



Malaria

What is Malaria?

Malaria is a life-threatening parasitic disease transmitted by mosquitoes and is considered one of the three “killer diseases” (HIV/AIDS, tuberculosis, and malaria). Today, approximately 40% of the world’s population lives in areas at risk of malaria. The malaria parasite enters the human host when an infected Anopheles mosquito bites a human. Once inside the human host, the parasite undergoes a series of changes that allow it to invade the immune system, effect the liver and red blood cells.

Symptoms appear about 9 to 14 days after the infectious mosquito bite. Symptoms include fever, headache, vomiting and other flu-like symptoms. Malaria can kill by infecting and destroying red blood cells (anemia) and by clogging the capillaries that carry blood to the brain or other vital organs.

African Countries with greater than 80% of population living in high intensity transmission areas:

Benin, Burkina Faso, Central African Republic, Chad, Congo, Dem. Republic of the Congo, Cote D'Ivoire, Equatorial Guinea, Gabon, The Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mozambique, Niger, Nigeria, Sao Tome and Principe, Senegal, Sierra Leone, Togo, and Zambia

Fast Facts

- 300-500 million people become infected with malaria every year—90% of them live in Africa.
- More than 1 million people die from malaria every year—almost all of them are young children in Africa; An African child dies from a mosquito bite every 30 seconds.
- Malaria is Africa's leading cause of under-five mortality, causing one in every five childhood deaths (20%)
- Malaria constitutes 10% of Africa’s overall disease burden.

Economic impact

- Malaria accounts for 40% of public health expenditure, 30-50% of inpatient admissions, and up to 50% of outpatient visits in areas with high malaria transmission.
- Malaria causes an average loss of 1.3% annual economic growth in countries with intense transmission.
- Malaria costs Africa an estimated \$12 billion a year in economic productivity, foreign investment, tourism and trade.¹
- At the household level, malaria can be a serious economic burden, accounting for over 10% of yearly spending. Direct costs range from 41 cents in Malawi to \$7.38 in Ghana. Outpatient costs can be as high as \$154 for cerebral malaria in Senegal.²

Raising the Resources and Awareness

The international community has designated 2015 as the target year for reducing and halting the global incidence of malaria. This goal includes achieving universal access to malaria prevention and treatment, which means that 80% of people at risk or suffering from malaria benefit from major preventative and curative interventions. Universal access will in turn ensure a reduction in the burden of malaria of at least 50% by 2010 and 75% by 2015. To reach these international goals, a total of \$38 to \$45 billion will be required from 2006

¹ Johns Hopkins Bloomberg School of Public Health, “Malaria: the Economic Burden,” 1.

² Johns Hopkins Bloomberg School of Public Health, “Malaria: the Economic Burden,” 1.



to 2015. The average cost during this period \$3.8 to \$4.5 billion per year. The average costs for Africa are \$1.7 to \$2.2 billion per year, while outside Africa cost estimates are \$2.1 to \$2.4 billion.



2. Prevention and Treatment

Strategy for Achieving Universal Access to Treatment and Prevention

WHO's Global Malaria Programme recommends a three tiered approach to achieving the MDG:

1. diagnosis of malaria cases and treatment with effective medicines
2. distribution of insecticide-treated nets (ITNs), and more specifically long-lasting insecticidal nets to achieve full coverage of populations at risk of malaria
3. indoor residual spraying (IRS) to reduce and eliminate malaria transmission

1. Diagnosis of malaria cases and treatment with effective medicines

What is the current recommendation for treatment?

Choloroquine is no longer recommended by WHO due to wide-spread resistance and treatment failures. Though many countries still treat a large proportion of children with fever with less effective traditional monotherapies, such as choloroquine, many high-burden countries have followed WHO recommendations to switch to artemesinin based combination therapies (ACTs). Intermittent preventive treatment for pregnant women is a safe and effective way to protect both mother and child from the risks of malaria. ACTs are more expensive than older treatments, though still only cost \$2 per treatment. Additional resources to improve ACT access are now being provided by the Global Fund, World Bank Malaria Booster Programme, and the US President's Malaria Initiative, UNITAID, and the International Drug Purchasing Facility.

What is the coverage rate?

Children living in rural areas are more likely to contract malaria – in sub-Sahara Africa, approximately 42% of children living in urban areas receive antimalarial medicines compared with 32% in rural areas. Based on 24 sub-Saharan African countries, 42 percent of children taking antimalarial medicines received treatment at home, which underscores the need to strengthen community-based treatment programmes and overall health systems to improve the coverage in high-burden areas.

