

ROLLING BACK **MALARIA**

THE WORLD BANK

**GLOBAL STRATEGY &  
BOOSTER PROGRAM**



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## Foreword

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Malaria afflicts millions in low- and middle-income countries. For centuries, it has impaired economic growth, child development, learning, health, and productivity on a large scale. The World Bank has worked to reduce the burden of malaria, together with many partner agencies. In 1998 the Bank cofounded, with the World Health Organization (WHO), the United Nations Children's Fund (UNICEF), and the United Nations Development Program (UNDP), the global Roll Back Malaria (RBM) Partnership to coordinate and enhance the global fight against malaria. There has been some success, but the pace of work was slower than desired and the scale was less than expected. The world now faces additional challenges, not the least of which is the emergence of drug-resistant forms of malaria.

Despite the challenges, there are great opportunities to be explored. We have access to more effective technologies to prevent and cure malaria. Countries are renewing efforts to control the disease, and there is a global consensus that more needs to be done, urgently, on a large scale and in a sustainable way.

This report translates our corporate commitment into increased efforts to control malaria. It lays the basis for a Booster Program for Malaria Control, through which the Bank will make an important contribution to malaria control in the years ahead. We will undertake this effort in support of country-led programs and in partnership with community service organizations, specialized agencies, and financiers of malaria control at all levels. Consistent with the new Global Strategic Plan of the Roll Back Malaria Partnership, the Bank's work will combine measures to increase coverage of malaria-specific interventions with effective service delivery, broader health-system development, and capacity building across multiple sectors.

A multidisciplinary Malaria Task Force prepared this report, together with the Program of Action. The Task Force included staff from across the World Bank Group, with much appreciated contributions from the International Finance Corporation. Consultations with country officials helped to shape the results-based and client-oriented approach in this strategy. Many peer reviewers, colleagues in the Roll Back Malaria Partnership Secretariat, and an External Consultative Group provided critical reviews and helpful suggestions. The Roll Back Malaria Department of the WHO provided data

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on malaria case notification and coverage with key interventions. We thank all contributors for their time and inputs.

Looking to the future, a steering committee of vice presidents in operational and corporate units will provide guidance and support for its implementation. Regional and country teams will lead the implementation of the proposed Booster Program for Malaria Control in a way that is responsive to country needs. We will monitor progress, evaluate impacts, and learn from experiences. Working with multiple partners, the proposed program will boost malaria control, foster economic growth, and accelerate progress toward the Millennium Development Goals, which are central to the Bank's overall mission of reducing poverty.

*Jean-Louis Sarbib*  
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## Abbreviations and Acronyms

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|                 |   |
|-----------------|---|
| AAA             | Analytic and advisory services  |
| ACT             | Artemisinin-based combination therapy                                       |
| CAS             | Country assistance strategy   |
| CDD             | Community-driven development  |
| CSO             | Civil society organization  |
| CQ              | Chloroquine   |
| DALY            | Disability-adjusted life year   |
| DEC             | Development Economics Vice Presidency                                       |
| DHS             | Demographic and Health Surveys  |
| EMCP            | Enhanced Malaria Control Project  |
| FTE             | Full-time equivalent  |
| GDP             | Gross domestic product  |
| GNP             | Gross national product  |
| GFATM           | Global Fund to Fight AIDS, Tuberculosis and Malaria                         |
| HAMSET          | HIV/AIDS, Malaria, STDs, and TB Control Project                             |
| HIPC Initiative | Highly Indebted Poor Country Initiative                                     |
| IDA             | International Development Association                                       |
| IFC             | International Finance Corporation   |
| IRS             | Indoor residual spraying  |
| ITN             | Insecticide-treated bed net   |
| LICUS           | Low Income Countries Under Stress   |
| LLIN            | Long-lasting insecticidal nets  |
| M&E             | Monitoring and evaluation   |
| MACEPA          | Malaria Control and Evaluation Project in Africa                            |
| MAP             | Multi-country HIV/AIDS Program  |
| MDGs            | Millennium Development Goals  |
| MICS            | Multiple Indicator Cluster Surveys  |
| MTEF            | Medium-Term Expenditure Framework   |
| NGO             | Nongovernmental organization  |
| NMCP            | National Malaria Control Program  |
| PRSC            | Poverty Reduction Support Credit  |
| PRSP (I-PRSP)   | Poverty Reduction Strategy Paper (Interim Poverty Reduction Strategy Paper) |
| RBM             | Roll Back Malaria Partnership   |
| SP              | Sulfadoxine pyrimethamine   |
| SWAp            | Sectorwide approach   |
| UNDP            | United Nations Development Program  |
| UNICEF          | United Nations Children's Fund  |

|          |  |
|----------|--|
| USAID    | U.S. Agency for International Development            |
| VPU      | Vice presidential unit                               |
| WHO      | World Health Organization                            |
| WHO AFRO | World Health Organization Regional Office for Africa |
| WPRO     | WHO Office for the Western Pacific                   |



## Executive Summary

---

### Introduction

This Global Strategy and Booster Program is a significant upgrade of the World Bank's support for malaria control, with emphasis on closing the gap between knowing and doing. It provides the basis for a new Booster Program for Malaria Control, which is designed to accelerate malaria control and progress toward the Millennium Development Goals (MDGs, box 1).

The World Health Organization estimates that there are more than 1.1 million deaths per year from malaria, mostly among children less than five years old (WHO 2002).<sup>1</sup> The disease is preventable and curable with available technologies. However, in the absence of strong and sustained malaria control efforts, coverage with effective interventions is low, particularly among the poor. At least 85 percent of deaths from malaria occur in Africa, 8 percent in Southeast Asia, 5 percent in the Eastern Mediterranean region, 1 percent in the Western Pacific, and 0.1 percent in the Americas (Arrow, Panosian, and Gelband 2004). Globally, there are more than 500 million cases of malaria per year; a recent study put the number of cases from a particularly severe form of the malaria parasite, *Plasmodium falciparum*, at 515 million in 2002 alone (Snow et al. 2005).

### Rationale

The Global Strategy and Booster Program responds to the inadequacy of global efforts to control malaria and the modesty of the Bank's current efforts relative to its potential. The Bank was a key contributor to recent successes in malaria control, including those in Brazil, Eritrea, parts of

**Box 1:** Malaria and Selected MDGs**Goal 2: Achieving universal primary education**

- Malaria is a leading source of illnesses and absenteeism in school-age children and teachers. It adversely affects education by impeding school enrollment, attendance, cognition, and learning.

**Goal 4: Reducing child mortality**

- Malaria is a leading cause of child mortality in endemic areas.

**Goal 5: Improving maternal health**

- Malaria causes anemia in pregnant women and low birth weight.

**Goal 6: The combating of HIV/AIDS, malaria, and other diseases**

- Malaria morbidity and mortality are increasing in Africa.

**Goal 8: Developing a global partnership for development, including as a target the provision of access to affordable essential drugs**

- There is a lack of access to affordable essential drugs for malaria.

India, and Vietnam. It cofounded and supports the global RBM Partnership.<sup>2</sup> However, the Bank's efforts have been severely understaffed and underfunded, in terms of both funds committed to malaria control at the country level and the internal budget for the Bank's Malaria Team—a budget that declined during much of the period since RBM was founded in 1998. On balance, the Bank's activities were very useful, but not sufficient for success on a larger scale.

The rationale for a stronger World Bank effort includes the following:

- Malaria impairs economic growth and human development in many of the World Bank's client countries, particularly in Sub-Saharan Africa.
- The disease is preventable, curable, and controllable on a large scale, with good returns on investment.
- Malaria control has positive externalities and is a global public good.
- At the regional and global levels, there is a wide gap between what is feasible and the current level of effort. Despite successes in a few countries, measurable progress in malaria control is well below the 60 percent coverage target set by countries and development agencies for 2005 in terms of coverage with preventive and curative interventions.<sup>3</sup>

- The Bank has the capacity to do a lot more than it has in malaria control, including financing, policy advice, and implementation support.
- Clients, partner agencies, independent observers, civil society organizations, and potential cofinanciers are requesting that the Bank play a more decisive role in malaria control. There is much unmet demand for the Bank's financing and advisory services.

At the macroeconomic level, annual economic growth in malarious countries between 1965 and 1990 averaged 0.4 percent of gross domestic product (GDP) per capita, compared with 2.3 percent in the rest of the world, after controlling for the other standard growth determinants used in macroeconomic models (Sachs and Malaney 2002). These analyses do not constitute proof that malaria is a cause of low incomes and poor aggregate growth, but that the disease must be considered a legitimate contributor (Arrow, Panosian, and Gelband 2004). At the microeconomic level, estimates of the “total” (direct plus indirect) costs of malaria vary: 0.75 percent of gross national product (GNP) in Pakistan (Khan 1966); 7 percent of household income in Malawi (Ettling et al. 1994); 9–18 percent of annual income for small farmers in Kenya, and 7–13 percent in Nigeria (Leighton and Foster 1993). One multicountry study attempted an Africa-wide estimate of total costs of malaria based on extrapolations from case studies of areas in Burkina Faso, Chad, the Democratic Republic of Congo, and Rwanda. The totals reported translated to 0.6 percent of total Sub-Saharan African GDP (Shephard et al. 1991).

Malaria control gives good value for money. In Vietnam, at a cost to the government of about US\$11 (1998 costs) for a clinic visit plus drugs to treat an episode, the direct costs saved were about US\$9.5 million, which is about twice the amount spent on malaria control each year. To this is added about US\$14 million in reduced out-of-pocket health care costs to households (Laxminarayan 2004). In Brazil, compared to what would have happened in the absence of the malaria control program, nearly 2 million cases of malaria and 231,000 deaths were prevented. The overall cost-effectiveness was US\$2,672 per life saved, or US\$69 per disability-adjusted life year (DALY),<sup>4</sup> which compares favorably to many other disease control interventions (Akhavan et al. 1999). Other sources indicate that insecticide treatment of existing mosquito nets costs US\$4–10 per DALY saved, providing nets and retreatment costs US\$19–85 per DALY saved, and intermittent presumptive treatment of pregnant women through existing prenatal services costs US\$4–29 per DALY saved (Goodman, Coleman, and Mills 1999).

## Priorities and Business Model

The Bank's priority is enabling countries to achieve and sustain large-scale impact in malaria control. More specifically, the Bank will support countries to develop and implement programs to (i) cost-effectively reduce morbidity, productivity losses in multiple sectors, and mortality due to malaria, particularly among the poor and vulnerable subgroups such as children and pregnant women; and (ii) address the challenges of regional and global public goods. The Bank will achieve the stated priorities through a new business model that combines an *emphasis on outcomes* with *flexibility in approaches and lending instruments*.<sup>5</sup> Products and services will be tailored to different client segments in a way that meets their needs and maximizes the institution's comparative advantages. This approach is consistent with the new Global Strategic Plan of RBM (RBM 2004a). The Bank participated actively in the formulation of that strategy.

## The Booster Program for Malaria Control

In the short to medium term, a new Booster Program for Malaria Control will provide increased financing and technical support to accelerate program design and implementation, increase coverage, and improve outcomes more rapidly than in the recent past. The Booster Program for Malaria Control will be global in scope and consist initially of an intensive effort over a five-year period. It may include one or more Horizontal Adaptable Programs<sup>6</sup> at the global or regional level, covering many countries, with emphasis on country ownership, measurable outcomes, and rigorous application of epidemiology. While the immediate objectives are fixed—increasing coverage, improving outcomes, and building capacity—the means will be flexible. The financial commitment is subject to consideration by the Board of Executive Directors of the World Bank.

The new business model and the Booster Program for Malaria Control take into account lessons learned from successful malaria programs and experiences from the Multi-country HIV/AIDS Program (MAP). They constitute a substantial departure from the Bank's previous approach to malaria control. There is a need for decisive action on a large scale in order to achieve impact. Experience of the past five years shows that a pledge of commitment, such as that made by the Bank in Abuja in 2000, with neither a

clearly funded program for malaria control nor the internal budget to ensure that the Bank's malaria team can function effectively, does not lead to success on a large scale. A different and more robust approach is needed for success.

Drawing on lessons of the past five years, Bank management is designing a program for Board approval to ensure that the Bank responds to country demands with flexibility and speed. On the basis of initial demand from clients, the working assumption is that a total commitment of US\$500 million to US\$1 billion is feasible over the next five years. The Bank will mobilize financial and technical resources from within and outside the institution, including the public and private sectors, to stimulate the production of commodities such as insecticide-treated bed nets (ITNs) and antimalarial drugs; lower taxes and tariffs on such commodities; improve and maintain long-term commitment to malaria control by governments and civil society groups; and build public-private partnerships for program design, management, and evaluation. Several key partners have expressed interest in a collaborative and stronger effort. The International Finance Corporation (IFC), which has a particularly strong comparative advantage in working with the private sector, will play an important role in this enhanced effort by the World Bank Group.

Significant cofinancing will be leveraged by a demonstration of the Bank's own commitment up front, together with the emphasis on measurable results. Crucially, the Bank's approach will be proactive while respecting and supporting country leadership and ownership. It will complement the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM), WHO, United Nations Children's Fund (UNICEF), the Bill and Melinda Gates Foundation, and others in ensuring sufficient financing as well as technical and implementation support for effective malaria control. Henceforth, malaria control will be mainstreamed into the Poverty Reduction Strategies and large sector-development programs that emphasize outcomes. The high coverage rates achieved in most countries would be sustained through combinations of domestic financing, programmatic operations, and budget support on a case-by-case basis. High coverage with preventive interventions will decrease the burden of disease and the pressures on health services.

Countries will have three main options for accessing more funds and technical support from the Bank. These options, which are not mutually exclusive, are outlined below.

## Rolling Back Malaria

- *Enhancing PRSCs and health SWAps to support malaria control.* In this option, the Booster Program for Malaria Control will be used to enhance Poverty Reduction Support Credits (PRSCs) and sectorwide approaches (SWAps) for health to include stronger malaria control programs, with additional financing when required, technical support, and results-based monitoring and evaluation. The recently approved PRSC for Rwanda is a useful example. It includes technically sound malaria control activities within the health sector plan of work, including the monitoring and evaluation matrix and the Medium-Term Expenditure Framework (MTEF). Beyond the health sector, PRSCs provide opportunities for cross-sectoral work on malaria through, for example, the education, agriculture, environment, and transport sectors.
- *Malaria Control Projects at the country or subregional level.* Based on country requests, the Booster Program for Malaria Control will support Malaria Control Projects, as in the successful examples of Brazil, Eritrea, India, and Vietnam. Project design and objectives will depend on the local context in terms of government policy, disease burden and distribution, the nature of the vector (the mosquito), and local management capacity. Countries may choose to use community-driven development (CDD) approaches, depending on the context. These Malaria Control Projects will supplement, not disrupt, systemic health sector development programs. Strengthening the health infrastructure will facilitate malaria control and help to sustain the gains to be achieved under the Booster Program for Malaria Control. For Low Income Countries Under Stress (LICUS) and postconflict countries, special implementation arrangements may include more extensive contracting of civil society organizations (CSOs) for service delivery, combined with technical and operational support from agencies such as WHO and UNICEF.
- *Combined HIV, Tuberculosis, and Malaria Control Projects.* Another option is to develop and implement operations covering HIV, tuberculosis, and malaria, such as those in Eritrea and Angola. In this option, the Booster Program for Malaria Control will support broader operations covering several disease control objectives in a way that is consistent with medium- to long-term sectoral and multisectoral development.

Implementation of the Booster Program implies an increase in the deliverables to be planned and achieved by Bank regional vice presidencies,

country units, and sector units working on malaria control from fiscal 2006 onwards. The Booster Program will support operations at the subregional and country levels. Depending on specific contexts, the operations will include proactive engagement of CSOs and the private sector to the extent that is compatible with their comparative advantages. Such engagement may include contracting or financing of activities to be undertaken by CSOs and the private sector. In order to promote sustainability and mitigate the risks of distortions, the Booster Program will supplement programmatic approaches such as health SWAps and PRSCs. The Bank would seek cofinancing or performance-based buydowns from partners, including but not limited to foundations and multinational corporations.

### **The Malaria Task Force and Steering Committee**

The Malaria Task Force is a Bank-wide group drawn from corporate units, networks, operational vice presidential units (VPUs), and the IFC. It will support the Bank's country and regional teams to (i) increase rapidly the scale and impact of the Bank's support for malaria control at the country level and (ii) improve the institutional knowledge base regarding the economics of malaria at the household, sectoral, and macro levels, and channel that knowledge into the Bank's work on poverty reduction. A high-level Steering Committee will provide institutional oversight and guidance. The Steering Committee will include the Senior Vice President and Head of the Human Development Network; the Regional Vice Presidents for Africa, South Asia, East Asia and the Pacific; the Vice President for Operations Policy and Country Services; and the Senior Vice President and Chief Economist. The Poverty Reduction and Economic Management Network will provide guidance on the integration of malaria control into Poverty Reduction and Strategy Papers (PRSPs). Subject to satisfactory performance and resource availability, the Bank will continue its highly selective support for partnerships working on product development and applied research that are relevant to malaria control.

By the end of the fifth year of the Booster Program for Malaria Control, most of the eligible countries are expected to have achieved significant increases in coverage of essential interventions.





## CHAPTER 1

# Introduction

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The purpose of this Global Strategy and Booster Program is to translate the World Bank's corporate commitment into a serious effort to close the gap between knowing and doing in malaria control. Implementation of the Global Strategy and Booster Program will increase rapidly the scale and impact of the Bank's support for malaria control at the country level, with a view to reducing the burden of economic loss, impaired development, preventable illnesses, and deaths due to malaria. This effort will facilitate the achievement of results at the country, regional, and global levels, consistent with the emerging themes of the International Development Association (IDA), including achievement of the Millennium Development Goals (MDGs), collaboration with relevant partners, results measurement, and attention to communicable diseases: "IDA will continue its work to combat these diseases and mitigate their effects, both at the country level through disease-specific interventions and support for health systems strengthening, and across countries through regional projects, as well as through support for international initiatives" (IDA 2005).

Following this introduction, the rationale for a major World Bank effort on malaria control is outlined in section 2. Section 3 presents the priorities and business model for the future. This is followed by the Program of Action in section 4, which includes the options in financing and instruments for assisting the countries. Section 5 is on the Malaria Task Force, a Bank-wide group that will be charged with implementation of the Global Strategy and Booster Program. Finally, section 6 presents a results-based monitoring and evaluation framework and draft plan. The appendices provide details and context for much of the foregoing discussions.

The Global Strategy and Booster Program has a dual audience. The primary audience is internal. It includes the corporate, regional, country, and sector units with direct or indirect responsibilities for, or influence on, the Bank's support for malaria control. This internal audience will find the Global Strategy and Booster Program useful in the following ways: placing the malaria control agenda within the broader efforts of poverty reduction, health, and economic development; defining the unmet needs at the country, regional, and global levels; and assisting countries to develop and implement effective programs. The secondary audience is external, including country clients (represented by ministries of finance, planning, economic development and health, malaria control programs, research institutions, the commercial and private sectors, civil society groups, and so forth); members of the RBM Partnership,<sup>7</sup> including regional and country officers in the major multilateral and bilateral organizations and local and international nongovernmental organizations; and financiers of health and malaria control programs. These external clients and partner agencies will find the Global Strategy and Booster Program useful in better understanding the World Bank's work on malaria. This will enable more effective collaboration among the Bank and other institutions in malaria control.



## CHAPTER 2

# Rationale for a Renewed World Bank Effort on Malaria

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The Global Strategy and Booster Program is a response to the inadequacy of efforts to control malaria and the inadequacy of the Bank's current efforts relative to its potential. The Bank was a key contributor to recent successes in malaria control, including those in Brazil, Eritrea, parts of India, and Vietnam. It cofounded and supports the global Roll Back Malaria Partnership. However, the institution's efforts have been severely understaffed and underfunded, in terms of both funds committed to malaria control at the country level and the internal budget for the Bank's Malaria Team—a budget that *declined* during much of the period since 1998.<sup>8</sup> On balance, the Bank's activities were useful but not sufficient for success on a larger scale.

A stronger World Bank effort for malaria is needed on the following grounds:

- Malaria impairs economic growth and human development in many of the World Bank's client countries, particularly in Sub-Saharan Africa.
- Malaria is preventable, curable, and controllable on a large scale, with good returns on investment.
- Malaria control has positive externalities and is a global public good.
- At the regional and global levels, there is a wide gap between what is feasible and the current level of effort. Despite successes in a few countries, measurable progress in malaria control is well below the 60 percent coverage targets set by countries and development agencies for 2005 in terms of coverage with preventive and curative interventions.<sup>9</sup>

## Rolling Back Malaria

- The Bank has the capacity to do a lot more than it has in malaria control, including financing, policy advice, and implementation support.
- Clients, partner agencies, independent observers, civil society organizations, and potential cofinanciers are requesting that the Bank play a more decisive role in malaria control. There is much unmet demand for the Bank's financing and advisory services.

### 2.1 Malaria Impairs Economic Growth and Human Development

Malaria impairs economic development and health in many of the World Bank's client countries, particularly in Sub-Saharan Africa (Chima, Goodman, and Mills 2003; Ettlting et al. 1994; Ettlting and Shepard 1991; Shepard et al. 1991). For many low-income countries, malaria control is essential for progress toward achieving the MDGs, which the Bank has adopted as a corporate priority. The link between malaria and economic development is bidirectional; impaired health from malaria restrains economic development, whereas economic development, by improving living conditions and access to both effective prevention and treatment, reduces the illnesses from malaria. Malaria potentially affects both the volume and the productivity of inputs.

At the macroeconomic level, annual economic growth in malarious countries between 1965 and 1990 averaged 0.4 percent of GDP per capita, compared with 2.3 percent in the rest of the world, after controlling for the other standard growth determinants used in macroeconomic models (Sachs and Malaney 2002). This analysis does not constitute proof that malaria is a cause of low incomes and poor aggregate growth, but that the disease must be considered a legitimate contributor to these failings (Arrow, Panosian, and Gelband 2004). At the microeconomic level, estimates of the total (direct plus indirect) costs of malaria vary: 0.75 percent of GNP in Pakistan (Khan 1966); 7 percent of household income in Malawi (Ettlting et al. 1994); 9–18 percent of annual income for small farmers in Kenya, and 7–13 percent in Nigeria (Leighton and Foster 1993). One multicountry study attempted an Africa-wide estimate of total costs of malaria based on extrapolations from case studies of areas in Burkina Faso, Chad, the Democratic Republic of Congo, and Rwanda. The totals reported translated to 0.6 percent of total Sub-Saharan GDP (Shephard et al. 1991).

## 2.2 Malaria is Preventable and Curable, with Good Returns on Investment

There is no accurate count of the global toll of illnesses and deaths from malaria. This is due to multiple factors, including weaknesses in data collection and reporting systems, inaccurate diagnoses that may result in over- or underreporting and, for many people in malaria-endemic areas, lack of access to skilled workers who can make accurate diagnoses. WHO estimated that there were 1,124,000 deaths due directly to malaria in 2002, of which about 970,000 were in Africa (WHO 2002). Globally, there are more than 500 million cases of malaria per year; a recent study put the number of cases from a particularly severe form of the malaria parasite, *Plasmodium falciparum*, at 515 million in 2002 alone (Snow et al. 2005).

The disease is preventable and easy to cure with available technologies. RBM and WHO support an evidence-based consensus on a combination of preventive and curative measures that include integrated vector management—insecticide-treated bed nets (ITNs) and curtains, indoor residual (house) spraying with WHO-approved insecticides where the pattern of transmission makes such measures appropriate, environmental modifications to eliminate breeding sites of mosquitoes, and biological control (e.g., bacteria, fungi, nematodes, copepods, and larvicidal fish); intermittent preventive treatment in pregnancy; and prompt treatment with effective drugs (RBM 2004a, WHO 2004b, WHO 2004c). In each context, the priorities and appropriate combination of interventions will depend on factors such as the epidemiology of malaria, the type and behavior of the mosquito, local customs and preferences, the susceptibility of the malaria parasite to different drugs, feasibility of the logistics required, the quantity and quality of human resources for malaria control, and affordability. A full documentation of these factors is beyond the immediate scope of this strategy but is available from specialized texts, journals, project reports, and the website of WHO (<http://www.who.int>). Effective malaria control is complex and challenging. In the absence of strong and sustained malaria control efforts, coverage with effective interventions is low, particularly among the poor in most of the affected countries. Estimates suggest that malaria accounts for up to 40 percent of all public expenditures on health and 20–50 percent of hospital admissions in many settings (WHO and UNICEF 2003).

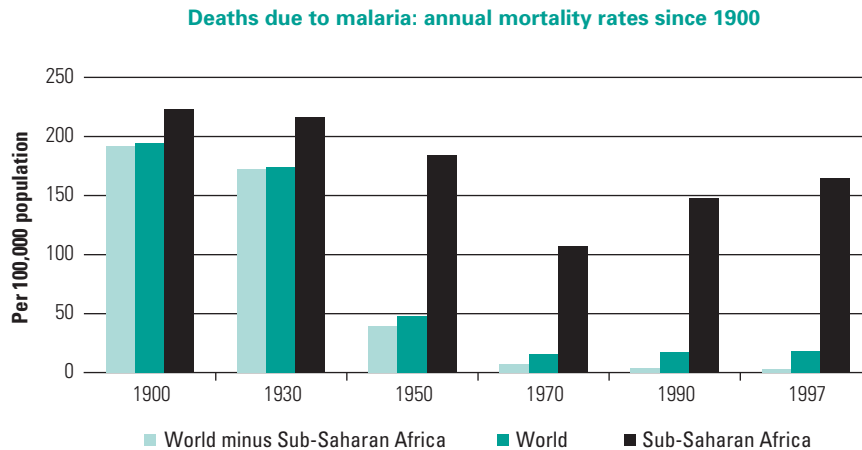
In 1954 the Pan American Sanitary Conference adopted a continental plan to eradicate malaria from the Americas. In 1955 this plan was extended

to the world by the World Health Assembly. In 1956, the Sixth Expert Committee formulated a strategy for eradicating malaria (WHO 1957). The goal of malaria eradication was understood by the committee as a problem of economic and political development, as much as of public health (Packard 1998). Malaria was eliminated in Europe, North America, and parts of other continents through deliberate programs of mosquito control and clinical treatment, as well as through generally improved social and living conditions (see figure 2.1). The commitment and persistence behind *eradication*<sup>10</sup> efforts elsewhere were never applied in Africa's highly endemic areas (Breman, Egan, and Keutsch 2001). Taking into account lessons learned during the eradication campaigns, in 1969 the World Health Assembly reaffirmed that eradication was the ultimate goal but stated that, in regions where eradication was not yet feasible, *control*<sup>11</sup> of malaria should be encouraged and may be a necessary and valid step toward that goal (WHO 1969).

The recent efforts to *control* malaria fall short of agreed goals in Africa. Today, at least 85 percent of deaths from malaria occur in Africa, 8 percent in Southeast Asia, 5 percent in the Eastern Mediterranean region, 1 percent in the Western Pacific, and 0.1 percent in the Americas. The poor bear a disproportionate burden of malaria; while the average total cost burden of malaria was 7.2 percent of household income, the total cost burden for very poor households was much higher at a potentially catastrophic 32 percent of annual income in Malawi (Ettling et al. 1994). Despite the fact that Africa bears the largest share of the malaria burden, the problem is not exclusive to Africa. For example, parts of Southeast Asia bear high burdens of the disease. In addition, Southeast Asia has been the epicenter of drug-resistant malaria (Arrow, Panosian, and Gelband 2004). These drug-resistant forms later spread elsewhere. Consequently, good malaria control in Southeast Asia and other places with similar patterns of malaria would benefit not only residents of these regions but, by reducing the emergence of drug-resistant forms of malaria, would benefit Africa as well.

### 2.3 Success is Possible on a Large Scale

Although large-scale successes in malaria control have been rare in the low- and middle-income countries, the World Bank was a key player in recent large-scale successes, as in Brazil, Eritrea, several states in India, and Viet-

**Figure 2.1:** Profile in Contrasts: The Persistent Burden of Malaria in Africa

Source: WHO 1999.

nam (see appendix 3 for details). In Vietnam, at a cost to the government of about US\$11 (1998 costs) for a clinic visit plus drugs to treat an episode, the direct costs saved were about US\$9.5 million, which is about twice the amount spent on malaria control each year. To this is added about US\$14 million in reduced out-of-pocket health care costs to households (Laxminarayan 2004). In Brazil, compared to what would have happened in the absence of the malaria control program, nearly 2 million cases of malaria and 231,000 deaths were prevented. The overall cost-effectiveness was US\$2,672 per life saved or US\$69 per disability-adjusted life year (DALY), which compares favorably with many other disease control interventions (Akhavan et al. 1999). Other sources indicate that insecticide treatment of existing mosquito nets costs US\$4–10 per DALY saved, providing nets and retreatment costs US\$19–85 per DALY saved, and intermittent presumptive treatment of pregnant women through existing prenatal services costs US\$4–29 per DALY saved (Goodman, Coleman, and Mills 1999).

The Bank responded to requests for malaria-specific investment projects in some countries, such as in Eritrea and India. This combination of country commitment with Bank support has resulted in measurable success. For example, through the US\$40 million IDA credit for the HIV/AIDS, Malaria, STDs, and TB Control Project (HAMSET) in Eritrea, with tech-

nical support from and partnership with the U.S. Agency for International Development (USAID), Eritrea has reduced malaria morbidity and mortality for four consecutive years and has seen the use of ITNs rise from 20 percent in 2000 to 58.5 percent in 2002. India's Enhanced Malaria Control Project, which the Bank supports, started in 1997. Reported cases of malaria declined by 93.3 percent, 80.8 percent, and 40.6 percent for the states of Maharashtra, Gujarat, and Rajasthan, respectively, from 1997 to 2002.<sup>12</sup> Key factors in these success stories include a results-oriented approach; local leadership and good management capacity; explicit prioritization of malaria control by the government; levels of financing that were sufficient to achieve impact; evidence-based decision making to align interventions with the local patterns and causes of disease transmission; flexibility in the mechanism of Bank support; effective systems for delivering commodities; and proactive Task Teams from the Bank. These factors may be adapted for use elsewhere, and are taken into account in the new business model, priorities, and program of action.

## 2.4 There is a Wide Gap between Knowing and Doing

The use of ITNs has major effects on malaria and child mortality. When ITN coverage is over 60 percent, there may be up to a 20 percent reduction in all-cause mortality among children under five years of age, a 50 percent reduction in clinical malaria episodes, and widespread uptake confers protection on nonusers over time. When ITN coverage in Tanzanian infants increased from 10 to more than 50 percent, child survival increased by 27 percent and anemia decreased by 63 percent (Lengeler 2001).

Despite the efforts and successes in a few countries, measurable progress in malaria control is well below the 60 percent coverage targets set by countries and development agencies for 2005 in terms of coverage with preventive and curative interventions. This is particularly true in Africa, where malaria control efforts remain patchy in most of the severely affected countries. In many of them, there are indications of a real or potential increase in the burden of malaria, partly due to increases in drug-resistant forms of the malaria parasite. In Ghana, for example, "malaria continues to be a leading cause of morbidity and mortality. There are high levels of chloroquine resistance in the country, resulting in a change in drug policy to more expensive drugs. Coupled with the low coverage of ITNs, a major issue will

be the need to subsidize both the cost of ITNs and the drug to make them more affordable to government and to the people” (Ghana Ministry of Health and Health Partners 2004).

According to the report of the External Evaluation of Roll Back Malaria (Malaria Consortium 2002): “Due to inadequacies in the systems available for monitoring and evaluation (M&E), it is not possible to know with any certainty how the malaria burden has changed during the first three years of RBM. However, anecdotal evidence and the strong consensus among experts suggest that, at the very least, the malaria burden has not decreased. What is more likely, and believed to be the case by those involved, is that malaria has got[ten] somewhat worse during this period.” While current data on coverage with RBM-endorsed interventions are sparse, the most recent official data from WHO indicate that, in many malaria-endemic countries, national coverage with key interventions is well below agreed targets of 60 percent for 2005 (WHO and UNICEF 2005) and the poor have much less access to effective interventions than others (table 2.1 and figure 2.2). At the same time, high coverage rates in some districts signal what can be achieved in a relatively short period when programs are based on priority interventions and use a results-based approach.<sup>13</sup>

Treatment, when prompt and effective, is associated with improved outcomes, even in very poor settings. For example, teaching mothers to provide prompt chloroquine treatment for fevers at home resulted in a 40 percent reduction in under-five mortality in Tigray, Ethiopia (Kidane and Morrow 2000). However, the poor also have less access to *any* treatment, as shown in figure 2.2, not to mention *effective* treatment.

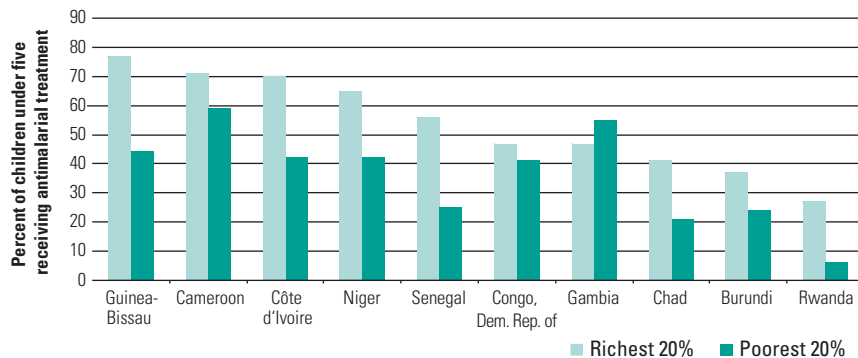
### The challenge of drug-resistant malaria

One of the reasons for the resurgence and increased burden of malaria is the development of resistance to traditional first-line antimalarial treatments such as chloroquine (CQ) and sulfadoxine pyrimethamine (SP, or Fansidar)

**Table 2.1:** Ownership of Insecticide-Treated Bed Nets in Malawi, by Income Group

| BED NET OWNERSHIP                         | BOTTOM 28% | TOP 35% |
|---|------------|---------|
| % of households with at least one bed net | 5.1        | 25.6    |
| % of households with at least one ITN     | 0.9        | 5.4     |

Source: Gwatkin 2004.

**Figure 2.2:** Access to Antimalarial Treatment

Source: Worrall, Basu, and Hanson 2003.

by *Plasmodium falciparum*, the parasite that causes a severe form of malaria. Faced with increasing resistance to these first-line treatments, countries are revising their antimalarial drug policies and exploring alternative treatment options. Experience in some areas of Southeast Asia has shown combination therapy containing artemisinin-based drugs, so-called artemisinin-based combination therapy (ACT), to be successful in treating and reversing the spread of drug-resistant malaria. Based on such evidence, WHO has revised its guidance to countries to promote the use of ACT when a new drug policy is required.

There is a dual crisis in responding to drug-resistant malaria. First, at US\$1–2 per course of treatment, ACTs are 10–20 times as expensive as the failed or failing chloroquine. Second, there is a potential biomedical crisis. Since the artemisinin-based drugs are the *only* first-line antimalarial drugs appropriate for widespread use that still work against chloroquine-resistant malaria parasites, malaria's toll could rise even higher if resistance to artemisinin were allowed to spread. The challenge is thus twofold: to facilitate the widespread use of artemisinins where appropriate while preserving their effectiveness for as long as possible. Arrow, Panosian, and Gelband (2004) asserted that preserving the effectiveness of ACTs means delaying the development of resistance, which creates a benefit for all—"a global public good." In July 2004, the Institute of Medicine (of the National Academies in the United States) published a report recommending a sustained global ACT subsidy, in which artemisinins are coformulated with other

antimalarials, as the most economically and biomedically sound means to meet this dual challenge. Without external funding, neither governments nor consumers, who bear most of the cost, can afford ACTs at current prices. The Institute of Medicine report identified the International Development Association (IDA) of the World Bank Group as a potential financier of an estimated annual subsidy of US\$300–500 million (Arrow, Panosian, and Gelband 2004). As of March 2005, the Bank was examining the “global public good” rationale for a high-level subsidy through a study financed by the RBM Secretariat as part of the work program of RBM’s Finance and Resource Working Group.

### **Global estimates of financing needs**

International estimates provide a range of what may be needed to achieve the Abuja Targets and MDGs, with the caveat that many estimates are based on epidemiological scenarios rather than scenarios that take account of constraints on implementation. Country-specific estimates of financing requirements are required to obtain a more robust picture. Furthermore, since the financial burden of malaria control falls mostly on the household level in Africa, the manner in which malaria control funding should be targeted remains a topic for debate (Jowett, Miller, and Mnzava 2000; WHO 2002).

Estimates of the financing needs for worldwide malaria control vary, but all estimates indicate that more money is needed, even after taking into account grants from the GFATM, which had committed a total of US\$904.5 million as of December 2004 (in two-year grants, up to mid-2006). The rising cost of treatment has added to what was already a difficult financial situation. In 2004, the Copenhagen Consensus estimated that US\$1–3 billion per year is needed to halve deaths from malaria worldwide by 2010 (Mills and Shillcutt 2004). In 2000, The Abuja Declaration called for the allocation of new resources of at least US\$1 billion per year, from African countries and their development partners, to halve malaria morbidity and mortality in Sub-Saharan Africa by 2010.

### **Addressing both disease-specific interventions and health system support**

The financial constraint remains an urgent and key factor, but not the only key factor, holding back malaria control in most countries. As with broader

health and development issues, additional financing is likely to make a difference when combined with sound policies, good governance, effective implementation arrangements that suit the local context (World Bank 2002; World Bank 2004a), technical rigor, better use of existing human resources, and the concurrent improvement of human resource capacity in the countries (Chen et al. 2004). Weak health systems need to be improved, both for sustainability and to ensure that a more proactive effort to control malaria does not distort the health system. Efforts to enhance PRSCs and SWAPs for malaria control will take account of systemic constraints in the use and development of human resources, drug procurement and management, planning and budgeting, and monitoring and evaluation. Immunization campaigns and maternal and child health services provide opportunities for integration of malaria control into routine health services.

However, health system constraints *alone* justify neither inaction nor a continuation of the inadequate level of the Bank's commitment to malaria control. There is evidence that, in disease control and public health, major interventions have worked on a large scale even in poor settings with grinding poverty and weak health systems (Levine et al. 2004). At the same time, there is evidence that a persistent failure to achieve improvements in health outcomes could lead to a backlash against broader efforts to reform the health system, as in Zambia, where "continued deterioration of health conditions during the mid-1990s was a key factor in the Government's 1998 back-pedaling on the reform agenda" (World Bank 2003b, p. 10), along with local perceptions that there was too much emphasis on process and too little on content. It is crucial to address the content, not only the process, of programmatic operations in order to achieve measurable improvements in health outcomes.

An effective approach needs to be more robust than a mutually exclusive framework of either health system strengthening versus disease control programs, or horizontal versus vertical programs. The Booster Program would support an effective combination of both as appropriate. Malaria control may be thought of as a diagonal program that needs elements of horizontal and vertical approaches, with the balance dependent on the context.

### **Growing pressures on scarce resources**

The pressures on governments to finance treatment for malaria increased dramatically from 2004 to 2005 due to drug resistance and the emergence

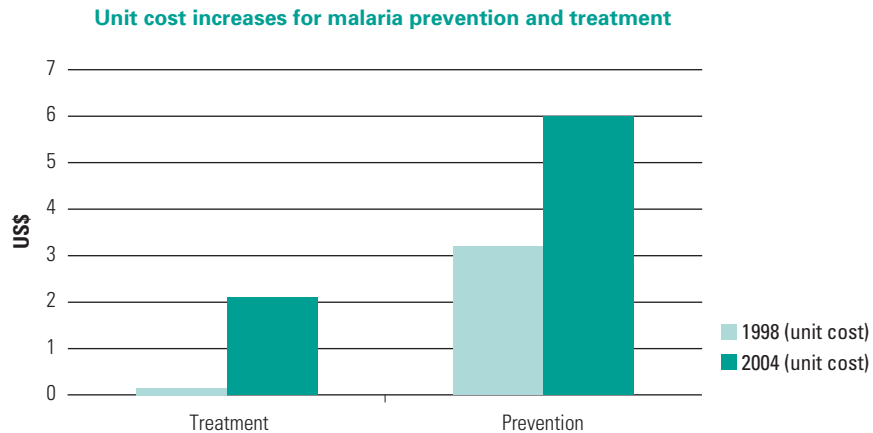
of new preventive technologies. Increased resistance of the malaria parasite to long-standing treatment has forced countries to shift first-line treatment for malaria from drugs that cost US\$0.05–0.10 per treatment course (such as CQ and SP [Fansidar]) to ACTs that cost up to US\$2 per treatment course. Funds available to clients, including those from the GFATM, are insufficient to maintain treatment coverage. Clients have requested substantial financing from the Bank, not only to purchase the drugs, but also to increase the capacity of health systems to cope with the increased demands on service delivery.

The costs of prevention are increasing as well. ITNs are clearly effective in preventing malaria when deployed on a significant scale. A key bottleneck to increasing net use, however, is that nets have to be retreated with insecticide every six months in order to maintain their effectiveness. In Sub-Saharan Africa of the average 13 percent of the population covered by ITNs, retreatment rates were generally under 4 percent (WHO and UNICEF 2003). In response to this problem, WHO prompted the industry to develop long-lasting insecticidal nets (LLINs), which are ready-to-use, factory-pretreated nets that require no further treatment during their expected lifespan of four to five years. According to the WHO, “this technology obviates the need for re-treatment (unlike conventional ITNs, LLINs resist washing) and reduces both human exposure (at any given time, most of the insecticide is hidden and not bioavailable) and the risk of environmental contamination” (WHO 2004a). This development, however, comes at an increased upfront price: about US\$6, compared to approximately US\$3 for a conventional ITN (see figure 2.3), though the costs over time may be lower than a conventional ITN given that retreatment costs would not be incurred by users of LLINs.

The GFATM is currently the major financier of ACTs. However, the short term of GFATM grants (two years in a first instance, with a possibility of extension to five years) puts vulnerable countries, governments, and populations in a precarious position should funds not be available beyond two years. Furthermore, manufacturers of ITNs and ACTs have been either unwilling or unable to produce sufficient quantities of either commodity, largely as a result of the uncertain financial landscape for malaria control and the absence of predictable, large-scale demand. Although the GFATM has approved some grants for this purpose, the way they are disbursed means that the process is too slow and too fragmented to give firms reassurance, leading to more calls for a commitment from an organization

## Rolling Back Malaria

**Figure 2.3:** The Increasing Costs of Commodities for Malaria Control



Source: RBM 2004b.

such as the World Bank to address the issue through complementary financing, and a centralized global purchasing body to coordinate the orders (*Economist* 2004). The Bank Group has a combination of comparative advantages, including a medium- to long-term financial horizon, procurement expertise, experience with innovative financing instruments, and international credibility among pharmaceutical manufacturers to work with governments, the private sector, CSOs, and multiple agencies (see box 2.1). The Bank's Malaria Team has received requests from clients and independent agencies to engage more strongly in helping countries meet the need for effective treatment of malaria.

### 2.5 The World Bank Has Underused its Comparative Advantage in Malaria Control

There are publicly available reports and perceptions that the Bank (i) has not kept its promise on malaria control; (ii) was aloof from the needs and operational realities of those who implement malaria control programs at the country level; and (iii) was insufficiently focused on outcomes in terms of reducing the burden of illness, productivity losses, and preventable deaths. Many of these reports and perceptions have merit.

**Box 2.1:** Putting the Bank's Comparative Advantage to Work:  
Assisting Countries to Develop Strategies for Financing Treatment with ACTs

Many countries in the Bank's Africa Region are facing a combination of finance-related issues around the shift in first-line treatment to ACTs, including but not limited to the inadequacy of current funds for ACTs and concerns in client governments about financial sustainability given growth projections. Planning and budgeting officials are skeptical about epidemiologically driven cost estimates, while program-based cost projections remain unclear.

In response, the Bank and USAID, through the "Partners for Health Reform Plus Project," are now working together in Tanzania and the Democratic Republic of Congo to address their respective concerns around a shift to ACTs. The studies will address both incremental resource requirements and gains in health outcomes. The findings will help to inform ministries of health and finance about the potential for increased expenditures and the benefits such expenditures would buy in the short and medium term.

In the Democratic Republic of Congo, this work will inform directly the preparation of the proposed Health Rehabilitation Project, which will support malaria control and help close the gap between available financing and what is required for impact. It may also assist the country team in its efforts to secure project cofinancing, by articulating clearly what outcomes an increased investment might purchase.

In Tanzania, this work will inform the discussions with Ministries of Health and Finance on whether or not the new first-line treatment should be supported, given the medium- to long-term financial implications. The proposed work could help inform Ministry of Health decisions on intrasectoral allocations with evidence on the cost-effectiveness of ACT expenditures, given the burden of disease and the longer-term affordability of financing such costs.

Since September 2004, this type of assistance has been requested by Benin, Burkina Faso, Kenya, Rwanda, and Senegal. While many more requests are expected, the Bank's capacity to respond to this demand has already been exceeded due to the inadequacy of current internal budgets.

The World Bank is capable of doing a lot more than it has on malaria control. Much of the Bank's comparative advantage in malaria control lies in the combination of its cross-sectoral capacity in analytical work, advisory services, financing, operational support, and convening power across multiple sectors that contribute to or benefit from malaria control. The Bank has strategic access to, and support for, the following:

- Country-led and country-owned processes for developing Poverty Reduction Strategies, Medium-Term Expenditure Frameworks, and debt relief agreements under the Highly Indebted Poor Country Initiative (HIPC Initiative)

## Rolling Back Malaria

- Planning and budgeting at the country level, with attention to operational constraints and linkages to expected outcomes
- Coformulation of sector-wide approaches and budget support to address systemic constraints within sectors (particularly health), and across multiple sectors
- Financing or cofinancing (as in the successful efforts in Brazil, Eritrea, India, and Vietnam).

### External evaluation of Roll Back Malaria and implications for the World Bank

In 2002, the RBM Partnership underwent an External Evaluation as a requirement for continued funding from the British government's Department for International Development and Development Grant Facility financing from the Bank.<sup>14</sup> In summary, the evaluation concluded that while the RBM Partnership had made impressive gains in global advocacy, it had not succeeded in making large-scale impacts at the country level in terms of reducing morbidity and mortality from malaria (Malaria Consortium 2002).

The evaluation team found that the Bank could be playing a more active role to fulfill its responsibility in RBM. The evaluation team identified a tension between two views: whereas many in the RBM Partnership argued that funding was a major problem holding back malaria control, the World Bank argued that money was not the rate-limiting factor. The Bank cited as rate-limiting factors limited absorptive capacity and poor prioritization of malaria control, as evidenced by significant unspent monies at the close of many IDA-financed operations. The RBM evaluation team cited difficulties experienced by the Bank's clients in navigating and understanding SWAps, Poverty Reduction and Strategy Papers (PRSPs), and HIPC debt relief financing modalities, as well as confusion in the Partnership about whose responsibility it was to channel funds from these existing opportunities to malaria control efforts (the country, the Bank, other RBM partners, or another?). The evaluation team noted that "the Bank's presumed comparative advantage in development policies, sector-wide planning and budgeting was inaccessible to the broader RBM partnership" due to the complexity of its processes, and due to many partners' lack of familiarity with those processes. The reported impression of the Bank among other partners was

that “it talks the talk, but does not deliver in practice on the ground” (Malaria Consortium 2002).

### **The Bank’s financing of malaria control**

At the Abuja Summit in April 2000, the Bank, along with heads of state and senior government officials from 44 of the 50 malaria-endemic countries in Africa, pledged to (i) halve the malaria burden in Africa by 2010 and (ii) achieve by 2005 a coverage of 60 percent with key malaria control interventions.<sup>15</sup> The Bank stated the following before signing the declaration:

We would like to significantly increase the resources needed to address malaria through World Bank financing. We estimate that we now have re-allocated somewhere between US\$100–150 million for RBM activities in our Africa Region health portfolio, a healthy amount already available for malaria at the country level. However, we can do much more. We estimate that we can finance an additional US\$300–500 million for RBM action across Africa and we hope that the RBM Partnership and the African Leadership will be instrumental in specifically creating a demand for the World Bank operations in this direction. The resources can be deployed to increase the fight against malaria, but there has to be an explicit, country-driven, country-owned, and country prioritization in order to win that fight. There should be more common objectives between the Ministers of Finance and Health. The presence here of so many Heads of State sends a promising signal that a regional effort is urgent, yet viable.

Since 2000, total Bank commitments in all regions are about US\$100–150 million in earmarked funds for malaria control. These include only health sector investment credits and grants, as well as commitments through broad programmatic operations such as SWAps. Total World Bank support for malaria control was higher, due to financing through debt relief, multisectoral operations such as PRSCs, Emergency Recovery Credits, and Social Funds. However, it is difficult to quantify exactly how many of these commitments went to malaria control, since these operations have not tracked details of disease-specific inputs. Investments in health sector development activities, such as training of nurses and management training at the country and district levels, have not been included. These investments contribute to the capacity of health systems to undertake effective malaria control.

