SHORT ARTICLE

A review of infectious disease training programs for healthcare professionals in India: Identifying gaps and the way forward

Sirshendu Chaudhuri, Anil Kaul
Indian Institute of Public Health, Hyderabad, Telangana

CORRESPONDING AUTHOR
Dr. Sirshendu Chaudhuri, Associate Professor, Indian Institute of Public Health, Hyderabad, Telangana 500030
Email: sirshendusisu@gmail.com

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ABSTRACT
Infectious diseases pose a significant public health burden in India, necessitating a well-trained workforce equipped to manage both clinical and community-level challenges. In this study, a review of the existing short-term infectious disease courses in India was done, excluding postgraduate programs. Thirteen courses were identified, with ten exclusively targeting clinicians. Most are delivered online, last between 4 and 52 weeks, and range in cost from INR 12,000 to 1,25,200. None of the programs focused on public health competencies such as disease surveillance or outbreak investigations. The findings highlight a critical gap in skill-based training for public health professionals.

KEYWORDS
Capacity Building; Communicable Diseases; Public Health

INTRODUCTION
Infectious diseases remain a major public health challenge globally, especially in countries like India, where a significant burden of morbidity and mortality is attributed to preventable and treatable infections. (1) With the advent of new pathogens, antimicrobial resistance, and the recurrence of age-old infections like tuberculosis and dengue, there is an increasing demand for well-trained healthcare professionals who can manage and control these diseases. (2) The skill sets required for prevention and treatment of the infectious diseases and investigating outbreak or pandemic conditions are diverse. However, the availability of specialized training in infectious diseases for clinicians and public health specialists in India remains limited. (3) While certain postgraduate medical programs offer infectious disease modules, these are often fragmented and lack a comprehensive focus on emerging and re-emerging infections, epidemiology, and infection control strategies in both hospital and community settings. (2)

In contrast to other countries, where robust infectious disease training programs are established, India faces significant gaps in developing dedicated courses that cater to both clinicians managing individual patients

and public health professionals focusing on community-level interventions. (4) Moreover, infectious disease training is often not tailored to local contexts, limiting its applicability in real-world scenarios. Addressing these gaps through improved and specialized curricula is crucial to strengthening India's healthcare workforce and ensuring preparedness for future infectious threats. (4) In this background, we have reviewed the existing courses (offline or online) in India to understand the gaps in infectious disease training in India.

Material & Methods

A comprehensive search was conducted to identify infectious disease-related courses available for healthcare professionals in India. The search focused on programs targeted at both clinicians and public health specialists. It excluded the current postgraduate courses including MPH courses. Only dedicated infectious disease courses programmes up to one year were considered. The methodology included a keyword-based Google search using terms such as "Infectious Disease courses India," "Postgraduate programs in Infectious Diseases," "Infectious Disease training for clinicians," and "Public Health Infectious Disease courses." Additional terms like "Hospital Infection Control training" and "Epidemiology of Infectious Diseases" were also employed to capture a wide range of available programs.

The search was limited to programs offered by Indian medical colleges, public health institutions, and recognized online platforms. Results were filtered based on program relevance, duration, and whether they provided specialized infectious disease training. Institutional websites, course brochures, and related academic publications were reviewed to gather details on course content, structure, and target audience. We abstracted data for those courses for which information was available during September 2024.

Data collected included course titles, institutions offering them, target audience, duration, mode of delivery (online/offline), and focus areas (clinical, public health, or both). Gaps in the availability of comprehensive training programs were noted by comparing the search results with the current demands for infectious disease expertise in India, as reported in the literature.

The present work was exempted from a full review by the institutional ethics committee (Ref number IIPHH/TRCIEC/404/2024, dated 08-08-2024)

Results

We found that at least 13 courses are currently running in the country out of which at least 10 are exclusively for the clinicians. Most of the courses are delivered online for a duration ranging between 4 weeks and 52 weeks and costs between 12,000 and 1,25,200 INR. The only course offered by the Ministry of Education through SWAYAM NPTEL is free of cost. None of the courses explicitly offered skill development in Public Health like infectious disease surveillance and outbreak investigations. (Table 1)

Discussion

Infectious disease outbreaks have been witnessed by many parts of the globe in the last two years. The recent COVID-19 pandemic has exposed the gap in preparedness of the health systems of even the high-income countries. (5) It has been observed that the even during the post-COVID period, the infectious disease outbreaks remained similar in the country compared to the pre-Covid era. (6) Looking at future, capacity building is possibly one of the key strategies to develop an effective and pro-active system in combating the outbreaks of infectious disease origin. (4) Fortunately, India has a tremendous potential to develop such a resilient health system. India has a well-known structure called integrated disease surveillance project (IDSP) to identify the warning signals at an initial stage but has its own limitations and criticism. (7)

