

Social and Economic aspects of Dengue Epidemics and a Rationale for a Regional Approach

Dengue A Case in Point

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Why worry about Dengue

- ▶ In 1950 nine (9) countries reported dengue to W.H.O.
- ▶ In 2004 one hundred (100) countries reported dengue to W.H.O. – it is spreading and the incidence rate is increasing
- ▶ W.H.O. estimates more than 2.5 billion people are at risk of dengue
- ▶ It has become a leading cause of mortality in several Asian and South American Countries

Despite recognition of dengue fever as an important, some say the most important, arboviral disease affecting humans, and in spite of a greater emphasis on community-based control approaches, the burden placed on the communities, countries, and regions affected by this disease continues to rise

Why worry about Dengue in the GMS?

because people suffer (a lot) and people (mostly kids) die

The current outbreak in GMS – 9 months data

- number of cases – over 115,000 in Viet Nam, Laos and Cambodia (significantly under-reported)
- case fatality rate has ranged from 0 to 0.4% to 0.8% to 1% to 2.8% in different areas

?? Why the variation – data issues? – is case management poorer in areas – can people not access appropriate care when they need it – are there barriers to access?

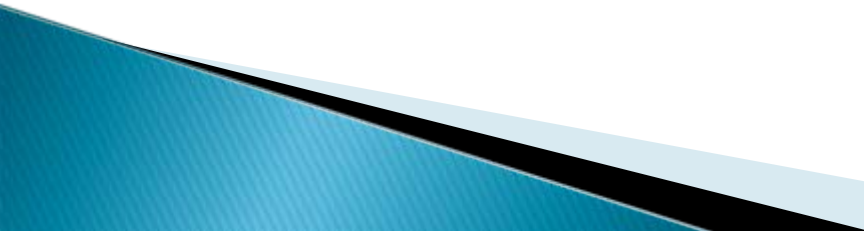
Why do we need Regional Cooperation in the GMS?

Because mosquitoes don't know about border control

Even if you eradicate mosquitoes in 1 country or 1 province or 1 village they can come back

And because many people cross and recross borders in the GMS - regularly

We make better use of scant resources if we work together



Why should other countries worry if there is an epidemic in Cambodia – because dengue can travel at the speed of 148kms a month

Travelling waves in the occurrence of dengue haemorrhagic fever in Thailand Nature 247 344-347 (22 January 2004)



The dengue mosquito is very good at hitching a ride – in water containers



What if we could eliminate dengue in 1 area

Aedes aegypti was eliminated in Mexico. However, subsequent social and economic changes in the Americas have permitted the rapid reinfestation of the vector throughout the region.

In Mexico, there was high population movement from rural areas to urban centres (in the GMS there is increasing urbanization- even if on small scale it still increases risk of dengue).

Reinfestation happened in Mexico because increasing urbanization was not matched with adequate housing and sufficient water, sewage, and waste management systems.

The introduction and proliferation of water containers and non recyclable products (left lying around) provided numerous and effective breeding sites for mosquitoes.

What has this got to do with the GMS?

As the forest retreats – people move into these areas and establish small communities (that grow to large communities)

More people are collecting water in containers – that attract mosquitos – other objects that act as water reservoirs lie around communities


Overtime the increase in ‘small communities’ means an increase in risk of dengue

Prevention of Dengue is important

As there is no effective cure for dengue (only supportive care) then:

Prevention is critical

and this means we need decrease the number of mosquitos – breeding sites – individuals and families, villages, districts, provinces and countries all need to act together




But – early diagnosis and treatment is also critical

The international – objective is to keep case fatality rate at 1% or less

But in the Cook Island in 2002 they had 2,900 cases of dengue (population of 15,000) and no one died – case fatality rate of 0 – yes they do the DHF

Why the difference in the Cook Islands?? Maybe because when 1 person (1 case always leads to more) is diagnosed a Dengue Action Plan is initiated. A prevention, case finding and aggressive case management strategy is put in place.


Why aren't people getting access to appropriate care when they need it ??

