

Challenges in Medical Microbiology in Indian scenario in the backdrop of International Health Regulations Compliance

Vaishali Sarma^{1,*}, B. C. Bhagabati²

¹State Microbiologist, Integrated Disease Surveillance Programme, Assam, ²SDM & HO, Ex State Surveillance Officer, The Director of Health Services, Assam, Integrated Disease Surveillance Programme, Assam

***Corresponding Author:**

Email: vsarmadr@gmail.com

Abstract

Introduction: The International Health Regulations (IHR) were formulated in 1969 and finally revised in 2005 to develop a universal approach to public health to tackle international spread of diseases so that adequate response can be initiated timely and avoiding unnecessary restrictions on international trade and travel.

Discussion: There are eight IHR core capacities viz. Legislation policy, Coordination, Surveillance, Response, Preparedness, Risk Communication, Human resource and Laboratory. When speaking of infectious diseases and public health risks particularly Public Health Emergencies of International Concern (PHEIC) substantial lab work has to be covered by medical microbiologists. A laboratory total quality programme is a laboratory core capacity that has to be achieved in designated labs for delivering standard quality services. Six key strategic pillars for building laboratory capacity for IHR implementation has been laid out.

Conclusion: Medical microbiologists, people in the administration, policy makers and all stake-holders also have to come on board to formulate precise strategy that fits the Indian health system for optimum output towards a healthy society.

Keywords: International Health Regulations, Medical Microbiologists, Laboratory

Introduction

Emerging and re-emerging pathogens, drug resistance, changing population pattern and behavior, travel, socio-economic conditions, climatic changes are continuing in augmentation of infectious disease burden and with globalization, the impact has also reached tremendous extents. These factors exert significant affect on medical microbiologists in diagnosis, management and preventive activities including surveillance of epidemic outbreaks and bioterrorism events.

The International Health Regulations (IHR) were formulated in 1969 and finally revised in 2005 to develop a universal approach to public health to tackle international spread of diseases so that adequate response can be initiated timely and avoiding unnecessary restrictions on international trade and travel. India is a signatory to the International Health Regulations (IHR), the IHR focal point has been established at the, National Centers for Disease Control, New Delhi. For comprehensive IHR compliance a vital role rests with the medical microbiologists for which a deep sense of commitment both political and professional cannot be overemphasized.

Discussion

There are eight IHR core capacities viz. Legislation policy, Coordination, Surveillance, Response, Preparedness, Risk Communication, Human resource and Laboratory. When speaking of infectious diseases and public health risks particularly Public Health Emergencies of International Concern (PHEIC) substantial lab work has to be covered by medical microbiologists.⁽¹⁾ A laboratory total quality programme

is a laboratory core capacity that has to be achieved in designated labs for delivering standard quality services.^(2,3,4) Six key strategic pillars for building laboratory capacity for IHR implementation has been laid out:

- 1. Coordination of laboratory services:** Lab organization, structure in Ministry of Health, national policy for health laboratories, establishment of national public health laboratory network and national laboratory focal point.⁽⁵⁾
- 2. Laboratory capacity for the priority diseases or events:** Up to date mapping of laboratories, infrastructure for public health events (PHE) confirmation, MoU with collaborating centres.⁽¹⁾
- 3. Quality management system:** Quality officer, national quality norms quality manual, internal quality control(IQC), external quality assessment(EQA), certification and accreditation
- 4. Specimen collection and transport:** Nationwide operational system, prepositioned material, trained staff with valid certification
- 5. Biosafety and Biosecurity:** Guidelines/trained staff, personal protective equipment(PPE), biorisk assessment and legislation, training, maintenance (for example, certified Biosafety Cabinet), laboratory containment capacity development
- 6. Laboratory based surveillance and public health actions:** Networking (national, regional, international), data management and reporting procedures, collaboration with other disciplines (food, veterinarian, sanitary, etc.).^(6,7)

