Public Health Reforms: Vaccination, Sanitation, and Hospital

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ABSTRACT:

Public health always been central to Indian society, reflecting the ancient belief that prevention is superior to cure. Historical evidence highlights hygiene, safe water supply, and environmental health as vital and enduring longevity. Public health services, measures sanitation, vaccination, and vector control, are essential components of national development in the developed world and East Asia. Such efforts raised labour productivity, life expectancies, and rapid economic growth and poverty reduction even before modern medical technologies emerged. In India, public funds have focused largely on medical services, public health services and regulations have been neglected. This lacks systematic planning, hindering delivery of effective public health services.

KEYWORDS:

Public Health, Vaccination, Sanitation, Health Reforms, India.

Introduction:

Public health focuses on promoting and protecting health of people and communities by encouraging healthy behaviours and ensuring safe living conditions. It involves activities such as disease prevention, health education, vaccination, and development of safety standards and health policies to ensure access to safe food and overall well–being (Kimmo et al., 2013).

Effective strategies for improving population health emphasize disease prevention rather than treatment. Public health services are often publicly funded due to limited market incentives. In India, health policies have primarily concentrated on curative care and immunization, with public health initiatives receiving less attention, contributing to poorer health (Waage et al., 2010; Dieppe et al., 2013).

The evolution of public health continues through new challenges and innovations aimed at preventing disease, injuries, and death while promoting well–being. The New Public Health integrates policy, resource allocation, and health systems management within a framework of social and global context (Halpin et al., 2010).

History of public health

Public health originated with the sanitary movement of the 18th century, emphasizing hygiene and preventive measures, such as vaccination. Early advances, including Hippocratic focus on environmental factors and Roman system of hygiene and sanitation, laid its foundation (Sudha et al., 2009).

In the Middle Ages, Arab scholars preserved and expanded medical knowledge, enabling medieval cities to develop organized public hygiene systems. The Renaissance marked the rise of modern science and technology, setting the stage for contemporary public health development balance between the role of the individual, with the feckless poor having only themselves to blame, and that of the state in protecting them from danger and enabling them to make health choices (Dieppe et al., 2013).

Preventive medicine emerged in the mid–twentieth century, along with advances in scientific medicine, emphasizing hygiene and disease prevention. While it promoted public health through education and mass activities like screening. In some regions, it also took problematic forms, such as "racial hygiene", influencing collective Health approaches for decades (Kumar et al., 2011).

Concept of public health

Public health means protecting, improving the health of people and their communities. Public health is defined as 'the art and science of preventing disease, protecting life and promoting health through the organized efforts of society (Acheson, 1988). It promotes the welfare of the entire population, ensures security, protects from the spread of infectious diseases and environmental hazards, and helps to provide safe, quality care.

Public health emphasizes structural determinants of health and illness, revived by 'new public health', which highlights the importance of social factors (Baggott, 2013). Addressing global ill–health, therefore, requires political and social intervention along with biomedical approaches.

The growing recognition of these determinants emerged from critiques and social movements that challenged the uncritical acceptance of biomedical models.

In India, a new public health (NPH) approach was integrated into the National Tuberculosis Programme, combining sociological data with epidemiological information to develop a people–centered strategy. Although the NPH multidisciplinary and community–based approaches go beyond hospital–focused medicine, they still rely on biomedical, scientific, and epidemiological frameworks. This dependence reinforces professional authority over lay participation, extending expert surveillance and control. Conversely, technological interventions have become central to public health practice, often emphasizing technical efficiency over societal factors (Margaret et al., 2001).

Essential services of public health

There are many public health services; the ten essential services are ideal; every country should adhere. This framework was developed by the Core Public Health Functions Steering Committee in 1994, which included major public health organizations at the global level (Jeffery and Roger 1988).

- Monitor and address community health problems
- Identify and control health hazards.
- Educate and empower the public on health issues.
- Mobilize community partnerships for health improvement.
- Develop and implement supportive health policies.
- Enforce health laws and safety regulations.
- Provide essential health services when unavailable.
- Maintain a skilled public health workforce.
- Evaluate the quality, access, and effectiveness of health services.
- Research for new insights and innovative solutions to health problems.

The development of public health in India

India has the world's oldest civilizations. Traces its origins to the Indus Valley Civilization. Evidenced by the Mohenjo–Daro and Harappa. These reveal remnants of planned urban settlements with advanced drainage, brick houses, and public baths, suggesting early practices of environmental

sanitation by an ancient people as far back as 3, 000 B. C. Around 1400 B. C., the Aryan invasion introduced significant cultural shifts, during which the Ayurveda and Siddha systems of medicine emerged. Ayurveda, regarded as a comprehensive science of life, emphasized the integration of physical, mental, and spiritual health. The Manu Samhita prescribed rules and regulations concerning hygiene, diet, and rituals associated with birth and death (Rao, 1966).

