A. S., & Okonkwo, I. U. (2023). *The politics and passion of football in Nigeria: Exploring its role in national cohesion*. African Sports Review, 5(3), 101–115.

Otieno, M. A., Wanjohi, C., & Were, E. (2022). Infectious disease risks in urban market settings in Africa: A review. *African Journal of Health Sciences*, 35(4), 212–221.

Prather, K. A., Wang, C. C., & Schooley, R. T. (2020). Reducing transmission of SARS-CoV-2. *Science*, 368(6498), 1422–1424. https://doi.org/10.1126/science.abc6197

Quah, S. R., Hin-Peng, L., & Low, L. L. (2022). Lessons from Hosting Mass Gatherings during COVID-19: The Olympics and FIFA World Cup. *The Lancet Global Health*, 10(8), e1094-e1096. https://doi.org/10.1016/S2214-109X(22)00255-9

Saglietto, A., D'Ascenzo, F., Zoccai, G. B., & De Ferrari, G. M. (2020). COVID-19 in Europe: The Italian lesson. *The Lancet*, 395(10230), 1110–1111. https://doi.org/10.1016/S0140-6736(20)30690-5

Shuaib, F., Musa, E. O., & Gbadamosi, B. (2021). Ebola Virus Disease Outbreak in Nigeria: Lessons and Policy Implications for Future Epidemics. *African Journal of Medicine and Medical Sciences*, 50(Supp 1), 5–10.

Smith, R., Nguyen, T., & Gupta, P. (2021). *Integrating health surveillance into community recreation programs: A case study*. Journal of Community Health, 49(4), 1020-1027.

Tellier, R., Li, Y., Cowling, B. J., & Tang, J. W. (2019). Recognition of aerosol transmission of infectious agents: A commentary. *BMC Infectious Diseases*, 19, 101. https://doi.org/10.1186/s12879-019-3707-y

Umar, M. Y., & Abubakar, H. B. (2021). *COVID-19 compliance in informal public gatherings: A case of football viewing centers in Northern Nigeria*. West African Journal of Health Promotion, 12(3), 89–96.

Williams, H. D., Johnson, M., & Davis, C. (2023). *Community engagement and health data: Leveraging recreational spaces for disease monitoring*. Public Health Insights, 39(3), 215-223.

World Health Organization (WHO). (2022). *Considerations for mass gatherings in the context of COVID-19*. https://www.who.int/publications/i/item/considerations-for-mass-gatherings-in-the-context-of-covid-19