

Partnership in Surveillance: A Kerala model to Emerging Public Health Threats

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Objective

To prove the role of partnerships in Disease Surveillance and Response to emerging public health threats in Kerala state, India.

Introduction

Kerala is a small state in India, having a population of only 34 million (2011 census) but with excellent health indices, human development index and a worthy model of decentralised governance. Integrated Disease Surveillance Program, a centrally supported surveillance program, in place since 2006 and have carved its own niche among the best performing states, in India. Laboratory confirmation of health related events/disease outbreaks is the key to successful and timely containment of such events, which need support from a wide range of Laboratories-from Primary care centers to advanced research laboratories, including private sector. In a resource constraint setting, an effective model of Partnership have helped this state in achieving great heights. Networking with laboratories of Medical Education Department, and Premier Private sector laboratories, Financing equipment and reagents through decentralised governance program, resource sharing with other National programs, Laboratories of Food Safety, Fisheries and Water authorities have resulted in laboratory confirmation of public health events to the extend of 75-80% in the past 5 years in the state. Etiological confirmation accelerated response measures, often multidisciplinary, involving Human health sector, Animal Health, Agriculture, wild life and even environmental sectors, all relevant in One Health context.

Methods

During 2013-14, state launched a laboratory networking initiative, with aid and guidance from central government through a mutually beneficial MoU, linking all the 5 Govt Medical College Microbiology Laboratories with the State Health surveillance system. A State Laboratory Coordinator was designated, and these teaching Hospital were requested to assist the state in testing of outbreak samples from adjoining 3-4 districts. Additional funds were provided for these institutions after a team assessment and periodic monitoring. All the 14 districts of state gained remarkably in laboratory confirmation of various outbreaks.

During 2013, when one of the remote districts in the state detected an unusual fever cluster among the indigenous community, investigation by a multidisciplinary team, supported by a reputed private sector virology laboratory of an academic institution of the neighbouring state, confirmed Lyme disease, first time in the state. In 2014 and 2015, the same laboratory confirmed another hitherto unreported disease, Kyasanur Forest disease, in the same district. These two events lead to the establishing of a Private Public Partnership model in disease surveillance in the state. This model shared physical infrastructure in the govt hospital premises with technological support from the virology center. Since then, this laboratory has contributed to >90% of laboratory confirmation of health events in the district. Eventually, the same laboratory became the pioneer in confirmation of the first Nipah Virus outbreak in the state in 2018. This laboratory is also the Reference laboratory for H1N1 and Avian Influenza for whole of South India. This surveillance network, has since then, established additional units in other parts of the state through special government order.

From the response perspective also, the state adopted similar partnership approach. The strategy for control of Kyasanur Forest Disease(KFD) is a classical example. Monkey deaths were autopsied by Wildlife experts, domestic animals were treated for tick infestation by the veterinary officers, research work done at Veterinary university, human cases treated and vulnerable population vaccinated by Human Health officers, Tribal and Revenue department addressed the welfare aspects of the affected indigenous communities, and the district collector coordinated all related activities. It was a pathbreaking experience, and since 2015, till date, no new case is reported from the district, unlike hotspots in other parts of India.

In 2014, the state gained from Fisheries department laboratory, by confirmation of a fish toxin from an event of food borne infection outbreak. In the same year, Veterinary University laboratory isolated Vibrio Cholera from water samples from a Cholera outbreak. In 2018, the state surveillance unit, engaged with Veterinary University of the state to undertake MAT testing of Human Leptospirosis cases for facilitating the identification of serovars, another landmark effort, approved by Govt of India. The state surveillance system also receives tremendous support from laboratories of research centers like Rajeev Gandhi center for Biotechnology and Vector Control Research Center of ICMR (Indian council of Medical Research center). The state is now,



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preparing a draft action plan for constituting a One Health Governance Secretariate in Kerala, to bring together all the stakeholders in disease surveillance, for optimizing their contribution.

Results

State Health surveillance system detected 135,130,140,130,disease outbreaks during the years 2014,15,16,17,and 93, till date in 2018. The laboratory confirmation of 65%,75%,80%,82.5% and 65.5% in respective years facilitated prompt response by the state. This was made possible with an extensive laboratory collaboration with partners ranging from Institutional labs of state government as well as decentralised local self governments,(12.3%) Regional Public Health labs(13.8%), Referral Network Labs of Govt Medical College Hospitals (16.2%), Manipal Center for Viral Research Lab(11.5%) Kerala Water Authority Labs (6.2%), Food Security and Safety department (2.3%) and a small contribution by Private Laboratories (1.5%) during 2017. In 2018, 324 human samples were tested and 16 samples confirmed for Nipah virus disease, from MCVR Manipal. The same laboratory confirmed Lyme disease (2013) and Kyasanur Forest Disease (2014 and 2015) from human samples. 3 environmental samples were tested positive for Legionnaires bacteria from cooling system of 2 Tourist Hotels, following notification of Legionnaires Pneumonia among 2 foreign tourists (2016 and 17). Fish toxin "Ciguaterin" was confirmed from an incident of food borne outbreak by a laboratory attached to Fisheries department (2015) - a unique example of One Health application in disease surveillance and outbreak response. Laboratories attached to Kerala Water Authority supports testing of water samples during water borne infections and Food Safety department facilitates analysis of food items during food borne infections. 7 water samples tested positive for Vibrio Cholerae during a Cholera outbreak, done through Research wing of Veterinary University Microbiology Lab in 2016. An instance of Primary Amoebic Meningoencephalitis was confirmed through a premier private tertiary center laboratory. Leptospira serovars are being identified through a collaborative project with a Veterinary University(2018).

Conclusions

Kerala state in India has shown many successful models in development sector. Partnership in Laboratory surveillance is the most recent one in the segment. Besides interdepartmental collaboration, a unique model of Private Public Partnership is also tried by this state, resulting in historic achievements like high eteological confirmation of outbreaks including the most recent and first ever Nipah virus disease ample evidence for state's commitment to IHR compliance as well. This model, I feel is replicable in similar situations in resource poor countries across the globe.



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