2. Insecticide treated nets (ITNs or LLITNs)

Quick Facts:

- The number of ITNs produced worldwide was 63 million in 2006. An estimated 130 million to 264 million ITNs are needed to achieve RBM's 80% coverage target for pregnant women and children under age 5 at risk of malaria.
- Across SSA, about one-quarter of households own at least one mosquito net of any type. Some countries, including Guinea-Bissau, Congo, and Niger, have over 69% coverage.

What are they?

Long-lasting insecticide-treated bednets (LLITNs) are nets that have been dipped in pyrethoroid insecticide solution. The nets create a barrier "halo" around the net, repelling or killing the mosquitoes.

How effective are they?

LLITNS cost around \$5 USD per net and being used more often because they remain effective up to 5 years preventing the need for re-treating the nets. A Cochrane review showed that when full



coverage is achieved, ITNs reduce all-cause child mortality by an average of 18% in SSA and that they reduce clinical episodes of common types of malaria by 50% on average.

The World Health Organization recently recommended that insecticidal bed nets be long-lasting, and distributed either free or highly subsidized and used by all community members in at-risk areas. This was in response to the successes in Kenya of free bednet distribution, bringing some resolution to a lengthy debate between social marketing of nets and free distribution. For ITNs to be effective, distribution of ITNs should be coupled with a campaign to promote proper usage.

3. Indoor Residual Spraying (IRS)

What is it?

IRS is the application of long-lasting chemical insecticide to the inside of houses and other structures to kill mosquitoes resting on interior walls, ceilings and other surfaces

History

Indoor spraying with DDT and other insecticides was phased out nearly thirty years ago. Widespread use of DDT in agriculture and domestic hygiene led to massive releases of the compound into the environment. This is not the case in IRS.

In September of 2006, WHO announced that IRS would once again play a major role in its efforts to fight the disease. Extensive research and testing has since demonstrated that well-managed IRS programs using DDT pose no harm to wildlife or to humans. Of the dozen insecticides approved for safe house spraying, the most effective is DDT.

Environmental Defense fund (which launched the anti-DDT campaign in the 1960s), the Sierra Club, and the Endangered Wildlife Trust now endorse the indoor use of DDT for malaria control in accordance with the Stockholm Convention. They would all like to see research progress on alternative pesticides that do not have the negative consequences of DDT on the environment, but concede that the public health emergency posed by malaria necessitate its use for IRS.

Cost-Effectiveness

Programmatic evidence shows that correct and timely use of IRS, in combination with LLITNs and other prevention techniques, can reduce malaria transmission by up to 90% and has in major areas of tropical Asia and Southern America. Though some types of mosquitoes that do not rest indoors will be less affected by IRS, most types of malaria carrying mosquitoes can be killed or repelled by IRS. Parts of West and Central Africa may have large swaths of resistance mosquitoes because of widespread past use in agriculture. DDT is now used only in public health so there is less risk of further resistance developing because of agricultural use.



3. Vaccine Status

Glaxo Smith Kline currently has a malaria vaccine candidate, known as mosquirix, that showed efficacy against new infections of 65% of a three-month follow-up period in infants – a 35% reduction over a six-month period after the first dose.

A large scale Phase III trial is needed and is slated to begin in the second half of 2008; this trial was to assess if the vaccine was safe. The vaccine involves 3 injected doses – a problem in Africa and other poor countries with weak health infrastructure.

Partners on this vaccine trial include GSK and Gates Funded programs, the Malaria Vaccine Initiative and PATH. There has been over \$300 million invested in the development of the vaccine.

9 other vaccines in trials – mosquirix is the furthest along.



4. Success Stories

Success Stories: Where key interventions have been scaled up and sustainable, remarkable impacts have been achieved.

