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Gaps and Priorities in U.S. Contributions to Global Disease Challenges: What has the U.S. done well and not as well?

Conquering Malaria

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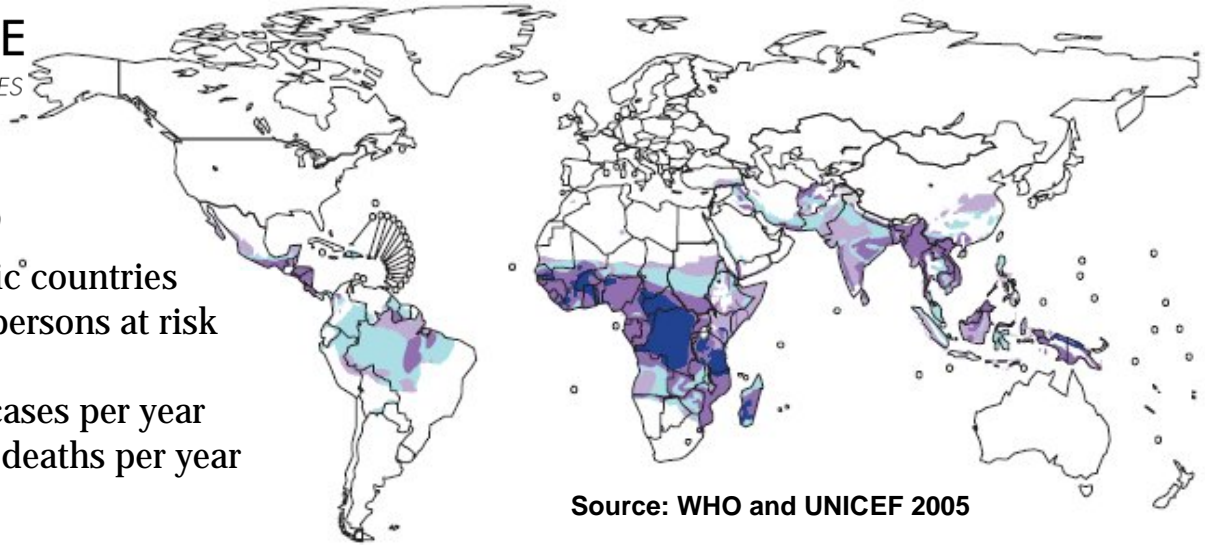
July 7, 2008
IOM Working Group Meeting



Challenges

Epidemiology

- 107 endemic countries
- >3 billion persons at risk
- >1 billion cases per year
- 1-2 million deaths per year



Source: WHO and UNICEF 2005

Plasmodium falciparum, 2005

P. vivax, 2004

P. falciparum +
P. vivax

Region	Population at risk (million)	Cases (million)(%)	Population at risk (millions)	Cases/year (million)	Cases (millions)
Africa	521	365 (215 - 374) (57%)	50	—	215-374
Southeast Asia	1,314	119 (66 - 224) (34%)	1,347	90 -248 (63%)	156-472
Western Pacific	142	15 (9 - 26) (4%)	89	20 - 77 (20%)	29-103
Eastern Mediterranean	176	12 (5 - 25) (4%)	211	11 - 34 (9%)	16-59
Americas	55	4 (2 - 8) (1%)	78	10 - 28 (7%)	12-36
Europe	4	1 (0 - 1) (<1%)	20	1 - 4 (1%)	1-5
Total	2,211	515 (298 - 659) (100%)	2,596	132-391 (100%)	429-1,049

