

The Roles of public health worker

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ABSTRACT

This seminar paper examined the role of public health workers in disease prevention and highlighted their importance in promoting and protecting community health. Public health workers play a critical role in reducing the spread of communicable and non-communicable diseases through activities such as disease surveillance, vaccination programmes, health education, environmental sanitation, policy advocacy, and community mobilisation. The seminar was motivated by the growing global health challenges facing societies today, particularly the lessons learned from the COVID-19 pandemic and the increasing burden of preventable diseases worldwide. The study adopted a qualitative, literature-based methodology using secondary sources such as textbooks, peer-reviewed journal articles, reports from the World Health Organization, and other credible public health publications. Relevant materials were carefully selected and analysed to provide a broad understanding of the functions, contributions, and challenges of public health workers in disease prevention. Findings from the seminar revealed that public health workers are essential to effective healthcare systems because they focus on prevention rather than treatment alone. The study further revealed that despite their importance, public health workers continue to face numerous challenges, including inadequate funding, workforce shortages, burnout, weak health infrastructure, misinformation, and limited public trust. The seminar also identified emerging innovations in public health practice such as digital health technologies, artificial intelligence, precision public health, and the One Health approach. The seminar concluded that strengthening the public health workforce is necessary for improving disease prevention efforts, promoting health equity, and building resilient healthcare systems. It recommended increased investment in public health programmes, continuous training of public health workers, improved surveillance systems, stronger community engagement, and better policy support for preventive healthcare initiatives.

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I. INTRODUCTION

Public health is one of the most fundamental pillars of any functioning society. At its core, public health is about protecting and improving the health of entire communities rather than focusing solely on the care of individual patients. Central to this mission are public health workers; a broad and diverse group of professionals who dedicate their careers to preventing disease, prolonging life, and promoting good health across populations. From epidemiologists tracking the spread of infectious diseases to community health educators raising awareness about non-communicable conditions, public health workers serve as the first line of defence between communities and the threats that endanger their wellbeing.

Disease prevention, which sits at the heart of public health practice, has become increasingly important in the twenty-first century. The global burden of disease continues to evolve rapidly, with rising rates of non-communicable diseases (NCDs) such as diabetes, cardiovascular disease, and cancer occurring alongside persistent threats from infectious diseases including tuberculosis, malaria, HIV/AIDS, and, most recently, novel pathogens such as SARS-CoV-2. According to the World Health Organization (WHO,2023), approximately 74% of global deaths are attributable to non-communicable diseases, yet many of these deaths are preventable through timely interventions, behavioural change, and strong health systems. This reality underscores the critical importance of public health workers in identifying risk factors, designing interventions, and mobilising communities to act.

The COVID-19 pandemic, which swept across the world beginning in late 2019 and continuing into subsequent years, offered a vivid and often sobering illustration of what happens when public health infrastructure is strained. It also highlighted the extraordinary value of public health workers — contact tracers, vaccinators, health educators, surveillance officers, and policy advisors — all working in concert to contain a

disease that had no boundaries of geography, class, or status. Nations with robust public health systems and well-resourced public health workforces were generally better equipped to manage the crisis, protect vulnerable populations, and implement evidence-based responses (Shadmi et al., 2020).

Despite this importance, public health workers remain among the least recognised cadre of health professionals in many countries, particularly in low- and middle-income nations. Limited funding, inadequate training, poor working conditions, and insufficient staffing continue to hamper the effectiveness of public health systems globally. Recognising and understanding the role of public health workers is therefore not merely an academic exercise; it is a matter of urgent practical significance for health policy, resource allocation, and the future resilience of health systems worldwide.

This seminar paper explores the multifaceted roles of public health workers in disease prevention. It examines how these professionals contribute to surveillance and monitoring, health education and promotion, policy formulation, community engagement, vaccination programmes, and emergency response. The paper further draws on recent literature to discuss the challenges public health workers face and the strategies that can strengthen their capacity to prevent disease effectively. By the end of this seminar, it is hoped that participants will have a deeper appreciation of the breadth and depth of public health work, and will be inspired to advocate for greater investment in public health systems and the workforce that sustains them.