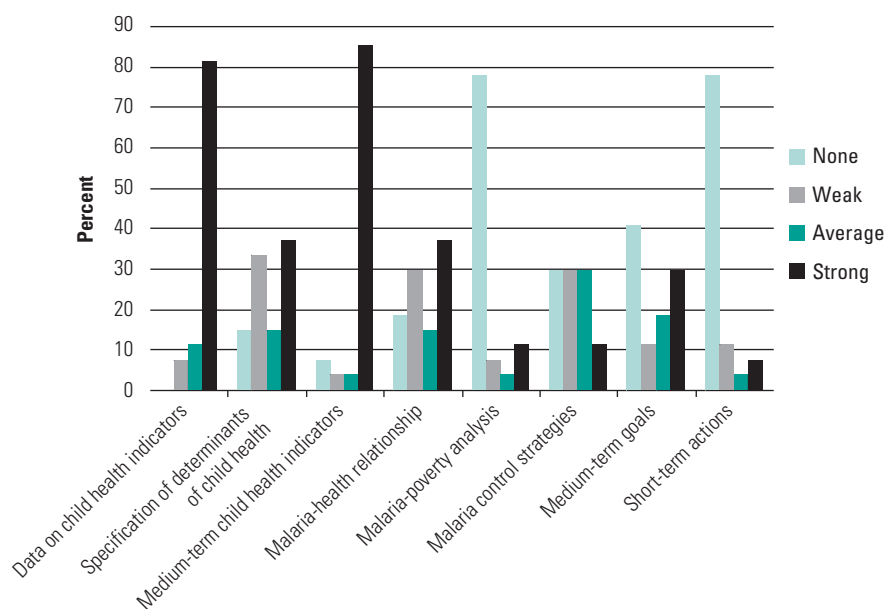
### **Enhancing PRSPs, PRSCs, and health SWAps to achieve measurable results in malaria control coverage and health outcomes**

Malaria control would benefit from the application of key principles underlying the Poverty Reduction Strategy Initiative—ownership, results focus, multisectoral perspectives, and country-led partnership. The Bank could support countries to apply these principles. However, this potential has yet to be realized in many malaria-endemic countries. For example, analyses of PRSPs and Interim Poverty Reduction and Strategy Papers (I-PRSPs) of 27 countries in Sub-Saharan Africa showed that inclusion of malaria in PRSPs is generally low. While 81 percent of PRSPs and I-PRSPs include data on child health indicators, only 37 percent further the analysis to specify the determinants of child health. As a result, the discussion on malaria, which is a major contributing factor to under-five mortality, typically does not include country-specific, quantitative, or, where necessary, costed information on the problems due to malaria. It rarely includes strategies and actions to achieve malaria control targets. Figure 2.4 and its accompanying table show a categorical distribution of PRSPs and I-PRSPs according to how well they addressed specific items. The analytical base and results focus of the PRSPs are weak in relation to malaria control. These findings are consistent with those from a recent evaluation that was done by the Bank's Operations Evaluation Department and indicate a major opportunity for each eligible country to integrate malaria control into its PRSP, given the role that the PRSP plays in development planning and assistance (World Bank, 2004b). With reference to Sub-Saharan Africa, Bank support for this approach would be consistent with the principles addressed in *Improving Health, Nutrition, and Population Outcomes in Sub-Saharan Africa* (World Bank 2004c).

### **There is a need to combine PRSCs and health SWAps with an emphasis on measurable outcomes**

Budget support through PRSCs, as well as programmatic operations in the form of basket funding and health SWAps, has the potential to sustain medium- to long-term gains in malaria control and the broader health system. However, they have not been consistently applied in ways that enable rapid improvements in coverage while improving systems to ensure sustainability. An important question is whether these are problems of concept, design, execution, or some combination of the three.

Figure 2.4: Effectiveness of PRSPs in Addressing Malaria



| PERCENT             | DATA ON CHILD HEALTH INDICATORS | DETERMINANTS OF CHILD HEALTH | MEDIUM-TERM CHILD HEALTH INDICATOR | MALARIA-HEALTH RELATIONSHIP | MALARIA-POVERTY ANALYSIS | MALARIA CONTROL STRATEGIES | MEDIUM-TERM GOALS | SHORT-TERM ACTIONS |
|---------------------|---------------------------------|------------------------------|------------------------------------|-----------------------------|--------------------------|----------------------------|-------------------|--------------------|
| None                | 0                               | 15                           | 7                                  | 19                          | 78                       | 30                         | 41                | 78                 |
| Weak                | 7                               | 33                           | 4                                  | 30                          | 7                        | 30                         | 11                | 11                 |
| Average             | 11                              | 15                           | 4                                  | 15                          | 4                        | 30                         | 19                | 4                  |
| Strong              | 81                              | 37                           | 85                                 | 37                          | 11                       | 11                         | 30                | 7                  |
| <b>Total:</b>       |                                 |                              |                                    |                             |                          |                            |                   |                    |
| <b>Avg + Strong</b> | <b>93</b>                       | <b>52</b>                    | <b>89</b>                          | <b>52</b>                   | <b>15</b>                | <b>41</b>                  | <b>48</b>         | <b>11</b>          |

Source: Pande, Adeyi, and Basu 2004.

For example, the Operations Evaluation Department's report on the Zambia Health Sector Support Project (IDA Credit 003239) noted that while progress was made on the reforms and harmonization agendas, "there is no clear evidence that the overall quality of, and access to, a national package of essential health services had improved" (World Bank 2003a). The Implementation Completion Report for the project noted that there was "no evidence to suggest that the project had any measurable impact on the health status of the Zambian population," and the case fatality rate for malaria in children (45 deaths per 1,000 cases) was higher than projected (25 deaths per 1,000 cases). Furthermore, there was a local perception of "too much emphasis on process and not enough on achieving visible results on the ground." Drug shortages were common, especially in the urban health centers (World Bank 2003b).

According to the Implementation Completion Report, this project was designed as a SWAp, one of the first of its kind in the social sectors in Africa; hence, the findings reflect in part the challenges of a pioneering effort, in addition to local complexities. Lessons were learned about sustained commitment, good governance, fiduciary issues, strengthening of procurement capacity, and human resource development. Other lessons learned included: (i) the need to engage with technical personnel who are implementing reforms; and (ii) the perils of a lack of baseline indicators and a system for monitoring progress toward goals, which, along with an inadequate mechanism for tracking sector expenditures, seriously undermined effective implementation of a sector-program approach. In such instances, the appropriate strategy would be a phased transition toward sector-wide management that supports capacity building in key areas and protects high-priority public health interventions while introducing over time SWAp processes such as annual reviews and pooled support for districts.

An important lesson is the need to address concurrently the policy, process, and technical issues, including short-term improvements in coverage and health outcomes, while working toward medium- to long-term improvements across the health system. Therefore, it is prudent to (i) maximize use of PRSCs and health SWAps whenever possible, by enhancing them to address malaria control explicitly, and (ii) undertake a more intensive malaria control program to ensure major gains in coverage with effective interventions, thereby maximizing health and economic gains as rapidly as possible.

This effort will facilitate the achievement of results at the country, regional, and global levels, consistent with the emerging themes of the

IDA, including achievement of the MDGs, collaboration with relevant partners, results measurement, and attention to communicable diseases:

“IDA will continue its work to combat these diseases and mitigate their effects, both at the country level through disease-specific interventions and support for health systems strengthening, and across countries through regional projects, as well as through support for international initiatives” (IDA 2005, p. 13).

There are promising developments in integrating strong malaria control efforts within budget support and health SWAps. For example, the Poverty Reduction Support Credit and Grant to the Republic of Rwanda (World Bank 2004d) includes the following malaria-specific measures:

- “Use of ITNs by pregnant women will increase from 10 percent in 2003 to 30 percent by 2006, and the percent of children under five covered will increase from 18 percent to 40 percent.” This is one of the three primary coverage indicators chosen for the health sector.
- “Block grants will be transferred to districts by the Ministry of Health, using agreed performance-based criteria related to malaria control and other high-impact health care services.”

Furthermore, key actions on malaria include the following (World Bank 2004d):

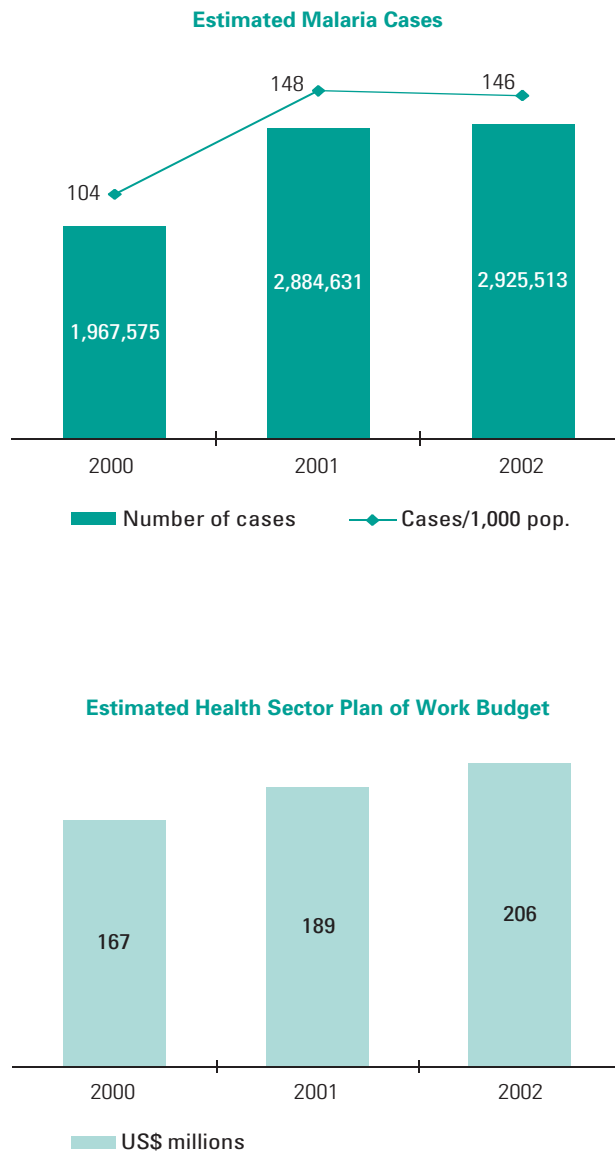
- *By end 2004*: “Publish policy on antimalarial drug (ACT) and ITN pricing and subsidy scheme.”
- *By November 2005*: “(i) Ensure that 35 percent of districts have trained promoters in malaria prevention and case management. (ii) Ensure that budget reflects the purchase of any higher cost treatment to be provided at subsidized prices, ensuring that cost to consumers is maintained at current or lower levels according to the RBM Plan.”
- *By November 2006*: “(i) Design and test malaria epidemic early warning system. (ii) Ensure that budget reflects cost of purchasing new high cost antimalarial drugs, ensuring cost to consumers is maintained at current or lower levels according to RBM Plan.”

The new Malawi Health SWAp provides an opportunity to integrate malaria control within a broader approach to health sector development. The Joint Program of Work (2004–2010) for the SWAp recognized malaria as “the leading cause of outpatient visits (30 percent)” (Government of Malawi, 2004). However, there was no mention of malaria among the 42 indicators in the SWAp indicator matrix. This raises questions about the technical rigor and strategic relevance of the contents around which donors are harmonizing processes, given the *Zambian* experience.

### **Malaria Control Programs have found it difficult to navigate the changing landscape of development assistance at the country level**

One reason for difficulties with development assistance, as given by some RBM partners at the country level, is poor access to health sector resources by National Malaria Control Programs (NMCPs). There is a lack of guidance on how NMCPs might operate in a decentralized planning and budgeting environment. More specifically, it was determined that the combination of increased health sector support and low malaria control coverage is partly due to weak linkages among disease control programs, health sector plans of work, and associated funding. There is evidence that malaria control activities in countries using SWAps or budget support remain generally supported by small projects and have been below the threshold where impact on disease transmission is possible, leaving many to question what tangible outcomes the health system investment is buying. In Ghana, for instance, despite donor harmonization in the sector, an increased Ministry of Health budget, and a growing percentage of that budget being spent at the district level, malaria incidence is on the rise (figure 2.5). This raises concerns, which have been confirmed by operational experiences, that the malaria control program has limited engagement in and ownership of the overall Ministry of Health budget and, therefore, of IDA funds which are channeled through a SWAp (through the Second Health Sector Support Project, US\$90 million). According to an external review of the achievements in implementing the 2002 Program of Work, malaria remained the leading cause of morbidity and mortality in the country, accounting for 40 percent of all outpatient contacts and 25 percent of all under-five mortality (Government of Ghana 2003).

**Figure 2.5:** Malaria Control Efforts Have Not Benefited from Increased Health Spending in Ghana



Source: Government of Ghana, Ministry of Health 2003.

### **Expanding ownership of malaria control to district level in Senegal**

In Senegal, key roadblocks to more widespread implementation of RBM activities include weak and spotty implementation of district-level activities and the overly centralized structure of the NMCP. Dialogue between the central program and the provincial and district health directors has been relatively weak, as has been ownership at the district level of key malaria control activities. In August 2004, at the request of the NMCP and the Bank, the RBM Secretariat provided the NMCP with US\$60,000 to carry out a process by which the central NMCP staff spread out across the country to discuss with each district the activities and performance targets needed to reduce morbidity and mortality from malaria. This process has been completed and the agreed-upon activities have been integrated into the overall health sector plan of work, to avoid duplicate planning and budgeting for malaria control activities. Sector-wide or budget support to districts would automatically support malaria control activities through support of the more technically robust district plans. Critical now to success will be funding flows to the district level, as well as the availability of commodities. The latter will be increasingly difficult given the impending increase in the cost of malaria treatment (for ACTs).

## **2.6 Clients and Partners Demand a Stronger World Bank Effort**

The Bank's clients in malaria control include not only ministries of finance, which are the prime institutional counterpart for Bank-country relations, but also multiple stakeholders that either play key roles in effective malaria control or are affected by the Bank's work in this area. These stakeholders include the line ministries such as health, education, agriculture, environment, and infrastructure; malaria control programs; maternal and child health programs; CSOs; and the private sector. Tacit knowledge acquired in the past five years indicated that while engagement with the ministry of finance was necessary, it was not sufficient to ensure effective Bank support for malaria control. Recent consultations with stakeholders pointed to lessons learned and also indicated areas in which the Bank should improve its work on malaria control.

During the annual joint Malaria Control/Integrated Management of Childhood Illnesses Program Managers meeting in Maputo, Mozambique,

in September 2004, the WHO Regional Office for Africa (WHO AFRO) gave Bank representatives the opportunity to discuss the Bank's performance in malaria control. In addition to participating in plenary discussions, Bank representatives asked NMCP managers to provide feedback on the Bank's role in malaria control by filling out a short, self-administered questionnaire, the results of which were considered in the development of the new Strategy and Program of Action. *Since this was a convenience sample, the findings are only illustrative of a range of issues to be considered and cannot be generalized beyond the sample.* The findings raise many questions to be addressed on a country-by-country basis and provide the Bank with an interim idea of how its work on malaria is perceived by one of the key client constituencies in malaria control—technical experts and program managers responsible for malaria control in client countries.

Thirteen client countries were consulted on the status of work at the country level, NMCP managers' successes and perceived challenges in working with the Bank on malaria, recent achievements in malaria control, their unmet needs and expectations, and how the Bank might respond to those needs. Separate discussions with officials from many of the countries included their experiences with and perceptions of the Bank's approach to malaria control, including policy dialogue, program design, financing, implementation support, lending instruments, cross-cutting health system constraints and efforts to address them, and suggestions for the future.

Nine of the 13 clients (69 percent) responded that the Bank provided financing for malaria control in their countries. Interestingly, for two major health sector support programs implemented through SWAs, program managers claimed either that they were "not sure" of Bank financing for malaria or that there was "no financing" for malaria. The limited knowledge and ownership of malaria financing by the program managers, as evidenced by their responses, is a major issue, regardless of the level of financing. Of the countries using health SWAs (71 percent of the countries sampled), 90 percent of the program managers attended the planning meetings, though their levels of participation varied from simply attending to active participation through involvement in the planning, presentation, and reviews of progress.

The Bank scored highest in its active involvement in policy discussions on malaria control in client countries, with 8 of 13 (62 percent) responding positively. The Bank's lowest performance rating (with 100 percent of clients assigning a "very poor" rating) was in response to a question about

the simplicity of procedures to help malaria control programs access World Bank funds. In addition to this issue, the two other questions on which the Bank scored very poorly both involve the limited engagement of the Bank with non-governmental organizations (NGOs) and civil society groups, and the formal or informal commercial private sector work on malaria control in client countries. (Regarding NGO engagement, 92 percent scored the Bank a “poor” or “very poor” rating, with the Democratic Republic of Congo being a key exception, scoring the Bank “excellent” on this question. Regarding private sector engagement, 75 percent scored the Bank a “poor” or “very poor” rating.) Given that the majority of malaria cases in endemic areas (as in most of Sub-Saharan Africa) are prevented and treated in the nonpublic sector, the low ratings on this front are troubling.

While the results of the questionnaire do not provide the Bank with a positive scorecard overall, the clients do not want to see the Bank disengage; 100 percent of the respondents would like the Bank to “do more than it is doing today.” In response to an open-ended question, NMCP managers’ most common requests for how the Bank might better support malaria control in the future centered around the following:

- Increased financing (through direct support to malaria control programs, through SWAp/budget support, and through both), particularly long-term financing for commodities such as ACTs
- Support for economic analyses relating to malaria control
- Sharing of best practices across countries
- Simplification of disbursement to support programs.



## CHAPTER 3

# Priorities and Business Model

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The Bank's priority is to enable countries to achieve and sustain large-scale impact in malaria control. More specifically, the Bank will support countries to develop and implement programs to (i) cost-effectively reduce morbidity, productivity losses in multiple sectors, and mortality due to malaria, particularly among the poor and vulnerable subgroups such as children and pregnant women, and (ii) address challenges of regional and global public goods. The Bank will achieve the stated priorities through a business model that combines an *emphasis on outcomes* with *flexibility in approaches and lending instruments*.<sup>16</sup> Products and services will be tailored to different client segments in a way that meets their needs and maximizes the institution's comparative advantages. This approach is consistent with the new Global Strategic Plan of the Roll Back Malaria Partnership (RBM 2004). The Bank participated actively in the formulation of that strategy.

In the short to medium term, a new Booster Program for Malaria Control, outlined in table 3.1, will provide increased financing and technical support to accelerate program design and implementation, increase coverage, and improve outcomes more rapidly than in the recent past. The Booster Program for Malaria Control will be global in scope and consist initially of an intensive effort over a five-year period. It may include one or more Horizontal Adaptable Programs<sup>17</sup> at the global or regional level and will cover many countries, with emphasis on country ownership, measurable outcomes, and rigorous application of epidemiology. While the immediate objectives are fixed—increasing coverage, improving outcomes, and building capacity—the means will be flexible. The business model and the Booster Program take into account lessons learned from successful malaria programs in several countries, and also constitute a substantial departure

from the Bank's previous approach to malaria control. There is a need for decisive action on a large scale in order to achieve impact. Crucially, the Bank's approach will be proactive while respecting and supporting country leadership and ownership. Experience of the past five years shows that a pledge of commitment, such as that made by the Bank in Abuja in 2000, with neither a clearly funded program for malaria control nor the internal budget to ensure that the Bank's malaria team can function effectively, does not lead to success on a large scale. A different and more robust approach is needed for success.

Drawing on lessons of the past five years, Bank management is designing a program for Board approval to ensure that the Bank responds to country demands with flexibility and speed. On the basis of initial demand from clients, the working assumption is that a total commitment of US\$500 million to US\$1 billion is feasible over the next five years. The Bank will mobilize financial and technical resources from within and outside the institution, including the public and private sectors, to: stimulate the production of commodities such as ITNs and antimalarial drugs; lower taxes and tariffs on such commodities; improve and maintain a long-term commitment to malaria control by governments and civil society groups; and build public-private partnerships for program design, management, and evaluation. Several key partners have expressed interest in a collaborative and stronger effort. The International Finance Corporation (IFC), which has a particularly strong comparative advantage in working with the private sector, will play an important role in this enhanced effort by the World Bank Group. Subject to satisfactory performance and resource availability, the Bank will continue its highly selective support for partnerships working on product development and applied research that are relevant to malaria control.

Henceforth, malaria control will be mainstreamed into the Poverty Reduction Strategies and large sector-development programs that emphasize outcomes. The high coverage rates achieved in most countries will be sustained through combinations of domestic financing, programmatic operations, and budget support on a case-by-case basis. High coverage with preventive interventions will decrease the burden of disease and the pressures on health services.

Approaches and instruments will depend on what is needed in each context. This combination of an emphasis on outcomes with flexibility of approaches and instruments will make the Booster Program relevant and adaptable to a variety of countries in each region, taking into account dif-

ferences in their institutional capacities, risk profiles (which vary from post-conflict to stable), resource needs, relative strength of the public and private sectors, and the pattern of malaria in each setting. For Sub-Saharan Africa, which bears the highest burden of malaria, the approach is consistent with the Strategic Framework for Assistance to Africa in its recognition of the need for adaptability to a client typology continuum. The Framework states that “the array of instruments appropriate for a given country will vary with the country’s capacity and performance” (World Bank 2004e, p. 85). The Booster Program is adaptable to postconflict settings, Low Income Countries Under Stress (LICUS), middle performers, and high performers. The business model puts emphasis on results, system indicators, and high-impact partnerships with a predictable resource flow.

Countries will have three main options for accessing more funds and technical support from the Bank. These options, which are not mutually exclusive, are outlined below.

- *Enhancing PRSCs and health SWAs to support malaria control.* In this option, the Booster Program for Malaria Control will be used to enhance health SWAs and PRSCs, with additional financing when required, to include stronger malaria control programs, technical support, and results-based monitoring and evaluation. The recently approved PRSC for Rwanda is a useful example. It includes technically sound malaria control activities within the health sector plan of work, including the monitoring and evaluation matrix and the Medium-Term Expenditure Framework (MTEF). Beyond the health sector, PRSCs provide opportunities for cross-sectoral work on malaria through, for example, the education, agriculture, environment, and transport sectors.
- *Malaria Control Projects at the country or subregional level.* Based on country requests, the Booster Program for Malaria Control will support Malaria Control Projects, as in the successful examples of Brazil, India, and Vietnam. Project design and objectives will depend on the local context in terms of government policy, disease burden and distribution, the nature of the vector (the mosquito), and local management capacity. Countries may choose to use community-driven development (CDD) approaches, depending on the context. These Malaria Control Projects will supplement, not disrupt, systemic development programs for the health sector. Strengthening the health infrastructure will facilitate malaria control and help to sustain the gains to be achieved under the

Booster Program for Malaria Control. The success of the Onchocerciasis Control Program, as well as the ongoing lessons from the Bank's work on HIV/AIDS, will be applied to the challenge of addressing system-wide needs while improving coverage and outcomes in the short to medium term. In this option, the Booster Program for Malaria Control will support investment operations that are consistent with broader sectoral frameworks in each context. For LICUS and postconflict countries, special implementation arrangements may include more extensive contracting of CSOs for service delivery, combined with technical and operational support from agencies such as WHO and UNICEF.

- *Combined HIV, Tuberculosis, and Malaria Control Projects.* Another option is to develop and implement operations covering HIV, tuberculosis, and malaria, such as those in Angola and Eritrea. In this option, the Booster Program for Malaria Control will support broader operations covering several disease control objectives in a way that is consistent with medium- to long-term sectoral and multisectoral development.

By the end of the fifth year of the Booster Program, most eligible countries are expected to have achieved significant increases in coverage of essential interventions, in line with targets set by client countries and the global Roll Back Malaria Partnership for 2010.

**Table 3.1:** The Booster Program for Malaria Control: Matrix of Options for Financing and Instruments

| KEY FEATURES OF THE PROGRAM  |   |   |
|--|---|---|
| <ul style="list-style-type: none"> <li>• May include one or more Horizontal Adaptable Programs at the global or regional level, covering many countries</li> <li>• Can combine with cofinancing from other sources (foundations, bilateral agencies) and country-by-country partnerships with the GFATM</li> <li>• Can use grants or performance-based buydowns (converting credits into grants and providing incentives to achieve results)</li> <li>• Linked to a Malaria Control Advisory Service, to be funded through grants (foundations, multilateral and bilateral agencies)</li> <li>• Addresses the global public good financing and supply issue to expand access to malaria-related commodities (namely, the new ACTs and long-lasting ITNs).</li> </ul>                     |   |   |
| OPTIONS FOR IMPLEMENTATION<br>(These are not mutually exclusive.)  | Main requirements   | Implications for Bank operations  |
| Enhancing PRSCs and health SWAps to support malaria control  | Emphasis on measurable results  | Increased operating budget (Bank Budget)                                      |
| Malaria Control Projects <ul style="list-style-type: none"> <li>• At country level</li> <li>• At subregional level</li> </ul>  | Increased and more predictable flow of funds for malaria control  | Untied Trust Funds<br>Commitment from country directors                       |
| Combined HIV, TB, and Malaria Control Projects   | Increased technical support<br>Clients have choices in the type of instrument that they can use to access support from the World Bank | Incentives for team leaders to focus on results and be flexible in approaches |
| CROSS-CUTTING ISSUES   |   |   |
| <ul style="list-style-type: none"> <li>• More proactive and effective collaboration with CSOs</li> <li>• Better utilization of country capacity, concurrent with development of human resources</li> <li>• User-friendly tools and operational support for country-based planning and budgeting</li> <li>• The roles of major partners: leveraging financing, coordination and technical resources from partners such as the RBM Secretariat, Bill and Melinda Gates Foundation (which finances the Malaria Control and Evaluation Project in Africa [MACEPA]), GFATM, UN Foundation, WHO, large multinational corporations, and others</li> </ul>   |   |   |
| IMPLICATIONS FOR BANK OPERATIONS   |   |   |
| <ul style="list-style-type: none"> <li>• Increased operating budget and untied trust funds to enable effective Bank support</li> <li>• A Bank-wide Malaria Task Force to prepare and spearhead execution of the Global Strategy and Booster Program</li> <li>• Emphasis on measurable results, with flexibility in approaches, depending on client preferences and contexts</li> <li>• Internal coding and tracking: Bank will know how much it is committing to malaria control</li> <li>• Review of programmatic operations related to the health sector and their effects on malaria control: What is the evidence?</li> <li>• Strategic communications: The Bank will be more active in shaping global discussions and in disseminating its approach and success stories.</li> </ul> |   |   |





## CHAPTER 4

# Program of Action

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The Booster Program will be an umbrella program for intensified work, including analytical and advisory services, lending, and grants. Table 4.1 is an indicative schedule of deliverables and major activities by fiscal year.

### 4.1 The Program and Deliverables

Implementation of the Booster Program implies an increase in the deliverables to be planned and achieved by regional vice presidential units (VPUs), country units, and sector units that are working on malaria control from fiscal 2006 onwards. The Program would support operations at the subregional and country levels. Depending on specific contexts, the operations would include proactive engagement of CSOs and the private sector to the extent that it is compatible with their comparative advantages. Such engagement could include contracting and/or financing of activities to be undertaken by CSOs and the private sector. In order to promote sustainability and mitigate the risks of distortions, this Program will supplement and be concurrent and synergistic with programmatic approaches such as health SWAs and PRSCs. Contingent upon the commitment of IDA resources for the Booster Program, the Bank will seek cofinancing or performance-based buydowns from partners, including but not limited to foundations and multinational corporations.

The program document for the Booster Program will address, among other things: (i) operational aspects of complementarity with the GFATM, of which there is an emerging example in Angola; (ii) procurement of commodities for malaria prevention and treatment; (iii) technical support for teams with primary responsibilities for work at the country level, particu-

larly to overcome implementation bottlenecks; and (iv) better utilization and improvement of local capacity for implementation. The program document will include guidelines and sample terms of reference for speedy application at the country level, with considerable room for country teams to customize it to local contexts, given the importance of local adaptation and flexibility for successful malaria control. Furthermore, it will make explicit the linkages with other major providers of development assistance for health, namely, the GFATM.

Under Phase I of the Booster Program, which began in fiscal 2005, the Bank-wide Malaria Task Force, with guidance from a high-level Steering Committee, started developing operational guidelines and discussing arrangements with strategic partners to enhance programmatic operations so that they are better designed and supported to achieve more rapid progress in malaria control. The Malaria Task Force will also undertake or commission analytical work, jointly with economists in the Development Economics (DEC) and regional VPUs, to improve the knowledge base for the economics of malaria control, such as what the medium- to long-term economic implications would be for clients should they undertake more intensive efforts to control malaria and the optimal deployment of treatment given increasing rates of drug resistance and the costs of new treatments. Concurrent efforts to develop a learning program on malaria control for World Bank staff and a strategic communications program aimed at internal and external audiences will increase both clients' and Bank counterparts' understanding of the Bank's new Global Strategy and Booster Program.

During Phase II (fiscal 2006–7), contingent upon Board approval in fiscal 2006 of the Booster Program, the emphasis will be on the application of the operational guidelines and arrangements developed in fiscal 2005 to: (i) enhance programmatic operations to achieve rapid progress in malaria control and (ii) support project preparation and implementation at the country and subregional levels, including malaria-specific operations, where appropriate. By the end of Phase II, at least five countries will have enhanced their programmatic operations by increasing significantly their financial resources or strengthening technical support for malaria control. Such financial increases will be on budget and reflected in MTEFs as appropriate. In addition to strengthened malaria control under programmatic operations, given existing client demands, the Task Force will support country and regional teams to deliver at least 10 Malaria Control Projects (or MDG-related communicable disease control projects) at the country or

subregional level by the end of fiscal 2007. All country or subregional operations will be managed by regional VPUs.

Other key activities in Phase II will include the completion and application of analytical work on the economics of malaria control, further development and application of tools and support mechanisms to enable country and program teams to do their work effectively, including Web-based resources, and a Malaria Advisory Service. Phase III (fiscal 2008) will include lending (programmatic and disease-specific if required), analytical, and advisory services, as well as an evaluation of the Booster Program. The Booster Program will be adjusted in line with country needs and corporate priorities, or phased out as required.

### **Deliverables**

The timeline and deliverables are indicative (see table 4.1). The execution of this program will be responsive to the needs of clients, with emphasis on results and concurrent improvement of country capacity for implementation. It will be flexible, rather than sequential and rigid. This combination of emphasis on outcomes with flexibility in approaches and lending instruments will make the Booster Program relevant and adaptable to a variety of countries in every region, including LICUS and postconflict countries. The program will be results-driven, with the goals of increasing malaria intervention coverage, reducing illness, minimizing productivity loss, and decreasing deaths attributable to malaria.

## **4.2 The International Finance Corporation and the Private Sector in Malaria Control**

The private sector is essential for the supply, distribution, and sale of inputs needed for tackling malaria, such as drugs and ITNs, as well as in the delivery of related services. However, until now, the private sector has been constrained in many of these activities. The market for these needed goods is often unpredictable and difficult to forecast. Although needs are high, the ability of poor households to pay for these goods and services is limited. Current public financing arrangements are limited and not dependable, and even donor-supported aid offers only short-term predictability. The Global Strategy and Booster Program will play an important role in stimulating

## Rolling Back Malaria

**Table 4.1:** The Booster Program for Malaria Control: Deliverables

| DELIVERABLES  | COMMENTS  |
|---|---|
| <b>1</b>  | <b>Phase I: Fiscal Year 2005 (start-up phase)</b>   |
| 1.1 Global Strategy and Booster Program, which provides the basis for future actions.   | Completion date: April 2005.  |
| 1.2 Booster Program for Malaria Control.  | <p>For preparation in fiscal 2005 and early fiscal 2006, followed by presentation to the Board of Directors in fiscal 2006.</p> <p>Potential sources of cofinancing or performance-based buydowns include major foundations and multinational corporations. Further exploration of such cofinancing is contingent upon World Bank commitment to a stronger effort to control malaria.</p> <p>The program document will address operational aspects of complementarity with GFATM (example from Angola), procurement of commodities, support for Teams with primary responsibilities for work at the country level, and better utilization and improvement of local capacity for implementation. It will address collaboration with WHO, UNICEF, and other key partners such as foundations and multinational corporations.</p> <p>The program document will include guidelines and sample terms of reference for speedy application at the country level, with considerable room for country teams to adapt guidelines to local contexts.</p> |
| 1.3 Development of practical guidelines for Task Teams on (i) assisting countries to enhance PRSCs or health SWAps to strengthen malaria control; (ii) programming incremental resources from the HIPC initiative; (iii) ensuring complementarity among the Booster Program, health SWAps, and PRSCs; (iv) developing malaria-responsive PRSPs; and (v) developing malaria-responsive Country Assistance Strategies (CASs) as part of results-based CASs. | To be done jointly with RBM Secretariat and subregional networks as appropriate.  |
| 1.4 Report of first phase of analytic and advisory services (AAA) on the operational and budgetary implications of policy shifts to artemisinin-based combination therapies in selected countries.  | Ongoing, jointly with USAID.  |

**Table 4.1:** The Booster Program for Malaria Control: Deliverables (*continued*)

| DELIVERABLES   | COMMENTS  |
|--|---|
| <p>1.5 Formulation of a learning program on malaria control for World Bank staff.</p> <p>Concurrently, five learning sessions for Bank staff on important aspects of malaria control.</p>  |   |
| <p>1.6 Formulation and implementation of the first stages of a Communication Strategy.</p>   | <p>To address both internal and external communication needs.</p>   |
| <p>1.7 Development of procurement guidelines for malaria commodities.</p>  | <p>Jointly with OPCPR and RBM Partnership Secretariat.</p>  |
| <b>2 Phase II: Fiscal Years 2006–7</b>   |   |
| <p>2.1 At least five countries have enhanced programmatic operations, increased significantly their financial resources to and strengthened technical support for malaria control from funds already committed under PRSCs, other multisectoral operations, or health SWAps. All increases within budget and reflected in MTEF as appropriate.</p> | <p>Jointly with WHO, MACEPA, Roll Back Malaria (RBM) Partnership Secretariat and subregional networks. Intense country support (for example, attendance at all joint sector review meetings, technical assistance between reviews) combined with cofinancing or performance-based buydowns of parts of credits spent on malaria control. Additional financing will meet the incremental resources needed for effective malaria control.</p> |
| <p>2.2 Preparation of at least 10 Malaria Control Projects (investment operations) at the country or subregional level, depending on the combination of client demands, feasibility, and pattern of disease.</p> <p>(Includes malaria-specific operations wherever appropriate.)</p>   | <p>Jointly with WHO, MACEPA, Regional Collaboration Center in Ouagadougou, RBM Partnership Secretariat, and subregional networks. Intense country support combined with cofinancing or performance-based buydowns of parts of credits spent on malaria control. The number of operations will depend upon client demand.</p>  |
| <p>2.3 Implementation of learning program for Bank staff.</p> <p>Continuation of learning sessions for Bank staff on important aspects of malaria control, with emphasis on operational effectiveness.</p>   | <p>Jointly with the World Bank Institute and the Global Development Learning Network.</p>   |
| <p>2.4 Report of AAA on modalities to engage the formal and informal private sector, given the importance of such engagement in reaching and sustaining coverage.</p> <p>Commissioning of applied research on epidemiology, service delivery, and quality of care.</p>   | <p>Jointly with Africa Region (ongoing private-public partnerships work) and IFC.</p> <p>Jointly with technical and academic partners. Findings to be applied to ongoing and planned operations as part of broader monitoring and evaluation (M&amp;E).</p>   |

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**Table 4.1:** The Booster Program for Malaria Control: Deliverables (*continued*)

| DELIVERABLES  | COMMENTS   |
|---|--|
| 2.5 Web-based directory of technical and managerial resources for malaria control programs.   | Jointly with RBM Secretariat, WHO, MACEPA, and others as appropriate.  |
| 2.6 Continued implementation of the first stages of a communication strategy.   | To address both internal and external communication needs.   |
| <b>3 Phase III: Fiscal Year 2008</b>  |  |
| 3.1 Preparation of 20 country-specific or subregional Malaria Control Projects (cumulative total of investment operations) under the Booster Program.   | <p>Subject to Board approval of a Booster Program and client demand.</p> <p>To be managed by regional VPUs, with incremental operating budget from one or more of Bank budget, trust funds, or credit lines.</p> <p>The Bank-wide Malaria Task Force will support country teams.</p>   |
| 3.2 A cumulative total of at least 10 countries have enhanced programmatic operations, increased significantly their financial resources to and strengthened technical support for malaria control from funds already committed under PRSCs, other multisectoral operations, or health SWAps. All increases within budget and reflected in MTEF as appropriate. | Jointly with WHO, MACEPA, RBM Secretariat, and RBM subregional networks. Intense country support (for example, attendance at all joint sector reviews) combined with cofinancing or malaria-related debt buydowns (for example, ACT or ITN investments) will be employed to improve the incentive system for clients to use Bank monies for malaria control. Additional financing would help mitigate the increasing costs of malaria control. |
| 3.3 Malaria control is mainstreamed into the major development instruments in all malaria-endemic countries (all CASs, PRSPs) beginning in fiscal 2006.   | <p>Regional VPUs will be responsible for this.</p> <p>The Malaria Task Force will provide support.</p>   |
| 3.4 Continued implementation of the Communication Strategy.   | To address both internal and external communication needs.   |
| 3.5 Malaria Advisory Service established and operational.   | Jointly with WHO, MACEPA, RBM Secretariat, and one or more foundations.  |
| 3.6 Evaluation.   | Operations Evaluation Department or external evaluation team (or both).  |

wider involvement of the private sector by providing more predictability and stability to the market.

The IFC could potentially finance private companies involved in a number of activities, such as manufacturing of drugs, nets, and diagnostics, and drug distribution. To date the private sector has not sufficiently engaged in these activities to meet demand. There are several roles the Bank could undertake with proposed financing that could facilitate involvement of the private sector. The draft business plan of the Roll Back Malaria Initiative calls for “stimulating development, manufacturing and widespread distribution of long-lasting insecticidal nets” and sets out a useful framework within which the private sector and potentially the IFC could engage. Several of these roles are more broadly applicable:

- *Advance purchase contracts for drugs, nets, diagnostics, or other inputs with a medium-term duration (seven years or longer):* Guaranteed markets would give manufacturers incentive to invest
- *Buydowns of drugs, nets, diagnostics, and so forth:* Buydowns would close the gap between ability to pay and demand
- *Grant funding to cover first loss or a Debt Service Reserve Account:* If the IFC were to finance a local producer directly or through a financial intermediary, grant funding could potentially cover a first loss or support a Debt Service Reserve Account.

For a private company, activities that the Bank may support to increase the attractiveness of investment, and the market more generally, include:

- *Loan buydowns and other mechanisms to lower the cost of capital*
- *Improved transparency and streamlining of regulatory frameworks:* Currently these serve as a major barrier to entry in a number of countries. Improving transparency and streamlining regulatory frameworks would benefit a company’s bottom line and enhance the incentive to supply a given market
- *Efforts to lower taxes and tariffs:* Taxes and tariffs may introduce unfair barriers to entry and discourage market entry.

If some of the initiatives above are undertaken and the right market conditions exist, the IFC could then undertake the following:

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- Identify and finance private sector partners to fill these gaps
- Use trust fund money to identify manufacturers, distributors, and others essential to achieving overall goals.

Though they require further consideration, other products the IFC could offer for small enterprises and NGOs for which the transaction costs of doing business with the IFC are too high include:

- Fund or line of credit for small manufacturers and distributors
- Loan guarantees to back local banks' financing of small companies
- New grassroots initiative that provides a mixture of grants and small loans to small companies and NGOs.

### 4.3 Cooperation with the Global Fund and Other Major Partners in Malaria Control

The Bank's work will continue to be done with country leadership and in collaboration with major partners. The RBM partnership provides the global mechanism for interagency collaboration in malaria control. The Bank will be proactive in seeking major sources of cofinancing for country-led operations, including but not limited to the GFATM, major bilateral and multilateral organizations, the Bill and Melinda Gates Foundation, the United Nations Foundation, and large corporations. In all partnerships, the Bank will emphasize an orientation toward measurable outcomes at the country level, and collective actions to utilize and improve local capacity for sustainable programs.

The GFATM "only finances programs when it is assured that its assistance does not replace or reduce other sources of funding, either those for the fight against AIDS, tuberculosis and malaria or those that support public health more broadly. The GFATM actively seeks to complement the finance of other donors and to use its own grants to catalyze additional investments by donors and by recipients themselves."<sup>18</sup> The Bank will work closely with the GFATM to increase synergies and avoid overlaps and gaps, while keeping in mind the GFATM's mandate as an additional source of financing and the Bank's comparative advantage in development economics,

financing, system-wide development, capacity building, and implementation support.

For some countries, over the short term, the Booster Program and Task Force may place more emphasis on analytical and advisory services and the removal of implementation bottlenecks and less emphasis on increased lending, given existing GFATM commitments. Other countries face short-term financial constraints or long-term uncertainties; IDA resources are needed in these contexts. The deployment of ACTs is one area in which the importance of collaboration between the Bank's Booster Program and the GFATM is evident. Currently, clients have concerns regarding the sustainability of short-term health sector investments (through increased drug financing) without both medium- to long-term guarantees of financing or returns (economic and health) and the establishment of a timeframe over which greater investments will be required. Other challenges include stimulating local production capacity for commodities used in malaria control, reducing market and demand uncertainties for drug companies, and completing procurement in a timely manner.





## CHAPTER 5

# The Malaria Task Force

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## 5.1 Objectives

The Malaria Task Force is a Bank-wide group drawn from corporate units, networks, operational VPUs, and the IFC. It will support the Bank's country and regional teams to do the following:

- Increase rapidly the scale and impact of the Bank's support for malaria control at the country level, with the aim of reducing the burdens of preventable illness and deaths due to malaria over both the short and medium term
- Improve the institutional knowledge base regarding (i) the economic effects of malaria at the household, sectoral, and macro levels, and the implications of these effects for the Bank's work on poverty reduction, and (ii) the effects of subsidies for antimalarial drugs and ITNs on households, service providers, and program managers
- Mainstream malaria control into PRSPs and into the Bank's lending and nonlending services.

This Task Force will support the execution (by country and regional units) of the Global Strategy and Booster Program to enable countries to make more rapid progress in malaria control. The Task Force will have a lifespan of five years, after which it will be dissolved or modified on the basis of progress made and corporate needs. It will be nimble and results-oriented, with a small bureaucratic footprint and cross-sectoral membership from regional and corporate units.

## 5.2 Oversight

A Steering Committee will provide institutional oversight and guidance. The Steering Committee will include the Senior Vice President and Head of the Human Development Network, the Regional Vice Presidents for Africa, South Asia, East Asia, and the Pacific, the Vice President for Operations Policy and Country Services, and the Senior Vice-President and Chief Economist. The Poverty Reduction and Economic Management Network will provide guidance on the integration of malaria control into PRSPs.

## 5.3 Staffing: Secretariat and Regional Clusters

The Malaria Task Force will have a small secretariat in the Health, Nutrition and Population Unit of the Human Development Network Hub (HDNHE) and a substantial presence in the regional VPUs, with membership from corporate units and multiple sectors in the Bank. Apart from those in the secretariat, the Malaria Task Force members will remain in their home units within the Bank. No new full-time staff members will be recruited for the Secretariat, whereas Task Force Members will either be providing cross support or be seconded. The only exceptions are (i) a full-time Public Health Specialist on secondment from the Roll Back Malaria Secretariat in Geneva and (ii) one Young Professional (YP) and one Assistant in the Task Force Secretariat. At the discretion of each regional VPU, full-time specialists could be recruited over time.

*Regional clusters:* The Malaria Task Force will operate mainly through regional clusters that may include senior specialists, economists, operations officers, and external relations officers. The size and configuration of the cluster will depend on the needs of each region and decisions made by the respective regional VPUs.

Table 5.1 shows a possible staffing and distribution of the Task Force.

## 5.4 Financing the Malaria Task Force

One of the main lessons from Bank experience is that major commitments such as those outlined in this document require sustained financing from the

regular Bank budget and trust funds. For example, both the highly successful Onchocerciasis Control Program (see <http://www.worldbank.org/afr/gper/>) and the ongoing work on HIV/AIDS in Africa (see <http://www.worldbank.org/afr/aids/actafrica.htm>) had unstinting support from senior management and regular financing, at a level of US\$1.5 to US\$3 million per year. There is a need for equally strong senior management commitment to the Malaria Task Force, commensurate with the size of the problem and the level of effort that is required to tackle it. Budget allocation from the regular Bank budget would make it possible to leverage additional resources from partner institutions. Regional VPUs and Country Units would need to allocate funds for project preparation on a country-by-country basis in addition to this budget. Funding should be consistent with the decisions around the increases in deliverables agreed to by RVPs, country units, and sector units.

**Table 5.1:** Potential Staffing and Distribution of the Malaria Task Force

| LOCATION  | FULL-TIME EQUIVALENT (FTE)          |
|---|-------------------------------------|
| <b>Secretariat (in HDNHE)</b>   |                                     |
| Coordinator   | 0.4 (Bank staff)                    |
| Public Health Specialist  | 1.0 (Secondee from RBM Secretariat) |
| Operations Officer  | 0.5 (Bank staff)                    |
| Health Economist or Specialist  | 1.0 (Bank staff, YP)                |
| Communications Specialist   | 0.5 (Bank staff, from HDNVP)        |
| Task Force Assistant  | 1.0 (Bank staff)                    |
| <b>Regional and corporate clusters</b>  |                                     |
| <i>Africa (to be determined by Africa VPU, and will take into account lessons learned through the Onchocerciasis Control Program and ACTafrica)</i> |                                     |
| • Regional Focal Point  | 1 (Bank staff)                      |
| • Regional Implementation Specialists   | 1.5 (Bank staff)                    |
| • Task Team Leaders   | $8 \times 0.25 = 2.0$ (Bank staff)  |
| • Task Force Assistant  | 1.0 (Bank staff)                    |
| • External Relations Officer  | 0.5 (Bank staff)                    |
| South Asia  | $4 \times 0.25 = 1.0$ (Bank staff)  |
| East Asia and Pacific   | $2 \times 0.25 = 0.5$ (Bank staff)  |
| Latin America and the Caribbean   | $2 \times 0.25 = 0.5$ (Bank staff)  |
| Development Economics   | $2 \times 0.25 = 0.5$ (Bank staff)  |
| Operations Policy and Country Services  | $1 \times 0.25 = 0.25$ (Bank staff) |
| World Bank Institute  | $1 \times 0.25 = 0.25$ (Bank staff) |





## CHAPTER 6

# Results-Based Monitoring and Evaluation

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### 6.1 Results Framework

The Bank's Global Strategy and Booster Program is focused on impact in countries, with links to selected MDGs:

- Reduction of all-cause child (under five) mortality (MDG 4)
- Improvement of maternal health (MDG 5)
- Reduction of malaria-specific morbidity and mortality (MDG 6)
- Reduction of productivity losses attributable to malaria (MDG 6)
- Reduction of illness and absenteeism in school-age children and mitigation of other impediments to learning caused by malaria (MDG 2).

The Strategy and Program of Action are thus designed to be results-driven and to strengthen the country capacity for monitoring and evaluation. In this regard it is responsive to key recommendations of an independent evaluation of the World Bank's approach to global programs, which called for greater emphasis on outcome and impact evaluation (World Bank 2004f). A results framework has been developed as the basis for a monitoring and evaluation system. It is conceived around the three main thrusts of the Program: (i) to improve the quality and intensity of the Bank's (lending and nonlending) assistance to its client countries; (ii) to improve the quality and intensity of the Bank's contribution to regional and global partnerships, in line with its comparative advantage; and (iii) to strengthen the Bank's internal capacity to rise to the challenges of (i) and (ii).

These three thrusts are complementary and build upon one another. For this reason, results frameworks for each have been developed, and each framework presents a results chain of inputs, outputs, outcomes, and impacts. The impacts and outcomes of the Bank's strengthened capacity are inputs to the results chain of the other two thrusts (support to countries and improved partnerships). They are presented in this section.

## 6.2 Steps to a Results-Based Monitoring and Evaluation System

The review, clarification, and confirmation of these results chains are an important first step in building a viable M&E system for tracking the performance and impact of the Bank's Global Strategy and Booster Program. These results require the understanding and full engagement of all staff and managers involved in implementing and overseeing Program implementation. The final articulation of results will also benefit from the understanding and input of those standing to benefit from the Bank's improved and intensified support—client countries and partners.

Once the results are fully defined and agreed, a number of other key steps will need to be taken to establish a viable M&E system. They include:

- Selection of key performance indicators to monitor outcomes
- Establishment of baseline data on indicators, including the collection of data and documentation of sources
- Quantification of targets
- Definition of modes and frequency of data collection, analysis, and reporting for each input, output, and outcome indicator (monitoring), and the instruments for analysis and reporting
- Definition of the types, timing, and levels of evaluations
- Definition of how the findings will be disseminated and utilized in decision making and incorporated into improved performance (for example, through reports to the Steering Committee and subsequent decision making)
- Definition of roles and responsibilities for carrying out the various tasks of the M&E plan and for its overall coordination.

In addition to developing a system for monitoring and evaluating the Bank's performance, the support to countries to improve their own M&E systems for malaria (in the context of health M&E systems) will be critical. Among many other advantages, decentralized, results-based, in-country M&E will help key actors and contributors to the fight against malaria take the following steps:

- Articulate their goals in various catchment areas based on challenges, opportunities, and baseline data
- Monitor their performance and improve their effectiveness as a consequence of the above articulation
- Build a local knowledge base and credibility that will, together, strengthen analysis of the malaria problem and its appropriate prioritization in cross-sectoral development strategies such as PRSPs, as well as mobilize additional funding
- Set the stage for the design of results-based (or performance-based) disbursements in the context of the Bank's lending support and possibly, as well, in the context of technical and financial support of other partners. A detailed outline of the monitoring and evaluation framework is provided in appendix 1.

### 6.3 RBM Technical Strategies and Indicators of Population Coverage

The Roll Back Malaria Partnership Monitoring and Evaluation Reference Working Group has defined the core set of program indicators to monitor programs. For ease of use, technical rigor, and comparability in measuring outcomes, these indicators will guide clients and Bank task teams in the Booster Program. *They will be modified and adapted to each context as necessary.*

#### **Vector control via ITNs**

1. Proportion of households with at least one ITN.
2. Proportion of children under five years old who slept under an ITN the previous night.

**Prompt access to effective treatment**

3. Proportion of children under five years old with fever in the last two weeks who received antimalarial treatment according to national policy within 24 hours from onset of fever.

