

BEYOND THE BARRIERS

Transforming Public Health in
Nigeria and Developing Nations

Jalal-Eddeen Abubakar Saleh

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Beyond the Barriers: Transforming Public Health in Nigeria and Developing Nations

Authored by

Jalal-Eddeen Abubakar Saleh

World Health Organization

Nigeria

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PREFACE

In recent decades, the world has witnessed unprecedented advancements in healthcare, resulting in remarkable improvements in life expectancy and quality of life. However, these achievements have not been evenly distributed. In many developing nations, particularly Nigeria, public health systems face formidable challenges that threaten to reverse the progress made thus far. The barriers to effective healthcare in these regions are numerous and complex, ranging from weak governance and political instability to poverty, insecurity, and inadequate infrastructure. These obstacles not only impede access to essential health services but also perpetuate a cycle of poor health outcomes and underdevelopment.

Beyond the Barriers: Transforming Public Health in Nigeria and Developing Nations is a follow-up to my earlier work, **Resilient Communities: Navigating Public Health Challenges in Developing Nations**, which was intended to empower local health actors to drive resilience and innovation in health service delivery. This new book is a culmination of my experiences, observations, engagements with government officials and development partners, and personal reflections as a public health professional committed to tackling these challenges.

Over the past three decades, I have worked in the health sector—15 years as a clinician and the subsequent 15 as a public health expert with the World Health Organization—focusing on immunization and disease prevention and control. Throughout this journey, I have witnessed firsthand the struggles of underserved and hard-to-reach communities, communities that are often overlooked and left behind by conventional health systems. I have seen the toll that poverty, conflict, and systemic neglect take on human lives. Yet, I have also witnessed the incredible resilience of those who work tirelessly to overcome these barriers.

This book is not merely an analysis of the problems; it is a call to action. It is an invitation to policymakers, health professionals, community leaders, and international partners to rethink and reimagine our approach to public health in Nigeria and other developing countries. It urges us to go beyond the barriers that have held us back for too long and to seek innovative, sustainable solutions that can transform the health landscape of the developing world.

Each chapter explores a specific aspect of Nigeria's public health challenges, offering insights, case studies, and practical recommendations. I hope that this book will serve as a valuable resource for those who are committed to improving the lives of millions who continue to suffer from preventable diseases, inadequate healthcare, and systemic neglect.

Transforming public health in Nigeria and other developing nations is not merely a possibility; it is an imperative. I invite you to join me on this journey as we work together to build a healthier, more equitable future for all.

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Disclaimer: The views expressed in this book are solely my own and do not reflect the official positions or policies of the World Health Organization. The content of this book is objective, non-partisan, and was not influenced by my affiliation with WHO.

Dedication

To the unsung heroes of public health—those who tirelessly work behind the scenes, from bustling urban clinics to remote village outposts. May your dedication continue to light the path toward a healthier, more equitable world.

ACKNOWLEDGEMENTS

I wish to acknowledge that in the final stages of refining this book, I chose to use ChatGPT as an editorial aid and an intellectual companion. While the ideas, arguments, lived experiences, and analytical processes presented in these pages are entirely my own, I deliberately used ChatGPT as a powerful tool for grammar, reflection, flow, and clarity. This has helped to sharpen the language, strengthen the structure, and enhance the content without diluting authorial intent. I appreciate the intellectual capacity of ChatGPT to engage critically with complex concepts, suggest alternative framings, and streamline dense material, which mirrors the evolving role of Artificial Intelligence (AI) not as a substitute but as an enabler of human creativity. I leveraged this advanced technology thoughtfully and responsibly, bridging insight with expression more efficiently. This has reaffirmed that when AI is used with discernment, ChatGPT and the like can expand the reach of human thought, scholarship, and storytelling, and not entirely replace them.

GLOSSARY

In this comprehensive glossary, we provide key terms and their definitions that have been introduced and discussed throughout this handbook. The glossary provides definitions for key terms and concepts discussed throughout the book, helping readers to better understand the context and significance of the topics addressed.

Access to Healthcare: The ability of individuals to obtain and make use of appropriate health services on time, influenced by factors such as cost, geography, availability, and cultural acceptability.

Accountability: The obligation of individuals or organizations to report, explain, and be answerable for their actions, particularly in the management of resources or in public service.

Anti-Corruption Initiatives: Programs or strategies are implemented to prevent, detect, and punish corruption, particularly in public sectors such as health and education.

Brain Drain: The emigration of trained and talented health professionals from their home country to more developed regions, often due to better working conditions, pay, or security.

Case Study: A detailed examination of a specific instance or event used to illustrate broader principles, strategies, or outcomes, often utilized to draw lessons in public health interventions.

Community-Driven Health Initiatives: Health programs or interventions that are led and implemented by local communities, emphasizing local knowledge, participation, and ownership.

Community Health Workers (CHWs): Trained public health workers who provide healthcare services, health education, and referrals at the community level, especially in underserved or hard-to-reach areas.

Conflict Zones: Geographic areas experiencing armed conflict or insecurity, often resulting in disrupted health services and increased public health risks.

Corruption: The abuse of entrusted power for private gain can undermine the effectiveness of public health services and hinder equitable access to healthcare.

Crisis Situations: Emergency or unstable situations, such as natural disasters, pandemics, or armed conflicts, that severely impact health infrastructure and service delivery.

Development Goals: Specific targets set by international bodies, such as the United Nations, aimed at improving global health, reducing poverty, and fostering sustainable development. The Sustainable Development Goals (SDGs) are the most prominent example.

Economic Determinants of Health: Factors related to economic conditions—such as income, employment, and financial stability—that influence individual and community health outcomes.

Equity in Health: The fair distribution of health resources, opportunities, and services across different populations ensures that everyone has the opportunity to attain their full health potential.

Health Budget: The allocation of financial resources by a government or organization to fund health services, programs, and infrastructure.

Health Governance: The processes, structures, and institutions through which decisions about health systems and policies are made and implemented at national, regional, and local levels.

Health Information Systems (HIS): Systems that collect, analyze, and disseminate health-related data to support evidence-based policy-making and health program management.

Health Literacy: The capacity of individuals to obtain, process, and understand basic health information and services to make informed health decisions.

Health Promotion: Activities aimed at enhancing health and preventing disease by enabling people to increase control over and improve their health.

Health Systems Strengthening (HSS): Efforts to improve the performance of health systems, focusing on components such as healthcare delivery, financing, workforce, information systems, and governance.

Immunization Coverage: The proportion of a population that has received specific vaccines, often used as an indicator of access to essential health services.

Innovative Financing Mechanisms: New or creative financial tools and strategies are designed to mobilize resources for health initiatives, often involving partnerships between the public and private sectors.

International Partnerships: Collaborations between countries or international organizations aimed at addressing global challenges, including health crises, through shared knowledge, resources, and strategies.

Malnutrition: A condition resulting from inadequate or imbalanced nutrient intake, which significantly affects public health, especially among vulnerable populations.

Mental Health and Psychosocial Support (MHPSS): Services that address emotional, psychological, and social well-being, especially important in settings affected by conflict or disaster.

Mobile Health (mHealth): The use of mobile devices and technology to deliver health information, services, and interventions, particularly in remote or underserved areas.

Monitoring and Evaluation (M&E): A systematic process of collecting, analyzing, and using data to assess the performance of health programs or interventions and guide decision-making.

Nutrition-Sensitive Interventions: Public health programs that address the underlying causes of malnutrition by integrating nutrition objectives into sectors like agriculture, education, and social protection.

Policy Implementation: The process of putting health-related policies into action through programs, regulations, and practices at various levels of governance.

Post-Conflict Recovery: The process of rebuilding and restoring health systems, infrastructure, and services in areas affected by conflict or disasters.

Primary Health Care (PHC): Essential healthcare based on scientifically sound and socially acceptable methods, made universally accessible to individuals and families in the community.

