The President's Malaria Initiative

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An Agenda for Global Health Funding Agencies

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The President's Malaria Initiative

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List of Acronyms and Abbreviations

ACT	Artemisinin-based combinational therapy
AED	Academy for Educational Development
BCS	Behavior Change Support
CDC	U.S. Centers for Disease Control and Prevention
C-Change	Communication for Change
DDT	Dichlorodiphenyltrichloroethane
DALY	Disability-adjusted life year
DRC	Democratic Republic of the Congo
FY	Fiscal year
GHI	Global Health Initiative
Global Fund	The Global Fund to Fight AIDS, Tuberculosis and Malaria
HHS	Department of Health and Human Services
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome
IAA	Interagency Agreement
IHP	Integrated Health Program
IPTp	Intermittent preventive treatment for pregnant women
IQC	Indefinite quantity contract
IRS	Indoor residual spraying
ITN	Insecticide Treated Nets
JSI	John Snow, Inc
LLIN	Long-lasting insecticide treated nets
MAPS	Malaria Action Program for States
MCHIP	Maternal and Child Health Integrated Program
MOP	Malaria Operational Plan
NGO	Non-governmental organization
NIH	National Institutes of Health
NMCP	National malaria control program
OGAC	Office of the Global AIDS Coordinator
PEPFAR	President's Emergency Plan for AIDS Relief
PMI	President's Malaria Initiative
RA	Resident Advisor
RBM	Roll Back Malaria
RDT	Rapid diagnostic test
RTI	Research Triangle Institute
SP	Sulfadoxine-pyrimethamine
SPS	Strengthening Pharmaceutical Systems
TBD	To be determined
TSHIP	Targeted States High Impact Program
USAID	United States Agency for International Development
UN	United Nations
UNICEF	United Nations Children's Fund
WHO	World Health Organization

Part I: Funding History, Landscape, and Governance

The President's Malaria Initiative (PMI) was launched by President George W. Bush in 2005 "to reduce the intolerable burden of malaria and help relieve poverty on the African continent."[1]

Phase 1: 2005-2008

The PMI was originally conceived as a five-year (FY2006-2010), $1.2 billion initiative to scale-up malaria treatment and prevention interventions, aiming to halve malaria-related mortality in a group of 15 "focus countries." The initiative focused its prevention efforts on women and children under five years old.[2]

Previously, U.S. malaria efforts had been plagued by scandal and ineffectiveness, particularly in the years immediately prior to its launch. Bate (2007) describes the situation at the time:

> "Prompted by anti-malaria advocates, the US Congress[3] led a series of investigations into USAID's malaria control programs between September 2004 and January 2006. These hearings found almost no monitoring and evaluation of performance, no ability to account for spending with any meaningful precision, and the promotion of poor public health and clinical practices…Of the money accounted for, most went to general advice-giving programs and consultants who were seemingly incapable of building sustainable local capacity. Only approximately 8% of USAID's $80 million FY 2004 budget was used to purchase actual life-saving interventions…USAID could provide almost no evidence to show that programs actually helped save lives or even build sustainable capacity."[4]

According to Bate, the PMI's design was responsive to Congressional criticisms of previous malaria efforts, including that they showed a lack of accountability; spread resources too thin to be effective; failed to support cost-effective interventions; and lacked cooperation between U.S. agencies.[5]

The PMI was thus designed as an inter-agency initiative led by a U.S. Global Malaria Coordinator housed within the United States Agency for International Development (USAID). Rear Adm. Tim Ziemer was appointed as Global Malaria Coordinator in 2006 and remains in office today.[6] The initiative is implemented by USAID and the U.S. Centers for Disease Control (CDC) of the Department of Health and Human Services (HHS).[7]

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[1] President's Malaria Initiative. "About the President's Malaria Initiative." Accessed March 18, 2012 at http://www.pmi.gov/about/index.html
[2] *Ibid.*
[3] Particularly the House Committee on International Relations (now Foreign Affairs) and the Senate Committee on Foreign Relations
[4] Bate, Roger (2007). "USAID's Health Challenges: Improving US Foreign Assistance." Journal of the Royal Society of Medicine Vol. 100: pp. 29-33.
[5] *Ibid.*
[6] President's Malaria Initiative. "Rear Adm. Tim Ziemer, U.S. Global Malaria Coordinator ." Accessed March 18, 2012 at http://pmi.gov/about/bio_ziemer.html
[7] President's Malaria Initiative. "About the President's Malaria Initiative." Accessed March 18, 2012 at http://www.pmi.gov/about/index.html

Countries were selected for inclusion as "focus countries" based on five factors: disease burden from malaria; strong leadership and country commitment; having a strong national plan for malaria control; support from other funding partners such as the World Bank and the Global Fund; and willingness to work with the United States.[8] In the PMI's first year (FY2006), the focus countries were Angola, Tanzania, and Uganda. In FY2007 the initiative expanded to include Malawi, Mozambique, Rwanda, and Senegal as focus countries. Eight more focus countries – Benin, Ethiopia, Ghana, Kenya, Liberia, Madagascar, Mali, and Zambia – were added in FY2008.[9] Only countries which are designed as 'PMI focus countries' receive PMI attention and funding.

From the beginning, the PMI supported a package of four proven interventions to help treat and prevent malaria: indoor residual spraying with insecticides (IRS); insecticide-treated mosquito nets (ITNs); intermittent preventive treatment for pregnant women (IPTp); and treatment with artemisinin-based combination therapy (ACT) for those diagnosed with malaria.[10] The cost - effectiveness of these particular interventions is discussed below in Part II.

The U.S. also gives a substantial contribution to the Global Fund to Fight AIDS, Tuberculosis, and Malaria (the Global Fund), which acts as a multilateral mechanism for U.S. malaria control efforts. While U.S. funding to the Global Fund is not specifically earmarked for malaria, a significant portion of Global Fund disbursements go towards malaria control efforts. For example, in 2011 the United States gave $1.05 billion to the Global Fund, or 31% of the Global Fund's total commitments.[11] As of 2011 the Global Fund funded malaria grants in 70 countries; those grants represented 28% of its total spending, with the remainder going towards HIV/AIDS and tuberculosis. However, the U.S. contribution to the Global Fund is channeled through PEPFAR and is not considered a part of the PMI.[12]

The PMI is organized around four operational principles:

1. Using a comprehensive, integrated package of proven prevention and treatment interventions;
2. Strengthening health systems and integrated maternal and child health services;
3. Strengthening national malaria control programs (NMCPs) and building capacity for country ownership of malaria control; and
4. Coordinating closely with international and in-country partners.[13]