**Prevention and control of malaria in pregnant women**

4. Proportion of pregnant women who slept under an ITN the previous night.
5. Proportion of women who received intermittent preventive treatment for malaria during their last pregnancy.

**Proposed measurement tools**

Nationally representative, population-based sample surveys are the principal measurement tools required to collect the necessary data for constructing all five core RBM indicators for population coverage. Many different forms of these surveys are currently being routinely implemented; however, few of these surveys collect data on malaria-specific issues. Two large survey efforts that do currently collect data on malaria are the Demographic and Health Surveys (DHS) and the Multiple Indicator Cluster Surveys.

In addition to these ongoing survey efforts, the RBM partners have developed a standard Management Information System (MIS) package for assessing the key household coverage indicators. This includes a core questionnaire and data tabulation plan, as well as related materials for organizing and conducting fieldwork. This stand-alone survey is designed to be implemented in a similar manner to the DHS, producing nationally representative, population-based data from which all five core RBM outcome indicators of population coverage can be constructed. The MIS will also produce a wide range of data for in-depth assessment of the malaria situation within countries. It is designed to be shorter, less expensive, and quicker to implement than many of the more comprehensive national survey efforts. Where appropriate, surveys and other monitoring and evaluation modalities of this sort will form a core component of operations under the Booster Program.



## APPENDIX 1

# Outline of the Monitoring and Evaluation Framework

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## A1.1 Support to Countries

| RESULTS CHAIN  | EXPECTED RESULTS   |
|----------------|--|
| <b>Impact</b>  | Reduction of all-cause child (under five) mortality (MDG 4)  |
|                | Improvement of maternal health (MDG 5)   |
|                | Reduction of malaria-specific morbidity and mortality (MDG 6)  |
|                | Reduction of productivity losses attributable to malaria   |
|                | Reduction of illness and absenteeism in school-age children and mitigation of other impediments to learning caused by malaria (MDG 2)  |
| <b>Outcome</b> | Improved coverage, access, and utilization of technically sound and cost-effective program interventions for (i) prevention and (ii) treatment at community and facility levels, as appropriate  |
|                | Data-driven and evidence-based strategic management and decision making  |
| <b>Output</b>  | Good disease surveillance to track trends and ability to detect and respond promptly to epidemics  |
|                | Operational research (epidemiology and economics of malaria) to provide knowledge on (i) the cost-effectiveness of interventions in the country and (ii) resource flows, including malaria modules within national health accounts, household expenditures, public and private sector expenditures |
|                | Viable M&E system (with baseline data, indicators, targets, staffing, capacity at all levels of program activity) that enables (i) data-driven/evidence-based decision making; (ii) the delineation and monitoring of accountabilities; and (iii) information of the public at large               |
|                | M&E system to be in line with technically sound consensus of the M&E reference Group of the RBM Partnership, including (i) vector control, (ii) prompt access to effective treatment for vulnerable populations, and (iii) prevention and control of malaria in pregnant women.                    |

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Strong leadership and commitment at all levels of government and among relevant sectors for high priority, intensified efforts to control malaria:

- PRSPs and CASs have well-justified, prioritized, and sound strategies for fighting malaria with explicit goals and targets that fit country goals and strategies
  - Full integration of malaria control into national planning/budgeting frameworks (MTEFs and development plans) (and used as an instrument for donor coordination and collaboration)
  - Appropriate linkages with other sectors
- 

Technically sound, well-targeted, and well-implemented malaria program thanks to:

- Technical knowledge and support
  - National capacity and trained personnel
  - Adequate and flexible/decentralized financing to accommodate needs of front-line implementers
  - Partnerships with other sectors and civil society; private sector in line with comparative advantages (underpinned by analytic work on capacity and comparative advantages)
  - Adequate infrastructure
- 

### Inputs

*\*see also matrix on Bank capacity building*

Lending and Grant Assistance (increase in funding for malaria programs)

- *Health sector and PRSC lending*
    - Board approval of the Booster Program
      - Country-specific programs effective in at least 10 eligible countries by fiscal 2006–7
      - 20 eligible countries (cumulative total) by fiscal 2008
    - Mobilization of financing under other health lending instruments (PRSCs and SWAPs) and reflected on MTEF
      - at least 5 countries by fiscal 2006–7
      - at least 10 countries (cumulative) by fiscal 2008
  - *Other development sector lending*
    - Malaria components in other, selected priority development sectors (number retrofitted, number incorporated into new projects)
      - Education
      - Agriculture
      - Infrastructure
      - Water
      - Environment
      - Other
    - Malaria addressed in CDD and other cross-cutting lending (e.g., public sector service delivery) (number retrofitted, number incorporated into new projects)
-

Nonlending assistance and analytic and advisory services

- Technical assistance/joint analytic work to:
  - Establish/complete baseline for malaria program, establish targets, and set up M&E system and plan
  - Elevate and justify its importance in PRSPs (burden of disease and its implications for social and economic development and poverty reduction prospects)
  - Assessment of capacity and institutional/organizational frameworks for greater efficiencies and productive partnerships (government, central and decentralized; civil society; private sector [formal and informal])

## A1.2 Support to Regional/Global Partnerships and Collective Efforts

| RESULTS CHAIN            | EXPECTED RESULTS   |
|--------------------------|--|
| <b>Ultimate impact</b>   | Reduction of all-cause child (under five) mortality (MDG 4)  |
|                          | Improvement of maternal health (MDG 5)   |
|                          | Reduction of malaria-specific morbidity and mortality (MDG 6)  |
|                          | Reduction of productivity losses attributable to malaria   |
|                          | Reduction of illness and absenteeism in school-age children and mitigation of other impediments to learning caused by malaria (MDG 2)  |
| <b>Short-term impact</b> | Minimization of wasteful overlaps and gaps among partners by proactive focus on Bank's comparative advantage, including: <ul style="list-style-type: none"> <li>• Evaluative and operational research</li> <li>• Medium- to long-term financing horizon</li> <li>• Cross-sectoral work</li> <li>• Budgeting/planning frameworks and fit with overall macroeconomic growth agenda</li> <li>• Selective support for product development and applied research</li> <li>• Convening power</li> </ul> |
|                          | Improved coherence and evidence base of the Bank's and other partners' strategies and packages of assistance to countries through the development and dissemination of the Bank's knowledge and experience (macroeconomics, system-wide approach, cross-sectoral perspective, evaluations, operational research, and so forth)   |
| <b>Outcome</b>           | Improved (and well-earned) appreciation of the Bank's contribution to global malaria control efforts   |

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|                |  |
|----------------|--|
|                | Improved knowledge to inform evidence-based decision making and support (thanks to research on epidemiology, economics, development effectiveness of malaria). Improved knowledge base/continual update of approaches/strategies based on emerging best practices/technologies   |
|                | Shared information systems that enable coordination among agencies   |
|                | In coordination with other partners, subsidized antimalarial drugs available to any eligible purchaser from malaria-endemic countries in order to ensure universal access and to crowd out monotherapy   |
| <b>Outputs</b> | High-impact operational research on epidemiology and economics of malaria, service delivery, and program management  |
|                | Evaluative research on development effectiveness of malaria control  |
| <b>Inputs</b>  | Implementation of strategic communications strategy to shape the global discussion around issues related to the Bank's comparative advantage among RBM partners. This will include dissemination of the Bank's strategy and program of action, progress toward meeting targets, implementation bottlenecks, research findings and implications, and so forth |
|                | (See also the matrix on strengthened Bank capacity.)   |

### A1.3 Strengthening of Bank's Capacity to Contribute Effectively to Malaria Control

(Achievement of this objective is an input into results chains for Support to Countries and Support to Global Efforts.)

| RESULTS CHAIN  | EXPECTED RESULTS  |
|----------------|---|
| <b>Impact</b>  | Improved quality and development effectiveness of the Bank's work on malaria  |
|                | Expanded scope, coverage, and intensity of Bank assistance on malaria   |
|                | Greater flexibility and client orientation  |
| <b>Outcome</b> | Increase in the responsiveness of PRSPs and CASs to malaria control in malaria-endemic countries, measured by the consideration of the relationship between malaria and poverty, country strategies for malaria control, medium-term goals, and short-term actions  |
|                | Strong Bank leadership through the establishment of a high-level Steering Committee and commitment of World Bank country directors responsible for malaria-endemic countries in the Bank, as evidenced by: <ul style="list-style-type: none"> <li>• High priority accorded to malaria work</li> <li>• Intensified advocacy for malaria control in the context of PRSPs, country dialogue, and sector dialogues</li> </ul> |

|               |   |
|---------------|---|
| <b>Output</b> | Bank strategy and program of action on malaria: available and being implemented   |
|               | M&E plan and system for M&E of its support to countries functional and in line with technically sound consensus of the M&E Reference Group of the RBM Partnership. These include (i) vector control, (ii) prompt access to effective treatment for vulnerable populations, and (iii) prevention and control of malaria in pregnant women.   |
|               | Guideline(s) to staff on assisting countries to develop malaria-responsive PRSPs and the preparation of malaria-responsive CASs, PRSCs, and SWAPs in malaria-endemic countries  |
|               | Learning Strategy for the Bank produced   |
|               | Five learning sessions for Bank staff on important aspects of malaria control with emphasis on operational effectiveness (pending learning strategy)  |
|               | Board approval of new lending facility: Booster Program for Malaria Control (and effectiveness of country interventions—see country-level support)  |
|               | <p>AAA work program including:</p> <ul style="list-style-type: none"> <li>• Effects of subsidies for antimalarial drugs and insecticide-treated nets on households, service providers, and program managers</li> <li>• Macroeconomic effects of increased expenditures for malaria control</li> <li>• Modalities to engage the formal and informal private sector</li> <li>• Web-based directory of technical and managerial resources for malaria control programs</li> <li>• Applied research on epidemiology, service delivery, and quality of care</li> </ul> |
|               | Multidisciplinary Malaria Advisory Service established and operational (jointly with WHO, MACEPA, RBM Secretariat, and other partners as appropriate and feasible)  |
|               | <p>Development and implementation of a strategic communications program, including:</p> <ul style="list-style-type: none"> <li>• Documentation and dissemination of best practices and portfolio reviews of the Bank's (improved/expanded) performance</li> </ul>   |
| <b>Inputs</b> | <p>Human resources—recruitment, training, mobilization of internal expertise for:</p> <ul style="list-style-type: none"> <li>• Lending and nonlending assistance to countries</li> <li>• Malaria task force</li> <li>• Steering committee</li> </ul>  |
|               | <p>Financial resources:</p> <ul style="list-style-type: none"> <li>• Administrative budget</li> <li>• Untied Trust Funds</li> </ul>   |





## APPENDIX 2

# Malarial Case Notification and Coverage with Key Interventions (Courtesy of RBM Department of WHO)

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Source: RBM Global Malaria Database: accessed February 7, 2005. Available online at: [http://www.who.int/globalatlas/autologin/malaria\\_login.asp](http://www.who.int/globalatlas/autologin/malaria_login.asp)

### Notes on Available Information

**Reported epidemiological burden of malaria.** This burden includes the annual malaria cases and deaths notified in Health Information Systems (HIS), recorded separately for laboratory-confirmed, clinically diagnosed, and imported cases as far as data were reported to WHO. Also, the total number of slides and rapid diagnostic tests taken (of which a part would have resulted in a confirmed case) are presented, if countries recorded and reported this information. Malaria case and death notifications are presented for all countries thought to have malaria transmission and that reported at least one case of malaria to WHO that was not reported to have been imported from outside the country.

*Malaria cases clinically diagnosed* denotes, for countries with very little or no reported laboratory confirmation of malaria cases, such as in most of Sub-Saharan Africa, clinically diagnosed malaria cases. For countries with routine laboratory confirmation of malaria diagnosis, this denotes probable or suspected malaria cases, and in the case of Pakistan, all patients with fever. For countries in the Pacific and selected countries in eastern Asia, clinically diagnosed cases denotes the number of suspected malaria cases minus the number of patients tested for malaria. These

## Rolling Back Malaria

probable cases do not include suspected malaria patients who test negative during laboratory confirmation.

*Probable or clinically diagnosed severe cases* denotes, for areas reporting only clinically diagnosed cases, clinically diagnosed patients requiring hospitalization for signs or symptoms of severe malaria and receiving antimalarial treatment.

*Probable or clinically diagnosed deaths* denotes, for areas reporting only clinically diagnosed malaria cases, deaths among patients diagnosed with probable severe malaria.

*Parasitologically confirmed cases* denotes, for areas performing laboratory confirmation of malaria diagnosis, all patients with signs or symptoms of malaria and laboratory-confirmed diagnosis who received antimalarial treatment.

*Plasmodium falciparum* or *mixed* denotes those cases laboratory-diagnosed as due to infection with *Plasmodium falciparum* or a mix of *Plasmodia* species including *falciparum*.

*Plasmodium vivax* denotes those cases laboratory-diagnosed as due to infection with *Plasmodium vivax*.

*Parasitologically confirmed severe cases* denotes, among laboratory-diagnosed cases, the number requiring hospitalization for signs or symptoms of severe malaria and receiving antimalarial treatment.

*Parasitologically confirmed deaths* denotes deaths among patients with a laboratory-confirmed diagnosis of severe malaria.

*Imported cases* denotes malaria cases where the infection was acquired outside the country in which it was diagnosed, implying that the origin could be traced to a known malarious area.

The *case notification rate* is a standardized rate, per 1,000 persons per year, calculated against national population sizes in each calendar year as estimated by the UN Population Division. Standardized rates are derived from the rate of reported case notifications, based on an appreciation of what proportion of cases are laboratory confirmed. For countries where none of the reported cases were confirmed (as in most of Sub-Saharan Africa), the rate was based on probable/clinically diagnosed cases. For

countries where all cases are laboratory confirmed, the rate was based on parasitologically confirmed cases minus imported cases. For the few countries where some cases were laboratory confirmed (“Some” in column 5, for Somalia, Sudan, Afghanistan, and Yemen), the standardized rate was based on the sum of the mutually exclusive reported categories “Probable/clinically diagnosed” and “Parasitologically confirmed.”

*Source of data:* WHO annual reporting forms, country presentations, reports, and publications.

**Estimated coverage of the key RBM interventions** according to the core indicators recommended by the RBM Monitoring & Evaluation Reference Group. These indicators include:<sup>19</sup>

- The percentage of households possessing at least one mosquito net, and possessing at least one ITN
- The percentage of children under five years old and of pregnant women who slept under a net or an ITN during the night before a survey
- The percentage (for African countries) of febrile children under five years old who received treatment with any antimalarial, with chloroquine, and with SP.

Each outcome is reported as the national estimate, where applicable and available, disaggregated by the background characteristics urban/rural and male/female.

The treatment with antimalarials of febrile children is reported only for African countries, because outside Africa malaria makes up only a very small proportion of fevers reported in surveys. Africa-centered reporting possibly results in a misleadingly low coverage of antimalarial treatment; results may also be misleading because children under five are the only group considered in this evaluation of the coverage of antimalarial treatment. Also, for African countries only, the period prevalence of fevers for children under five in the two weeks preceding a survey is reported as an indicator of the burden of malaria on African health systems.

*Source of data:* Reports from household surveys, including DHS and Multiple Indicator Cluster Surveys (MICS) or cluster-sampled subnational surveys. Only surveys with appropriate documentation of dates of field work, sampling design, and sample sizes were included.

**Data Table 1:** Malarial Case Notification: Malaria Notifications for the Most Recent Year Information Received**AFRICA**

| COUNTRY                | STANDARDIZED MALARIA NOTIFICATIONS |                        |            |                |                  |        | PROBABLE/CLINICALLY DIAGNOSED |            |         |        |
|------------------------|------------------------------------|------------------------|------------|----------------|------------------|--------|-------------------------------|------------|---------|--------|
|                        | YEAR                               | POPULATION (THOUSANDS) | CASES      | RATE PER 1,000 | CONFIRMED STATUS | DEATHS | SLIDES/RDTs                   | CASES      | SEVERE  | DEATHS |
|                        | 1                                  | 2                      | 3          | 4              | 5                | 6      | 7                             | 8          | 9       | 10     |
| <b>Central Africa</b>  |                                    |                        |            |                |                  |        |                               |            |         |        |
| Cameroon               | 1998                               | 14,458                 | 664,413    | 45.96          | NR               |        |                               | 664,413    |         |        |
| CAR                    | 2003                               | 3,865                  | 95,644     | 24.75          | NR               |        |                               |            |         |        |
| Chad                   | 2001                               | 8,103                  | 386,197    | 47.66          | NR               | 1,001  |                               | 386,197    | 19,463  |        |
| Congo, Rep. of         | 1998                               | 3,244                  | 17,122     | 5.28           | NR               |        |                               | 17,122     |         |        |
| Congo, Dem. Rep. of    | 2003                               | 52,771                 | 4,386,638  | 83.13          | NR               | 16,498 |                               | 4,386,638  |         | 16,498 |
| Equatorial Guinea      | 1995                               | 401                    | 12,530     | 31.25          | NR               |        |                               | 12,530     |         |        |
| Gabon                  | 1998                               | 1,202                  | 80,247     | 66.78          | NR               |        |                               | 80,247     |         |        |
| Sao Tome and Principe  | 2003                               | 161                    | 63,199     | 393.53         | NR               |        |                               | 63,199     |         |        |
| <b>East Africa</b>     |                                    |                        |            |                |                  |        |                               |            |         |        |
| Burundi                | 2002                               | 6,602                  | 1,808,588  | 273.96         | NR               | 330    |                               | 1,808,588  |         | 330    |
| Comoros                | 2001                               | 726                    | 3,718      | 5.12           | NR               | 16     |                               | 3,718      | 820     | 16     |
| Djibouti               | 2003                               | 703                    | 5,036      | 7.17           | All              |        |                               |            |         |        |
| Eritrea                | 2003                               | 4,141                  | 72,023     | 17.39          | NR               | 78     |                               | 72,023     |         | 78     |
| Ethiopia               | 2003                               | 70,678                 | 565,273    | 8.00           | All              |        | 1,210,868                     |            |         |        |
| Kenya                  | 2002                               | 31,540                 | 124,197    | 3.94           | NR               | 135    | 12,491                        | 124,197    | 9,584   | 135    |
| Rwanda                 | 2003                               | 8,387                  | 856,233    | 102.09         | Some             |        |                               | 856,233    | 94,990  | 1,045  |
| Somalia                | 2003                               | 9,890                  | 23,349     | 2.36           | Some             | 10     | 12,578                        | 15,778     |         | 44     |
| Sudan                  | 2003                               | 33,610                 | 3,084,320  | 91.77          | Some             | 2,479  |                               | 1,998,367  | 105,813 | 2,479  |
| Uganda                 | 2003                               | 25,827                 | 12,343,411 | 477.93         | NR               | 8,450  |                               | 12,343,411 |         | 8,450  |
| UR Tanzania            | 2003                               | 36,977                 | 10,712,526 | 289.71         | Some             | 14,156 | 3,116,332                     | 10,712,526 | 521,019 | 14,156 |
| <b>Northern Africa</b> |                                    |                        |            |                |                  |        |                               |            |         |        |
| Algeria                | 2002                               | 31,266                 | 52         | <0.01          | All              | 0      |                               |            |         |        |
| Egypt                  | 2003                               | 71,931                 | 0          | <0.01          | All              | 0      | 1,041,767                     |            |         |        |
| Morocco                | 2003                               | 30,566                 | 4          | <0.01          | All              |        | 405,800                       |            |         |        |

**Notes:**

Please refer to explanatory notes for regional tabulations.

NR = None Reported

RDTs = Rapid Diagnostic Tests

Pf/mixed = the number of reported *Plasmodium falciparum* or mixed casesPv = the number of reported *Plasmodium vivax* cases

Malarial Case Notification and Coverage with Key Interventions

| NOTIFIED MALARIA CASES AND DEATHS DESCRIPTION |                      |          |       |         |        |        |                |       |
|---|----------------------|----------|-------|---------|--------|--------|----------------|-------|
|   | LABORATORY CONFIRMED |          |       |         |        |        | INVESTIGATIONS |       |
|   | CASES                | PF/MIXED | (%)   | PV      | SEVERE | DEATHS | IMPORTED       | (%)   |
|   | 11                   | 12       | 13    | 14      | 15     | 16     | 17             | 18    |
|   | 5,036                |          |       |         |        |        |                |       |
|   | 565,273              | 395,964  | 70.0  | 158,115 |        |        |                |       |
|   | 411,069              |          |       |         |        |        |                |       |
|   | 7,571                | 7,571    | 100.0 |         |        | 10     |                |       |
|   | 1,085,853            |          |       |         |        |        |                |       |
|   | 1,509,236            |          |       |         |        |        |                |       |
|   | 307                  | 188      | 61.2  | 116     |        | 0      | 255            | 83.1  |
|   | 45                   | 44       | 97.8  | 1       |        |        | 45             | 100.0 |
|   | 73                   | 62       | 84.9  |         |        |        | 69             | 94.5  |

Data Table 1, *continued*AFRICA, *continued*

| COUNTRY                | STANDARDIZED MALARIA NOTIFICATIONS |                           |           |                   |                     |         | PROBABLE/CLINICALLY DIAGNOSED |           |         |        |  |
|------------------------|------------------------------------|---------------------------|-----------|-------------------|---------------------|---------|-------------------------------|-----------|---------|--------|--|
|                        | YEAR                               | POPULATION<br>(THOUSANDS) | CASES     | RATE<br>PER 1,000 | CONFIRMED<br>STATUS | DEATHS  | SLIDES/RDTS                   | CASES     | SEVERE  | DEATHS |  |
|                        | 1                                  | 2                         | 3         | 4                 | 5                   | 6       | 7                             | 8         | 9       | 10     |  |
| <b>Southern Africa</b> |                                    |                           |           |                   |                     |         |                               |           |         |        |  |
| Angola                 | 2002                               | 13,184                    | 1,409,328 | 106.90            | NR                  | 11,344  |                               | 1,409,328 |         | 11,344 |  |
| Botswana               | 2003                               | 1,785                     | 22,418    | 12.56             | Some                | 10      |                               | 22,418    |         |        |  |
| Madagascar             | 2003                               | 17,404                    | 2,114,400 | 121.49            | NR                  | 759     |                               | 2,114,400 | 10,359  | 759    |  |
| Malawi                 | 2002                               | 11,871                    | 2,853,317 | 240.36            | NR                  | 6,993   |                               | 4,216,059 | 157,862 | 9,579  |  |
| Mauritius              | 2002                               | 1,210                     | 22        | 0.02              | NR                  | 22      |                               |           |         |        |  |
| Mozambique             | 2003                               | 18,863                    | 5,087,865 | 269.72            | NR                  | 3,569   |                               | 5,087,865 | 3,569   |        |  |
| Namibia                | 2003                               | 1,987                     | 444,081   | 223.44            | NR                  | 1,095   |                               | 444,081   | 20,968  | 1,095  |  |
| South Africa           | 2003                               | 45,026                    | 13,446    | 0.30              | NR                  | 141     |                               | 13,446    | 141     |        |  |
| Swaziland              | 2003                               | 1,077                     | 36,664    | 34.03             | NR                  | 36,664  |                               | 977       |         |        |  |
| Zambia                 | 2001                               | 10,570                    | 2,010,185 | 190.18            | NR                  | 5,763   |                               | 2,010,185 | 162,709 | 5,763  |  |
| Zimbabwe               | 2002                               | 12,835                    | 1,252,668 | 97.60             | NR                  | 626     |                               | 599,416   | 626     |        |  |
| <b>Western Africa</b>  |                                    |                           |           |                   |                     |         |                               |           |         |        |  |
| Benin                  | 2001                               | 6,387                     | 779,041   | 121.98            | NR                  | 670     |                               | 779,041   | 32,008  | 670    |  |
| Burkina Faso           | 2002                               | 12,624                    | 1,451,125 | 114.95            | NR                  | 4,417   |                               | 1,451,125 | 73,017  | 4,417  |  |
| Cape Verde             | 2000                               | 436                       | 143       | 0.33              | NR                  | 143     |                               |           |         |        |  |
| Côte d'Ivoire          | 2001                               | 16,098                    | 400,402   | 24.87             | NR                  | 422     |                               | 400,402   | 40,375  | 422    |  |
| Gambia, The            | 1999                               | 1,273                     | 127,899   | 100.47            | NR                  | 127,899 |                               |           |         |        |  |
| Ghana                  | 2003                               | 20,922                    | 3,552,869 | 169.81            | Some                | 3,245   |                               | 3,552,869 | 478,960 | 3,245  |  |
| Guinea                 | 2000                               | 8,117                     | 889,089   | 109.53            | NR                  | 441     |                               | 889,089   | 14,933  | 441    |  |
| Guinea-Bissau          | 2002                               | 1,449                     | 194,976   | 134.57            | NR                  | 780     |                               | 194,976   | 66,703  | 780    |  |
| Liberia                | 1998                               | 2,580                     | 777,754   | 301.51            | NR                  | 777,754 |                               |           |         |        |  |
| Mali                   | 2003                               | 13,007                    | 809,428   | 62.23             | NR                  | 1,309   |                               | 809,428   | 1,309   |        |  |
| Mauritania             | 2002                               | 2,807                     | 167,423   | 59.64             | NR                  | 100     |                               | 167,423   | 7,312   | 100    |  |
| Niger                  | 2002                               | 11,544                    | 681,707   | 59.05             | NR                  | 1,096   |                               | 681,707   | 4,777   | 1,096  |  |
| Nigeria                | 2003                               | 124,009                   | 2,608,479 | 21.03             | NR                  | 5,343   |                               | 2,608,479 | 5,343   |        |  |
| Senegal                | 2000                               | 9,393                     | 1,120,094 | 119.25            | NR                  | 1,337   |                               | 1,120,094 | 36,860  | 1,337  |  |
| Sierra Leone           | 1999                               | 4,294                     | 409,670   | 95.41             | NR                  | 409,670 |                               |           |         |        |  |
| Togo                   | 2001                               | 4,686                     | 431,826   | 92.15             | NR                  | 791     |                               | 431,826   | 12,904  | 791    |  |

*Notes:*

Please refer to explanatory notes for regional tabulations.

NR = None Reported

RDts = Rapid Diagnostic Tests

Pf/mixed = the number of reported *Plasmodium falciparum* or mixed casesPv = the number of reported *Plasmodium vivax* cases

## Malarial Case Notification and Coverage with Key Interventions

| NOTIFIED MALARIA CASES AND DEATHS DESCRIPTION |                      |          |     |    |        |        |                |     |
|---|----------------------|----------|-----|----|--------|--------|----------------|-----|
|   | LABORATORY CONFIRMED |          |     |    |        |        | INVESTIGATIONS |     |
|   | CASES                | PF/MIXED | (%) | PV | SEVERE | DEATHS | IMPORTED       | (%) |
|   | 11                   | 12       | 13  | 14 | 15     | 16     | 17             | 18  |
|   | 1,811                |          |     |    |        |        |                |     |
|   | 478,960              |          |     |    |        |        |                |     |

Data Table 1, continued

## ASIA

| COUNTRY                                  | STANDARDIZED MALARIA NOTIFICATIONS |                           |           |                   |                     |           | PROBABLE/CLINICALLY DIAGNOSED |           |        |        |
|--|------------------------------------|---------------------------|-----------|-------------------|---------------------|-----------|-------------------------------|-----------|--------|--------|
|  | YEAR                               | POPULATION<br>(THOUSANDS) | CASES     | RATE<br>PER 1,000 | CONFIRMED<br>STATUS | DEATHS    | SLIDES/RDTS                   | CASES     | SEVERE | DEATHS |
|  | 1                                  | 2                         | 3         | 4                 | 5                   | 6         | 7                             | 8         | 9      | 10     |
| <b>Central Asia &amp; Trans-Caucasus</b> |                                    |                           |           |                   |                     |           |                               |           |        |        |
| Armenia                                  | 2003                               | 3,061                     | 8         | <0.01             | All                 | 0         |                               |           |        |        |
| Azerbaijan                               | 2003                               | 8,370                     | 480       | 0.06              | All                 | 0         |                               |           |        |        |
| Georgia                                  | 2003                               | 5,126                     | 308       | 0.06              | All                 | 0         |                               |           |        |        |
| Kyrgyzstan                               | 2003                               | 5,138                     | 465       | 0.09              | All                 | 0         |                               |           |        |        |
| Tajikistan                               | 2003                               | 6,245                     | 5,428     | 0.87              | All                 | 0         |                               |           |        |        |
| Turkmenistan                             | 2002                               | 4,794                     | 15        | <0.01             | All                 | 0         |                               |           |        |        |
| Uzbekistan                               | 2003                               | 26,093                    | 33        | <0.01             | All                 | 0         |                               |           |        |        |
| <b>Eastern Mediterranean</b>             |                                    |                           |           |                   |                     |           |                               |           |        |        |
| Afghanistan                              | 2003                               | 23,897                    | 591,441   | 24.75             | Some                |           |                               | 224,662   |        |        |
| Iran                                     | 2003                               | 68,920                    | 17,060    | 0.25              | All                 | 1,358,262 | 0                             |           |        |        |
| Iraq                                     | 2003                               | 25,175                    | 303       | 0.01              | All                 |           | 0                             | 581,938   | 0      | 0      |
| Oman                                     | 2003                               | 2,851                     | 6         | <0.01             | All                 |           |                               |           |        |        |
| Pakistan                                 | 2003                               | 153,578                   | 122,560   | 0.80              | All                 | 29        | 4,145,290                     | 3,985,915 |        | 29     |
| Saudi Arabia                             | 2003                               | 24,217                    | 596       | 0.02              | All                 | 0         | 819,869                       |           |        |        |
| Syrian Arab Republic                     | 2003                               | 17,800                    | 2         | <0.01             | All                 |           |                               |           |        |        |
| Turkey                                   | 2003                               | 71,325                    | 9,182     | 0.13              | All                 | 0         |                               |           |        |        |
| United Arab Emirates                     | 2003                               | 2,995                     | 0         | <0.01             | All                 |           | 42,601                        |           |        |        |
| Yemen                                    | 2003                               | 20,010                    | 265,023   | 13.24             | Some                | 29        | 414,919                       | 214,212   |        |        |
| <b>South-East Asia</b>                   |                                    |                           |           |                   |                     |           |                               |           |        |        |
| Bangladesh                               | 2003                               | 146,736                   | 56,879    | 0.39              | All                 | 574       | 434,723                       | 434,723   |        | 1,250  |
| Bhutan                                   | 2003                               | 2,257                     | 3,806     | 1.69              | All                 | 15        | 61,246                        | 237       |        |        |
| Korea, DPR                               | 2003                               | 22,664                    | 16,538    | 0.73              | All                 | 0         | 32,083                        | 46,251    | 0      | 0      |
| India                                    | 2003                               | 1,065,462                 | 1,781,336 | 1.67              | All                 | 990       | 98,154,977                    |           |        |        |
| Indonesia                                | 2002                               | 217,131                   | 220,073   | 1.01              | All                 | 197       | 1,298,194                     | 1,355,714 |        |        |
| Myanmar                                  | 2003                               | 49,485                    | 716,100   | 14.47             | Some                | 2,476     | 849,517                       | 539,929   |        |        |
| Nepal                                    | 2003                               | 25,164                    | 9,394     | 0.37              | All                 | 3         | 195,376                       | 56,640    |        |        |
| Sri Lanka                                | 2003                               | 19,065                    | 10,510    | 0.55              | All                 | 2         | 1,192,259                     |           |        |        |
| Thailand                                 | 2003                               | 62,833                    | 35,076    | 0.56              | All                 | 325       | 3,259,607                     |           |        |        |
| Timor Leste                              | 2003                               | 778                       | 31,819    | 40.89             | All                 | 8         | 50,815                        | 100,000   |        | 100    |

## Notes:

Please refer to explanatory notes for regional tabulations.

NR = None Reported

RDTs = Rapid Diagnostic Tests

Pf/mixed = the number of reported *Plasmodium falciparum* or mixed casesPv = the number of reported *Plasmodium vivax* cases

## Malarial Case Notification and Coverage with Key Interventions

| NOTIFIED MALARIA CASES AND DEATHS DESCRIPTION |                      |          |      |         |        |        |                |       |
|---|----------------------|----------|------|---------|--------|--------|----------------|-------|
|   | LABORATORY CONFIRMED |          |      |         |        |        | INVESTIGATIONS |       |
|   | CASES                | PF/MIXED | (%)  | PV      | SEVERE | DEATHS | IMPORTED       | (%)   |
|   | 11                   | 12       | 13   | 14      | 15     | 16     | 17             | 18    |
|   | 29                   | 4        | 13.8 |         |        | 0      | 21             | 72.4  |
|   | 482                  | 0        | 0.0  |         |        | 0      | 2              | 0.4   |
|   | 316                  | 2        | 0.6  |         |        | 0      | 8              | 2.5   |
|   | 468                  | 1        | 0.2  |         |        | 0      | 3              | 0.6   |
|   | 5,428                | 250      | 4.6  |         |        | 0      | 0              | 0.0   |
|   | 18                   | 0        | 0.0  |         |        | 0      | 3              | 16.7  |
|   | 74                   | 0        | 0.0  |         |        | 0      | 41             | 55.4  |
|   | 366,779              | 44,243   | 12.1 | 322,536 |        |        |                |       |
|   | 23,562               | 4,475    | 19.0 | 18,818  | 131    |        | 6,502          | 27.6  |
|   | 307                  | 0        | 0.0  | 307     | 0      | 0      | 4              | 1.3   |
|   | 740                  | 299      | 40.4 |         |        |        | 734            | 99.2  |
|   | 125,152              | 39,944   | 31.9 | 85,240  |        | 14     | 2,592          | 2.1   |
|   | 1,724                | 1,234    | 71.6 | 462     |        | 0      | 1,128          | 65.4  |
|   | 24                   | 13       | 54.2 | 10      |        |        | 22             | 91.7  |
|   | 9,222                | 12       | 0.1  |         |        | 0      | 40             | 0.4   |
|   | 1,796                | 405      | 22.6 |         |        |        | 1,796          | 100.0 |
|   | 50,811               | 48,741   | 95.9 |         |        | 29     |                |       |
|   | 56,879               | 42,012   | 73.9 | 14,867  | 10,332 | 574    |                |       |
|   | 3,806                | 1,681    | 44.2 | 2,126   | 1,621  | 15     |                |       |
|   | 16,538               | 0        | 0.0  | 16,538  | 0      | 0      |                |       |
|   | 1,781,336            | 845,173  | 47.4 | 936,163 |        | 990    |                |       |
|   | 220,073              | 71,202   | 32.4 | 148,871 |        | 197    |                |       |
|   | 176,171              | 139,315  | 79.1 | 74,833  | 12,962 | 2,476  |                |       |
|   | 9,394                | 1,218    | 13.0 | 8,177   |        | 3      |                |       |
|   | 10,510               | 1,273    | 12.1 | 9,237   |        | 2      |                |       |
|   | 37,355               | 19,024   | 50.9 | 18,295  |        | 325    | 2,279          | 6.1   |
|   | 31,819               | 17,370   | 54.6 | 14,449  | 409    | 8      |                |       |

Data Table 1, *continued***ASIA, continued**

|                        | STANDARDIZED MALARIA NOTIFICATIONS |                           |        |                   |                     |        | PROBABLE/CLINICALLY DIAGNOSED |           |        |        |
|------------------------|------------------------------------|---------------------------|--------|-------------------|---------------------|--------|-------------------------------|-----------|--------|--------|
|                        | YEAR                               | POPULATION<br>(THOUSANDS) | CASES  | RATE<br>PER 1,000 | CONFIRMED<br>STATUS | DEATHS | SLIDES/RDTS                   | CASES     | SEVERE | DEATHS |
| COUNTRY                | 1                                  | 2                         | 3      | 4                 | 5                   | 6      | 7                             | 8         | 9      | 10     |
| <b>Western Pacific</b> |                                    |                           |        |                   |                     |        |                               |           |        |        |
| Cambodia               | 2003                               | 14,144                    | 71,258 | 5.04              | All                 | 492    | 160,326                       |           | 4,936  |        |
| China                  | 2002                               | 1,294,867                 | 25,520 | 0.02              | All                 | 42     |                               |           |        |        |
| Lao PDR                | 2003                               | 5,657                     | 18,894 | 3.34              | All                 | 187    | 256,534                       |           |        |        |
| Malaysia               | 2003                               | 24,425                    | 5,477  | 0.22              | All                 | 21     |                               |           |        |        |
| Papua New Guinea       | 2003                               | 5,711                     | 70,226 | 12.30             | All                 | 537    |                               | 1,729,697 | 17,590 | 537    |
| Philippines            | 2003                               | 79,999                    | 43,644 | 0.55              | All                 |        |                               |           |        |        |
| Korea, Rep. of         | 2003                               | 47,700                    | 1,107  | 0.02              | All                 | 0      |                               |           |        |        |
| Solomon Islands        | 2003                               | 477                       | 90,606 | 189.94            | All                 | 71     | 297,897                       |           |        | 71     |
| Vanuatu                | 2003                               | 212                       | 15,240 | 71.90             | All                 | 0      |                               |           |        |        |
| Vietnam                | 2003                               | 81,377                    | 37,416 | 0.46              | All                 | 50     | 2,738,600                     | 12,694    | 423    | 4      |

*Notes:*

Please refer to explanatory notes for regional tabulations.

NR = None Reported

RDts = Rapid Diagnostic Tests

Pf/mixed = the number of reported *Plasmodium falciparum* or mixed casesPv = the number of reported *Plasmodium vivax* cases

## Malarial Case Notification and Coverage with Key Interventions

| NOTIFIED MALARIA CASES AND DEATHS DESCRIPTION |                      |          |      |        |        |        |                |      |
|---|----------------------|----------|------|--------|--------|--------|----------------|------|
|   | LABORATORY CONFIRMED |          |      |        |        |        | INVESTIGATIONS |      |
|   | CASES                | PF/MIXED | (%)  | PV     | SEVERE | DEATHS | IMPORTED       | (%)  |
|   | 11                   | 12       | 13   | 14     | 15     | 16     | 17             | 18   |
|   | 71,258               | 63,739   | 89.4 |        |        | 492    |                |      |
|   | 25,520               | 5,937    | 23.3 |        |        | 42     |                |      |
|   | 18,894               | 17,878   | 94.6 | 1,016  |        | 187    |                |      |
|   | 6,338                | 2,884    | 45.5 | 3,127  | 421    | 21     | 861            | 13.6 |
|   | 70,226               | 55,638   | 79.2 |        |        |        |                |      |
|   | 43,644               |          |      |        |        |        |                |      |
|   | 1,107                | 0        | 0.0  | 1,107  | 0      | 0      |                |      |
|   | 90,606               | 64,302   | 71.0 | 26,304 |        |        |                |      |
|   | 15,240               | 8,406    | 55.2 |        |        | 0      |                |      |
|   | 37,416               | 29,435   | 78.7 |        |        | 46     |                |      |

Data Table 1, *continued*

## THE AMERICAS

|  | STANDARDIZED MALARIA NOTIFICATIONS |                           |         |                   |                     |        | PROBABLE/CLINICALLY DIAGNOSED |       |        |        |
|--|------------------------------------|---------------------------|---------|-------------------|---------------------|--------|-------------------------------|-------|--------|--------|
|  | YEAR                               | POPULATION<br>(THOUSANDS) | CASES   | RATE<br>PER 1,000 | CONFIRMED<br>STATUS | DEATHS | SLIDES/RDTS                   | CASES | SEVERE | DEATHS |
| COUNTRY                                    | 1                                  | 2                         | 3       | 4                 | 5                   | 6      | 7                             | 8     | 9      | 10     |
| <b>Central America<br/>&amp; Caribbean</b> |                                    |                           |         |                   |                     |        |                               |       |        |        |
| Belize                                     | 2002                               | 251                       | 928     | 3.70              | All                 | 0      | 15,480                        |       |        |        |
| Costa Rica                                 | 2003                               | 4,173                     | 718     | 0.17              | All                 | 0      | 9,622                         |       |        |        |
| Dominican Republic                         | 2003                               | 8,745                     | 1,296   | 0.15              | All                 | 16     | 391,216                       |       |        |        |
| El Salvador                                | 2003                               | 6,515                     | 85      | 0.01              | All                 |        | 102,053                       |       |        |        |
| Guatemala                                  | 2003                               | 12,347                    | 31,127  | 2.52              | All                 | 0      | 156,227                       |       |        |        |
| Haiti                                      | 2003                               | 8,326                     | 9,837   | 1.18              | All                 | 16     | 51,067                        |       |        |        |
| Honduras                                   | 2003                               | 6,941                     | 10,122  | 1.46              | All                 | 0      | 90,575                        |       |        |        |
| Mexico                                     | 2003                               | 103,457                   | 4,289   | 0.04              | All                 | 0      | 1,577,647                     |       |        |        |
| Nicaragua                                  | 2003                               | 5,466                     | 6,812   | 1.25              | All                 | 0      | 449,839                       |       |        |        |
| Panama                                     | 2003                               | 3,120                     | 13,365  | 4.28              | All                 | 3      | 333,622                       |       |        |        |
| <b>South America</b>                       |                                    |                           |         |                   |                     |        |                               |       |        |        |
| Argentina                                  | 2003                               | 38,428                    | 122     | 0.00              | All                 | 0      | 3,977                         |       |        |        |
| Bolivia                                    | 2003                               | 8,808                     | 20,343  | 2.31              | All                 | 2      | 158,299                       |       |        |        |
| Brazil                                     | 2003                               | 178,470                   | 379,551 | 2.13              | All                 | 30     | 1,474,656                     |       |        |        |
| Colombia                                   | 2003                               | 44,222                    | 164,722 | 3.72              | All                 | 24     | 520,980                       |       |        |        |
| Ecuador                                    | 2003                               | 13,003                    | 52,065  | 4.00              | All                 | 0      | 433,244                       |       |        |        |
| French Guiana                              | 2003                               | 178                       | 3,823   | 21.49             | All                 | 0      | 46,548                        |       |        |        |
| Guyana                                     | 2003                               | 765                       | 27,627  | 36.09             | All                 |        | 185,877                       |       |        |        |
| Paraguay                                   | 2003                               | 5,878                     | 1,392   | 0.24              | All                 | 0      | 126,582                       |       |        |        |
| Peru                                       | 2003                               | 27,167                    | 143,686 | 5.29              | All                 | 34     | 1,426,410                     |       |        |        |
| Suriname                                   | 2003                               | 436                       | 14,657  | 33.65             | All                 |        | 70,670                        |       |        |        |
| Venezuela                                  | 2003                               | 25,699                    | 31,719  | 1.23              | All                 |        | 346,586                       |       |        |        |

*Notes:*

Please refer to explanatory notes for regional tabulations.