- In **Kenya**, a near tenfold increase in net coverage in the most endemic regions was achieved between 2004 and 2006 after a Global Fund grant of \$17 million allowed the government to distribute 3.4 million bed nets free of charge to children under-five. In the targeted districts, malarial mortality for children under five has declined by 44%.
- In **Zanzibar**, a partnership among the government, the Global Fund and USAID achieved 90% coverage with ITNs and indoor residual spraying (IRS) and oversaw the roll-out of ACT. These efforts have led to an 86% decline of reported malaria cases since 2004 and a decline in under-five malaria prevalence by 63-94%. In mainland **Tanzania**, child mortality has declined by 50% in a number of districts where ITN use has increased from 10 to 60% and where IRS and effective malaria treatment have been introduced.
- Significant achievements against malaria have been made in the Lubombo region of **Southern Africa** which includes the border regions of South Africa, Swaziland and Mozambique. Since 2003, insecticide-treated bed net coverage (ITN) has increased by 67% and the rollout of ACTS has begun. These interventions have contributed to a 70% decline in malaria cases since 2001 and a decrease in malaria mortality and morbidity by 64 % and 57%.
- **Malawi:** In 2003 the Government of Malawi initiated one of the largest insecticide-treated net distribution programmes in Africa, targeting pregnant women and children under age five. As a result, the number of children under 5 sleeping under bednets has increased sevenfold (from 3%-23%) between 2000 and 2006). Preventive treatment coverage for pregnant women also increased from 29% in 2000 to 45% in 2006.
- **Togo:** Togo made history in December 2004 by conducting the first-ever national insecticide-treated net distribution campaign integrated with other key child survival interventions including deworming and measles immunization. Around 900,000 insecticide-treated nets were distributed free of charge during the integrated child health campaign. As a result, Togo's dramatic gains in insecticide-treated net use—including a nineteenfold increase in share of children sleeping under insecticide-treated nets, (from 2% in 2000 to 38% in 2006. Education and communication were key elements of the Togo campaign. Before the campaign Red Cross volunteers conducted door-to-door and community mobilization, and after the campaign they visited households to advise families on the proper use of insecticide-treated nets and to provide more vaccinations and additional free nets. Togo's approach to distributing nets free of charge to end-users likely also contributed to the equitable distribution of nets among the population.
- **Zambia:** In Zambia 58 per cent of febrile children are treated with antimalarial medicines — nearly reaching the Abuja target of 60 per cent by 2005. Zambia was one of the first African countries to adopt artemisinin-based combination therapy as the recommended first-line treatment for uncomplicated malaria, having changed its national treatment policy in 2002. Since then, Zambia has greatly increased the use of artemisinin-based combination therapies for treating malaria in febrile children under age five. In 2006 Zambia had the highest treatment rates with artemisinin-based combination therapy among



African countries, with nearly one child in four treated with antimalarial medicines receiving artemisinin-based combination therapies.



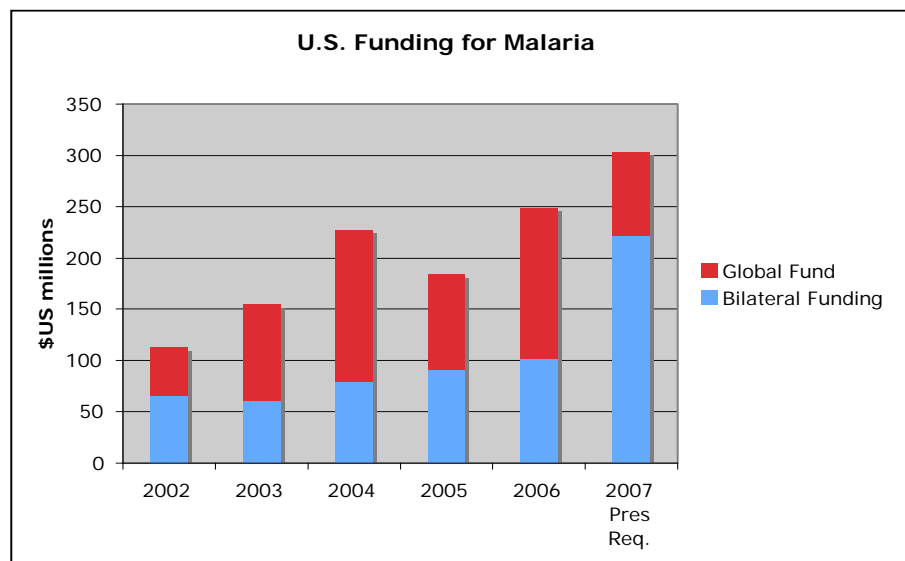
5. U.S. Funding

The U.S. directs money to the fight against malaria in three ways:

1. **President's Malaria Initiative (PMI)**—The PMI is a bilateral, interagency initiative that is scaling up existing bilateral efforts by focusing on 15 countries with the goal of cutting malaria deaths by 50 percent in these target countries. It is a five-year, \$1.2 billion program implemented by the U.S. Agency for International Development (USAID) in partnership with the Centers for Disease Control (CDC) and Department of Health & Human Services. PMI has assisted in the procurement and distribution of 2.3 million insecticide treated mosquito nets, provided indoor residual spraying (IRS) in five PMI countries, reaching more than 5 million people and assisted in the procurement of 15 million treatments of ACTs in six PMI countries. PMI is led by Rear Admiral, R. Timothy Ziemer and Deputy Coordinator, Dr. Bernard Nahlen, M.D.