Aim and Objectives of the Seminar

The overarching aim of this seminar is to provide a comprehensive understanding of the roles that public health workers play in the prevention of disease, with a view to highlighting both their contributions and the challenges they encounter in practice.

The specific objectives of this seminar are as follows:

1. To define the concept of public health and examine the scope of disease prevention within the public health framework.
2. To identify and describe the various categories of public health workers and the distinct functions they perform in disease prevention.
3. To explore the key strategies and interventions through which public health workers contribute to reducing the burden of communicable and non-communicable diseases.
4. To examine the challenges and barriers that public health workers face in effectively carrying out their disease prevention roles, including resource constraints, health inequities, and workforce shortages.
5. To discuss emerging trends, innovations, and best practices that are shaping the future of public health work and disease prevention globally.

Significance of the Seminar

The significance of this seminar cannot be overstated, particularly in an era marked by complex and evolving public health threats. Understanding the role of public health workers is valuable not only for students and practitioners in the health sector, but also for policymakers, community leaders, and the general public who stand to benefit from stronger disease prevention systems.

First and foremost, this seminar contributes to filling a critical knowledge gap. While clinical medicine receives considerable attention in academic and public discourse, the preventive dimensions of health — and the workforce responsible for them — are often underexplored. By dedicating a structured academic forum to this topic, the seminar elevates public health work to the level of visibility it deserves.

Secondly, the seminar is significant in its timing. The aftermath of the COVID-19 pandemic has created a unique window of opportunity to re-imagine and reinvest in public health systems. Globally, governments, health organisations, and civil society are grappling with questions about how to build more resilient health systems, and the public health workforce is central to any meaningful answer. This seminar contributes to that conversation by providing evidence-based insights and fostering informed discussion.

Thirdly, the seminar holds particular significance for students entering or advancing in the health professions. For aspiring public health workers, understanding the breadth of their potential roles and responsibilities is essential for professional development and career planning. The seminar helps participants develop a critical perspective on public health practice and prepares them to contribute meaningfully to disease prevention efforts in their communities and beyond.

Finally, the seminar is significant from a policy perspective. By articulating the essential functions of public health workers and documenting the challenges they face, the seminar provides a platform for advocating for policy changes — such as increased funding for public health programmes, improved workforce training, and better working conditions for public health professionals — that can translate into tangible improvements in population health outcomes.

Motivation for the Seminar

The motivation for organising this seminar arose from several interconnected observations and concerns. The most immediate catalyst was the profound lessons

Offered by the COVID-19 pandemic. The pandemic laid bare both the critical importance of public health workers and the dire consequences of years of underinvestment in public health infrastructure. Watching contact tracers, vaccinators, health communicators, and surveillance officers struggle to contain a rapidly spreading virus with limited resources and support was both illuminating and deeply troubling. It became clear that society had long taken the work of public health professionals for granted, and that this neglect carried a heavy human cost (Haldane *et al.*, 2021).

Beyond the pandemic, the broader epidemiological landscape also served as a powerful motivating force. The growing burden of non-communicable diseases — conditions that are largely preventable through lifestyle modification, early detection, and community-level interventions — represents a public health emergency in slow motion. Yet the public health workforce, who is best positioned to address these conditions through preventive action, remains underfunded and understaffed in many parts of the world. This disconnect between the scale of the problem and the resources devoted to its solution is both alarming and motivating.

There is also a deeply human motivation at the heart of this seminar. Public health workers often operate in the background, rarely receiving the recognition that frontline clinicians do, even when their work prevents thousands or millions of people from becoming sick in the first place. A vaccination campaign that prevents a measles outbreak, a health education programme that reduces smoking rates, or a water sanitation initiative that eliminates a source of cholera — these are victories that save lives, yet they are rarely celebrated. This seminar is, in part, a tribute to the public health workers who carry out this vital work every day, often under difficult circumstances and without adequate acknowledgement.

Additionally, the motivation for this seminar is rooted in an academic commitment to interdisciplinary learning. Disease prevention is not a purely biomedical concern; it is shaped by social, economic, political, cultural, and environmental factors. Engaging with the literature on public health workers means engaging with a rich and complex body of knowledge that draws from epidemiology, sociology, anthropology, political science, health economics, and beyond. This seminar provides an opportunity to explore this rich intellectual terrain and to develop a more holistic understanding of health and disease.