Table 1: Description of the infectious disease-related courses in India, 2024

Name of the institute	Name of the course	University affiliation	Registration	Mode of	Frequency	Area	Target audience	Prerequisite degree (Eligibility)	Capacity	Duration in weeks	Competency	Assignment	End Exam	Exam type	Course fee	Certificate	Credit/CME	Any link to
Johns Hopkins	Intensive course on infectious diseases in primary care India	+	O	H	-	C	Any HP			18	K/S	-	-		300 USD	+	-	-
Medversity	Post Graduate Program in Infectious Diseases	-	O	O	Year-round	B	Clinician	BHMS, MBBS, BDS		52	K	±	+	O	125200 INR	+	-	-
Medversity	Certificate in Infection Prevention and Control	-	O	O	Year-round	PH	Clinician	BHMS, MBBS, BDS		4	K	±	+	O	17000 INR	+	-	+
Medversity	Advanced Certificate in Infection Prevention and Control	-	O	O	Year-round	B	Clinician	BHMS, MBBS, BDS		4	K	±	+	O	18000 INR	+	-	-
Medversity	Certificate Course in Communicable Diseases	-	O	O	Year-round	B	Clinician	BHMS, MBBS, BDS		8	K	±	+	O	15000 INR	+	-	-
Medversity	Certificate in Infection Prevention and Control for Nurses	-	O	O	Year-round	C	Clinician & Nurses	BHMS, MBBS, BDS, AYUSH, Nursing		12	K/S	±	+	O	12000 INR	+	-	-
Medversity	Advanced Certificate in Infection Prevention and Control Essentials	-	O	O	Year-round	C	Clinician	MBBS/MD/MS/DNB/ AYUSH/BHMS		12	K/S	±	+	O	35000 INR	+	-	-
CMC Vellore	Fellowship in General Infectious Diseases and Antimicrobial Stewardship	-	I	H	Yearly once	C	Clinician	MCI/State medical council registration	30	52	K/S	+	+	I	+	-	-	-
Quexst Healthcare	Certificate Program In Infectious Diseases	-	O	O	Year-round	C	Clinician	MBBS, registration number		16	K	+	+	O	26,550 INR	+	-	-
Medigrad	Fellowship in Infectious Diseases	-	O	O	Year-round	C	Clinician	MBBS		52	K	±	-		85000 INR	-	-	-
Rela Hospital	Fellowship in Infectious Diseases	-																
Swayam NPTEL (ICMR NIE)	Basic course in Vector-Borne Diseases for health professionals	-	O	O	Year-round	PH	Any HP	Any degree in medical/allied health courses				+	-		Free	+	-	-
Swayam NPTEL (ICMR NIN)	Prevention of COVID-19 and Other Respiratory Infections	-	O	O	Year-round	PH	Unclear	Unclear	U		K							

B-Basic, C-Clinical, H-Hybrid, HP- Health professional, I- In-person, K-knowledge, O-online, PH- Public Health, S-Skill

Nevertheless, the system also needs enough human resource who are capable of identifying and manage the infectious disease outbreaks by investigating outbreaks, analysing surveillance data and taking timely actions with the stakeholders. For example, in India, almost all the districts are supposed to have one epidemiologist, and they are expected to perform the same along with other stakeholders. It is clear from the present analysis that infectious disease-related training critically lacks in India.

It is mentionable that various postgraduate courses like India Field Epidemiology Training Program (FETP), and Masters in Public Health (MPH) are available, and these are critical for understanding public health concepts related to IDs. However, these courses run for a period of two years. The working professionals might require upskilling them within a shorter period of time. Unfortunately, the current courses identified in table 1 are only limited to clinicians with a varying degree cost, and uncertainty about the skills imparted.

Conclusion

The number of infectious disease-related training is significantly low in India. The course content, mode of delivery, cost, and outcome varies significantly across the existing courses.

Recommendation

Shorter skill-building courses are required for the public health professionals in India to develop a strong commitment to developing a resilient infectious disease surveillance system in India. To address these gaps, several steps can be taken. Expanding the number of institutions offering specialized infectious disease courses is a critical first step. This can be achieved through government initiatives, public-private partnerships, and international collaborations. Standardizing curricula to ensure uniformity in training and competency levels is also essential. Accrediting bodies can play a pivotal role in this process by developing and enforcing educational standards.

Limitation of the Study

This review relied mainly on information available from institutional websites, brochures, and online searches, which may not have captured all relevant training programs, especially smaller or newly developed ones. Some course details (such as competencies, assessments, or career pathways) were incomplete or unavailable, limiting the ability to fully evaluate program quality. The study excluded postgraduate degrees (e.g., MPH, MD, FETP), which, although longer, also contribute to infectious disease capacity-building. Additionally, the cross-sectional nature of the review does not account for future updates or changes in course offerings.

Relevance of the Study

This study draws attention to an underexplored area in training in infectious diseases in India. By mapping the limited range of short-term courses currently available, this work provides a snapshot of the imbalance between clinical training and public health training. The study adds useful evidence to the ongoing conversation about how India can prepare its workforce for emerging infectious threats.

Authors Contribution

SC: Conceptualization; Methodology; Data Curation; Investigation; Formal Analysis; Writing- Original Draft Preparation; Visualization; Project Administration. AK: Supervision; Validation; Writing- Review & Editing.

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Conflict of Interest

There are no conflicts of interest.

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The authors did not use any AI and AI assisted technologies in the writing process.

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