Funding: FY2006 – \$30 million
FY2007 – \$135 million
FY2008 - \$300 million (expected – Senate authorization)
FY2009 - \$300 million (expected)
FY2010 - \$500 million (expected)

- 7 countries supported in FY2006 & FY2007: Angola, Tanzania, Uganda, Malawi, Mozambique, Rwanda, and Senegal
 - 8 countries joined on Dec. 14, 2006 – supported in FY2008: Benin, Ethiopia (Oromia Region), Ghana, Kenya, Liberia, Madagascar, Mali, and Zambia
2. **Other bilateral programs**—Funding for bilateral malaria efforts outside of PMI are also programmed through USAID and CDC. In addition to the 15 PMI focus countries, the U.S. maintains efforts in Burundi, the Democratic Republic of Congo, Eritrea, Guinea, Nigeria and Sudan.
 3. **The Global Fund to Fight AIDS, TB and Malaria**—Primarily due to pressure to increase resources available to fight global HIV/AIDS, U.S. contributions to the Global Fund have increased in recent years, and as a result, overall U.S. funding for malaria has increased as well. In 2007, the US gave \$625 million. Funding for the Global Fund in 2008 will be between \$850-890 million (an increase of \$125-\$165 million). GFATM currently gives 2/3rds of all donor funding for malaria.





6. Programs

- 1. Global Fund:** To date, the Global Fund has approved a total of \$2.6 billion to support 117 malaria control initiatives in 76 countries worldwide. In Africa, \$2 billion has been approved to support malaria proposals in 41 countries. A total of \$950 million has been disbursed to date, including \$760 million for Africa. Globally, these resources have allowed the Fund to deliver 30 million insecticide treated nets and 28 million malaria treatments.
- 2. President's Malaria Initiative (PMI):** The PMI is a bilateral, interagency initiative that is scaling up existing bilateral efforts by focusing on 15 countries. It is implemented by the U.S. Agency for International Development (USAID) in partnership with the Centers for Disease Control (CDC). PMI funding in FY2006 was \$30 million, rose to \$135 million in FY2007, is expected to increase to \$300 million in FYs 2008 and 2009 and to \$500 million in 2010. These resources have allowed PMI to assist in the procurement and distribution of 2.3 million insecticide treated mosquito nets, provided indoor residual spraying (IRS) in five PMI countries, reaching more than 5 million people and assisted in the procurement of 15 million treatments of ACTs in six PMI countries.
- 3. The World Bank Malaria Booster Program:** Countries that choose to participate in the Booster Program reallocate part of their resources from their IDA envelopes, putting that sum towards malaria control. There are currently 19 projects across 18 countries. The Booster Program's total commitments for malaria control will reach at least \$452 million by June 2008 (a nine-fold increase since 2005). By the end of 2007, the Booster Program is expected to have helped deliver 20 million bed nets and 15 million ACT doses.
- 4. UNICEF** is one of the largest procurers of insecticide treated nets world wide. The number of nets procured by UNICEF has tripled in only two years, from around 7 million in 2004 to nearly 25 million in 2006.
- 5. UNITAID** leverages funds to finance the fights against HIV/AIDS, TB and malaria through innovative financing mechanisms such as a solidarity contribution on air tickets, as well as multi-year predictable budgetary contributions. UNITAID was launched in September 2006 during the United Nations General Assembly. At present, 27 countries of which 19 are in Africa are members. The budget of UNITAID for 2007 is over US\$ 300 million and 90% has already been committed to programmes in more than 80 countries. In partnership with the World Health Organization (WHO) and UNICEF, UNITAID has purchased and distributed 1.3 million Artemisinin-based Combination Therapies (ACTs) in Burundi and Liberia. In addition, UNITAID is supporting ACT procurement and delivery to eight countries through collaboration with the Global Fund to Fight AIDS, Tuberculosis and Malaria, and UNICEF. Delivery of the ACTs will begin in October 2007.
- 6. Department for International Development** In January 2005, Prime Minister Tony Blair announced that the UK will provide £45 million for the delivery of insecticide treated mosquito nets. DFID is a board member of the Roll Back Malaria (RBM) Partnership and has contributed £49 million to the partnership to date. DFID has also been a key donor to the GFATM and has committed £359 million through by 2008.