Public-Private Partnerships (PPPs): Collaborative agreements between government entities and private sector companies to deliver public services or infrastructure, such as healthcare, while sharing risks and rewards.

Resilient Health Systems: Health systems capable of preparing for, responding to, and recovering from shocks such as disease outbreaks or natural disasters while maintaining essential services.

Social Determinants of Health: The non-medical factors that influence health outcomes, including education, housing, employment, income, and social support networks.

Social Protection Systems: Policies and programs designed to reduce poverty and vulnerability by promoting efficient labor markets, diminishing people's exposure to risks, and enhancing their capacity to manage economic and social risks.

Surveillance Systems: Mechanisms for the continuous collection, analysis, and interpretation of health data for planning, implementation, and evaluation of public health practices.

Sustainable Development Goals (SDGs): A collection of 17 global goals set by the United Nations in 2015, aimed at ending poverty, protecting the planet, and ensuring prosperity for all by 2030. Goal 3 focuses on good health and well-being.

Technological Innovations in Healthcare: The application of advanced technologies, such as digital tools, telemedicine, and mobile health applications, to improve the delivery of healthcare services.

Transparency: The practice of making information accessible and understandable to the public, particularly regarding government actions, budgets, and decision-making processes in the health sector.

Universal Health Coverage (UHC): A health system goal ensuring that all individuals receive the health services they need without suffering financial hardship.

Zero-Dose Children: Children who have not received any basic vaccines are particularly vulnerable to vaccine-preventable diseases.

CHAPTER 1

The Foundation of Health: Political Will and Governance

Abstract: The chapter delves into the critical role that political leadership and governance play in shaping health outcomes in Nigeria and other developing nations. It explores the multifaceted impact of political will on public health, emphasising how effective leadership can drive the formulation and implementation of health policies that are essential for sustainable health systems. The chapter is structured to provide a comprehensive analysis, beginning with the role of political leadership in health and governance structures at the federal, state, and local levels. It then examines the processes involved in health policy formulation and implementation, highlighting key successes and failures through various case studies. The chapter further discusses the detrimental effects of political instability on health programs and concludes by proposing pathways to strengthen political commitment, thereby fostering an environment conducive to improved health outcomes. Through a blend of theoretical insights and practical case studies, this chapter underscores the necessity of robust political engagement to overcome the barriers hindering health system development in Nigeria.

Keywords: Case studies, Federalism, Governance structures, Health systems, Health governance, Health policy, Health reform, Health programs, Leadership, Nigeria, Political instability, Political will, Public health.

INTRODUCTION

Public health is a reflection of a nation's commitment to the well-being of its people. It encompasses not only the prevention and treatment of diseases but also the broader socio-economic and environmental factors that contribute to overall health. In developing countries like Nigeria, the state of public health is intricately tied to leadership, political will, and governance structures that drive decision-making as well as resource mobilisation and allocation. Without strong political leadership and effective governance, even the most well-intentioned health initiatives can falter, leaving communities vulnerable and underserved.

This chapter delves into the crucial role of political leadership and governance in shaping Nigeria's health landscape. It will explore how political will, or the lack

thereof, influences health outcomes and the effectiveness of health systems. Through an examination of governance structures at the federal, state, and local levels, it will analyse how these layers of government interact to formulate and implement health policies. Additionally, it will present case studies that highlight both the successes and failures of health governance in Nigeria, offering insights into the challenges that must be overcome to achieve sustainable health improvements. Finally, it will discuss the impact of political instability on health programs and propose pathways to strengthen political commitment to health in Nigeria and other developing nations.

THE ROLE OF POLITICAL LEADERSHIP IN HEALTH

Political leadership is a cornerstone of public health systems worldwide. It is the driving force that shapes health policies, mobilises resources, and creates an enabling environment for effective healthcare delivery. In the context of developing nations, such as Nigeria, the role of political leadership is even more critical. The health challenges faced by these countries - ranging from inadequate infrastructure and workforce shortages to infectious disease outbreaks and chronic underfunding - require strong, visionary leadership that prioritises health as a fundamental pillar of national development [1 - 3].

Globally, health transformation by governments of countries is dependent on the interplay between political will and governance. The term Political Will is considered to be that commitment demonstrated by political leaders in prioritising, resourcing, and sustaining actions that advance public health goals, which sometimes may be difficult or unpopular. The measurable indicators are actions that link the decisions to outcomes, and this includes budgetary allocations to health, policy enactment and enforcement of policies, establishing accountability mechanisms, and consistency of priorities across political transitions [1 - 5].

Governance, on the other hand, refers to a set of structures, processes, and relationships through which power is exercised in the management of public affairs, including health. The measurable indicators include transparency, policy coherence, responsiveness to evidence, coordination efficiency, and equity in service delivery. Thus, ensuring that the health of citizens remains a non-negotiable priority across political cycles, there is a need to have strong governance that transforms good intentions into operational realities.

Given that developing nations have health systems that are often fragile and fragmented, political will and governance in health are non-negotiable dimensions, as they help in determining whether public health programs achieve

sustainable impact or are trapped in cycles of systemic relapse and short-term success [1 - 6].

Political Leadership as a Catalyst for Health Reform

Effective political leadership has the power to transform health systems and drive meaningful reform. Leaders who prioritise health not only shape policy but also inspire national momentum, allocate critical resources, and mobilise cross-sectoral support. Their commitment can elevate health on the political agenda, foster innovation, and push through reforms that otherwise stall in bureaucratic inertia. In many successful global health stories, strong and visionary political leadership has been the defining factor behind progress [1, 2].

1. **Setting the Health Agenda:** Political leaders have the power to set the national health agenda, determining the priorities and focus areas of public health efforts. In Nigeria, where the burden of disease is high and health outcomes are often poor, the importance of a clear and robust health agenda cannot be overstated. Effective political leadership involves not only identifying key health challenges but also articulating a strategic vision for overcoming them. This vision must be rooted in a commitment to universal health coverage, equitable access to care, and the reduction of health disparities across different population groups.
2. **Mobilising Resources and Ensuring Accountability:** One of the most significant roles of political leadership in health is the mobilisation of resources. In many developing nations, healthcare systems suffer from chronic underfunding, which hampers their ability to deliver quality services. Political leaders must advocate for increased investment in health, both from domestic sources and through international partnerships. This includes ensuring that health budgets are adequate and that funds are allocated efficiently and transparently. Moreover, political leaders must establish mechanisms for accountability to prevent corruption and ensure that resources are used effectively to achieve health outcomes.
3. **Health Policy Formulation and Implementation:** Political leadership is crucial in the formulation and implementation of health policies that address the specific needs of the population. In Nigeria, this involves creating policies that are responsive to the diverse health challenges facing the country, from infectious diseases like Tuberculosis, Malaria, and HIV/AIDS to the rising burden of non-communicable diseases. Effective policies must be evidence-based, inclusive, and adaptable to changing circumstances. Political leaders play a key role in ensuring that these policies are not only well-designed but also implemented with the necessary resources, infrastructure, and human capacity.

CHAPTER 2

Poverty and Public Health: Addressing Socio-Economic Barriers

Abstract: This chapter examines the profound influence of poverty on health outcomes in Nigeria and other developing nations. The chapter delves into the interconnectedness of poverty and health, exploring how economic constraints hinder access to healthcare and exacerbate malnutrition, particularly among vulnerable populations. By evaluating the impact of poverty reduction programs and social protection systems, this chapter sheds light on the successes and limitations of current initiatives aimed at improving public health. Additionally, it discusses the importance of empowering communities through economic development as a sustainable solution to break the cycle of poverty and enhance health outcomes. Through a detailed analysis of the socio-economic barriers to health, this chapter provides insights into strategies that can be employed to create a healthier and more equitable society.

Keywords: Economic development, Health inequities, Healthcare access, Malnutrition, Nigeria, Poverty reduction programs, Poverty, Public health, Social protection systems, Socio-economic barriers, Vulnerable populations.

