MALARIA: CAN IT BE ERADICATED?

3rd ASIA PACIFIC CONFERENCE ON PUBLIC HEALTH
MALAYSIA

DR. CHRISTINA RUNDI
DISEASE CONTROL DIVISION
MINISTRY OF HEALTH
MALAYSIA
• Definition
• Lessons learned from GMEP (1955 – 1969)
• Why eradication again?
• What are the current issues/problems?
• Current Strategies
• Can Malaria be eradicated?
DEFINITIONS

• “.....the ending of the transmission of malaria and the elimination of the reservoir of infective cases in a campaign limited in time and carried out to such a degree of perfection that when it comes to an end, there is no resumption of transmission” (The WHO Expert Committee on Malaria, 1956)

• **Eradication** is the interruption of transmission and reduction of the disease incidence to zero worldwide.

• **Elimination** is the interruption of transmission and reduction of the disease incidence to zero in a defined geographical area. WHO defines elimination as having no domestic transmission for the past three years.
OUTLINE

• Definition
• Lessons learned from GMEP (1955 – 1969)
  • Why eradication again?
  • What are the current issues/problems?
• Current strategies
• Can Malaria be eradicated?
Global Malaria Eradication Programme (1955 - 1969)
Malaria Elimination Programme....Malaysia, 1960s
Lessons learned from GMEP (1955–1969)

• Overreliance on a single strategy - indoor residual spraying with DDT)
• Wrong assumption that all the necessary knowledge for eradication was available.

“Between malaria control and eradication there is as great a difference as that between night and day. Control … is a primitive technique. Now we know exactly … the schedule of an eradication campaign which will last four or five years, followed by three years of consolidation”.

• Rigid policy: No deviation in practice at country level.
• General disregard for social and cultural barriers, which often affected the acceptance of the campaign activities in many of the remote areas.
• “Forgot” to address the technical challenges in dealing with the malaria problem in Africa.
• Ignored reports of chloroquine and insecticide resistance.
• Absence of a public health service in many countries to support malaria surveillance.
• FUNDING
So, why are we talking about eradication again?
Malaria back on the agenda

- 1992: the combination of a worsening malaria situation and promising technical developments led to renewed global focus on malaria control.
- 1998: The Roll Back Malaria initiative was launched by WHO. Increased resources through the Global Fund to Fight AIDS, Tuberculosis and Malaria, the World Bank’s Booster Program, the US President’s Malaria Initiative and many others.
- 2007: there was a renewed call for malaria eradication and a consultative process to define a research and development agenda for malaria eradication. malERAs was established.
- Oct 2007, at the Gates Foundation Malaria Forum: Bill & Melinda Gates called for a new plan for malaria eradication, by going as far as possible with existing tools while also investing in new ones.
- Sept 2008: Global Malaria Action Plan (GMAP) was unveiled.
OUTLINE

• Definition
• Lessons learned from GMEP (1955 – 1969)
• Why eradication again?
• What are the current issues/problems?
• Current strategies
• Can Malaria be eradicated?
If you know the enemy and know yourself, you need not fear the result of a hundred battles.

If you know yourself but not the enemy, for every victory gained you will also suffer a defeat.

If you know neither the enemy nor yourself, you will succumb in every battle.

Sun Tzu (c.500–320. B.C)
Malaria: Current knowledge and gaps

- Certain vulnerable groups: pregnant women & children < 5 years old
- Certain high risk activities: travel to endemic areas, jungle related activities, occupational hazards (army personnel, rangers)
- Practice – use of counterfeit drugs (drug resistance)

- 200 species and counting…
- At least 11 species infect human
- Hypnozoites (P. vivax & ovale): When and why become activated?
- Dormant form of P. falciparum?
- P. malariae – low parasitaemia for many years?

- Climate: Temperature
- Exploitation of natural resources such as logging, opening of new areas for agricultural purposes
Malaria: current knowledge and gaps

- ~ 460 species, 100 can transmit malaria, only 30-40 commonly transmit
- Found in many countries – risk of reintroduction of malaria.
- Breeding sites – wide range of habitats.
- Preference sources for blood meals: anthropophily and/or zoophily
- Survivorship
- Patterns of feeding and resting: crepuscular (active at dusk or dawn) or nocturnal; feed indoor (endophagic) or outdoor (exophagic), rest in door (endophilic) or outdoor (exophilic)
- Adaptive behaviour?
## CURRENT STRATEGIES & APPROACHES