Roll Back Malaria Partnership: The Roll Back Malaria Partnership was established in 1998 by the World Health Organization, the United Nations Children’s Fund, the United Nations Development Program and the World Bank. Since its inception, the Partnership has expanded to encompass a wide range of partners—including malaria-endemic countries, their bilateral and multilateral development partners, the private sector, nongovernmental and community-based organizations, foundations, and research and academic institutions. The Partnership is dedicated to ensuring that the malaria-related Millennium Development Goals are achieved by 2015 and the proper prevention. The key role of the RBM Partnership is to lead advocacy campaigns to raise awareness of malaria at the global, regional, national and community levels, thus keeping malaria high on the development agenda, mobilizing resources for malaria control and for research into new and more effective tools (including a vaccine), and ensuring that vulnerable individuals are key participants in rolling back malaria.



7. Eradication Program

Malaria: Malaria eradication pilot projects were initiated in the 1950s in Benin, Burkina Faso, Burundi, Cameroon, Kenya, Liberia, Madagascar, Nigeria, Rwanda, Senegal, Uganda, and the United Republic of Tanzania. The projects demonstrated that malaria was highly responsive to control with IRS, but IRS was not taken to scale in large parts of sub-Saharan Africa. Bill and Melinda Gates have recently called on global leaders to embrace "an audacious goal—to reach a day when no human being has malaria, and no mosquito on earth is carrying it."

Smallpox: In 1966 there were approximately 10 to 15 million cases in more than 50 countries and 1.5 to 2 million people died from the disease each year. No new cases have been reported since 1978. In 1965, international efforts to eradicate smallpox were revitalized with the establishment of the Smallpox Eradication Unit at the WHO and a pledge for more technical and financial support from the largest donor – the United States. The annual cost of the campaign between 1967 and 1979 was \$23 million – international donors provided \$98 million, while \$200 million came from the endemic countries. The US saves the total of all its contributions every 26 days because it does not have to vaccinate or treat the disease.

- The \$300 million investment in global smallpox eradication returned more than \$3 billion in economic benefits.

Polio: Today, polio is on the verge of being eradicated from the globe, when as recently as 1988, 125 countries were endemic for polio – an estimated 350,000 cases. This is currently (2006) down to four countries (Nigeria, India, Afghanistan, and Pakistan) and 700 cases worldwide. This is the result of an oral polio vaccine and global eradication campaign. The first five years of the polio campaign cost \$120 million which will pay for itself in 15 years in costs of treatment saved. The global campaign is considered the largest public health campaign in history was led the WHO, Rotary International, UNICEF, and CDC.

Guinea worm: The Carter Center spearheads the International Guinea worm disease eradication campaign with the CDC, WHO, UNICEF, and other partners. If eradicated, this would be the first parasitic disease eradicated and will likely be done without a vaccine. Guinea worm remains endemic in 9 countries, all in Africa, causing over 25,000 reported cases in 2006. Education and low-technology measures to promote behavior change are the most effective means of preventing Guinea worm disease (i.e. filtering water and preventing those with Guinea worm wounds from entering drinking water sources).



8. Key Documents

Stockholm Convention: The Stockholm Convention is a global treaty to protect human health and the environment from persistent organic pollutants (POPs). POPs are chemicals that remain intact in the environment for long periods, become widely distributed geographically, accumulate in the fatty tissue of living organisms and are toxic to humans and wildlife. The convention allows the use of DDT for “disease vector control.” The United States signed this convention in 2001, but has not ratified it.

WHO Bulletin - Estimated global resources needed to attain international malaria control goals: This is the most recent cost estimate for the total costs of scaling up the recommended set of interventions, supporting services and strengthening program activities in each of the 81 most heavily affected malaria-endemic countries. The total for 2006-2015 was between \$38 and 45 billion USD. A breakdown of the U.S. share of the cost estimates per year was included in the original malaria briefing.

G8 Gleanegles Communiqué (2005): “By contributing to the additional \$1.5bn a year needed annually to help ensure access to anti-malaria insecticide-treated mosquito nets, adequate and sustainable supplies of Combination Therapies including Artemisin, presumptive treatment for pregnant women and babies, household residual spraying and the capacity in African health services to effectively use them, we can reduce the burden of malaria as a major killer of children in sub-Saharan Africa.”

Roll Back Malaria Global Strategic Plan (2005-2015): This plan is intended as a call to action and practical guide for those implementing, supporting or monitoring progress on the fight against malaria. The strategy is geared towards achieving the Millennium Development Goals related to malaria.