INTRODUCTION

Poverty is one of the most significant determinants of health outcomes in developing countries. The intricate relationship between poverty and public health is a cycle that perpetuates vulnerability, where the poor are disproportionately affected by disease, malnutrition, and lack of access to healthcare. In Nigeria and other developing nations, the socio-economic barriers created by poverty pose immense challenges to achieving universal health coverage and improving overall public health.

According to the World Bank's national-poverty estimates, the proportion of Nigerians living below both national and international poverty lines has risen significantly in recent years; extreme poverty increased from 34.7 per cent in 2018/19 to 41.8 per cent in 2022/23, based on the international poverty line of \$3.00 per person per day (2021 PPPs). These figures reflect economic shocks, high food inflation, and conflict-driven displacement. Additionally, there are sub-

national regional differences within the country. In 2022/23, the poverty rate in the northern region was 57.4 per cent, while in the southern region it was 21.2 per cent, up from 44.7 per cent and 14.9 per cent, respectively, in 2018/19. Globally, Nigeria's under-five and infant mortality rates remain among the highest. The data from UNICEF and the World Bank indicate that under-five mortality stands at approximately 105 per 1,000 live births, with neonatal mortality around 34 per 1,000, well above regional averages, with northern and rural states experiencing disproportionately higher child mortality and malnutrition rates as compared to the southern region [1 - 7].

This chapter delves into the nexus between poverty and health, exploring how economic constraints affect access to healthcare, the impact of malnutrition, and the effectiveness of poverty reduction programs. By examining social protection systems and community empowerment initiatives, this chapter aims to present strategies that can mitigate the adverse effects of poverty on health, ultimately fostering a more equitable and healthy society.

THE NEXUS BETWEEN POVERTY AND HEALTH

The intricate relationship between poverty and health is a central concern in public health, particularly in developing nations like Nigeria. Poverty is not merely an economic condition; it is a multifaceted phenomenon that impacts every aspect of life, including health. The nexus between poverty and health is a vicious cycle where each perpetuates the other, making it a significant barrier to achieving equitable health outcomes [8 - 10]. Income inequality could amplify disease burden through these three mechanisms:

1. **Deprivation of basic amenities:** households with poor income lack food, safe water, sanitation, and access to affordable healthcare, increasing exposure and vulnerability to infectious diseases and malnutrition.
2. **Barrier to accessing preventive care:** out-of-pocket costs and opportunity costs (lost wages, travel time) reduce access and utilisation of antenatal care services, immunisation services, and early treatment of basic ailments.
3. **Social determinants of health:** societal inequality results in weaker social cohesion and psychosocial stress, worse maternal and child health outcomes, and predisposition to chronic diseases.

Empirically, income-inequality metrics (*e.g.*, Nigeria's Gini and poverty gap measures) correlate with lower service coverage and higher child mortality across states; the World Bank's inequality and poverty briefs show Nigeria's persistent Gini and rising poverty rates, which are linked in the literature to poorer population health [2].

Poverty as a Determinant of Health

Poverty is a powerful social determinant of health, shaping exposure to risks, access to care, and overall well-being. It limits access to nutritious food, safe housing, clean water, and healthcare services, while increasing vulnerability to disease and reducing life expectancy. In Nigeria and other Low- and Middle-Income Countries (LMICs), poverty is more than a lack of income; it dictates health outcomes from birth onward. Poor communities are disproportionately affected by infectious diseases such as malaria, tuberculosis, and HIV/AIDS, which thrive in overcrowded settings with inadequate sanitation and limited preventive tools. Poverty also delays or prevents healthcare-seeking due to costs, leading to worse health outcomes. Addressing poverty is therefore essential not only for economic development but also for improving public health and achieving health equity. Some of these consequences include [8]:

1. **Limited Access to Healthcare Services:** Poverty restricts individuals and households from accessing healthcare when they need it most. Many impoverished families cannot afford consultation fees, transportation to health facilities, or the cost of medications. In the absence of functional health insurance systems, out-of-pocket expenditures become catastrophic, often leading to delayed care, self-medication, or complete abandonment of treatment. This results in poor health-seeking behaviour, late presentation of illnesses, and higher mortality rates, especially among children and mothers.
2. **Poor Living Conditions and Environmental Hazards:** Poor communities often reside in overcrowded, poorly ventilated, and unsanitary environments that increase susceptibility to communicable diseases. Lack of access to clean water, proper sanitation, and waste management exposes residents to cholera, typhoid, and parasitic infections. In urban slums and rural settlements, inadequate housing infrastructure and environmental degradation further worsen health outcomes through increased exposure to air pollution, vector-borne diseases, and climate-related health risks.
3. **Nutritional Deficiencies and Food Insecurity:** Poverty is closely tied to undernutrition and food insecurity, which disproportionately affect children and pregnant women. Malnutrition weakens immunity, stunts growth, and increases vulnerability to disease and death. Inadequate diets among the poor often lack essential nutrients, leading to conditions such as anaemia, kwashiorkor, and rickets. Moreover, food insecurity may also contribute to obesity in low-income populations through reliance on cheap, calorie-dense but nutrient-poor foods, creating a paradox of undernutrition and obesity within the same populations.
4. **Educational Inequality and Health Literacy:** Poverty often goes hand-in-hand with low educational attainment, which in turn affects health literacy.

Strengthening Fragile Health Systems

Abstract: This chapter delves into the essential components that constitute a robust health system, emphasising the need for comprehensive reforms in developing nations, particularly Nigeria. It begins by outlining the critical elements of a well-functioning health system, including governance, health financing, workforce, essential medicines, information systems, and service delivery. The chapter then explores the significant infrastructure gaps that hinder healthcare delivery and discusses the opportunities for improvement through investments and public-private partnerships. A detailed analysis of supply chain management highlights the challenges and strategies for ensuring a consistent supply of essential medicines. The importance of health information systems for data-driven decision-making is underscored, followed by an examination of the financing mechanisms needed to sustain health systems. The chapter concludes with a discussion on building resilience in health systems, drawing lessons from past crises to enhance their capacity to respond to future challenges. Overall, this chapter provides a roadmap for policymakers and healthcare providers to strengthen health systems, ensuring they are capable of delivering quality care to all individuals, even in the face of adversity.

Keywords: Developing nations, Essential medicines, Governance, Health systems, Health infrastructure, Health information systems, Health financing, Nigeria, Public-private partnerships, Resilience, Supply chain management.

INTRODUCTION

Health systems form the backbone of any nation's ability to deliver essential services, respond to public health emergencies, and ensure the well-being of its population. In many developing countries, including Nigeria, health systems are often fragile, characterised by weak infrastructure, inadequate financing, poor governance, and limited access to essential medicines and technologies. These vulnerabilities have been further exposed during global health crises, such as the COVID-19 pandemic, highlighting the urgent need for reforms. This chapter explores the various components of a robust health system, identifies existing gaps, and discusses opportunities for strengthening these systems to build resilience and ensure sustainable health outcomes.

COMPONENTS OF A ROBUST HEALTH SYSTEM

A robust health system is the cornerstone of any nation's ability to deliver quality healthcare, respond to public health emergencies, and improve the overall well-being of its population. In developing nations, where health systems are often fragile and under-resourced, understanding the key components of a robust health system is critical for guiding efforts to strengthen these systems and achieve sustainable health outcomes. This section explores the fundamental components that constitute a robust health system, drawing on global best practices and lessons learned from both successful and struggling health systems [1 - 3].

Fig. (1) and Table 1 present the WHO’s six building blocks of a functional health system, contextualised with practical examples from Nigeria. The six components, service delivery, health workforce, information systems, essential medicines, financing, and governance, are critical for sustainable public health. The table helps readers understand how each element interrelates to support the broader system; for instance, efficient health information systems underpin evidence-based policymaking, while an adequate health workforce ensures service accessibility. Through localised examples such as the DHIS2 data platform, the Basic Health Care Provision Fund, and national drug policy initiatives, the table illustrates the current strengths and gaps in Nigeria’s health system. By breaking down complex structural concepts into digestible segments, the table enables readers, especially policy practitioners and health planners, to identify which areas require investment and reform to strengthen resilience and ensure equitable health outcomes.