Phase 2: 2008-2013

[8] Ziemer, Rear Adm. Tim (2008). "Leadership Interview: A Good Leader Cares for His People." *Roll Back Malaria* interview, conducted by Katya Hill. Accessed March 18, 2012 at http://www.fightingmalaria.gov/news/speeches/ziemer_interview.html
[9] President's Malaria Initiative. "Funding." Accessed March 18, 2012 at http://www.pmi.gov/funding/index.html
[10] USAID (2010). *The President's Malaria Initiative: Sustaining Momentum Against Malaria: Saving Lives in Africa*. Fourth Annual Report.
[11] The Global Fund to Fight AIDS, Tuberculosis, and Malaria. "Core Pledges and Contributions List." Accessed March 18, 2012 at http://www.theglobalfund.org/documents/core/financial/Core_PledgesContributions_List_en/
[12] The Henry J. Kaiser Family Foundation (2011). "Fact Sheet: The President's Malaria Initiative." U.S. Global Health Policy. Accessed March 18, 2012 at http://www.kff.org/globalhealth/upload/7922-02.pdf
[13] USAID (2011). *The President's Malaria Initiative: Fifth Annual Report to Congress.*

In 2008, the Lantos-Hyde Act authorized an expanded PMI for FY2009-2013, substantially increasing its funding. The bill authorized up to $5 billion over five years for malaria prevention and control, and codified the U.S. Global Malaria Coordinator as a Presidential appointee (congressional approval is not required).[14] However, the reauthorization required the submission of a 5-year strategy and annual reports from the President to the "appropriate congressional committees," including the Senate Foreign Relations Committee and the House Foreign Affairs committee.[15] With the additional funding commitment came a more ambitious mandate: to halve the burden of malaria in 70 percent of at-risk populations in sub-Saharan Africa.[16] By April 2011, the initiative had expanded its efforts to include regions within two new focus countries (the Democratic Republic of the Congo [DRC] and Nigeria), as well as a regional program for the greater Mekong delta area, the only PMI program outside of sub-Saharan Africa.[17] Guinea and Zimbabwe were added as focus countries later in 2011.[18]

In early 2009, the Obama administration introduced the Global Health Initiative (GHI), pledging $63 billion over six years to global health assistance.[19] The PMI is considered a major component of the GHI, which aims to better integrate malaria treatment and prevention with a range of other U.S. global health programs, including HIV/AIDS, tuberculosis, maternal and child health, nutrition, and other neglected tropical diseases.[20] The GHI also aims to coordinate global health funding across U.S. agencies – primarily the Office of the Global AIDS Coordinator (OGAC), USAID, and the CDC. However, the GHI has been plagued by inter-agency power struggles[21] and a tight budget environment; as of early 2012, total appropriations were on track to fall approximately $12 billion short of the original six-year target.[22][23]

Funding Trends

The PMI represented a rapid scale-up of U.S. government malaria funding. In FY2004, prior to the start of the initiative, bilateral funding for malaria was $198.2 million. By FY2012, the budget had more than tripled, to an estimated $650 million.[24] However, bilateral malaria funding has declined since FY2011, in part due to an increasing congressional austerity. Figure 1 shows bilateral funding

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[14] The Henry J. Kaiser Family Foundation (2011). "Fact Sheet: The President's Malaria Initiative." U.S. Global Health Policy. Accessed March 18, 2012 at http://www.kff.org/globalhealth/upload/7922-02.pdf

[15] 110th Congress of the United States of America (2008). "Tom Lantos and Henry J. Hyde United States Global Leadership Against HIV/AIDS, Tuberculosis, and Malaria Reauthorization Act of 2008." Public Law 110-293.

[16] PMI 5 year strategy

[17] USAID (2011). *The President's Malaria Initiative: Fifth Annual Report to Congress.*

[18] President's Malaria Initiative. "Guinea" and "Zimbabwe." PMI Country Profiles. Accessed March 18, 2012 at http://pmi.gov/countries/profiles

[19] The White House, Office of the Press Secretary. "Statement by the President on Global Health Initiative." Accessed March 16, 2012 at http://www.whitehouse.gov/the_press_office/Statement-by-the-President-on-Global-Health-Initiative/

[20] USAID (2011). *The President's Malaria Initiative: Fifth Annual Report to Congress.*

[21] Oomman, Nandini and Rachel Silverman. "Is USAID Being Set Up to Fail on the GHI?" Rethinking U.S. Foreign Assistance Blog. Center for Global Development. Posted October 28, 2011. Available at http://blogs.cgdev.org/mca-monitor/2011/10/is-usaid-being-set-up-to-fail-on-the-ghi.php

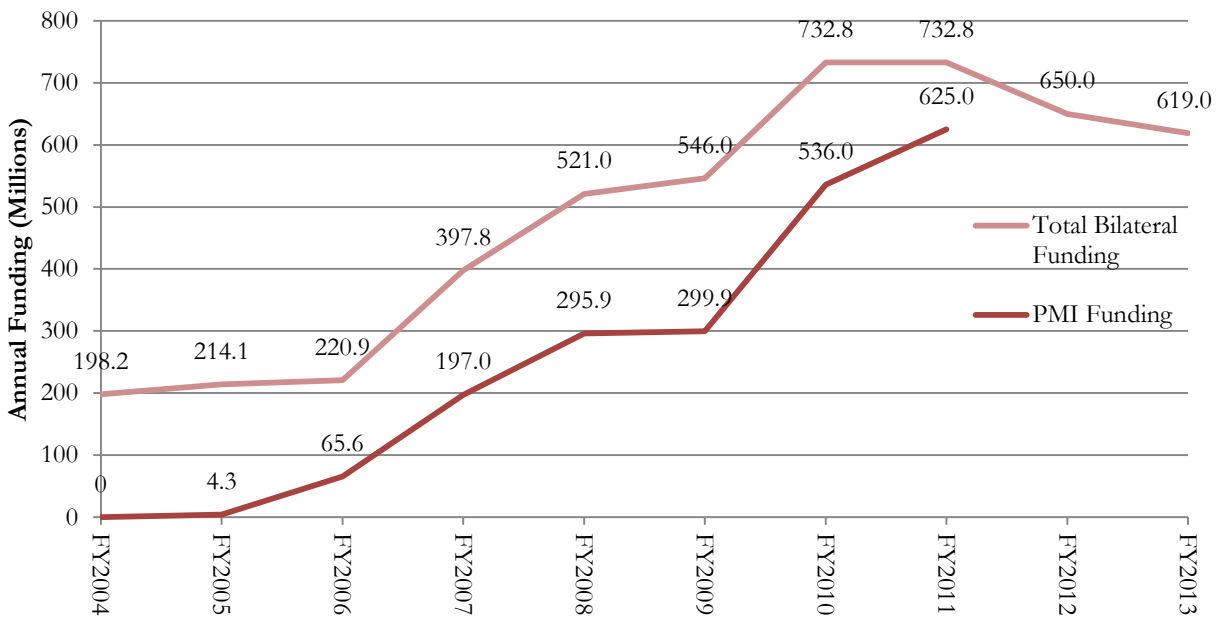
[22] The Henry J. Kaiser Family Foundation (2012). "Fact Sheet: The U.S. Global Health Initiative." U.S. Global Health Policy.