Millennium Development Goals: One of the millennium development goals is to “reverse the spread of disease, especially HIV/AIDS and malaria. These goals, established at the Millennium Summit in 2000 are to be achieved by 2015. No country in Africa is on target to achieve all of the goals. Additionally, the burden of malaria contributes to other MDGs including reducing child mortality, improving maternal mortality, achieving universal primary education and eradicating extreme poverty.

Abuja Declaration: African heads of state rededicated themselves to the principles of the Harare Declaration of 1997. They committed themselves to an intense effort to halve mortality for Africa by 2010 by implementing strategies and actions for Roll Back Malaria. The goals articulated in this declaration are often referred to in discussion about malaria and are commonly called the Abuja targets.



9. Preventing Needless Deaths from Malaria

1. Current Disease Burden

1. 300 million people become infected with severe malaria every year—90% of them live in Africa.
2. More than 1 million people die from malaria every year—almost all of them are young children in Africa; An African child dies from a mosquito bite every 30 seconds.
3. Malaria is Africa's leading cause of under-five mortality, causing one in every five childhood deaths (20%)
4. Malaria causes an average loss of 1.3% annual economic growth in countries with intense transmission. According to a study recently published in the Lancet, controlling endemic malaria in Africa will raise its GDP by 20% over 15 years.
5. Malaria costs Africa an estimated \$12 billion a year in economic productivity, foreign investment, tourism and trade.³

2. Past Disease Eradication Efforts:

1. **Smallpox:** In 1966 there were approximately 10 to 15 million cases in more than 50 countries and 1.5 to 2 million people died from the disease each year. No new cases have been reported since 1978. In 1965, international efforts to eradicate smallpox were revitalized with the establishment of the Smallpox Eradication Unit at the WHO and a pledge for more technical and financial support from the largest donor – the United States. The annual cost of the campaign between 1967 and 1979 was \$23 million – international donors provided \$98 million, while \$200 million came from the endemic countries. The US saves the total of all its contributions every 26 days because it does not have to vaccinate or treat the disease. The smallpox campaign created huge international diplomatic dividends during the height of the cold war. Diplomatic channels were kept open with Iran, Russia and Somalia – for example – through the smallpox eradication units.
2. **Polio:** Today, polio is on the verge of being eradicated from the globe, when as recently as 1988, 125 countries were endemic for polio – an estimated 350,000 cases. This is currently (2006) down to four countries (Nigeria, India, Afghanistan, and Pakistan) and 700 cases worldwide. This is the result of an oral polio vaccine and global eradication campaign. The first five years of the polio campaign cost \$120 million which will pay for itself in 15 years in costs of treatment saved. The global campaign is considered the largest public health campaign in history and was led by the WHO, Rotary International, UNICEF, and CDC.

3. Progress on malaria

A malaria effort was undertaken in the 1950s and 1960s in north and west Africa and experienced great success. Financial and political support for the program were not sustained and the program ceased when the environmental movement vehemently fought the use of DDT (it was then used for mass sprayings in agricultural). Though we do not have a vaccine to prevent malaria, we can achieve a 90% control rate with the use of IRS, ITN and the use ACTs for those that contract the disease. There are currently aggressive efforts to contain the disease. An infusion of political and financial support to create a global eradication program would follow the path of these earlier eradication efforts.

³ Johns Hopkins Bloomberg School of Public Health, “Malaria: the Economic Burden,” 1.



Kenya is just one example of recent success. In Kenya, a near tenfold increase in net coverage in the most endemic regions was achieved between 2004 and 2006 after a Global Fund grant of \$17 million allowed the government to distribute 3.4 million bed nets free of charge to children under-five. In the targeted districts, malarial mortality for children under five has declined by 44%.

4. What would an accelerated malaria program look like?

Prevention:

- Programmatic evidence shows that correct and timely use of IRS when combined with ITNs and other localized prevention methods can reduce malaria transmission by up to 90% and has in major areas of tropical Asia and Southern America.
- Both polio and smallpox had vaccines when eradication was undertaken, so that should be a concern, but a malaria vaccine research trial is underway and has shown early success. A full scale trial is going to start mid-way through next year.
- Environmental Defense fund (which launched the anti-DDT campaign in the 1960s), the Sierra Club, and the Endangered Wildlife Trust now endorse the indoor use of DDT for malaria control in accordance with the Stockholm Convention. They would all like to see research progress on alternative pesticides that do not have the negative consequences of DDT on the environment, but concede that the public health emergency posed by malaria necessitate its use in IRS programs which, when done correctly, use small amounts of contained DDT.

