



PUBLIC HEALTH MANAGEMENT & DISEASE OUTBREAKS IN NIGERIA: APPRAISING IMPLICATIONS FOR SDG 3 IN EDO SOUTH SENATORIAL DISTRICT

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Abstract

Across the globe, studies have revealed that the state of public health management is a direct reflection of the degree of public health in place and its ability to manage public disease outbreaks could make or mar her chances of achieving SDG 3. This is the core reason why we have embarked on this study with the intention of evaluating the state of public health management of disease outbreaks with respect to SDG actualization in Nigeria. Taking into cognizance the geographical location of Edo state to other states in the country while considering the fact that indigenes of the other states are significantly represented in the state, we have narrowed our studies to Edo state. This is rooted in our belief that on completion of the work, our findings will be quite helpful to others will the recommendations if adhered to will help the Nigerian state contain disease outbreaks and expeditiously achieve the global health goals (SDG 3).

Introduction

Over the years, the globe has experienced disease outbreaks of significant proportions (Burkle, 2020). It is a given that, in all parts of the world, disease outbreaks have adversely affected human populations with calamitous consequences. It is a worrisome development that despite being Africa's most populous state, Nigeria faces a myriad of challenges especially in her health sector (Onyeaka et.al, 2021). According to Enabulele, the nation's healthcare system can be described as being in a precarious state (Enabulele, 2020), especially with the quantum of diseases it is always exposed to. The subject matter of disease outbreaks vis-a-vis its untoward impacts on the global goals has called for serious concerns and generated renewed academic interest. Considering the failure of the Nigerian state to achieve the MDG'S and the nearness of the due date for the SDG'S, there is a need to interrogate the pitfalls of public health management in the state particularly as it concerns disease outbreaks and the actualization of SDG 3.

That Nigeria contends with a weak healthcare system is not news. However, while public health analysts are quick to blame the outbreak of the global pandemic for the weak state of the nation's health sector, an event described as one that led to the greatest shock in public health globally (Macassa, 2021). It is important to state that Nigeria's healthcare challenges precedes the coronavirus pandemic, as it was just exacerbated by it (Ndu et.al, 2024). Worthy of note is the fact that aside the fragile healthcare system she has, the burden of disease outbreaks seem to adversely impact the state (Okorie et.al, 2025). Hence, in view of the risks Nigeria is exposed to, there is a need to engage in this study as its outputs will rescue the state from the precarious nature of disease outbreaks and its untoward effects on the global developmental goals.

Granted that responsible agencies have tried to checkmate the spread of diseases and protect the populace from the risk of contagion, very minimal success seems to have been achieved in developing countries such as Nigeria. This represents the crux of our study as we intend to critically investigate the reasons for the inability of public health agencies to tackle disease outbreaks considering its implications for the attainment of SDG 3 in Nigeria. Taking into account the central

location of Edo state to Nigeria, we have decided to restrict the study to Edo State, as we believe that the findings that will emanate from the study will be replicated in other states of the federation

Objectives

The core objective of this study is to interrogate the tripartite relationship that subsists between public health management, diseases outbreaks and the sustainable development goals.

1. To establish the nexus between public health management and disease outbreaks in Edo South Senatorial District, Nigeria.
2. To examine the impacts of public health management on the attainment of SDG 3 in Edo South Senatorial District, Nigeria.
3. To identify strategies that can be adopted by public health administrators in tackling disease outbreaks in Edo South Senatorial District, Nigeria

Anticipated Outcomes

The expected outputs of this study are as enunciated below;

1. Establishment of the nexus between public health management and disease outbreaks in Edo South Senatorial District, Nigeria.
2. An in-depth examination of the impacts of public health management on the attainment of SDG 3 in Edo South Senatorial District, Nigeria.
3. Successful identification of strategies that can be adopted by public health administrators in tackling disease outbreaks in Edo South Senatorial District, Nigeria.

Literature Review

A plethora of literature abound on the subject of disease outbreaks in Nigeria, preliminary search has revealed that there are several documentations to support the fact that Nigeria has been exposed to a varied eruptions of diseases which do not only threaten her populations but could adversely affect the attainment of SDG 3. While this state of affairs is quite worrisome, studies have shown that with the right intervention by public administrators to disease outbreaks, the SDG's can be chiefly attained (Ramirez-Rubio et.al, 2019).