[23] Oomman, Nandini and Rachel Silverman (2012). "GHI Mid-Term Review and a Way Forward." A Report of the Rethinking U.S. Foreign Assistance Program. Center for Global Development.

[24] The Henry J. Kaiser Family Foundation (2012). "Updated: Senate Appropriations Committee approves FY2013 State and Foreign Operations Appropriations Bill." Accessed June 19, 2012 at http://globalhealth.kff.org/Policy-Tracker/Content/2012/May/24/Senate-FY13-Full-Committee-Summary.aspx

trends between FY2004 and FY2013. At the time of writing, data on PMI funding for FY 2012 and 2013 was unavailable.[2526]

Figure 1: Bilateral U.S. Funding for Malaria, All Agencies, FY2004-2013*[2728]



*FY2012 is estimated. FY2013 figure is the President's request only. PMI funding figures were unavailable for FYs 2012 and 2013.

The PMI accounted for approximately 85% of total bilateral funding for malaria in FY2011. The remaining bilateral funding is primarily channeled through USAID and the CDC to non-PMI focus countries, including Burkina Faso, Burundi, and South Sudan, plus several other regional programs and research by the National Institutes of Health (NIH).[29]

Partnerships

The PMI coordinates with a wide range of multilateral and bilateral partners, as well as other agencies within the U.S. government. PMI has been praised for the success of its collaborative approach.[30]

[25] The Henry J. Kaiser Family Foundation (2011). "Fact Sheet: The President's Malaria Initiative." U.S. Global Health Policy. Accessed March 18, 2012 at http://www.kff.org/globalhealth/upload/7922-02.pdf
[26] USAID (2011). *The President's Malaria Initiative: Fifth Annual Report to Congress.*
[27] The Henry J. Kaiser Family Foundation (2011). "Fact Sheet: The President's Malaria Initiative." U.S. Global Health Policy. Accessed March 18, 2012 at http://www.kff.org/globalhealth/upload/7922-02.pdf
[28] USAID (2011). *The President's Malaria Initiative: Fifth Annual Report to Congress.*
[29] The Henry J. Kaiser Family Foundation (2011). "Fact Sheet: The President's Malaria Initiative." U.S. Global Health Policy. Accessed March 18, 2012 at http://www.kff.org/globalhealth/upload/7922-02.pdf
[30] Loewenberg, Samuel (2007). "The US President's Malaria Initiative: 2 Years On." Special Report. The Lancet; Vol. 370: pp. 1893-1894.

By design, the PMI focuses its investments in countries which have also received Global Fund financing for malaria programs. The PMI's leadership plays an active role in Global Fund strategic decisions and coordination: the U.S. Global Malaria Coordinator is part of the U.S. delegation to Global Fund board meetings (U.S. Global AIDS Coordinator Eric Goosby sits on the board). PMI staff members also assist, where possible, with coordination and implementation of Global Fund-supported projects at the country level, particularly notable given that the Global Fund lacks on-the-ground technical staff.[31]

The PMI also participates in the Roll Back Malaria (RBM) partnership. RBM is a global alliance which aims to coordinate global efforts to fight malaria among governments, multilaterals, foundations, and other stakeholders. PMI finances some RBM activities, serves on its board of directors, and "[manages] a grant to RBM for the provision of technical assistance to countries experiencing problems with their Global Fund grants."[32]

The PMI works with the World Health Organization (WHO) through funding to its Global Malaria Program, which addresses antimalarial drug resistance among other priorities. The PMI also leverages WHO infrastructure (and provides it with about $3 million in funding) to support anti-malaria programs outside of sub-Saharan Africa, particularly in the Greater Mekong region. [33]

In country, PMI coordinates with a range of multilateral organizations, as well as recipient country governments, to harmonize funding and leverage each other's activities and infrastructure. Such multilateral PMI partners include UNICEF, UNITAID, the World Bank, and the Office of the UN Special Envoy for Malaria.[34]

In keeping with the GHI's "whole of government" approach, the PMI also works with other U.S. agencies to integrate health programs and reduce duplication. At the country level, PMI coordinates its work with PEPFAR, the U.S. Department of Defense, and the Peace Corps. In Rwanda, for example, PMI worked with PEPFAR to strengthen the national surveillance system to produce timely and relevant data on the distribution of malaria cases.[35]

Finally, the PMI has been relatively successful at forming public-private partnerships at the country level with private corporations and associated foundations, including AngloGold Ashanti, the ExxonMobil Foundation, Chevron, and ArcelorMittal, among others. For example, in Angola the PMI partnered with the ExxonMobil Foundation to support health worker training and supervision. Through this collaboration, the PMI received $4 million in donations between 2006 and 2010.[36]

[31] USAID (2011). *The President's Malaria Initiative: Fifth Annual Report to Congress.*
[32] *Ibid.*
[33] *Ibid.*
[34] *Ibid.*
[35] *Ibid.*
[36] *Ibid.*

Part II: Expenditures and Value for Money

Cross-Country Allocations

PMI funding goes exclusively to 19 African focus countries and a regional program for Asia's Greater Mekong Sub-Region, spanning Myanmar, Cambodia, China, Laos, Thailand, and Vietnam. Other countries receive U.S. malaria funding from USAID and through the Global Fund, as well as technical assistance through the CDC. Such funds are not considered to be part of the PMI.