Scope of the Seminar

This seminar paper covers a broad but carefully defined range of topics related to the role of public health workers in disease prevention. The scope is designed to be comprehensive enough to capture the complexity of the subject while remaining focused enough to allow for meaningful depth of analysis.

Geographically, the seminar adopts a global perspective, drawing on examples, data, and case studies from diverse regions of the world, including sub-Saharan Africa, South and Southeast Asia, Europe, and the Americas. Special attention is given to the context of low- and middle-income countries, where the burden of disease is often highest and the public health workforce faces the most acute challenges. Where relevant, specific attention is paid to the Nigerian and West African context, given the setting of this seminar.

Thematically, the seminar covers six broad areas: the conceptual foundations of public health and disease prevention; the roles and responsibilities of different categories of public health workers; the key strategies and interventions used in disease prevention; the structural and systemic challenges that constrain public health work; emerging trends and innovations in the field; and policy recommendations for strengthening the public health workforce.

In terms of diseases addressed, the seminar encompasses both communicable diseases such as HIV/AIDS, tuberculosis, malaria, cholera, and vaccine-preventable illnesses and non-communicable diseases, including cardiovascular disease, diabetes, cancer, and mental health conditions. This dual focus reflects the reality that modern public health workers must be equipped to address a complex and shifting disease landscape.

The temporal scope of the seminar is primarily contemporary, drawing on literature and evidence published from 2020 onwards, in recognition of the rapidly evolving nature of global public health. Where historical context is necessary for understanding current practices or challenges, relevant historical background is provided.

It is important to note what falls outside the scope of this seminar. Clinical treatment of diseases, hospital-based care, and medical management of individual patients are not the primary focus here, although the interface between clinical and public health practice is acknowledged. Similarly, while health policy is discussed in relation to public health work, the seminar does not constitute a comprehensive analysis of health policy systems or health financing frameworks.

II. LITERATURE REVIEW

Review of Related Literature

The literature on public health workers and their role in disease prevention is vast, spanning multiple disciplines and drawing on evidence from diverse geographical, social, and epidemiological

contexts. This review synthesises key themes from recent scholarship published from 2020 onwards, with the aim of providing a rigorous, up-to-date foundation for the discussions that follow in this seminar.

Conceptual Foundations: Public Health and Disease Prevention

To situate the role of public health workers, it is first necessary to understand the conceptual framework within which they operate. Public health has been defined in numerous ways, but the definition offered by the Institute of Medicine — "what we, as a society, do collectively to assure the conditions in which people can be healthy" — remains widely cited for its emphasis on collective action and social responsibility (Schneider, 2021). More recently, scholars have broadened this definition to reflect the social determinants of health, recognising that health outcomes are shaped not only by biological factors but also by social, economic, environmental, and political conditions (Marmot et al., 2020).

Disease prevention, as a core function of public health, is typically categorised into three levels: primary prevention, which aims to stop disease from occurring in the first place through measures such as vaccination, health education, and environmental modification; secondary prevention, which involves the early detection and treatment of disease before it progresses; and tertiary prevention, which focuses on reducing the impact of established disease and preventing complications or recurrence (Bonita et al., 2023). Public health workers operate across all three levels, though their greatest impact is arguably at the primary and secondary levels, where early intervention can prevent the need for costly treatment and reduce the overall burden on health systems.

The concept of the "health in all policies" approach has gained considerable traction in recent years as a framework for embedding disease prevention thinking across government sectors. Originated in Finland and later adopted by the WHO, this approach recognises that health is influenced by decisions made in sectors such as agriculture, transport, education, and urban planning, and advocates for routine consideration of health impacts in all policy decisions (Leppo et al., 2020). Public health workers play a pivotal role in operationalising this approach by providing technical expertise, conducting health impact assessments, and engaging in intersectoral collaboration.

Categories of Public Health Workers and Their Roles

The public health workforce is remarkably diverse, encompassing a wide range of professional backgrounds, qualifications, and specialisations. (Bhutta *et al.* 2021) identify several distinct categories of public health workers, including epidemiologists, biostatisticians, environmental health officers, health educators, nutritionists, community health workers, public health nurses, health policy analysts, and public health administrators. Each of these categories brings a unique set of skills and competencies to the enterprise of disease prevention.