- ▶ In Cambodia only some 16% of the population use public health facilities
 - ▶ Government funds for health care are low – around USD 34 per capita in Cambodia
 - ▶ Cost of private care is a barrier to access – per capita private expenditure in Cambodia around USD 160 – out-of-pocket costs are a barrier to access
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What happens when a child gets sick – why don't they get care when they need it?

It is all about economics.

All about lack adequate resources:

- ▶ money;
 - ▶ time; and
 - ▶ adequate numbers of appropriately skilled health care providers.
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Women in rural areas in make decisions based on:

- availability of 'free' time (don't have any free time);
- money (that they don't often have – might have to sell goods/buffalo or borrow money – some sell land to pay health debts); and
- they don't like going to health centres as they are seen as poor quality – in some case health centre staff are not qualified to provide dengue (role is to refer not treat)

Day 1 child has a fever but mother keeps farming – wait to see to see if fever continues

Day 2/3 decide to treat with drugs purchased locally – often borrow money to do this – don't go to health centre too busy farming, no confidence in health centre and it costs money and it takes time (waiting) – have to pay up front – in Cambodia are NOT ALLOWED treat dengue – their role is to refer on

Then if child doesn't respond – they might go to private clinic (can pay later and it is closer to home)

And if child still sick - might go to a private or public health facility in a town – given injections – why – makes parents happy to see action but have to borrow more money


If no improvement - go to referral hospital – borrow more money – or try get admitted to private hospital (often too late)

Impact of economics on health in the GMS – dengue incidence and outcomes

Poor people mostly live in areas where there is no reticulated water supply, non efficient waste management – water is stored jars – water collects in discard containers – mosquitos breed in jars and containers

Poor people don't have screens on their windows to keep mosquitos out

The cost of treatment (money and time) is a barrier to access to appropriate timely care



Economic Impact of Dengue

It is difficult to measure economic impact of dengue as most cases go unreported and to date most studies have concentrated on single epidemic – not whole of year impact

However, we do have some information:

- ▶ 1981 epidemic in Cuba – USD 103 million – ½ for mosquito control
- ▶ 1994 epidemic in Puerto Rico – USD 12 million – treatment costs only
- ▶ In Thailand annual economic burden is estimated to be USD 31.5 to 51.5 million per year

Cost of dengue in Viet Nam 2005 epidemic

Direct Costs	average USD	range USD
hospital bill	16.16	2.31-125.75)
doctors visits/admission to local hospital and medication	12.46	0-158.23
lab tests not included in hospital bill	3.62	0-101.27
total	32.73	5.34 - 198.29
Indirect costs	average USD	range USD
Loss of Income	12.78	0 -125.58
transport	6.56	0 -75.95
food	9.29	0 - 63.29
total	28.63	0-177.22

Cost of dengue – Cambodia 2001 epidemic

Average family income in rural areas ?? Less than USD 100 per year

Health Care Providers	no. of households	average o-o-p expenditure	median (range)
Private providers	44	US \$ 103	US \$ 77 (9-460)
Combination of private provider and public hospital	15	US\$ 32	US\$ 29 (6-97)
hospital only	15	US\$ 8	US\$ 5 (0-28)

2007 cost of admission USD 50 to USD 100 – However, Cambodia Government supported by donors is providing dengue care free – current outbreak only

Cost of lost tourism dengue epidemic in the
Cook Islands – pop. 15,000 – lost tourism
estimated
USD 3 million

Activity	2002 cost of epidemic
Surveillance*(5 entry points)	\$4,000
Vector Control - all islands	\$4,000
Emergency Response	\$401,159
Clinical Management**	\$497,879
loss from tourism	\$3,000,000
Total	\$3,907,038

* Passive surveillance ** outpatient and inpatient treatment

Estimating Cost of Dengue

Current estimates of the cost of dengue are seen to be gross under-estimates as that don't take into account the cost unreported cases and general “flu-like symptoms” and serious “body ache” on the economy

For example: lost work and productivity, absence from school, lost tourism, poor quality of life and social disruption.

