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Title:	Dengue season arrives early in Kerala			
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The long queues in the outpatient clinics at medical colleges and general hospitals are often the first indicator of the beginning of the epidemic season in Kerala. Usually, dengue cases begin to peak with the arrival of the southwest monsoon. But this year, the unprecedented drought, extremely hot and humid climate and acute shortage of drinking water seem to have heralded the arrival of dengue much sooner.

Already, the State has reported 2,123 confirmed cases and two deaths and public health authorities fear the State could be in for a major epidemic situation this year too. To complicate matters, a wave of H1N1 too is currently sweeping across the State, but even while effective antiviral drugs are available to treat the disease, the mortality rate has been on the high side owing to various reasons. The first recorded cases of dengue fever and associated deaths — 14 cases and 4 deaths — in Kerala was reported from Kottayam in 1997 (ICMR).

And since 2001, dengue epidemics with varying levels of severity and mortality profiles have been an inevitable annual hazard in the State, overwhelming the public health system and leaving thousands affected. In 2013, the State recorded the worst dengue epidemic so far, reporting 7,938 confirmed cases and 29 deaths. This is only

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**Integrated Disease Surveillance Programme (IDSP), National Centre for Disease Control,
Ministry Of Health & Family Welfare, Government of India**

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the tip of the iceberg as the Integrated Disease Surveillance Project (IDSP) records only the confirmed cases coming to government hospitals. In a State where over 60% of the care takes place in the private sector, the actual figures could be manifold.

Climate & epidemic

"It is not surprising at all that we have an early epidemic because the climate is dry and humid and there is acute water shortage across the State. Everywhere, people are storing water long-term in containers at home. This is a classic situation that promotes the breeding of Aedes mosquitoes, the dengue vector, which breeds in artificial containers," points out E. Sreekumar, senior Scientist at the Rajiv Gandhi Centre for Biotechnology, Thiruvananthapuram.

In the colonies in the coastal area of Vizhinjam, for instance, where water shortage is a perennial problem, people are used to buying water and storing it in huge containers. "These are huge breeding sites for Aedes mosquitoes and we advise people to throw away the water weekly and maintain 'dry days' to prevent the larvae from hatching. But water is so scarce now that we cannot even suggest that," a health field worker says. "We speak of hospitals being crowded only when the daily OP exceeds 200 or 250. Dengue fever and H1N1 are on an upswing but we are not panicking yet because we expect the worst only when the rains begin," says S. S. Santhoshkumar, Deputy Superintendent at the medical college here.

Both dengue as well as the vector responsible for spreading the disease, the Aedes species of mosquitoes, are well established in the State. In the urban areas, the Aedes aegypti is the primary vector transmitting dengue, while in the semi-forested areas and hilly terrains, it is the A. albopictus which is the incriminating vector. A. albopictus is a less efficient vector, but it makes up for this by its huge numbers. This mosquito has adapted its breeding habits so well to spill over to the plains and to even breed indoors in refrigerator drip trays.

Four sero types

Dengue has been hyper-endemic in the State for the past several years, with all four sero types of the virus in wide circulation in the community. Virologists believe that Dengue virus 2 (DENV 2) and 3 may be creating the major outbreaks, while DENV-4 is reported from only a few districts. The evolutionary dynamics of the dengue virus circulating in Kerala have been changing since 2008 and the sero type and geno type shifts occurring in circulating dengue viral strains in a locality are important causes for enhanced severity of dengue outbreaks.

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Dengue infection can result in a spectrum of illnesses, ranging from mild, self-limiting febrile illness to dengue haemorrhagic fever or shock syndrome and death. But thankfully, majority of the infections in the community are mild, sub-clinical infections.

Severity of the dengue infection depends on various virus or patient-specific factors. Doctors, especially those in the periphery, have been advised to treat fever cases strictly as per the short febrile illnesses management guidelines issued by the Health Department (available on the website of the Directorate of Health Services) and to avoid unnecessary transfusion of platelets and intravenous fluids. Patients are advised to keep themselves well hydrated through oral fluids which is important.

Early detection of dengue is one major advantage that doctors now say has made the illness much more self-limiting. "Earlier, we had the Igm Elisa test to confirm dengue, which could be done only after the seventh day of the infection, by which time some complications would have perhaps set in. NS1 antigen rapid test kits are now widely used in all government labs and hospitals. They can give a confirmation of dengue on day one of the onset of fever itself," says S. Sunija, the Director of State Public Health Lab.

Vector control

An effective vaccine for dengue is still in the making and hence dengue prevention is currently limited to mosquito control. But controlling the Aedes species is fraught with many challenges because of the peculiar breeding and feeding habits of the species. It can breed in stagnant water collected in a discarded bottle cap or even an egg shell. There has been a universal reliance on source reduction activities for limiting the artificial breeding sites of A. Aegypti, particularly inside and around individual buildings and at construction sites. But these efforts rarely yield quantifiable results, unless executed in a systematic and sustained manner with total community involvement.

Public health experts point out that vector-control strategies should be deployed early in the event of an outbreak and sustained over inter-epidemic periods to prevent escalation in transmission. But apart from launching a flurry of activities when epidemics strike, the Health Department has had seldom any long-term strategy to maintain the momentum in preventive activities. Though the Health Department had launched a pre-monsoon, pre-epidemic disease-control programme focussing on intensive vector control measures, it seems to be fighting a losing battle against mosquitoes

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Several review meetings to seek inter-sectoral participation and to encourage community participation for sustained vector control activities through local bodies appear to have achieved little at the field level. "We did launch control activities early, but it is evident that whatever is happening in the field now is just not enough. It has not helped that in many districts such as Thrissur, Malappuram and Kasaragod, the Health Department's field staff are being deployed for other work and surveys by the local bodies, thereby affecting basic public health service delivery," says K J. Reena, Additional Director of Health Services (Public Health).

Reasons

Increased global travel and rampant urbanisation, with its accompanying issues of over-crowding, dismal waste management and erratic water supply systems, have all contributed to the rapid spread of dengue globally. But lack of local community participation remains one of the key reasons why vector control measures have failed to halt the march of dengue.

Dengue prevention

The World Health Organization, in its 2013 report on neglected tropical diseases, had called for an increased focus on dengue prevention. The report had also called for evaluation and integration of current intervention strategies to achieve a 50% reduction in dengue mortality and 25% reduction in dengue morbidity by 2020.

Meanwhile, there is growing consensus amongst the international community of public health experts that 'no single intervention will be sufficient to control dengue disease... due to heterogeneities in mosquito vector, viral pathogen, and human host factors that drive the complexity of transmission' (A Critical Assessment of Vector Control for Dengue Prevention, PLOS, May 2015).

With a dengue vaccine in the making and a host of promising biotechnology breakthroughs for mosquito control, the future efforts at reducing the dengue burden appear bright.

Yet, dengue-endemic regions could, ideally, adopt a more comprehensive approach, integrating vector control techniques, robust disease surveillance strategies clubbed with epidemiological data and active public participation to break the mosquito-human chain of dengue transmission.

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