Approaches for building lab core capacities.⁽⁸⁾

- National political commitment
- Financing

- Partnership
- Mapping of laboratory capacities
- Building on existing capacities
- Cross sectoral collaboration

Of all the above points, several require direct participation from medical microbiologists, being issues directly under purview of the lab. Even for issues like partnership, financing, etc microbiologists have to put in their contributions as part of the bigger overall team for addressing the issues. They must be willing to take up these challenges and participate in all ways required. Apart from individual will and commitment, they should motivate others in their field for adherence to the above recommendations, as much possible in resource hungry settings.⁽⁹⁾ For IHR implementation countries are encouraged to report annually to World Health Assembly on 20 indicators, to monitor progress in core capacities at a point in time, as well as progress over time and to update their plan of action to address the identified gaps.^(10,11) For laboratory component following actions at country level are required:

- Coordinating mechanism for laboratory services
- Laboratory services available to test priority health threats
- Influenza surveillance established as proxy for diseases in Annex2 of IHR
- Establishing system for collection, packaging and transport of clinical specimens
- Laboratory biosafety and biosecurity (biorisk management) are in place
- Establishing laboratory data management and reporting

In India, development of microbiology labs in public health sector has been very slow and for much of the microbiology services including some basic microbiology tests, medical colleges or private labs have to be depended upon. However the concept of microbiology services at district level has gradually and steadily gained ground, with phase-wise establishment of District Public Health Laboratories in various districts across all states in India through the Integrated Disease Surveillance Programme (IDSP).⁵ Through IDSP regular trainings and workshops are conducted for capacity building of these labs and their manpower towards IHR compliance. In this regard, significant support from Centers for Disease Control and Prevention (CDC), United States towards capacity building and strengthening of these district labs has been remarkable. Considerable upgradation has taken place on IHR guidelines and laboratory recommendations in certain areas like building a laboratory network, coordination for laboratory services, sample collection and transport, availability of testing facilities, etc has been achieved for priority diseases. These in addition to areas of quality management, biosafety and biosecurity, laboratory surveillance, intersectoral coordination, etc. require

continuous efforts to accomplish uniformity and continued adherence.

Public Health Emergencies of International Concern (PHEIC) have become a matter of grave concern today and for medical microbiologists particularly those part of rapid response teams (RRT), this topic has a lot of importance. Emergencies across several fields form part of PHEIC and microbiologists today have to be oriented to health threats, not only from infectious agents of humans, but also those arising from veterinary origin, radiation threats, chemical threats, IATA (International Air Transport Association) regulations violation, breach of guidelines during packaging and transport of goods and livestock via air /sea etc. Medical microbiologists today should know the precautions to be taken at international Points of Entry (POE) i.e. airports and sea-ports, for anticipated as well as accidental events, that have potential to become public health threats and be aware of mandatory response actions to be taken thereafter. They must be alert and agile in the face of such events and have the will to persevere for the benefit of public health. Comprehensive technical knowledge and continuous training of such newer aspects, are foremost challenging, but of paramount importance nevertheless.

Conclusion

In India many labs, particularly many medical colleges and reference centres have fulfilled the IHR recommendations for laboratory and also received accreditation, but for many public health labs particularly the microbiology labs, the above strategies are still uphill challenges amidst the resource poor settings encountered in most regions of India. IHR compliance and continued adherence have become all the more important particularly after the Ebola outbreak.⁽¹²⁾ Medical microbiologists have to embrace the recent advances in this field and adopt to the latest techniques and protocols, be conversant with modern information systems, continue training and develop networking and contribute towards intersectoral coordination across various disciplines, for greater public health interest. The role of a medical microbiologist has never been limited to strictly the lab and with globalisation, microbiologists today have to deal with several issues like patient safety (antibiotic policy), infection control (in hospital and community), public health, surveillance and response, translational research to name a few. Besides the microbiologists, people in the administration, policy makers and all stake-holders also have to come on board to formulate precise strategy that fits the Indian health system for optimum output towards a healthy society.

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