Treatment: The current recommended treatment is artemisinin-based combination therapy (ACTs) cost less than \$2 per treatment. Though older treatments have become less effective, ACTs remain a very cost-effective option.

Managerial: Similar to the experience of previous eradication efforts at this stage, there is no eradication program yet. A WHO office with that purpose could provide critical coordination to the sundry of bilateral and multilateral control efforts currently under way. Given the strength of the current Director General and her Chinese nationality, this could have both positive diplomatic and health externalities.

Programmatic Features of a malaria program:

- Integrating malaria control into existing maternal and child health programs
- Strengthening partnerships and harmonizing efforts
- Expanding social and behavior change communication
- Improving forecasting, procurement, and supply chain management for malaria commodities
- Strengthening monitoring systems for evidence based programming

5. Cost of universal access to treatment and prevention services

The only public estimates for eradication that exist are back of the envelope estimates. We do have robust WHO estimates for global control programs that would include LLITNs, IRS, rapid diagnostic testing, needed health infrastructure building, health worker training, communication and evaluation. Estimates for funding malaria control are:

| Year | Optimist Scenario | Pessimistic Scenario | U.S. Share – avg. of scenarios |
|------|-------------------|----------------------|--------------------------------|
| 2009 | 3.883 | 4.516 | 1.399 |
| 2010 | 3.508 | 4.254 | 1.294 |



| | | | |
|---------------|---------------|---------------|---------------------|
| 2011 | 3.661 | 4.489 | 1.358 |
| 2012 | 4.380 | 5.335 | 1.620 |
| 2013 | 3.889 | 4.942 | 1.472 |
| 2014 | 3.662 | 4.792 | 1.409 |
| 2015 | 4.468 | 5.660 | 1.688 |
| Total: | 27.451 | 33.988 | \$10.24b USD |

***based on WHO cost estimates published in WHO Bulletin in August 2007**

6. Announcing a malaria program

1. History shows us that major health disease control programs generate good will towards the United States.
2. Malaria is a huge direct (health) and indirect (economic) burden on African countries.
3. In an age with the kind of technology we have, it is incredible that a mosquito continues to kill over a million of people each year.
4. Though DDT historically created concern among environmentalists, the use of DDT for IRS is largely settled for public health purposes. Major environmental groups, including the Environmental Defense Fund founded to oppose DDT use, now endorse its use in IRS programs in keeping with current conventions.
5. It is visionary to call for eradication or elimination of deaths from a disease and historic to accomplish it. Millions of children will have a future because the United States leveraged its power in the world to protect them from this disease.



10. Key lines on malaria for global health leaders:

- Malaria used to wreak havoc across North America, but today it is a distant memory from most of our continent. Yet, this preventable and treatable disease still kills over a million people a year and makes over 350 million severely ill.
- Malaria keeps people out work slowing economic growth across Africa, it keeps children out of school because they are too sick, and it unfairly targets pregnant women and young children. It is the most common cause of death in young children in Africa.
- The United States history of innovation, for instigating global cooperation and for responding to the call to serve when needed makes us uniquely positioned to stop this killer. Our nation has lost some of its positive standing in the world at a time when the world over desperately craves leadership. As president, I will commit the United States to leading a global effort to make sure that no one dies needlessly from malaria, from a mosquito bite.
- To do this, we will harness the world's best science – the American scientific community that is already hard at work – with some recent successes – on a vaccine for this disease. We will make sure that the most susceptible people - every woman and child living in high risk areas - has access to bed nets and indoor spraying techniques that prevent transmission. We will make sure that every infected person has access to the best medications available, which are less than \$2 per treatment. \$2 to save someone's life, what an investment.
- The goal of development assistance is to support the world's poor in their quest to become self-sufficient – to make sure that everyone has the opportunity to contribute to society. Preventing needless and debilitating suffering from malaria is critical to this goal. To accomplish this goal, we will learn from past successes – eradicating smallpox, nearly eradicating polio, and children's vaccination programs – and failures. Our failures tell us that we must support the growth of systems in developing countries so that successes in the near term are not undone by future health problems.

1) Child Survival Lines

- Improving and saving the lives on millions of children in the developing world is relatively easy when compared to many development challenges. Most of the diseases that children under 5 in the developing world die from are things we consider nuisances or do not have to worry about in the developed world – tetanus, malnutrition, digestive system illnesses. HIV/AIDS causes only 3% of the deaths among this age group – AIDS has rightfully received much attention in the past several years, but we cannot forget about less visible killers.
- Simple, cost-effective interventions per person include vitamin A tablets, measles vaccinations, oral rehydration therapy, antibiotics, drugs that protect against malaria. Using a small amount our nation's financial power and our enduring charitable spirit, we can save millions of children's lives and generate good will towards our nation. This is not just the right thing to do, it is the smart thing.