Fig. (1). Health system building blocks.

Table 1. Health system building blocks.

Building Block	Description	Example in Nigeria
Service Delivery	Quality and availability of health services	Immunization campaigns
Health Workforce	Availability and competence of staff	Community health workers

(Table 1) cont....

Building Block	Description	Example in Nigeria
Health Information Systems	Data collection and use	DHIS2 platform
Essential Medicines	Availability of necessary drugs and equipment	National Drug Policy
Health Financing	Adequate and equitable funding	Basic Health Care Provision Fund
Leadership/Governance	Policy and oversight	National Health Policy

Health Service Delivery

At the heart of any health system is the delivery of health services that are accessible, equitable, and of high quality. Effective health service delivery requires the following elements [1]:

- **Availability of Services:** A strong health system guarantees that essential health services, including preventive, curative, rehabilitative, and palliative care, are accessible to all parts of the population. This encompasses a wide range of services from primary care to specialised medical services, tailored to meet the diverse needs of the community.
- **Accessibility and Equity:** Services must be physically and financially accessible to all, regardless of geographic location, socio-economic status, or cultural background. A strong health system actively addresses barriers to access, such as distance, cost, and discrimination, to ensure that no one is left behind.
- **Quality of Care:** The quality of health services is a critical determinant of health outcomes. A robust health system emphasises the continuous improvement of service quality through the implementation of evidence-based practices, adherence to clinical guidelines, regular training of healthcare providers, and the integration of patient safety measures.
- **Continuity of Care:** Ensuring that patients receive coordinated and uninterrupted care across different levels of the health system, from primary care to tertiary services, is essential for achieving positive health outcomes. This requires effective referral systems, patient tracking, and integration of services across different care settings.

Health Workforce

The health workforce is the backbone of any health system, and its strength is a key determinant of the system's overall performance. Critical aspects of a strong health workforce include [2]:

Education as a Catalyst for Health Improvement

Abstract: This chapter explores the pivotal role of education as a driving force in improving public health. The chapter highlights the interconnectedness between education and health outcomes, emphasizing how health literacy serves as the foundation for public health. It examines the impact of basic education on health, the importance of integrating health education into school curricula, and the role of adult education in community health. Additionally, the chapter discusses the influence of media on health promotion and presents case studies of successful health education initiatives. By demonstrating the transformative power of education, this chapter advocates for increased investment in educational programs as a critical strategy for enhancing public health.

Keywords: School curricula, Adult education, Basic education, Community health, Health literacy, Health outcomes, Health education initiatives, Media in health promotion, Public health.

INTRODUCTION

Education is universally recognised as a critical driver of individual and societal progress. Beyond its intrinsic value, education serves as a powerful tool for improving public health outcomes. This chapter delves into the multifaceted relationship between education and health, illustrating how education serves as a catalyst for health improvement at both the individual and community levels. From basic health literacy to the integration of health education into school curricula, education empowers people to make informed health decisions, promotes healthier behaviours, and fosters environments that support better health outcomes.

HEALTH LITERACY: THE FOUNDATION OF PUBLIC HEALTH

Health literacy is increasingly recognised as a cornerstone of public health, particularly in developing nations like Nigeria, where the burden of disease remains high and access to healthcare services is often limited. Health literacy, broadly defined, is the degree to which individuals can obtain, process, and understand basic health information and services needed to make appropriate

health decisions. It encompasses not only the ability to read and comprehend health-related materials but also the capacity to navigate complex healthcare systems, communicate effectively with healthcare providers, and apply health knowledge in everyday life [1 - 3].

The Importance of Health Literacy

Health literacy is fundamental to achieving positive health outcomes and improving public health. It serves as the foundation upon which individuals and communities can build healthy behaviours, access healthcare services, and engage in preventive health practices. The importance of health literacy can be understood through several key dimensions [1]:

- **Empowerment and Autonomy:** Health literacy empowers individuals by providing them with the knowledge and skills needed to make informed decisions about their health. This includes understanding medical instructions, recognising symptoms of illness, knowing when to seek care, and adhering to prescribed treatments. Empowered individuals are more likely to take control of their health, leading to better health outcomes and reduced healthcare costs.
- **Disease Prevention and Health Promotion:** Individuals with high health literacy are more likely to engage in preventive health behaviors, such as getting vaccinated, practicing safe hygiene, and adopting healthy lifestyles. Health literacy also plays a critical role in disease prevention by enabling individuals to understand risk factors, recognize early signs of illness, and seek timely medical care. By promoting healthy behaviors, health literacy contributes to the overall well-being of communities and reduces the burden of disease.
- **Access to Healthcare Services:** Health literacy is essential for navigating the healthcare system. Individuals with adequate health literacy can more effectively communicate with healthcare providers, understand their rights and responsibilities, and access the services they need. This is particularly important in contexts where healthcare systems are complex and resources are limited. Health literacy helps individuals overcome barriers to care, such as language, cultural differences, and a lack of familiarity with healthcare processes.
- **Health Equity:** Health literacy is closely linked to health equity. Populations with low health literacy are often the most vulnerable, including those with low socio-economic status, limited education, and marginalized communities. These populations are at greater risk of poor health outcomes due to limited access to health information and services. Improving health literacy can help address health disparities by ensuring that all individuals, regardless of their background, have the knowledge and skills needed to make informed health decisions.

- **Cost-Effectiveness:** Health literacy is also associated with cost savings in healthcare. Individuals with high health literacy are less likely to require emergency services, be hospitalized for preventable conditions, or experience medication errors. By improving health literacy, health systems can reduce the financial burden of preventable diseases and improve the efficiency of healthcare delivery.

Challenges in Achieving Health Literacy

Despite its importance, achieving high levels of health literacy remains a significant challenge, particularly in developing nations like Nigeria. Several factors contribute to low health literacy [2]:

- **Educational Barriers:** In many developing countries, access to quality education is limited, particularly in rural and underserved areas. Low levels of general literacy, especially among women and marginalized groups, contribute to low health literacy. Educational systems that do not prioritize health education further exacerbate this issue.
- **Cultural and Linguistic Diversity:** Nigeria is a linguistically and culturally diverse nation, with over 500 languages spoken across the country. This diversity presents challenges in delivering health information that is accessible and understandable to all populations. Health messages that are not culturally sensitive or delivered in a language that individuals can comprehend are less likely to be effective.
- **Complexity of Health Information:** Health information is often complex and difficult to understand, particularly for individuals with low literacy levels. Medical terminology, complicated instructions, and the use of technical language can create barriers to comprehension. Health literacy efforts must focus on simplifying and clarifying health information to make it more accessible.
- **Misinformation and Health Mistrust:** The spread of misinformation, particularly through social media and informal networks, poses a significant challenge to health literacy. Misinformation can lead to harmful health behaviors, such as vaccine hesitancy, and undermine public health efforts. Additionally, mistrust in the healthcare system, fueled by historical and ongoing inequalities, can prevent individuals from seeking accurate health information and care.
- **Resource Constraints:** In many developing nations, health systems are under-resourced and overburdened. Limited funding for health education programs, a shortage of trained health educators, and inadequate infrastructure for delivering health information contribute to low health literacy. Resource constraints also

Insecurity and Public Health: Navigating Conflict Zones

Abstract: This chapter delves into the profound impact of insecurity on public health, particularly in conflict zones. It explores the multifaceted health consequences of conflict and displacement, including the spread of diseases, mental health issues, and the collapse of healthcare infrastructure. The chapter highlights the challenges of delivering healthcare in such dangerous environments, where health workers face significant risks. It also emphasizes the importance of mental health and psychosocial support in crises and examines strategies to protect health workers and maintain health service continuity during crises. The chapter concludes by discussing post-conflict recovery and the rebuilding of health systems, offering insights into creating resilient healthcare frameworks that can withstand the pressures of insecurity.