The post–Vedic period (600 B. C. – 600 A. D.) was dominated by religious teachings of Buddhism and Jainism influenced health practices and medical thoughts. Universities of Taxila and Nalanda offered formal medical education, conferring titles like Pran Acharya and Pranavi Shara (Rao, 1966). Under the region of Rahula Sankirtyana (son of Buddha) and later Emperor Ashoka, hospital systems were established for humans and animals, marking an early form of organized healthcare. The origin of Unani medicine is traced back to Greek medicine. The Unani system, since then, became part of Indian medicine.

In the history of public health, four distinct phases may be demarcated:

Disease Control Phase (1880–1920)

In 19th century, public health focused on sanitation reforms like clean water, sewage disposal, etc. Clearly, these measures were not aimed at controlling any specific disease due to the technical knowledge. However, these measures improved the health of people due to disease and death control (Aggarwal, 2008).

Health Promotional Phase (1920–1960)

Beginning of 20th century, the concept of "health promotion" emerged, recognizing that public health had overlooked the individual, and that the State bore direct responsibility for citizens' health. Consequently, public health expanded beyond disease control to include personal health services such as maternal and child health, school health, industrial health, mental health, and rehabilitation. Public health departments gradually broadened their scope to encompass health promotional activities. With the State assuming a role in individual well–being, two major movements shaped modern public health. (a) The provision of basic health services through primary health centres and sub–centres– a concept first mooted in 1920 by Lord Dawson in England and endorsed by the League of

Nations Health Organization (1931). The Bhore Committee (1946) later recommended establishing PHCs in India to deliver integrated curative and preventive care. b) the Community Development Programme, which aimed to advance rural development through community participation. Despite its ambitious goals and limited resources, leading to its decline, it laid the foundation for rural health infrastructure. The creation of PHCs and sub–centres ultimately provided a crucial framework for extending health services to India's rural population.

Social Engineering Phase (1960–1980)

Advances in preventive medicine and public health led to a shift in disease patterns within developed nations. While acute illnesses were largely controlled, new challenges emerged in the form of chronic and lifestyle–related diseases, e. g., cancer, diabetes and cardiovascular disorder etc., especially in the affluent societies. These problems could not be tackled by traditional public health measures like isolation, immunization, or disinfection, nor fully explained by the germ theory of disease. The concept of "risk factors" arose as a framework for understanding chronic disease causation. The increasing Societal burden of such conditions prompted a new challenge in public health during the 1960s, as the "social engineering" phase, Social and behavioural aspects of health, and prioritizing preventive and rehabilitative strategies.

Health for All Phase (1981–2000AD)

Despite advances in medicine, Major health disparities persisted between developed and developing nations. While affluent populations enjoyed adequate living conditions and health care. Over half the world lacked basic services. In response, the WHO in 1981 launched the "Health for All by 2000" initiative, promoting equitable access to essential care. India's National Health Policy (1983) echoed this vision through universal primary health care and population stabilization efforts, marking a shift from. Medicalized models to policies emphasizing social determinants and healthy public policy (Jaggi, 1979).

Early Phase of Public Health and Sanitation

Before the 1860s, sanitary arrangements for the civilian population were discussed sporadically. For example, in 1810, when some Dacca citizens proposed local improvements, such as the repair of wells and drains, the governor–general rejected the proposal out of hand (Ahmed,

1980). More concern was shown for the health of the army; for example, after 1835, medical officers were encouraged to submit details of the climate, geography, and medical statistics of districts in order to guide military campsites and cantonments to healthy places (Ramasubban, 1982). However, one measure of civilian preventive medicine predated the 1860s: vaccination against smallpox was supported with fluctuating energy, and attempts were made to eradicate the indigenous practice of inoculation (Arnold, 1985).

Critical Appraisal of Public Health and Sanitation

In 1859, A Royal Commission investigated the poor health of the British Army in India and

Linked it to unsanitary condition in nearby native region. It recommended establishing Public Health commission in each presidency, improving water supply, drainage, and epidemic control, stressing that army health depended on the surrounding civil population's sanitation (Sanitary Commission 1865; Statistical Abstract:1870).

In 1888, Government of India directed, sanitation should be looked after by local bodies, but no public health department was created. Sanitary policy restricted to towns and military areas. Progress was slow due to the subordination of sanitary officers to medical officials and ongoing disputes over the role of clean water in preventing diseases like cholera (Bhat, 1996). Medical administrators appreciated the links between sanitation and public health, especially in urban areas requiring organized waste disposal and safe water supply.

Epidemics and Public Health

In 1896, plague epidemic in India prompted Government to improve public health, leading the Epidemic Diseases Act. After 1900, improvement trusts were set in major towns to develop urban areas and address poor living conditions. However, efforts to improve housing faced opposition from powerful slum landlords and municipal committees, due to high costs (Bhat, 1996).