A significant gap in the literature is the paucity of researches that have attempted to interrogate the impact of public health administration on disease outbreaks with a view to evaluating its implications for the actualization of SDG 3 in Edo South senatorial district. This is the gap we intend to fill, as the outputs from this study will right the wrongs that currently exist in public health management of diseases in Edo South senatorial district and the Nigerian state by extension.

Public health management & disease outbreaks: an appraisal

Disease outbreaks come with a huge burden that only proper management can help overcome (Omosigho et.al, 2024). For Nigeria, she has suffered several disease outbreaks in its history. Diseases such as African swine fever (Owolodun et.al, 2010), Diphthera (Balakrishnan, 2024), Lassa fever (Ajayi et.al, 2013), yellow fever (Nomhwange et.al, 2021), Ebola (Musa et.al, 2015), and most recently, the Covid-19 virus (Oyeranti & Sokeye, 2020).

Considering the threats posed by disease outbreaks, there is the need to properly manage them. It is pertinent to state that one way diseases are managed is through the issuance of guidelines which help in the management of such eruptions (Hall et.al, 2011), more often than not, these guidelines detail prevention and control measures that can help in resolving the intractable challenge of these diseases (Johnston et.al, 2007). Communication also plays a significant role in their management (Smith, 2006). To buttress, there have been cases where correct data on disease outbreaks was not provided (Omoleke et.al, 2018). It is instructive to state that the multiplicity of actions and inactions taken towards diseases play a determining role in their continuity or termination. Infact, the ability to promptly respond by creating frameworks that can help to arrest these public health conditions to a large extent determines the efficacy or otherwise of the public health administration in place.

Failure to effectively manage public disease outbreaks can come with calamitous consequences especially for novel diseases such as the recently experienced coronavirus. Hence, to checkmate

this, in diverse regions, disease management and coordination centers have also been established or revamped during such occurrences. A case in point is the Nigerian Center for Disease Control which was upgraded during the novel coronavirus outbreak. In most instances, outbreak management systems (OMS), are developed and deployed (Yavlinsky et.al, 2020). This seems to be a derivative of Kroschewski et.al research output, as they harped on the need to utilize high impact crisis management tools to stem the tide of public health disease outbreaks (Kroschewski et.al, 2006). System enabled software's are equally deployed by tech experts who continually research on applications that are suitable for detecting and tracking such diseases (Chen et.al, 2011). A great deal of tact is equally required as health administrators must be able to ascertain which type of response would be most effective and beneficial for a particular type of disease outbreak. The use of relevant strategies in managing disease outbreaks also makes it a very effective endeavor (Matua et.al, 2015). By adopting the right policies towards disease management by public health administrators, diseases can be curtailed or left to spread (Massaro et.al, 2018). Training of healthcare workers and front-line respondents is also a very effective way of managing diseases when they occur (Vivalya et.al, 2021).

Disease outbreaks, public health management & SDG 3 in Nigeria & Beyond

Outbreaks of diseases can pose one of the greatest challenges to the actualization of the SDG's (Brennan et.al, 2022). This remains a truism in all respects especially when public health management systems are weak or non-existent. To borrow a leaf from Asi & Williams, although SDG 3 gives priority to health for all, the prospects of achieving it can become slimmer if concerted efforts are not made to tackle factors that can thwart it (Asi & Williams, 2018).

Africa holds a record of high incidences of diseases outbreaks when compared to other climes (Chapungu & Nhamo, 2021). The same anomalous situation can be observed in Nigeria where every year, diseases plague the Nigerian state like a colossus of sorts (Muhammad et.al, 2017). Infact, to capture it more succinctly, managing diseases in Nigeria remains a challenging endeavour same way other African countries have encountered similar challenges (Olumade et.al, 2020). Rather than bemoan the situation, Olaniyi et.al, opine with a great deal of pessimism that considering the quantum of public disease outbreaks in Nigeria, the onus lies on public health administrators in the country to strengthen the resilience and response capacity of the state towards such eruptions (Olaniyi et.al, 2022).