Table 1 shows the distribution of PMI funds by country between FY2005 and FY2011. The PMI has been implemented in five "waves," with a new set of focus countries added at each juncture. Each country received a relatively small amount of funding in its first year or two. These allocations, known as "jump-start" funds, are advance monies from previous fiscal years which are used before annual central funding becomes available. These funds pay for "jump start" in-country activities, before a dramatic scale up (between two- and ten-fold) occurs the following year. Jump start funds enabled the PMI activities to begin in country activities 12+ months before it would otherwise have been possible, given the constraints of the US fiscal year funding calendar.[37]

Table 1: PMI Funding by Country (Millions), FY2005-2011[38]

	FY2005	FY2006	FY2007	FY2008	FY2009	FY2010	FY2011	**TOTAL**
Angola	1.7	7.5	18.5	18.8	18.7	35.5	30.6	131.3
Tanzania	2.0	11.5	31.0	33.7	35.0	52.0	46.9	212.1
Uganda	0.5	9.5	21.5	21.8	21.6	35.0	34.9	144.8
Malawi	n/a	2.0	18.5	17.8	17.7	27.0	26.4	109.4
Mozambique	n/a	6.3	18.0	19.8	19.8	38.0	29.2	131.1
Rwanda	n/a	1.5	20.0	16.8	16.3	18.0	18.9	91.5
Senegal	n/a	2.2	16.7	15.8	15.7	27.0	24.4	101.8
Benin	n/a	1.8	3.6	13.8	13.8	21.0	18.3	72.3
Ethiopia	n/a	2.6	6.7	19.8	19.7	31.0	40.9	120.7
Ghana	n/a	1.5	5.0	16.8	17.3	34.0	29.8	104.4
Kenya	n/a	5.5	6.1	19.8	19.7	40.0	36.4	127.5
Liberia	n/a	n/a	2.5	12.4	11.8	18.0	13.2	57.9
Madagascar	n/a	2.2	5.0	16.8	16.7	33.9	28.7	103.3
Mali	n/a	2.5	4.5	14.8	15.4	28.0	26.9	92.1
Zambia	n/a	7.7	9.5	14.8	14.7	25.6	23.9	96.2
DRC	n/a	n/a	n/a	n/a	n/a	18.0	34.9	52.9
Nigeria	n/a	n/a	n/a	n/a	n/a	18.0	43.6	61.6
Guinea	n/a	n/a	n/a	n/a	n/a	n/a	10.0	10.0
Zimbabwe	n/a	n/a	n/a	n/a	n/a	n/a	12.0	12.0
Greater Mekong	n/a	n/a	n/a	n/a	n/a	n/a	12.0	12.0

[37] Correspondence with PMI staff.
[38] USAID (2012). *The President's Malaria Initiative: Sixth Annual Report to Congress.*

Sub-Region								
Headquarters	n/a	1.5	10.0	21.6	26.1	36.0	36.0	131.2
Jump-Start Total	4.25	35.6	42.8	n/a	n/a	36.0	n/a	118.6
TOTAL	**4.25**	**65.6**	**197.0**	**295.9**	**299.9**	**536.0**	**578.4**	**1,977.0**

Note: Data compiled by author from 2012 PMI Annual Report. n/a refers to not applicable.

A few other trends emerge from Table 1. Funding allocations rose universally and substantially in FY2010, following the passage of the Lantos-Hyde reauthorization and expansion. As of FY2011, the largest funding recipients (in descending order) were Tanzania, Nigeria, Ethiopia, Kenya, Uganda, and the Democratic Republic of the Congo. PMI funding in Nigeria and the DRC initially focused on a small subset of states and provinces (about 25%) due to budget constraints. Funding and program scope for those countries has increased in the interim; however, unlike other (national) PMI programs, they remain regionally focused rather than nationwide.[39]

Beyond the criteria for focus country selection – disease burden from malaria; strong leadership and country commitment; having a strong national plan for malaria control; support from other funding partners such as the World Bank and the Global Fund; willingness to work with the United States; and presence of a USAID mission – the PMI does not offer an explicit rationale for its funding allocation decisions. Of these factors, disease burden from malaria might be expected to be the greatest determinant of funding allocations. However, disease burden can be defined in a number of different ways, including at-risk population, estimated deaths per 100,000, and total deaths per country. Due to poor data collection and surveillance systems, estimates for all of these indicators are subject to considerable error.

In a 2008 PLoS article, Snow et al. argue that "allocation of funds to countries should reflect the size of the populations at risk of infection, disease, and death."[41] Table 2 presents their calculations on the top 20 countries in terms of

Table 2: Population at Risk for Malaria Transmission, 2007[40]

Country	Population at Risk for Stable P. Falciparum Transmission
India	414,526,403
Nigeria	134,600,419
Indonesia	68,587,572
Congo (DR)	57,971,600
Ethiopia	46,083,236
Myanmar	42,879,657
Tanzania	39,839,080
Pakistan	30,735,199
Sudan	28,989,857
Uganda	27,034,398
Philippines	26,946,253
Kenya	25,618,195
Ghana	22,213,252
Mozambique	21,063,225
Vietnam	19,307,195
Côte d'Ivoire	17,795,354
Madagascar	17,280,940
China	17,127,853
Cameroon	16,950,947
Thailand	16,533,262

[39] Correspondence with PMI staff.
[40] USAID (2011). *The President's Malaria Initiative: Fifth Annual Report to Congress.*
[41] Snow, Robert W. et al (2008). "International Funding for Malaria Control in Relation to Populations at Risk of Stable *Plasmodium falciparum* Transmission." PLoS Medicine Vol. 5(7): pp. 1068-1078.

population at risk (both children and adults) for stable *Plasmodium falciparum* transmission in 2007. PMI focus countries are highlighted in red.

In contrast, Table 3 lists the 30 countries with the highest mortality rates from malaria, according to WHO estimates for 2008. Table 4 lists estimates of total malaria deaths from the WHO for 2006, and from a recent Lancet study for 2010. PMI focus countries are highlighted in red. The Lancet study has generated significantly larger estimates for the malaria disease burden, estimating approximately 1.24 million deaths worldwide in 2010, approximately twice the official WHO estimate.[42] However, the Lancet figures are much more recent, and reflect real reductions in the malaria disease burden since 2006.

The different methods yield wildly different rankings of the global malaria burden. For example, India has by far the largest population at risk, at about three times the size of its nearest rival (Nigeria). However, India does not even rank in the top thirty for estimated malaria deaths per 100,000 or total malaria deaths, perhaps due to greater success in fighting the disease with domestic funds.