Keywords: Conflict zones, Crisis management, Displacement, Insecurity, Healthcare delivery, Health system resilience, Health worker protection, Mental health, Psychosocial support, Public health, Post-conflict recovery.

INTRODUCTION

Insecurity, whether from armed conflict, terrorism, or civil unrest, profoundly affects public health, particularly in developing nations. The interplay between insecurity and public health is multifaceted, with direct impacts ranging from physical injuries to long-term psychological trauma, and indirect consequences such as the disruption of healthcare services, displacement of populations, and the breakdown of health systems. In Nigeria, as in many other developing countries, insecurity presents one of the most significant challenges to achieving universal health coverage and improving public health outcomes. This chapter explores the health consequences of conflict and displacement, examines the unique challenges of delivering healthcare in conflict zones, and discusses strategies for protecting health workers, ensuring continuity of services, and rebuilding health systems post-conflict.

THE HEALTH CONSEQUENCES OF CONFLICT AND DISPLACEMENT

Conflict and displacement have profound and far-reaching effects on public health, particularly in developing nations where health systems are already fragile. The breakdown of infrastructure, the disruption of services, and the displacement of populations create a cascade of health challenges that can persist long after the immediate violence has ended. This section explores the various health consequences of conflict and displacement, with a focus on the direct and indirect impacts on individuals and communities [1 - 4].

In Nigeria, there is a large geographically concentrated humanitarian crisis that drives both displacement and worsens health outcomes of the vulnerable population, particularly in the northern region. Based on the IOM's Displacement Tracking Matrix (Round 16, February 2025) figures, there are approximately 1.32 million internally displaced persons (IDPs) in north-west and north-central zones. The figure is more leveraging broader monitoring that includes northeast and other conflict-affected areas, revealing a national figure of between 3.0 - 3.6 million IDPs, a figure that aligns with the UNHCR reports. It is important to mention that conflict and displacement result in acute health consequences, with a surge in acute malnutrition and child mortality in affected states, vaccine-preventable diseases outbreaks, and poor access to reproductive, maternal, and child health services, to mention but a few [1].

Direct Health Impacts of Conflict

The direct health consequences of conflict are often the most visible and immediate, including [1]:

- **Injury and Trauma:** Armed conflict leads to high levels of physical injury and trauma, including gunshot wounds, shrapnel injuries, and fractures. In conflict zones, access to emergency medical care is often limited, exacerbating the severity of these injuries and increasing the likelihood of long-term disability or death.
- **Psychological Trauma:** Conflict exposes individuals, particularly children, to severe psychological stress. Witnessing violence, losing loved ones, and living in constant fear can result in mental health conditions such as post-traumatic stress disorder (PTSD), depression, and anxiety. The lack of mental health services in conflict zones means that these conditions often go untreated, leading to long-term psychological morbidity.
- **Sexual and Gender-Based Violence (SGBV):** Conflict often leads to an increase in sexual violence, including rape, forced prostitution, and sexual

slavery. Women and girls are particularly vulnerable, but men and boys can also be victims. The physical and psychological consequences of SGBV are severe, including trauma, Sexually Transmitted Infections (STIs), and unwanted pregnancies.

Indirect Health Impacts of Conflict

Beyond the immediate injuries and trauma, conflict also creates conditions that lead to a host of indirect health consequences [1, 2]:

- **Disruption of Health Services:** Conflict often destroys health infrastructure, including hospitals, clinics, and supply chains. Health workers may flee or be targeted, leading to a critical shortage of personnel. As a result, essential health services, such as immunizations, maternal care, and chronic disease management, are often interrupted, leading to preventable deaths and the resurgence of infectious diseases.
- **Malnutrition:** Conflict disrupts food production, supply chains, and markets, leading to food shortages and increased food prices. Displaced populations, in particular, may struggle to access sufficient and nutritious food. Malnutrition, especially among children, can lead to stunting, wasting, and increased vulnerability to infectious diseases.
- **Spread of Infectious Diseases:** Conflict exacerbates the spread of infectious diseases due to overcrowded living conditions, poor sanitation, and lack of access to clean water. Displaced populations living in camps or informal settlements are particularly at risk for outbreaks of diseases such as cholera, measles, and respiratory infections. Additionally, the breakdown of immunisation programs can lead to the resurgence of vaccine-preventable diseases.

Health Consequences of Displacement

Displacement, whether internal or across borders, brings its own set of health challenges. The forced movement of people from their homes disrupts their lives and places them in precarious situations where their health and well-being are compromised [1 - 3].

- **Living Conditions in Refugee Camps:** Refugee camps and internally displaced persons (IDP) settlements are often overcrowded and lack basic amenities such as clean water, sanitation, and adequate shelter. These conditions create a breeding ground for communicable diseases and exacerbate existing health conditions. The lack of privacy and security also increases the risk of sexual and gender-based violence.

CHAPTER 6

The Human Resources Crisis: Building a Sustainable Health Workforce

Abstract: The health workforce is a critical pillar of any functional health system, especially in developing nations like Nigeria, where shortages, inequitable distribution, and brain drain are prevalent. Chapter 6 explores the multifaceted challenges of the human resources crisis in the health sector, focusing on the causes and consequences of workforce shortages, training and capacity-building efforts, and strategies to retain skilled health workers. It also examines the role of community health workers in bridging service delivery gaps and offers policy recommendations for strengthening the health workforce. The chapter underscores the need for a coordinated approach to build a sustainable and resilient health workforce, crucial for achieving universal health coverage and improving public health outcomes in Nigeria and beyond.

Keywords: Brain drain, Capacity building, Community health workers, Developing nations, Health system, Health workforce, Human resources, Nigeria, Retention strategies, Workforce distribution.

INTRODUCTION

The health workforce is the backbone of any healthcare system, playing a pivotal role in delivering essential health services and ensuring the overall functioning of the health sector. In many developing nations, including Nigeria, the health workforce faces a myriad of challenges that undermine its ability to meet the population's health needs. This chapter delves into the human resources crisis in the health sector, exploring the causes and consequences of workforce shortages, strategies for training and capacity building, and approaches to retain and equitably distribute health workers. The chapter also highlights the critical role of community health workers in bridging service delivery gaps and offers policy recommendations to build a sustainable health workforce.

THE HEALTH WORKFORCE SHORTAGE: CAUSES AND CONSEQUENCES

The shortage of health workers is one of the most critical challenges facing health systems, particularly in developing nations like Nigeria. This crisis not only

hampers the delivery of essential health services but also exacerbates existing health disparities, leaving the most vulnerable populations without access to care. The WHO benchmark of 4.45 health workers per 1,000 people is not an easy target for Nigeria and many sub-Saharan African countries. In Nigeria, according to the World Bank, there are approximately 1.682 nurses and midwives per 1,000 people in 2022, an indication of a deep and multi-layered human resources for health crisis [1]. The available NHWA (National Health Workforce Accounts) indicate severe shortages of medical doctors, nurses, and midwives in Nigeria. The projected workforce modelling suggests a needs-based shortfall in Africa of several million health workers by 2030, and regional analyses highlight that Nigeria will require large-scale production and retention to close its gap [2]. Understanding the causes of the health workforce shortage and its far-reaching consequences is essential for developing effective strategies to address this issue [1, 2].