NR = None Reported

RDTS = Rapid Diagnostic Tests

Pf/mixed = the number of reported *Plasmodium falciparum* or mixed casesPv = the number of reported *Plasmodium vivax* cases

## Malarial Case Notification and Coverage with Key Interventions

| NOTIFIED MALARIA CASES AND DEATHS DESCRIPTION |                      |          |       |         |        |        |                |     |
|---|----------------------|----------|-------|---------|--------|--------|----------------|-----|
|   | LABORATORY CONFIRMED |          |       |         |        |        | INVESTIGATIONS |     |
|   | CASES                | PF/MIXED | (%)   | PV      | SEVERE | DEATHS | IMPORTED       | (%) |
|   | 11                   | 12       | 13    | 14      | 15     | 16     | 17             | 18  |
|   | 928                  | 0        | 0.0   | 928     |        | 0      |                |     |
|   | 718                  | 14       | 1.9   | 704     |        | 0      |                |     |
|   | 1,296                | 1,034    | 79.8  | 4       |        | 16     |                |     |
|   | 85                   | 2        | 2.4   | 83      |        |        |                |     |
|   | 31,127               | 1,310    | 4.2   | 29,817  | 5      | 0      |                |     |
|   | 9,837                | 9,837    | 100.0 | 0       |        | 16     |                |     |
|   | 10,122               | 323      | 3.2   | 9,799   |        | 0      |                |     |
|   | 4,289                | 17       | 0.4   | 4,272   |        | 0      |                |     |
|   | 6,812                | 1,245    | 18.3  | 5,567   |        | 0      |                |     |
|   | 13,365               | 627      | 4.7   | 3,873   |        | 3      |                |     |
|   | 122                  | 0        | 0.0   | 122     |        | 0      |                |     |
|   | 20,343               | 793      | 3.9   | 17,319  |        | 2      |                |     |
|   | 379,551              | 81,343   | 21.4  | 297,962 | 10,719 | 30     |                |     |
|   | 164,722              | 69,238   | 42.0  | 95,484  |        | 24     |                |     |
|   | 52,065               | 10,724   | 20.6  | 41,341  |        | 0      |                |     |
|   | 3,823                | 3,166    | 82.8  | 657     |        | 0      |                |     |
|   | 27,627               | 12,970   | 46.9  | 14,654  |        |        |                |     |
|   | 1,392                | 3        | 0.2   | 1,389   |        | 0      |                |     |
|   | 143,686              | 30,045   | 20.9  | 113,538 |        | 34     |                |     |
|   | 14,657               | 13,043   | 89.0  | 1,614   |        |        |                |     |
|   | 31,719               | 5,562    | 17.5  | 26,111  |        |        |                |     |

**Data Table 2:** Malarial Case Notification: Standardized Malaria Notifications and Notification Rates per 1,000, since 1990**AFRICA**

|                       | 1990                | 1991               | 1992               | 1993               | 1994               | 1995               | 1996               | 1997               |  |
|-----------------------|---------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--|
| <b>Central Africa</b> |                     |                    |                    |                    |                    |                    |                    |                    |  |
| Cameroon              | 869,048<br>74.5     | 787,796<br>65.6    | 664,413<br>53.8    | 478,693<br>37.7    | 189,066<br>14.5    | 784,321<br>58.5    | 931,311<br>67.7    | 787,796<br>55.8    |  |
| CAR                   | 174,436<br>59.3     | 125,038<br>41.4    | 89,930<br>29.0     | 82,072<br>25.8     | 82,057<br>25.1     | 100,962<br>30.1    | 95,259<br>27.7     | 99,718<br>28.4     |  |
| Chad                  | 212,554<br>36.5     | 246,410<br>41.1    | 229,444<br>37.2    | 234,869<br>37.0    | 278,225<br>42.6    | 293,564<br>43.6    | 278,048<br>40.1    | 343,186<br>47.9    |  |
| Congo, Rep. of        | 32,428<br>13.0      | 32,391<br>12.6     | 21,121<br>7.9      | 15,504<br>5.6      | 35,957<br>12.7     | 28,008<br>9.5      | 14,000<br>4.6      | 9,491<br>3.0       |  |
| Congo, Dem Rep. of    |                     |                    |                    |                    |                    |                    | 198,064<br>4.4     |                    |  |
| Equatorial Guinea     | 25,552<br>72.3      | 22,598<br>62.5     | 25,100<br>67.7     | 17,867<br>46.9     | 14,827<br>37.9     | 12,530<br>31.3     |                    |                    |  |
| Gabon                 | 57,450<br>60.3      | 80,247<br>81.6     | 100,629<br>99.2    | 70,928<br>67.8     | 82,245<br>76.3     | 54,849<br>49.4     | 74,310<br>65.2     | 57,450<br>49.0     |  |
| São Tomé and Príncipe |                     |                    |                    |                    |                    | 51,938<br>396.3    | 47,074<br>350.1    | 47,757<br>346.2    |  |
| <b>East Africa</b>    |                     |                    |                    |                    |                    |                    |                    |                    |  |
| Burundi               | 92,870<br>16.6      | 568,938<br>99.4    | 773,539<br>132.9   | 828,429<br>140.4   | 831,481<br>139.3   | 932,794<br>154.9   | 974,226<br>160.8   | 670,857<br>110.3   |  |
| Comoros               |                     |                    |                    | 12,012<br>20.9     | 13,860<br>23.4     | 15,707<br>25.8     | 15,509<br>24.7     |                    |  |
| Djibouti              | 3,237<br>6.1        | 7,338<br>13.5      | 7,468<br>13.6      | 4,166<br>7.5       | 6,140<br>11.0      | 5,982<br>10.5      | 6,105<br>10.5      | 4,314<br>7.1       |  |
| Eritrea               |                     |                    |                    |                    |                    | 81,183<br>25.3     | 129,908<br>39.7    |                    |  |
| Ethiopia              |                     |                    | 206,262<br>4.0     | 305,616<br>5.7     | 358,469<br>6.4     | 412,609<br>7.2     | 478,411<br>8.1     | 509,804<br>8.4     |  |
| Kenya                 |                     |                    |                    |                    | 6,103,447<br>228.9 | 4,343,190<br>158.6 | 3,777,022<br>134.5 |                    |  |
| Rwanda                | 1,282,012<br>189.2  | 1,331,494<br>204.7 | 1,373,247<br>226.7 | 733,203<br>131.7   | 371,550<br>71.2    | 1,391,931<br>271.0 | 1,145,759<br>213.0 | 1,331,494<br>226.0 |  |
| Somalia               |                     |                    |                    | 3,049<br>0.4       |                    |                    |                    |                    |  |
| Sudan                 | 7,508,704<br>301.2  | 6,947,787<br>272.5 | 9,326,944<br>357.3 | 9,867,778<br>368.9 | 8,562,205<br>312.3 | 6,347,143<br>226.1 | 4,595,092<br>159.9 | 4,065,460<br>138.3 |  |
| Uganda                |                     |                    | 2,446,659<br>132.1 | 1,470,662<br>77.0  | 2,191,277<br>111.3 | 1,431,068<br>70.6  |                    | 2,317,840<br>107.9 |  |
| Tanzania              | 10,715,736<br>411.1 | 8,715,736<br>322.9 | 7,681,524<br>274.7 | 8,777,340<br>303.2 | 7,976,590<br>266.6 | 2,438,040<br>79.0  | 4,969,273<br>156.6 | 1,131,655<br>34.8  |  |

Malarial Case Notification and Coverage with Key Interventions

|  | 1998       | 1999      | 2000      | 2001      | 2002      | 2003       |
|--|------------|-----------|-----------|-----------|-----------|------------|
|  | 664,413    |           |           |           |           |            |
|  | 46.0       |           |           |           |           |            |
|  | 105,664    | 127,964   | 89,614    | 140,742   |           | 95,644     |
|  | 29.5       | 35.0      | 24.1      | 37.3      |           | 24.7       |
|  | 395,205    | 392,815   | 369,263   | 386,197   |           |            |
|  | 53.5       | 51.5      | 47.0      | 47.7      |           |            |
|  | 17,122     |           |           |           |           |            |
|  | 5.3        |           |           |           |           |            |
|  | 141,353    | 1,508,042 | 964,623   | 2,199,247 | 2,640,168 | 4,386,638  |
|  | 3.0        | 31.7      | 19.9      | 44.2      | 51.6      | 83.1       |
|  |            |           |           |           |           |            |
|  | 80,247     |           |           |           |           |            |
|  | 66.8       |           |           |           |           |            |
|  | 46,026     | 37,026    | 43,488    | 55,630    | 66,619    | 63,199     |
|  | 325.1      | 254.9     | 291.9     | 364.1     | 425.2     | 393.5      |
|  |            |           |           |           |           |            |
|  | 687,301    | 1,936,584 | 3,057,239 | 2,855,868 | 1,808,588 |            |
|  | 112.4      | 313.9     | 487.9     | 445.4     | 274.0     |            |
|  | 3,844      | 9,793     | 9,618     | 3,718     |           |            |
|  | 5.8        | 14.3      | 13.6      | 5.1       |           |            |
|  | 5,920      | 6,140     | 4,667     | 4,312     | 5,021     | 5,036      |
|  | 9.5        | 9.5       | 7.0       | 6.3       | 7.2       | 7.2        |
|  | 255,150    | 147,062   | 119,155   | 125,746   | 75,386    | 72,023     |
|  | 73.6       | 41.0      | 32.1      | 32.7      | 18.9      | 17.4       |
|  | 604,960    | 647,919   | 383,382   | 400,371   | 427,831   | 565,273    |
|  | 9.7        | 10.1      | 5.8       | 6.0       | 6.2       | 8.0        |
|  | 80,718     | 122,792   | 74,194    | 132,590   | 124,197   |            |
|  | 2.7        | 4.1       | 2.4       | 4.3       | 3.9       |            |
|  | 1,279,581  | 906,552   | 915,916   |           |           | 856,233    |
|  | 195.1      | 125.7     | 118.6     |           |           | 102.1      |
|  |            | 9,055     | 10,364    | 10,364    | 96,922    | 23,349     |
|  |            | 1.1       | 1.2       | 1.1       | 10.2      | 2.4        |
|  | 5,062,000  | 4,215,308 | 4,332,827 | 3,985,702 | 3,056,400 | 3,084,320  |
|  | 168.4      | 137.1     | 137.8     | 124.0     | 93.0      | 91.8       |
|  | 2,845,811  | 3,070,800 | 3,552,859 | 5,622,934 | 7,216,411 | 12,343,411 |
|  | 128.6      | 134.8     | 151.3     | 232.1     | 288.6     | 477.9      |
|  | 30,504,654 | 423,967   |           |           | 7,489,890 | 10,712,526 |
|  | 915.1      | 12.4      |           |           | 206.5     | 289.7      |

Data Table 2, *continued***AFRICA, *continued***

|                        | 1990               | 1991               | 1992               | 1993               | 1994               | 1995               | 1996               | 1997               |  |
|------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--|
| <b>Northern Africa</b> |                    |                    |                    |                    |                    |                    |                    |                    |  |
| Algeria                | 152<br><0.1        | 229<br><0.1        | 106<br><0.1        | 84<br><0.1         | 206<br><0.1        | 107<br><0.1        | 221<br><0.1        | 197<br><0.1        |  |
| Egypt                  | 75<br><0.1         | 24<br><0.1         | 16<br><0.1         | 17<br><0.1         | 495<br><0.1        | 313<br><0.1        | 23<br><0.1         | 4<br><0.1          |  |
| Morocco                | 837<br><0.1        | 494<br><0.1        | 405<br><0.1        | 198<br><0.1        | 158<br><0.1        | 166<br><0.1        | 53<br><0.1         | 76<br><0.1         |  |
| <b>Southern Africa</b> |                    |                    |                    |                    |                    |                    |                    |                    |  |
| Angola                 | 243,673<br>26.1    | 1,143,701<br>119.0 | 782,988<br>79.0    | 722,981<br>70.6    | 667,376<br>63.2    | 156,603<br>14.4    |                    | 893,232<br>78.0    |  |
| Botswana               | 10,750<br>7.9      | 14,364<br>10.3     | 4,995<br>3.5       | 55,331<br>37.6     | 29,591<br>19.6     | 17,599<br>11.4     | 80,004<br>50.4     | 101,887<br>62.6    |  |
| Madagascar             |                    |                    |                    |                    |                    | 196,358<br>14.2    |                    |                    |  |
| Malawi                 | 3,870,904<br>409.3 |                    | 7,590,313<br>774.8 | 4,686,201<br>475.5 | 4,736,974<br>477.4 | 6,164,666<br>613.6 | 6,183,290<br>603.5 | 2,761,269<br>263.0 |  |
| Mauritius              | 54<br>0.1          | 48<br><0.1         | 66<br>0.1          | 54<br><0.1         | 65<br>0.1          | 46<br><0.1         | 82<br>0.1          | 65<br>0.1          |  |
| Mozambique             |                    |                    |                    |                    |                    |                    | 12,794<br>0.8      |                    |  |
| Namibia                |                    |                    |                    | 380,530<br>245.2   | 401,519<br>251.3   | 275,442<br>167.3   | 345,177<br>203.4   | 390,601<br>223.2   |  |
| South Africa           | 6,822<br>0.2       | 4,693<br>0.1       | 2,872<br>0.1       | 13,285<br>0.3      | 10,289<br>0.3      | 8,750<br>0.2       | 27,035<br>0.6      | 23,121<br>0.5      |  |
| Swaziland              |                    |                    |                    |                    |                    | 13,749<br>14.6     | 38,875<br>40.5     | 23,754<br>24.2     |  |
| Zambia                 | 1,933,696<br>235.8 | 2,340,994<br>277.5 | 2,953,692<br>340.6 | 3,514,000<br>394.5 | 3,514,000<br>384.5 | 2,742,118<br>292.6 | 3,215,866<br>335.0 |                    |  |
| Zimbabwe               | 662,613<br>63.3    | 581,168<br>54.0    | 420,137<br>38.1    | 877,734<br>77.9    | 324,188<br>28.2    | 761,791<br>64.9    | 1,696,192<br>142.0 | 1,849,383<br>152.2 |  |

Malarial Case Notification and Coverage with Key Interventions

|  | 1998      | 1999      | 2000      | 2001      | 2002      | 2003      |
|--|-----------|-----------|-----------|-----------|-----------|-----------|
|  | 256       | 701       | 63        | 53        | 52        |           |
|  | <0.1      | <0.1      | <0.1      | <0.1      | <0.1      |           |
|  | 0         | 0         | 0         | 0         | 0         | 0         |
|  | 0         | 0         | 0         | 0         | 0         | 0         |
|  | 68        | 17        | 3         | 0         | 20        | 4         |
|  | <0.1      | <0.1      | <0.1      | 0         | <0.1      | <0.1      |
|  | 1,169,028 | 1,471,993 | 1,635,884 | 1,385,597 | 1,409,328 |           |
|  | 99.6      | 122.2     | 132.1     | 108.5     | 106.9     |           |
|  | 59,696    | 72,640    | 71,403    | 48,237    | 28,858    | 22,418    |
|  | 35.9      | 42.8      | 41.4      | 27.6      | 16.3      | 12.6      |
|  |           | 1,141,474 | 1,383,239 | 1,429,491 | 1,543,130 | 2,114,400 |
|  |           | 73.6      | 86.6      | 87.0      | 91.2      | 121.5     |
|  | 2,985,659 | 4,193,145 | 3,774,982 | 2,955,627 | 2,853,317 |           |
|  | 276.6     | 378.1     | 332.0     | 254.2     | 240.4     |           |
|  | 0         | 0         | 0         | 0         | 22        |           |
|  | 0         | 0         | 0         | 0         | <0.1      |           |
|  | 194,024   | 2,336,640 | 3,278,525 | 3,978,397 | 4,458,589 | 5,087,865 |
|  | 11.3      | 133.4     | 183.6     | 218.6     | 240.5     | 269.7     |
|  | 353,110   | 429,571   | 519,113   | 537,115   | 442,527   | 444,081   |
|  | 196.0     | 232.1     | 274.2     | 278.3     | 225.6     | 223.4     |
|  | 26,445    | 51,444    | 64,622    | 26,506    | 15,649    | 13,446    |
|  | 0.6       | 1.2       | 1.5       | 0.6       | 0.3       | 0.3       |
|  | 4,410     | 30,420    | 45,581    | 19,799    | 14,863    | 36,664    |
|  | 4.4       | 29.6      | 43.6      | 18.7      | 13.9      | 34.0      |
|  | 3,399,630 | 2,992,203 | 1,139,489 | 2,010,185 |           |           |
|  | 338.5     | 292.1     | 109.4     | 190.2     |           |           |
|  | 1,719,960 | 1,804,479 | 1,533,960 | 1,609,296 | 1,252,668 |           |
|  | 139.3     | 144.2     | 121.3     | 126.2     | 97.6      |           |

Data Table 2, *continued***AFRICA, *continued***

|                       | 1990               | 1991              | 1992              | 1993               | 1994              | 1995               | 1996               | 1997               |  |
|-----------------------|--------------------|-------------------|-------------------|--------------------|-------------------|--------------------|--------------------|--------------------|--|
| <b>Western Africa</b> |                    |                   |                   |                    |                   |                    |                    |                    |  |
| Benin                 | 92,870<br>20.0     | 118,796<br>24.7   | 290,868<br>58.5   | 403,327<br>78.5    | 546,827<br>103.0  | 579,300<br>105.9   | 623,396<br>110.9   | 670,857<br>116.2   |  |
| Burkina Faso          | 496,513<br>55.7    | 448,917<br>48.9   | 420,186<br>44.5   | 502,275<br>51.6    | 472,355<br>47.2   | 501,020<br>48.6    | 582,658<br>54.9    | 672,752<br>61.6    |  |
| Cape Verde            | 69<br>0.2          | 80<br>0.2         | 38<br>0.1         | 44<br>0.1          | 21<br>0.1         | 127<br>0.3         | 77<br>0.2          | 20<br><0.1         |  |
| Côte d'Ivoire         | 511,916<br>40.9    | 466,895<br>36.2   | 553,875<br>41.7   | 421,043<br>30.8    |                   | 755,812<br>52.6    | 1,109,011<br>75.5  | 983,089<br>65.6    |  |
| Gambia, The           | 222,538<br>237.7   | 215,414<br>221.9  | 188,035<br>187.0  |                    | 299,824<br>278.3  | 135,909<br>121.9   | 266,189<br>230.8   | 325,555<br>272.9   |  |
| Ghana                 | 1,438,713<br>94.2  | 1,372,771<br>87.4 | 1,446,947<br>89.5 | 1,697,109<br>102.1 | 1,672,709<br>98.0 | 1,928,316<br>110.1 | 2,189,860<br>122.1 | 2,227,762<br>121.4 |  |
| Guinea                | 21,762<br>3.6      | 17,718<br>2.8     |                   |                    | 607,560<br>85.6   | 600,317<br>82.0    | 772,731<br>102.8   | 802,210<br>104.3   |  |
| Guinea-Bissau         | 81,835<br>80.5     | 64,123<br>61.2    | 56,073<br>51.8    | 158,748<br>142.0   |                   | 197,386<br>165.9   | 6,457<br>5.3       | 10,632<br>8.4      |  |
| Liberia               |                    |                   |                   | 430,085<br>209.1   | 534,559<br>258.2  | 362,774<br>170.4   | 239,998<br>107.2   | 826,151<br>344.9   |  |
| Mali                  | 248,904<br>27.5    | 282,256<br>30.4   | 280,562<br>29.4   | 295,737<br>30.2    | 263,100<br>26.1   | 95,357<br>9.2      | 29,818<br>2.8      | 384,907<br>35.2    |  |
| Mauritania            | 26,903<br>13.3     | 42,112<br>20.3    | 45,687<br>21.4    | 43,892<br>20.1     | 156,080<br>69.7   | 214,478<br>93.3    | 181,204<br>76.7    | 189,571<br>78.1    |  |
| Niger                 | 1,162,824<br>152.0 | 808,968<br>102.3  | 865,976<br>106.0  | 726,666<br>86.0    | 806,204<br>92.3   | 778,175<br>86.1    | 1,162,824<br>124.4 | 978,855<br>101.2   |  |
| Nigeria               | 1,116,992<br>13.0  | 909,656<br>10.3   | 1,219,348<br>13.4 | 981,943<br>10.4    | 1,175,004<br>12.1 | 1,133,926<br>11.4  | 1,149,435<br>11.2  | 1,148,542<br>10.9  |  |
| Senegal               |                    |                   |                   |                    | 450,071<br>55.3   | 628,773<br>75.4    |                    | 861,276<br>98.5    |  |
| Sierra Leone          |                    |                   |                   | 9,636<br>2.4       | 16,851<br>4.1     | 5,865<br>1.4       | 7,192<br>1.8       | 209,312<br>50.5    |  |
| Togo                  | 810,509<br>234.6   | 780,825<br>220.9  | 634,166<br>175.7  | 561,328<br>152.4   | 328,488<br>87.2   | 297,326<br>76.9    | 352,334<br>88.3    | 366,672<br>88.8    |  |

Malarial Case Notification and Coverage with Key Interventions

|  | 1998      | 1999      | 2000      | 2001      | 2002      | 2003      |
|--|-----------|-----------|-----------|-----------|-----------|-----------|
|  | 650,025   | 709,348   | 707,408   | 779,041   |           |           |
|  | 109.9     | 116.9     | 113.7     | 122.0     |           |           |
|  | 721,480   | 867,866   | 1,032,886 | 1,203,640 | 1,451,125 |           |
|  | 64.2      | 75.1      | 86.8      | 98.2      | 114.9     |           |
|  | 41        | 29        | 143       |           |           |           |
|  | 0.1       | 0.1       | 0.3       |           |           |           |
|  |           |           | 1,491,943 | 400,402   |           |           |
|  |           |           | 94.3      | 24.9      |           |           |
|  |           | 127,899   |           |           |           |           |
|  |           | 100.5     |           |           |           |           |
|  | 1,745,214 | 2,895,079 | 3,349,528 | 3,383,025 | 2,830,784 | 3,552,869 |
|  | 93.0      | 151.0     | 171.0     | 168.9     | 138.3     | 169.8     |
|  | 817,949   | 807,895   | 889,089   |           |           |           |
|  | 104.3     | 101.2     | 109.5     |           |           |           |
|  | 2,113     | 197,454   | 246,316   | 202,379   | 194,976   |           |
|  | 1.6       | 148.6     | 180.2     | 143.9     | 134.6     |           |
|  | 777,754   |           |           |           |           |           |
|  | 301.5     |           |           |           |           |           |
|  | 12,234    | 530,197   | 546,634   | 612,895   | 723,077   | 809,428   |
|  | 1.1       | 45.8      | 45.9      | 50.0      | 57.3      | 62.2      |
|  | 168,131   | 253,513   | 259,093   | 243,942   | 167,423   |           |
|  | 67.3      | 98.7      | 98.0      | 89.5      | 59.6      |           |
|  | 872,925   | 815,895   | 646,757   | 606,802   | 681,707   |           |
|  | 87.2      | 78.7      | 60.2      | 54.5      | 59.1      |           |
|  | 2,122,663 | 1,965,486 | 2,476,608 | 2,253,519 | 2,605,381 | 2,608,479 |
|  | 19.5      | 17.6      | 21.6      | 19.1      | 21.5      | 21.0      |
|  | 948,823   | 1,145,112 | 1,120,094 |           |           |           |
|  | 105.9     | 124.9     | 119.3     |           |           |           |
|  | 249,744   | 409,670   |           |           |           |           |
|  | 59.4      | 95.4      |           |           |           |           |
|  | 368,472   | 412,619   | 398,103   | 431,826   |           |           |
|  | 86.1      | 93.3      | 87.3      | 92.1      |           |           |

Data Table 2, *continued***ASIA**

|  | 1990    | 1991    | 1992   | 1993   | 1994    | 1995    | 1996    | 1997      |  |
|--|---------|---------|--------|--------|---------|---------|---------|-----------|--|
| <b>Central Asia &amp; Trans-Caucasus</b> |         |         |        |        |         |         |         |           |  |
| Armenia                                  | 0       | 0       | 0      | 0      | 1       | 0       | 149     | 567       |  |
|  | 0       | 0       | 0      | 0      | <0.1    | 0       | <0.1    | 0.2       |  |
| Azerbaijan                               | 24      | 113     | 27     | 23     | 667     | 2,840   | 13,135  | 9,911     |  |
|  | <0.1    | <0.1    | <0.1   | <0.1   | 0.1     | 0.4     | 1.7     | 1.2       |  |
| Georgia                                  | 0       | 0       | 0      | 0      | 0       | 0       | 3       | 0         |  |
|  | 0       | 0       | 0      | 0      | 0       | 0       | <0.1    | 0         |  |
| Kyrgyzstan                               | 0       | 0       | 0      | 0      | 0       | 0       | 1       | 0         |  |
|  | 0       | 0       | 0      | 0      | 0       | 0       | <0.1    | 0         |  |
| Tajikistan                               | 175     | 294     | 404    | 619    | 2,411   | 6,103   | 16,561  | 29,794    |  |
|  | <0.1    | 0.1     | 0.1    | 0.1    | 0.4     | 1.1     | 2.8     | 5.1       |  |
| Turkmenistan                             | 0       | 13      | 5      | 1      | 1       | 0       | 3       | 4         |  |
|  | 0       | <0.1    | <0.1   | <0.1   | <0.1    | 0       | <0.1    | <0.1      |  |
| Uzbekistan                               | 3       | 1       | 0      | 0      | 0       | 0       | 0       | 0         |  |
|  | <0.1    | <0.1    | 0      | 0      | 0       | 0       | 0       | 0         |  |
| <b>Eastern Mediterranean</b>             |         |         |        |        |         |         |         |           |  |
| Afghanistan                              | 317,479 | 297,605 |        |        | 88,302  |         | 303,955 | 202,767   |  |
|  | 23.0    | 20.3    |        |        | 4.8     |         | 15.3    | 10.0      |  |
| Iran                                     | 77,470  | 96,340  | 76,971 | 64,581 | 51,089  | 67,532  | 56,362  | 38,684    |  |
|  | 1.4     | 1.7     | 1.3    | 1.1    | 0.8     | 1.1     | 0.9     | 0.6       |  |
| Iraq                                     | 3,924   | 1,764   | 5,752  | 49,863 | 98,243  | 98,705  | 49,840  | 13,959    |  |
|  | 0.2     | 0.1     | 0.3    | 2.6    | 5.0     | 4.9     | 2.4     | 0.7       |  |
| Oman                                     | 32,720  | 19,274  | 14,827 | 16,873 | 7,083   | 1,164   | 603     | 129       |  |
|  | 17.7    | 10.0    | 7.4    | 8.1    | 3.3     | 0.5     | 0.3     | 0.1       |  |
| Pakistan                                 | 79,689  | 66,586  | 99,015 | 92,634 | 108,586 | 109,792 | 98,035  | 77,480    |  |
|  | 0.7     | 0.6     | 0.8    | 0.8    | 0.9     | 0.9     | 0.8     | 0.6       |  |
| Saudi Arabia                             | 15,666  | 9,962   | 19,623 | 18,380 | 10,032  | 15,662  | 15,221  | 17,692    |  |
|  | 0.9     | 0.6     | 1.1    | 1.0    | 0.5     | 0.8     | 0.8     | 0.9       |  |
| Syrian Arab Republic                     | 107     | 54      | 456    | 966    | 583     | 582     | 280     | 83        |  |
|  | <0.1    | <0.1    | <0.1   | 0.1    | <0.1    | <0.1    | <0.1    | <0.1      |  |
| Turkey                                   | 8,675   | 12,213  | 18,665 | 47,206 | 84,321  | 81,754  | 60,634  | 35,376    |  |
|  | 0.2     | 0.2     | 0.3    | 0.8    | 1.4     | 1.3     | 0.9     | 0.5       |  |
| United Arab Emirates                     | 3,514   | 3,457   | 3,605  | 3,735  | 3,335   | 8       | 2,863   | 1         |  |
|  | 1.7     | 1.6     | 1.6    | 1.6    | 1.4     | <0.1    | 1.1     | <0.1      |  |
| Yemen                                    | 11,384  | 12,717  | 29,320 | 31,262 | 37,201  | 500,000 | 416,246 | 1,394,495 |  |
|  | 1.0     | 1.0     | 2.2    | 2.3    | 2.6     | 33.1    | 26.5    | 85.6      |  |

Malarial Case Notification and Coverage with Key Interventions

|  | 1998    | 1999      | 2000      | 2001    | 2002    | 2003    |
|--|---------|-----------|-----------|---------|---------|---------|
|  | 542     | 329       | 56        | 31      | 16      | 8       |
|  | 0.2     | 0.1       | <0.1      | <0.1    | <0.1    | <0.1    |
|  | 5,175   | 2,311     | 1,526     | 1,054   | 505     | 480     |
|  | 0.6     | 0.3       | 0.2       | 0.1     | 0.1     | 0.1     |
|  | 14      | 35        | 244       | 437     | 473     | 308     |
|  | <0.1    | <0.1      | <0.1      | 0.1     | 0.1     | 0.1     |
|  | 5       | 0         | 7         | 15      | 2,712   | 465     |
|  | <0.1    | 0         | <0.1      | <0.1    | 0.5     | 0.1     |
|  | 19,351  | 13,493    | 19,064    | 11,387  | 6,160   | 5,428   |
|  | 3.2     | 2.2       | 3.1       | 1.9     | 1.0     | 0.9     |
|  | 115     | 10        | 18        | 5       | 15      |         |
|  | <0.1    | <0.1      | <0.1      | <0.1    | <0.1    |         |
|  | 0       | 7         | 46        | 9       | 11      | 33      |
|  | 0       | <0.1      | <0.1      | <0.1    | <0.1    | <0.1    |
|  | 288,070 | 395,581   | 203,911   | 364,243 | 590,176 | 591,441 |
|  | 14.0    | 18.9      | 9.5       | 16.5    | 25.7    | 24.7    |
|  | 32,951  | 23,110    | 19,716    | 8,895   | 9,122   | 17,060  |
|  | 0.5     | 0.4       | 0.3       | 0.1     | 0.1     | 0.2     |
|  | 9,684   | 4,143     | 1,860     | 1,265   | 952     | 303     |
|  | 0.4     | 0.2       | 0.1       | 0.1     | <0.1    | <0.1    |
|  | 116     | 30        | 6         | 2       | 6       | 6       |
|  | <0.1    | <0.1      | <0.1      | <0.1    | <0.1    | <0.1    |
|  | 73,516  | 91,774    | 82,526    | 104,003 | 101,761 | 122,560 |
|  | 0.5     | 0.7       | 0.6       | 0.7     | 0.7     | 0.8     |
|  | 36,139  | 10,099    | 4,736     | 1,614   | 1,226   | 596     |
|  | 1.7     | 0.5       | 0.2       | 0.1     | 0.1     | <0.1    |
|  | 14      | 5         | 6         | 63      | 15      | 2       |
|  | <0.1    | <0.1      | <0.1      | <0.1    | <0.1    | <0.1    |
|  | 36,780  | 20,908    | 11,381    | 10,758  | 10,184  | 9,182   |
|  | 0.6     | 0.3       | 0.2       | 0.2     | 0.1     | 0.1     |
|  | 0       | 0         | 0         | 0       | 0       | 0       |
|  | 0       | 0         | 0         | 0       | 0       | 0       |
|  |         | 2,781,640 | 1,394,495 |         | 187,159 | 265,023 |
|  |         | 159.7     | 77.4      |         | 9.7     | 13.2    |

Data Table 2, *continued***ASIA, continued**

|                        | 1990             | 1991             | 1992             | 1993             | 1994             | 1995             | 1996             | 1997             |  |
|------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|--|
| <b>South-East Asia</b> |                  |                  |                  |                  |                  |                  |                  |                  |  |
| Bangladesh             | 53,875<br>0.5    | 63,578<br>0.6    | 115,660<br>1.0   | 125,402<br>1.1   | 166,564<br>1.4   | 152,729<br>1.2   | 100,864<br>0.8   | 68,594<br>0.5    |  |
| Bhutan                 | 9,497<br>5.6     | 22,126<br>12.8   | 28,900<br>16.6   | 28,116<br>15.9   | 39,852<br>22.3   | 23,188<br>12.8   | 15,696<br>8.5    | 9,029<br>4.8     |  |
| Korea, DPR             |                  |                  |                  |                  |                  |                  |                  |                  |  |
| India                  | 2,018,783<br>2.4 | 2,117,460<br>2.5 | 2,125,826<br>2.4 | 2,207,431<br>2.5 | 2,511,453<br>2.7 | 2,988,231<br>3.2 | 3,035,588<br>3.2 | 2,660,057<br>2.8 |  |
| Indonesia              | 171,908<br>0.9   | 132,412<br>0.7   | 103,277<br>0.5   | 136,367<br>0.7   | 145,920<br>0.8   | 123,226<br>0.6   | 179,878<br>0.9   | 161,285<br>0.8   |  |
| Maldives               | 16<br>0.1        | 27<br>0.1        | 25<br>0.1        | 29<br>0.1        | 16<br>0.1        | 17<br>0.1        | 9<br><0.1        | 10<br><0.1       |  |
| Myanmar                | 989,042<br>24.4  | 939,257<br>22.8  | 789,672<br>18.8  | 702,239<br>16.5  | 701,043<br>16.2  | 656,547<br>14.9  | 664,507<br>14.8  | 568,262<br>12.5  |  |
| Nepal                  | 22,856<br>1.2    | 29,135<br>1.5    | 23,234<br>1.2    | 16,380<br>0.8    | 9,442<br>0.5     | 9,718<br>0.5     | 6,628<br>0.3     | 8,957<br>0.4     |  |
| Sri Lanka              | 287,384<br>17.1  | 400,263<br>23.5  | 399,349<br>23.2  | 327,020<br>18.8  | 273,434<br>15.5  | 142,294<br>8.0   | 184,319<br>10.3  | 218,550<br>12.1  |  |
| Thailand               | 273,880<br>5.0   | 198,383<br>3.6   | 168,370<br>3.0   | 115,220<br>2.0   | 102,119<br>1.8   | 82,743<br>1.4    | 87,622<br>1.5    | 97,540<br>1.7    |  |
| Timor Leste            |                  |                  |                  |                  |                  |                  |                  |                  |  |
| <b>Western Pacific</b> |                  |                  |                  |                  |                  |                  |                  |                  |  |
| Cambodia               | 123,796<br>12.7  | 102,930<br>10.2  | 93,595<br>9.0    | 98,956<br>9.2    | 74,190<br>6.7    | 76,923<br>6.7    | 74,883<br>6.3    | 85,661<br>7.0    |  |
| China                  | 89,000<br>0.1    | 83,000<br>0.1    | 74,000<br>0.1    | 59,000<br><0.1   | 62,000<br>0.1    | 47,118<br><0.1   | 33,382<br><0.1   | 26,800<br><0.1   |  |
| Lao PDR                | 22,044<br>5.3    | 41,048<br>9.7    | 39,904<br>9.2    | 41,556<br>9.3    | 53,707<br>11.7   | 52,021<br>11.1   | 51,544<br>10.7   | 54,133<br>11.0   |  |
| Malaysia               | 50,500<br>2.8    | 39,189<br>2.1    | 36,853<br>2.0    | 39,890<br>2.1    | 58,958<br>3.0    | 59,208<br>2.9    | 52,060<br>2.5    | 26,651<br>1.2    |  |
| Papua New Guinea       | 104,900<br>25.5  | 86,500<br>20.5   | 86,500<br>19.9   | 66,797<br>15.0   | 65,000<br>14.2   | 99,000<br>21.1   | 71,013<br>14.7   | 38,105<br>7.7    |  |
| Philippines            | 86,200<br>1.4    | 86,400<br>1.4    | 95,778<br>1.5    | 64,944<br>1.0    | 61,959<br>0.9    | 56,852<br>0.8    | 40,545<br>0.6    | 42,005<br>0.6    |  |
| Republic of Korea      | 0<br>0           | 0<br>0           | 0<br>0           | 1<br><0.1        | 20<br><0.1       | 107<br><0.1      | 396<br><0.1      | 1,724<br><0.1    |  |

Malarial Case Notification and Coverage with Key Interventions

|  | 1998      | 1999      | 2000      | 2001      | 2002      | 2003      |
|--|-----------|-----------|-----------|-----------|-----------|-----------|
|  | 60,023    | 63,738    | 55,599    | 55,646    | 55,646    | 56,879    |
|  | 0.5       | 0.5       | 0.4       | 0.4       | 0.4       | 0.4       |
|  | 7,693     | 12,237    | 5,935     | 5,982     | 6,511     | 3,806     |
|  | 3.9       | 6.1       | 2.9       | 2.8       | 3.0       | 1.7       |
|  | 1,085     | 7,980     | 73,742    | 115,615   | 98,852    | 16,538    |
|  | <0.1      | 0.4       | 3.3       | 5.2       | 4.4       | 0.7       |
|  | 2,222,748 | 2,284,713 | 2,031,790 | 2,085,484 | 1,842,019 | 1,781,336 |
|  | 2.3       | 2.3       | 2.0       | 2.0       | 1.8       | 1.7       |
|  | 160,282   |           | 245,612   | 267,592   | 220,073   |           |
|  | 0.8       |           | 1.2       | 1.2       | 1.0       |           |
|  | 25        | 20        | 0         | 0         | 0         | 0         |
|  | 0.1       | 0.1       | 0         | 0         | 0         | 0         |
|  | 548,066   | 591,826   | 592,354   | 661,463   | 721,739   | 716,100   |
|  | 11.9      | 12.6      | 12.5      | 13.7      | 14.8      | 14.5      |
|  | 8,498     | 8,959     | 7,616     | 6,408     | 12,786    | 9,394     |
|  | 0.4       | 0.4       | 0.3       | 0.3       | 0.5       | 0.4       |
|  | 211,691   | 264,549   | 210,039   | 66,522    | 41,411    | 10,510    |
|  | 11.6      | 14.3      | 11.3      | 3.5       | 2.2       | 0.6       |
|  | 131,055   | 125,379   | 81,692    | 63,528    | 45,240    | 35,076    |
|  | 2.2       | 2.1       | 1.3       | 1.0       | 0.7       | 0.6       |
|  | 10,332    |           | 49,836    | 63,440    | 26,651    | 31,819    |
|  | 13.8      |           | 71.0      | 89.2      | 36.1      | 40.9      |
|  | 58,874    | 64,679    | 62,439    | 53,601    | 46,902    | 71,258    |
|  | 4.7       | 5.0       | 4.7       | 4.0       | 3.4       | 5.0       |
|  | 27,090    | 26,797    | 18,620    | 26,945    | 25,520    |           |
|  | <0.1      | <0.1      | <0.1      | <0.1      | <0.1      |           |
|  | 41,039    | 28,096    | 40,023    | 26,932    | 21,384    | 18,894    |
|  | 8.1       | 5.4       | 7.6       | 5.0       | 3.9       | 3.3       |
|  | 13,491    | 11,106    | 12,705    | 12,780    | 11,019    | 5,477     |
|  | 0.6       | 0.5       | 0.6       | 0.5       | 0.5       | 0.2       |
|  | 20,900    | 18,564    | 81,192    | 89,819    | 79,822    | 70,226    |
|  | 4.1       | 3.6       | 15.2      | 16.4      | 14.3      | 12.3      |
|  | 50,709    | 37,061    | 36,596    | 34,787    | 37,005    | 43,644    |
|  | 0.7       | 0.5       | 0.5       | 0.5       | 0.5       | 0.5       |
|  | 3,992     | 3,621     | 4,142     | 2,488     | 1,763     | 1,107     |
|  | 0.1       | 0.1       | 0.1       | 0.1       | <0.1      | <0.1      |

Data Table 2, *continued***ASIA, *continued***

|  | 1990             | 1991             | 1992             | 1993             | 1994             | 1995             | 1996            | 1997            |  |
|--|------------------|------------------|------------------|------------------|------------------|------------------|-----------------|-----------------|--|
| <b>Western Pacific,<br/><i>continued</i></b> |                  |                  |                  |                  |                  |                  |                 |                 |  |
| Solomon Islands                              | 116,500<br>365.7 | 141,400<br>429.9 | 153,359<br>451.5 | 126,123<br>359.6 | 131,687<br>363.6 | 118,521<br>316.9 | 84,795<br>219.7 | 68,125<br>171.0 |  |
| Vanuatu                                      | 28,805<br>192.7  | 19,466<br>126.7  | 12,842<br>81.3   | 11,483<br>70.6   | 5,765<br>34.4    | 11,954<br>69.4   | 5,740<br>32.4   | 6,103<br>33.5   |  |
| Vietnam                                      | 123,796<br>1.9   | 187,994<br>2.8   | 225,928<br>3.3   | 156,069<br>2.2   | 140,120<br>2.0   | 100,116<br>1.4   | 76,356<br>1.0   | 65,859<br>0.9   |  |

## Malarial Case Notification and Coverage with Key Interventions

|  | 1998   | 1999   | 2000   | 2001   | 2002   | 2003   |
|--|--------|--------|--------|--------|--------|--------|
|  | 72,808 | 63,169 | 67,884 | 76,417 | 74,865 | 90,606 |
|  | 177.2  | 149.1  | 155.4  | 169.8  | 161.5  | 189.9  |
|  | 6,181  | 5,180  | 6,422  | 7,647  | 14,339 | 15,240 |
|  | 33.1   | 27.0   | 32.6   | 37.9   | 69.3   | 71.9   |
|  | 72,091 | 64,679 | 62,442 | 53,601 | 46,902 | 37,416 |
|  | 0.9    | 0.8    | 0.8    | 0.7    | 0.6    | 0.5    |

Data Table 2, *continued***THE AMERICAS**

|  | 1990           | 1991           | 1992           | 1993           | 1994           | 1995           | 1996           | 1997           |
|--|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| <b>Central America<br/>&amp; Caribbean</b> |                |                |                |                |                |                |                |                |
| Belize                                     | 3,033<br>16.3  | 3,317<br>17.4  | 5,341<br>27.2  | 8,586<br>42.5  | 9,957<br>47.9  | 9,413<br>44.1  | 6,605<br>30.2  | 4,014<br>17.9  |
| Costa Rica                                 | 1,151<br>0.4   | 3,273<br>1.0   | 6,951<br>2.2   | 5,033<br>1.5   | 4,445<br>1.3   | 4,515<br>1.3   | 5,480<br>1.5   | 4,712<br>1.3   |
| Dominican Republic                         | 356<br>0.1     | 377<br>0.1     | 698<br>0.1     | 987<br>0.1     | 1,670<br>0.2   | 1,808<br>0.2   | 1,414<br>0.2   | 816<br>0.1     |
| El Salvador                                | 9,269<br>1.8   | 5,933<br>1.1   | 4,539<br>0.9   | 3,887<br>0.7   | 2,803<br>0.5   | 3,362<br>0.6   | 5,888<br>1.0   | 2,719<br>0.5   |
| Guatemala                                  | 41,711<br>4.8  | 57,829<br>6.4  | 57,560<br>6.2  | 41,868<br>4.4  | 22,057<br>2.3  | 24,178<br>2.4  | 20,268<br>2.0  | 32,099<br>3.0  |
| Haiti                                      | 4,806<br>0.7   | 25,511<br>3.6  | 13,457<br>1.9  | 853<br>0.1     | 23,140<br>3.1  |                | 18,877<br>2.5  |                |
| Honduras                                   | 53,095<br>10.9 | 73,352<br>14.6 | 70,838<br>13.7 | 44,513<br>8.4  | 52,110<br>9.5  | 59,446<br>10.5 | 74,487<br>12.8 | 65,863<br>11.0 |
| Mexico                                     | 44,513<br>0.5  | 26,565<br>0.3  | 16,170<br>0.2  | 15,793<br>0.2  | 12,864<br>0.1  | 7,316<br>0.1   | 6,293<br>0.1   | 5,046<br>0.1   |
| Nicaragua                                  | 35,785<br>9.4  | 27,653<br>7.0  | 26,866<br>6.6  | 44,037<br>10.6 | 41,490<br>9.7  | 69,444<br>15.7 | 75,606<br>16.6 | 42,819<br>9.1  |
| Panama                                     | 381<br>0.2     | 1,115<br>0.5   | 727<br>0.3     | 481<br>0.2     | 684<br>0.3     | 730<br>0.3     | 476<br>0.2     | 505<br>0.2     |
| <b>South America</b>                       |                |                |                |                |                |                |                |                |
| Argentina                                  | 1,660<br>0.1   | 803<br><0.1    | 643<br><0.1    | 758<br><0.1    | 948<br><0.1    | 1,065<br><0.1  | 2,048<br>0.1   | 592<br><0.1    |
| Bolivia                                    | 19,680<br>3.0  | 19,031<br>2.8  | 24,486<br>3.5  | 27,475<br>3.8  | 34,749<br>4.8  | 46,911<br>6.3  | 64,012<br>8.4  | 51,478<br>6.6  |
| Brazil                                     | 560,396<br>3.8 | 614,431<br>4.1 | 609,860<br>4.0 | 466,190<br>3.0 | 564,406<br>3.6 | 565,727<br>3.5 | 455,194<br>2.8 | 392,976<br>2.4 |
| Colombia                                   | 99,489<br>2.8  | 184,156<br>5.2 | 184,023<br>5.1 | 129,377<br>3.5 | 127,218<br>3.4 | 187,082<br>4.9 | 135,923<br>3.5 | 180,898<br>4.5 |
| Ecuador                                    | 71,670<br>7.0  | 59,400<br>5.7  | 41,089<br>3.8  | 46,859<br>4.3  | 30,006<br>2.7  | 18,128<br>1.6  | 11,882<br>1.0  | 16,365<br>1.4  |
| French Guiana                              | 5,909<br>50.8  | 3,573<br>29.5  | 4,072<br>32.4  | 3,974<br>30.6  | 4,241<br>31.6  | 4,711<br>34.0  | 4,724<br>32.9  | 3,195<br>21.5  |
| Guyana                                     | 22,681<br>31.0 | 42,204<br>57.8 | 39,702<br>54.3 | 33,172<br>45.2 | 39,566<br>53.6 | 59,311<br>80.0 |                | 32,103<br>42.9 |

|  | 1998    | 1999    | 2000    | 2001    | 2002    | 2003    |
|--|---------|---------|---------|---------|---------|---------|
|  | 2,614   | 1,850   | 1,486   | 1,097   | 928     |         |
|  | 11.4    | 7.9     | 6.2     | 4.5     | 3.7     |         |
|  | 5,148   | 3,998   | 1,879   | 1,363   | 1,021   | 718     |
|  | 1.4     | 1.0     | 0.5     | 0.3     | 0.2     | 0.2     |
|  | 2,006   | 3,589   | 1,215   | 1,038   | 1,296   | 1,296   |
|  | 0.2     | 0.4     | 0.1     | 0.1     | 0.2     | 0.1     |
|  | 1,182   | 1,230   | 745     | 362     | 117     | 85      |
|  | 0.2     | 0.2     | 0.1     | 0.1     | <0.1    | <0.1    |
|  | 47,689  | 45,098  | 53,311  | 35,824  | 35,540  | 31,127  |
|  | 4.4     | 4.1     | 4.7     | 3.1     | 3.0     | 2.5     |
|  | 34,449  | 1,196   | 16,897  | 9,837   |         | 9,837   |
|  | 4.4     | 0.2     | 2.1     | 1.2     |         | 1.2     |
|  | 42,979  | 46,740  | 35,122  | 24,023  | 17,223  | 10,122  |
|  | 7.0     | 7.4     | 5.4     | 3.6     | 2.5     | 1.5     |
|  | 14,451  | 6,402   | 7,390   | 4,831   | 4,289   | 4,289   |
|  | 0.2     | 0.1     | 0.1     | <0.1    | <0.1    | <0.1    |
|  | 33,903  | 38,676  | 24,014  | 10,482  | 7,466   | 6,812   |
|  | 7.0     | 7.8     | 4.7     | 2.0     | 1.4     | 1.2     |
|  | 1,039   | 936     | 1,036   | 928     | 2,244   | 13,365  |
|  | 0.4     | 0.3     | 0.4     | 0.3     | 0.7     | 4.3     |
|  | 339     | 222     | 440     | 215     | 215     | 122     |
|  | <0.1    | <0.1    | <0.1    | <0.1    | <0.1    | <0.1    |
|  | 73,913  | 50,037  | 31,468  | 15,765  | 14,276  | 20,343  |
|  | 9.3     | 6.1     | 3.8     | 1.9     | 1.7     | 2.3     |
|  | 471,892 | 609,594 | 610,878 | 388,658 | 349,873 | 379,551 |
|  | 2.8     | 3.6     | 3.6     | 2.2     | 2.0     | 2.1     |
|  | 185,455 | 66,845  | 107,616 | 206,195 | 195,719 | 164,722 |
|  | 4.6     | 1.6     | 2.6     | 4.8     | 4.5     | 3.7     |
|  | 43,696  | 87,620  | 98,598  | 108,903 | 86,757  | 52,065  |
|  | 3.6     | 7.2     | 7.9     | 8.6     | 6.8     | 4.0     |
|  | 3,462   | 5,307   | 3,708   | 3,823   | 3,661   | 3,823   |
|  | 22.5    | 33.3    | 22.6    | 22.6    | 21.1    | 21.5    |
|  | 41,200  | 27,283  | 24,018  | 27,122  | 21,895  | 27,627  |
|  | 54.8    | 36.1    | 31.7    | 35.6    | 28.7    | 36.1    |

Data Table 2, *continued***THE AMERICAS, *continued***

|  | 1990          | 1991          | 1992          | 1993          | 1994           | 1995           | 1996           | 1997           |  |
|--|---------------|---------------|---------------|---------------|----------------|----------------|----------------|----------------|--|
| <b>South America,<br/><i>continued</i></b> |               |               |               |               |                |                |                |                |  |
| Paraguay                                   | 2,912<br>0.7  | 2,983<br>0.7  | 1,289<br>0.3  | 436<br>0.1    | 583<br>0.1     | 898<br>0.2     | 637<br>0.1     | 567<br>0.1     |  |
| Peru                                       | 28,882<br>1.3 | 33,705<br>1.5 | 54,922<br>2.4 | 95,222<br>4.1 | 122,039<br>5.2 | 192,629<br>8.1 | 208,132<br>8.6 | 183,740<br>7.4 |  |
| Suriname                                   | 1,608<br>4.0  | 1,490<br>3.7  | 1,404<br>3.5  |               | 4,704<br>11.5  | 6,606<br>16.1  | 16,649<br>40.4 | 11,323<br>27.3 |  |
| Venezuela                                  | 46,910<br>2.4 | 43,454<br>2.2 | 21,416<br>1.0 | 12,539<br>0.6 | 13,727<br>0.6  | 16,371<br>0.7  | 18,858<br>0.8  | 22,400<br>1.0  |  |

|  | 1998    | 1999    | 2000   | 2001   | 2002   | 2003    |
|--|---------|---------|--------|--------|--------|---------|
|  | 2,091   | 9,947   | 6,853  | 2,710  | 2,778  | 1,392   |
|  | 0.4     | 1.9     | 1.3    | 0.5    | 0.5    | 0.2     |
|  | 247,004 | 166,579 | 69,726 | 79,473 | 85,742 | 143,686 |
|  | 9.8     | 6.5     | 2.7    | 3.0    | 3.2    | 5.3     |
|  | 12,412  | 13,939  | 13,132 | 17,074 | 13,091 | 14,657  |
|  | 29.7    | 33.1    | 30.9   | 39.8   | 30.3   | 33.7    |
|  | 21,862  | 19,086  | 29,736 | 29,491 | 29,491 | 31,719  |
|  | 0.9     | 0.8     | 1.2    | 1.2    | 1.2    | 1.2     |

**Data Table 3:** Percentage of Households That Have at Least One Mosquito Net, by Background Characteristics**AFRICA**

| COUNTRY            | YEAR | SOURCE       | SCALE           | TOTAL       |  |
|--------------------|------|--------------|-----------------|-------------|--|
| Benin              | 2002 | PSI 2002     | 1 district      | 12.0        |  |
|                    | 2001 | DHS 2001     | <b>national</b> | <b>40.2</b> |  |
|                    |      | PSI 2001     | subnational     | 58.0        |  |
|                    |      | RBM 2000     | 3 health zones  | 47.4        |  |
| Burkina Faso       | 2003 | DHS 2003     | <b>national</b> | <b>40.4</b> |  |
| Cameroon           | 2001 | PSI 2001     | 3 provinces     | 15.0        |  |
| Chad               | 2000 | RBM 2001     | 5 districts     | 68.2        |  |
| Congo, Dem Rep. of | 2003 | PSI 2003     | 1 district      | 27.9        |  |
| Eritrea            | 2003 | MoH 2003     | 3 zobas         | 91.2        |  |
|                    | 2002 | DHS 2002     | <b>national</b> | <b>33.8</b> |  |
| Ethiopia           | 2001 | RBM 2001     | 14 districts    | 16.2        |  |
|                    | 2000 | DHS 2000     | <b>national</b> | <b>1.1</b>  |  |
| Ghana              | 2003 | DHS 2003     | <b>national</b> | <b>17.6</b> |  |
| Kenya              | 2003 | DHS 2003     | <b>national</b> | <b>21.8</b> |  |
|                    | 2001 | PSI 2000     | 6 regions       | 37.0        |  |
|                    |      | RBM 2001     | 4 districts     | 29.7        |  |
| Madagascar         | 2001 | PSI 2001     | 1 district      | 60.8        |  |
| Malawi             | 2004 | MoH 2004     | <b>national</b> | <b>42.9</b> |  |
|                    | 2000 | DHS 2000     | <b>national</b> | <b>13.1</b> |  |
|                    |      | IMCI 2000    | 5 districts     | 18.2        |  |
|                    | 1998 | PSI 1998     | 1 district      | 22.2        |  |
| Mali               | 2003 | NetMark 2003 | 5 areas         | 72.8        |  |
|                    | 2001 | DHS 2001     | <b>national</b> | <b>54.4</b> |  |
| Mauritania         | 2004 | DHS 2003–04  | <b>national</b> | <b>56.0</b> |  |
|                    | 2001 | DHS 2000–01  | <b>national</b> | <b>55.6</b> |  |
| Mozambique         | 2000 | NetMark 2000 | 5 areas         | 26.5        |  |
| Namibia            | 2000 | DHS 2000     | <b>national</b> | <b>13.1</b> |  |
| Nigeria            | 2003 | DHS 2003     | <b>national</b> | <b>11.8</b> |  |
|                    | 2000 | NetMark 2000 | 5 areas         | 12.0        |  |
| Rwanda             | 2001 | PSI 2001     |                 | 11.1        |  |
|                    | 2000 | DHS 2000     | <b>national</b> | <b>6.6</b>  |  |
|                    | 1997 | PSI 1997     | 3 areas         | 3.2         |  |
| Senegal            | 2000 | NetMark 2000 | 5 areas         | 33.6        |  |
| Togo               | 2000 | RBM 2000     | 3 districts     | 30.5        |  |

|  | RESIDENCE   |             | WEALTH QUINTILE |             |             |             |             |
|--|-------------|-------------|-----------------|-------------|-------------|-------------|-------------|
|  | URBAN       | RURAL       | POOREST         | SECOND      | MIDDLE      | FOURTH      | RICHEST     |
|  | —           | —           | —               | —           | —           | —           | —           |
|  | <b>48.9</b> | <b>35.0</b> | —               | —           | —           | —           | —           |
|  | —           | —           | —               | —           | —           | —           | —           |
|  | —           | —           | —               | —           | —           | —           | —           |
|  | <b>46.4</b> | <b>38.8</b> | <b>34.1</b>     | <b>39.7</b> | <b>37.3</b> | <b>38.6</b> | <b>51.5</b> |
|  | —           | —           | —               | —           | —           | —           | —           |
|  | —           | —           | —               | —           | —           | —           | —           |
|  | —           | —           | —               | —           | —           | —           | —           |
|  | —           | —           | —               | —           | —           | —           | —           |
|  | <b>28.3</b> | <b>37.3</b> | —               | —           | —           | —           | —           |
|  | —           | —           | —               | —           | —           | —           | —           |
|  | <b>3.1</b>  | <b>0.6</b>  | —               | —           | —           | —           | —           |
|  | <b>9.9</b>  | <b>24.2</b> | <b>27.9</b>     | <b>23.6</b> | <b>17.1</b> | <b>12.1</b> | <b>11.4</b> |
|  | <b>37.6</b> | <b>16.6</b> | <b>11.2</b>     | <b>11.4</b> | <b>14.0</b> | <b>24.4</b> | <b>39.3</b> |
|  | —           | —           | —               | —           | —           | —           | —           |
|  | —           | —           | —               | —           | —           | —           | —           |
|  | —           | —           | —               | —           | —           | —           | —           |
|  | <b>63.3</b> | <b>39.3</b> | —               | —           | —           | —           | —           |
|  | <b>32.1</b> | <b>10.1</b> | —               | —           | —           | —           | —           |
|  | —           | —           | —               | —           | —           | —           | —           |
|  | 28.0        | 14.0        | —               | —           | —           | —           | —           |
|  | 81.0        | 67.3        | —               | —           | —           | —           | —           |
|  | <b>57.7</b> | <b>53.4</b> | —               | —           | —           | —           | —           |
|  | <b>42.5</b> | <b>66.2</b> | —               | —           | —           | —           | —           |
|  | <b>39.9</b> | <b>66.8</b> | —               | —           | —           | —           | —           |
|  | 34.0        | 21.5        | —               | —           | —           | —           | —           |
|  | <b>10.9</b> | <b>14.5</b> | —               | —           | —           | —           | —           |
|  | <b>5.4</b>  | <b>15.5</b> | <b>23.0</b>     | <b>15.5</b> | <b>10.8</b> | <b>8.0</b>  | <b>3.3</b>  |
|  | 13.3        | 11.2        | —               | —           | —           | —           | —           |
|  | 56.0        | 4.3         | —               | —           | —           | —           | —           |
|  | <b>29.7</b> | <b>2.9</b>  | —               | —           | —           | —           | —           |
|  | —           | —           | —               | —           | —           | —           | —           |
|  | 28.8        | 36.8        | —               | —           | —           | —           | —           |
|  | —           | —           | —               | —           | —           | —           | —           |