Public health administrators owe the citizenry a responsibility to initiate public health measures to stem the tide of disease outbreaks (Mustapha et.al, 2020), this is a necessity to strengthen health care systems (Nguku et.al, 2014). In tandem with existing discourses, Shandryk et.al, opine that the right approach to public administration can guarantee the achievement of the global goals (Shandryk et.al, 2023), especially during times of disease outbreaks. The concept of public administration intersects with the entire SDG's (Bouckaert et.al, 2016). This explains why public health administrators have educated the citizenry on disease management strategies in a bid to stem the tide of disease outbreaks (Sow et.al, 2022). Equally worthy of mention is the activation of an early warning system and engagement in public health education activities, which are ways to tackle the ravenous scourge of disease outbreaks (Codjoe & Atiglo, 2020). Hence, despite the gloomy picture painted, studies have shown that with the right intervention by public administrators to disease outbreaks, the SDG's can be chiefly attained (Ramirez-Rubio et.al, 2019).

In retrospect, the Covid-19 pandemic was a historic event that shook the foundations of the health sector globally (Raimi et.al, 2020). This was in addition to the myriad of health challenges plaguing the health sector, which has led to some degree of pessimism by scholars on the possibility of attaining the SDG's by its due date of 2030 (Balogun, 2021). Bureaucratic bottlenecks experienced in public health facilities is equally not helping matters as people go through a lot in their bid to access healthcare services (Ibeneme et.al, 2020). Managing public health to achieve SDG 3 in every clime of the world comes with a preponderance of challenges which is worse for developing parts of the world (Fischer & Carow, 2022). To state it more succinctly, with emerging diseases affecting public health, it has become quite expedient that public health administrators must be more responsive in tackling these threats (Guégan et.al, 2018). Seidman captures it more profoundly by positing that the need to improve public health responses to diseases outbreaks cannot be over-

emphasized (Seidman, 2017). To further buttress the relevance of public health, Macassa describes it as a preconditionality for sustainable development (Macassa, 2021). Takian et.al affirm that virile healthcare systems which are required for the expeditious attainment of SDG 3 can only be achieved when public health administration is at its optimum (Takian et.al, 2022).

Although the World Health Organization is the global body responsible for health issues in the global arena, it works in concert with public health agencies situated in different countries (Onyekuru et.al, 2023). This implies that public health administrators owe the public the duty of putting measures in place to nip disease outbreaks in the bud (Wilson & Brownstein, 2009). One way this can be done is to deploy surveillance systems that can aid in early detection of these outbreaks (Wagner et.al, 2001). The use of AI can also help in disease detection and tracking which are a necessity for its containment (Owoyemi et.al, 2020).

Methodology

The research engaged a mixed method (qualitative and quantitative methods), in carrying out this study. While the quantitative approach deployed structured likert scale questionnaires, the qualitative component engaged key informants with semi-structured interviews and focused group discussions, it also relied on secondary data for pre-existing data. It is pertinent to state that the paper engaged an integrative review approach under the qualitative method as advanced by (Whittemore & Knafl, 2005). This method helped us to properly understand the issues as the researchers were well positioned to address them (Smythe & Carter, 2022). We towed the path of Kim & Baek, by accessing databases using specific search terms (Kim & Baek, 2022). The integrative review is known for its ability to identify problems, engage in literature search, evaluate harvested data, analyze and present obtained findings (Wells & Dietsch, 2014), hence, its adoption in this study, as it provided the researchers with the opportunity of synthesizing information from a plethora of sources (Russell, 2005).

The study area was Edo South Senatorial district made up of seven local government areas. However, we restricted our study to Oredo, Ovia West and Ikpoba Okha local government due to their cosmopolitan nature as other indigence of the remaining four local governments are located within the selected three. Hence, the findings from them were representative of others. All questionnaire responses were collated, coded and analyzed with the aid of the Statistical Package for Social Sciences (SPSS), while interview responses were transcribed and analyzed with the Nvivo software.

The population for this study comprised all residents of the Edo South Senatorial District in Edo State, Nigeria. The senatorial district is made up of three (3) Local Government Areas (LGAs). Based on the available population figures, the breakdown is as follows:

- **Oredo:** 514,095
- **Ovia West:** 312,608
- **Ikpoba Okha:** 379,112

This gives a total population of 1,205,815 residents across the three LGAs.