Plague was probably common in India before the British arrived, and its association with rats was known. However, it apparently disappeared from India in the early nineteenth century before being reinforced from China through Bombay. The disease spread quickly in most parts of the country, sped by railways, trade, and commerce. The urban poor suffered

most, panic–stricken, escaped into rural areas, taking the disease with them. The vital point to note here is plague reappeared in India, when control and prevention measures were understood, and yet the response of the authorities totally ineffective. The Bombay authorities took drastic action; sufferers compulsorily removed to hospital, the infected were segregated, evacuated, a sanitary cordon attempted around affected areas, and travellers medically inspected. Some traders rejected bans on exports or the movement of goods, mill owners rejected steam cleansing and destroyed rattraps. Others concealed infected people and then dumped their dead bodies anonymously in the street, escaped around cordons, or refused to leave infected areas for fear of theft from their unprotected houses (Klein, 1973). In 1900, plague epidemic treated as a political emergency and regarded as a matter of public health.

Late Nineteenth Century: Enter Bacteriology

Another major development in public health took at the nineteenth century. Rapid advances in scientific knowledge about causes and prevention of numerous diseases brought about tremendous changes in public health. Many major contagious diseases were brought under control through science applied to public health. Louis Pasteur, proved in 1877 anthrax is caused by bacteria. By 1884, he developed artificial immunization against disease. In few years, discoveries of bacteriologic agents of disease were made in European and American laboratories for such contagious diseases as tuberculosis, diphtheria, typhoid, and yellow fever. (Winslow, 1923)

The identification of bacteria and the development of immunization and water purification techniques made possible to control and prevent disease. The germ theory of disease provided public health a solid scientific foundation. Focus remained on public contagious diseases, but control methods evolved through laboratory research identifying specific strategies for preventing diseases. Science revealed that both the environment and people could spread disease. Public health agencies expanded from sanitation to include laboratory science, epidemiology, public responsibility for both environmental and individual health (Devadasan et al., 2006).

Vaccine development in India

The termination of smallpox in 1980 marked a major medical

milestone, ending a disease that killed 300 million people (Zakir et al., 2018). Edward Jenner's 1796 cowpox–infected human experiment began true vaccination (Das et al., 2022). Louis Pasteur developed the first live vaccine against rabies, in the 1880s. In the 19th century, vaccination for diphtheria, tetanus, whooping cough, and tuberculosis treatment were followed preventing over 103 million cases of childhood diseases Since 1924 (Kakar et al., 2021).

The first genetically engineered vaccine, for hepatitis B, introduced in 1986, followed by the polio vaccine 15 years later, marking the golden age of vaccines with additions like measles, rubella, and mumps. Vaccination has good effects on productivity, well–being, and cognitive growth of individuals as well. Vaccination prevents disease, boots productivity, and reduces healthcare costs, crucial for low–income populations in countries like India (Doherty et al., 2016). It also promotes health equity and helps break the cycle of poverty by preventing childhood infections (Wagstaff et al., 2018). Unlike medicines that treat illness, vaccines train the immune system for lasting protection.

Despite positive results, the process from vaccine development to market entry remains extremely difficult. Vaccine efficacy varies among individuals, largely influenced by age–related changes in immune function that affect vaccine design.

Reforms in Public Health

In 1919, the Montague–Chelmsford Reforms transferred responsibility of public health, sanitation, and vital statistics to the provinces under elected minister, making the beginning of decentralized health administration in India. Municipality and Local Board Acts, provided legal backing for the advancement of public health. The All–India Institute of Hygiene and Public Health was founded in Calcutta with Rockefeller Foundation support in 1932, and in 1937, the Central Advisory Board of Health was set up to coordinate national activities, followed by the Madras Public Health Act (1939) and the first Rural Health Training Centre.

In 1943, the Bhore Committee was appointed to review health conditions and propose long term improvements, in 1946 report emphasized modern health practice and equal health services. Public health in pre–independent India was largely a failure. Despite British

control, living conditions were poor, with high mortality and morbidity in urban areas, Capitalist development and the rapid, unplanned urban squalor (Bhattacharya 2006).

After independence in 1947, Ministries of Health were established at Central and States levels. India joined the World Health Organization in 1948. Article 246 and 47of the Constitution includes health under the union and directed the state to improve nutrition, living standards, and public health. The Planning Commission (1950) and Community Development Programme (1952), promoted rural and national health development.

Conclusion

Public health, though rooted in science, have evolved under social and political influences. Its purpose extended beyond disease control to implementing health goals through social action. Over time, changing views on health, governance, and society have redefined its scope. Despite major advances, government regulation of individual health behaviour remains debated. Vaccines demonstrate public health's global value by preventing disease and saving billions in health care system relying on strict testing and coordinated regulation. In India, consistent efforts in sanitation, vaccination, epidemiology, and maternal– child health have strengthened the public health framework, though disparities in implementation persist.

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