Chapter 1: Introduction

This study is the culmination of concerted efforts over nearly four years, including a series of literature review, in-depth interviews, focus group discussions, workshops, internal debates & discussions with experts directed towards understanding and discovering possible futures of the public health professionals (PHPs) in India.

Estimating the supply, need, demand and career opportunities for the public health professionals in India was a challenging task due to the multifaceted nature of the work and diverse roles performed by public health professionals in India.

This study had the following objectives:

1. To estimate current supply, need and demand of public health professionals in India
2. To measure current gap between the supply and requirement; and estimate projected requirement of public health professionals by 2025 in India
3. To undertake mapping of jobs for public health professionals in both public and private sector in India
4. To give suitable recommendations to the NITI Aayog and Ministry of Health and Family Welfare (MoHFW), GoI regarding planning of public health professionals in India

1.1 Background
The Lancet Series on India highlights a coexistence of substantial burdens of infectious diseases,(1) reproductive and child health problems,(2) nutritional deficiencies,(2) chronic diseases,(3) and injuries.(3) The burdens of disability are further worsened by unrecognized and inadequately treated mental illness and the increasing toll of intentional and unintentional injuries. Several adverse social determinants together corrode the health of vulnerable populations, whereas behavioural risk factors like smoking, oral tobacco consumption, and binge drinking of alcohol account for much death and disability.(3)

India is currently grappling with new challenges on healthcare front thus this calls for ensuring adequate quality health care services. As compared to the other South East Asian countries India has low levels of life expectancy. As per the World Bank data, for the year 2015, life expectancy at birth in India was 68.3 years (males - 66.9 years, females - 69.9 years). (4) (details presented in Table 1)
Table 1: Life Expectancy at Birth in South Asian Countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Life expectancy at birth (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
</tr>
<tr>
<td>India</td>
<td>66.8</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>70.5</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>71.7</td>
</tr>
<tr>
<td>Thailand</td>
<td>71.3</td>
</tr>
<tr>
<td>China</td>
<td>74.6</td>
</tr>
</tbody>
</table>

Source: World Bank, 2017 (4)

These burdens of ill-health are inequitably distributed across geographical, social, gender, income, and educational strata, with substantial differences in health indicators between and within the different states in India.(3)

In September 2015, the United Nations General Assembly universally adopted Resolution 70/1, Transforming our World: the 2030 Agenda for Sustainable Development.(5) The 2030 Agenda effectively lays out an array of ambitious goals and targets which includes one Sustainable Development Goal (SDG) on health and many health-related SDG targets.(6) The agenda talks about potentially daunting challenges of global health threats, off-track Millennium Development Goals (MDGs) particularly those related to maternal, newborn & child health, reproductive health and promotion of physical & mental health.(5) To achieve these goals, we must achieve universal health coverage (UHC) and access to quality health care.(5) The World Health Organization (WHO) and the World Bank both have been promoting UHC as the most important immediate goal for global health. As stated by WHO’s Director General, Margaret Chan, “UHC is the most important concept that public health must offer.”(7) Thus public health’s role becomes utmost critical in achieving these health-related SDG targets by 2030.

Today health systems are the crux in designing, implementing and monitoring health programs, delivering quality health services and in ensuring UHC. A strong health system can help
translate healthcare services into improved health outcomes. The World Health Organization (WHO) has developed a framework in 2007 entitled Everybody's Business: Strengthening Health Systems to Improve Health Outcomes. The framework has six building blocks leading to specific goals and outcomes and builds on previous WHO work. The six building blocks are financing, health workforce, information, medical products and technology, service delivery, and leadership/governance. Building upon the foundation of these six blocks, if the coverage and access to safe and quality health services is ensured, these can lead to the intended goals and outcomes of the health systems.

The scheme being used by the WHO is presented in the Figure 1. The building blocks result into the improvement of health (health indicators and health equity), the social and financial risk protection, and improved efficiency of the health system. On the right-hand side of the figure are the outcomes of the performance of the building blocks, their coverage, and quality and are the results that are expected from the health system.

![Figure 1: The WHO Health System Framework](image)

An improvement in the health system requires technical knowledge, competencies and the importance of health workforce as a building block of this framework is well acknowledged globally. Lack of trained manpower inhibits the proper implementation and monitoring of all health system responsibilities. A critical mass of health professionals is necessary to manage a health system and is often a crucial limiting factor in the delivery of quality health services.

Health systems across the globe are heavily dependent on health manpower. The health manpower is the channel for delivering health interventions to entire populations. The World Health Report 2006 considers that “health workers are all people primarily engaged in actions with the primary intent of enhancing health”. As per WHO’s estimate, there are a total of 59.2 million full-time paid health workers across the world. As per a WHO report, globally
there is a deficit of about 7.2 million skilled health professionals. If this issue is not addressed now then the world will be short of 12.9 million healthcare workers by 2035. This may have serious implications over the health of billions of people across all regions of the world.