Epidemiologists occupy a central role in public health, serving as the scientists of disease prevention. Their work involves identifying the distribution and determinants of disease in populations, investigating outbreaks, and using data to inform public health responses. During the COVID-19 pandemic, epidemiologists became some of the most prominent public health workers globally, as their models and analyses guided governments in their responses to the crisis (Reiner et al., 2021). The field has evolved considerably with the advent of genomic epidemiology, which uses pathogen sequencing to trace transmission chains and identify emerging variants with greater precision than traditional epidemiological methods (Rambaut *et al.*, 2020).

Community health workers (CHWs) represent another critically important cadre. Unlike many public health professionals who work in offices or laboratory settings, CHWs are embedded within the communities they serve, often sharing the same cultural background, language, and lived experiences as the populations they support. Research consistently demonstrates that CHWs are effective in improving health outcomes across a range of conditions, from maternal and child health to HIV management and chronic disease prevention (Bhutta *et al.*, 2021). In sub-Saharan Africa and South Asia, CHWs have been instrumental in extending the reach of health services to remote and underserved populations that would otherwise have little or no access to formal health care.

Health educators and health promotion specialists constitute another key pillar of the public health workforce. Their work centres on empowering individuals and communities with the knowledge, skills, and motivation to adopt health-promoting behaviours and resist disease risk factors. Increasingly, health educators are harnessing digital technologies, social media, and mobile health applications to reach wider audiences and deliver more personalised health messages (Galea and Abdalla, 2020). The growing field of behavioural science has enriched health education practice by providing more nuanced understandings of how people make health-related decisions and how interventions can be designed to support positive behavioural change.

Disease Surveillance and Monitoring

Disease surveillance — the systematic and ongoing collection, analysis, and interpretation of health data— is one of the most fundamental functions of public health workers. Without accurate and timely surveillance data, it is impossible to detect emerging outbreaks, monitor disease trends, evaluate the impact of interventions, or allocate resources effectively. The COVID-19 pandemic exposed significant weaknesses in surveillance systems globally, particularly in low-income countries where laboratory capacity, data infrastructure, and reporting systems were often insufficient to capture the true scale of the epidemic (Jha *et al.*, 2022).

In recent years, there has been considerable innovation in disease surveillance methods. Traditional surveillance, which relied on passive reporting from health facilities, has been supplemented by active surveillance, sentinel surveillance, and syndromic surveillance systems that use data from a variety of sources — including emergency department visits, pharmacy sales, and social media trends — to detect potential outbreaks before they are formally confirmed (Brownstein *et al.*, 2023). The integration of artificial intelligence and machine learning into surveillance systems has opened new possibilities for real-time analysis of large data sets and the early identification of disease signals that might otherwise be missed (Brownstein *et al.*, 2023).

Public health workers responsible for surveillance face a number of challenges, including fragmented data systems, inconsistent reporting practices, inadequate laboratory infrastructure, and human resource constraints. In many low- and middle- income countries, the under-reporting of disease remains a significant problem, distorting the epidemiological picture and undermining efforts to mount timely and proportionate responses. Addressing these challenges requires sustained investment in health information systems, laboratory capacity, and the training of surveillance personnel (Jha *et al.*, 2022).

Immunisation and Vaccination Programmes

Vaccination is arguably the most powerful and cost-effective tool in the public health arsenal for disease prevention. The elimination of smallpox, the near-eradication of polio, and the dramatic reductions in the incidence of measles, diphtheria, whooping cough, and many other vaccine-preventable diseases stand as towering achievements of public health in the twentieth century. Public health workers play indispensable roles at every stage of immunisation programmes, from vaccine procurement and cold chain management to community outreach, hesitancy counselling, and coverage monitoring.

The development and global rollout of COVID-19 vaccines from late 2020 onwards presented both an extraordinary achievement and a sobering lesson in equity. While vaccines were developed with unprecedented speed, their distribution was profoundly unequal, with high-income countries securing the vast majority of initial supplies and low-income countries left with little or nothing for many months. Public health workers in affected countries were forced to navigate these inequities while simultaneously managing ongoing disease transmission and maintaining essential health services (Wouters *et al.*, 2021).