CAUSES OF HEALTH WORKFORCE SHORTAGE

Several factors contribute to the health workforce shortage, each intersecting with broader socio-economic and political dynamics. Some of these include [1, 2]:

1. Insufficient Training Capacity:
 - **Educational Bottlenecks:** Many countries cannot train a sufficient number of health professionals. Medical, nursing, and allied health schools are often underfunded, poorly equipped, and suffer from a shortage of qualified instructors. This limits the number of new graduates entering the workforce each year.
 - **Curriculum Misalignment:** In some cases, health education curricula do not align with the needs of the health system, resulting in graduates who are not adequately prepared for the realities of clinical practice or public health challenges in their communities.
2. Migration of Health Workers:
 - **Brain Drain:** The migration of health workers to more developed countries in search of better working conditions, higher salaries, and professional opportunities significantly depletes the health workforce in developing nations. This “brain drain” leaves countries like Nigeria with a severe shortage of skilled professionals.
 - **Regional Disparities:** Within countries, health workers often migrate from rural to urban areas, exacerbating the shortage in already underserved regions. The lack of incentives to work in rural or remote areas further fuels this internal migration.

3. Poor Working Conditions:
 - **Inadequate Infrastructure:** Health workers in many developing countries face poor working conditions, including inadequate infrastructure, a lack of essential supplies, and unsafe environments. These conditions contribute to job dissatisfaction and high attrition rates.
 - **Low Compensation:** Many health workers are underpaid, with salaries that do not reflect the demands and risks of their work. Inconsistent or delayed payment of salaries further demoralizes the workforce and drives many to seek alternative employment or migrate abroad.
4. Policy and Governance Challenges:
 - **Weak Health Governance:** Ineffective health governance, including poor workforce planning, a lack of data on workforce needs, and insufficient investment in human resources, undermines efforts to build a sustainable health workforce.
 - **Inadequate Health Financing:** Limited financial resources allocated to health systems often result in insufficient funding for health worker recruitment, training, and retention. This financial constraint further exacerbates the workforce shortage.
5. Health System Strain:
 - **Epidemics and Crises:** Public health emergencies, such as the COVID-19 pandemic, Ebola outbreaks, or natural disasters, place additional strain on the health workforce. These crises can lead to overwork, burnout, and increased mortality among health workers, further depleting the workforce.
 - **Population Growth:** Rapid population growth in many developing countries increases the demand for health services, which outpaces the growth of the health workforce. This results in higher patient-to-provider ratios and overburdened health workers.

Consequences of Health Workforce Shortage

The shortage of health workers has profound and far-reaching consequences for public health, socio-economic development, and global health security. The following consequences are worth noting [1]:

1. Compromised Health Service Delivery:
 - **Reduced Access to Care:** A shortage of health workers leads to reduced access to healthcare, particularly in rural and underserved areas. This can result in delayed treatment, unmet health needs, and an increase in preventable morbidity and mortality.
 - **Overburdened Health Workers:** Health workers in areas with severe shortages often face overwhelming workloads, leading to burnout, decreased

CHAPTER 7

Immunisation and Disease Prevention: Overcoming Coverage Gaps

Abstract: Immunisation remains one of the most effective public health interventions, yet in Nigeria, significant gaps in coverage persist, leaving millions vulnerable to preventable diseases. This chapter examines the current state of immunisation in Nigeria, highlighting the challenges that hinder widespread coverage, including cultural, economic, and geographical barriers. It explores strategies for reaching zero-dose children, emphasising the importance of integrating immunisation efforts with other health services. Additionally, the chapter discusses the role of disease surveillance and early detection systems in preventing outbreaks. By analysing success stories and best practices, this chapter offers insights into overcoming the barriers to achieving high immunisation coverage in Nigeria and other developing nations.

Keywords: Cultural barriers, Disease surveillance, Disease prevention, Geographical barriers, Health integration, Immunisation coverage, Nigeria, Public health, Vaccination strategies, Zero-dose children.

INTRODUCTION

Immunisation is one of the most cost-effective public health interventions, significantly reducing morbidity and mortality from preventable diseases. In Nigeria, however, immunisation coverage remains suboptimal, with wide disparities across regions and socio-economic groups. Despite global and national efforts, the country continues to struggle with low vaccination rates, particularly among “zero-dose” children who have not received any vaccines. This chapter explores the current state of immunisation in Nigeria, identifies the barriers to achieving comprehensive coverage, and discusses strategies to overcome these challenges. It also highlights the importance of integrating immunisation with other health services and examines successful case studies that have led to improved immunisation rates in similar contexts.

In Nigeria, routine immunisation coverage remains sub-optimal, incomplete, and often uneven across the states. The most recent national statistics on RI show an estimated coverage for key infant vaccines as BCG 74%, DTP3 56%, MCV1

60%, and PCV3 52% (latest WUENIC/WHO country profile). However, aggregating the data reveals wide subnational inequities and a substantial percentage of children who have not received even a single dose of a DTP-containing vaccine, tagged as zero-dose. The huge percentage of the zero-dose children, with estimates ranging from ~1.2 million (administrative) up to >2.2 million (WUENIC/UNICEF modelling), ranked Nigeria as one of the largest zero-dose populations in the world, most of whom are in the underserved population of the northern region [1].

THE STATE OF IMMUNISATION COVERAGE IN NIGERIA

Immunisation is one of the most cost-effective public health interventions, playing a crucial role in reducing mortality and morbidity from vaccine-preventable diseases. In Nigeria, however, achieving comprehensive immunisation coverage remains a significant challenge. Despite efforts to strengthen immunisation programs, the country continues to face substantial gaps in coverage, particularly among rural and marginalised populations. This section explores the current state of immunisation coverage in Nigeria, highlighting the progress made, the challenges that persist, and the implications for public health [2 - 4].

Progress in Immunisation Coverage

Over the past few decades, Nigeria has made considerable strides in expanding access to immunisation services. Despite these achievements, Nigeria's immunisation coverage remains uneven, with significant disparities between regions, states, and socio-economic groups. Key achievements include [2 - 4]:

1. **Introduction of New Vaccines:** Nigeria has introduced several new vaccines into its national immunisation program, including the pentavalent vaccine, which protects against five major diseases (diphtheria, tetanus, pertussis, hepatitis B, and *Haemophilus influenzae* type b), and the rotavirus vaccine, which prevents severe diarrhoea in children.
2. **Expanded Program on Immunisation (EPI):** The Expanded Program on Immunisation (EPI) in Nigeria has been instrumental in increasing vaccine coverage rates. The program has focused on reaching children under five years of age with essential vaccines, including those for measles, polio, and tuberculosis.
3. **Polio Eradication Efforts:** Nigeria's efforts to eradicate polio have been particularly noteworthy. The country was declared free of wild poliovirus in 2020, a significant public health milestone achieved through intense vaccination campaigns and surveillance.

4. **Strengthened Routine Immunisation:** Routine immunisation services have been strengthened through initiatives such as the National Immunisation Plus Days (NIPDs) and the introduction of the Reaching Every Ward (REW) strategy, which aims to improve vaccine delivery at the local level.

Current Coverage Levels

Nigeria's immunisation coverage levels vary widely, with national averages masking substantial regional differences. According to the 2023/24 NDHS data [2 - 4], there is a wide variation between the six geopolitical regions as highlighted below:

1. **National Coverage Rates:** The 2023 National Demographic and Health Survey (NDHS) report shows that, overall, 39% of children aged 12–23 months are fully vaccinated with basic antigens. Nationally, coverage rates for key vaccines such as DPT-HepB-Hib and measles remain below the recommended 90% threshold. The 2023/24 NDHS reported that sixty-seven per cent of children aged 12–23 months received the BCG vaccine, 53% received the third dose of DPT-HepB-Hib, 46% received the third dose of OPV, and 51% received a dose of measles vaccine.
2. **Regional Disparities:** Immunisation coverage is significantly higher in the southern regions of Nigeria compared to the northern regions. For example, while the south-south region has achieved a coverage rate above 60%, the north-central region reported a coverage as low as 30%.
3. **Urban-Rural Divide:** There is a pronounced urban-rural divide in immunisation coverage, with children in urban areas more likely to be fully immunised than those in rural areas. This disparity is driven by factors such as better access to health services in urban centres and higher levels of education and awareness among urban populations.
4. **Socio-Economic Factors:** Immunisation coverage is also influenced by socio-economic factors. Children from wealthier households are more likely to be fully vaccinated than those from poorer households. Additionally, maternal education plays a critical role, with children of mothers who have secondary or higher education being more likely to receive complete vaccinations.