Data Table 3, *continued***AFRICA, *continued***

| COUNTRY        | YEAR | SOURCE                         | SCALE           | TOTAL       |
|----------------|------|--------------------------------|-----------------|-------------|
| Uganda         | 2003 | Fapohunda BM 2003              | 6 districts     | 30.0        |
|                |      | Gertrude N. 2004               | 1 district      | 43.7        |
|                | 2002 | Spencer et al. 2004            | 1 district      | 78.2        |
|                |      | DHS 2000–01                    | <b>national</b> | <b>12.8</b> |
|                | 2001 | MoH 2001 (RBM Baseline survey) | 4 districts     | 17.6        |
|                |      | CMS 2000                       | district        | 22.4        |
|                |      | NetMark 2000                   | 5 areas         | 34.0        |
|                | 1999 | PSI 2000                       | 4 provinces     | 22.4        |
| Nuwaha F. 1999 |      | 1 district                     | 55.0            |             |
| Tanzania       | 2001 | NSO 2001                       | <b>national</b> | <b>37.1</b> |
|                | 2000 | Nathan R. et al. 2004          | 2 districts     | 73.0        |
|                |      | PSI 2000                       | 4 areas         | 51.1        |
|                | 1999 | DHS 1999                       | <b>national</b> | <b>30.3</b> |
|                | 1998 | PSI 1998                       | 4 areas         | 32.0        |
|                | 1997 | Nathan R. et al. 2004          | 2 districts     | 37.0        |
| Zambia         | 2002 | DHS 2002–03                    | <b>national</b> | <b>27.2</b> |
|                | 2000 | NetMark 2000                   | 5 areas         | 26.5        |
| Zimbabwe       | 1999 | DHS 1999                       | <b>national</b> | <b>10.2</b> |

**ASIA**

| COUNTRY     | YEAR | SOURCE   | SCALE           | TOTAL       |
|-------------|------|----------|-----------------|-------------|
| Afghanistan | 2002 | MoH 2002 | 50 districts    | 10.8        |
| Cambodia    | 2000 | DHS 2000 | <b>national</b> | <b>82.0</b> |
| Lao PDR     | 2001 | PSI 2001 | 2 provinces     | 96.9        |
| Myanmar     | 2001 | PSI 2001 | 1 state         | 50.0        |
| Nepal       | 2003 | MoH 2003 | 8 districts     | 73.0        |
| Timor Leste | 2004 | MoH 2005 | <b>national</b> | <b>36.0</b> |

**THE AMERICAS**

| COUNTRY   | YEAR | SOURCE    | SCALE           | TOTAL       |
|-----------|------|-----------|-----------------|-------------|
| Bolivia   | 2002 | PSI 2002  | 1 province      | 92.4        |
|           | 2001 | PSI 2001a | 1 province      | 94.4        |
|           |      | PSI 2001b | 1 province      | 95.6        |
| Colombia  | 2000 | DHS 2000  | <b>national</b> | <b>31.0</b> |
| Nicaragua | 2001 | DHS 2001  | <b>national</b> | <b>42.1</b> |

|  | RESIDENCE   |             | WEALTH QUINTILE |        |        |        |         |
|--|-------------|-------------|-----------------|--------|--------|--------|---------|
|  | URBAN       | RURAL       | POOREST         | SECOND | MIDDLE | FOURTH | RICHEST |
|  | —           | —           | —               | —      | —      | —      | —       |
|  | —           | —           | —               | —      | —      | —      | —       |
|  | —           | —           | —               | —      | —      | —      | —       |
|  | <b>32.9</b> | <b>9.2</b>  | —               | —      | —      | —      | —       |
|  | —           | —           | —               | —      | —      | —      | —       |
|  | 45.5        | 16.5        | —               | —      | —      | —      | —       |
|  | 47.4        | 24.9        | —               | —      | —      | —      | —       |
|  | —           | —           | —               | —      | —      | —      | —       |
|  | —           | —           | —               | —      | —      | —      | —       |
|  | <b>67.4</b> | <b>27.9</b> | —               | —      | —      | —      | —       |
|  | —           | —           | 54.0            | 64.0   | 74.0   | 83.0   | 92.0    |
|  | —           | —           | —               | —      | —      | —      | —       |
|  | <b>57.1</b> | <b>20.8</b> | —               | —      | —      | —      | —       |
|  | —           | —           | —               | —      | —      | —      | —       |
|  | —           | —           | 20.0            | 29.0   | 32.0   | 45.0   | 63.0    |
|  | <b>34.9</b> | <b>23.3</b> | —               | —      | —      | —      | —       |
|  | 34.9        | 20.8        | —               | —      | —      | —      | —       |
|  | <b>16.5</b> | <b>6.3</b>  | —               | —      | —      | —      | —       |

|  | RESIDENCE   |             |
|--|-------------|-------------|
|  | URBAN       | RURAL       |
|  | —           | —           |
|  | <b>91.5</b> | <b>80.3</b> |
|  | —           | —           |
|  | —           | —           |
|  | —           | —           |
|  | —           | —           |

|  | RESIDENCE   |             |
|--|-------------|-------------|
|  | URBAN       | RURAL       |
|  | —           | —           |
|  | —           | —           |
|  | —           | —           |
|  | <b>30.6</b> | <b>32.1</b> |
|  | <b>45.6</b> | <b>37.0</b> |

**Data Table 4:** Percentage of Households That Have at Least One Insecticide-treated Mosquito Net, by Background Characteristics**AFRICA**

| COUNTRY      | YEAR | SOURCE                         | SCALE           | TOTAL       |  |
|--------------|------|--------------------------------|-----------------|-------------|--|
| Benin        | 2002 | PSI 2002                       | 1 district      | 2.1         |  |
|              | 2001 | PSI 2001                       | subnational     | 26.7        |  |
|              |      | RBM 2000                       | 3 health zones  | 5.4         |  |
| Burkina Faso | 2003 | DHS 2003                       | <b>national</b> | <b>4.6</b>  |  |
|              | 2001 | RBM 2000                       | district        | 17.4        |  |
| Chad         | 2000 | RBM 2001                       | 5 districts     | 5.4         |  |
| Congo        | 2003 | PSI 2003                       | 1 district      | 2.4         |  |
| Eritrea      | 2003 | MoH 2003                       | 3 zobas         | 71.0        |  |
| Ethiopia     | 2000 | DHS 2000                       | <b>national</b> | <b>0.2</b>  |  |
| Ghana        | 2003 | DHS 2003                       | <b>national</b> | <b>3.2</b>  |  |
|              | 2001 | RBM 2001                       | 5 districts     | 12.2        |  |
| Guinea       | 2001 | RBM 2001                       | 4 districts     | 7.0         |  |
| Kenya        | 2003 | DHS 2003                       | <b>national</b> | <b>5.9</b>  |  |
| Malawi       | 2004 | MoH 2004                       | <b>national</b> | <b>33.8</b> |  |
|              | 2000 | DHS 2000                       | <b>national</b> | <b>4.9</b>  |  |
|              |      | IMCI 2000                      | 5 districts     | 7.0         |  |
| Mali         | 1998 | PSI 1998                       | 1 district      | 0.4         |  |
|              | 2003 | RBM 2003                       | district        | 25.1        |  |
| Mauritania   | 2004 | DHS 2003–04                    | <b>national</b> | <b>0.6</b>  |  |
| Mozambique   | 2000 | NetMark 2000                   | 5 areas         | 7.2         |  |
| Nigeria      | 2003 | DHS 2003                       | <b>national</b> | <b>2.2</b>  |  |
|              | 2000 | NetMark 2000                   | 5 areas         | 0.1         |  |
| Senegal      | 2000 | NetMark 2000                   | 5 areas         | 11.0        |  |
| Uganda       | 2003 | Gertrude N. 2004               | 1 district      | 11.5        |  |
|              | 2002 | Spencer et al. 2004            | 1 district      | 75.6        |  |
|              | 2001 | MoH 2001 (RBM Baseline survey) | 4 districts     | 1.7         |  |
|              | 2000 | NetMark 2000                   | 5 areas         | 3.8         |  |
|              | 1999 | Nuwaha F. 1999                 | 1 district      | 6.8         |  |
| Tanzania     | 1999 | DHS 1999                       | <b>national</b> | <b>1.3</b>  |  |
|              | 1998 | PSI 1998                       | 4 areas         | 6.0         |  |
| Zambia       | 2002 | DHS 2002–03                    | <b>national</b> | <b>13.6</b> |  |
|              | 2001 | RBM 2001                       | 10 districts    | 1.6         |  |
| Zambia       | 2000 | NetMark 2000                   | 5 areas         | 9.3         |  |

|  | RESIDENCE   |             | WEALTH QUINTILE |            |            |            |             |
|--|-------------|-------------|-----------------|------------|------------|------------|-------------|
|  | URBAN       | RURAL       | POOREST         | SECOND     | MIDDLE     | FOURTH     | RICHEST     |
|  | —           | —           | —               | —          | —          | —          | —           |
|  | —           | —           | —               | —          | —          | —          | —           |
|  | —           | —           | —               | —          | —          | —          | —           |
|  | <b>12.0</b> | <b>2.7</b>  | <b>1.5</b>      | <b>1.7</b> | <b>2.2</b> | <b>3.6</b> | <b>13.1</b> |
|  | —           | —           | —               | —          | —          | —          | —           |
|  | —           | —           | —               | —          | —          | —          | —           |
|  | —           | —           | —               | —          | —          | —          | —           |
|  | —           | —           | —               | —          | —          | —          | —           |
|  | <b>0.4</b>  | <b>0.1</b>  | —               | —          | —          | —          | —           |
|  | <b>2.3</b>  | <b>4.0</b>  | <b>7.1</b>      | <b>2.1</b> | <b>2.0</b> | <b>2.2</b> | <b>3.7</b>  |
|  | —           | —           | —               | —          | —          | —          | —           |
|  | —           | —           | —               | —          | —          | —          | —           |
|  | <b>10.6</b> | <b>4.4</b>  | <b>2.5</b>      | <b>2.6</b> | <b>4.2</b> | <b>5.6</b> | <b>11.7</b> |
|  | <b>52.3</b> | <b>30.4</b> | —               | —          | —          | —          | —           |
|  | —           | —           | —               | —          | —          | —          | —           |
|  | —           | —           | —               | —          | —          | —          | —           |
|  | 0.6         | 0.0         | —               | —          | —          | —          | —           |
|  | —           | —           | —               | —          | —          | —          | —           |
|  | <b>0.5</b>  | <b>0.6</b>  | —               | —          | —          | —          | —           |
|  | 9.3         | 5.8         | —               | —          | —          | —          | —           |
|  | <b>1.0</b>  | <b>2.9</b>  | <b>4.5</b>      | <b>1.3</b> | <b>2.4</b> | <b>2.1</b> | <b>1.0</b>  |
|  | 0.3         | 0.0         | —               | —          | —          | —          | —           |
|  | 10.0        | 11.7        | —               | —          | —          | —          | —           |
|  | —           | —           | —               | —          | —          | —          | —           |
|  | —           | —           | —               | —          | —          | —          | —           |
|  | —           | —           | —               | —          | —          | —          | —           |
|  | 6.7         | 1.8         | —               | —          | —          | —          | —           |
|  | —           | —           | —               | —          | —          | —          | —           |
|  | —           | —           | —               | —          | —          | —          | —           |
|  | <b>16.1</b> | <b>12.4</b> | —               | —          | —          | —          | —           |
|  | —           | —           | —               | —          | —          | —          | —           |
|  | 9.4         | 9.2         | —               | —          | —          | —          | —           |

Data Table 4, *continued***ASIA**

| COUNTRY     | YEAR | SOURCE   | SCALE        | TOTAL |
|-------------|------|----------|--------------|-------|
| Afghanistan | 2002 | MoH 2002 | 50 districts | 4.8   |
| Lao PDR     | 2001 | PSI 2001 | 2 provinces  | 63.8  |

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| COUNTRY  | YEAR | SOURCE    | SCALE           | TOTAL      |
|----------|------|-----------|-----------------|------------|
| Bolivia  | 2001 | PSI 2001b | 1 province      | 13.4       |
| Colombia | 2000 | DHS 2000  | <b>national</b> | <b>2.8</b> |

|  | RESIDENCE  |            |
|--|------------|------------|
|  | URBAN      | RURAL      |
|  | -          | -          |
|  | <b>2.5</b> | <b>3.7</b> |

**Data Table 5:** Percentage of Children under Five Years Old That Slept under a Mosquito Net during the Night Preceding the Survey, by Background Characteristics**AFRICA**

| COUNTRY                  | YEAR       | SOURCE          | SCALE           | TOTAL           |             |
|--------------------------|------------|-----------------|-----------------|-----------------|-------------|
| Angola                   | 2001       | MICS 2001       | <b>national</b> | <b>10.2</b>     |             |
| Benin                    | 2002       | PSI 2002        | subnational     | 46.2            |             |
|                          | 2001       | DHS 2001        | <b>national</b> | <b>32.0</b>     |             |
|                          | 1999       | MICS 1999       | <b>national</b> | <b>38.7</b>     |             |
| Burkina Faso             | 2003       | DHS 2003        | <b>national</b> | <b>19.8</b>     |             |
| Burundi                  | 2000       | MICS 2000       | <b>national</b> | <b>2.6</b>      |             |
| Cameroon                 | 2001       | PSI 2001        | 3 provinces     | 6.2             |             |
|                          | 2000       | MICS 2000       | <b>national</b> | <b>11.3</b>     |             |
| Central African Republic | 2000       | MICS 2000       | <b>national</b> | <b>30.9</b>     |             |
| Chad                     | 2000       | MICS 2000       | <b>national</b> | <b>26.9</b>     |             |
|                          |            | RBM 2001        | 5 districts     | 43.3            |             |
| Comoros                  | 2000       | MICS 2000       | <b>national</b> | <b>36.4</b>     |             |
| Côte d'Ivoire            | 2000       | MICS 2000       | <b>national</b> | <b>9.6</b>      |             |
| Congo, Dem. Rep. of      | 2001       | MICS 2001       | <b>national</b> | <b>11.8</b>     |             |
| Equatorial Guinea        | 2000       | MICS 2000       | <b>national</b> | <b>15.4</b>     |             |
| Eritrea                  | 2003       | MoH 2003        | 3 zobas         | 81.0            |             |
|                          | 2002       | DHS 2002        | <b>national</b> | <b>12.1</b>     |             |
| Ethiopia                 | 2001       | RBM 2001        | 14 districts    | 17.1            |             |
| Gabon                    | 2000       | DHS 2000        | <b>national</b> | <b>8.7</b>      |             |
| Gambia, The              | 2000       | MICS 2000       | <b>national</b> | <b>42.1</b>     |             |
| Ghana                    | 2003       | DHS 2003        | <b>national</b> | <b>14.7</b>     |             |
|                          | 2001       | RBM 2001        | 5 districts     | 27.0            |             |
| Guinea                   | 2001       | RBM 2001        | 4 districts     | 27.2            |             |
| Guinea-Bissau            | 2000       | MICS 2000       | <b>national</b> | <b>67.0</b>     |             |
| Kenya                    | 2003       | DHS 2003        | <b>national</b> | <b>14.5</b>     |             |
|                          | 2001       | PSI 2000        | 6 regions       | 31.2            |             |
|                          |            | RBM 2001        | 4 districts     | 15.1            |             |
| 2000                     | MICS 2000  | <b>national</b> | <b>16.4</b>     |                 |             |
|                          | Madagascar | 2001            | PSI 2001        | 1 district      | 54.7        |
| 2000                     | MICS 2000  | <b>national</b> | <b>30.3</b>     |                 |             |
|                          | Malawi     | 2004            | MoH 2004        | <b>national</b> | <b>38.0</b> |
| 2000                     | DHS 2000   | <b>national</b> | <b>7.6</b>      |                 |             |
|                          | Malawi     | 2000            | IMCI 2000       | 5 districts     | 8.6         |
| 1998                     | PSI 1998   | 1 district      | 58.0            |                 |             |

|  | GENDER |        | RESIDENCE |       | WEALTH QUINTILE |        |        |        |         |
|--|--------|--------|-----------|-------|-----------------|--------|--------|--------|---------|
|  | MALE   | FEMALE | URBAN     | RURAL | POOREST         | SECOND | MIDDLE | FOURTH | RICHEST |
|  | 9.5    | 10.9   | 10.9      | 8.6   | 7.1             | 5.7    | 5.4    | 11.1   | 20.2    |
|  | —      | —      | —         | —     | —               | —      | —      | —      | —       |
|  | 31.7   | 32.3   | 42.9      | 26.8  | —               | —      | —      | —      | —       |
|  | —      | —      | 48.0      | 32.2  | —               | —      | —      | —      | —       |
|  | 19.6   | 20.0   | 22.8      | 19.3  | 22.3            | 19.4   | 17.1   | 16.0   | 26.4    |
|  | 2.7    | 2.6    | 27.6      | 0.7   | 0.2             | 0.7    | 0.8    | 1.9    | 8.8     |
|  | —      | —      | —         | —     | —               | —      | —      | —      | —       |
|  | 11.4   | 11.3   | 17.6      | 8.7   | 7.3             | 9.8    | 8.9    | 14.5   | 18.6    |
|  | 31.0   | 30.8   | 48.2      | 19.8  | 18.6            | 16.7   | 23.1   | 41.4   | 58.8    |
|  | 26.6   | 27.2   | 57.5      | 18.6  | 22.5            | 13.6   | 19.5   | 32.1   | 50.3    |
|  | —      | —      | —         | —     | —               | —      | —      | —      | —       |
|  | 37.3   | 35.5   | 56.8      | 31.1  | 23.4            | 25.6   | 32.8   | 40.9   | 60.6    |
|  | 9.7    | 9.4    | 11.9      | 7.9   | 7.0             | 8.0    | 12.9   | 11.0   | 9.8     |
|  | 11.9   | 11.7   | 15.0      | 10.3  | 7.1             | 14.0   | 9.7    | 9.6    | 18.6    |
|  | 16.7   | 14.0   | 29.8      | 9.9   | 7.3             | 8.6    | 22.8   | 16.3   | 26.8    |
|  | —      | —      | —         | —     | —               | —      | —      | —      | —       |
|  | 11.8   | 12.4   | 14.3      | 11.0  | —               | —      | —      | —      | —       |
|  | —      | —      | —         | —     | —               | —      | —      | —      | —       |
|  | —      | —      | 7.5       | 14.4  | —               | —      | —      | —      | —       |
|  | 43.1   | 41.0   | 35.7      | 45.9  | 44.5            | 46.1   | 44.5   | 37.8   | 32.9    |
|  | —      | —      | 9.0       | 17.5  | 16.8            | 17.1   | 16.0   | 11.2   | 9.6     |
|  | —      | —      | —         | —     | —               | —      | —      | —      | —       |
|  | —      | —      | —         | —     | —               | —      | —      | —      | —       |
|  | 67.2   | 66.7   | 74.9      | 63.5  | 60.5            | 63.4   | 66.8   | 71.4   | 74.7    |
|  | 14.9   | 14.2   | 32.6      | 10.7  | 6.4             | 7.0    | 11.4   | 18.3   | 35.3    |
|  | —      | —      | —         | —     | —               | —      | —      | —      | —       |
|  | —      | —      | —         | —     | —               | —      | —      | —      | —       |
|  | 15.7   | 17.1   | 34.9      | 10.2  | 6.8             | 8.6    | 9.2    | 19.2   | 42.5    |
|  | —      | —      | —         | —     | —               | —      | —      | —      | —       |
|  | 30.1   | 30.5   | 31.7      | 29.9  | 27.9            | 38.0   | 30.3   | 23.0   | 31.6    |
|  | —      | —      | 57.5      | 34.1  | —               | —      | —      | —      | —       |
|  | —      | —      | 20.8      | 5.7   | —               | —      | —      | —      | —       |
|  | —      | —      | —         | —     | —               | —      | —      | —      | —       |
|  | —      | —      | 60.0      | 53.0  | —               | —      | —      | —      | —       |

Data Table 5, *continued***AFRICA, continued**

| COUNTRY               | YEAR | SOURCE                         | SCALE           | TOTAL       |  |
|-----------------------|------|--------------------------------|-----------------|-------------|--|
| Mali                  | 2003 | NetMark 2003                   | 5 areas         | 52.7        |  |
| Mauritania            | 2004 | DHS 2003–4                     | <b>national</b> | <b>30.8</b> |  |
| Mozambique            | 2000 | NetMark 2000                   | 5 areas         | 12.5        |  |
| Namibia               | 2000 | DHS 2000                       | <b>national</b> | <b>6.7</b>  |  |
| Niger                 | 2000 | MICS 2000                      | <b>national</b> | <b>16.6</b> |  |
| Nigeria               | 2003 | DHS 2003                       | <b>national</b> | <b>5.9</b>  |  |
|                       | 2000 | NetMark 2000                   | 5 areas         | 8.8         |  |
| Rwanda                | 2001 | PSI 2001                       |                 |             |  |
|                       | 2000 | DHS 2000                       | <b>national</b> | <b>5.6</b>  |  |
|                       |      | MICS 2000                      | <b>national</b> | <b>6.0</b>  |  |
| São Tomé and Príncipe | 2000 | MICS 2000                      | <b>national</b> | <b>42.5</b> |  |
| Senegal               | 2000 | MICS 2000                      | <b>national</b> | <b>15.2</b> |  |
|                       |      | NetMark 2000                   | 5 areas         | 17.7        |  |
| Sierra Leone          | 2000 | MICS 2000                      | <b>national</b> | <b>15.2</b> |  |
| Somalia               | 1999 | MICS 1999                      | <b>national</b> | <b>15.6</b> |  |
| Sudan                 | 2000 | MICS 2000                      | <b>national</b> | <b>23.1</b> |  |
| Swaziland             | 2000 | MICS 2000                      | <b>national</b> | <b>0.2</b>  |  |
| Togo                  | 2000 | MICS 2000                      | <b>national</b> | <b>14.8</b> |  |
|                       |      | RBM 2000                       | 3 districts     | 22.7        |  |
| Uganda                | 2003 | CMS 2003a                      | 2 districts     | 1.0         |  |
|                       |      | CMS 2003b                      | 4 districts     | 1.0         |  |
|                       |      | Fapohunda BM 2003              | 6 districts     | 22.0        |  |
|                       |      | GTZ 2001                       | 3 districts     | 1.0         |  |
|                       | 2001 | DHS 2000–01                    | <b>national</b> | <b>7.3</b>  |  |
|                       |      | MoH 2001 (RBM Baseline survey) | 4 districts     | 11.8        |  |
|                       | 2000 | NetMark 2000                   | 5 areas         | 24.7        |  |
| Tanzania              | 1999 | DHS 1999                       | <b>national</b> | <b>20.7</b> |  |
| Zambia                | 2002 | DHS 2002–03                    | <b>national</b> | <b>16.3</b> |  |
|                       | 2001 | RBM 2001                       | 10 districts    | 13.2        |  |
|                       | 2000 | NetMark 2000                   | 5 areas         | 11.9        |  |
|                       | 1999 | MICS 1999                      | <b>national</b> | <b>6.0</b>  |  |
| Zimbabwe              | 1999 | DHS 1999                       | <b>national</b> | <b>3.0</b>  |  |



Data Table 5, *continued***ASIA**

| COUNTRY     | YEAR | SOURCE                      | SCALE           | TOTAL       |  |
|-------------|------|-----------------------------|-----------------|-------------|--|
| Azerbaijan  | 2000 | MICS 2000                   | <b>national</b> | <b>12.4</b> |  |
| Indonesia   | 2000 | MICS 2000                   | <b>national</b> | <b>32.0</b> |  |
| Iraq        | 2000 | MICS 2000                   | <b>national</b> | <b>7.4</b>  |  |
| Lao PDR     | 2001 | PSI 2001                    | 2 provinces     | 98.3        |  |
|             | 2000 | National Health Survey 2002 | <b>national</b> | <b>82.3</b> |  |
| Tajikistan  | 2000 | MICS 2000                   | <b>national</b> | <b>5.9</b>  |  |
| Timor Leste | 2002 | MICS 2002                   | <b>national</b> | <b>47.5</b> |  |
| Vietnam     | 2000 | MICS 2000                   | <b>national</b> | <b>95.9</b> |  |

**THE AMERICAS**

| COUNTRY   | YEAR | SOURCE    | SCALE           | TOTAL       |  |
|-----------|------|-----------|-----------------|-------------|--|
| Bolivia   | 2001 | PSI 2001a | 1 province      | 97.1        |  |
| Colombia  | 2000 | DHS 2000  | <b>national</b> | <b>23.9</b> |  |
| Guatemala | 1999 | MICS      | <b>national</b> | <b>6.4</b>  |  |
| Guyana    | 2000 | MICS 2000 | <b>national</b> | —           |  |
| Suriname  | 2000 | MICS 2000 | <b>national</b> | <b>76.6</b> |  |

|  | GENDER      |             | RESIDENCE   |             | WEALTH QUINTILE |             |             |             |             |
|--|-------------|-------------|-------------|-------------|-----------------|-------------|-------------|-------------|-------------|
|  | MALE        | FEMALE      | URBAN       | RURAL       | POOREST         | SECOND      | MIDDLE      | FOURTH      | RICHEST     |
|  | <b>12.8</b> | <b>12.0</b> | <b>6.5</b>  | <b>18.1</b> | <b>17.1</b>     | <b>19.7</b> | <b>8.9</b>  | <b>5.4</b>  | <b>4.7</b>  |
|  | <b>32.0</b> | <b>32.2</b> | <b>23.3</b> | <b>37.5</b> | —               | —           | —           | —           | —           |
|  | <b>7.3</b>  | <b>7.5</b>  | <b>6.9</b>  | <b>8.3</b>  | —               | —           | —           | —           | —           |
|  | —           | —           | —           | —           | —               | —           | —           | —           | —           |
|  | <b>82.8</b> | <b>81.9</b> | <b>96.9</b> | <b>77.9</b> | <b>72.9</b>     | <b>82.2</b> | <b>83.2</b> | <b>86.4</b> | <b>91.1</b> |
|  | <b>5.6</b>  | <b>6.1</b>  | <b>6.1</b>  | <b>5.8</b>  | <b>2.9</b>      | <b>6.8</b>  | <b>7.3</b>  | <b>6.5</b>  | <b>6.0</b>  |
|  | <b>48.1</b> | <b>46.8</b> | <b>74.6</b> | <b>39.3</b> | <b>26.1</b>     | <b>33.2</b> | <b>46.3</b> | <b>58.6</b> | <b>77.1</b> |
|  | <b>95.5</b> | <b>96.2</b> | <b>93.7</b> | <b>96.4</b> | <b>92.4</b>     | <b>98.6</b> | <b>98.7</b> | <b>99.0</b> | <b>92.7</b> |

|  | GENDER      |             | RESIDENCE   |             | WEALTH QUINTILE |            |             |             |             |
|--|-------------|-------------|-------------|-------------|-----------------|------------|-------------|-------------|-------------|
|  | MALE        | FEMALE      | URBAN       | RURAL       | POOREST         | SECOND     | MIDDLE      | FOURTH      | RICHEST     |
|  | —           | —           | —           | —           | —               | —          | —           | —           |             |
|  | —           | —           | <b>23.2</b> | <b>25.6</b> | —               | —          | —           | —           |             |
|  | —           | —           | <b>5.6</b>  | <b>19.1</b> | —               | —          | —           | —           |             |
|  | <b>68.7</b> | <b>65.8</b> | —           | —           | —               | —          | —           | —           |             |
|  | <b>75.4</b> | <b>77.9</b> | —           | —           | —               | <b>0.0</b> | <b>50.0</b> | <b>58.1</b> | <b>74.9</b> |

**Data Table 6:** Percentage of Children Under Five Years Old That Slept under an Insecticide-treated Mosquito Net during the Night Preceding the Survey, by Background Characteristics**AFRICA**

| COUNTRY                  | YEAR | SOURCE          | SCALE           | TOTAL       |  |
|--------------------------|------|-----------------|-----------------|-------------|--|
| Angola                   | 2001 | MICS 2001       | <b>national</b> | <b>2.3</b>  |  |
| Benin                    | 2003 | AIMI/Benin 2003 | 3 districts     | 47.0        |  |
|                          | 2001 | DHS 2001        | <b>national</b> | <b>7.4</b>  |  |
|                          |      | RBM 2000        | 3 health zones  | 4.4         |  |
| Burkina Faso             | 1999 | MICS 1999       | <b>national</b> | <b>5.0</b>  |  |
|                          | 2003 | DHS 2003        | <b>national</b> | <b>1.6</b>  |  |
|                          | 2001 | RBM 2000        | district        | 12.4        |  |
| Burundi                  | 2000 | MICS 2000       | <b>national</b> | <b>1.3</b>  |  |
| Cameroon                 | 2000 | MICS 2000       | <b>national</b> | <b>1.3</b>  |  |
| Central African Republic | 2000 | MICS 2000       | <b>national</b> | <b>1.5</b>  |  |
| Chad                     | 2000 | MICS 2000       | <b>national</b> | <b>0.6</b>  |  |
|                          |      | RBM 2001        | 5 districts     | 2.9         |  |
| Comoros                  | 2000 | MICS 2000       | <b>national</b> | <b>9.3</b>  |  |
| Côte d'Ivoire            | 2000 | MICS 2000       | <b>national</b> | <b>1.1</b>  |  |
| Congo, Dem. Rep. of      | 2001 | MICS 2001       | <b>national</b> | <b>0.7</b>  |  |
| Equatorial Guinea        | 2000 | MICS 2000       | <b>national</b> | <b>0.7</b>  |  |
| Eritrea                  | 2003 | MoH 2003        | 3 zobas         | 63.0        |  |
|                          | 2002 | DHS 2002        | <b>national</b> | <b>4.2</b>  |  |
| Gambia, The              | 2000 | MICS 2000       | <b>national</b> | <b>14.7</b> |  |
| Ghana                    | 2003 | DHS 2003        | <b>national</b> | <b>3.5</b>  |  |
|                          | 2001 | RBM 2001        | 5 districts     | 9.1         |  |
| Guinea                   | 2001 | RBM 2001        | 4 districts     | 0.5         |  |
| Guinea-Bissau            | 2000 | MICS 2000       | <b>national</b> | <b>7.4</b>  |  |
| Kenya                    | 2003 | DHS 2003        | <b>national</b> | <b>4.6</b>  |  |
|                          | 2001 | RBM 2001        | 4 districts     | 4.5         |  |
|                          | 2000 | MICS 2000       | <b>national</b> | <b>2.9</b>  |  |
| Madagascar               | 2000 | MICS 2000       | <b>national</b> | <b>0.2</b>  |  |
| Malawi                   | 2004 | MoH 2004        | <b>national</b> | <b>35.5</b> |  |
|                          | 2000 | DHS 2000        | <b>national</b> | <b>2.5</b>  |  |
| Mali                     | 2003 | NetMark 2003    | 5 areas         | 17.7        |  |
|                          |      | RBM 2003        | district        | 8.4         |  |
| Mauritania               | 2004 | DHS 2003–04     | <b>national</b> | <b>2.1</b>  |  |
| Mozambique               | 2000 | NetMark 2000    | 5 areas         | 3.5         |  |
| Niger                    | 2000 | MICS 2000       | <b>national</b> | <b>1.0</b>  |  |
| Nigeria                  | 2003 | DHS 2003        | <b>national</b> | <b>1.2</b>  |  |
|                          | 2000 | NetMark 2000    | 5 areas         | 0.1         |  |
| Rwanda                   | 2000 | DHS 2000        | <b>national</b> | <b>4.3</b>  |  |
|                          |      | MICS 2000       | <b>national</b> | <b>5.0</b>  |  |

|  | GENDER |        | RESIDENCE |       | WEALTH QUINTILE |        |        |        |         |
|--|--------|--------|-----------|-------|-----------------|--------|--------|--------|---------|
|  | MALE   | FEMALE | URBAN     | RURAL | POOREST         | SECOND | MIDDLE | FOURTH | RICHEST |
|  | 2.3    | 2.3    | 2.9       | 0.9   | 0.8             | 0.8    | 0.8    | 3.8    | 4.7     |
|  | —      | —      | —         | —     | —               | —      | —      | —      | —       |
|  | 7.0    | 7.8    | 13.5      | 4.4   | —               | —      | —      | —      | —       |
|  | —      | —      | —         | —     | —               | —      | —      | —      | —       |
|  | —      | —      | 4.3       | 0.7   | —               | —      | —      | —      | —       |
|  | 1.4    | 1.9    | 5.2       | 1.1   | 1.1             | 0.4    | 0.6    | 1.5    | 6.0     |
|  | —      | —      | —         | —     | —               | —      | —      | —      | —       |
|  | 1.4    | 1.2    | 14.8      | 0.2   | 0.0             | 0.7    | 0.2    | 0.5    | 4.7     |
|  | 1.3    | 1.4    | 2.7       | 0.8   | 0.5             | 0.1    | 1.1    | 2.5    | 3.1     |
|  | 1.3    | 1.8    | 2.1       | 1.2   | 0.6             | 1.3    | 1.1    | 2.0    | 2.7     |
|  | 0.6    | 0.6    | 1.3       | 0.4   | 0.4             | 0.4    | 0.0    | 0.2    | 2.1     |
|  | —      | —      | —         | —     | —               | —      | —      | —      | —       |
|  | 9.3    | 9.3    | 16.8      | 7.4   | 5.0             | 6.0    | 7.1    | 9.2    | 19.9    |
|  | 1.2    | 1.1    | 1.9       | 0.6   | 0.3             | 1.0    | 1.6    | 1.2    | 2.1     |
|  | 0.7    | 0.8    | 2.1       | 0.1   | 0.0             | 0.1    | 0.2    | 0.4    | 3.1     |
|  | 0.9    | 0.6    | 3.2       | 0.2   | 0.0             | 0.2    | 1.9    | 0.6    | 3.1     |
|  | —      | —      | —         | —     | —               | —      | —      | —      | —       |
|  | 4.3    | 4.1    | 4.8       | 4.0   | —               | —      | —      | —      | —       |
|  | 14.4   | 15.2   | 7.2       | 19.4  | 17.6            | 20.7   | 13.9   | 10.8   | 7.4     |
|  | —      | —      | 3.5       | 3.5   | 6.2             | 1.6    | 1.9    | 2.6    | 5.0     |
|  | —      | —      | —         | —     | —               | —      | —      | —      | —       |
|  | —      | —      | —         | —     | —               | —      | —      | —      | —       |
|  | 7.9    | 7.1    | 19.0      | 2.5   | 2.2             | 2.7    | 4.1    | 9.3    | 23.0    |
|  | 5.1    | 4.1    | 9.8       | 3.5   | 1.2             | 2.2    | 4.9    | 4.8    | 12.0    |
|  | —      | —      | —         | —     | —               | —      | —      | —      | —       |
|  | 3.0    | 2.8    | 3.9       | 2.6   | 2.0             | 2.7    | 2.5    | 3.2    | 4.2     |
|  | 0.2    | 0.2    | 0.8       | 0.2   | 0.2             | 0.2    | 0.3    | 0.2    | 0.3     |
|  | —      | —      | 50.1      | 32.2  | —               | —      | —      | —      | —       |
|  | —      | —      | 10.6      | 1.3   | —               | —      | —      | —      | —       |
|  | —      | —      | —         | —     | —               | —      | —      | —      | —       |
|  | —      | —      | —         | —     | —               | —      | —      | —      | —       |
|  | 2.5    | 1.7    | 2.4       | 1.9   | —               | —      | —      | —      | —       |
|  | —      | —      | 4.6       | 2.9   | —               | —      | —      | —      | —       |
|  | 0.9    | 1.1    | 4.0       | 0.5   | 0.3             | 0.3    | 0.5    | 0.1    | 3.7     |
|  | 1.1    | 1.2    | 0.6       | 1.4   | —               | —      | —      | —      | —       |
|  | —      | —      | 0.2       | 0.0   | —               | —      | —      | —      | —       |
|  | —      | —      | 20.8      | 1.3   | —               | —      | —      | —      | —       |
|  | 4.8    | 5.3    | 23.9      | 1.7   | 0.3             | 0.6    | 0.5    | 8.4    | 31.9    |

Data Table 6, *continued***AFRICA, *continued***

| COUNTRY               | YEAR | SOURCE                         | SCALE           | TOTAL       |  |
|-----------------------|------|--------------------------------|-----------------|-------------|--|
| São Tomé and Príncipe | 2000 | MICS 2000                      | <b>national</b> | <b>22.8</b> |  |
| Senegal               | 2000 | MICS 2000                      | <b>national</b> | <b>1.7</b>  |  |
|                       |      | NetMark 2000                   | 5 areas         | 5.7         |  |
| Sierra Leone          | 2000 | MICS 2000                      | <b>national</b> | <b>1.5</b>  |  |
| Somalia               | 1999 | MICS 1999                      | <b>national</b> | <b>0.3</b>  |  |
| Sudan                 | 2000 | MICS 2000                      | <b>national</b> | <b>0.4</b>  |  |
| Swaziland             | 2000 | MICS 2000                      | <b>national</b> | <b>0.1</b>  |  |
| Togo                  | 2000 | MICS 2000                      | <b>national</b> | <b>2.0</b>  |  |
| Uganda                | 2003 | Fapohunda BM 2003              | 6 districts     | 4.0         |  |
|                       | 2001 | DHS 2000–01                    | <b>national</b> | <b>0.2</b>  |  |
|                       |      | MoH 2001 (RBM Baseline survey) | 4 districts     | 2.0         |  |
|                       | 2000 | NetMark 2000                   | 5 areas         | 3.1         |  |
| Tanzania              | 1999 | DHS 1999                       | <b>national</b> | <b>2.1</b>  |  |
| Zambia                | 2002 | DHS 2002–03                    | <b>national</b> | <b>6.5</b>  |  |
|                       | 2001 | RBM 2001                       | 10 districts    | 10.2        |  |
|                       | 2000 | NetMark 2000                   | 5 areas         | 4.1         |  |
|                       | 1999 | MICS 1999                      | <b>national</b> | <b>1.1</b>  |  |

**ASIA**

| COUNTRY     | YEAR | SOURCE                      | SCALE           | TOTAL       |  |
|-------------|------|-----------------------------|-----------------|-------------|--|
| Azerbaijan  | 2000 | MICS 2000                   | <b>national</b> | <b>1.4</b>  |  |
| Indonesia   | 2000 | MICS 2000                   | <b>national</b> | <b>0.1</b>  |  |
| Iraq        | 2000 | MICS 2000                   | <b>national</b> | <b>0.0</b>  |  |
| Lao PDR     | 2000 | National Health Survey 2002 | <b>national</b> | <b>14.6</b> |  |
| Tajikistan  | 2000 | MICS 2000                   | <b>national</b> | <b>1.9</b>  |  |
| Timor Leste | 2002 | MICS 2002                   | <b>national</b> | <b>3.9</b>  |  |
| Vietnam     | 2000 | MICS 2000                   | <b>national</b> | <b>15.8</b> |  |

|  | GENDER      |             | RESIDENCE   |             | WEALTH QUINTILE |            |             |             |             |
|--|-------------|-------------|-------------|-------------|-----------------|------------|-------------|-------------|-------------|
|  | MALE        | FEMALE      | URBAN       | RURAL       | POOREST         | SECOND     | MIDDLE      | FOURTH      | RICHEST     |
|  | <b>20.8</b> | <b>23.4</b> | <b>32.4</b> | <b>14.4</b> | <b>9.3</b>      | <b>7.9</b> | <b>12.8</b> | <b>12.2</b> | <b>26.1</b> |
|  | <b>1.7</b>  | <b>1.6</b>  | <b>1.5</b>  | <b>1.7</b>  | <b>0.7</b>      | <b>2.4</b> | <b>2.0</b>  | <b>1.5</b>  | <b>1.3</b>  |
|  | —           | —           | 4.9         | 6.2         | —               | —          | —           | —           | —           |
|  | <b>1.7</b>  | <b>1.3</b>  | <b>3.9</b>  | <b>0.7</b>  | <b>0.2</b>      | <b>0.3</b> | <b>0.6</b>  | <b>2.0</b>  | <b>5.3</b>  |
|  | <b>0.3</b>  | <b>0.5</b>  | <b>0.4</b>  | <b>0.6</b>  | —               | —          | —           | —           | —           |
|  | <b>0.4</b>  | <b>0.5</b>  | <b>0.7</b>  | <b>0.2</b>  | <b>0.1</b>      | <b>0.3</b> | <b>0.5</b>  | <b>0.5</b>  | <b>0.9</b>  |
|  | <b>0.1</b>  | <b>0.1</b>  | <b>0.2</b>  | <b>0.1</b>  | <b>0.1</b>      | <b>0.1</b> | <b>0.0</b>  | <b>0.0</b>  | <b>0.3</b>  |
|  | <b>2.3</b>  | <b>1.6</b>  | <b>3.7</b>  | <b>1.4</b>  | <b>0.9</b>      | <b>0.3</b> | <b>1.3</b>  | <b>2.4</b>  | <b>7.1</b>  |
|  | —           | —           | —           | —           | —               | —          | —           | —           | —           |
|  | —           | —           | <b>0.9</b>  | <b>0.2</b>  | —               | —          | —           | —           | —           |
|  | —           | —           | —           | —           | —               | —          | —           | —           | —           |
|  | —           | —           | 5.5         | 1.5         | —               | —          | —           | —           | —           |
|  | —           | —           | <b>4.8</b>  | <b>1.3</b>  | —               | —          | —           | —           | —           |
|  | <b>6.4</b>  | <b>6.6</b>  | <b>8.1</b>  | <b>5.8</b>  | —               | —          | —           | —           | —           |
|  | —           | —           | —           | —           | —               | —          | —           | —           | —           |
|  | —           | —           | 6.1         | 2.8         | —               | —          | —           | —           | —           |
|  | <b>1.3</b>  | <b>0.8</b>  | <b>1.6</b>  | <b>0.8</b>  | <b>0.2</b>      | <b>0.4</b> | <b>1.0</b>  | <b>1.1</b>  | <b>2.9</b>  |

|  | GENDER      |             | RESIDENCE   |             | WEALTH QUINTILE |             |             |             |             |
|--|-------------|-------------|-------------|-------------|-----------------|-------------|-------------|-------------|-------------|
|  | MALE        | FEMALE      | URBAN       | RURAL       | POOREST         | SECOND      | MIDDLE      | FOURTH      | RICHEST     |
|  | <b>1.5</b>  | <b>1.3</b>  | <b>0.9</b>  | <b>1.9</b>  | <b>2.0</b>      | <b>1.8</b>  | <b>1.6</b>  | <b>0.3</b>  | <b>0.8</b>  |
|  | <b>0.1</b>  | <b>0.1</b>  | <b>0.0</b>  | <b>0.1</b>  | —               | —           | —           | —           | —           |
|  | <b>0.0</b>  | <b>0.0</b>  | <b>0.0</b>  | <b>0.0</b>  | —               | —           | —           | —           | —           |
|  | <b>14.5</b> | <b>14.6</b> | <b>10.9</b> | <b>15.3</b> | <b>10.8</b>     | <b>17.7</b> | <b>14.2</b> | <b>15.8</b> | <b>15.2</b> |
|  | <b>1.6</b>  | <b>2.3</b>  | <b>1.1</b>  | <b>2.1</b>  | <b>0.9</b>      | <b>3.1</b>  | <b>2.5</b>  | <b>1.8</b>  | <b>0.8</b>  |
|  | <b>4.0</b>  | <b>3.9</b>  | <b>8.8</b>  | <b>2.5</b>  | <b>0.9</b>      | <b>1.7</b>  | <b>4.1</b>  | <b>8.0</b>  | <b>5.7</b>  |
|  | <b>14.4</b> | <b>17.3</b> | <b>3.8</b>  | <b>18.6</b> | <b>27.3</b>     | <b>15.1</b> | <b>11.0</b> | <b>11.6</b> | <b>4.1</b>  |

Data Table 6, *continued***THE AMERICAS**

| COUNTRY   | YEAR | SOURCE    | SCALE           | TOTAL      |  |
|-----------|------|-----------|-----------------|------------|--|
| Bolivia   | 2001 | PSI 2001a | 1 province      | 15.3       |  |
| Colombia  | 2000 | DHS 2000  | <b>national</b> | <b>2.8</b> |  |
| Guatemala | 1999 | MICS      | <b>national</b> | <b>1.2</b> |  |
| Guyana    | 2000 | MICS 2000 | <b>national</b> | —          |  |
| Suriname  | 2000 | MICS 2000 | <b>national</b> | <b>2.7</b> |  |

|  | GENDER     |            | RESIDENCE  |            | WEALTH QUINTILE |        |        |            |            |
|--|------------|------------|------------|------------|-----------------|--------|--------|------------|------------|
|  | MALE       | FEMALE     | URBAN      | RURAL      | POOREST         | SECOND | MIDDLE | FOURTH     | RICHEST    |
|  | —          | —          | —          | —          | —               | —      | —      | —          | —          |
|  | —          | —          | <b>2.5</b> | <b>3.7</b> | —               | —      | —      | —          | —          |
|  | —          | —          | <b>1.2</b> | <b>1.5</b> | —               | —      | —      | —          | —          |
|  | <b>8.1</b> | <b>5.6</b> | —          | —          | —               | —      | —      | —          | —          |
|  | <b>2.1</b> | <b>3.3</b> | —          | —          | —               | —      | —      | <b>6.5</b> | <b>3.1</b> |

**Data Table 7:** Percentage of Pregnant Women That Slept under a Mosquito Net during the Night Preceding the Survey, by Background Characteristics**AFRICA**

| COUNTRY      | YEAR | SOURCE       | SCALE           | TOTAL       |
|--------------|------|--------------|-----------------|-------------|
| Benin        | 2001 | DHS 2001     | <b>national</b> | <b>33.2</b> |
|              |      | RBM 2000     | 3 health zones  | 36.9        |
| Burkina Faso | 2003 | DHS 2003     | <b>national</b> | <b>24.0</b> |
| Cameroon     | 2001 | PSI 2001     | 3 provinces     | 5.0         |
| Chad         | 2000 | RBM 2001     | 5 districts     | 45.5        |
| Eritrea      | 2002 | DHS 2002     | <b>national</b> | <b>6.6</b>  |
| Ethiopia     | 2001 | RBM 2001     | 14 districts    | 4.7         |
| Ghana        | 2003 | DHS 2003     | <b>national</b> | <b>9.5</b>  |
|              |      | RBM 2001     | 5 districts     | 21.6        |
| Guinea       | 2001 | RBM 2001     | 4 districts     | 25.5        |
| Kenya        | 2003 | DHS 2003     | <b>national</b> | <b>13.1</b> |
|              |      | PSI 2000     | 6 regions       | 23.1        |
| Madagascar   | 2001 | PSI 2001     | 1 district      | 53.3        |
| Malawi       | 2004 | MoH 2004     | <b>national</b> | <b>34.1</b> |
| Mali         | 2003 | NetMark 2003 | 5 areas         | 49.1        |
| Mauritania   | 2004 | DHS 2003–04  | <b>national</b> | <b>31.2</b> |
| Mozambique   | 2000 | NetMark 2000 | 5 areas         | 18.8        |
| Nigeria      | 2003 | DHS 2003     | <b>national</b> | <b>5.4</b>  |
|              |      | NetMark 2000 | 5 areas         | 7.4         |
| Senegal      | 2000 | NetMark 2000 | 5 areas         | 21.4        |
| Uganda       | 2001 | DHS 2000–01  | <b>national</b> | <b>6.6</b>  |
|              |      | NetMark 2000 | 5 areas         | 20.8        |
| Zambia       | 2002 | DHS 2002–03  | <b>national</b> | <b>17.4</b> |
|              |      | NetMark 2000 | 5 areas         | 4.1         |

**ASIA**

| COUNTRY | YEAR | SOURCE   | SCALE       | TOTAL |
|---------|------|----------|-------------|-------|
| Lao PDR | 2001 | PSI 2001 | 2 provinces | 96.0  |



**Data Table 8:** Percentage of Pregnant Women That Slept under an Insecticide-treated Mosquito Net during the Night Preceding the Survey, by Background Characteristics