Summary Dengue and Economics

Good Health is a determinant of economic success and poor health is a determinant of low economic success

Health impacts directly on household income and wealth, labor (farming) productivity, labor force participation, savings and other human capital factors

During epidemic in Cambodia in 2001 after treatment was completed 45 out of 72 households were in debt. After 1 Year 26 families were still in debt and paying high interest rates – 2.5% to 15% per month* The researchers gained the impression that poorer families paid higher interest rates.

Cost of dengue treatment especially when money is borrowed and high interest rates paid can push families into *poverty*. 40% of new poverty in Cambodia measured in terms of landlessness is a result of out-of-pocket costs

Summary Dengue and Economics

Treatment costs and lost labor productivity – means less resources available for other uses

Another cost of ill-health is lost time associated with higher levels of child mortality. When children die, the net cost of raising each child who does survive increases. For each child who dies before the fifth birthday it represents an average loss of 1300–1800 hours of parental work time.

Of course that doesn't take account of the pain and misery of losing a child – another economic cost – health economists find it hard to put a \$ value on pain and suffering and a loss of life.

Social Impact of Dengue

Family disruption

Sick children impacts on adversely on family members and the loss of a child is catastrophic – mothers often get blamed for not looking after the child properly and there is a lot of guilt for not being able to save the child

Social Impact of Dengue

Social Disruption

In an outbreak (as has happened in Cambodia recently) there is often chaos and confusion as families try to get help for their loved ones*.

Dengue is a debilitating painful disease (break-bone disease) and dengue hemorrhagic fever can be a very dramatic disease – and progress very quickly – sometimes in hours to irreversible shock and death.

Patients and families who experience this rapid deterioration do not usually for get it and this contributes to (fear) confusion and overload of health services.

Social Impact of Dengue

Sense of false security

During outbreaks there is demand for governments to act – health officials and politicians want to be seen to be responding – so often put in place emergency measures like spraying everything – but it is not effective in controlling the dengue mosquito – spraying is expensive – spraying leads to a false sense of security which means people don't do anything to control mosquitos around the house and this just perpetuates the cycle of epidemics.

In many countries people just go from 1 outbreak to another thinking they can't do anything about it – but they can and that is the tragedy.

However:

- ▶ if people/families/villages/districts took more action regularly to prevent mosquito breeding then there would be less risk of outbreaks – in emergency, as is the case in Cambodia, there is sometimes a national and international response – but there should be a national and international response before an outbreak – to prevent an outbreak

Social Impact of Dengue

Poverty

How do families finance care – even relatively modest outlays cause indebtedness and can lead to poverty – they:

- use savings;
- sell consumables;
- sell assets – buffalos and in some cases land; and
or
- borrow money

What do we need?

We need to address the barriers to effective dengue prevention and case management and build bridges so we can maximise our effort

To effectively and sustainably protect human populations from dengue fever, we must be prepared to dynamically translate our understanding of what is need for social-ecological systems into effective actions.

The failure to appreciate how complex systems interact has ultimately prevented sustainable solutions from being adopted to control dengue.

How can we make things happen

We need a:

GMS Dengue Social Mobilisation Strategy


A Regional Strategic Plan for Comprehensive and Multi-Sectoral Response

We need Action Research in the GMS – we need to know what is happening and why and how we can effectively intervene and for what cost and for what outcomes