Vaccine hesitancy — defined by the WHO as the reluctance or refusal to vaccinate despite the availability of vaccines — has emerged as a significant challenge for public health workers globally. Hesitancy is driven by a complex mix of factors, including distrust of health authorities, misinformation spread through social media, religious beliefs, and concerns about vaccine safety. Combating hesitancy requires culturally sensitive communication, community engagement, engagement of trusted local leaders, and the transparent communication of vaccine safety data (MacDonald *et al.*, 2022). Public health workers are at the forefront of these efforts, often engaging in time- intensive one-on-one conversations with hesitant individuals and families.

Health Promotion, Education, and Behaviour Change

Health promotion goes beyond the transmission of health information to encompass the broader enabling conditions that allow people to take control of and improve their own health. The Ottawa Charter for Health Promotion, now over three decades old, identified five action areas that remain highly relevant today: building healthy public policy, creating supportive environments, strengthening community action, developing personal skills, and reorienting health services. Public health workers are active in all five of these areas, though their specific roles vary depending on their level of practice and the context in which they work.

The field of health communication has been transformed in recent years by the proliferation of digital media. Social media platforms, mobile applications, and online communities have created new channels through which public health workers can disseminate health information and engage with communities. However, these same platformshavealsobecomevectorsforhealthmisinformation—aphenomenonthathas been described as an "infodemic" by the WHO (Tangcharoensathien *et al.*, 2020). Managing the infodemic, by identifying and countering misinformation, has become an important and resource-intensive function of public health workers, particularly those working in health communication and risk communication roles.

Behaviour change communication (BCC) has evolved significantly, drawing increasingly on insights from behavioural economics, social psychology, and anthropology. Approaches such as nudge theory, which

uses small changes in the environment or the way choices are presented to encourage healthier behaviour without restricting individual choice, have been applied in public health contexts ranging from canteen food placement to organ donation opt-out systems (Thaler and Sunstein, cited in Bonita *et al.*, 2023). Public health workers with expertise in BCC are uniquely placed to design and implement these kinds of interventions in ways that are contextually appropriate, ethically grounded, and evidence-based.

Environmental and Occupational Health

Environmental health workers form a crucial segment of the public health workforce, focusing on identifying and mitigating environmental risk factors that contribute to disease. Clean water, sanitation, air quality, food safety, and safe housing are among the most fundamental determinants of health, and failures in any of these areas can rapidly translate into significant disease burdens. In low-income settings, inadequate water and sanitation infrastructure remains a leading cause of diarrhoeal disease, which kills hundreds of thousands of children annually (WHO, 2023).

The intersection of environmental change and public health has become an increasingly prominent area of research and practice. Climate change is altering the geographic distribution of vector-borne diseases such as malaria and dengue, extending the transmission seasons of some diseases, and creating new vulnerabilities for populations that have historically not been exposed to certain pathogens (Rocklöv and Dubrow, 2020).

Public health workers in environmental health are working to understand and respond to these changing patterns, often in collaboration with climatologists, urban planners, and policymakers.

Occupational health is another dimension of environmental public health that involves protecting workers from hazards in the workplace. Public health workers in this field conduct workplace inspections, advise on occupational safety standards, investigate clusters of occupational disease, and advocate for regulatory changes to protect workers. The COVID-19 pandemic brought occupational health concerns into sharp relief, as essential workers in settings such as meatpacking plants, care homes, and public transport were found to be at disproportionately high risk of infection (Shadmi *et al.*, 2020).

Health Policy, Advocacy, and Intersectoral Action

Public health workers increasingly operate at the interface between science and policy, translating research evidence into actionable recommendations for governments, health authorities, and other decision-makers. This role — sometimes described as "knowledge brokering" — requires not only technical expertise but also strong communications skills, political acumen, and an understanding of the policy process (Oliver *et al.*, 2020). The challenge of ensuring that policy decisions are informed by the best available evidence, rather than by political expediency or commercial interests, is one that public health workers must navigate on a daily basis.