Note on Child Survival: Recent polling by Lake Research Partners, the US Coalition for Child Survival and others showed that almost all Americans (95%) believe the issue of child survival is an important problem facing the world today; 93% feel child survival should be a priority; and 84% support increasing funding for reduce the top preventable causes of death among children. Eight in ten Americans (81%) support the "US Commitment to Global Child Survival Act," even when told it would cost \$7 per American per year.



Note on Global Child Survival Act:

- The U.S. Commitment to Global Child Survival Act is a bipartisan, bicameral bill lead by Representatives Betty McCollum (D-MN) and Christopher Shays (R-CT) and Senators Christopher Dodd (D-CT) and Gordon Smith (R-OR).
- This legislation would invest in proven, low-cost, highly effective life-saving interventions such as immunizations, antibiotics, clean drinking water and vitamin supplements.
- It also requires the U.S. to develop a comprehensive strategy for improving child and maternal health.
- Increases funding for child survival and maternal health programs to help save the lives tens of thousands of newborns, children and mothers



Clippings:

Malaria | Climate Change Affecting Malaria Transmission Worldwide, WHO Says Global Health Reporting . org

December 10, 2007

Climate change is having an impact on human health by increasing the number of people exposed to malaria and other diseases, the World Health Organization said Monday at a three-day workshop held at the United Nations Climate Change Conference in Bali, Indonesia, the AP/International Herald Tribune reports. Delegates from almost 190 countries are discussing ways to combat the consequences of global warming. According to WHO, rising temperatures already have been linked to the deaths of more than one million people worldwide since 2000. Countries, including Nepal and Bhutan, have reported malaria cases for the first time in higher elevations, likely because higher temperatures are increasing the size of mosquito populations, the AP/Tribune reports (AP/International Herald Tribune, 12/10).

In related news, malaria epidemics in the highlands of Papua New Guinea are "now basically happening every year" as a result of global warming, Ivo Mueller, a scientist at the Papua New Guinea Institute of Medical Research, said recently, the AP/Google.com reports. WHO recorded 4,986 malaria cases in the country's Western Highlands province in 2005, compared with 638 cases in 2000. About 40% of Papua New Guineans live in the highlands, where there used to be "no malaria or low epidemic outbreaks," Mueller said. He said that if predictions of temperature increases of three to five degrees Fahrenheit prove true, "perhaps two million people would go from a low- or no-risk area to considerable risk." Malaria parasites need at least 64 degrees Fahrenheit to develop, but scientists have found that a small rise in temperature can increase significantly the size of mosquito populations, the AP/Google.com reports.

Mueller said that population movement, deforestation, inadequate health care systems and other factors can influence the spread of malaria. This year, the Intergovernmental Panel on Climate Change found in its annual report that "despite the known causal links between climate and malaria transmission dynamics, there is still much uncertainty about the potential impact of climate change on malaria at local and global scales." However, there is "no question ... if you put climate change into the equation and the climate change becomes more favorable, the mosquitoes' numbers go up, and you're going to have more and more transmission," Mueller said (Hanley, AP/Google.com, 12/9).

The IPCC report is available online.

Malaria | Gates Foundation Pledges \$30M for Malaria Vaccine Project

December 7, 2007

The Bill & Melinda Gates Foundation recently pledged a \$30 million, five-year grant to the Seattle-based Infectious Disease Research Institute for adjuvants, or components needed to manufacture malaria vaccines, the Puget Sound Business Journal reports (Holtzman, Puget Sound Business Journal, 12/5). When combined with an antigen, adjuvants prompt an effective immune system response and bolster the strength and lifespan of specific immune responses. According to an IDRI release, most adjuvants are owned by large



pharmaceutical companies and are not easily available to researchers who work on vaccines for diseases that largely affect developing countries (IDRI release, 12/4).

IDRI will work with the World Health Organization and the PATH Malaria Vaccine Initiative to identify promising vaccine candidates. The new vaccines will then be given adjuvants provided by the new Gates grant (Puget Sound Business Journal, 12/5). "This grant enables IDRI to help advance the development of malaria vaccines," Steven Reed, head of IDRI's research and development program, said (IDRI release, 12/4).