Sample Size and Sampling Technique

A total sample of 400 respondents was drawn using a purposive and stratified random sampling technique. The purposive component targeted individuals with knowledge of public health management and disease outbreaks in the study area. It also include people associated with well-being and good sanitation approach. This included public health officers, medical doctors, health workers, community leaders, and community health volunteers, ensuring a rich and diverse range of perspectives, traders, and students. The sample size was determined using the Taro Yamane formula, which is suitable for large populations and ensures that the sample is statistically representative at a 5% margin of error.

Formula:

$$n = \frac{N}{N + 1(e)^2}$$

Where:

- n = corrected sample size

- N = total population = 1,205,815
- e = margin of error = 0.05

Thus; $n = 399.99$, Based on the calculation, the sample size for this study is 400 respondents.

A multi-stage sampling technique was employed to select the respondents. The three LGAs within Edo South were purposively selected, as they represent the entire senatorial district. The sample of 400 respondents was then proportionally distributed among the three LGAs as follows:

- Oredo: $(514,095 / 1,205,815) 400 = 170$ respondents
- Ovia West: $(312,608 / 1,205,815) 400 = 104$ respondents
- Ikpoba Okha: $(379,112 / 1,205,815) 400 = 126$ respondents

DATA PRESENTATION, RESULT AND DISCUSSION

This section presents the findings of the study, derived from both the quantitative and qualitative data collection instruments. The quantitative data, obtained from the structured questionnaire, are presented in tables with corresponding interpretations. This is followed by a detailed thematic analysis of the qualitative data from the semi-structured interviews and focused group discussions (FGDs).

Demographic Characteristics of Respondents

This section presents the analysis of the respondents' demographic data, including their gender, age, and educational level.

Table 4.1.1: Gender Distribution of Respondents

S/N	Gender	Frequency	Percentage (%)
1	Male	215	53.75
	Female	185	46.25
	Total	400	100.0

Source: Research Field Survey, 2025

The data in Table 4.1.1 shows that out of the 400 respondents, 215 (53.75%) were male, while 185 (46.25%) were female. This indicates that there was a slightly higher participation of male respondents in the study compared to female respondents. However, the distribution is relatively balanced, ensuring that the findings are representative of both genders within the study population.

Age Distribution of Respondents

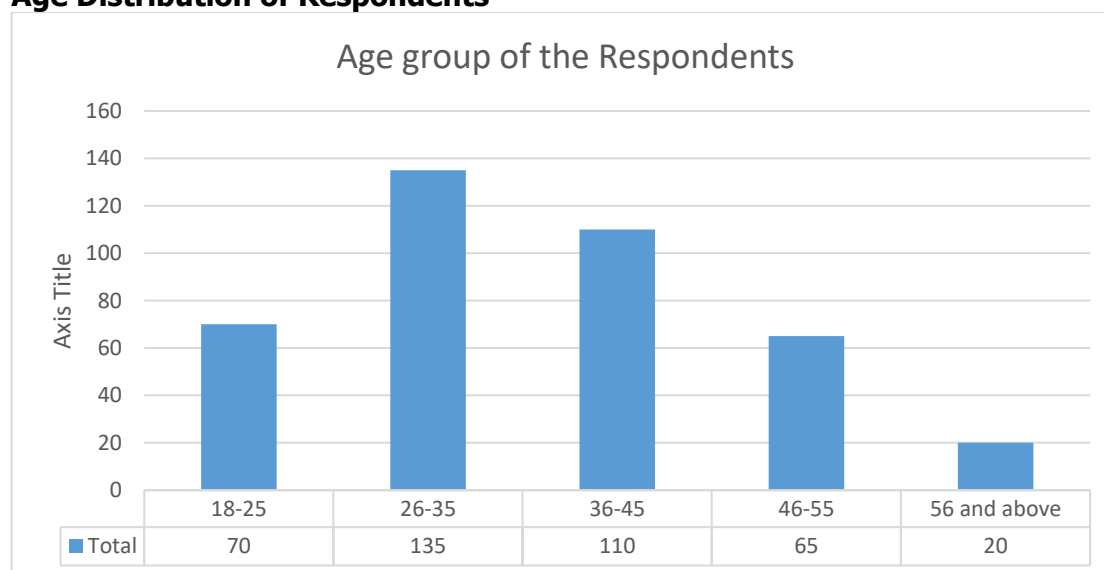


Figure 4.1: Age distribution of the respondents

Source: Research Field Survey, 2025

Figure 4.1 reveals the age distribution of the respondents. The majority of the respondents, 135 (33.75%), belong to the 26-35 age group, followed by the 36-45 age group with 110 (27.5%)