Snow et al, 2005, *Nature*

Price et al, 2007, *Am J Trop Med Hyg*
Hay et al, 2004, *Lancet Infect Dis*



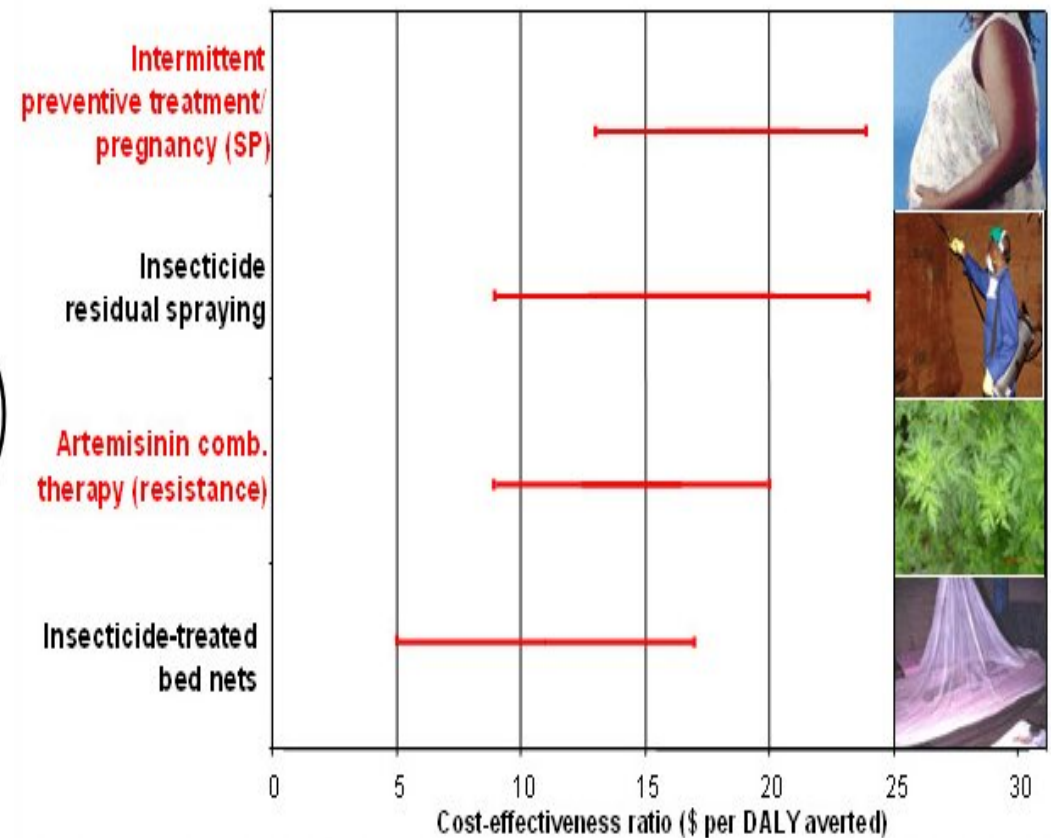
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Major Findings

Control of the Malaria Burden



Cost-Effectiveness of Interventions Against Malaria in Sub-Saharan Africa



Laxminarayan et al (DCPP authors), 2006, in Jamison et al, *Disease Control Priorities in Developing Countries*, 2nd ed.



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U.S. Contribution

U.S. Funding for Malaria (in millions)

<u>2007</u>	<u>2008</u>
\$776.8	\$926.2

- What has the U.S. done well? Malaria support:
 - PMI, June 2005 (\$1.2 billion/5 yrs); GFATM (~\$200M/yr)
 - NIH and DoD, drugs, resistance, vaccines, genetics, training
 - CDC epidemiology, surveillance
 - Field stations, Kenya (CDC), Mali (NIAID), NAMRUs
 - Foundation and private financing, Gates, Exxon Mobil
 - Increasing, plus advocacy (Global Health Council)
- Solo efforts vs. collaboration
 - Unilateral never optimal: multilateral most productive
 - Multilateral Initiative on Malaria, GFATM
- Missed opportunities
 - Drug subsidy, IOM report 2004
 - Control estimate \$3.0 billion a year
 - Designate Africa the focus continent
 - Successes needed (ex. Hispaniola)



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Gaps in Knowledge

□ Epidemiology

- Burden of disease: pregnant women, newborn, child
- Prediction and prevention: e-surveillance, remote sensing, R_0

□ Operations (“tipping points”)