Advocacy is another important dimension of public health work. Public health workers are often called upon to advocate for the interests of vulnerable populations, to highlight health inequities, and to push for the conditions — social, economic, environmental — that are necessary for good health. This advocacy can take many forms, from publishing research in peer-reviewed journals to testifying before legislative committees, engaging with media, or organising community-based campaigns. The willingness to speak truth to power, even when it is inconvenient for vested interests, is a hallmark of effective public health advocacy (Galea and Abdalla, 2020).

Health Equity and Social Determinants of Disease

Health equity — the principle that everyone should have a fair and just opportunity to be as healthy as possible — is both a core value of public health and a practical imperative for disease prevention. Research consistently demonstrates that health outcomes are not randomly distributed across populations; rather, they follow predictable patterns of inequality that track closely with social, economic, and demographic characteristics such as income, education, race, ethnicity, gender, and geographic location (Marmot *et al.*, 2020). Addressing these health inequities is not only a moral obligation but also a practical necessity, since disease does not respect social boundaries and the vulnerabilities of disadvantaged populations ultimately affect community health as a whole.

Public health workers are central to efforts to address health inequities, both by documenting and drawing attention to disparities and by designing and implementing interventions that target the most vulnerable populations. The concept of proportionate universalism — providing universal services but with a scale and intensity proportionate to the degree of disadvantage — has gained traction as a framework for achieving equity without stigmatising disadvantaged groups (Marmot *et al.*, 2020). In practice, this means that public health programmes must be designed with an explicit equity lens, ensuring that outreach, resources, and services are distributed in ways that reduce rather than reinforce existing disparities.

Challenges Facing the Public Health Workforce

Despite the critical importance of their work, public health workers face a formidable array of challenges that limit their effectiveness and threaten the sustainability of the public health workforce. Chief among these is chronic underfunding. In many countries, public health receives only a small fraction of the national health budget, with the majority of resources directed towards curative, hospital-based care. This funding imbalance means that public health programmes are perpetually under-resourced, limiting the ability of public health workers to recruit and retain talent, invest in technology, or sustain long-term programmes (Haldane *et al.*, 2021).

Workforce shortages represent another critical challenge. The WHO has projected a global health worker shortfall of 10 million by 2030, with public health workers disproportionately affected (WHO, 2023). In many low-income countries, there are simply not enough trained public health professionals to meet the needs of the population. Brain drain — the migration of skilled health workers from low-income to high-income countries — further exacerbates this problem, depleting the very countries that can least afford to lose qualified personnel. Addressing workforce shortages requires sustained investment in public health education and training, competitive remuneration packages and policies that incentivise public health professionals to work in underserved settings.

Burnout and mental health challenges among public health workers have also received growing attention, particularly in the wake of the COVID-19 pandemic. Studies conducted during and after the pandemic documented high rates of burnout, anxiety, depression, and post-traumatic stress disorder among public health professionals who had been subjected to prolonged periods of intense work, exposure to suffering and death, public criticism, and personal risk (Czeisler *et al.*, 2020). Creating psychologically safe and supportive work environments, providing access to mental health resources, and adequately staffing public health agencies are all important steps in addressing this challenge.

The erosion of public trust in health authorities and scientific institutions is another challenge with profound implications for public health practice. In many contexts, declining trust has been fuelled by political polarisation, the spread of misinformation, historical legacies of institutional racism and exploitation, and failures of communication by health authorities. Rebuilding trust requires long-term, sustained engagement with communities, transparency about uncertainty, and a genuine commitment to listening to and responding to community concerns (Jha *et al.*, 2022).

Emerging Trends and Innovations in Public Health Practice

The field of public health is not standing still in the face of these challenges. A number of exciting trends and innovations are reshaping the way public health workers approach disease prevention, offering new tools and strategies for a more effective, equitable and responsive public health system.

Digital health technologies — including mobile health applications, wearable devices, electronic health records, and telemedicine — are creating unprecedented opportunities for data collection, health monitoring, and service delivery. During the COVID-19 pandemic, digital contact tracing applications were deployed in numerous countries to supplement traditional contact tracing efforts, with varying degrees of success depending on uptake rates and technical design (Morley *et al.*, 2020). Looking ahead, the integration of big data analytics and artificial intelligence into public health surveillance and response holds considerable promise for more rapid and accurate identification of disease threats.