respondents. The 18-25 age group and the 46-55 age group account for 17.5% and 16.25% of the respondents, respectively. The age group of 56 and above constitutes the smallest proportion at 5.0%. This distribution highlights that the study's respondents are predominantly within the youthful and economically active population, making their perceptions and experiences particularly relevant to the study's focus on public health and development.

Educational Level of Respondents

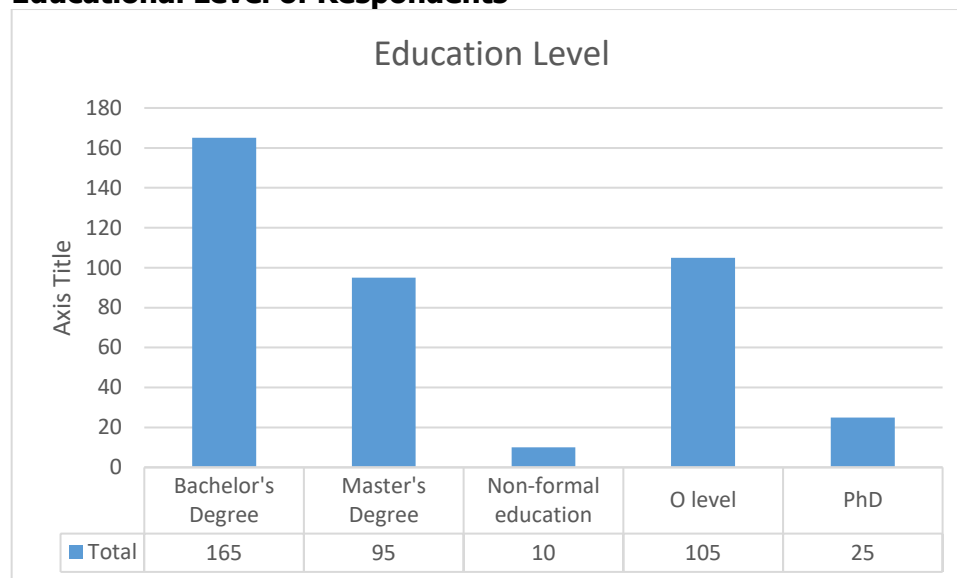


Figure 4.2: Education level of the respondents

Source: Research Field Survey, 2025

Table 4.1.3 reveals that a significant portion of the respondents are well-educated. The highest percentage of respondents, 165 (41.25%), hold a Bachelor's Degree. This is followed by those with an O level (26.25%) and a Master's Degree (23.75%). PhD holders and those with non-formal education represent the smallest groups at 6.25% and 2.5% respectively. The data indicate that the majority of respondents possess a high level of formal education, suggesting that they are well-informed and capable of providing insightful and objective responses to the study's research questions.

Is there a tripartite relationship between public health management, disease outbreaks, and the Sustainable Development Goals in Edo South Senatorial District?

Table 4.2.1: Tripartite Relationship

S/N	Statement	SD (%)	D (%)	N (%)	A (%)	SA (%)	Mean
5	The tripartite relationship is evident	5	10	15	40	30	3.8
6	The government's public health management	30	25	10	20	15	2.6
7	Effective public health management	2	5	10	45	38	4.1
8	The attainment of SDG 3 is hampered by disease outbreaks.	3	7	5	50	35	4.1
9	Investment in public health infrastructure	5	10	10	45	30	3.8
10	Community-led initiatives	10	15	20	35	20	3.4

Source: Research Field Survey, 2025

The data presented in Table 4.2.1 provides a quantitative perspective on the tripartite relationship between public health management, disease outbreaks, and the SDGs. The mean scores for most statements are above the neutral point of 2.5, indicating a general agreement among the respondents. Statements 7 and 8 have the highest mean scores of 4.1, with 83% of respondents

agreeing or strongly agreeing that effective public health management reduces the occurrence of outbreaks, and 85% agreeing or strongly agreeing that the attainment of SDG 3 is hampered by disease outbreaks. This strongly indicates a clear perception among the population that there is a direct and impactful link between these three factors.