It has been stated that by the year 2030, global demand for health workers may rise to 80 million workers, which would be double the current stock of health workers (2013). While the supply of health workers is expected to reach 65 million over the same period, which may estimate into a worldwide net shortage of 15 million health workers. As per this study by Liu et. al., efforts to scale-up health services to achieve UHC and health development goals are confronted by acute shortages and inequitable distribution of skilled health workers in many low- and middle-income countries. This HRH shortage in turn translates into a constraint towards delivering essential health services.

Today India is facing a “crisis in human resources for health” which can be described under following heads: Supply (availability of qualified health workers); Need (recruitment and retention of health workers where they are needed most); and Demand (health worker productivity and the quality of the care they provide). Thus, knowing the importance of the public health workforce in the Indian public health system, and criticality of time and resources invested for educating and developing skilled public health workforce, it becomes crucial to understand the factors that affect the size of the future public health workforce and plan appropriately from this day onwards.

Health service providers constitute about two thirds of the global health workforce, while the remaining third is composed of health management and support workers. The public health workforce is characterized by its diversity and its complexity and includes people from a wide range of occupational backgrounds – for example, doctors [allopathic, alternative medicine], nursing and midwifery professionals, public health professionals [medical, non-medical], pharmacists, dentists, paramedical workers [allied health professionals], grass-root workers (frontline workers) and support staff. However, there is a strong deficiency of trained public health professionals in the country, both in quality as well as in quantity.

According to the Association of Schools of Public Health (ASPH), public health encompasses a population-focused, organized effort to help individuals, groups, and communities reduce health risks, and maintain or improve health status. However, each definition has a common understanding that public health focuses on the health of populations,
involves a definable population, and operates at the level of the whole person. Therefore, a public health professional focuses on population level health.(14) People from diverse professional backgrounds and academic degrees are engaged in these activities and it is tough to identify and isolate a given set of professional qualifications for people who are involved in the delivery of public health activities. The ASPH further defines a public health professional as a person educated in public health or a related discipline who is employed to improve health through a population focus.(14) "They develop and implement programs designed to prevent the spread of infectious diseases, conduct research aimed at determining effectiveness of health intervention programs and at translating the results of other research to solve real-world health problems. Public health professionals work with policy makers to translate science into practical policies. They also work with communities to address the wide range of community-identified public health problems."(14)

Public health professionals are thus component of the overall health workforce and play a vital role in the creation and maintenance of a healthy community. To ensure a healthy community, public health professionals must communicate proficiently and interact effectively with multiple audiences. They must also be able to understand and incorporate the needs and perspectives of culturally diverse communities in public health interventions and research, and understand and be able to influence the policies, laws, and regulations that affect health. New approaches of research that involve practitioners, researchers, and the community in joint efforts to improve health are becoming necessary as we recognize the importance of multiple determinants on health. Finally, public health professionals contribute through practice, teaching, and research to improve health in the communities.(15)

As stated by Adam Smith, the capacities of individuals are depended on their access to education. The importance of Public Health Education rests in producing high-quality, motivated public health professionals, thereby enhancing their potential to contribute towards the health goals. Ensuring a numerical adequacy and ensuring acquisition of core competencies is therefore an important task. Public health being a multi-disciplinary field which provides requisite numbers of well-trained professionals in all appropriate disciplines that health system would need. Traditionally, in India, medical colleges were the centres for creating the public health professionals. In the last two decades, there has been a significant change in the way public health professionals are trained in the country. There has been a conscious shift towards the creation of public health schools outside the premises of medical colleges, thereby opening the doors for non-medical personnel to acquire academic competencies in public health
disciplines. These new institutions reflect a change in the way public health professionals in India would be produced and lead India in the 21st century. However, in spite of these initiatives, limited efforts have been undertaken to assess the situation. Thus, information detailing the origin, evolution and the current status of public health education in India is inadequate. (15)

1.2 Operational definitions
• ‘Public health professional’ is a person educated in public health or a related discipline who is employed to improve health through a population focus. (14)
• ‘Supply’ refers to supply of trained public health professionals from Indian educational institutions into health system
• ‘Need’ refers to the capacity of health system in India to benefit from trained public health professionals
• ‘Demand’ refers to existing demand for trained public health professionals from the point of view of experts, public health professionals, academicians etc. in Indian public health system
• ‘Career opportunities’ refers to existing career plans/pathways for public health professionals in India

1.3 Scope and statement of problem

Supply
There was limited information regarding the supply of public health professionals available in the country. During the last two decades, there has been an expansion and growth in institutions offering public health programs. Various universities/institutions in the country are offering various programs in public health but there was no single point source in the country to provide information regarding these institutes and courses. Thus, there was a need for undertaking a systematic effort as these institutions are not currently regulated by any specific council and it's difficult to assess the supply of public health professionals in the country.