## AFRICA

| COUNTRY      | YEAR | SOURCE                         | SCALE           | TOTAL       |
|--------------|------|--------------------------------|-----------------|-------------|
| Benin        | 2001 | RBM 2000                       | 3 health zones  | 3.8         |
| Burkina Faso | 2003 | DHS 2003                       | <b>national</b> | <b>2.6</b>  |
|              | 2001 | RBM 2000                       | district        | 10.0        |
| Chad         | 2000 | RBM 2001                       | 5 districts     | 7.2         |
| Eritrea      | 2002 | DHS 2002                       | <b>national</b> | <b>2.9</b>  |
| Ghana        | 2003 | DHS 2003                       | <b>national</b> | <b>2.7</b>  |
|              | 2001 | RBM 2001                       | 5 districts     | 7.8         |
| Guinea       | 2001 | RBM 2001                       | 4 districts     | 2.7         |
| Kenya        | 2003 | DHS 2003                       | <b>national</b> | <b>4.4</b>  |
| Malawi       | 2004 | MoH 2004                       | <b>national</b> | <b>31.4</b> |
| Mali         | 2003 | NetMark 2003                   | 5 areas         | 19.6        |
|              |      | RBM 2003                       | district        | 19.0        |
| Mozambique   | 2000 | NetMark 2000                   | 5 areas         | 5.6         |
| Nigeria      | 2003 | DHS 2003                       | <b>national</b> | <b>1.3</b>  |
|              | 2000 | NetMark 2000                   | 5 areas         | —           |
| Senegal      | 2000 | NetMark 2000                   | 5 areas         | 6.0         |
| Uganda       | 2001 | DHS 2000–01                    | <b>national</b> | <b>0.5</b>  |
|              |      | MoH 2001 (RBM Baseline survey) | 4 districts     | 2.3         |
|              | 2000 | NetMark 2000                   | 5 areas         | 1.5         |
| Zambia       | 2002 | DHS 2002–03                    | <b>national</b> | <b>7.9</b>  |
|              | 2000 | NetMark 2000                   | 5 areas         | 1.4         |

## THE AMERICAS

| COUNTRY | YEAR | SOURCE    | SCALE      | TOTAL |
|---------|------|-----------|------------|-------|
| Bolivia | 2001 | PSI 2001a | 1 province | 17.8  |



**Data Table 9:** Pregnant Women Receiving Sulfadoxine Pyrimethamine (SP) at Least Once during Pregnancy (Community Level, Prevention or Treatment), by Background Characteristics

## AFRICA

| COUNTRY    | YEAR     | SOURCE      | SCALE           | TOTAL       |
|------------|----------|-------------|-----------------|-------------|
| Benin      | 2001     | DHS 2001    | <b>national</b> | <b>6.2</b>  |
| Ghana      | 2003     | DHS 2003    | <b>national</b> | <b>1.0</b>  |
| Kenya      | 2003     | DHS 2003    | <b>national</b> | <b>12.5</b> |
| Malawi     | 2004     | MoH 2004    | <b>national</b> | <b>77.7</b> |
|            | 2000     | DHS 2000    | <b>national</b> | <b>67.5</b> |
| Mauritania | 2004 DHS | 2003–04     | <b>national</b> | <b>0.5</b>  |
| Nigeria    | 2003     | DHS 2003    | <b>national</b> | <b>2.4</b>  |
| Rwanda     | 2000     | DHS 2000    | <b>national</b> | <b>0.1</b>  |
| Zambia     | 2002     | DHS 2002–03 | <b>national</b> | <b>0.5</b>  |
| Benin      | 2001     | DHS 2001    | <b>national</b> | <b>6.2</b>  |
| Ghana      | 2003     | DHS 2003    | <b>national</b> | <b>1.0</b>  |
| Kenya      | 2003     | DHS 2003    | <b>national</b> | <b>12.5</b> |
| Malawi     | 2004     | MoH 2004    | <b>national</b> | <b>77.7</b> |
|            | 2000     | DHS 2000    | <b>national</b> | <b>67.5</b> |
| Mauritania | 2004 DHS | 2003–04     | <b>national</b> | <b>0.5</b>  |
| Nigeria    | 2003     | DHS 2003    | <b>national</b> | <b>2.4</b>  |
| Rwanda     | 2000     | DHS 2000    | <b>national</b> | <b>0.1</b>  |
| Zambia     | 2002     | DHS 2002–03 | <b>national</b> | <b>0.5</b>  |

**Data Table 10:** Pregnant Women Receiving Sulfadoxine Pyrimethamine (SP) at Least Twice during Pregnancy (Community Level, Prevention or Treatment), by Background Characteristics

## AFRICA

| COUNTRY | YEAR | SOURCE   | SCALE           | TOTAL       |
|---------|------|----------|-----------------|-------------|
| Malawi  | 2004 | MoH 2004 | <b>national</b> | <b>46.8</b> |
|         | 2000 | DHS 2000 | <b>national</b> | <b>29.3</b> |

|  | RESIDENCE |       | WEALTH QUINTILE |        |        |        |         |
|--|-----------|-------|-----------------|--------|--------|--------|---------|
|  | URBAN     | RURAL | POOREST         | SECOND | MIDDLE | FOURTH | RICHEST |
|  | 4.2       | 7.2   | —               | —      | —      | —      | —       |
|  | 0.9       | 1.1   | 1.3             | 0.7    | 1.0    | 0.9    | 1.4     |
|  | 13.1      | 12.4  | 12.6            | 11.8   | 13.8   | 11.9   | 12.5    |
|  | 88.9      | 75.4  | —               | —      | —      | —      | —       |
|  | —         | —     | —               | —      | —      | —      | —       |
|  | 0.9       | 0.2   | —               | —      | —      | —      | —       |
|  | —         | —     | —               | —      | —      | —      | —       |
|  | —         | —     | —               | —      | —      | —      | —       |
|  | 0.8       | 0.4   | —               | —      | —      | —      | —       |
|  | 4.2       | 7.2   | —               | —      | —      | —      | —       |
|  | 0.9       | 1.1   | 1.3             | 0.7    | 1.0    | 0.9    | 1.4     |
|  | 13.1      | 12.4  | 12.6            | 11.8   | 13.8   | 11.9   | 12.5    |
|  | 88.9      | 75.4  | —               | —      | —      | —      | —       |
|  | —         | —     | —               | —      | —      | —      | —       |
|  | 0.9       | 0.2   | —               | —      | —      | —      | —       |
|  | —         | —     | —               | —      | —      | —      | —       |
|  | —         | —     | —               | —      | —      | —      | —       |
|  | 0.8       | 0.4   | —               | —      | —      | —      | —       |

|  | RESIDENCE |       |
|--|-----------|-------|
|  | URBAN     | RURAL |
|  | 57.2      | 44.7  |
|  | —         | —     |

**Data Table 11:** Pregnant Women Receiving Sulfadoxine Pyrimethamine (SP) at Least Once during an Antenatal Visit, by Background Characteristics

## AFRICA

| COUNTRY    | YEAR | SOURCE      | SCALE           | TOTAL      |  |
|------------|------|-------------|-----------------|------------|--|
| Mauritania | 2004 | DHS 2003–04 | <b>national</b> | <b>0.3</b> |  |
| Nigeria    | 2003 | DHS 2003    | <b>national</b> | <b>1.0</b> |  |

**Data Table 12:** Pregnant Women Receiving Sulfadoxine Pyrimethamine (SP) at Least Twice during an Antenatal Visit, by Background Characteristics

## AFRICA

| COUNTRY | YEAR | SOURCE   | SCALE           | TOTAL      |  |
|---------|------|----------|-----------------|------------|--|
| Ghana   | 2003 | DHS 2003 | <b>national</b> | <b>0.8</b> |  |
| Kenya   | 2003 | DHS 2003 | <b>national</b> | <b>3.9</b> |  |
| Uganda  | 2001 | MoH 2002 | 17 districts    | 33.0       |  |

|  | RESIDENCE  |            |
|--|------------|------------|
|  | URBAN      | RURAL      |
|  | <b>0.7</b> | —          |
|  | <b>2.0</b> | <b>0.6</b> |

|  | RESIDENCE  |            | WEALTH QUINTILE |            |            |            |            |
|--|------------|------------|-----------------|------------|------------|------------|------------|
|  | URBAN      | RURAL      | POOREST         | SECOND     | MIDDLE     | FOURTH     | RICHEST    |
|  | <b>0.6</b> | <b>0.9</b> | <b>0.7</b>      | <b>0.7</b> | <b>1.0</b> | <b>0.6</b> | <b>1.1</b> |
|  | <b>4.2</b> | <b>3.9</b> | <b>3.0</b>      | <b>4.7</b> | <b>4.7</b> | <b>3.4</b> | <b>3.9</b> |
|  | —          | —          | —               | —          | —          | —          | —          |

**Data Table 13:** Percentage of Children under Five Years Old with Reported Fever in the Two Weeks Prior to the Survey, by Background Characteristics**AFRICA**

| COUNTRY                  | YEAR | SOURCE      | SCALE           | TOTAL       |  |
|--------------------------|------|-------------|-----------------|-------------|--|
| Angola                   | 2001 | MICS 2001   | <b>national</b> | <b>25.0</b> |  |
| Benin                    | 2001 | DHS 2001    | <b>national</b> | <b>41.0</b> |  |
|                          | 1999 | MICS 1999   | <b>national</b> | <b>15.0</b> |  |
| Botswana                 | 1988 | DHS 1988    | <b>national</b> | <b>3.9</b>  |  |
| Burkina Faso             | 2003 | DHS 2003    | <b>national</b> | <b>36.7</b> |  |
|                          | 1999 | DHS 1998–99 | <b>national</b> | <b>36.0</b> |  |
|                          | 1993 | DHS 1992–93 | <b>national</b> | <b>35.0</b> |  |
| Burundi                  | 2000 | MICS 2000   | <b>national</b> | <b>16.5</b> |  |
| Cameroon                 | 2000 | MICS 2000   | <b>national</b> | <b>24.8</b> |  |
|                          | 1991 | DHS 1991    | <b>national</b> | <b>23.0</b> |  |
| Central African Republic | 2000 | MICS 2000   | <b>national</b> | <b>31.8</b> |  |
| Chad                     | 2000 | MICS 2000   | <b>national</b> | <b>29.2</b> |  |
|                          | 1997 | DHS 1996–97 | <b>national</b> | <b>32.0</b> |  |
| Comoros                  | 2000 | MICS 2000   | <b>national</b> | <b>31.0</b> |  |
| Côte d'Ivoire            | 2000 | MICS 2000   | <b>national</b> | <b>30.7</b> |  |
|                          | 1999 | DHS 1998–99 | <b>national</b> | <b>36.0</b> |  |
| Congo, Dem Rep. of       | 2001 | MICS 2001   | <b>national</b> | <b>41.1</b> |  |
| Egypt                    | 1995 | DHS 1995–96 | <b>national</b> | <b>40.0</b> |  |
|                          | 1992 | DHS 1992    | <b>national</b> | <b>21.0</b> |  |
| Equatorial Guinea        | 2000 | MICS 2000   | <b>national</b> | <b>25.1</b> |  |
| Eritrea                  | 2002 | DHS 2002    | <b>national</b> | <b>29.8</b> |  |
| Ethiopia                 | 2001 | RBM 2001    | 14 districts    | 88.6        |  |
|                          | 2000 | DHS 2000    | <b>national</b> | <b>28.4</b> |  |
| Gabon                    | 2000 | DHS 2000    | <b>national</b> | <b>29.1</b> |  |
| Gambia, The              | 2000 | MICS 2000   | <b>national</b> | <b>14.8</b> |  |
| Ghana                    | 2003 | DHS 2003    | <b>national</b> | <b>21.3</b> |  |
|                          | 1998 | DHS 1998–99 | <b>national</b> | <b>26.8</b> |  |
|                          | 1988 | DHS 1988    | <b>national</b> | <b>35.0</b> |  |
| Guinea                   | 1999 | DHS 1999    | <b>national</b> | <b>41.9</b> |  |
| Guinea-Bissau            | 2000 | MICS 2000   | <b>national</b> | <b>42.2</b> |  |
| Kenya                    | 2003 | DHS 2003    | <b>national</b> | <b>41.6</b> |  |
|                          | 2000 | MICS 2000   | <b>national</b> | <b>15.3</b> |  |
| Kenya                    | 1998 | DHS 1998    | <b>national</b> | <b>42.3</b> |  |
|                          | 1993 | DHS 1993    | <b>national</b> | <b>41.0</b> |  |
|                          | 1989 | DHS 1988–89 | <b>national</b> | <b>42.0</b> |  |
| Liberia                  | 1986 | DHS 1986    | <b>national</b> | <b>50.0</b> |  |
| Madagascar               | 2000 | MICS 2000   | <b>national</b> | <b>15.9</b> |  |
|                          | 1992 | DHS 1992    | <b>national</b> | <b>27.0</b> |  |



Data Table 13, *continued***AFRICA, *continued***

| COUNTRY               | YEAR | SOURCE                         | SCALE           | TOTAL       |  |
|-----------------------|------|--------------------------------|-----------------|-------------|--|
| Malawi                | 2004 | MoH 2004                       | <b>national</b> | <b>39.0</b> |  |
|                       | 2000 | DHS 2000                       | <b>national</b> | <b>41.6</b> |  |
|                       | 1992 | DHS 1992                       | <b>national</b> | <b>40.0</b> |  |
| Mali                  | 2001 | DHS 2001                       | <b>national</b> | <b>26.8</b> |  |
|                       | 1987 | DHS 1987                       | <b>national</b> | <b>33.0</b> |  |
| Mauritania            | 2004 | DHS 2003–04                    | <b>national</b> | <b>37.5</b> |  |
|                       | 2001 | DHS 2000–01                    | <b>national</b> | <b>31.1</b> |  |
| Morocco               | 1992 | DHS 1992                       | <b>national</b> | <b>27.0</b> |  |
| Namibia               | 2000 | DHS 2000                       | <b>national</b> | <b>19.4</b> |  |
|                       | 1992 | DHS 1992                       | <b>national</b> | <b>34.0</b> |  |
| Niger                 | 2000 | MICS 2000                      | <b>national</b> | <b>41.6</b> |  |
|                       | 1992 | DHS 1992                       | <b>national</b> | <b>45.0</b> |  |
| Nigeria               | 2003 | DHS 2003                       | <b>national</b> | <b>31.6</b> |  |
|                       | 1999 | DHS 1999                       | <b>national</b> | <b>30.2</b> |  |
|                       | 1990 | DHS 1990                       | <b>national</b> | <b>32.0</b> |  |
| Rwanda                | 2000 | DHS 2000                       | <b>national</b> | <b>32.7</b> |  |
|                       |      | MICS 2000                      | <b>national</b> | <b>33.4</b> |  |
|                       | 1992 | DHS 1992                       | <b>national</b> | <b>41.0</b> |  |
| São Tomé and Príncipe | 2000 | MICS 2000                      | <b>national</b> | <b>29.0</b> |  |
| Senegal               | 2000 | MICS 2000                      | <b>national</b> | <b>20.5</b> |  |
|                       | 1993 | DHS 1992–93                    | <b>national</b> | <b>38.0</b> |  |
| Sierra Leone          | 2000 | MICS 2000                      | <b>national</b> | <b>45.9</b> |  |
| Somalia               | 1999 | MICS 1999                      | <b>national</b> | <b>17.0</b> |  |
| Sudan                 | 2000 | MICS 2000                      | <b>national</b> | <b>20.7</b> |  |
| Swaziland             | 2000 | MICS 2000                      | <b>national</b> | <b>4.0</b>  |  |
| Togo                  | 2000 | MICS 2000                      | <b>national</b> | <b>36.2</b> |  |
| Uganda                | 2003 | Fapohunda BM 2003              | 6 districts     | 46.3        |  |
|                       | 2001 | DHS 2000–01                    | <b>national</b> | <b>43.9</b> |  |
| Uganda                | 2001 | MoH 2001 (RBM Baseline survey) | 4 districts     | 1.0         |  |
|                       | 1989 | DHS 1988–89                    | <b>national</b> | <b>41.0</b> |  |
| Tanzania              | 1999 | DHS 1999                       | <b>national</b> | <b>35.1</b> |  |
|                       | 1996 | DHS 1996                       | <b>national</b> | <b>30.0</b> |  |
|                       | 1992 | DHS 1991–92                    | <b>national</b> | <b>31.0</b> |  |
| Zambia                | 2002 | DHS 2002–03                    | <b>national</b> | <b>43.3</b> |  |
|                       | 1999 | MICS 1999                      | <b>national</b> | <b>14.4</b> |  |
|                       | 1997 | DHS 1996–97                    | <b>national</b> | <b>40.0</b> |  |
|                       | 1992 | DHS 1992                       | <b>national</b> | <b>43.0</b> |  |
| Zimbabwe              | 1999 | DHS 1999                       | <b>national</b> | <b>25.8</b> |  |

|  | GENDER |        | RESIDENCE |       | WEALTH QUINTILE |        |        |        |         |
|--|--------|--------|-----------|-------|-----------------|--------|--------|--------|---------|
|  | MALE   | FEMALE | URBAN     | RURAL | POOREST         | SECOND | MIDDLE | FOURTH | RICHEST |
|  | —      | —      | 28.6      | 40.1  | —               | —      | —      | —      | —       |
|  | —      | —      | 31.9      | 43.0  | —               | —      | —      | —      | —       |
|  | —      | —      | —         | —     | —               | —      | —      | —      | —       |
|  | 27.0   | 26.6   | 24.0      | 27.7  | —               | —      | —      | —      | —       |
|  | —      | —      | —         | —     | —               | —      | —      | —      | —       |
|  | 39.9   | 34.4   | 34.1      | 40.2  | —               | —      | —      | —      | —       |
|  | 30.6   | 31.6   | 31.9      | 30.4  | —               | —      | —      | —      | —       |
|  | —      | —      | —         | —     | —               | —      | —      | —      | —       |
|  | 19.0   | 19.9   | 20.9      | 18.7  | —               | —      | —      | —      | —       |
|  | —      | —      | —         | —     | —               | —      | —      | —      | —       |
|  | 42.5   | 40.5   | 25.8      | 43.9  | 45.5            | 45.0   | 40.4   | 47.9   | 28.8    |
|  | —      | —      | —         | —     | —               | —      | —      | —      | —       |
|  | 31.6   | 31.6   | 27.8      | 33.3  | —               | —      | —      | —      | —       |
|  | 31.8   | 28.6   | 26.5      | 31.6  | —               | —      | —      | —      | —       |
|  | —      | —      | —         | —     | —               | —      | —      | —      | —       |
|  | —      | —      | —         | —     | —               | —      | —      | —      | —       |
|  | 31.5   | 35.1   | 22.7      | 35.3  | 38.1            | 38.5   | 31.4   | 32.1   | 18.1    |
|  | —      | —      | —         | —     | —               | —      | —      | —      | —       |
|  | 29.4   | 28.9   | 28.6      | 29.1  | 28.1            | 30.5   | 36.8   | 27.8   | 28.4    |
|  | 21.9   | 19.2   | 15.1      | 26.9  | 26.6            | 23.8   | 19.0   | 15.3   | 16.7    |
|  | —      | —      | —         | —     | —               | —      | —      | —      | —       |
|  | 46.3   | 45.6   | 43.9      | 46.6  | 46.3            | 50.1   | 45.2   | 48.5   | 37.8    |
|  | 17.5   | 16.5   | 18.5      | 17.6  | —               | —      | —      | —      | —       |
|  | 21.8   | 19.6   | 18.4      | 22.8  | 21.0            | 20.5   | 21.2   | 20.5   | 20.6    |
|  | 3.8    | 4.1    | 9.1       | 3.0   | 2.5             | 2.8    | 3.2    | 6.1    | 8.6     |
|  | 35.9   | 36.4   | 28.8      | 38.9  | 41.2            | 37.9   | 39.1   | 35.6   | 20.9    |
|  | —      | —      | —         | —     | —               | —      | —      | —      | —       |
|  | 44.7   | 43.1   | 32.9      | 45.3  | —               | —      | —      | —      | —       |
|  | —      | —      | —         | —     | —               | —      | —      | —      | —       |
|  | —      | —      | —         | —     | —               | —      | —      | —      | —       |
|  | 36.5   | 33.7   | 33.4      | 35.5  | —               | —      | —      | —      | —       |
|  | —      | —      | —         | —     | —               | —      | —      | —      | —       |
|  | —      | —      | —         | —     | —               | —      | —      | —      | —       |
|  | 42.2   | 44.4   | 33.2      | 47.8  | —               | —      | —      | —      | —       |
|  | 14.4   | 14.4   | 10.7      | 16.3  | 15.6            | 15.9   | 19.0   | 12.5   | 8.5     |
|  | —      | —      | —         | —     | —               | —      | —      | —      | —       |
|  | —      | —      | —         | —     | —               | —      | —      | —      | —       |
|  | 26.4   | 25.1   | 22.6      | 27.3  | —               | —      | —      | —      | —       |

Data Table 13, *continued***ASIA**

| COUNTRY      | YEAR | SOURCE                      | SCALE           | TOTAL       |
|--------------|------|-----------------------------|-----------------|-------------|
| Afghanistan  | 2003 | MICS 2003                   | <b>national</b> | <b>1.2</b>  |
| Armenia      | 2000 | DHS 2000                    | <b>national</b> | <b>16.5</b> |
| Azerbaijan   | 2000 | MICS 2000                   | <b>national</b> | <b>13.7</b> |
| Bangladesh   | 1997 | DHS 1996–97                 | <b>national</b> | <b>31.0</b> |
| Cambodia     | 2000 | DHS 2000                    | <b>national</b> | <b>35.4</b> |
| Indonesia    | 2000 | MICS 2000                   | <b>national</b> | <b>3.1</b>  |
|              | 1997 | DHS 1997                    | <b>national</b> | <b>26.0</b> |
|              | 1994 | DHS 1994                    | <b>national</b> | <b>28.0</b> |
|              | 1991 | DHS 1991                    | <b>national</b> | <b>27.0</b> |
| Iraq         | 2000 | MICS 2000                   | <b>national</b> | <b>18.2</b> |
| Lao PDR      | 2000 | National Health Survey 2002 | <b>national</b> | <b>2.9</b>  |
| Nepal        | 2001 | DHS 2001                    | <b>national</b> | <b>32.0</b> |
| Pakistan     | 1991 | DHS 1990–91                 | <b>national</b> | <b>30.0</b> |
| Philippines  | 1998 | DHS 1998                    | <b>national</b> | <b>26.0</b> |
|              | 1993 | DHS 1993                    | <b>national</b> | <b>25.0</b> |
| Tajikistan   | 2000 | MICS 2000                   | <b>national</b> | <b>1.7</b>  |
| Timor Leste  | 2002 | MICS 2002                   | <b>national</b> | <b>27.9</b> |
| Turkey       | 1993 | DHS 1993                    | <b>national</b> | <b>30.0</b> |
| Turkmenistan | 2000 | DHS 2000                    | <b>national</b> | <b>4.0</b>  |
| Vietnam      | 2000 | MICS 2000                   | <b>national</b> | <b>13.1</b> |
| Yemen        | 1997 | DHS 1997                    | <b>national</b> | <b>40.0</b> |
|              | 1992 | DHS 1991–92                 | <b>national</b> | <b>46.0</b> |



Data Table 13, *continued***THE AMERICAS**

| COUNTRY            | YEAR | SOURCE      | SCALE           | TOTAL       |  |
|--------------------|------|-------------|-----------------|-------------|--|
| Bolivia            | 1998 | DHS 1998    | <b>national</b> | <b>32.0</b> |  |
| Brazil             | 1996 | DHS 1996    | <b>national</b> | <b>26.0</b> |  |
| Colombia           | 2000 | DHS 2000    | <b>national</b> | <b>25.5</b> |  |
|                    | 1995 | DHS 1995    | <b>national</b> | <b>28.0</b> |  |
|                    | 1990 | DHS 1990    | <b>national</b> | <b>19.0</b> |  |
|                    | 1986 | DHS 1986    | <b>national</b> | <b>30.0</b> |  |
| Dominican Republic | 2002 | DHS 2002    | <b>national</b> | <b>26.4</b> |  |
|                    | 1996 | DHS 1996    | <b>national</b> | <b>28.8</b> |  |
|                    | 1991 | DHS 1991    | <b>national</b> | <b>27.0</b> |  |
| Guatemala          | 1999 | DHS 1998–99 | <b>national</b> | <b>27.0</b> |  |
|                    |      | MICS        | <b>national</b> | <b>20.3</b> |  |
|                    | 1995 | DHS 1995    | <b>national</b> | <b>28.0</b> |  |
| Guyana             | 2000 | MICS 2000   | <b>national</b> | <b>18.5</b> |  |
| Haiti              | 2000 | DHS 2000    | <b>national</b> | <b>40.6</b> |  |
|                    | 1995 | DHS 1994–95 | <b>national</b> | <b>40.0</b> |  |
| Nicaragua          | 2001 | DHS 2001    | <b>national</b> | <b>24.9</b> |  |
|                    | 1998 | DHS 1997–98 | <b>national</b> | <b>23.0</b> |  |
| Paraguay           | 1990 | DHS 1990    | <b>national</b> | <b>31.0</b> |  |
| Peru               | 2000 | DHS 2000    | <b>national</b> | <b>26.0</b> |  |
|                    | 1996 | DHS 1996    | <b>national</b> | <b>28.0</b> |  |



**Data Table 14:** Percentage of Febrile Children under Five Years Old That Received Treatment with Chloroquine, by Background Characteristics**AFRICA**

| COUNTRY                  | YEAR | SOURCE      | SCALE           | TOTAL       |
|--------------------------|------|-------------|-----------------|-------------|
| Angola                   | 2001 | MICS 2001   | <b>national</b> | <b>56.9</b> |
| Benin                    | 2001 | DHS 2001    | <b>national</b> | <b>59.0</b> |
| Burkina Faso             | 2003 | DHS 2003    | <b>national</b> | <b>47.7</b> |
| Burundi                  | 2000 | MICS 2000   | <b>national</b> | <b>23.3</b> |
| Cameroon                 | 2000 | MICS 2000   | <b>national</b> | <b>48.3</b> |
| Central African Republic | 2000 | MICS 2000   | <b>national</b> | <b>65.7</b> |
| Chad                     | 2000 | MICS 2000   | <b>national</b> | <b>31.1</b> |
| Comoros                  | 2000 | MICS 2000   | <b>national</b> | <b>61.5</b> |
| Côte d'Ivoire            | 2000 | MICS 2000   | <b>national</b> | <b>56.3</b> |
| Congo, Dem. Rep. of      | 2001 | MICS 2001   | <b>national</b> | <b>45.0</b> |
| Equatorial Guinea        | 2000 | MICS 2000   | <b>national</b> | <b>41.2</b> |
| Eritrea                  | 2002 | DHS 2002    | <b>national</b> | <b>2.4</b>  |
| Ethiopia                 | 2000 | DHS 2000    | <b>national</b> | <b>1.6</b>  |
| Gabon                    | 2000 | DHS 2000    | <b>national</b> | <b>38.8</b> |
| Gambia, The              | 2000 | MICS 2000   | <b>national</b> | <b>54.5</b> |
| Ghana                    | 2003 | DHS 2003    | <b>national</b> | <b>59.2</b> |
| Guinea-Bissau            | 2000 | MICS 2000   | <b>national</b> | <b>58.3</b> |
| Kenya                    | 2003 | DHS 2003    | <b>national</b> | <b>3.4</b>  |
|                          | 2000 | MICS 2000   | <b>national</b> | <b>43.5</b> |
| Madagascar               | 2000 | MICS 2000   | <b>national</b> | <b>29.7</b> |
| Malawi                   | 2000 | DHS 2000    | <b>national</b> | <b>1.3</b>  |
| Mali                     | 2001 | DHS 2001    | <b>national</b> | <b>38.2</b> |
| Mauritania               | 2004 | DHS 2003–04 | <b>national</b> | <b>28.3</b> |
|                          | 2001 | DHS 2000–01 | <b>national</b> | <b>21.3</b> |
| Mozambique               | 2003 | 2003        | subnational     | 14.9        |
| Namibia                  | 2000 | DHS 2000    | <b>national</b> | <b>14.4</b> |
| Niger                    | 2000 | MICS 2000   | <b>national</b> | <b>48.1</b> |
| Nigeria                  | 2003 | DHS 2003    | <b>national</b> | <b>32.9</b> |
| Rwanda                   | 2000 | DHS 2000    | <b>national</b> | <b>4.6</b>  |
|                          |      | MICS 2000   | <b>national</b> | <b>7.1</b>  |
| São Tomé and Príncipe    | 2000 | MICS 2000   | <b>national</b> | <b>60.7</b> |
| Senegal                  | 2000 | MICS 2000   | <b>national</b> | <b>35.9</b> |
| Sierra Leone             | 2000 | MICS 2000   | <b>national</b> | <b>59.6</b> |
| Somalia                  | 1999 | MICS 1999   | <b>national</b> | <b>18.5</b> |
| Sudan                    | 2000 | MICS 2000   | <b>national</b> | <b>49.4</b> |

|  | GENDER |        | RESIDENCE |       | WEALTH QUINTILE |        |        |        |         |
|--|--------|--------|-----------|-------|-----------------|--------|--------|--------|---------|
|  | MALE   | FEMALE | URBAN     | RURAL | POOREST         | SECOND | MIDDLE | FOURTH | RICHEST |
|  | 57.1   | 56.8   | 57.6      | 55.6  | 52.4            | 58.7   | 60.0   | 55.5   | 57.7    |
|  | 57.5   | 60.5   | 60.3      | 58.5  | —               | —      | —      | —      | —       |
|  | —      | —      | 52.3      | 47.1  | 35.9            | 43.9   | 49.0   | 56.9   | 55.1    |
|  | 22.8   | 23.9   | 25.0      | 23.2  | 14.8            | 27.5   | 24.6   | 21.2   | 26.0    |
|  | 47.4   | 49.3   | 48.3      | 48.3  | 41.7            | 46.8   | 47.8   | 59.8   | 47.8    |
|  | 65.3   | 66.1   | 71.4      | 62.7  | 57.7            | 62.3   | 68.8   | 70.6   | 73.1    |
|  | 30.1   | 32.0   | 39.9      | 28.8  | 20.0            | 33.8   | 28.9   | 32.7   | 39.5    |
|  | 60.7   | 62.2   | 63.0      | 61.1  | 48.4            | 66.6   | 60.3   | 67.4   | 64.6    |
|  | 55.8   | 56.9   | 67.4      | 48.9  | 40.9            | 53.7   | 59.6   | 72.0   | 67.1    |
|  | 44.4   | 45.5   | 49.2      | 43.2  | 40.7            | 43.8   | 47.8   | 45.9   | 45.9    |
|  | 40.0   | 42.7   | 43.6      | 39.5  | 40.2            | 41.4   | 43.2   | 39.9   | 42.7    |
|  | 3.4    | 1.3    | 2.8       | 2.3   | 1.5             | 1.8    | 2.5    | 4.9    | 0.9     |
|  | —      | —      | —         | —     | —               | —      | —      | —      | —       |
|  | —      | —      | 35.6      | 49.1  | —               | —      | —      | —      | —       |
|  | 58.9   | 50.4   | 57.0      | 53.1  | 54.9            | 54.4   | 54.7   | 58.1   | 47.4    |
|  | 58.0   | 60.5   | 61.7      | 57.9  | 55.2            | 52.1   | 64.0   | 69.6   | 56.3    |
|  | 57.4   | 59.1   | 71.5      | 51.7  | 43.7            | 56.0   | 57.1   | 61.7   | 76.2    |
|  | 3.7    | 3.0    | 2.6       | 3.5   | 6.5             | 4.7    | 1.7    | 0.9    | 2.1     |
|  | 44.9   | 40.7   | 35.7      | 44.5  | 43.4            | 39.8   | 46.8   | 44.0   | 41.7    |
|  | 29.5   | 29.9   | 23.3      | 30.8  | 28.1            | 31.2   | 30.4   | 30.5   | 21.2    |
|  | —      | —      | 0.5       | 1.4   | —               | —      | —      | —      | —       |
|  | —      | —      | 52.1      | 34.4  | —               | —      | —      | —      | —       |
|  | 28.6   | 27.9   | 22.0      | 32.4  | —               | —      | —      | —      | —       |
|  | 20.0   | 22.7   | 25.9      | 17.8  | —               | —      | —      | —      | —       |
|  | —      | —      | 12.7      | 15.7  | —               | —      | —      | —      | —       |
|  | 14.7   | 14.0   | 6.3       | 19.2  | —               | —      | —      | —      | —       |
|  | 48.7   | 47.4   | 59.0      | 47.1  | 41.6            | 43.3   | 49.2   | 47.7   | 64.9    |
|  | 31.6   | 34.1   | 37.6      | 31.1  | —               | —      | —      | —      | —       |
|  | —      | —      | —         | —     | —               | —      | —      | —      | —       |
|  | 8.2    | 6.1    | 11.9      | 6.5   | 5.0             | 5.9    | 7.3    | 6.7    | 26.9    |
|  | 61.9   | 60.2   | 61.2      | 61.1  | 60.6            | 51.7   | 59.4   | 62.9   | 61.8    |
|  | 34.4   | 37.5   | 49.0      | 23.3  | 25.4            | 30.0   | 32.6   | 54.8   | 54.2    |
|  | 60.6   | 58.6   | 58.3      | 60.0  | 52.5            | 58.5   | 62.7   | 63.6   | 62.1    |
|  | 18.7   | 18.4   | 11.1      | 24.4  | —               | —      | —      | —      | —       |
|  | 50.6   | 48.1   | 59.4      | 41.6  | 45.0            | 47.5   | 48.4   | 45.9   | 54.9    |

Data Table 14, *continued***AFRICA, *continued***

| COUNTRY   | YEAR | SOURCE      | SCALE           | TOTAL       |  |
|-----------|------|-------------|-----------------|-------------|--|
| Swaziland | 2000 | MICS 2000   | <b>national</b> | <b>22.6</b> |  |
| Togo      | 2000 | MICS 2000   | <b>national</b> | <b>59.2</b> |  |
| Tanzania  | 1999 | DHS 1999    | <b>national</b> | <b>52.9</b> |  |
| Zambia    | 2002 | DHS 2002–03 | <b>national</b> | <b>49.7</b> |  |
|           | 2000 | MICS 1999   | <b>national</b> | —           |  |
|           | 1999 | MICS 1999   | <b>national</b> | <b>56.4</b> |  |

**ASIA**

| COUNTRY     | YEAR | SOURCE                      | SCALE           | TOTAL       |  |
|-------------|------|-----------------------------|-----------------|-------------|--|
| Azerbaijan  | 2000 | MICS 2000                   | <b>national</b> | —           |  |
| Indonesia   | 2000 | MICS 2000                   | <b>national</b> | <b>3.3</b>  |  |
| Iraq        | 2000 | MICS 2000                   | <b>national</b> | <b>0.9</b>  |  |
| Lao PDR     | 2000 | National Health Survey 2002 | <b>national</b> | <b>8.7</b>  |  |
| Tajikistan  | 2000 | MICS 2000                   | <b>national</b> | <b>67.2</b> |  |
| Timor Leste | 2002 | MICS 2002                   | <b>national</b> | <b>42.7</b> |  |
| Vietnam     | 2000 | MICS 2000                   | <b>national</b> | <b>3.7</b>  |  |

**THE AMERICAS**

| COUNTRY   | YEAR | SOURCE    | SCALE           | TOTAL       |  |
|-----------|------|-----------|-----------------|-------------|--|
| Guatemala | 1999 | MICS      | <b>national</b> | <b>18.0</b> |  |
| Guyana    | 2000 | MICS 2000 | <b>national</b> | <b>2.1</b>  |  |
| Haiti     | 2000 | DHS 2000  | <b>national</b> | <b>11.7</b> |  |
| Nicaragua | 2001 | DHS 2001  | <b>national</b> | <b>1.6</b>  |  |

|  | GENDER      |             | RESIDENCE   |             | WEALTH QUINTILE |             |             |             |             |
|--|-------------|-------------|-------------|-------------|-----------------|-------------|-------------|-------------|-------------|
|  | MALE        | FEMALE      | URBAN       | RURAL       | POOREST         | SECOND      | MIDDLE      | FOURTH      | RICHEST     |
|  | <b>25.4</b> | <b>18.9</b> | <b>28.0</b> | <b>21.8</b> | <b>30.1</b>     | <b>12.0</b> | <b>25.8</b> | <b>28.1</b> | <b>18.8</b> |
|  | <b>59.9</b> | <b>58.5</b> | <b>61.4</b> | <b>58.6</b> | <b>56.6</b>     | <b>57.5</b> | <b>60.3</b> | <b>59.9</b> | <b>68.5</b> |
|  | —           | —           | —           | —           | —               | —           | —           | —           | —           |
|  | —           | —           | <b>46.0</b> | <b>50.9</b> | —               | —           | —           | —           | —           |
|  | —           | —           | —           | —           | <b>50.2</b>     | <b>50.4</b> | <b>65.5</b> | <b>54.7</b> | <b>62.4</b> |
|  | <b>56.6</b> | <b>56.2</b> | <b>56.2</b> | <b>56.5</b> | —               | —           | —           | —           | —           |

|  | GENDER      |             | RESIDENCE    |             | WEALTH QUINTILE |             |             |             |              |
|--|-------------|-------------|--------------|-------------|-----------------|-------------|-------------|-------------|--------------|
|  | MALE        | FEMALE      | URBAN        | RURAL       | POOREST         | SECOND      | MIDDLE      | FOURTH      | RICHEST      |
|  | —           | —           | —            | —           | —               | —           | —           | —           | —            |
|  | <b>2.4</b>  | <b>4.2</b>  | <b>2.2</b>   | <b>3.6</b>  | —               | —           | —           | —           | —            |
|  | <b>0.8</b>  | <b>1.1</b>  | <b>0.8</b>   | <b>1.1</b>  | —               | —           | —           | —           | —            |
|  | <b>7.4</b>  | <b>7.9</b>  | <b>2.1</b>   | <b>10.1</b> | <b>8.3</b>      | <b>14.0</b> | <b>9.5</b>  | <b>2.4</b>  | <b>10.6</b>  |
|  | <b>61.1</b> | <b>76.0</b> | <b>100.0</b> | <b>66.7</b> | <b>56.5</b>     | <b>85.7</b> | <b>71.4</b> | <b>62.5</b> | <b>100.0</b> |
|  | <b>42.2</b> | <b>43.3</b> | <b>51.8</b>  | <b>40.5</b> | <b>38.0</b>     | <b>36.6</b> | <b>45.2</b> | <b>41.9</b> | <b>58.4</b>  |
|  | <b>4.1</b>  | <b>3.3</b>  | <b>5.9</b>   | <b>3.2</b>  | <b>4.7</b>      | <b>5.1</b>  | <b>0.4</b>  | <b>3.9</b>  | <b>5.1</b>   |

|  | GENDER      |             | RESIDENCE   |             |
|--|-------------|-------------|-------------|-------------|
|  | MALE        | FEMALE      | URBAN       | RURAL       |
|  | —           | —           | <b>22.7</b> | —           |
|  | —           | <b>4.3</b>  | —           | <b>2.1</b>  |
|  | <b>12.6</b> | <b>10.8</b> | <b>7.3</b>  | <b>13.2</b> |
|  | —           | —           | —           | —           |

**Data Table 15:** Percentage of Febrile Children under Five Years Old That Received Treatment with Sulfadoxine Pyrimethamine (SP), by Background Characteristics

## AFRICA

| COUNTRY                  | YEAR | SOURCE      | SCALE              | TOTAL       |  |
|--------------------------|------|-------------|--------------------|-------------|--|
| Angola                   | 2001 | MICS 2001   | <b>national</b>    | <b>1.4</b>  |  |
| Benin                    | 2001 | DHS 2001    | <b>national</b>    | <b>0.9</b>  |  |
| Burkina Faso             | 2003 | DHS 2003    | <b>national</b>    | <b>0.2</b>  |  |
| Burundi                  | 2000 | MICS 2000   | <b>national</b>    | <b>1.6</b>  |  |
| Cameroon                 | 2000 | MICS 2000   | <b>national</b>    | <b>1.4</b>  |  |
| Central African Republic | 2000 | MICS 2000   | <b>national</b>    | <b>0.3</b>  |  |
| Chad                     | 2000 | MICS 2000   | <b>national</b>    | <b>1.2</b>  |  |
| Comoros                  | 2000 | MICS 2000   | <b>national</b>    | <b>4.0</b>  |  |
| Côte d'Ivoire            | 2000 | MICS 2000   | <b>national</b>    | <b>2.5</b>  |  |
| Congo, Dem. Rep. of      | 2001 | MICS 2001   | <b>national</b>    | <b>0.8</b>  |  |
| Eritrea                  | 2002 | DHS 2002    | <b>national</b>    | <b>0.5</b>  |  |
| Ethiopia                 | 2000 | DHS 2000    | <b>national</b>    | <b>0.7</b>  |  |
| Gambia, The              | 2000 | MICS 2000   | <b>national</b>    | <b>3.1</b>  |  |
| Ghana                    | 2003 | DHS 2003    | <b>national</b>    | <b>0.3</b>  |  |
| Guinea-Bissau            | 2000 | MICS 2000   | <b>national</b>    | <b>2.5</b>  |  |
| Kenya                    | 2003 | DHS 2003    | <b>national</b>    | <b>11.1</b> |  |
|                          | 2000 | MICS 2000   | <b>national</b>    | <b>26.3</b> |  |
| Madagascar               | 2000 | MICS 2000   | <b>national</b>    | <b>0.7</b>  |  |
| Malawi                   | 2000 | DHS 2000    | <b>national</b>    | <b>23.2</b> |  |
| Mauritania               | 2004 | DHS 2003–04 | <b>national</b>    | <b>0.7</b>  |  |
| Mozambique               | 2003 | HDS 2003    | <b>subnational</b> | <b>10.7</b> |  |
| Niger                    | 2000 | MICS 2000   | <b>national</b>    | <b>0.1</b>  |  |
| Nigeria                  | 2003 | DHS 2003    | <b>national</b>    | <b>0.4</b>  |  |
| Rwanda                   | 2000 | DHS 2000    | <b>national</b>    | <b>1.2</b>  |  |
|                          |      | MICS 2000   | <b>national</b>    | <b>2.3</b>  |  |
| São Tomé and Príncipe    | 2000 | MICS 2000   | <b>national</b>    | <b>0.8</b>  |  |
| Senegal                  | 2000 | MICS 2000   | <b>national</b>    | <b>0.5</b>  |  |
| Sierra Leone             | 2000 | MICS 2000   | <b>national</b>    | <b>4.3</b>  |  |
| Somalia                  | 1999 | MICS 1999   | <b>national</b>    | —           |  |
| Sudan                    | 2000 | MICS 2000   | <b>national</b>    | <b>1.4</b>  |  |
| Swaziland                | 2000 | MICS 2000   | <b>national</b>    | <b>5.7</b>  |  |
| Togo                     | 2000 | MICS 2000   | <b>national</b>    | <b>3.4</b>  |  |
| Tanzania                 | 1999 | DHS 1999    | <b>national</b>    | —           |  |
| Zambia                   | 2002 | DHS 2002–03 | <b>national</b>    | <b>2.4</b>  |  |
|                          | 2000 | MICS 1999   | <b>national</b>    | —           |  |
|                          | 1999 | MICS 1999   | <b>national</b>    | <b>2.4</b>  |  |

|  | GENDER |        | RESIDENCE |       | WEALTH QUINTILE |        |        |        |         |
|--|--------|--------|-----------|-------|-----------------|--------|--------|--------|---------|
|  | MALE   | FEMALE | URBAN     | RURAL | POOREST         | SECOND | MIDDLE | FOURTH | RICHEST |
|  | 1.6    | 1.2    | 1.0       | 2.4   | 1.0             | 0.7    | 1.6    | 2.5    | 0.8     |
|  | 0.7    | 1.0    | 0.4       | 1.0   | —               | —      | —      | —      | —       |
|  | —      | —      | 0.9       | 0.2   | —               | —      | —      | 0.6    | 1.0     |
|  | 1.8    | 1.5    | —         | 1.8   | 1.1             | 2.5    | 1.8    | 1.0    | 1.6     |
|  | 1.6    | 1.1    | 1.8       | 1.2   | —               | 2.1    | 1.8    | 2.3    | 0.8     |
|  | 0.3    | 0.3    | 0.5       | 0.2   | 0.2             | 0.2    | —      | 0.5    | 0.5     |
|  | 1.0    | 1.5    | 1.9       | 1.1   | 1.7             | 0.5    | 1.8    | 0.9    | 1.7     |
|  | 4.1    | 3.8    | 3.8       | 4.0   | 4.3             | 3.7    | 3.9    | 3.7    | 4.3     |
|  | 3.0    | 1.9    | 2.5       | 2.4   | 1.6             | 2.1    | 4.1    | 2.3    | 2.4     |
|  | 0.9    | 0.7    | 1.0       | 0.7   | 0.2             | 0.6    | 0.4    | 2.2    | 0.8     |
|  | 0.5    | 0.4    | 0.3       | 0.6   | 0.3             | 0.6    | 0.7    | 0.7    | —       |
|  | —      | —      | —         | —     | —               | —      | —      | —      | —       |
|  | 4.0    | 2.4    | 3.9       | 2.7   | 4.0             | 3.0    | 3.2    | 2.5    | 2.7     |
|  | 0.5    | —      | 0.8       | —     | —               | —      | —      | 0.6    | 1.0     |
|  | 2.7    | 2.2    | 3.4       | 2.0   | 0.7             | 0.9    | 3.8    | 3.4    | 3.7     |
|  | 11.9   | 10.2   | 7.6       | 11.9  | 11.1            | 12.5   | 15.1   | 8.3    | 7.6     |
|  | 25.7   | 28.9   | 33.9      | 25.8  | 23.5            | 29.6   | 21.7   | 24.8   | 39.9    |
|  | 1.2    | 0.2    | —         | 0.8   | —               | 0.5    | 1.3    | 1.8    | 1.8     |
|  | —      | —      | 27.6      | 22.8  | —               | —      | —      | —      | —       |
|  | 1.2    | —      | 0.6       | 0.8   | —               | —      | —      | —      | —       |
|  | —      | —      | 9.2       | 11.3  | —               | —      | —      | —      | —       |
|  | 0.2    | —      | 0.2       | 0.1   | —               | —      | —      | 0.3    | 0.1     |
|  | 0.5    | 0.6    | 0.4       | 0.4   | —               | —      | —      | —      | —       |
|  | —      | —      | —         | —     | —               | —      | —      | —      | —       |
|  | 2.7    | 1.9    | 0.2       | 2.5   | 1.7             | 1.8    | 2.0    | 3.6    | 0.6     |
|  | 0.3    | 1.3    | 1.0       | 0.6   | —               | —      | —      | —      | 1.0     |
|  | 0.6    | 0.3    | —         | 0.3   | —               | 0.2    | 0.5    | 0.5    | 2.1     |
|  | 4.3    | 4.3    | 6.7       | 3.6   | 2.7             | 1.6    | 4.9    | 7.7    | 5.6     |
|  | —      | —      | —         | —     | —               | —      | —      | —      | —       |
|  | 1.9    | 0.8    | 2.0       | 0.9   | 0.8             | 0.6    | 1.6    | 1.0    | 2.0     |
|  | 7.7    | 4.5    | —         | 9.9   | 25.2            | 4.3    | 4.3    | —      | —       |
|  | 2.8    | 4.0    | 4.5       | 3.1   | 2.6             | 2.0    | 3.1    | 3.5    | 10.9    |
|  | —      | —      | —         | —     | —               | —      | —      | —      | —       |
|  | —      | —      | 4.7       | 1.7   | —               | —      | —      | —      | —       |
|  | —      | —      | —         | —     | 2.4             | 0.1    | 1.9    | 3.5    | 6.6     |
|  | 2.6    | 2.2    | 3.2       | 2.2   | —               | —      | —      | —      | —       |

Data Table 15, *continued***ASIA**

| COUNTRY     | YEAR | SOURCE                      | SCALE           | TOTAL       |
|-------------|------|-----------------------------|-----------------|-------------|
| Indonesia   | 2000 | MICS 2000                   | <b>national</b> | <b>0.3</b>  |
| Iraq        | 2000 | MICS 2000                   | <b>national</b> | <b>0.3</b>  |
| Lao PDR     | 2000 | National Health Survey 2002 | <b>national</b> | —           |
| Tajikistan  | 2000 | MICS 2000                   | <b>national</b> | <b>57.4</b> |
| Timor Leste | 2002 | MICS 2002                   | <b>national</b> | <b>11.9</b> |
| Vietnam     | 2000 | MICS 2000                   | <b>national</b> | <b>1.4</b>  |

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| COUNTRY   | YEAR | SOURCE    | SCALE           | TOTAL      |
|-----------|------|-----------|-----------------|------------|
| Guyana    | 2000 | MICS 2000 | <b>national</b> | <b>0.5</b> |
| Nicaragua | 2001 | DHS 2001  | <b>national</b> | <b>0.2</b> |

|  | GENDER      |             | RESIDENCE   |             | WEALTH QUINTILE |             |             |             |             |
|--|-------------|-------------|-------------|-------------|-----------------|-------------|-------------|-------------|-------------|
|  | MALE        | FEMALE      | URBAN       | RURAL       | POOREST         | SECOND      | MIDDLE      | FOURTH      | RICHEST     |
|  | <b>0.2</b>  | <b>0.4</b>  | <b>0.4</b>  | <b>0.2</b>  | —               | —           | —           | —           | —           |
|  | <b>0.2</b>  | <b>0.3</b>  | <b>0.3</b>  | <b>0.2</b>  | —               | —           | —           | —           | —           |
|  | —           | —           | —           | —           | —               | —           | —           | —           | —           |
|  | <b>55.6</b> | <b>60.0</b> | —           | <b>58.3</b> | <b>56.5</b>     | <b>71.4</b> | <b>52.4</b> | <b>62.5</b> | <b>50.0</b> |
|  | <b>12.2</b> | <b>11.5</b> | <b>11.7</b> | <b>11.9</b> | <b>13.3</b>     | <b>12.3</b> | <b>5.7</b>  | <b>14.3</b> | <b>14.1</b> |
|  | <b>1.4</b>  | <b>1.4</b>  | <b>0.5</b>  | <b>1.6</b>  | <b>1.4</b>      | <b>4.4</b>  | <b>0.4</b>  | —           | —           |

|  | GENDER     |        | RESIDENCE |            |
|--|------------|--------|-----------|------------|
|  | MALE       | FEMALE | URBAN     | RURAL      |
|  | <b>1.0</b> | —      | —         | <b>0.5</b> |
|  | —          | —      | —         | —          |