Conversely, statement 6, which assesses the government's public health management, has the lowest mean score of 2.6. With 55% of respondents disagreeing or strongly disagreeing, this suggests a general dissatisfaction with the current state of public health management by the government. The mean scores of 3.8 for statements 5 and 9 indicate that respondents agree on the tripartite relationship and the importance of investing in public health infrastructure. Finally, the mean score of 3.4 for statement 10 suggests moderate agreement on the role of community-led initiatives, though this is seen as less impactful than government action and infrastructure investment.

Are there linkages between public health management and disease outbreaks in Edo South Senatorial District?

Table 4.3.1: Linkages Between Management and Outbreaks

S/N	Statement	SD (%)	D (%)	N (%)	A (%)	SA (%)	Mean
11	Poor waste disposal and sanitation	1	4	5	40	50	4.3
12	The absence of adequate surveillance	5	10	15	35	35	3.8
13	Public health campaigns	5	10	15	40	30	3.8
14	Overburdened and under-resourced	10	15	20	35	20	3.4

Source: Research Field Survey, 2025

The findings in Table 4.3.1 reveal the perceived linkages between public health management and the frequency of disease outbreaks. The mean scores for all statements are well above the neutral point, indicating general agreement on the stated linkages. The highest mean score of 4.3 for statement 11, with 90% of respondents agreeing or strongly agreeing, signifies that poor waste disposal and sanitation are seen as the most significant factor linking poor management to outbreaks. This highlights the public's awareness of environmental factors in disease transmission.

Statements 12 and 13 both have a mean score of 3.8. This indicates that the absence of adequate surveillance and the effectiveness of public health campaigns are also perceived as strong linkages. The high percentage of respondents agreeing or strongly agreeing (70% for both statements) reinforces the importance of these factors in managing and preventing outbreaks. Statement 14, with a mean score of 3.4, suggests that while respondents agree that overburdened and under-resourced healthcare facilities contribute to outbreaks, this factor is not as prominently recognized as sanitation or surveillance.

What are the impacts of effective public health management on the attainment of SDG 3 in Edo South Senatorial District?

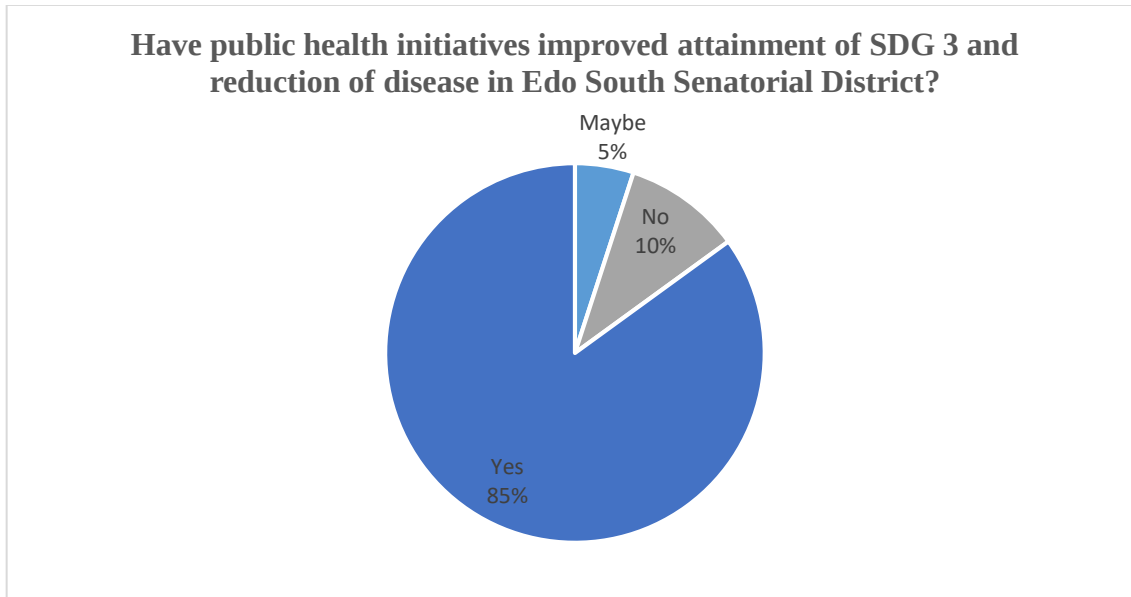


Figure 4.3: Have public health initiatives improved attainment of SDG 3 and reduction of disease in Edo South Senatorial District?