Precision public health — an approach that uses advanced data analytics, genomics, and other technologies to tailor preventive interventions to specific population subgroups — represents another frontier of innovation. By identifying individuals or communities at elevated risk of specific diseases, precision public health enables more targeted and efficient allocation of preventive resources, potentially improving the cost-effectiveness of public health programmes (Khoury *et al.*, 2022).

The One Health framework, which recognises the interconnectedness of human, animal, and environmental health, has gained significant momentum in recent years, particularly in the context of zoonotic diseases — diseases that can be transmitted between animals and humans. The COVID-19 pandemic, which is widely believed to have originated in animals before spilling over into humans, underscored the importance of a One Health approach to pandemic preparedness and disease prevention. Public health workers are increasingly called upon to collaborate with veterinarians, ecologists, and environmental scientists within this framework to identify and mitigate zoonotic disease risks at their source (Zinsstag *et al.*, 2020).

III. Methodology

RESEARCH METHODOLOGY

This seminar adopted a qualitative and literature-based methodology. Since the topic focuses on the role of public health workers in disease prevention, the study relied mainly on existing scholarly materials, public health reports, journal articles, textbooks, and publications from recognised health organisations.

The method was designed to gather reliable information on public health practice, disease prevention strategies, community health interventions, vaccination programmes, disease surveillance, health education, and the challenges facing public health workers. The approach helped to provide a broad understanding of how public health workers contribute to preventing both communicable and non-communicable diseases. Rather than collecting primary data through interviews or questionnaires, this seminar used secondary sources because the subject has already been widely discussed in academic and professional public health literature. This made it possible to compare different views, identify common themes, and draw meaningful conclusions from recent studies.

Sourcing and Selection of Materials

The materials used for this seminar were sourced from textbooks, peer-reviewed journal articles, reports from the World Health Organization, and other credible publications related to public health and disease prevention. Priority was given to recent materials published from 2020 onwards, especially because public health practice has changed significantly after the COVID-19 pandemic.

The selection of materials was guided by their relevance to the topic. Sources were chosen based on how well they explained the role of public health workers in areas such as disease surveillance, immunisation, health promotion, environmental health, policy advocacy, and emergency response.

Materials that focused only on hospital treatment or clinical care were not given major attention because the seminar is centred on prevention rather than cure. The selected sources were therefore those that directly supported the aim and objectives of the seminar.

Novel Methodological Approach

The methodological approach used in this seminar is unique because it does not only describe the roles of public health workers; it also connects those roles to real public health challenges affecting communities today. The study considered both communicable diseases such as malaria, tuberculosis, cholera, HIV/AIDS, and COVID-19, as well as non-communicable diseases such as diabetes, cancer, cardiovascular diseases, and mental health conditions.

The approach also examined public health workers from different angles. It looked at them as educators, surveillance officers, vaccinators, community mobilisers, policy advocates, environmental health officers, and emergency responders. This made the seminar more balanced and practical.

Another important feature of the approach is that it considered public health from a global perspective while also paying attention to low- and middle-income countries, including Nigeria and other African settings where public health workers often face limited resources, poor infrastructure, and workforce shortages.

Evaluation of Methodologies and Selection of Approach

Several possible methods could have been used for this seminar, including surveys, interviews, field observation, and case studies. However, a literature-based approach was selected because it was the most suitable for the purpose of the seminar.

A survey method would have required direct responses from public health workers, which may not have been easy to obtain within the limited time available. Interviews could have provided personal experiences, but they would not have covered the wide range of public health roles discussed in this paper. Field observation would also have been useful, but it would have required access to public health facilities and community health programmes.

The literature-based method was therefore selected because it allowed the seminar to draw from a wide range of credible sources and present a broader understanding of the topic. It also made it possible to compare findings from different countries, public health systems, and disease prevention programmes.

Summary

This section explained the methodology used for the seminar. The study adopted a qualitative literature-based approach, using reliable secondary sources such as textbooks, Journal articles, and public health reports. The materials were carefully selected based on their relevance to the role of public health workers in disease prevention.