**Data Table 16:** Percentage of Febrile Children under Five Years Old That Received Treatment with Any Antimalarial, by Background Characteristics**AFRICA**

| COUNTRY                  | YEAR | SOURCE      | SCALE           | TOTAL       |  |
|--------------------------|------|-------------|-----------------|-------------|--|
| Angola                   | 2001 | MICS 2001   | <b>national</b> | <b>63.0</b> |  |
| Benin                    | 2001 | DHS 2001    | <b>national</b> | <b>60.4</b> |  |
| Burkina Faso             | 2003 | DHS 2003    | <b>national</b> | <b>49.6</b> |  |
|                          | 1993 | DHS 1992–93 | <b>national</b> | <b>31.5</b> |  |
| Burundi                  | 2000 | MICS 2000   | <b>national</b> | <b>31.3</b> |  |
| Cameroon                 | 2000 | MICS 2000   | <b>national</b> | <b>66.1</b> |  |
| Central African Republic | 2000 | MICS 2000   | <b>national</b> | <b>68.8</b> |  |
| Chad                     | 2000 | MICS 2000   | <b>national</b> | <b>31.9</b> |  |
| Comoros                  | 2000 | MICS 2000   | <b>national</b> | <b>62.7</b> |  |
| Côte d'Ivoire            | 2000 | MICS 2000   | <b>national</b> | <b>57.5</b> |  |
| Congo, Dem. Rep. of      | 2001 | MICS 2001   | <b>national</b> | <b>45.4</b> |  |
| Equatorial Guinea        | 2000 | MICS 2000   | <b>national</b> | <b>48.6</b> |  |
| Eritrea                  | 2002 | DHS 2002    | <b>national</b> | <b>3.6</b>  |  |
| Ethiopia                 | 2001 | RBM 2001    | 14 districts    | 73.7        |  |
|                          | 2000 | DHS 2000    | <b>national</b> | <b>3.0</b>  |  |
| Gambia, The              | 2000 | MICS 2000   | <b>national</b> | <b>55.2</b> |  |
| Ghana                    | 2003 | DHS 2003    | <b>national</b> | <b>62.8</b> |  |
|                          | 1998 | DHS 1998–99 | <b>national</b> | <b>60.7</b> |  |
| Guinea-Bissau            | 2000 | MICS 2000   | <b>national</b> | <b>58.4</b> |  |
| Kenya                    | 2003 | DHS 2003    | <b>national</b> | <b>26.5</b> |  |
|                          | 2000 | MICS 2000   | <b>national</b> | <b>64.5</b> |  |
|                          | 1998 | DHS 1998    | <b>national</b> | <b>40.4</b> |  |
| Madagascar               | 2000 | MICS 2000   | <b>national</b> | <b>60.7</b> |  |
| Malawi                   | 2004 | MoH 2004    | <b>national</b> | <b>31.6</b> |  |
|                          | 2000 | DHS 2000    | <b>national</b> | <b>27.0</b> |  |
| Mauritania               | 2004 | DHS 2003–04 | <b>national</b> | <b>33.4</b> |  |
| Mozambique               | 2003 | HDS 2003    | subnational     | 14.8        |  |
| Namibia                  | 2000 | DHS 2000    | <b>national</b> | <b>14.4</b> |  |
| Niger                    | 2000 | MICS 2000   | <b>national</b> | <b>48.1</b> |  |
| Nigeria                  | 2003 | DHS 2003    | <b>national</b> | <b>33.8</b> |  |
| Rwanda                   | 2000 | DHS 2000    | <b>national</b> | <b>9.2</b>  |  |
|                          |      | MICS 2000   | <b>national</b> | <b>12.6</b> |  |
| São Tomé and Príncipe    | 2000 | MICS 2000   | <b>national</b> | <b>61.2</b> |  |
| Senegal                  | 2000 | MICS 2000   | <b>national</b> | <b>36.2</b> |  |
| Sierra Leone             | 2000 | MICS 2000   | <b>national</b> | <b>60.7</b> |  |
| Somalia                  | 1999 | MICS 1999   | <b>national</b> | <b>18.5</b> |  |

|  | GENDER |        | RESIDENCE |       | WEALTH QUINTILE |        |        |        |         |
|--|--------|--------|-----------|-------|-----------------|--------|--------|--------|---------|
|  | MALE   | FEMALE | URBAN     | RURAL | POOREST         | SECOND | MIDDLE | FOURTH | RICHEST |
|  | 63.1   | 62.8   | 63.1      | 62.7  | 57.8            | 64.2   | 64.2   | 65.0   | 62.7    |
|  | 59.0   | 62.0   | 62.3      | 59.7  | —               | —      | —      | —      | —       |
|  | —      | —      | 60.1      | 48.4  | 36.5            | 44.7   | 49.7   | 59.3   | 62.7    |
|  | 33.3   | 29.6   | 39.1      | 30.5  | —               | —      | —      | —      | —       |
|  | 30.2   | 32.6   | 41.7      | 30.6  | 23.9            | 34.2   | 29.8   | 28.8   | 37.4    |
|  | 67.0   | 65.1   | 70.8      | 64.4  | 59.1            | 66.7   | 61.0   | 76.7   | 70.8    |
|  | 69.0   | 68.6   | 75.8      | 65.2  | 59.3            | 64.6   | 71.6   | 74.7   | 79.0    |
|  | 30.9   | 32.8   | 41.2      | 29.5  | 21.1            | 34.3   | 29.5   | 33.5   | 40.5    |
|  | 62.2   | 63.1   | 65.2      | 62.1  | 51.2            | 67.5   | 60.7   | 67.9   | 66.3    |
|  | 57.0   | 58.0   | 68.6      | 49.8  | 41.9            | 54.3   | 60.8   | 73.2   | 69.5    |
|  | 44.9   | 45.9   | 49.6      | 43.7  | 40.9            | 44.3   | 47.8   | 46.9   | 46.7    |
|  | 47.2   | 50.2   | 55.2      | 42.9  | 44.2            | 45.2   | 53.8   | 49.1   | 53.2    |
|  | 4.2    | 2.9    | 4.0       | 3.5   | 2.4             | 3.3    | 4.2    | 5.8    | 1.5     |
|  | —      | —      | —         | —     | —               | —      | —      | —      | —       |
|  | —      | —      | —         | —     | —               | —      | —      | —      | —       |
|  | 59.6   | 51.0   | 58.0      | 53.5  | 54.9            | 56.0   | 56.5   | 58.1   | 47.4    |
|  | 62.1   | 63.5   | 65.2      | 61.4  | 59.0            | 55.4   | 65.0   | 76.9   | 58.3    |
|  | 60.7   | 60.7   | 60.1      | 60.9  | —               | —      | —      | —      | —       |
|  | 57.5   | 59.4   | 71.9      | 51.7  | 43.7            | 56.0   | 57.3   | 61.8   | 76.8    |
|  | 27.5   | 25.5   | 21.5      | 27.7  | 27.5            | 31.6   | 28.7   | 24.9   | 18.2    |
|  | 65.6   | 63.4   | 63.6      | 64.7  | 64.0            | 62.7   | 63.7   | 62.4   | 75.8    |
|  | 39.9   | 40.8   | 35.2      | 41.5  | —               | —      | —      | —      | —       |
|  | 59.3   | 62.3   | 61.9      | 60.5  | 66.0            | 55.9   | 64.2   | 58.2   | 52.7    |
|  | —      | —      | 39.3      | 31.0  | —               | —      | —      | —      | —       |
|  | —      | —      | 33.7      | 26.3  | —               | —      | —      | —      | —       |
|  | 34.0   | 32.6   | 26.7      | 37.7  | —               | —      | —      | —      | —       |
|  | —      | —      | 12.7      | 12.7  | —               | —      | —      | —      | —       |
|  | 14.7   | 14.0   | 6.3       | 19.2  | —               | —      | —      | —      | —       |
|  | 48.7   | 47.4   | 59.0      | 47.1  | 41.6            | 43.3   | 49.2   | 47.7   | 64.9    |
|  | 32.5   | 35.2   | 38.5      | 32.2  | —               | —      | —      | —      | —       |
|  | —      | —      | 11.5      | 9.0   | —               | —      | —      | —      | —       |
|  | 14.5   | 11.1   | 20.7      | 11.7  | 8.8             | 10.0   | 12.0   | 16.0   | 30.4    |
|  | 62.2   | 60.8   | 61.9      | 61.4  | 60.6            | 51.7   | 59.4   | 62.9   | 62.4    |
|  | 34.9   | 37.6   | 52.7      | 30.1  | 25.4            | 30.0   | 33.1   | 54.8   | 56.1    |
|  | 61.4   | 59.9   | 60.8      | 60.7  | 53.3            | 58.5   | 63.9   | 65.2   | 64.4    |
|  | 18.7   | 18.4   | 11.1      | 24.4  | —               | —      | —      | —      | —       |

Data Table 16, *continued***AFRICA**

| COUNTRY   | YEAR | SOURCE      | SCALE           | TOTAL       |  |
|-----------|------|-------------|-----------------|-------------|--|
| Sudan     | 2000 | MICS 2000   | <b>national</b> | <b>50.2</b> |  |
| Swaziland | 2000 | MICS 2000   | <b>national</b> | <b>25.5</b> |  |
| Togo      | 2000 | MICS 2000   | <b>national</b> | <b>60.0</b> |  |
| Tanzania  | 1999 | DHS 1999    | <b>national</b> | <b>53.4</b> |  |
| Zambia    | 2002 | DHS 2002–03 | <b>national</b> | <b>51.9</b> |  |
|           | 1999 | MICS 1999   | <b>national</b> | <b>58.0</b> |  |

**ASIA**

| COUNTRY     | YEAR | SOURCE                      | SCALE           | TOTAL       |  |
|-------------|------|-----------------------------|-----------------|-------------|--|
| Azerbaijan  | 2000 | MICS 2000                   | <b>national</b> | <b>0.8</b>  |  |
| Indonesia   | 2000 | MICS 2000                   | <b>national</b> | <b>4.4</b>  |  |
| Iraq        | 2000 | MICS 2000                   | <b>national</b> | <b>1.3</b>  |  |
| Lao PDR     | 2000 | National Health Survey 2002 | <b>national</b> | <b>8.7</b>  |  |
| Tajikistan  | 2000 | MICS 2000                   | <b>national</b> | <b>68.9</b> |  |
| Timor Leste | 2002 | MICS 2002                   | <b>national</b> | <b>47.7</b> |  |
| Vietnam     | 2000 | MICS 2000                   | <b>national</b> | <b>6.5</b>  |  |

**THE AMERICAS**

| COUNTRY | YEAR | SOURCE    | SCALE           | TOTAL      |  |
|---------|------|-----------|-----------------|------------|--|
| Guyana  | 2000 | MICS 2000 | <b>national</b> | <b>2.6</b> |  |

|  | GENDER      |             | RESIDENCE   |             | WEALTH QUINTILE |             |             |             |             |
|--|-------------|-------------|-------------|-------------|-----------------|-------------|-------------|-------------|-------------|
|  | MALE        | FEMALE      | URBAN       | RURAL       | POOREST         | SECOND      | MIDDLE      | FOURTH      | RICHEST     |
|  | <b>51.7</b> | <b>48.5</b> | <b>60.6</b> | <b>42.1</b> | <b>32.1</b>     | <b>41.3</b> | <b>54.6</b> | <b>61.3</b> | <b>75.3</b> |
|  | <b>27.1</b> | <b>23.9</b> | <b>28.4</b> | <b>26.9</b> | <b>35.1</b>     | <b>16.2</b> | <b>28.3</b> | <b>27.7</b> | <b>18.7</b> |
|  | <b>60.2</b> | <b>59.8</b> | <b>62.2</b> | <b>59.4</b> | <b>56.8</b>     | <b>58.1</b> | <b>61.3</b> | <b>61.2</b> | <b>70.0</b> |
|  | <b>54.3</b> | <b>52.4</b> | <b>61.7</b> | <b>51.6</b> | —               | —           | —           | —           | —           |
|  | <b>52.8</b> | <b>51.0</b> | <b>49.3</b> | <b>52.7</b> | —               | —           | —           | —           | —           |
|  | <b>58.2</b> | <b>57.8</b> | <b>57.9</b> | <b>58.0</b> | <b>52.6</b>     | <b>50.4</b> | <b>66.7</b> | <b>56.9</b> | <b>65.5</b> |

|  | GENDER      |             | RESIDENCE    |             | WEALTH QUINTILE |             |             |             |              |
|--|-------------|-------------|--------------|-------------|-----------------|-------------|-------------|-------------|--------------|
|  | MALE        | FEMALE      | URBAN        | RURAL       | POOREST         | SECOND      | MIDDLE      | FOURTH      | RICHEST      |
|  | <b>1.4</b>  | —           | <b>0.8</b>   | <b>0.8</b>  | —               | —           | <b>2.6</b>  | <b>1.7</b>  | —            |
|  | <b>3.6</b>  | <b>5.2</b>  | <b>5.7</b>   | <b>3.6</b>  | —               | —           | —           | —           | —            |
|  | <b>1.1</b>  | <b>1.5</b>  | <b>1.1</b>   | <b>1.7</b>  | —               | —           | —           | —           | —            |
|  | <b>7.4</b>  | <b>7.9</b>  | <b>2.1</b>   | <b>10.1</b> | <b>8.3</b>      | <b>14.0</b> | <b>9.5</b>  | <b>2.4</b>  | <b>10.6</b>  |
|  | <b>63.9</b> | <b>76.0</b> | <b>100.0</b> | <b>68.3</b> | <b>60.9</b>     | <b>85.7</b> | <b>71.4</b> | <b>62.5</b> | <b>100.0</b> |
|  | <b>46.6</b> | <b>48.2</b> | <b>55.8</b>  | <b>45.3</b> | <b>44.0</b>     | <b>41.2</b> | <b>47.9</b> | <b>49.4</b> | <b>60.8</b>  |
|  | <b>7.4</b>  | <b>5.6</b>  | <b>10.3</b>  | <b>5.7</b>  | <b>8.1</b>      | <b>7.0</b>  | <b>2.6</b>  | <b>6.1</b>  | <b>10.2</b>  |

|  | GENDER     |            | RESIDENCE  |       |
|--|------------|------------|------------|-------|
|  | MALE       | FEMALE     | URBAN      | RURAL |
|  | <b>1.0</b> | <b>4.3</b> | <b>2.6</b> |       |

**Data Table 17:** Summary of Antimalarial Drug Efficacy Results, Expressed as Treatment Failure**MONOTHERAPY***Chloroquine***AFRICA**

| COUNTRY                        | STUDY YEARS | NUMBER OF STUDIES | MEDIAN | RANGE |      | PERCENTILE |      |
|--------------------------------|-------------|-------------------|--------|-------|------|------------|------|
|                                |             |                   |        | LOW   | HIGH | 25TH       | 75TH |
| Angola                         | 2002        | 6                 | 41.8   | 8.2   | 54.1 | 14.8       | 52.1 |
| Benin                          | 1998–2002   | 14                | 19.4   | 3.4   | 47.6 | 14.1       | 23.2 |
| Botswana                       | 1997–2000   | 6                 | 24.4   | 20.7  | 44.0 | 20.7       | 44.0 |
| Burkina Faso                   | 1996–2003   | 24                | 12.0   | 5.3   | 35.5 | 10.0       | 21.7 |
| Burundi                        | 2001        | 4                 | 69.2   | 52.4  | 73.7 | 58.9       | 73.4 |
| Cameroon                       | 1994–2001   | 12                | 33.0   | 2.0   | 66.6 | 15.9       | 58.2 |
| Central African Republic       | 1997–1998   | 5                 | 20.8   | 19.0  | 57.1 | 19.3       | 39.6 |
| Chad                           | 1999–2003   | 3                 | 21.5   | 14.2  | 67.4 | 14.2       | 67.4 |
| Comoros                        | 1997–2001   | 9                 | 57.1   | 31.2  | 75.0 | 42.4       | 67.3 |
| Congo                          | 1999–2001   | 2                 | 44.0   | 38.0  | 50.0 | 38.0       | 50.0 |
| Côte d'Ivoire                  | 1997–2002   | 26                | 16.4   | 1.8   | 43.1 | 11.4       | 19.3 |
| Congo, Dem. Rep. of            | 2000–2001   | 7                 | 48.0   | 29.4  | 80.0 | 34.0       | 50.0 |
| Equatorial Guinea              | 1996–1999   | 2                 | 48.9   | 42.1  | 55.6 | 42.1       | 55.6 |
| Eritrea                        | 1997–2001   | 29                | 42.8   | 12.6  | 66.6 | 28.6       | 47.3 |
| Ethiopia                       | 1996–1998   | 18                | 70.0   | 5.0   | 97.8 | 55.8       | 85.2 |
| Gabon                          | 2001        | 2                 | 57.1   | 52.2  | 62.0 | 52.2       | 62.0 |
| Gambia                         | 1998–2003   | 4                 | 12.2   | 2.9   | 28.2 | 6.1        | 21.6 |
| Ghana                          | 1998–2003   | 9                 | 23.2   | 9.0   | 31.3 | 15.8       | 29.7 |
| Guinea                         | 1996–2001   | 8                 | 15.6   | 7.7   | 28.3 | 9.9        | 22.6 |
| Guinea-Bissau                  | 2001        | 3                 | 6.8    | 5.4   | 10.9 | 5.4        | 10.9 |
| Kenya                          | 1996–1999   | 7                 | 65.8   | 15.2  | 84.8 | 31.7       | 80.4 |
| Liberia                        | 1999        | 2                 | 25.9   | 22.5  | 29.2 | 22.5       | 29.2 |
| Madagascar                     | 1996–2004   | 13                | 9.5    | 0.0   | 25.6 | 6.9        | 17.1 |
| Mali                           | 1996–2003   | 19                | 11.0   | 2.0   | 24.3 | 4.2        | 13.0 |
| Mauritania                     | 1998        | 2                 | 24.0   | 11.6  | 36.4 | 11.6       | 36.4 |
| Mozambique                     | 1998–2001   | 20                | 35.9   | 13.0  | 53.0 | 22.1       | 42.9 |
| Namibia                        | 1997–2003   | 9                 | 19.0   | 4.0   | 66.7 | 6.5        | 35.1 |
| Niger                          | 1998–2001   | 2                 | 19.2   | 17.4  | 20.9 | 17.4       | 20.9 |
| Nigeria                        | 1998–2002   | 11                | 25.8   | 2.0   | 53.7 | 13.6       | 38.7 |
| Rwanda                         | 1997–2000   | 6                 | 52.4   | 18.5  | 60.6 | 33.2       | 59.2 |
| Senegal                        | 1996–2002   | 19                | 12.9   | 2.7   | 30.7 | 10.1       | 16.6 |
| Sierra Leone                   | 1998–2003   | 7                 | 34.5   | 26.3  | 58.5 | 32.0       | 51.5 |
| Somalia                        | 1997–2003   | 5                 | 51.0   | 27.5  | 78.0 | 30.4       | 74.0 |
| South Africa                   | 1997        | 4                 | 53.8   | 40.0  | 62.5 | 44.2       | 60.8 |
| Sudan                          |             |                   |        |       |      |            |      |
| High transmission area         | 1996–2003   | 5                 | 53.1   | 16.6  | 60.7 | 32.4       | 59.4 |
| Moderate/low transmission area | 1996–2003   | 24                | 50.0   | 0.0   | 80.3 | 33.8       | 65.6 |
| Swaziland                      | 2000        | 1                 | 12.5   |       |      |            |      |
| Togo                           | 1998–2001   | 6                 | 6.1    | 0.0   | 28.8 | 1.6        | 23.7 |
| Uganda                         | 1996–2001   | 18                | 29.3   | 7.5   | 81.2 | 16.4       | 58.7 |
| Tanzania                       |             |                   |        |       |      |            |      |
| Mainland                       | 1997–2001   | 8                 | 43.0   | 27.6  | 71.0 | 36.6       | 53.5 |
| Zanzibar                       | 1997–2001   | 2                 | 60.5   | 60.2  | 60.8 | 60.2       | 60.8 |

Data Table 17—Chloroquine, continued

**AFRICA, continued**

| COUNTRY              | STUDY YEARS      | NUMBER OF STUDIES | MEDIAN      | RANGE      |             | PERCENTILE  |             |
|----------------------|------------------|-------------------|-------------|------------|-------------|-------------|-------------|
|                      |                  |                   |             | LOW        | HIGH        | 25TH        | 75TH        |
| Zambia               | 1996–2002        | 22                | 31.9        | 6.6        | 54.0        | 24.6        | 46.3        |
| Zimbabwe             | 1999–2003        | 28                | 10.8        | 0.0        | 42.3        | 5.0         | 19.9        |
| <b>TOTAL: Africa</b> | <b>1994–2004</b> | <b>433</b>        | <b>24.0</b> | <b>0.0</b> | <b>97.8</b> | <b>12.6</b> | <b>43.9</b> |

Notes: Median, range, and quartiles are based on percentage clinical failure with at least 14-day follow up for countries in Africa south of the Sahara. For all other areas, including South Africa and moderate/low transmission areas of Sudan, percentage total failure is used.

**ASIA**

| COUNTRY            | STUDY YEARS      | NUMBER OF STUDIES | MEDIAN      | RANGE      |              | PERCENTILE  |             |
|--------------------|------------------|-------------------|-------------|------------|--------------|-------------|-------------|
|                    |                  |                   |             | LOW        | HIGH         | 25TH        | 75TH        |
| Afghanistan        | 1999–2002        | 4                 | 67.7        | 60.0       | 89.5         | 61.7        | 80.8        |
| Bangladesh         | 1996–1999        | 3                 | 63.6        | 50.0       | 77.2         | 50.0        | 77.2        |
| Bhutan             | 1997             | 4                 | 78.1        | 64.7       | 80.7         | 70.8        | 80.0        |
| China              | 1997–1999        | 2                 | 29.6        | 18.4       | 40.7         | 18.4        | 40.7        |
| India              | 1996–2004        | 25                | 34.0        | 0.0        | 95.9         | 23.6        | 65.4        |
| Indonesia          | 1995–2003        | 18                | 69.5        | 11.1       | 100.0        | 49.5        | 78.3        |
| Iran, Islamic Rep. | 2000–2002        | 4                 | 72.5        | 61.0       | 75.0         | 66.4        | 74.2        |
| Lao PDR            | 1998–2002        | 5                 | 44.8        | 31.3       | 52.8         | 36.7        | 49.5        |
| Malaysia           | 2003             | 1                 | 58.7        |            |              |             |             |
| Myanmar            | 1997–2002        | 18                | 24.7        | 6.0        | 76.0         | 12.5        | 34.7        |
| Pakistan           | 2001–2002        | 13                | 28.9        | 18.2       | 79.0         | 25.9        | 66.6        |
| Philippines        | 1996–2000        | 9                 | 42.1        | 16.4       | 76.2         | 32.1        | 52.0        |
| Saudi Arabia       | 1997–1998        | 2                 | 15.4        | 12.4       | 18.4         | 12.4        | 18.4        |
| Solomon Islands    | 1997–2001        | 5                 | 27.8        | 10.7       | 66.7         | 12.2        | 49.8        |
| Sri Lanka          | 2002–2003        | 2                 | 31.8        | 10.0       | 53.5         | 10.0        | 53.5        |
| Tajikistan         | 2002             | 1                 | 56.0        |            |              |             |             |
| Timor Leste        | 2000             | 1                 | 66.7        |            |              |             |             |
| Vietnam            | 1997–2001        | 4                 | 52.3        | 6.2        | 71.9         | 27.0        | 64.3        |
| Yemen              | 1998–2003        | 9                 | 42.4        | 9.0        | 57.0         | 23.3        | 44.9        |
| <b>TOTAL: Asia</b> | <b>1995–2004</b> | <b>130</b>        | <b>44.1</b> | <b>0.0</b> | <b>100.0</b> | <b>26.3</b> | <b>66.7</b> |

**THE AMERICAS**

| COUNTRY                    | STUDY YEARS      | NUMBER OF STUDIES | MEDIAN      | RANGE      |              | PERCENTILE  |             |
|----------------------------|------------------|-------------------|-------------|------------|--------------|-------------|-------------|
|                            |                  |                   |             | LOW        | HIGH         | 25TH        | 75TH        |
| Colombia                   | 1997–1998        | 5                 | 66.6        | 44.5       | 96.6         | 47.3        | 83.7        |
| Ecuador                    | 1998–2003        | 4                 | 85.4        | 83.3       | 94.4         | 84.2        | 90.1        |
| Guyana                     | 1998             | 1                 | 55.6        |            |              |             |             |
| Peru                       | 1998–2002        | 6                 | 86.4        | 75.6       | 90.0         | 78.3        | 89.8        |
| Venezuela                  | 1997–2002        | 5                 | 48.6        | 0.0        | 100.0        | 13.1        | 88.6        |
| <b>TOTAL: The Americas</b> | <b>1997–2003</b> | <b>21</b>         | <b>81.0</b> | <b>0.0</b> | <b>100.0</b> | <b>52.8</b> | <b>88.8</b> |

Data Table 17, *continued**Sulfadoxine pyrimethamine***AFRICA**

| COUNTRY                        | STUDY YEARS      | NUMBER OF STUDIES | MEDIAN     | RANGE      |             | PERCENTILE |             |
|--------------------------------|------------------|-------------------|------------|------------|-------------|------------|-------------|
|                                |                  |                   |            | LOW        | HIGH        | 25TH       | 75TH        |
| Angola                         | 2002–2003        | 8                 | 5.7        | 0.0        | 28.2        | 2.7        | 8.8         |
| Benin                          | 2002             | 5                 | 9.5        | 1.6        | 17.2        | 4.8        | 16.8        |
| Burkina Faso                   | 1998–2003        | 9                 | 0.8        | 0.0        | 6.3         | 0.0        | 4.3         |
| Burundi                        | 2001             | 4                 | 30.8       | 10.9       | 52.8        | 20.2       | 42.4        |
| Cameroon                       | 1997–2003        | 8                 | 9.0        | 0.0        | 14.1        | 6.7        | 11.0        |
| Chad                           | 2002–2003        | 2                 | 11.7       | 4.0        | 19.4        | 4.0        | 19.4        |
| Comoros                        | 2004             | 2                 | 1.5        | 0.0        | 3.0         | 0.0        | 3.0         |
| Congo                          | 1999–2002        | 3                 | 0.0        | 0.0        | 9.5         | 0.0        | 9.5         |
| Côte d'Ivoire                  | 1999             | 2                 | 14.8       | 5.9        | 23.6        | 5.9        | 23.6        |
| Congo, Dem. Rep. of            | 2000–2004        | 12                | 9.3        | 0.0        | 30.2        | 4.4        | 18.3        |
| Equatorial Guinea              | 1996–1999        | 2                 | 5.0        | 0.0        | 10.0        | 0.0        | 10.0        |
| Eritrea                        | 2001–2002        | 6                 | 3.1        | 0.0        | 15.4        | 0.0        | 10.3        |
| Ethiopia                       | 1997–2003        | 17                | 10.3       | 0.0        | 44.9        | 2.0        | 26.1        |
| Gabon                          | 2000             | 1                 | 4.4        |            |             |            |             |
| Ghana                          | 1998–2003        | 3                 | 3.0        | 0.0        | 5.2         | 0.0        | 5.2         |
| Kenya                          | 1996–2003        | 27                | 8.4        | 0.0        | 51.6        | 3.4        | 17.9        |
| Madagascar                     | 2003             | 1                 | 0.0        |            |             |            |             |
| Malawi                         | 1998–2002        | 15                | 18.6       | 2.8        | 40.0        | 16.6       | 33.3        |
| Mali                           | 2001–2003        | 3                 | 0.6        | 0.0        | 2.0         | 0.0        | 2.0         |
| Mozambique                     | 1998–2002        | 10                | 5.4        | 0.2        | 17.3        | 2.7        | 13.7        |
| Namibia                        | 1997–2003        | 5                 | 8.8        | 0.0        | 22.8        | 0.0        | 18.6        |
| Nigeria                        | 2001–2002        | 7                 | 9.3        | 5.7        | 43.5        | 7.7        | 40.5        |
| Rwanda                         | 2000             | 3                 | 35.1       | 11.6       | 35.7        | 11.6       | 35.7        |
| Senegal                        | 2001–2002        | 7                 | 3.3        | 1.7        | 10.2        | 2.0        | 5.8         |
| Sierra Leone                   | 2001–2003        | 5                 | 11.2       | 7.8        | 23.4        | 9.1        | 17.7        |
| Somalia                        | 1997–2003        | 3                 | 4.0        | 2.0        | 5.9         | 2.0        | 5.9         |
| South Africa                   | 1997–2002        | 6                 | 7.3        | 3.6        | 87.8        | 3.7        | 55.7        |
| Sudan                          |                  |                   |            |            |             |            |             |
| High transmission area         | 1996–2003        | 3                 | 6.0        | 0.0        | 12.0        | 0.0        | 12.0        |
| Moderate/low transmission area | 1996–2003        | 7                 | 4.1        | 0.0        | 22.0        | 1.0        | 9.9         |
| Uganda                         | 1996–2002        | 25                | 11.4       | 0.0        | 25.0        | 5.0        | 16.8        |
| Tanzania                       |                  |                   |            |            |             |            |             |
| Mainland                       | 1997–2002        | 15                | 10.5       | 1.4        | 33.8        | 5.6        | 16.9        |
| Zanzibar                       | 1997–2002        | 2                 | 8.9        | 4.7        | 13.1        | 4.7        | 13.1        |
| Zambia                         | 1996–2003        | 17                | 7.9        | 0.0        | 17.9        | 3.3        | 14.2        |
| Zimbabwe                       | 1999             | 2                 | 10.0       | 0.0        | 20.0        | 0.0        | 20.0        |
| <b>TOTAL: Africa</b>           | <b>1996–2004</b> | <b>247</b>        | <b>8.6</b> | <b>0.0</b> | <b>52.8</b> | <b>3.3</b> | <b>16.6</b> |

Data Table 17—*Sulfadoxine pyrimethamine, continued***ASIA**

| COUNTRY            | STUDY YEARS      | NUMBER OF STUDIES | MEDIAN      | RANGE      |              | PERCENTILE |             |
|--------------------|------------------|-------------------|-------------|------------|--------------|------------|-------------|
|                    |                  |                   |             | LOW        | HIGH         | 25TH       | 75TH        |
| Afghanistan        | 2002–2003        | 3                 | 8.7         | 4.0        | 22.7         | 4.0        | 22.7        |
| Bhutan             | 1998             | 1                 | 34.8        |            |              |            |             |
| India              | 1999–2003        | 12                | 17.9        | 0.0        | 68.2         | 3.0        | 45.4        |
| Indonesia          | 1996–2003        | 12                | 17.8        | 0.0        | 82.9         | 12.0       | 43.0        |
| Iran, Islamic Rep. | 1999–2001        | 3                 | 0.0         | 0.0        | 5.7          | 0.0        | 5.7         |
| Lao PDR            | 2001–2002        | 3                 | 18.0        | 17.9       | 18.7         | 17.9       | 18.7        |
| Malaysia           | 1996             | 1                 | 29.4        |            |              |            |             |
| Myanmar            | 1997–2002        | 18                | 27.8        | 0.0        | 100.0        | 7.9        | 37.7        |
| Nepal              | 1997–2003        | 7                 | 22.0        | 0.0        | 88.2         | 0.0        | 72.7        |
| Pakistan           | 2001–2002        | 4                 | 13.0        | 8.7        | 18.7         | 9.8        | 16.9        |
| Philippines        | 2000–2001        | 7                 | 42.6        | 8.5        | 66.7         | 12.5       | 60.6        |
| Tajikistan         | 2002             | 1                 | 16.0        |            |              |            |             |
| Timor Leste        | 2001             | 1                 | 10.0        |            |              |            |             |
| Vietnam            | 1997–2002        | 4                 | 12.7        | 5.5        | 70.6         | 8.9        | 41.9        |
| Yemen              | 2003             | 1                 | 0.0         |            |              |            |             |
| <b>TOTAL: Asia</b> | <b>1996–2003</b> | <b>78</b>         | <b>18.4</b> | <b>0.0</b> | <b>100.0</b> | <b>8.5</b> | <b>40.8</b> |

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| COUNTRY                    | STUDY YEARS      | NUMBER OF STUDIES | MEDIAN      | RANGE      |             | PERCENTILE |             |
|----------------------------|------------------|-------------------|-------------|------------|-------------|------------|-------------|
|                            |                  |                   |             | LOW        | HIGH        | 25TH       | 75TH        |
| Bolivia                    | 2002             | 1                 | 18.7        |            |             |            |             |
| Colombia                   | 1997–2002        | 12                | 10.8        | 0.0        | 26.5        | 1.9        | 15.8        |
| Ecuador                    | 2001–2003        | 3                 | 4.0         | 0.0        | 17.1        | 0.0        | 17.1        |
| Peru                       | 1998–2002        | 9                 | 11.8        | 0.0        | 80.0        | 1.7        | 65.2        |
| Venezuela                  | 1997–1999        | 3                 | 20.0        | 0.0        | 23.0        | 0.0        | 23.0        |
| <b>TOTAL: The Americas</b> | <b>1997–2003</b> | <b>28</b>         | <b>12.2</b> | <b>0.0</b> | <b>80.0</b> | <b>1.7</b> | <b>19.4</b> |

Data Table 17, *continued***Amodiaquine****AFRICA**

| COUNTRY                | STUDY YEARS      | NUMBER OF STUDIES | MEDIAN     | RANGE      |             | PERCENTILE |            |
|------------------------|------------------|-------------------|------------|------------|-------------|------------|------------|
|                        |                  |                   |            | LOW        | HIGH        | 25TH       | 75TH       |
| Angola                 | 2002–2003        | 2                 | 8.7        | 3.9        | 13.4        | 3.9        | 13.4       |
| Burkina Faso           | 1996             | 1                 | 4.4        |            |             |            |            |
| Cameroon               | 1997–2003        | 9                 | 1.6        | 0.0        | 5.3         | 0.0        | 3.2        |
| Chad                   | 2002–2003        | 2                 | 3.4        | 1.9        | 4.9         | 1.9        | 4.9        |
| Ethiopia               | 1998             | 7                 | 18.9       | 6.2        | 66.7        | 6.5        | 45.8       |
| Gabon                  | 1997–2002        | 5                 | 12.5       | 3.2        | 14.0        | 7.9        | 14.0       |
| Kenya                  | 1996–2003        | 24                | 2.4        | 0.0        | 23.1        | 0.0        | 8.3        |
| Liberia                | 2001             | 1                 | 7.4        |            |             |            |            |
| Madagascar             | 2004             | 1                 | 0.0        |            |             |            |            |
| Mozambique             | 2001             | 1                 | 8.4        |            |             |            |            |
| Nigeria                | 2001–2002        | 2                 | 1.5        | 0.0        | 2.9         | 0.0        | 2.9        |
| Rwanda                 | 2001–2002        | 6                 | 0.0        | 0.0        | 2.3         | 0.0        | 2.0        |
| Senegal                | 2001–2002        | 3                 | 2.8        | 2.0        | 5.1         | 2.0        | 5.1        |
| Sierra Leone           | 2002–2003        | 5                 | 1.8        | 0.0        | 7.6         | 0.0        | 5.8        |
| Sudan                  |                  |                   |            |            |             |            |            |
| High transmission area | 2001             | 2                 | 6.5        | 6.0        | 7.0         | 6.0        | 7.0        |
| Uganda                 | 1999–2002        | 5                 | 8.8        | 0.0        | 14.5        | 1.6        | 12.3       |
| Tanzania               |                  |                   |            |            |             |            |            |
| Mainland               | 1999–2002        | 12                | 3.7        | 0.0        | 10.8        | 1.6        | 6.9        |
| Zanzibar               | 1999–2002        | 2                 | 5.6        | 4.7        | 6.5         | 4.7        | 6.5        |
| <b>TOTAL: Africa</b>   | <b>1996–2004</b> | <b>90</b>         | <b>3.3</b> | <b>0.0</b> | <b>66.7</b> | <b>0.0</b> | <b>8.4</b> |

*Notes:*

Median, range, and quartiles are based on percentage clinical failure with at least 14-day follow up for countries in Africa south of the Sahara. For all other areas, including South Africa and moderate/low transmission areas of Sudan, percentage total failure is used.

**ASIA**

| COUNTRY            | STUDY YEARS      | NUMBER OF STUDIES | MEDIAN      | RANGE       |             | PERCENTILE  |             |
|--------------------|------------------|-------------------|-------------|-------------|-------------|-------------|-------------|
|                    |                  |                   |             | LOW         | HIGH        | 25TH        | 75TH        |
| Afghanistan        | 2004             | 1                 | 37.7        |             |             |             |             |
| Pakistan           | 2002             | 1                 | 83.3        |             |             |             |             |
| <b>TOTAL: Asia</b> | <b>2002–2004</b> | <b>2</b>          | <b>60.5</b> | <b>37.7</b> | <b>83.3</b> | <b>37.7</b> | <b>83.3</b> |

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| COUNTRY                    | STUDY YEARS      | NUMBER OF STUDIES | MEDIAN      | RANGE      |             | PERCENTILE |             |
|----------------------------|------------------|-------------------|-------------|------------|-------------|------------|-------------|
|                            |                  |                   |             | LOW        | HIGH        | 25TH       | 75TH        |
| Colombia                   | 1997–2002        | 7                 | 11.5        | 0.0        | 50.0        | 3.2        | 27.3        |
| <b>TOTAL: The Americas</b> | <b>1997–2002</b> | <b>7</b>          | <b>11.5</b> | <b>0.0</b> | <b>50.0</b> | <b>3.2</b> | <b>27.3</b> |

Data Table 17, *continued***Mefloquine****AFRICA**

| COUNTRY                                 | STUDY YEARS      | NUMBER OF STUDIES | MEDIAN     | RANGE      |            | PERCENTILE |            |
|---|------------------|-------------------|------------|------------|------------|------------|------------|
|   |                  |                   |            | LOW        | HIGH       | 25TH       | 75TH       |
| Malawi                                  | 1998             | 1                 | 10.2       |            |            |            |            |
| Sudan<br>Moderate/low transmission area | 1999             | 1                 | 2.5        |            |            |            |            |
| <b>TOTAL: Africa</b>                    | <b>1998–1999</b> | <b>2</b>          | <b>2.5</b> | <b>2.5</b> | <b>2.5</b> | <b>2.5</b> | <b>2.5</b> |

**ASIA**

| COUNTRY            | STUDY YEARS      | NUMBER OF STUDIES | MEDIAN     | RANGE      |             | PERCENTILE |             |
|--------------------|------------------|-------------------|------------|------------|-------------|------------|-------------|
|                    |                  |                   |            | LOW        | HIGH        | 25TH       | 75TH        |
| Bangladesh         | 1996             | 1                 | 27.2       |            |             |            |             |
| Bhutan             | 1999             | 1                 | 9.7        |            |             |            |             |
| India              | 1996–2001        | 3                 | 4.5        | 0.0        | 7.8         | 0.0        | 7.8         |
| Lao PDR            | 2001             | 1                 | 0.0        |            |             |            |             |
| Malaysia           | 1996             | 1                 | 0.0        |            |             |            |             |
| Myanmar            | 1997–2002        | 18                | 6.0        | 0.0        | 44.4        | 0.0        | 16.4        |
| Thailand           | 1995–2003        | 19                | 13.8       | 2.0        | 68.4        | 7.5        | 28.0        |
| Vietnam            | 1998–1999        | 4                 | 11.7       | 0.0        | 42.3        | 0.0        | 32.8        |
| <b>TOTAL: Asia</b> | <b>1995–2003</b> | <b>48</b>         | <b>8.0</b> | <b>0.0</b> | <b>68.4</b> | <b>2.7</b> | <b>18.5</b> |

**THE AMERICAS**

| COUNTRY                    | STUDY YEARS      | NUMBER OF STUDIES | MEDIAN     | RANGE      |             | PERCENTILE |            |
|----------------------------|------------------|-------------------|------------|------------|-------------|------------|------------|
|                            |                  |                   |            | LOW        | HIGH        | 25TH       | 75TH       |
| Bolivia                    | 2001             | 2                 | 0.0        | 0.0        | 0.0         | 0.0        | 0.0        |
| Brazil                     | 1996–2002        | 6                 | 5.2        | 0.0        | 9.7         | 0.5        | 7.9        |
| Colombia                   | 2002–2003        | 3                 | 2.2        | 0.0        | 6.4         | 0.0        | 6.4        |
| French Guiana              | 1996             | 1                 | 3.4        |            |             |            |            |
| Guyana                     | 2003             | 1                 | 28.1       |            |             |            |            |
| Peru                       | 1999–2000        | 4                 | 0.0        | 0.0        | 0.0         | 0.0        | 0.0        |
| Suriname                   | 2002             | 1                 | 7.3        |            |             |            |            |
| <b>TOTAL: The Americas</b> | <b>1996–2003</b> | <b>18</b>         | <b>1.6</b> | <b>0.0</b> | <b>28.1</b> | <b>0.0</b> | <b>6.2</b> |

*Notes:*

Median, range, and quartiles are based on percentage clinical failure with at least 14-day follow up for countries in Africa south of the Sahara. For all other areas, including South Africa and moderate/low transmission areas of Sudan, percentage total failure is used.

Data Table 17, *continued***COMBINATION THERAPY*****Chloroquine sulfadoxine pyrimethamine*****AFRICA**

| COUNTRY                                 | STUDY YEARS      | NUMBER OF STUDIES | MEDIAN     | RANGE      |             | PERCENTILE |             |
|---|------------------|-------------------|------------|------------|-------------|------------|-------------|
|   |                  |                   |            | LOW        | HIGH        | 25TH       | 75TH        |
| Comoros                                 | 2003             | 3                 | 0.0        | 0.0        | 2.6         | 0.0        | 2.6         |
| Eritrea                                 | 2002–2003        | 4                 | 6.5        | 0.0        | 10.2        | 1.9        | 9.7         |
| Rwanda                                  | 2000             | 6                 | 13.2       | 6.1        | 39.7        | 8.1        | 37.7        |
| Sudan<br>Moderate/low transmission area | 2003             | 2                 | 10.2       | 5.9        | 14.4        | 5.9        | 14.4        |
| Uganda                                  | 1996–2003        | 15                | 12.0       | 0.0        | 37.0        | 7.0        | 19.0        |
| Zimbabwe                                | 2001–2004        | 25                | 1.1        | 0.0        | 8.6         | 0.0        | 3.9         |
| <b>TOTAL: Africa</b>                    | <b>1996–2004</b> | <b>55</b>         | <b>4.3</b> | <b>0.0</b> | <b>39.7</b> | <b>0.5</b> | <b>10.1</b> |

**ASIA**

| COUNTRY            | STUDY YEARS      | NUMBER OF STUDIES | MEDIAN      | RANGE      |             | PERCENTILE |             |
|--------------------|------------------|-------------------|-------------|------------|-------------|------------|-------------|
|                    |                  |                   |             | LOW        | HIGH        | 25TH       | 75TH        |
| Bangladesh         | 1996–2003        | 7                 | 30.7        | 12.9       | 37.2        | 24.0       | 33.0        |
| India              |                  | 1                 | 6.5         |            |             |            |             |
| Indonesia          | 1999–2003        | 2                 | 22.2        | 6.2        | 38.2        | 6.2        | 38.2        |
| Lao PDR            | 2001             | 2                 | 12.3        | 7.8        | 16.7        | 7.8        | 16.7        |
| Malaysia           | 1999–2003        | 4                 | 47.6        | 32.6       | 62.5        | 38.2       | 57.0        |
| Papua New Guinea   | 1998–2003        | 4                 | 0.0         | 0.0        | 27.0        | 0.0        | 13.5        |
| Philippines        | 2001–2002        | 3                 | 18.4        | 11.1       | 29.6        | 11.1       | 29.6        |
| Tajikistan         | 2003             | 1                 | 2.1         |            |             |            |             |
| Vanuatu            | 2001             | 1                 | 16.0        |            |             |            |             |
| <b>TOTAL: Asia</b> | <b>1996–2003</b> | <b>25</b>         | <b>24.0</b> | <b>0.0</b> | <b>62.5</b> | <b>7.2</b> | <b>33.0</b> |

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| COUNTRY                    | STUDY YEARS      | NUMBER OF STUDIES | MEDIAN      | RANGE      |             | PERCENTILE |             |
|----------------------------|------------------|-------------------|-------------|------------|-------------|------------|-------------|
|                            |                  |                   |             | LOW        | HIGH        | 25TH       | 75TH        |
| Colombia                   | 2002             | 2                 | 17.4        | 12.1       | 22.6        | 12.1       | 22.6        |
| Ecuador                    | 2003             | 1                 | 0.0         |            |             |            |             |
| <b>TOTAL: The Americas</b> | <b>2002–2003</b> | <b>3</b>          | <b>12.1</b> | <b>0.0</b> | <b>22.6</b> | <b>0.0</b> | <b>22.6</b> |

*Notes:*

Median, range, and quartiles are based on percentage clinical failure with at least 14-day follow up for countries in Africa south of the Sahara. For all other areas, including South Africa and moderate/low transmission areas of Sudan, percentage total failure is used.

Data Table 17, *continued****Amodiaquine sulfadoxine pyrimethamine*****AFRICA**

| COUNTRY              | STUDY YEARS      | NUMBER OF STUDIES | MEDIAN     | RANGE      |             | PERCENTILE |            |
|----------------------|------------------|-------------------|------------|------------|-------------|------------|------------|
|                      |                  |                   |            | LOW        | HIGH        | 25TH       | 75TH       |
| Cameroon             | 2001–2003        | 4                 | 0.0        | 0.0        | 0.0         | 0.0        | 0.0        |
| Congo, Dem. Rep. of  | 2002–2004        | 5                 | 1.7        | 0.0        | 6.0         | 0.7        | 4.4        |
| Ghana                | 2002             | 1                 | 1.4        |            |             |            |            |
| Kenya                | 2003             | 2                 | 2.0        | 1.6        | 2.4         | 1.6        | 2.4        |
| Mozambique           | 2001             | 1                 | 0.0        |            |             |            |            |
| Rwanda               | 2001             | 3                 | 0.0        | 0.0        | 0.0         | 0.0        | 0.0        |
| Senegal              | 2001–2003        | 4                 | 0.0        | 0.0        | 0.0         | 0.0        | 0.0        |
| Uganda               | 1999–2003        | 12                | 1.6        | 0.0        | 13.0        | 0.5        | 3.5        |
| Tanzania<br>Mainland | 1999             | 1                 | 3.4        |            |             |            |            |
| <b>TOTAL: Africa</b> | <b>1999–2004</b> | <b>33</b>         | <b>1.0</b> | <b>0.0</b> | <b>13.0</b> | <b>0.0</b> | <b>2.2</b> |

**ASIA**

| COUNTRY            | STUDY YEARS      | NUMBER OF STUDIES | MEDIAN     | RANGE      |            | PERCENTILE |            |
|--------------------|------------------|-------------------|------------|------------|------------|------------|------------|
|                    |                  |                   |            | LOW        | HIGH       | 25TH       | 75TH       |
| Afghanistan        | 2003–2004        | 2                 | 2.0        | 1.0        | 3.0        | 1.0        | 3.0        |
| Papua New Guinea   | 1998             | 1                 | 0.0        |            |            |            |            |
| <b>TOTAL: Asia</b> | <b>1998–2004</b> | <b>3</b>          | <b>1.0</b> | <b>0.0</b> | <b>3.0</b> | <b>0.0</b> | <b>3.0</b> |

**THE AMERICAS**

| COUNTRY                    | STUDY YEARS      | NUMBER OF STUDIES | MEDIAN     | RANGE      |             | PERCENTILE |            |
|----------------------------|------------------|-------------------|------------|------------|-------------|------------|------------|
|                            |                  |                   |            | LOW        | HIGH        | 25TH       | 75TH       |
| Colombia                   | 2001–2003        | 4                 | 2.3        | 0.0        | 10.8        | 1.1        | 6.6        |
| <b>TOTAL: The Americas</b> | <b>2001–2003</b> | <b>4</b>          | <b>2.3</b> | <b>0.0</b> | <b>10.8</b> | <b>1.1</b> | <b>6.6</b> |

*Notes:*

Median, range, and quartiles are based on percentage clinical failure with at least 14-day follow up for countries in Africa south of the Sahara. For all other areas, including South Africa and moderate/low transmission areas of Sudan, percentage total failure is used.

