Dengue is spread by *Aedes* mosquitoes, and like other public health challenges, the responsibility to prevent and control dengue lies with the states and the local health authorities. These efforts include generating awareness regarding the disease, taking measures to prevent mosquito breeding and the spread of dengue, and ensuring availability of health services for those infected. The occurrence of dengue cases in any setting indicates and reflects a lack of timely and sufficient preventive and public health efforts by the local health administration. There could be multitude of reasons for insufficient public health efforts i.e. a lack of role clarity among multiple agencies providing services, insufficient funding, lack of trained and motivated workforce, and more attention on curative care. Hence, when the cases are reported the initial reaction of the health officials is to deny the reports. Year after year, health authorities claim that adequate preventive measures are being taken, yet dengue keeps returning to haunt the poor and rich alike.

The situation is similar for many other diseases. Since 1978, almost every summer, children in Gorakhpur region of eastern Uttar Pradesh and Muzaffarpur in Bihar die due to what was earlier thought to be Japanese encephalitis and is now identified as acute encephalitis syndrome. When cases are reported, under media glare; teams are sent to the affected areas and commitments...
made. However, policy attention shifts soon after the cases disappear – only to return the following year.

One of the commonly cited reasons for the poor health status in India is insufficient overall spending on health by the union and state governments. The Government's expenditure on health in India ranges from 1.1% to 1.3% of gross domestic product (GDP), which is among one of the lowest in the world (Global average is 6% of GDP on health by government). In India, while experts have strongly recommended raising public expenditure on health in India to 2.5%–3.0% of GDP, it has continued to remain low. While health expenditure is low, the public health measures and preventive and promotive efforts get minimal share of limited funds. The low health expenditure (including only 2% of total health expenditure on public health) in India is reflected in poor disease surveillance, regular disease outbreaks and limited public health measures such as health education, prevention and control of mosquito breeding, community awareness, and so on. These efforts are solely with the government authorities, and the private health sector (which mainly focuses on curative and diagnostic health care) has limited incentives to invest resources in such measures. The limited private sector engagement should be considered a reason for higher government investment on public health. The current investment in India on public health at approx Indian Rupee 100 or US$ 1.6 per capita is extremely low by any standard.

At present, the most prevalent approach to crisis management in the context of disease epidemics/outbreak focuses excessively on treatment through clinical care and hospitals, and the public health functions for prevention of the disease and on-population services receive a limited focus.

In this context, it is proposed that public health challenges require actions both from within health sector through comprehensive approach such as strengthening of health systems as well as coordination among different ministries and departments through Health in All Policies (HiAP) or health in policies of all departments. Within health sector, it needs HSA to ensure that all components of health system be strengthened. In this background, the author proposes that a “policy and system approach (PSA)” is adopted for the operational planning in public health. This requires an improved understanding among the policymakers and program managers about PSA. This article gives an example of PSA approach for dengue prevention and control as a public health measure.

HiAP approach for dengue prevention and control indicates various departments/ministries in a particular setting agree on their roles, assign their responsibilities, develop monitoring and accountability framework, and include the tasks in their specific policy documents. An indicative list of stakeholders in dengue prevention and control and their roles is provided in Box 1.

The HSA for dengue prevention and control would mean that rather than restricting to curative and diagnostic services, a systematic and concerted strategy is required that would incorporate functions of the health system – services provision, resource creation, financing, and stewardship/governance. How this can work has been explained in Box 2.

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Box 1: Dengue prevention and control: Health in All Policies (HiAP) approach

A number of departments, ministries and institutions need to be engaged and have explicit roles in dengue prevention and control, as public health measure. These have been listed below as indicative purpose and the list is not exhaustive

Department of Health: Primary responsibility in all aspects including stakeholder coordination
Department of Urban Development: Either through municipal corporations or other direct measures should have explicit role in information, education and communication, prevention of mosquito breeding, providing preventive and control measures etc.
Urban local bodies and local self-governments
Community engagement should be ensured through councilors in municipal corporations, Member of Legislative Assembly and Member of Parliament
Department of Medical Education through medical colleges
Nursing council through nursing schools
Professional associations of doctors and nurses
Public works departments
Self-help groups and community groups
Public and community

Box 2: Dengue prevention and control: Health systems approach

Service provision: The services should not focus on curative and diagnostic aspects only and need to have focus on population services including awareness generation & mosquito control etc., Health facilities need to be kept ready for surge capacity at the out-patient and in-patient levels so that patients can visit and consult doctors in a timely manner. The private sector should be appropriately engaged. This requires attention on information, education and communication as well
Creating resources: Availability of sufficient & trained public health staff should be ensured to visit communities to check mosquito breeding sites, conduct fogging and take other preventive measures. Adequate supplies of insecticides, spray machines etc., should be provided. On curative side, clinics and other health facilities should be equipped with trained workforce and regents for conducting tests for dengue virus, and human resources for counseling patients etc., Widespread capacity for conducting laboratory testing should be established
Financing: Often either sufficient financing is not available to conduct community outreach efforts for prevention, and whatever is available is not released on time. Sufficient funds need to be allocated for prioritizing public health activities, including recruitment and training of the staff, laboratory investigations and surveillance
Stewardship and leadership: As for all diseases, the mechanisms for reporting of emerging and re-emerging viral diseases are poor. There is a need for strengthening disease reporting systems and to use the information on cases/deaths as a basis for action. Policies should be informed by learning from local experiences. Accountability mechanisms should be put in place to ensure that planned public health actions are implemented in a timely manner. Metropolitan cities such as Delhi have a multitude of agencies delivering public health services & there needs to be strong leadership to coordinate the efforts of various agencies. A clear and succinct policy mechanism has to be established along with the monitoring and accountability indicators and mechanisms
PSA could provide an opportunity for a comprehensive look at (a) role of various departments and institutions and (b) whether all functions of health systems are getting sufficient attention. Through PSA, this could be done in more accountable manner and efficiently. The author is aware that the only evidence of success of this approach is that both of its components (HiAP and HSA) are individually effective. It is likely that these put together would have a synergistic effect. However, the proof of this approach would come from ground-level implementation. The stakeholders and entities are encouraged to adopt this approach for tackling public health challenges in low- and middle-income countries.

This article calls the policy makers and program managers to adopt "Policy and Systems Approach (PSA) to tackle existing and emerging public health challenges. An effective implementation of this PSA would need engagement of stakeholders such as academician & training institutions to develop material and built capacity. The PSA could help in developing conducive polices, ensuring that health systems will be strengthened.

Conclusion

There are public health challenges including the emergence of new viral diseases and epidemics. An appropriate way to handle these challenges is to have coordinated efforts by public health authorities, with focus on all components of the health system and all stakeholders (including nonhealth) having stated policy objectives to improve health. PSA could prove an useful tool and should be given a due consideration in health sector planning.

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