Need and Demand
The normative need for PHPs was calculated using “service target approach” for PHPs in the areas of practice, research and education. Need was accounted for PHPs to work in domains of health management, hospital management, occupational health and environmental health,
epidemiology, health financing, medical entomology, biostatistics, demography, public health engineering, public health laboratories, public health nutrition, veterinary public health, monitoring & evaluation, public health law and public health ethics. For calculating the normative need for these domains, the author replicated the methodology as used by other authors in previous studies (16-30) to calculate values for the year 2017. Additionally, requirement for public health professionals was also calculated on the basis of benchmark analysis\(^1\). The most quoted PHPs to population ratio estimate of the Association of Schools of Public Health (ASPH) is 220:100,000.\(^{31}\) Similarly, Brazil has 0.97 public health officers per 1000 inhabitants i.e. 97 per 100,000.\(^{32}\)

A qualitative analysis based on the review of recently undertaken research work\(^{11}\) and data collected during the study was undertaken for demand estimation of public health professionals in India.

Career Opportunities

In the year 1920, public health was defined by CEA Winslow as “the science and art of preventing disease, prolonging life and promoting health and efficiency through organized community effort”\(^{33}\). However nearly a century later - in the year 2010, public health was defined by Koo et al. as “what we as a society do collectively to assure conditions in which people can be healthy”. \(^{34}\) Thus, over the years, the scope of public health has broadened which requires a diverse and multidisciplinary workforce for offering a much broader range of services to the populations.

Due to the changing demand for PHPs, the public health education sector in India has also undergone transformation. Previously, public health education was offered by medical colleges through post graduate courses such as (Doctor of Medicine [MD] [Community Medicine/Preventive and Social Medicine], Diploma in Public Health [DPH] and Diploma in Community Medicine [DCM]). \(^{15}\) There has been a conscious shift in public health education in India with several institutions offering public health programs for both medical and non-medical graduates such as the Master of Public Health (MPH). \(^{15}\)

\(^{1}\) Simple benchmark ratios of required public health professionals’ numbers (based on a benchmark) to appropriate populations
Additionally, in the job market there are variety of employers available (such as government health departments, public sector undertakings, research organizations, academic institutions/ universities, consulting firms, NGOs, INGOs etc.) which offer a plethora of job opportunities for PHPs ranging from research, teaching, consultancy to advocacy in various sectors such as pharmacy, information technology etc.

Given the rapidly expanding public health horizon, mapping of career opportunities for public health professionals in India was vital to plan for the future.

1.4 Objectives of this study
1. To estimate current supply, need and demand of public health professionals in India
2. To measure current gap between the supply and requirement; and estimate projected requirement of public health professionals by 2025 in India
3. To undertake mapping of jobs for public health professionals in both public and private sector in India
4. To give suitable recommendations to the NITI Aayog and Ministry of Health and Family Welfare (MoHFW), GoI regarding planning of public health professionals in India

1.5 Research questions
1. What are the current and future estimates of supply, need and demand of public health professionals in India?
2. What are the career opportunities available for public health professionals in India?

1.6 Relevance of proposed research work
• Limited efforts have been undertaken to assess the origin, evolution and the current status of public health education in India.(15)
• We have limited understanding of the supply side (15) with no single point source of information. The need and demand of public health professionals is also similarly understudied.(15)
• Planners have limited data on supply, need and demand on public health professionals
• Our work has the potential to provide policy makers with the data for decision making

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1.7 Limitations
- The supply side of public health professionals is understudied with no single point source of information
- The need and demand of public health professionals is also similarly understudied
- Inadequate information about career opportunities and career pathways available for public health professionals in the country

1.8 Organization of thesis
This dissertation shows how a realistic model can help policy makers and Government of India to understand, plan and take initiatives to meet the demand for public health professionals over the coming years. The organization of this thesis is as follows. Chapter 2 is focusing on reviewing other related research work undertaken in India and across the globe; and show how our work is distinguished from other works estimating supply, need, demand and mapping career opportunities for public health professionals in India.

Chapter 3 provides a description of methodology undertaken to meet the research objectives during the thesis work. The ethical considerations, tools and techniques of data collection and analysis were explicitly described in this chapter. The details of research papers published and submitted out of thesis were mentioned as well.

In Chapter 4 the results of the research were explicitly mentioned. The estimated supply, need, demand and mapping of jobs for public health professionals was specified in this chapter. Additionally, competencies for public health professionals and tuition fee of select public health programs with Master’s degree were provided. Chapters 5 and 6 provides the discussion and recommendations as concluded from the research work. The Appendices provide approvals from ethics committee, details ofIDI & FGD respondents, tools, research papers published and submitted out of thesis and plagiarism report.