Challenges to Achieving Full Coverage

Several challenges continue to hinder the achievement of full immunisation coverage in Nigeria. Some of these include [2 - 4]:

1. **Inadequate Health Infrastructure:** Many parts of Nigeria, particularly in the northern and rural areas, suffer from inadequate health infrastructure. Health

CHAPTER 8**Tackling Corruption and Improving Accountability in Public Health**

Abstract: Corruption within the public health sector is a significant barrier to achieving equitable and effective healthcare, particularly in developing nations like Nigeria. This chapter examines the pervasive impact of corruption on health outcomes, demonstrating how misallocation of resources, embezzlement, and lack of transparency compromise the delivery of essential health services. The chapter explores the importance of transparency in health budgets and expenditures as a critical measure to combat corruption, highlighting the need for robust monitoring and evaluation systems to ensure accountability. Additionally, the role of civil society and community participation in health governance is discussed as a means of strengthening public oversight and enhancing accountability mechanisms. The chapter also delves into the legal and institutional frameworks necessary to combat corruption in the health sector, offering case studies of successful anti-corruption initiatives that provide valuable lessons for other contexts. Ultimately, this chapter underscores the urgent need for comprehensive reforms to tackle corruption and build a more accountable and transparent public health system in Nigeria and other developing nations.

Keywords: Anti-corruption initiatives, Accountability, Civil society participation, Corruption, Health governance, Legal frameworks, Monitoring and evaluation, Nigeria, Public health, Transparency.

INTRODUCTION

Corruption is a pervasive challenge in many sectors, and public health is no exception. It undermines the efficiency of health systems, distorts health priorities, and ultimately compromises the delivery of essential services. In developing nations, where resources are already limited, corruption exacerbates inequalities, disproportionately affecting the most vulnerable populations. In the health sector, it undermines service delivery by diverting scarce resources and eroding public trust. The WHO estimates that, globally, up to US\$500 billion of health spending is lost annually to inefficiencies and corrupt practices, equivalent to 6–7 per cent of total health expenditure [1, 2].

The term ‘Corruption’ could be referred to as the misuse of entrusted power for personal gain, and one of the ways to checkmate corruption in the health sector is by institutionalising ‘Transparency’ and ‘Accountability.’ The term ‘Transparency’ refers to the openness and accessibility of information, whereas ‘Accountability’ refers to the obligation of public officials to justify actions and accept responsibility [1 - 3]. The impact in Nigeria and other Low- and Middle-Income Countries (LMICs) is even severe, translating into preventable deaths, stockouts of drugs and other hospital consumables, and persistent under-performance of public health programmes. It is important to note that corruption in the health sector occurs at multiple levels. It is best understood through clear typologies, allowing targeted prevention and accountability mechanisms.

This chapter explores the multifaceted impact of corruption on health outcomes, highlighting the urgent need for transparency, accountability, and robust governance structures in the public health sector.

THE IMPACT OF CORRUPTION ON HEALTH OUTCOMES

Corruption is a pervasive issue that undermines the effectiveness of public health systems worldwide, particularly in developing nations like Nigeria. It diverts scarce resources, erodes trust in public institutions, and exacerbates health inequalities, ultimately leading to poorer health outcomes. Understanding the impact of corruption on health is crucial for devising strategies to combat it and improve public health [4 - 6].

Table 1 identifies major areas within the health system where corruption risks are most prevalent: procurement, human resources, service delivery, and financing. By mapping specific vulnerabilities, such as bribery during drug procurement or ghost workers on payrolls, the table helps illuminate how systemic inefficiencies are perpetuated by unethical practices. Each corruption point is linked to tangible impacts, like drug shortages or the collapse of patient trust. This clear mapping of corruption risks serves as a foundation for targeted reforms and policy responses. It advocates for greater transparency, robust oversight, and institutional checks across vulnerable functions. Furthermore, it positions anti-corruption as a health issue, not merely an administrative one, by illustrating how corrupt practices directly undermine service quality, financial integrity, and ultimately, population health outcomes.

Resource Diversion and Its Consequences

Corruption often leads to the misallocation and diversion of resources intended for healthcare, severely hampering the delivery of essential services. This diversion can occur at multiple levels, from the misappropriation of funds by high-level

officials to the theft of medical supplies by lower-level staff. These dire consequences include [4]:

Table 1. Corruption risk points in the health system.

Health System Component	Corruption Risk	Potential Impact
Procurement	Bribery, overpricing	Shortage of drugs and supplies
Human Resources	Ghost workers, favoritism	Inefficiency, low morale
Service Delivery	Informal payments	Reduced access, inequity
Finance	Misallocation of funds	Program failure, underfunding

1. **Reduced Access to Care:** When funds allocated for health infrastructure, equipment, and medicines are siphoned off, the availability and quality of healthcare services diminish. This can result in the closure of health facilities, shortages of essential drugs, and the deterioration of healthcare infrastructure, leaving communities, particularly the most vulnerable, with limited or no access to care.
2. **Increased Out-of-Pocket Costs:** Corruption often forces patients to pay out-of-pocket for services and medications that should be free or subsidised. These illegal payments, often in the form of bribes, disproportionately affect the poor, who may be unable to afford care, leading to delayed treatment, worsening of conditions, or even death.
3. **Wastage and Inefficiency:** Corruption fosters inefficiency within the health system, as funds are diverted from their intended purposes. This inefficiency results in the wastage of resources, such as the procurement of substandard or unnecessary medical supplies, and contributes to a lack of accountability in the management of public health funds.

Erosion of Trust in Public Institutions

Corruption undermines public trust in health systems and institutions, a critical component of effective healthcare delivery. When people perceive the health system as corrupt, they are less likely to seek care, follow medical advice, or participate in public health initiatives, such as immunisation campaigns [4].

1. **Distrust in Healthcare Providers:** When corruption is rampant, patients may lose trust in healthcare providers, fearing that their care is compromised by the providers' pursuit of illicit gains. This distrust can lead to reluctance in seeking care, self-medication, or turning to unqualified practitioners, all of which can have detrimental effects on health outcomes.

Innovations in Public Health

Abstract: This chapter explores the transformative role of innovation in public health, focusing on case studies from Nigeria and other developing nations. It highlights how technological advancements, public-private partnerships, community-driven initiatives, and mobile health services have reshaped healthcare delivery, making it more accessible, efficient, and effective. The chapter also examines innovative financing mechanisms that have enabled the scaling of health interventions and presents key lessons from successful public health innovations. These insights offer valuable guidance for policymakers, practitioners, and stakeholders aiming to improve health outcomes in resource-constrained settings.

Keywords: Community-driven health initiatives, Case studies, Developing countries, Healthcare delivery, Innovative financing, Mobile health, Nigeria, Public health innovation, Public-private partnerships, Technological advancements.

INTRODUCTION

In public health, innovation extends beyond technology; it encompasses new approaches, partnerships, and financing models that solve persistent health challenges in more effective and sustainable ways. In Nigeria and other developing nations, innovations are bridging long-standing gaps in access, data visibility, financing, and workforce distribution. Innovation is the lifeblood of progress, and nowhere is this more evident than in the field of public health. In Nigeria and other developing nations, the need for creative solutions to overcome entrenched health challenges has never been more urgent. From technological advancements to novel financing mechanisms, innovative approaches are reshaping the landscape of healthcare delivery, making it more accessible, efficient, and effective. This chapter explores a range of innovations that have been instrumental in addressing public health challenges in Nigeria and beyond. It delves into the role of technology, public-private partnerships, community-driven initiatives, and mobile health services in revolutionising healthcare. It highlights both technological and community-driven innovations, showing how they contribute to health-system transformation when embedded within supportive

governance and accountability frameworks. The chapter also examines innovative financing mechanisms that have enabled the scaling of health interventions and draws lessons from successful public health innovations that can be applied in other contexts [1, 2].