Table 3: Estimated Malaria Deaths per 100,000[43]

	World Malaria Report for 2008
Sierra Leone	239
Chad	235
Burkina Faso	221
Guinea-Bissau	203
DRC	193
Central African Republic	192
Niger	184
Mozambique	171
Guinea	165
Nigeria	146
Mali	131
Congo	121
Cameroon	121
Cote d'Ivoire	116
Benin	105
Zambia	104
Uganda	103
Liberia	98
Equatorial Guinea	98
Gambia	93
Angola	89
Tanzania	87

Table 4: Estimated Total Malaria Deaths

	World Malaria Report for 2006[44]	*Murray et al. for 2010*[45]
Nigeria	225,424	380,642
DRC	96,113	107,550
Uganda	43,490	41,648
Ethiopia	40,963	47,507
Tanzania	38,730	44,430
Sudan	31,975	17,323
Niger	31,501	30,412
Kenya	27,049	27,165
Burkina Faso	25,625	40,730
Ghana	25,075	22,624
Mali	24,073	39,283
Cameroon	21,146	23,181
Angola	21,130	14,514
Cote d'Ivoire	19,557	31,664
Mozambique	19,211	52,189
Chad	18,059	14,513
Guinea	15,081	19,506
India	15,008	46,970
Zambia	14,204	18,070
Malawi	12,950	13,953
Benin	12,770	14,415
Senegal	9,613	10,150

[42] Murray, Christopher JL et al. (2012). "Global Malaria Mortality between 1980 and 2010: A Systematic Analysis." The Lancet; Vol. 379 (9814): pp. 413-431.
[43] World Health Organization (2011). *World Health Statistics 2011*.
[44] World Health Organization (2008). *World Malaria Report 2008*.
[45] Murray, Christopher JL et al. (2012). "Global Malaria Mortality between 1980 and 2010: A Systematic Analysis." The Lancet; Vol. 379 (9814): pp. 413-431.

Malawi	87		Myanmar	9,097	21,995
East Timor	83		Sierra Leone	8,857	12,343
Senegal	76		Burundi	7,662	16,262
Togo	65		Togo	7,261	8,216
Comoros	58		Bangladesh	6,564	3,370
Ghana	48		Liberia	6,128	7,635
Papua New Guinea	45		Rwanda	5,626	10,962
Zimbabwe	40		Congo	4,566	4,112

Still, all of the aforementioned measures shed some light on its PMI's funding distribution and choice of focus countries. By population at risk, almost all of the top-ranking *African* countries are covered by the PMI. Likewise, when looking at disease burden by total malaria deaths, all five of the top-ranking countries have been selected as focus countries. Interestingly, however, the two countries with the highest burden – Nigeria and the DRC – were only added to the PMI during a recent expansion in FY2010.

According to PMI staff, the decision to exclude Nigeria and the DRC from the initial group of focus countries was made by the PMI team and approved by the interagency Advisory Group, based on the goal of covering nationwide scale-up in 15 countries, which was promised by President Bush in his launch statement. This target would not have been achievable with the available funds at the time of launch if two countries as large as Nigeria and the DRC were included in the initial list of focus countries.[46] According to the PMI's 2011 external evaluation, these allocation decisions were also partially motivated by the U.S. political economy:

> "PMI's initial country selection explicitly prioritized countries with functioning Global Fund grants and/or World Bank Booster Program for Malaria Control support. This would appear to contradict a basic principle in coordination among development or donor agencies – namely, to fill in existing gaps and avoid overlaps to maximize resource use and avoid potential conflict. In the team's view, the tendency to join forces was motivated by the political need to maximize chances of demonstrating early success to generate on-going support for the effort. When PMI started this was justifiable, considering the dearth of inspiring success stories in malaria control in Africa, and the political attacks on USAID's previous malaria activities. In PMI's second phase…political support is more secure; as a result, there is more of a willingness to take up the most daunting challenges, by working in big, difficult countries like Democratic Republic of Congo and Nigeria."[47]

Funding Process

Country-specific Malaria Operational Plans (MOPs) are one-year implementation plans prepared yearly for each focus country. Each MOP is prepared at the country level, then submitted for review and approval by the PMI Interagency Technical Working Group, the PMI Coordinator, and the

[46] Correspondence with PMI staff.
[47] Simon, Jonathon et al (2011). *External Evaluation of the President's Malaria Initiative Final Report*. Report No. 11-01-545. Prepared for the United States Agency for International Development through the Global Health Technical Assistance Project.

PMI Interagency Advisory Group. Among other features, the MOPs describe planned inputs and activities; discuss how PMI funding will leverage the programs of other donors and national malaria control programs; provides estimates of both intervention coverage; and outlines the planned PMI budget for the relevant fiscal year, including the expected allocation of funding to specific programs and recipients. [48]

The 2011 External Evaluation describes the process as follows:

> "A MOP writing team consists of staff from USAID/Washington and CDC/Atlanta, as well as the in-country PMI advisers and other staff from the U.S. Government Mission. The in-country PMI advisers play leading roles in writing and editing the MOP. NMCP and other major partners…are consulted during the preparation of the MOPs."[49]

Throughout the MOP process, the PMI consults with the NMCP and other in-country malaria partners and works to align its funding decisions with country plans and to "support and complement the planned investments by other donors," who take part in the planning process. In particular, the MOP process enables the PMI to engage these partners in something called "gap analysis," where they seek to identify gaps in support for needed interventions, and proposals for how to fill those gaps. According to the 2011 External Evaluation, "PMI is seen as attempting to fill most, but not all, gaps in countries, whether they result from lapses in funding principally from the Global Fund, or from when other donors and host governments encounter difficulties in honoring their pledges." The MOP process has been praised as inclusive, transparent, and effective.[50] Notably, the MOPs are not legally binding, as funding levels are not assured at the time the MOPs are written and approved. They are planning documents, not contracts with either the recipient countries or implementing organizations. Once approved, the plans are posted to the PMI website and accessible to the public.

Intervention Mix

The PMI is a focused initiative which supports four discrete interventions:

1. Indoor residual spraying with insecticides;
2. Insecticide-treated mosquito nets;
3. Intermittent-preventive treatment for pregnant women; and
4. Diagnosis of malaria and treatment with ACTs.

About 50% of the PMI's funds are spent on prevention and treatment commodities.[51] In addition, to "ensure successful uptake of these prevention and treatment measures," the PMI supports

[48] *Ibid.*
[49] *Ibid.*
[50] *Ibid.*
[51] *Ibid.*

monitoring and evaluation, communications, health systems strengthening, and integration with other public health efforts.[52]

The PMI measures and publically releases output data by country and year for a range of interventions, including bednets procured, distributed, or sold with PMI support; people and households reached by IRS spraying; spray personnel trained; SP treatments procured and distributed; health workers trained in IPTp, malaria diagnosis, and ACT treatment; rapid diagnostic tests (RDTs) procured and distributed; and ACT procured and distributed. The MOPs provide broad categorization of the planned budget by activity; with significant effort, it may be possible to extract sufficient information to conduct cost-effectiveness analysis.