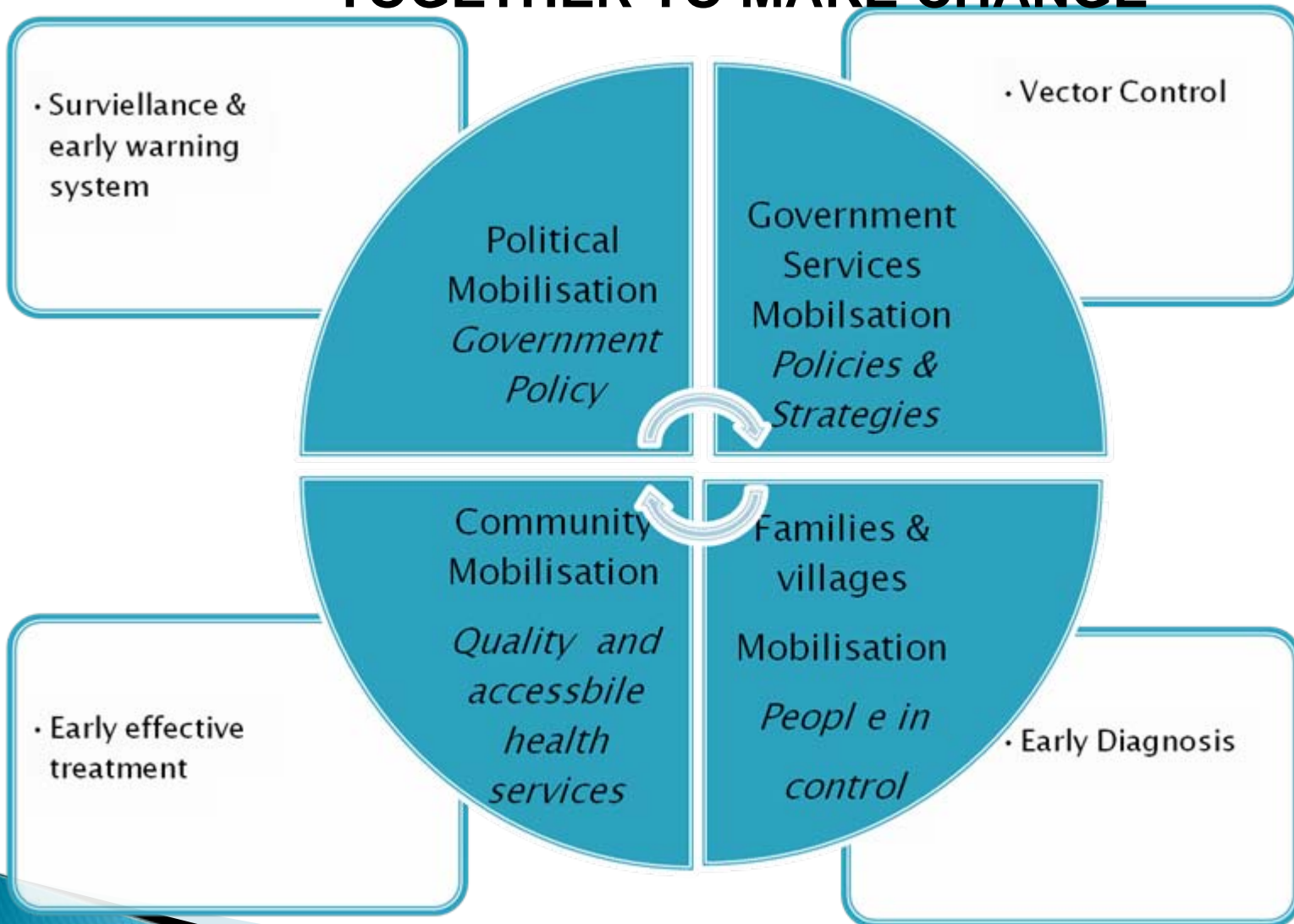
A Social Mobilisation strategy is a Change Management Strategy

We need a multi-faceted multi-sector strategy

We need to understand what is happening and why and change the way things are managed including:

- surveillance;
 - early warning;
 - vector control;
 - diagnosis; and
 - treatment
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SOCIAL MOBILISATION – MEANS ALL WORKING TOGETHER TO MAKE CHANGE



In Conclusion

Dengue is one of the most important emerging diseases of the 21st century it is still perceived by many as unimportant – go to Vietnam, Cambodia and Laos, Tonga and the Cook Islands as I have and ask the health ministers and CEOs what keeps them awake at night and they wont say AIDs or avian flu – they will say dengue –there are strategies in place to address AIDs and avian flu but little is done re dengue

To date very little has been invested internationally in dengue control

Of critical importance is the need to address:

1. barriers to access to effective case management at the local level in the GMS;
 2. lack of effective early warning system at the village level;
 3. lack of adequate knowledge of signs and symptoms of complicated dengue at the individual/family level;
 4. cost of diagnosis and treatment to the individual/the family; and
 5. lack of skilled health staff at the local level
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