

To the vector borne.....mosquito-transmitted diseases in Singapore

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This issue of the journal features important messages about malaria and dengue, the world's two most significant mosquito-borne human threats. While local transmission of malaria in Singapore has not been documented since Aug 2003^(1,2), two articles in the current issue of the Singapore Medical Journal (SMJ) remind us of its international and regional significance, and the importance of clinical and simple laboratory criteria for diagnosis and monitoring of large numbers of infected individuals in resource-poor settings^(3,4). Up to September 24 this year, 108 cases of imported malaria had been notified to Singapore's Ministry of Health (MOH)⁽²⁾. As such re-establishment of locally-transmitted malaria remains a threat.

Dengue is, of course, a much more real story. Despite a coordinated public health approach, including aggressive vector control programmes, public education and law enforcement, Singapore is having its worst ever year with 10,951 cases up to September 24, 2005, compared to 5,573 in the same period last year, and a median annual incidence of 3,560 cases in the last five years^(2,5). Two dengue case reports in this issue of the SMJ^(6,7) show us the consequences when large numbers of patients present. We start to see uncommon manifestations more commonly. This in itself is a message to all of Singapore's medical community.

So why are we having this outbreak? After all, we have been publishing about the effects of dengue for over a hundred years^(8,9). In 1902, the Straits Settlements medical report described "epidemic proportions during the year". It described 124 cases of which 122 were admitted. As recently as 1998, a wonderful 260-page monograph demonstrating our great understanding of dengue in Singapore was published⁽¹⁰⁾. The fact is that this disease is endemic and has a propensity to periodic high levels of dengue fever (DF), dengue haemorrhagic fever (DHF) and dengue shock syndrome (DSS), as we are now experiencing.

The most important vector for dengue is *Aedes aegypti*. It is an extraordinarily well-designed vector

that enjoys the tropical climates and the rainfall of a place such as Singapore. Its eggs can survive desiccation in times of no rainfall. To transmit dengue, it needs a dense human reservoir for the virus. Its bite can be imperceptible, and the disease is usually not severe enough to kill or drive its human reservoir away from future feeding. It is little wonder that we have a problem!

Recently, we have significantly increased our numbers of potential breeding site inspection teams. On September 14, 2005, in response to this dengue outbreak, the MOH announced the formation of a seven-member multidisciplinary expert advisory panel⁽¹¹⁾. Its aims are to:

- Review the current dengue situation in Singapore and to identify possible causes for the resurgence.
- Identify gaps in dengue surveillance and control.
- Recommend operational research to address the gaps identified.
- Recommend short-term and long-term cost effective strategies in the prevention and control of dengue.

While such efforts are an excellent reaction, one may ask where these efforts have been before now. It could be argued that paradoxical harm can result from good vector control by decreasing herd immunity, producing an increased potential for outbreaks, especially of DHF and DSS. After all, all four serotypes are endemic⁽¹²⁻¹⁴⁾. History suggests that try as we might, this is a vector and a virus that cannot be eradicated in this country by currently available means. To give up, however, would be to neglect the tens of thousands who will suffer in the years to come, together with accompanied resource loss at the work place and in health expenditure. So far this year, 11 people have died from dengue.

Such an expert advisory committee needs to be sustained in the long-term as dengue will not be defeated until there is an available tetravalent vaccine for mass use. Until that time, we must sustain our public health efforts, particularly when numbers fall and with it the size of the reservoir for

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further transmission. The committee must consider Singapore's needs and consider all new research including that relating to insecticide efficacy such as that published in this issue of the SMJ⁽¹⁵⁾.

So do our experiences with malaria and dengue serve any lessons for other communicable diseases in Singapore?

In 2003, I was privileged to be at the coalface, experiencing SARS management in Singapore. I saw a first class effort by government, health administrators, healthcare workers and the public. Still now, Singapore hospitals continue to develop their abilities to counter the next epidemic of respiratory infectious disease. Excellent daily surveillance and coordinated correspondence between administrators, epidemiologists and infectious disease units persist in this "green light" environment as testimony to a proactive approach to such communicable disease threats.

With regard to food and water-borne diseases, Singapore clearly is world class. While one can only hold these efforts with esteem, there are many more issues upon us now and on our doorstep. Each year, Singapore has an increasing number of new human immunodeficiency virus (HIV) notifications. There seems to be an increasing burden of infectious disease related to intravenous drug abuse that cannot be denied. These include hepatitis C, bacterial endocarditis, as well as HIV. Our hospitals have an extraordinary problem with multi-resistant nosocomial infections, including methicillin-resistant *Staphylococcus aureus* (MRSA), vancomycin-resistant enterococci (VRE) and extended-spectrum beta-lactamases (ESBLs). The region has avian influenza, poliomyelitis and Japanese encephalitis virus (JEV) to name a few.

The model of a formalised expert advisory panel on dengue could be extrapolated to all of Singapore's emerging and potential communicable disease problems. Such groups (perhaps under one banner) can stay affront of local, regional and world

epidemiology, and research advancements. It could also input into the research efforts of our excellent National University, achieving relevant translatable research via targeted grants. This could be a wonderful tool for the government to allow a sustained, broad-based proactive approach to communicable disease management in Singapore. **SMJ**

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