PMI Implementers

The following funding information has been aggregated by the author from PMI country operational plans for FY2012 (see Table 4 and Appendix). A few significant caveats should be noted. First, these figures are gathered from a combination of programmed funds and planned data, not obligations or disbursements; as such, about $86 million dollars are designated to a "TBD" recipient. Second, the country operational plans typically referred to the funding mechanism rather than directly to the implementer; projects were attributed to a distinct recipient using internet research and available contract data from the PMI website, subjecting the data cleaning process to potential human error. This process proved particularly difficult for a mechanism called the Indoor Residual Spraying (IRS) 2 indefinite quantity contract (IQC), as it was awarded to multiple parties (described in more detail below). Third, this data only lists the prime funding recipient, or the lead organization in a consortium of several implementing partners. Therefore, the amounts listed exclude sub-partners, which are likely to account for a substantial share of the total funding. Fourth, figures are compiled from the original FY2012 MOPs, and may not reflect reprogramming by the PMI since the time of data collection (April 2012). Finally, the figures exclude headquarters costs at the implementing agencies (i.e. USAID and the CDC). Accordingly, these figures should be treated as informed estimates rather than precise amounts. Nonetheless, the available data on a total of 56 PMI recipients illustrates some striking trends in funding allocation.

Table 4 lists the top 15 recipients of PMI funding in the 19 focus countries and Mekong region, based on the figures listed in the MOPs for FY2012 (a full list is included as Appendix A). In total, MOPs describe about $511 million in spending; $440 million of that funding mentions a specific recipient, while the recipient for the remaining $71 million (14%) had not yet been determined. Of the $511 million described in the MOPs, $485 million was allocated to programs; that figure excludes the administrative and operational costs of USAID and the CDC.

[52] President's Malaria Initiative (2011). "Fast Facts: The President's Malaria Initiative (PMI)." Accessed March 18, 2012 at http://www.pmi.gov/resources/reports/pmi_fastfacts.pdf

It is immediately apparent that funding decisions are highly consolidated and centralized; the PMI appears to avoid the project proliferation that has plagued other U.S. government programs. About 50% of program funds, or $255 million, are given directly to John Snow, Inc. and Research Triangle Institute (RTI), each of which has been awarded a lucrative IQC for commodity purchases and delivery. Both contracts were awarded following a competitive bidding process.

Table 4: Top 15 Recipients of Planned PMI Funding, FY2012*

Recipient	Amount Allocated	Notable Contracts/Funding Mechanisms
John Snow, Inc	178,900,424	DELIVER (supply chain and commodities procurement)
Abt Associates	89,238,600	IRS2 IQC (indoor residual spraying)
UNICEF	70,815,750	Grants for commodity purchase/distribution and mass campaigns
In-Country USAID/CDC Staffing and Administration Costs	29,075,000	
AED	26,705,476	Communication for Change (C-Change, social marketing, Ethiopia); Malaria Action Program for States (MAPS, Nigeria)
RTI International	17,800,000	IRS2 IQC (indoor residual spraying)
CDC Programs	14,283,500	Interagency Agreement (IAA) for staffing costs, operational research
Johns Hopkins Center for Communication Programs	11,160,700	NetWorks (LLINs); AFFORD Health Marketing Initiative (Uganda); Ghana Behavior Change Support (BCS)
Management Sciences for Health	10,943,750	Strengthening Pharmaceutical Systems (SPS); Integrated Health Program (IHP, Nigeria)
Chemonics	8,991,000	IRS2 IQC (indoor residual spraying)
ICF International	6,500,000	Measure DHS (surveys and evaluation)
University Research Co.	5,950,000	Mekong Malaria Program
WHO	2,988,000	
JSI Research and Training Institute, Inc.	2,950,000	
Child Fund International	2,885,000	

*Estimates compiled by author from 2012 malaria operational plans, contracts, and implementer websites. Planned funding is described in the MOPs and approved by the PMI Coordinator.

The bulk of funding for John Snow, Inc. (JSI) is awarded through the USAID | DELIVER project. DELIVER is primarily a supply chain consortium, similar to PEPFAR's Partnership for Supply Chain Management, which provides USAID with a range of public health commodities, including products for HIV/AIDS and family planning. Under DELIVER's Task Order 3, JSI and its partners procure and deliver long-lasting insecticide nets (LLINs), rapid diagnostic tests (RDTs), ACTs, and other commodities.[53] The current IQC is a five-year contract through April 2012, and has a ceiling

[53] USAID | DELIVER Project. "Malaria Commodities." Accessed March 18, 2012 at http://deliver.jsi.com/dhome/topics/health/malaria

of $894,917,675.[54] The PMI's 2011 External Evaluation credited the DELIVER project for its responsiveness and flexibility, which "minimized or prevented serious stock-outs, probably saving many lives."[55] Task Order 7-Malaria under the DELIVER IQC was awarded in March 2011. Under the terms of its contract, JSI does not charge overhead or other fees on the cost of commodity purchases, which represents a large proportion of its total award value.[56]

RTI holds an IQC to plan and implement indoor residual spraying, known as the IRS2 IQC. This contract is part of a multi-award IQC mechanism, which awarded three contracts in total; Abt Associates and Chemonics were the other recipients.[57] To date, it appears that RTI is set to receive the vast majority of funding under this mechanism, with the other two companies appearing much further down on the list of recipients. However, as mentioned above, it is not entirely clear from the MOPs which implementer will be responsible for IRS2 in each country. The author used internet-based research, including available contracts from the PMI website, press releases and websites of the implementing partners, as well as correspondence with PMI staff, to determine which awardee was responsible for spraying in each country; however, this may have been subject to potential human error.

After the top two recipients, total amount received drops off considerably. USAID and CDC in-country administrative costs are relatively low, totaling about 5% of overall country-level expenditures. UNICEF receives PMI funding in three countries (Angola, the DRC, and Ethiopia), generally for commodity procurement and distribution.[58] The Academy for Educational Development (AED) held two large contracts, which have now been acquired by FHI 360: the comprehensive 5-year, $79.9 million Malaria Action Program for States (MAPS) in Nigeria, and the Communication for Change (C-Change) social marketing program in Ethiopia. Similarly, funding to the Johns Hopkins Center for Communication Programs and Management Sciences for Health is concentrated in a handful of grants/contracts per recipient.

Notably, all of top recipients (with the exception of UNICEF and the WHO) are U.S. organizations, although they are able to involve local or international organizations as sub-partners. According to the 2011 External Evaluation, local officials from NMCPs have expressed concern about the broad use of U.S. contractors and non-governmental organizations (NGOs), pointing to their high administrative costs, lack of expenditure transparency, and lack of coordination due to project proliferation. However, some saw the use of such NGOs as a "necessity," as the national governments lacked capacity to ensure nationwide intervention coverage.[59]

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[54] USAID. "DELIVER 2 Indefinite Quantity Contract Task Order." Contract No. GPO-I-00-06-00007-00, Order No. GPO-I-03-06-00007-00. Accessed March 18, 2012 at http://pmi.gov/countries/contracts/deliver2-iqc.pdf

[55] Simon, Jonathon et al (2011). *External Evaluation of the President's Malaria Initiative Final Report*. Report No. 11-01-545. Prepared for the United States Agency for International Development through the Global Health Technical Assistance Project.