TECHNOLOGICAL INNOVATIONS IN HEALTHCARE DELIVERY

Technological innovations have the potential to revolutionise healthcare delivery, making it more efficient, accessible, and responsive to populations' needs. This section explores key technological innovations in healthcare delivery, focusing on successful case studies from Nigeria and other regions. Highlighting these innovations aims to illustrate how technology can address critical public health challenges and improve health outcomes [1, 2]. Undoubtedly, digital transformation has reshaped how health services are delivered, monitored, and financed. Recent advances in Nigeria illustrate the growing impact of telemedicine, mobile health (mHealth), and drone technology on access and efficiency [3 - 5].

Table 1 showcases some innovative public health interventions successfully piloted or implemented in Nigeria. Each innovation, ranging from mobile health apps to drone deliveries of medical supplies, is described alongside its sponsor and observed outcomes. This structured presentation underscores the diversity of approaches being deployed to bridge healthcare access gaps and improve service efficiency. By capturing both government-led and private-sector-driven initiatives, the table illustrates how innovation thrives at the intersection of need, technology, and collaboration. The examples reinforce that scalable success is often rooted in context-appropriate solutions, like task-shifting to community pharmacies or leveraging mobile technology in remote regions. The table ultimately invites policymakers to institutionalise and scale these innovations while fostering a supportive environment for experimentation and adaptive learning.

Table 1. Selected Public Health Innovations.

Innovation	Description	Examples	Impact/Outcome
mHealth Apps (by NGOs, MOH)	Use of mobile apps for health messaging	The <i>mTRAC</i> and <i>CommCare</i> platforms enable community health workers to report data in real time.	Increased awareness
Telemedicine (by the private sector)	Remote diagnosis and treatment	<i>Dokita247</i> and <i>CribMD</i> provide remote consultations and e-prescriptions through mobile platforms.	Improved rural access

(Table 1) cont....

Innovation	Description	Examples	Impact/Outcome
Artificial Intelligence (AI) and Data Analytics	Real-time disease surveillance across national and subnational levels.	NCDC's use of predictive models for outbreak detection through the <i>Surveillance Outbreak Response Management and Analysis System (SORMAS)</i> and DHIS2 integration.	Enables faster response to infectious disease alerts and resource optimisation.
Community Pharmacies (by Govt., NAFDAC)	Task-shifting to licensed pharmacies	<i>Community Pharmacy Scheme</i> to improve access to essential health services in urban and peri-urban communities.	Improved drug access
Drone Delivery (by private firms)	Medical supply delivery to remote areas	<i>Zipline</i> (in Ghana and Kaduna State, Nigeria) delivers vaccines and blood products to hard-to-reach areas.	Faster response

Telemedicine and Digital Health Platforms

Telemedicine and digital health platforms have emerged as transformative tools in healthcare delivery, particularly in underserved and remote areas. These technologies facilitate remote consultations, diagnostics, and treatment, bridging the gap between patients and healthcare providers [1 - 5].

Case Study: Telemedicine Initiative in Nigeria

Background: The telemedicine initiative in Nigeria, spearheaded by various organisations, including the government and private sector partners, aims to improve healthcare access in remote and underserved regions.

Key Features:

- 1. Remote Consultations:** Telemedicine platforms enable patients to consult with healthcare providers remotely via video calls, reducing the need for travel and minimising the strain on local healthcare facilities.
- 2. Integrated Health Records:** Digital health platforms often include electronic health records (EHR) systems that store patient information securely and allow seamless data sharing between healthcare providers.
- 3. Specialised Services:** Telemedicine services in the country include specialised consultations in areas such as cardiology, dermatology, and mental health, addressing gaps in local expertise.

Impact: The telemedicine initiative has improved healthcare access for individuals in remote areas, reducing travel times and associated costs. It has also enhanced the capacity of local health workers by providing them with access to specialist consultations and continuing education.

The Road Ahead: Strategies for Sustainable Health Transformation

Abstract: This chapter provides a comprehensive roadmap for sustainable health transformation in Nigeria and other developing nations. It emphasises the need for evidence-based policy recommendations, robust international partnerships, and the strengthening of health systems to tackle current and future public health challenges. The chapter aligns health transformation efforts with the Sustainable Development Goals (SDGs), particularly SDG 3. It explores the future of public health in the context of technological advancements, demographic changes, and environmental challenges. Finally, it calls for collective action across all sectors to mobilise for health transformation, ensuring that health gains are sustained for future generations.

Keywords: Collective Action, Future of Public Health, Health systems strengthening, Health Equity, International partnerships, Public health policy, Sustainable health transformation, Sustainable Development Goals (SDGs).

INTRODUCTION

As Nigeria and other developing nations navigate the complexities of public health, the journey toward sustainable health transformation is both challenging and promising. The road ahead demands a holistic approach that integrates policy innovation, international collaboration, and community engagement. The chapter explores the strategies necessary for sustaining the gains made in public health, strengthening health systems, and preparing for future challenges. It emphasises the importance of aligning with global health agendas, such as the SDGs, and mobilising all sectors of society to ensure that health transformation is not only achieved but sustained.

This concluding chapter summarises the lessons from the previous chapters. It distils lessons from the preceding chapters and emphasises that achieving sustainable health transformation in Nigeria and similar developing countries relies on the following:

- **Strong Governance and political will** that align policy with accountability.
- **Poverty reduction measures** and inclusive social protection mechanisms.
- **Strong, resilient health systems** anchored on infrastructure, workforce, and financing reforms.
- **Security, equity, and transparency**, ensuring health for all, even in fragile contexts.
- **Innovation and partnerships** that accelerate impact through technology and collaboration.

These insights once again reaffirmed that health transformation is not a linear journey but a continuous cycle of learning, adapting, and reinforcing systemic resilience.

Fig. (1) is a flowchart of the Roadmap to Health Transformation. It outlines a systematic pathway from policy formulation to measurable health outcomes. It begins with Policy Design and Strategic Planning, which lays the foundational vision and priorities for the health system. This leads to Stakeholder Engagement and Partnerships, ensuring inclusive collaboration across government agencies, communities, civil society, and the private sector. Resource Mobilisation and Sustainable Funding follows, highlighting the importance of securing and efficiently utilising financial, human, and material resources. At the core of operationalisation are Governance Structures and Institutional Capacity, which enable transparent coordination and resilient leadership. These elements feed into Program Implementation and Service Delivery, where interventions are rolled out, followed by Monitoring, Evaluation, and Accountability to assess performance and guide improvement. The outcome is Health Outcomes and Impact, which reflects the effectiveness and equity of the health transformation agenda.

Interwoven throughout the roadmap are essential cross-cutting enablers that sustain and amplify progress at every stage. Governance and Leadership provide vision, legitimacy, and coordination. Funding and Financial Sustainability ensure continuity and responsiveness in health interventions. Partnerships and Collaboration leverage multisectoral inputs and shared ownership, while Transparency and Accountability reinforce trust, drive results, and reduce inefficiencies. Together, these enablers create a robust ecosystem for achieving transformational change in health systems, particularly in low- and middle-income contexts.



Fig. (1). Flowchart showing the roadmap to health transformation.

POLICY RECOMMENDATIONS FOR HEALTH TRANSFORMATION

The transformation of health systems in Nigeria and other developing nations requires comprehensive and well-coordinated policy interventions. Sustainable health transformation is not only about immediate improvements in health outcomes but also about creating a resilient system that can adapt to future challenges [1, 2].

This section outlines key policy recommendations and action steps that are essential for achieving sustainable health transformation, focusing on governance,

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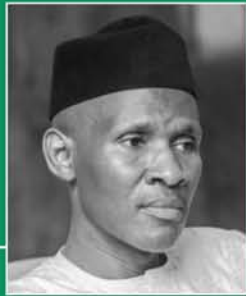
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