Data Table 17, *continued**Artemether lumefantrine***AFRICA**

| COUNTRY              | STUDY YEARS      | NUMBER OF STUDIES | MEDIAN     | RANGE      |            | PERCENTILE |            |
|----------------------|------------------|-------------------|------------|------------|------------|------------|------------|
|                      |                  |                   |            | LOW        | HIGH       | 25TH       | 75TH       |
| Burundi              | 2001             | 2                 | 0.0        | 0.0        | 0.0        | 0.0        | 0.0        |
| Comoros              | 2004             | 3                 | 0.0        | 0.0        | 1.8        | 0.0        | 1.8        |
| Ethiopia             | 2003             | 4                 | 0.0        | 0.0        | 0.0        | 0.0        | 0.0        |
| Gabon                | 2001–2002        | 2                 | 0.8        | 0.0        | 1.6        | 0.0        | 1.6        |
| Ghana                | 2003             | 1                 | 0.0        |            |            |            |            |
| Senegal              | 2003             | 1                 | 0.0        |            |            |            |            |
| South Africa         | 2002             | 1                 | 0.0        |            |            |            |            |
| Tanzania             |                  |                   |            |            |            |            |            |
| Zanzibar             | 2002             | 2                 | 1.0        | 0.0        | 2.0        | 0.0        | 2.0        |
| Zambia               | 2003             | 3                 | 0.0        | 0.0        | 0.0        | 0.0        | 0.0        |
| <b>TOTAL: Africa</b> | <b>2001–2004</b> | <b>19</b>         | <b>0.0</b> | <b>0.0</b> | <b>2.0</b> | <b>0.0</b> | <b>0.0</b> |

**ASIA**

| COUNTRY            | STUDY YEARS      | NUMBER OF STUDIES | MEDIAN     | RANGE      |             | PERCENTILE |            |
|--------------------|------------------|-------------------|------------|------------|-------------|------------|------------|
|                    |                  |                   |            | LOW        | HIGH        | 25TH       | 75TH       |
| Bangladesh         | 2002             | 1                 | 0.8        |            |             |            |            |
| Cambodia           | 2001–2004        | 3                 | 26.9       | 13.5       | 30.0        | 13.5       | 30.0       |
| Lao PDR            | 2001–2003        | 2                 | 4.7        | 3.1        | 6.3         | 3.1        | 6.3        |
| Myanmar            | 2003             | 3                 | 2.0        | 0.0        | 2.0         | 0.0        | 2.0        |
| Thailand           | 1996–2002        | 6                 | 2.6        | 0.0        | 3.9         | 0.5        | 3.5        |
| Vietnam            | 2001             | 1                 | 2.2        |            |             |            |            |
| <b>TOTAL: Asia</b> | <b>1996–2004</b> | <b>16</b>         | <b>2.6</b> | <b>0.0</b> | <b>30.0</b> | <b>1.5</b> | <b>5.1</b> |

**THE AMERICAS**

| COUNTRY                    | STUDY YEARS | NUMBER OF STUDIES | MEDIAN     | RANGE      |            | PERCENTILE |            |
|----------------------------|-------------|-------------------|------------|------------|------------|------------|------------|
|                            |             |                   |            | LOW        | HIGH       | 25TH       | 75TH       |
| Suriname                   | 2003        | 2                 | 2.0        | 1.9        | 2.0        | 1.9        | 2.0        |
| <b>TOTAL: The Americas</b> | <b>2003</b> | <b>2</b>          | <b>2.0</b> | <b>1.9</b> | <b>2.0</b> | <b>1.9</b> | <b>2.0</b> |

*Notes:*

Median, range, and quartiles are based on percentage clinical failure with at least 14-day follow up for countries in Africa south of the Sahara. For all other areas, including South Africa and moderate/low transmission areas of Sudan, percentage total failure is used.

Data Table 17, *continued**Artesunate amodiaquine***AFRICA**

| COUNTRY                | STUDY YEARS      | NUMBER OF STUDIES | MEDIAN     | RANGE      |            | PERCENTILE |            |
|------------------------|------------------|-------------------|------------|------------|------------|------------|------------|
|                        |                  |                   |            | LOW        | HIGH       | 25TH       | 75TH       |
| Angola                 | 2003             | 1                 | 0.0        |            |            |            |            |
| Burundi                | 2001             | 2                 | 1.3        | 0.0        | 2.6        | 0.0        | 2.6        |
| Comoros                | 2003             | 3                 | 0.0        | 0.0        | 0.0        | 0.0        | 0.0        |
| Congo, Dem. Rep. of    | 2003–2004        | 3                 | 0.0        | 0.0        | 1.4        | 0.0        | 1.4        |
| Eritrea                | 2002–2003        | 3                 | 0.0        | 0.0        | 1.4        | 0.0        | 1.4        |
| Gabon                  | 2001–2002        | 2                 | 0.9        | 0.0        | 1.7        | 0.0        | 1.7        |
| Ghana                  | 2003             | 1                 | 0.0        |            |            |            |            |
| Mozambique             | 2001             | 1                 | 0.0        |            |            |            |            |
| Rwanda                 | 2002             | 3                 | 0.0        | 0.0        | 1.6        | 0.0        | 1.6        |
| Senegal                | 2002             | 2                 | 0.0        | 0.0        | 0.0        | 0.0        | 0.0        |
| Sudan                  |                  |                   |            |            |            |            |            |
| High transmission area | 2003             | 2                 | 0.4        | 0.0        | 0.8        | 0.0        | 0.8        |
| Uganda                 | 2002–2003        | 5                 | 1.0        | 0.0        | 4.0        | 0.5        | 3.7        |
| Tanzania               |                  |                   |            |            |            |            |            |
| Zanzibar               | 2002             | 2                 | 1.9        | 1.8        | 1.9        | 1.8        | 1.9        |
| <b>TOTAL: Africa</b>   | <b>2001–2004</b> | <b>30</b>         | <b>0.0</b> | <b>0.0</b> | <b>4.0</b> | <b>0.0</b> | <b>1.5</b> |

**ASIA**

| COUNTRY            | STUDY YEARS      | NUMBER OF STUDIES | MEDIAN     | RANGE      |             | PERCENTILE |             |
|--------------------|------------------|-------------------|------------|------------|-------------|------------|-------------|
|                    |                  |                   |            | LOW        | HIGH        | 25TH       | 75TH        |
| Myanmar            | 2003             | 4                 | 4.0        | 3.0        | 7.0         | 3.5        | 5.5         |
| Pakistan           | 2002             | 1                 | 18.0       |            |             |            |             |
| <b>TOTAL: Asia</b> | <b>2002–2003</b> | <b>5</b>          | <b>4.0</b> | <b>3.0</b> | <b>18.0</b> | <b>3.5</b> | <b>12.5</b> |

Data Table 17, *continued**Artesunate chloroquine***AFRICA**

| COUNTRY              | STUDY YEARS | NUMBER OF STUDIES | MEDIAN     | RANGE      |            | PERCENTILE |            |
|----------------------|-------------|-------------------|------------|------------|------------|------------|------------|
|                      |             |                   |            | LOW        | HIGH       | 25TH       | 75TH       |
| Gambia               | 2000        | 1                 | 3.2        |            |            |            |            |
| <b>TOTAL: Africa</b> | <b>2000</b> | <b>1</b>          | <b>3.2</b> | <b>3.2</b> | <b>3.2</b> | <b>3.2</b> | <b>3.2</b> |

**ASIA**

| COUNTRY            | STUDY YEARS | NUMBER OF STUDIES | MEDIAN      | RANGE       |             | PERCENTILE  |             |
|--------------------|-------------|-------------------|-------------|-------------|-------------|-------------|-------------|
|                    |             |                   |             | LOW         | HIGH        | 25TH        | 75TH        |
| Pakistan           | 2002        | 1                 | 28.8        |             |             |             |             |
| Vietnam            |             | 2                 | 37.4        | 28.0        | 46.8        | 28.0        | 46.8        |
| <b>TOTAL: Asia</b> | <b>2002</b> | <b>3</b>          | <b>28.8</b> | <b>28.0</b> | <b>46.8</b> | <b>28.0</b> | <b>46.8</b> |

*Notes:*

Median, range, and quartiles are based on percentage clinical failure with at least 14-day follow up for countries in Africa south of the Sahara. For all other areas, including South Africa and moderate/low transmission areas of Sudan, percentage total failure is used.

Data Table 17, *continued***Artesunate sulfadoxine pyrimethamine****AFRICA**

| COUNTRY                         | STUDY YEARS      | NUMBER OF STUDIES | MEDIAN     | RANGE      |            | PERCENTILE |            |
|---------------------------------|------------------|-------------------|------------|------------|------------|------------|------------|
|                                 |                  |                   |            | LOW        | HIGH       | 25TH       | 75TH       |
| Angola                          | 2003             | 1                 | 1.2        |            |            |            |            |
| Comoros                         | 2003             | 3                 | 0.0        | 0.0        | 3.6        | 0.0        | 3.6        |
| Congo, Dem. Rep. of             | 2002–2004        | 6                 | 0.0        | 0.0        | 5.6        | 0.0        | 3.4        |
| Ghana                           | 2002             | 1                 | 0.8        |            |            |            |            |
| Mozambique                      | 2001             | 1                 | 0.0        |            |            |            |            |
| Rwanda                          | 2001             | 3                 | 0.0        | 0.0        | 0.0        | 0.0        | 0.0        |
| South Africa                    | 2004             | 1                 | 5.0        |            |            |            |            |
| Sudan<br>High transmission area | 2003             | 2                 | 1.7        | 0.8        | 2.5        | 0.8        | 2.5        |
| Uganda                          | 2000             | 1                 | 0.5        |            |            |            |            |
| Zambia                          | 2002–2003        | 5                 | 0.0        | 0.0        | 1.7        | 0.0        | 0.9        |
| <b>TOTAL: Africa</b>            | <b>2000–2004</b> | <b>24</b>         | <b>0.0</b> | <b>0.0</b> | <b>5.6</b> | <b>0.0</b> | <b>1.1</b> |

**ASIA**

| COUNTRY            | STUDY YEARS      | NUMBER OF STUDIES | MEDIAN     | RANGE      |             | PERCENTILE |            |
|--------------------|------------------|-------------------|------------|------------|-------------|------------|------------|
|                    |                  |                   |            | LOW        | HIGH        | 25TH       | 75TH       |
| Indonesia          | 1999             | 1                 | 4.3        |            |             |            |            |
| Myanmar            | 2003             | 2                 | 0.0        | 0.0        | 0.0         | 0.0        | 0.0        |
| Pakistan           | 2002             | 1                 | 0.0        |            |             |            |            |
| Sri Lanka          | 1999             | 1                 | 0.0        |            |             |            |            |
| Vietnam            |                  | 2                 | 33.2       | 8.3        | 58.1        | 8.3        | 58.1       |
| <b>TOTAL: Asia</b> | <b>1999–2003</b> | <b>7</b>          | <b>0.0</b> | <b>0.0</b> | <b>58.1</b> | <b>0.0</b> | <b>8.3</b> |

**THE AMERICAS**

| COUNTRY                    | STUDY YEARS      | NUMBER OF STUDIES | MEDIAN     | RANGE      |            | PERCENTILE |            |
|----------------------------|------------------|-------------------|------------|------------|------------|------------|------------|
|                            |                  |                   |            | LOW        | HIGH       | 25TH       | 75TH       |
| Ecuador                    | 2003             | 2                 | 0.0        | 0.0        | 0.0        | 0.0        | 0.0        |
| Peru                       | 2000             | 1                 | 1.1        |            |            |            |            |
| <b>TOTAL: The Americas</b> | <b>2000–2003</b> | <b>3</b>          | <b>0.0</b> | <b>0.0</b> | <b>1.1</b> | <b>0.0</b> | <b>1.1</b> |

*Notes:*

Median, range, and quartiles are based on percentage clinical failure with at least 14-day follow up for countries in Africa south of the Sahara. For all other areas, including South Africa and moderate/low transmission areas of Sudan, percentage total failure is used.

Data Table 17, *continued***Artesunate mefloquine****AFRICA**

| COUNTRY              | STUDY YEARS | NUMBER OF STUDIES | MEDIAN     | RANGE      |            | PERCENTILE |            |
|----------------------|-------------|-------------------|------------|------------|------------|------------|------------|
|                      |             |                   |            | LOW        | HIGH       | 25TH       | 75TH       |
| Senegal              | 2002        | 2                 | 0.0        | 0.0        | 0.0        | 0.0        | 0.0        |
| <b>TOTAL: Africa</b> | <b>2002</b> | <b>2</b>          | <b>0.0</b> | <b>0.0</b> | <b>0.0</b> | <b>0.0</b> | <b>0.0</b> |

**ASIA**

| COUNTRY            | STUDY YEARS      | NUMBER OF STUDIES | MEDIAN     | RANGE      |             | PERCENTILE |            |
|--------------------|------------------|-------------------|------------|------------|-------------|------------|------------|
|                    |                  |                   |            | LOW        | HIGH        | 25TH       | 75TH       |
| Bangladesh         | 2002             | 1                 | 0.9        |            |             |            |            |
| Cambodia           | 2001–2004        | 12                | 3.7        | 0.0        | 18.8        | 1.1        | 8.1        |
| India              | 2001             | 2                 | 6.4        | 1.9        | 10.9        | 1.9        | 10.9       |
| Lao PDR            | 2001–2003        | 2                 | 0.0        | 0.0        | 0.0         | 0.0        | 0.0        |
| Myanmar            | 1996–2003        | 10                | 1.5        | 0.0        | 8.0         | 0.0        | 5.1        |
| Thailand           | 1995–2003        | 35                | 4.0        | 0.0        | 27.2        | 1.3        | 8.1        |
| Vietnam            | 1998–2000        | 2                 | 5.6        | 0.0        | 11.1        | 0.0        | 11.1       |
| <b>TOTAL: Asia</b> | <b>1995–2004</b> | <b>64</b>         | <b>3.2</b> | <b>0.0</b> | <b>27.2</b> | <b>0.3</b> | <b>7.9</b> |

**THE AMERICAS**

| COUNTRY                    | STUDY YEARS      | NUMBER OF STUDIES | MEDIAN     | RANGE      |            | PERCENTILE |            |
|----------------------------|------------------|-------------------|------------|------------|------------|------------|------------|
|                            |                  |                   |            | LOW        | HIGH       | 25TH       | 75TH       |
| Bolivia                    | 2001             | 3                 | 0.0        | 0.0        | 0.0        | 0.0        | 0.0        |
| Guyana                     | 2003             | 1                 | 7.5        |            |            |            |            |
| Peru                       | 2000             | 1                 | 0.0        |            |            |            |            |
| Suriname                   | 2002–2003        | 2                 | 4.1        | 2.4        | 5.8        | 2.4        | 5.8        |
| <b>TOTAL: The Americas</b> | <b>2000–2003</b> | <b>7</b>          | <b>0.0</b> | <b>0.0</b> | <b>7.5</b> | <b>0.0</b> | <b>5.8</b> |

**Artesunate combinations****ASIA**

| COUNTRY            | STUDY YEARS      | NUMBER OF STUDIES | MEDIAN     | RANGE      |             | PERCENTILE |            |
|--------------------|------------------|-------------------|------------|------------|-------------|------------|------------|
|                    |                  |                   |            | LOW        | HIGH        | 25TH       | 75TH       |
| Bhutan             | 2000–2003        | 8                 | 4.9        | 1.1        | 12.0        | 2.2        | 8.7        |
| <b>TOTAL: Asia</b> | <b>2000–2003</b> | <b>8</b>          | <b>4.9</b> | <b>1.1</b> | <b>12.0</b> | <b>2.2</b> | <b>8.7</b> |

*Notes:*

Median, range, and quartiles are based on percentage clinical failure with at least 14-day follow up for countries in Africa south of the Sahara. For all other areas, including South Africa and moderate/low transmission areas of Sudan, percentage total failure is used.



## APPENDIX 3

# Four Success Stories: Malaria Control in Brazil, Eritrea, India, and Vietnam

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### Summary

In the last decade, while many countries have struggled to slow the spread of malaria, four countries—Brazil, Eritrea, India, and Vietnam—have successfully and dramatically reduced their malaria burden. The keys to these successes have been multiple, including:

- Conducive country conditions
- A sound and targeted technical approach, using a package of effective tools
- Data-driven decision making based on good surveillance and operational research
- Strong leadership and commitment at all levels of government
- Community involvement in planning and implementation
- Decentralized control of finances and implementation supported by a strong national control program
- Ability of managers to efficiently navigate bureaucratic hurdles
- Infrastructure and skilled technical capacity at national and subnational levels

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- Proactive technical and programmatic support from partner agencies
- Sufficient financing to take control activities to scale
- Flexibility in approach by the World Bank.

No single factor or small group of factors appears to be sufficient in achieving these successes. Many of these key success factors could be adapted to other country contexts.

The World Bank played an essential role in both providing sufficient financing to achieve appropriate scale and mobilizing necessary supervisory support for the projects. A more proactive engagement by the Bank in other countries could yield similar successes.

If the goals of RBM are to be achieved, governments and their partners must work to address as many of these key factors as are feasible and relevant. The World Bank must take a more active and flexible role in supporting countries to roll back malaria.

## Introduction

In recent years, several new and highly effective tools have been developed in the fight against malaria. Insecticide-treated bed nets can reduce all-cause child mortality by as much as 25 percent. Intermittent presumptive treatment of pregnant women can significantly reduce low birth weight in their newborns. In addition, ACTs hold great promise for reducing severe morbidity and mortality from malaria and for curtailing onward transmission of infection.

Despite these great advances, progress in reducing the global burden of malaria has been slow. Many malaria-affected countries have experienced great difficulty taking these interventions to scale. Lack of sufficient financing, poor public health infrastructures, limited skilled human capacity, poor quality health services and commodities in the private sector, and lack of intersectoral collaboration have all been posited as possible barriers to scaling up malaria control interventions. Such challenges have led some to question whether the RBM Partnership, which was formed in 1998 to assist countries to take proven malaria control measures to scale, will be successful in achieving its goal of halving the global burden of malaria by 50 percent by 2010.

RBM, though, has not been without its achievements. With the support of the World Bank and other RBM partners, four countries have been successful in reducing malaria morbidity and mortality during the last decade. The experiences of Brazil, Eritrea, India, and Vietnam provide strong evidence that control of malaria is possible with existing tools. These success stories offer hope to other affected countries that control of malaria is possible. This report briefly documents the malaria control efforts of these four countries and discusses key factors that led to the success of these programs.

## Methods

Information for this report was gathered from a number of sources. World Bank project supervision documents and available published and unpublished reports were reviewed. Informal interviews were conducted with some World Bank staff persons who were involved in the design or supervision of these projects. Information and insights were also sought from key country-level informants, including National Malaria Control Program Managers and WHO regional and country office staff. This report also reflects the viewpoints of the author, who was involved in the design and supervision of the Eritrea HIV/AIDS, Malaria, STD and TB (HAMSET) Control Project and in the supervision of the India Enhanced Malaria Control Project (EMCP).

All information was evaluated looking for common factors in the four countries that may have contributed to the success of the malaria control program. Draft versions of this manuscript were then shared with key World Bank and country informants for review and comment.

## Findings

### Brazil

From 1989 through 1996, the Ministry of Health of Brazil implemented the Amazon Basin Malaria Control Project or PCMAM. Financial support was provided by the World Bank (US\$73 million) and technical support from the Pan American Health Organization (PAHO). This project originally focused on vector control activities, including indoor residual spraying

(IRS) and environmental management, with a lesser focus on case management and disease surveillance.

During the project period, two significant events would greatly affect the progress of malaria control efforts. Control of implementation of malaria control activities was devolved from SUCAM, the national malaria control program, to municipalities as part of a larger government decentralization initiative. SUCAM retained responsibility for procuring and distributing commodities, including drugs and insecticides, setting standards, and providing technical support. Decentralization provided municipalities for the first time with the financial resources to invest in malaria control activities and generated local ownership of these efforts.

During the same period, Brazil's national malaria control strategy was revised in line with WHO's global strategy. Features of the new strategy included highly selective targeting of control efforts to high-risk municipalities. This required strengthening of malaria case detection and better use of surveillance data in decision making. The new strategy also shifted emphasis from vector control activities to more aggressive management of clinical cases, which included the introduction of artemisinin-based drug treatments. Antimalarials were made widely available, including in local shops in mining areas. All cases of fever in these areas were presumptively treated for malaria.

The outcome of this program was that reported malaria cases dropped by 60 percent, from 557,787 in 1989 to 221,600 in 1996. The percentage of cases caused by *Plasmodium falciparum* (the most lethal form of malaria) decreased from 47 percent to 29 percent during the same period. It has been projected that these efforts prevented nearly 2 million cases of malaria and 231,000 deaths.

## Eritrea

In response to a large malaria epidemic in 2000 and growing concerns about HIV/AIDS, the Ministry of Health of Eritrea established a new strategy for control of its high-burden communicable diseases. The combined program to control HIV/AIDS, malaria, STDs, and TB was dubbed HAMSET. The World Bank provided US\$40 million support through the HAMSET Project. Coincident with this investment, USAID provided significant resources to the Ministry of Health for technical support on malaria through their Environmental Health Project (EHP).

The technical strategy employed in Eritrea stressed more targeted use of IRS to the highest-risk areas, use of environmental management, scaling up of ITNs, and expansion of diagnosis and effective treatment. Key to these efforts was a strengthening of disease surveillance and operational research activities, and the use of these data in priority setting. EHP provided essential technical support to these efforts, including support for expatriate staff to develop capacity in entomology and epidemiology at national and subnational levels.

One of the objectives of the HAMSET program was to decentralize implementation of control activities to *zoba* (zonal) and sub-*zoba* levels. Zobas were provided with financial resources based on approved annual work plans. Many activities were focused on building technical and managerial capacity at *zoba* and sub-*zoba* levels. In addition, communities were actively involved in malaria control activities, including the distribution and retreatment of ITNs and environmental management (for example, filling of temporary water bodies and larviciding).

To date, the use of ITNs by children under five years in malarious areas of Eritrea has risen from 20 percent in 2000 to 63 percent in 2003, while the use of IRS has decreased. Despite recent heavy rains and large epidemics in neighboring countries, Eritrea has reduced malaria morbidity from 179,501 reported cases in 1999 to 65,540 cases in 2003, a 63 percent decline. Deaths from malaria fell from 176 to 78 during the same period, a decrease in mortality rate from 13.3 percent to 3.9 percent.

## India

In 1997, the World Bank provided US\$165 million in financing for the Enhanced Malaria Control Project (EMCP). EMCP invested in the 100 highest-risk districts in eight North Indian states. One of the primary objectives of EMCP was to assist India's Ministry of Health to transition from its unsuccessful eradication strategy to a more modern control strategy. Widespread use of IRS would become more targeted and supplemented by a broader range of control activities, including early diagnosis and prompt treatment of malaria cases, promotion of ITNs, use of alternative vector control methods (including environmental management and larvivorous fish), and strengthening of malaria surveillance.

Progress during the first years of the project was slow, in part because the initial project design excluded state health departments from implementa-

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tion activities. Districts were to be supervised directly by the National Anti-Malaria Program. After an unsatisfactory mid-term review, the project was redesigned. Most notably, state malaria control societies were provided with financing and took on a primary role in supervising and supporting district health staff.

After the redesign, implementation remained slow, causing the Bank to suspend disbursement. A change in leadership within the Ministry of Health and the National Anti-Malaria Program brought renewed interest in revitalizing EMCP. Outstanding issues were quickly addressed, the suspension was lifted, and the implementation took off rapidly.

Since the restart of the project, more than 300,000 village-based volunteers have been trained in malaria case management and provided supplies of chloroquine. Laboratory capacity has been greatly expanded; approximately 14 million blood slides were examined last year. Almost 3 million ITNs have been distributed and more than 20,000 larvivorous fish hatcheries established. Local governments, community groups, and NGOs have become actively involved in a number of activities, including distribution and retreatment of ITNs, breeding and stocking of larvivorous fish, and community awareness campaigns.

Reported cases of malaria declined by 93.3 percent, 80.8 percent, and 40.6 percent for the states of Maharashtra, Gujarat, and Rajasthan, respectively, from 1997 to 2002.<sup>20</sup>

## Vietnam

After many years of good control, Vietnam experienced a dramatic upsurge in malaria burden during the late 1980s and early 1990s. Vietnam's National Institute of Malariology, Parasitology, and Entomology (NIMPE) developed an aggressive plan to control malaria and the Government of Vietnam requested financial support from the World Bank to implement this plan. In 1997, a Health Sector Support Project was launched with a sizable malaria control component (US\$25 million). This project supported procurement of insecticides, drugs, and some equipment for all 61 provinces, but focused most of its resources on 15 high-burden provinces.

These 15 provinces were targeted for training in case management, strengthening of surveillance activities, public awareness campaigns, and improvement of laboratory capacity. Technical support for implementation

activities was provided by the WHO Regional Office for the Western Pacific.

As with the other successful programs, the technical approach included targeted use of IRS, promotion of ITN use, and use of effective treatment for clinical cases. National drug policy was changed to replace ineffective treatments with mefloquine and later artemisinin-based drugs. More than 1 million ITNs were distributed with support from the project. Community groups (such as youth leagues and women's unions) and village heads played key roles in information, education, and communication (IEC) activities, distribution of ITNs, and community-based treatment activities.

During the project period, the number of malaria cases dropped in 2003 to 37 percent of 1997 levels (445,200 to 164,706 cases). Malaria mortality decreased from 153 in 1997 to 50 in 2003, a mortality rate of 0.06 percent. Outbreaks of malaria ceased.

## Key Success Factors

### Epidemiologic factors

The four countries are in different geographic regions, have different mosquito vectors, and are subject to different climatic conditions. Despite these differences, there are some similarities in the epidemiologic pattern of malaria.

All four countries are characterized by wide geographic variability of disease risk and burden. The variability in risk is strongly related to variations in local climate. Arid, temperate, and mountainous regions have low to no risk, while risk is higher in tropical and subtropical areas and in areas with heavy rainfall.

The population at risk of severe disease and death is greatly affected by the intensity of transmission. In contrast to tropical Africa, where most of the burden is borne by young children, malaria in these four countries kills and severely debilitates people of all ages. In each of the four countries, development of new program strategies was preceded by periods of large epidemics or markedly increased malaria burden that heavily affected people in their productive years of life.

Although overall transmission intensity is moderate to low in these four countries, one cannot necessarily conclude that similar success is unachiev-

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able in countries with intense transmission. Each of these countries has been successful in reducing malaria burden in pockets of high-level transmission where these efforts were primarily targeted. This should give hope that control is possible in other high transmission areas.

In addition, malaria burden in Brazil, India, and Vietnam is most heavily concentrated in areas with sizable tribal or indigenous populations. The health infrastructure in these areas is generally much weaker than in the rest of the country and comparable to that of many parts of Africa. These populations are usually the most disconnected from public health structures and most resistant to health promotion activities.

### Country context

These four successful programs were launched in periods of relatively strong economic growth and political stability in these countries. Vietnam was rapidly recovering from a period of economic crisis. Brazil and India had growing economies. The effect of such favorable economic conditions on the health sector was most notable in Vietnam, where government investments in health almost tripled in the period between 1991 and 1994. Eritrea appears to be the one exception, as the country's economy has deteriorated somewhat since the launch of the project.

In each of these countries, commitment to malaria control was strong at the highest levels of government. At the core of this commitment was the recognition that malaria was a barrier to economic development. Evidence of such commitment moved well beyond simple rhetoric to increased investment of government resources in malaria control.

### Technical approach

All four countries adopted strikingly similar technical approaches to control malaria. Prior to the implementation of these programs, their malaria control strategies focused heavily on vector control, particularly use of IRS. The new strategy sought to use multiple approaches to controlling malaria, balancing case management with prevention measures, and introducing new technologies, particularly ITNs. In three of the four projects (India, Brazil, and Vietnam), this shift in strategy was explicitly listed as an objective of the World Bank-assisted project.

The new strategy shifted emphasis to improving and expanding the availability of effective case management. Vector control efforts, particularly IRS, became more targeted as alternative vector control measures were scaled up. Such alternative measures included environmental management (all countries), larviciding (Eritrea), and use of larvivorous fish (India). With the exception of Brazil, distribution of ITNs became a key prevention strategy.

Another fundamental change in the approach to malaria control was the emphasis on targeting interventions to high-risk areas. In Vietnam, Brazil, and India, a significant portion of the Bank's resources was for use only in such high-risk areas. In India, these were the 100 most heavily affected districts in eight states. Similarly, investments were highly targeted to high-risk municipalities in the Amazon Basin in Brazil and the 15 high-burden provinces in Vietnam. Even in Eritrea, where targeting was not central to the project design, control efforts were more focused on the most heavily affected zones. Such targeting was possible only because these countries invested heavily in improving their malaria surveillance systems. Laboratory capacity was strengthened and case reporting was streamlined, integrated, and computerized. These efforts improved both the completeness and timeliness of case reporting. There also was a strong emphasis in developing capacity at the subnational level to analyze and interpret surveillance data, which then impacted decision making at the district level.

### **Programmatic factors**

Prior to the implementation of these programs, all four countries had vertical, centrally managed implementation strategies. Under this arrangement, village-level functionaries were paid by the national malaria control program and worked solely on malaria control. The most extreme example of this was in Brazil, where malaria treatment was provided by free-standing malaria clinics, which had no formal link to local public health facilities.

With the development of new control strategies in these countries, there was a significant move toward integration and decentralization of implementation. Brazil decentralized most government functions during the first few years of the malaria control program, shifting the responsibility and resources for malaria control to municipalities. In Eritrea and India, much of the responsibility for implementation was shifted to zonal and state health authorities, respectively. The decentralization of responsibility and

resources frequently stimulated local governments to become more involved in malaria control efforts. Local involvement has been seen as pivotal to the success in India, Brazil, and, to some extent, Eritrea.

Despite this move toward integration, the national malaria control programs remained strong and continued to play important roles in program implementation. The national programs were still looked to for technical support and for procurement of essential commodities, including drugs, insecticides, ITNs, and laboratory equipment.

These four programs were led by directors who had strong technical and managerial skills. They understood the systems in which they worked and were capable of moving things quickly through their bureaucracies. These skills were likely acquired from years of managing vertical programs.

All four countries appear to have benefited from the extensive networks that remained from the earlier vertical programs. These networks provided the basic infrastructure necessary for efficient and effective implementation of program activities.

In general, these countries had much more developed public health infrastructures than many other malaria-affected countries, particularly those in Sub-Saharan Africa. It must be noted, though, that the areas targeted by these projects often had infrastructures that were much weaker than the rest of the country.

One characteristic that distinguishes these four country programs from most other malaria-affected countries is the presence of skilled technical staff at the subnational level. India's experiences during the first half of the project period demonstrate that their program would not have achieved such success without the involvement of the state malaria control programs. The same could be said of the zonal malaria control officers in Eritrea. These programs also built technical and programmatic capacity at district and, in some cases, subdistrict levels.

### **Partnership issues**

These four countries were notable in the limited number of major implementation partners involved at the national level. Beyond the involvement of the World Bank, Vietnam, Brazil, and Eritrea had only one major partner in their efforts. In Vietnam and Brazil, it was the regional offices of WHO (Regional Office for the Western Pacific and the Pan American Health Organization) that played key roles in providing technical guidance

and support. In Eritrea, USAID's Environmental Health Program played a similar technical support role.

At the local level, partnerships have flourished. In India, the local health departments have often partnered with tribal welfare, education, and agricultural departments, as well as NGOs, community groups, local governments, and private providers. Private shopkeepers also played an important role in expanding treatment in Brazil's mining areas. These partnerships have generally been focused on specific activities. For example, NGOs in India are contracted to distribute and re-treat ITNs and tribal welfare workers offer malaria treatment to the surrounding community.

### **Financing**

The financing provided by the World Bank coupled with increases in resources provided by the government represented a dramatic increase in funding for malaria control activities in India, Eritrea, and Vietnam. Most strikingly, Vietnam's investment in malaria control increased almost 12-fold from 1991 to 1995 (from US\$0.55 million to US\$6.4 million).

In all countries, the investments provided by governments went beyond support solely for salaries and minor operating expenses. In India, government support to the National Anti-Malaria Program was quite substantial and included resources for procurement of all required stocks of DDT. Several state governments also invested some of their own resources in malaria control.

Notwithstanding the slow rate of implementation in the first years of each project, disbursement and use of funds was rather brisk compared to health projects in many other countries. What could account for the rapidity of disbursement was the control exerted over the available resources by the national malaria control program managers. These program managers had either direct control or easy access to those who did control the purse strings. They also had a great capacity to move their bureaucracies so that finances flowed and procurements were made in a timely manner. This is in contrast to many African countries, where malaria control program managers have often reported significant barriers to accessing funds that have been allocated to their programs from World Bank grants and credits.

One factor that was felt to be pivotal to the success of the program in Brazil was the decentralization of control of resources to municipalities. This allowed these local authorities to prioritize spending on malaria, based

on local needs. It also provided a strong sense of ownership to municipal governments. The experience was similar for India, where the program initially faltered until state health departments were given control of some resources. Providing resources directly to zonal health authorities was also a key component of the Eritrea project.

### **World Bank factors**

The World Bank's approach to supervision of these projects was much more hands-on. The Bank ensured active technical supervision either through its own resources or through partner agencies, including WHO and USAID. Substantial programmatic support also was provided. In Eritrea, for example, when implementation was behind schedule, the Task Manager worked with the Ministry of Health to break large activities into a series of smaller tasks with benchmarks. This "Rapid Results Initiative" quickly accelerated implementation of project activities.

Another feature of the Bank's involvement in these four countries was its flexibility. In India, after an unsatisfactory mid-term review, the Bank worked aggressively with the government to significantly restructure the project and remove major bottlenecks to implementation. The Bank also demonstrated flexibility in the procedures for procuring insecticides. Similarly, the Bank reallocated funds from an earlier health sector project in Eritrea so that the Ministry of Health could purchase antimalarial drugs in response to a large malaria epidemic.

The Bank was not averse, though, to restricting the use of funds when progress was not satisfactory. In India, for example, when progress remained slow after the project redesign, the Bank suspended disbursement on all project components until the government met a series of benchmarks, which included the review and revision of some malaria control policies.

### **Conclusions**

Clearly, the success of these four malaria control programs was the result of the confluence of a number of factors. A sound targeted technical approach, skilled human resources and good infrastructure at national and subnational levels, strong technical and programmatic support from the World Bank

and its partners, and sufficient finances were all essential for these programs to accomplish their goals.

Many of the lessons learned from these program successes could be adapted by other countries. Countries interested in achieving such successes must strive to address most or all of these key factors. Focusing on only a few of them is unlikely to achieve these goals.

These country examples also point out that design does matter. Control efforts faltered in India and Brazil until the programs were redesigned. Notably, decentralization of program implementation and financing greatly facilitated the progress of these programs. It also was important, though, that a strong central malaria control program be maintained.

The World Bank played an important role in the success of these programs that went beyond simply providing financing. Consistent and proactive technical and programmatic support mobilized by the Bank was an important contribution to their success. So, too, was the willingness of the Bank to be flexible, supporting the redesign and reallocation of financing to overcome barriers and meet the changing needs of the program. The Bank also used its leverage with governments that were reluctant to effect changes in policy or program implementation.

If forced to select the most important factor in the success of these programs, it would have to be strong commitment and leadership at all levels of government. Decision makers in these countries did not consider these interventions to be World Bank projects, but rather their country programs. Government and community leaders from national to local levels considered malaria a priority problem and dedicated their resources and manpower to address it. Managers of national malaria control programs understood what worked in their countries and knew how to effectively navigate their bureaucracies. Without this leadership and ownership, it is doubtful that these programs would have gotten off the ground even if all other success factors had been in place.





## APPENDIX 4

# Strategic Communications

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### Context

An important component of the Global Strategy and Program of Action for Malaria Control is a strategic communications plan. RBM partners held a communications and advocacy meeting on September 1–3, 2004, to develop a comprehensive strategy in support of malaria control, providing a context for the Bank to renew its operational and communications strategies simultaneously.

### Goals

- Generate or renew awareness among external partners of the Bank's priorities and business model for supporting countries in controlling malaria.
- Generate or improve awareness among internal constituencies of the Bank's comparative advantages in malaria control and the potential for deploying it to maximum effect (including flexibility and simplification of procedures and instruments).

### Audience(s)

*Media:* Help the media better understand core issues of malaria control as a core health and development issue. Highlight the Bank's role in malaria

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control—past, present, and future. Advocate for better communication with the general public on challenges to achieving this goal.

*Civil Society/Faith-Based Organizations:* Help civil society better understand the Bank's support for malaria control programs and challenges to success. Communicate what the Bank's role is and is not, so that this is reflected broadly.

*Bank Staff:* Communicate internally with staff on the development impact of malaria, including all the subtopics relevant to their work. In other words, this is not just another fad, but a fundamental development issue.

*Bank Senior Management:* Get senior management to speak publicly more often about malaria as a core part of the development agenda in many client countries. This should not only be occurring on Africa Malaria Day, but also more regularly at major international health forums.

*Policymakers/Parliamentarians:* Raise awareness of Bank malaria control programs among policy makers and decision makers in countries so that they fully understand what resources are available and how to gain access to funds.

*Communications Staff at the Bank:* Coordinate announcements and interaction with the public at large on the Bank's malaria control programs. Strategically coordinate activities for the best possible impact, and establish a core communications group that will be kept in the loop as issues develop.

*RBM Partners:* Routinely communicate with the RBM Secretariat and core RBM partners on progress of the Bank's Global Malaria Strategy. Link up with global advocacy efforts in a visible way, including issuing joint press releases with selected partners, depending on the issue, the audience, and the context.

**Messages:** A communication campaign's bottom line.

***The Bank is fully committed to a serious effort to close the gap between knowing and doing in malaria control.***

The Bank will develop key messages that convey what we aim to achieve. The core malaria communications team will coordinate with the Bank's communicable disease coordinator and key Health, Nutrition, and Popula-

tion (HNP) staff to establish core messages on two levels: (i) the global level and (ii) a regional/country level. A few initial ideas include:

- Resolving nonfinancial constraints
  - Support program design and implementation
  - Facilitate access to undisbursed funds
- Ensuring adequate financing
  - Increase IDA financing for malaria control
  - Leverage funds from other financiers
- Rebranding the Bank's work on malaria
  - Outcome-oriented
  - Responsive to clients
  - Flexible means
  - Transparent

**Key strategies include:**

- Organizing a core Malaria Communications Campaign Team that meets regularly to discuss and update strategy. Merge the subunit communication strategies for the better common good of achieving the Bank's overall goals of rolling back malaria. This strategy will encompass corporate communications, development/project communications, internal communications, civil society, parliamentarians, and other relevant stakeholders as appropriate.
- Developing a general map that lays out who the key team members are for each category. The main categories are:
 

|                    |                              |
|--------------------|------------------------------|
| • Media            | • Civil society              |
| • Parliamentarians | • Publications               |
| • Speakers bureau  | • Youth outreach             |
| • Partnerships     | • Private sector development |

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- Capitalizing on existing communications channels. Create a malaria communications toolkit to assist CommNet staff. CommNet staff should regularly participate in supervision missions in order to understand the successes and challenges of project implementation and share those stories with key audiences.
- Ensuring collaboration and active participation in the Malaria Communications Strategy by regional representatives, especially from the Africa region. A key part of the overall strategy is building a solid, committed Bank-wide Malaria Communications Team with clear role definition.



## APPENDIX 5

# High-Impact Partnerships: Private Sector and Civil Society

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As there are transaction costs to working in partnership, the benefits of so doing need to be clear. The reasoning behind this strategy is based on pragmatism. Without partnering with the formal and informal private sectors, as well as with civil society, the Bank will be unable to leverage their capacities to support substantial increases in coverage, which is critical to reducing disease transmission, morbidity, and mortality. In addition, given the increasing financial demands for malaria control worldwide, coordination and cofinancing will be key. The Bank will leverage complementary investments by committing resources, identifying unmet needs, and supporting ownership and dialogue around common implementation strategies. Global-level partnerships will be useful to the extent that they support country operations and help to achieve measurable impact at reasonable transaction costs.

### The Private Sector in Malaria Control

Three layers of for-profit private sector will be engaged: (i) global providers for inputs such as ACTs and ITNs, (ii) international or local companies that employ large numbers of people in malarious affected countries, and (iii) health service providers, formal and informal. Each layer will have particular contributions to be extracted and needs to be fulfilled.

- Global providers need reliable forecasts. The Bank will have a regular dialogue to exchange information that has an impact on their forecasting. The new service, based at the RBM Secretariat called Malaria Medicines and Supply Service, aims to provide this function, but strengthened collaboration with the Bank's procurement specialists and the IFC is needed.

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- Large companies operating at the country level could become allies in the fight against malaria, offering treatment to their employees, their families, and communities. There are analogies to the role this part of the private sector plays in the fight against HIV/AIDS, and examples already exist relating to malaria. As part of its Chad-Cameroon Development Project, ExxonMobil protects project workers and their families with a strong malaria prevention and treatment program.<sup>21</sup>
- The informal health sector is the major supplier for malaria treatment in most countries. In the absence of adequate regulation and enforcement, what can be done to supply effective, good-quality medicines at prices affordable to the poor, through these informal channels? Issues such as pricing, financial incentives, distribution mechanisms, quality assurance, and counterfeiting come to mind. Educating and empowering consumers is an important aspect in this regard.

## Civil Society and Malaria Control

*At the country level:*

- Not-for-profit health care providers (NGOs, faith-based providers, and others) are already providing the majority of malaria control services, particularly in Sub-Saharan Africa. Linkages with national malaria control programs and with district implementation plans, however, are weak. Empowerment of local communities is key, starting with goal setting and monitoring of results in a practical and meaningful way. Nonprofits should have flexibility to channel funds to the providers that deliver results.
- Include local civil society in the top-level dialogue as much as possible, with an explicit understanding that the goal is to achieve measurable improvements in morbidity and mortality due to malaria through effective interventions.

*At the global level:*

- Maintain stakeholder dialogue at the global level throughout the strategy development and implementation process.

- Meet with global civil society leadership around country-specific projects and operational topics to ensure linkages with local counterparts where applicable.
- Ensure that civil society is updated on active and pipeline Bank support for malaria and that a mechanism exists through which they might align their support with the Bank's work, and vice versa.





## APPENDIX 6

# Impact of Malaria on Schoolchildren and the Education Sector

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**Incidence:** Estimates from Africa suggest that 20–50 percent of school-age children experience clinical malaria attacks in a given year (Clarke et al.). Higher rates have been reported from endemic areas of Asia (Luxemburger et al. 1994).

**Mortality:** Of all mortality in schoolchildren, 15–20 percent is attributable to malaria. In an area of intense transmission in Asia, 27 percent of all malaria mortality was in the school-age group (Bundy et al. 2000).

**Enrollment:** In Sub-Saharan Africa, 600,000 children under five years of age experience cerebral malaria, and each year 9,000–19,000 children (more than 2 percent of the survivors) experience neurological complications, including developmental and behavioral impairments, lasting for more than six months (Mung’ala-Odera, Snow, and Newton 2004; Murphy and Breman 2001). A study in Kenya found that these children were less likely to have been enrolled in school (Holding and Snow 2001).

**Absenteeism:** Studies in the Democratic Republic of Congo, Kenya, Senegal, and on the Thailand-Myanmar border indicate that malaria is a cause in 5–8 percent of all absenteeism, equivalent to 50 percent of all preventable absenteeism (Brooker et al. 2000; Bundy et al. 2000; Holding and Snow 2001; Luxemburger et al. 1994; Trape et al. 1987, 1993).

**Cognition, learning, and educational achievement:** School performance of 6–14-year-olds has been related to the number of previous clinical

malaria attacks (Fernando et al. 2003a; Fernando et al. 2003b). These effects appear to be mediated through the anemia that is associated with both asymptomatic and clinical malaria, and the neurological consequences of cerebral malaria. Anemia occurs in 50 percent of schoolchildren in Africa and 12 percent to 38 percent of schoolchildren in Asia (Partnership for Child Development 2001). Schoolchildren with anemia score more poorly (~ 1–3 standard deviation worse) on tests of education and of general reasoning ability (Pollitt et al. 1989). In Kenya, schoolchildren who had been hospitalized with cerebral malaria were 4.5 times more likely to suffer from mild to severe learning difficulties three to four years later, even though half of the children had no neurological problems at the time of hospitalization (Holding et al. 1999).

**Impact on the education system:** Malaria is reported to have a significant impact on education supply, through absenteeism of teachers. Anecdotal evidence suggests that in areas of unstable transmission, absenteeism of teachers can close schools during the transmission season.

### Conclusions

- There is strong evidence that malaria has an impact on the health and cognition of schoolchildren that adversely affects their education.
- Malaria interventions both early in life and at school age offer benefits for educational outcomes.
- There is a relative absence of efforts to address malaria in the school-age population.
- Ministries of education have a strong commitment to improving the health of schoolchildren and recognize the importance of malaria.

## Notes

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1. Malaria is a potentially deadly disease that is caused by infection with the parasite of the genus *Plasmodium*, which is transmitted to humans through the bite of a female *Anopheles* mosquito infected with the parasite. The most severe form of human malaria infection is caused by *Plasmodium falciparum*. The other forms in humans are caused by *Plasmodium vivax*, *Plasmodium malariae*, and *Plasmodium ovale*. For further details, see: <http://www.who.int/topics/malaria/en/>.
2. The Bank cofounded the Roll Back Malaria Partnership (RBM) in 1998, with the overall objective of halving the burden of malaria by 2010. RBM facilitates a coordinated global response to malaria. For further details, see: <http://www.rollback-malaria.org>.
3. In 2000, African heads of state, other country officials, and representatives of development organizations, including the World Bank, met in Abuja, Nigeria, to express commitments to tackling malaria and establishing targets for implementing the technical strategies. The targets set for 2005 are known as the “Abuja Targets.”
4. A frequently used measure of the burden of disease is the disability-adjusted life year (DALY) concept, which is a composite measure of both death and disability. The DALY is an indicator of the time lived with the disability and the time lost from premature mortality. Years of life lost from premature mortality are estimated with respect to a standard expectation of life at each age. Years lived with a disability are translated into an equivalent time loss through multiplication by a set of weights that reflect reduction in functional capacity. As such, the DALY represents an attempt to combine in a single indicator the impact of disease on mortality and morbidity.
5. Lending is used here in a generic sense to include loans, credit, and grants.
6. In general, adaptable programs support phased long-term development strategies and programs. They are designed to provide greater flexibility and adaptation. Horizontal adaptable programs provide for the replication and scaling up of a program across countries, within a common framework.
7. See <http://www.rollbackmalaria.org>.
8. The number of Bank staff working on malaria decreased from seven full-time equivalent (FTE) in fiscal 1998 to zero FTE in fiscal 2002. There was one FTE secondee in fiscal 2002. In fiscal 2003–4 there were two FTE secondees, one each from the U.S. Centers for Disease Control and Prevention and the RBM Partnership Secretariat. The Bank incurred no salary costs for the secondees. Both were supported by two senior staff members, each of whom worked on malaria on a limited basis. As of December 2004, only the RBM secondee was working full time on malaria. In mid-2004 the Bank appointed a Coordinator of Global Partnerships for Communicable Diseases to work part time on malaria. The total internal Bank budget for malaria control, including trust funds, declined from over US\$0.7 million in fiscal 1998 to

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US\$0.1 million in fiscal 2002, and a little more than US\$0.2 million in fiscal 2004. For fiscal 2005, the nonsalary budget for work on malaria was US\$50,000, plus a contingency budget of US\$250,000 to start preparing the Booster Program for Malaria Control.

9. In 2000, African heads of state, other country officials, and representatives of development organizations including the World Bank, met in Abuja, Nigeria, to express commitments to tackling malaria and establishing targets for implementing the technical strategies. The targets set for 2005 are known as the “Abuja Targets.”
10. Eradication is the reduction of new cases of the disease to zero.
11. Control is the reduction of the cases of the disease to an acceptable level, as determined by the area in question (Hotez et al. 2004).
12. Source: Status of Enhanced Malaria Control Project (2003-04). Obtained by the World Bank from the Directorate of National Anti Malaria Program in December 2003.
13. Appendix 2 shows the percentage of households that have at least one mosquito net, the percentage of children under five years old that slept under a mosquito net during the night preceding the survey, and the percentage of pregnant women that slept under a mosquito net during the night preceding the survey.
14. Through its Development Grant Facility the Bank provides US\$1 million annually to the RBM Partnership Secretariat. The RBM Secretariat is hosted by the World Health Organization in Geneva.
15. The declaration, known as the “Abuja Declaration,” calls for halving the burden of malaria in Africa by 2010 and includes a number of indicators to be met by 2005. The full text of the Declaration can be accessed at the Roll Back Malaria Web site: <http://www.rollbackmalaria.org>.
16. Lending is used here in a generic sense to include loans, credit, and grants.
17. In general, adaptable programs support phased long-term development strategies and programs. They are designed to provide greater flexibility and adaptation. Horizontal adaptable programs provide for the replication and scaling up of a program across countries within a common framework.
18. Source: <http://www.theglobalfund.org/en/about/how/#2>. Accessed on November 17, 2004.
19. RBM Monitoring & Evaluation Reference Group. For further details, see <http://www.rbm.who.int/merg>
20. Source: Status of Enhanced Malaria Control Project (2003-04). Obtained by the World Bank from the Directorate of National Anti Malaria Program in December 2003.
21. ExxonMobil. Chad/Cameroon Development Project. “Fighting Malaria in the Workforce.” Downloaded on November 15, 2004 at: <http://www.exxonmobil.com/corporate/citizenship>.

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The purpose of *Rolling Back Malaria: The World Bank Global Strategy & Booster Program* is to translate the World Bank's corporate commitment into a serious effort to close the gap between knowing and doing in malaria control. It builds on lessons learned and takes into account World Bank-supported successes in countries such as Brazil, Eritrea, India, and Vietnam, among others. The World Bank will now deepen and expand its efforts to enable more countries to achieve and sustain large-scale impact in malaria control.

The new business model combines an emphasis on outcomes with flexibility in approaches. Products and services related to malaria control will be tailored to client segments in order to meet the needs of countries and deploy the World Bank's comparative advantages while strengthening collaboration with partner agencies, cofinanciers, and civil society. In the short to medium term, the new Booster Program for Malaria Control will provide increased financing and technical support to accelerate program design and implementation, increase coverage, and improve outcomes more rapidly than in the recent past. Henceforth, malaria control will be mainstreamed into the Poverty Reduction Strategies and large sector-development programs that emphasize outcomes. Clients will have choices in the instruments for accessing funds and technical support from the World Bank, including malaria-specific programs where appropriate.

The *Global Strategy & Booster Program* represents a significant upgrade of World Bank support for malaria control. It is a living document that will be updated to take account of lessons from future operations and new knowledge from research.

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