[56] Correspondence with PMI staff.

[57] USAID. "Central Awards Listing/Indefinite Quantity Contracts (IQCs)." Accessed March 18, 2012 at http://www.usaid.gov/business/business_opportunities/iqc/iqc_health.html

[58] Described in malaria operational plans, accessed March 18, 2012 at http://www.pmi.gov/countries/mops/fy12/index.html.

[59] Simon, Jonathon et al (2011). *External Evaluation of the President's Malaria Initiative Final Report*. Report No. 11-01-545. Prepared for the United States Agency for International Development through the Global Health Technical Assistance Project.

Many of the largest contracts are multi-year mechanisms; however, the obligated amount is subject to considerable variation from year to year, so this cannot be considered a true multiyear commitment.

Cost-Effectiveness of PMI Interventions

Indoor Residual Spraying

The PMI commissioned a 2010 cost analysis of its IRS programs. Between 2008 and 2010, the cost per structure sprayed ranged between approximately seven dollars (Ethiopia, 2010) and $47 (Liberia, 2009). For 2009 and 2010, costs were significantly higher in the smaller program countries (fewer than 150,000 structures sprayed per year), suggesting economies of scale might make IRS more affordable. In most countries, unit costs declined between 2008 and 2010. Approached from another perspective, the cost per person protected ranged from about 2 to 11 dollars, with a mean cost of about $3.50 for 2010.[60] Structures need to be sprayed once or twice a year to maintain anti-malaria protection.

According to the 2011 External Evaluation, "at its start in 2005, PMI was under a political imperative to apply IRS [and particularly DDT] on a large scale." Such political pressure stemmed from the widely held "perception that for various reasons this effective intervention had been withheld, leading to the death of large numbers of African children every year." This may have led to disproportionate use of IRS and duplicate coverage between IRS and ITNs (discussed below) in the same community.[61] There is currently insufficient evidence to determine whether the cost of dual coverage is justified by added protective efficacy, though one study has shown a combination of IRS and ITNs to offer stronger protection than ITNs alone.[62]

Insecticide-Treated Mosquito Nets

According to its 2009 technical guidance for ITNs, the PMI exclusively supports the purchase of LLINs, which are manufactured to maintain insecticide efficacy through wash-resistant construction, allowing them to retain their protective power through at least 20 washes (traditional ITNs lose their efficacy after about three washes). Due to the longer-lasting insecticide, LLINs may remain effective for up to three years, compared to six months for other ITNs. However, preliminary evidence suggests that LLINs may lose their protective power more quickly due to limitations in "fiber durability and insecticide longevity."[63]

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[60] RTI International (2011). "An Economic Analysis of the Costs of Indoor Residual Spraying in 12 PMI Countries, 2008-2010." Prepared for the United States Agency for International Development. Accessed March 18, 2012 at http://www.pmi.gov/technical/irs/IRS_economic_analysis.pdf
[61] Simon, Jonathon et al (2011). *External Evaluation of the President's Malaria Initiative Final Report*. Report No. 11-01-545. Prepared for the United States Agency for International Development through the Global Health Technical Assistance Project.
[62] Hamel, Mary J et al (2011). "The Combination of Indoor Residual Spraying and Insecticide-Treated Nets Provides Added Protection against Malaria Compared With Insecticide-Treated Nets Alone." AJTMH 85(6): 1080-1086.
[63] President's Malaria Initiative (2009). "Technical Guidance on the Prevention and Control of Malaria." Accessed March 18, 2012 at http://www.pmi.gov/resources/reports/malaria_techguidance.pdf

On average, the cost to procure and deliver an LLIN is roughly $7 per person, but varies widely between and within countries.[64] Operating under a set of optimistic and simplified assumptions (that a single LLIN protects two people for three years and that budgets accurately reflected expenditures), the 2011 External Evaluation estimated that the per person-year cost of LLIN protection ranged between $1.20 and $2.26 ($1.45 on average); costs would be 50% higher if LLIN efficacy deteriorated after only two years. However, the evaluation also stressed the uncertainty of these estimates, recommending further assessment of LLIN unit costs "with greater precision, using expenditure data, [and] taking care to include all costs, for example post-campaign household visits, ITN disposal, etc." For these reasons, and because the assumptions of usage (two persons per net) may be optimistic, the above cost estimates are likely to be downwardly biased.[65]

While the PMI supports providing ITNs to poor and vulnerable populations at zero cost, it also works to increase demand for ITNs among national governments and citizens who can afford them in an effort to promote sustainability and focus resources on the neediest groups.[66]

Intermittent-Preventive Treatment for Pregnant Women

IPTp helps to reduce maternal and neonatal mortality by preventing life-threatening complications from malaria during pregnancy. The treatment requires two or more doses of sulfadoxine-pyrimethamine (SP) (an antimalarial drug) during the second and third trimesters. Because SP is extremely inexpensive to procure (about 10 cents per treatment) and distribution can be integrated with other maternal health services, IPTp can be administered at very low cost.[67] Cost effectiveness *vis a vis* infections, deaths, or disability-adjusted life years (DALYs) averted will vary depending on an area's disease burden. Illustratively, one study based in Mozambique found that IPTp cost approximately $1.02 per DALY averted after accounting for the health of both the mother and newborn child.[68]

Diagnosis and Treatment with Artemisinin-Based Combination Therapy

To diagnose and treat malaria, PMI provides RDTs, ACT treatment, and training for laboratory staff and health workers. As of 2009, the cost per RDT ranged from $0.60-$2.00[69] (prices have fallen in the interim),[70] but "may become cost-effective in settings where first-line malaria treatment is becoming more and more expensive," in large part due to the switch from monotherapies to ACTs

[64] *Ibid.*
[65] Simon, Jonathon et al (2011). *External Evaluation of the President's Malaria Initiative Final Report*. Report No. 11-01-545. Prepared for the United States Agency for International Development through the Global Health Technical Assistance Project.
[66] President's Malaria Initiative (2009). "Technical Guidance on the Prevention and Control of Malaria." Accessed March 18, 2012 at http://www.pmi.gov/resources/reports/malaria_techguidance.pdf
[67] USAID (2011). *The President's Malaria Initiative: Fifth Annual Report to Congress*.
[68] Sicuri, Elisa et al. (2010). "Cost-Effectiveness of Intermittent Preventive Treatment of Pregnancy in Southern Mozambique." PLoS ONE; Vol. 5(10).
[69] President's Malaria Initiative (2009). "Technical Guidance on the Prevention and Control of Malaria." Accessed March 18, 2012 at http://www.pmi.gov/resources/reports/malaria_techguidance.pdf
[70] Correspondence with PMI staff.

in order to prevent the spread of drug resistance.[71] According to the WHO, the average cost of ACTs is $.75 per treatment.[72]

Findings of the 2011 External Evaluation [73]

In May 2011, USAID commissioned an external evaluation of the President's Malaria Initiative's first five years (FY2006-2010), which was conducted by the QED Group in collaboration with CAMRIS International and Social & Scientific Systems, Inc. The ambitious evaluation aimed to assess the performance of PMI's management and leadership; the PMI's success in translating its four operating principles into practice; the initiative's partnership environment; progress toward its stated goals; and its research activities. Using this information, the evaluation issued a set of ten actionable recommendations to the administration.