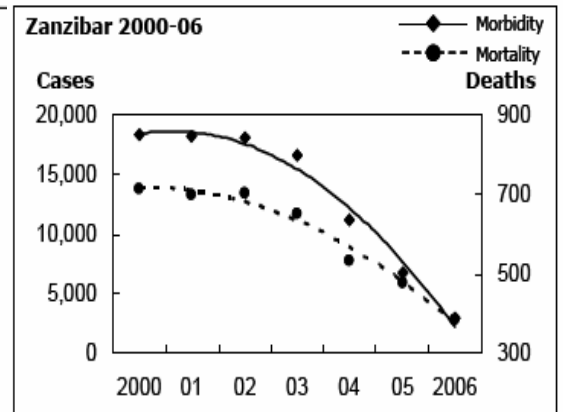
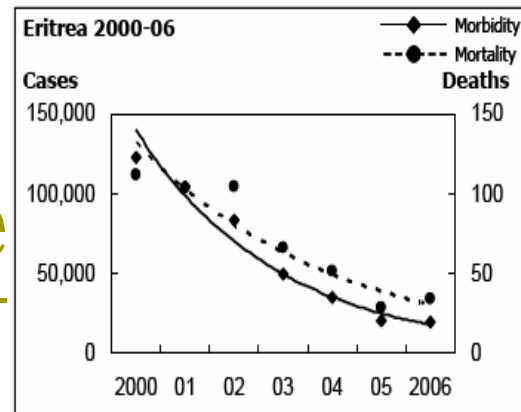
- Why takes so long to raise: bednet coverage, ACT use, IPT use
- From model projects to scale up
- Optimal mix for control, elimination, eradication

□ Basic understanding

- Host immunity and protection
- Impact of long-term control on population susceptibility
- Surrogate measures of protection for vaccine trials

□ Sustainability

- Training
- Financing
- Economics





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"...this report recommends a large subsidy...
which will lower the price to consumers
at all points of sale."

Recommendations

IOM, Saving Lives, Buying Time: Economics of
Malaria Drugs in an Age of Resistance, 2004

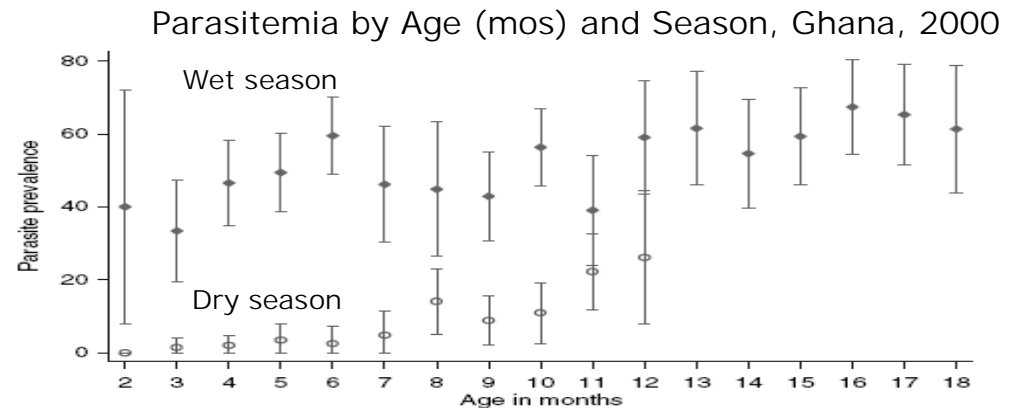
Massive support for operational and research agendas:
PMI, Multilateral Initiative on Malaria (MIM), UN, WHO
and the IOM:

- Interventions: implementation, scale up
 - Impact on transmission
 - Vector control: IRS, larviciding (integrated vector control), long - lasting insecticide treated nets (community scale up)
 - Patient management
 - Health unit and home treatment (quality)
 - Provision of ACTS
- Research
 - Vaccines: preerythrocytic and transmission blocking
 - Mosquito genetics: refractoriness to parasite maturation
- Financing
 - Support ACT subsidy, IOM study



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Strengthening Health Systems



- ❑ Challenge: 20%-40% of outpatients, inpatients, deaths
 - Pervasive infection: overwhelming African health systems
 - Quality: improved laboratory diagnosis and management of malaria-like illness; fever clinics
 - Training: leadership the priority; entomology; diagnosis; management (integrated); e-surveillance (integrated)
- ❑ Actions for U.S.: one contiguous area – Africa
- ❑ Actions outside health system: urban renewal (environmental); water management projects; construction
- ❑ Long-term financing mechanisms