Source: Research Field Survey, 2025

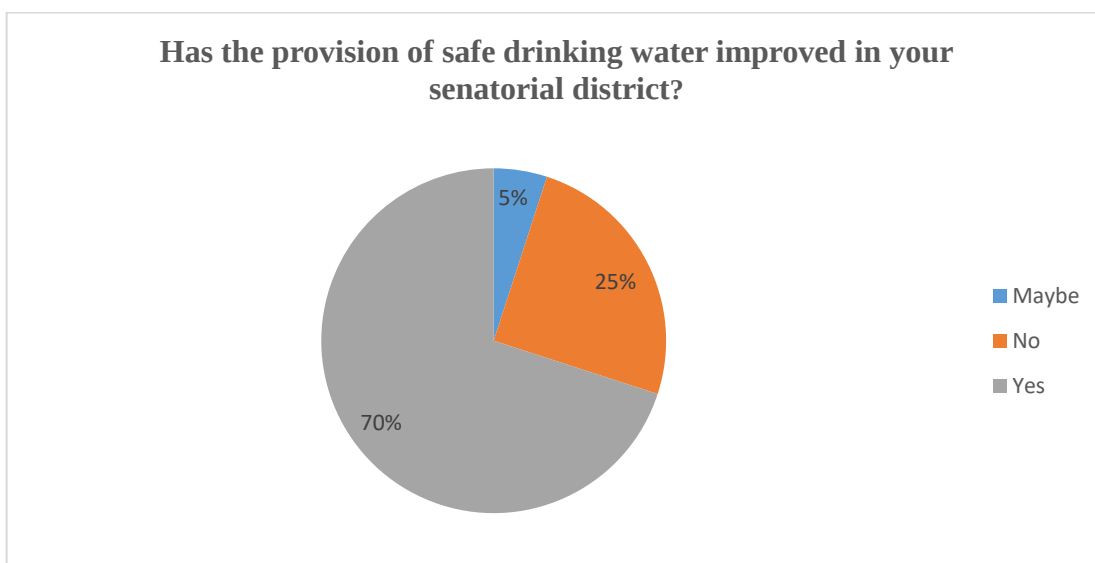


Figure 4.4: Has the provision of safe drinking water improved in your senatorial district?

Source: Research Field Survey, 2025

Does the current public health system effectively address attainment of SDG 3 in Edo South Senatorial?

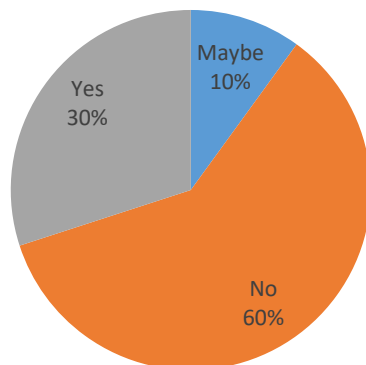


Figure 4.5: Does the current public health system effectively address attainment of SDG 3 in Edo South Senatorial

Source: Research Field Survey, 2025

Do you think that the state government's efforts is effective in attainment of SDG 3 in Edo South Senatorial District?

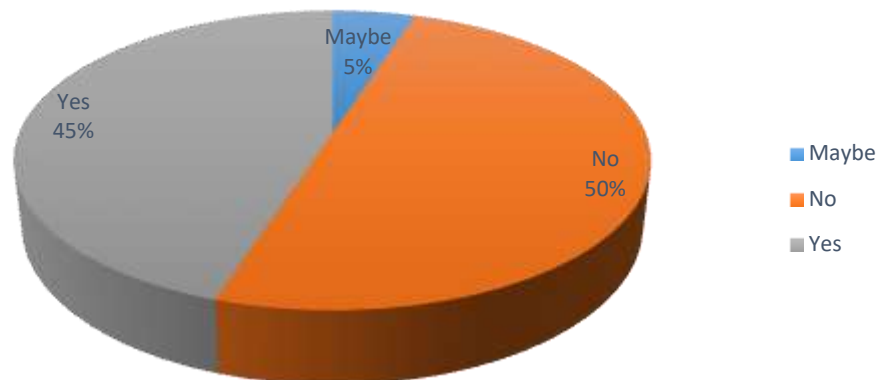


Figure 4.6: Do you think that the state government's efforts is effective in attainment of SDG 3 in Edo South Senatorial District?