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Currently available</th>
<th>Gaps/Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>♦ Quinine &amp; others&lt;br&gt;♦ 8-aminoquinoline&lt;br&gt;♦ Artemisinin Combination Therapy (ACT)</td>
<td>▪ Resistance to CQ, SP, MQ, ACT.&lt;br&gt;▪ Drugs that target hypnozoites&lt;br&gt;▪ G6PD Deficiency&lt;br&gt;▪ Gametocidal&lt;br&gt;▪ Contra-indication: pregnancy&lt;br&gt;▪ Single Encounter Radical Cure and Prophylaxis (SERCaP)</td>
</tr>
<tr>
<td>Diagnostic</td>
<td>♦ Microscopy&lt;br&gt;♦ Rapid Diagnostic Test</td>
<td>▪ Better RDT</td>
</tr>
<tr>
<td>Insecticides</td>
<td>♦ Pyrethroids: current use in IRS, ITN and LLIN</td>
<td>▪ Target mosquitoes that feed and rest indoor.&lt;br&gt;▪ Vectors resistant to pyrethroids.&lt;br&gt;▪ Limited development in formulation technology.</td>
</tr>
</tbody>
</table>
Malaria in the news

Scientists make malaria discovery

Scientists in Edinburgh have discovered a gene in the malaria parasite, which enables it to develop resistance to certain drugs.

Resistance to the plant-based remedy, artemisinin, potentially creates problems in controlling malaria.

Researchers at Edinburgh University hope the

Mosquitoes 'disappearing' in some parts of Africa

By Matt McGrath

Scientists are unsure as to why.

Figures indicate controls such as anti-mosquito nets are having a significant impact on the incidence of malaria in some sub-Saharan countries.

But in Malaria Journal, researchers say mosquitoes are also disappearing from areas with few controls.

Malaria vaccine trial raises hope

By Matt McGrath

Researchers are to expand a clinical trial of a new malaria vaccine after promising results in a preliminary study in Burkina Faso.

The trial was designed to test safety, but researchers found that vaccinated children had high levels of protection.

Described as a “most encouraging” result, a larger study involving 800 children is now to take place in Mali.
First Results of Phase 3 Trial of RTS,S/AS01 Malaria Vaccine in African Children

The RTS,S Clinical Trials Partnership*

Published on October 18, 2011 at NEJM.org

There have been too many claims of effective vaccines so we have to remain very cautious.”
Dr Pierre Druilhe Pasteur Institute, Paris

Scientist Joe Cohen, who has been working on a malaria vaccine since 1987, poses for a photograph at GlaxoSmithKline biologicals (GSK) research site in Rixensart December 8, 2010. Source: BBC.co.uk
OUTLINE

- Definition
- Lessons learned from GMEP (1955 – 1969)
- Why eradication again?
- What are the current issues/problems?
- Current strategies

- Can Malaria be eradicated?
Can malaria be eradicated?

- HOST
- ENVIRONMENT
- VECTOR
- AGENT

**Vaccine**

**HOST**

**VECTOR**

**AGENT**

**ENVIRONMENT**

- ACT
- Diagnostic methods
- Insecticide – IRS, ITN, LLIN
- Integrated Vector Management Control

**Political Will**

**Research**

**Efficient Programme Management**

**Leadership**

**Active participation**

**Strengthened Health System**

**Inter agency collaboration**

**Community participation**

**FINANCIAL MEANS**

**Leadership**

**Research**

**Efficient Programme Management**

**Political Will**

**Diagnostic methods**

**Insecticide – IRS, ITN, LLIN**

**Integrated Vector Management Control**
A word of caution

• Malaria is a disease of poverty.
• In many areas, access to care is the real problem!
• It is the poorest socioeconomic groups that disproportionately suffer from a lack of access to existing medicines.

• “An estimated one-third of the world population lacks regular access to essential drugs, with this figure rising to over 50 per cent in the poorest parts of Africa and Asia. And even if drugs are available, weak drug regulation may mean that they are substandard or counterfeit.” (WHO Medicines Strategy Report 2002–2003)

• Problem of access is an intractable political and economic problem.
MALARIA FIGHTS BACK....(with a vengeance)....

- when the drug stop working
- when the vector becomes resistant
- when the money stop flowing
- when people stop caring

Our eyes are wide open to the realities, the formidable challenges, the inevitable threats, and the fragility of progress. We know that eradication will take at least four decades. This is a long-term investment, not a quick win.

Dr. Margaret Chan
Director-General of the WHO
Thank you for your attention
References

• Tanner M, de Savigny D. Malaria eradication back on the table. Bulletin of the World Health Organization
• Dr Margaret Chan, WHO Director-General assesses prospects for malaria control. Keynote address at the Bill and Melinda Gates Foundation 2011 Malaria Forum: Optimism and Urgency. Seattle, Washington, United States of America , 17 October 2011