An ICT Enabled Conceptual Framework for Determining Epidemic Susceptibility and Acute Type Response: An Exemplar from India

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ABSTRACT

In a developing nation such as India, the national government is pursuing the pathway of ICT supported decentralized programs, to combat endemics, in the social contexts of each State. The State of Kerala, which has been an exemplar for development, has become susceptible to endemics, brought in by urbanization and non-resident Indian population and compounded by environmental disasters. In this paper, the authors contend that the psyche of the community which has changed from social amity to self-interest need to be re-awakened with the power of ICTs and Internet, so as to efficiently combat endemics. The authors also propose a preliminary framework for emergency responses based on existing ICT systems, recommended by the national government, to fit the context.

Keywords: Decentralized Programs, Developing Nation, Epidemic Susceptibility, India, Information Communication Technology Systems (ICT)

INTRODUCTION AND RESEARCH MOTIVATIONS

The World Health Organization defines a disease that exhibits large inter-annual variability as an epidemic (WHO, 2004). According to NICD (2009a) many communicable diseases tend to be endemic in India. They spread by long known pathogens, which arise and persist under conditions created by inappropriate development patterns. Deficient scientific planning has lead to the buildup of many areas without planned infrastructure, social and societal development in India. Therefore, preparedness to address endemics has become a prime public health function in India. The National Centre for Disease Control has avowed that an effective surveillance system is essential for planning, implementation, and monitoring of the various disease control programs that the
central government has implemented in India (NICD, 2009a).

A number of the epidemic prone communicable diseases have a seasonal and cyclical trend, which can be discerned through surveillance systems (NICD, 2009b). The risk of exposure to communicable diseases is associated primarily with the size and characteristics of the population including the demographic structure, the amount and availability of safe water and functioning latrines, the nutritional status of the population, the level of immunity to vaccine preventable diseases such as measles, and the level of access to health care services (WHO, 2007). Various factors promoting communicable disease transmission interact synergistically during emergencies such as mass population movement and resettlement in temporary locations, overcrowding, economic and environmental degradation, impoverishment, scarcity of safe water, poor sanitation and waste management, absence of shelter, poor nutritional status as a result of food shortages, poor access to health care (Connolly et al., 2004) and also environmental changes.

Rate of spread of these diseases, is as important as the genesis of their outbreak. In communicable diseases, the number of new cases occurring in a period of time is dependent on the number of infectious persons within a susceptible population and the degree of contact between them. The degree of contact depends upon many variables like proximity (expressed by population density) of populations; seasonality and climate factors etc. (Webber, 2004). Densely populated areas are perpetually under the threat of such diseases. Reducing the exposure to risk is a crucial part of protecting these highly vulnerable populations. While individuals fall sick and require the expertise of the medical profession, it is the overall assessment of the cause of the disease and how to control them that will most rapidly solve the problem in the community (Webber, 2004). A systematic assessment of risk of communicable diseases, based on the best available evidence, is necessary to guide interventions designed to mitigate this increased risk (WHO, 2007). Evidence should essentially contain history/context of the outbreak, the geographical location, the first case etc., as well as detailed information on the cases reported, confirmed, treated, cured and deaths that have occurred in this connection. In the specific context of India, wherein the government takes the responsibility of providing health care to its citizens, the strength and efficiency of the health care delivery system has a crucial role in developing preparedness for outbreak control.

The Integrated Disease Surveillance Project or IDSP is a project that was launched in India in 2004 following the recommendation of various expert committees on health. It is a decentralized, State-based surveillance program (Thakur, 2006). It proposes a comprehensive strategy for improving diseases surveillance and response through an integrated approach, which enables rational use of resources for disease control and prevention (NICD, 2009d). The project aimed to “…(1) to establish a decentralized State based system of surveillance for communicable and non-communicable diseases, so that timely and effective public health actions can be initiated in response to health challenges in the country at the state and national level; (2) improve the efficiency of the existing surveillance activities of disease control programs and facilitate sharing of relevant information with the health administration, community and other stakeholders so as to detect disease trends over time and evaluate control strategies” (MHFW, 2004). In addition to the core diseases which were to be under surveillance for all the States in India, each of the states were able to identify up to five additional conditions for which surveillance was initiated. However, the recurrent outbreaks of diseases despite the presence of this surveillance program highlight the weaknesses of the existing system.

The state of Kerala has occupied an eminent position in the development debate since the early 1970s. The policy-makers of the State followed a successful ‘basic-needs-first’ strategy, which prioritized the improvement of socio-economic standards of its population (in terms of education, health, food and social
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