Source: Research Field Survey, 2025

Figure 4.3, 4.4, 4.5 and 4.6 reveal the perceived impacts of public health management on the attainment of SDG 3. The results show a mixed but insightful perception among the respondents. For statement 15, a significant majority of respondents (85%) answered "Yes," indicating a strong belief that public health initiatives have been successful in reducing disease. Similarly, for statement 16, a high percentage (70%) of respondents believe that the provision of safe drinking water has improved. These findings suggest that the public recognizes and appreciates the tangible successes of specific health interventions.

However, the data also reveals significant concerns. For statement 17, a majority of respondents (60%) answered "No," signifying a lack of confidence in the current public health system's ability to address and contain epidemics and pandemics effectively. This points to a major gap between the

public's perception of small-scale interventions and the system's capacity for large-scale crisis management. Furthermore, for statement 18, half of the respondents (50%) answered "No" when asked if they think the state government's efforts are sufficient, suggesting that despite some perceived successes, the public feels that more needs to be done with 50 % response answering No, 45% answering Yes and 5 percent are indecisive.

Analysis of Research Question 4: What strategies can be adopted by public health administrators in tackling disease outbreaks in Edo South Senatorial District?

Table 4.5.1: Strategies for Tackling Outbreaks

S/N	Question	Options	Freq	Percentage (%)
19	What is the most significant constraint?	A. Inadequate funding for health programs.	180	45.0
		B. Lack of skilled personnel.	70	17.5
		C. Corruption in the health sector.	120	30.0
		D. Poor inter-agency collaboration.	30	7.5
20	What is a primary strategy for community buy-in?	A. Enforcing strict penalties.	25	6.25
		B. Ensuring transparent communication.	250	62.5
		C. Providing financial incentives.	55	13.75
		D. Bypassing community members.	70	17.5
21	What is the most effective use of technology?	A. Using social media for alerts.	40	10.0
		B. Implementing digital contact tracing.	100	25.0
		C. Using big data to predict hotspots.	210	52.5
		D. Creating mobile apps for reporting.	50	12.5
22	What should be the primary focus of resource allocation?	A. Prioritizing the most severely affected areas.	185	46.25
		B. Distributing resources equally.	70	17.5
		C. Focusing on preventing the outbreak.	105	26.25
		D. Investing in high-tech solutions.	40	10.0

Source: Research Field Survey, 2025

The analysis of the final set of questions provides clear guidance on perceived strategies for improving public health management. For Question 19, a significant majority of respondents (45.0%) identified inadequate funding for health programs as the most significant constraint, with corruption in the health sector also being a major concern at 30.0%. This points to financial and governance issues as the primary barriers to effective public health.

For Question 20, an overwhelming 62.5% of respondents selected ensuring transparent and consistent communication with the public as the primary strategy for community buy-in. This highlights the importance of trust and clear information in public health initiatives. In Question 21, the most effective use of technology was identified as using big data to predict disease hotspots and trends, with 52.5% of the votes, suggesting a desire for a proactive, data-driven approach to outbreak management. Lastly, for Question 22, the highest percentage of respondents (46.25%) chose prioritizing the most severely affected areas as the primary focus for resource allocation, advocating for a needs-based rather than an equal distribution of resources during crises.

CONCLUSION

This research was carried out with the core objective of appraising the state of public health management and disease outbreaks in Nigeria with a view to ascertain the level of preparedness towards SDG 3 attainment. In our quest to achieve the pre-stated objectives, we engaged an

admixture of the qualitative and quantitative methods. While the findings that have emanated from the study depict a sordid state of affair, we must reiterate that with the right approach towards disease outbreaks by public health officials and the entire citizenry, disease outbreaks can be curtailed and SDG 3 a soonest reality.

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