The chosen method was appropriate because it provided a broad, evidence-based understanding of the topic. It also allowed the seminar to examine public health workers from different perspectives, including their roles in surveillance, vaccination, health education, community engagement, policy advocacy, and emergency response.

IV. SUMMARY, CONCLUSION AND RECOMMENDATIONS

Introduction

This section presents the summary, conclusion, and recommendations of the seminar. It brings together the major points discussed in the previous sections and highlights the importance of strengthening the public health workforce for effective disease prevention. Public health workers remain essential to the health and safety of every society. Their work may not always be as visible as that of hospital-based medical professionals, but their contribution is powerful because they help prevent diseases before they spread or become severe. Through surveillance, health education, vaccination, environmental monitoring, community mobilisation, and policy advocacy, public health workers protect communities and reduce the burden on healthcare systems.

Summary

This seminar examined the role of public health workers in disease prevention. It began by explaining the meaning of public health and disease prevention, showing that public health focuses on protecting the health of communities rather than treating individuals alone.

The seminar also discussed the different categories of public health workers, including epidemiologists, community health workers, health educators, environmental health officers, public health nurses, nutritionists, policy analysts, and public health administrators. Each of these professionals contributes in a unique way to preventing diseases and promoting better health outcomes.

The paper further explained that public health workers are involved in disease surveillance and monitoring, which helps to detect outbreaks early and guide public health responses. Their role in immunisation and vaccination programmes was also discussed, especially in relation to vaccine-preventable diseases and the lessons learned from the COVID-19 pandemic.

In addition, the seminar highlighted the importance of health promotion, behaviour change communication, environmental health, occupational health, health equity, and intersectoral collaboration. It also identified major challenges facing public health workers, such as poor funding, workforce shortages, burnout, misinformation, weak health systems, and lack of public trust.

Finally, the seminar reviewed emerging trends in public health practice, including digital health technologies, artificial intelligence, precision public health, and the One Health approach.

Conclusions

In conclusion, public health workers play an indispensable role in disease prevention. Their contributions are not limited to hospitals or clinics; they work within communities, schools, workplaces, government agencies, laboratories, and policy spaces to protect the health of the population.

One major conclusion from this seminar is that prevention is more effective and less costly than treatment. When public health workers are well-trained, properly funded, and adequately supported, they can detect health threats early, educate communities, prevent outbreaks, and reduce the spread of both communicable and non-communicable diseases. The seminar also concludes that the COVID-19 pandemic exposed both the strength and weakness of public health systems across the world. It showed that countries with strong public health systems and effective public health workers were better prepared to respond to emergencies. At the same time, it revealed the dangers of underfunding, poor planning, weak surveillance systems, and lack of trust in public health authorities.

Therefore, strengthening the public health workforce is not optional; it is necessary for building healthier, safer, and more resilient societies.

Recommendations

Based on the findings of this seminar, the following recommendations are made:

- ✓ Governments should increase funding for public health programmes so that public health workers can carry out disease prevention activities effectively.
- ✓ More public health workers should be trained, recruited, and deployed, especially in rural and underserved communities where access to health services is limited.
- ✓ Public health workers should be provided with continuous professional training to keep them updated on modern disease prevention strategies, digital health tools, and emergency response methods.
- ✓ Disease surveillance systems should be strengthened through better data collection, laboratory support, reporting systems, and the use of modern technology.
- ✓ Community health education should be intensified to improve public awareness about vaccination, hygiene, nutrition, healthy lifestyles, and early disease detection.

- ✓ Public health workers should be given better working conditions, fair remuneration, protective equipment, and mental health support to reduce burnout and improve performance.
- ✓ Governments and health agencies should build stronger trust with communities through transparency, respectful communication, and active engagement with local leaders.
- ✓ Public health policies should give more attention to health equity by ensuring that vulnerable groups have fair access to preventive health services.
- ✓ Digital health tools, artificial intelligence, mobile health applications, and telemedicine should be adopted responsibly to improve disease monitoring and public health communication.
- ✓ Public health should be treated as a national priority because a strong public health system protects lives, improves productivity, and reduces the pressure on hospitals and healthcare facilities.

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