Overall, the evaluation rated the PMI as a "very successful, well-led component of the USG Global Health Initiative. Through its major contributions to the global malaria response…PMI has made substantial progress toward meeting its goal of reducing under-5 child mortality in most of the 15 focus countries." The specific conclusions have been referenced throughout the body of this report.

Value for Money Considerations

The PMI uses a number of mechanisms and tools which may promote value for money. The points below reflect some value for money considerations, but should not be considered a complete value for money analysis of the PMI as a whole.

- **Conditionality:** PMI exercises conditionality by exclusively funding programs in a set of 19 focus countries based on explicit criteria: malaria burden; strong leadership and country commitment; having a strong national plan for malaria control; support from other funding partners such as the World Bank and the Global Fund; and willingness to work with the United States.

- **Coordination and Partnerships:** The PMI appears to have a strong record of coordination with other international donors, multilaterals, U.S. agencies, private organizations, and host country governments and institutions. Other donors such as the Global Fund, RBM, the World Bank, the WHO, and UNICEF all lauded the PMI's flexibility and cooperation, and "often commented on how different it was from other U.S. Government initiatives," while local official characterized the PMI's support as "predictable, reliable, flexible, and

[71] President's Malaria Initiative (2009). "Technical Guidance on the Prevention and Control of Malaria." Accessed March 18, 2012 at http://www.pmi.gov/resources/reports/malaria_techguidance.pdf
[72] World Health Organization Global Malaria Programme (2009). "Questions and Answers." Accessed March 18, 2012 at http://www.who.int/malaria/publications/atoz/treatment_guidelines_questions_and_answers.pdf
[73] Simon, Jonathon et al (2011). *External Evaluation of the President's Malaria Initiative Final Report*. Report No. 11-01-545. Prepared for the United States Agency for International Development through the Global Health Technical Assistance Project.

responsible."[74] Its partnerships have helped reduce duplication and align its programs with governments' national priorities to achieve maximum impact.

- **Integration:** Through its partnerships with other U.S. agencies, host country governments, and other donors, the PMI is able to integrate malaria control with other global health priorities, helping to increase value for money. For example, the PMI trains health workers to include IPTp as a key part of antenatal care, leveraging existing programs for maternal and child health.

- **Use of Technical Assistance:** While the PMI has engaged NMCPs as their prime country partners, they also recognized low human resource capacity and placed two resident advisors (RAs), who were required to spend time at and provide technical assistance to the NMCPs. The PMI's technical assistance has strong buy-in from the NMCPs and is highly valued, seemingly avoiding a common pitfall technical assistance. However, there are concerns that the NMCPs have grown overly reliant upon the RAs for day-to-day operations.[75]

- **Allocative Efficiency:** The PMI allocates its resources in alignment with its stated strategy, particularly in four focus areas or interventions which are known to be cost-effective, and in countries where it believed it could achieve impact. However, the External Evaluation suggests there may have been "disproportionate use of resources for IRS in some countries to protect a relatively small number of their populations," such as Rwanda spending "one-third of its PMI budget on IRS to protect only 10% of the at-risk population."[76]

- **End Use Verification**: To avoid waste and monitor the success of distribution efforts, the PMI has implemented end use verification. This survey includes a short questionnaire and data aggregation system which monitors the availability of key malaria commodities at the clinic level, helping to ensure effective supply chains and hold implementers accountable for successful distribution. However, because the data is potentially sensitive and would require country permission to release, the PMI does not currently make end use verification data publically available to civil society and researchers, potentially limiting its ability to promote accountability and efficiency.[77]

- **Evaluation:** PMI exclusively supports four program areas, which have been proven cost-effective through evaluation studies. Moreover, PMI funds a significant amount of monitoring and evaluation, including DHS surveys in program countries, and a recent

[74] Simon, Jonathon et al (2011). *External Evaluation of the President's Malaria Initiative Final Report*. Report No. 11-01-545. Prepared for the United States Agency for International Development through the Global Health Technical Assistance Project.
[75] *Ibid.*
[76] *Ibid.*
[77] Glassman, Amanda (2011). "End-Use Verification: Simple but Potentially Powerful." Global Health Policy Blog. Center for Global Development. Available at http://blogs.cgdev.org/globalhealth/2011/08/end-use-verification-simple-but-potentially-powerful.php

external audit of its entire operations between FY2006 and FY 2010. In cooperation with RBM and other partners, the PMI is conducting a series of evaluations in all program countries to assess progress against malaria. However, the results will be collective, and will not specifically link PMI investments to outcomes.[78] Finally, the PMI funds operational malaria research (approximately 50 studies to date), mostly related to the efficacy and cost-effectiveness of malaria control interventions. An operational research strategy is currently under development.[7980] The extent to which PMI evaluates implementing partners is unclear, and the PMI does not use any results-based financing mechanisms.

- **Transparency:** Among U.S. programs, the PMI stands out as unusually transparent to the public. The website provides detailed country operational plans and even full contracts for public viewing, though the contracts section is missing some documents. However, the PMI does not release expenditure (obligations or outlay) data, nor does it offer line-item breakdowns of cost, although it does include planned expenditures with its publicly posted MOPs. The lack of more granular data and actual expenditures makes it difficult to assess the true distribution of costs and implementers' cost-effectiveness.

- **Limiting Transaction and Procurement Costs:** While many programs suffer from project proliferation, PMI has kept its programs highly centralized and consolidated. The PMI creates supply chain economies of scale by awarding large, flexible multi-year contracts through a competitive bidding process. These contracts help reduce the transaction costs that arise from multiple awards, and to maximize the benefits of supply chain integration and bulk purchasing of commodities. The PMI also analyzes and responds to market dynamic trends for key commodities in an effort to achieve greater cost efficiencies.[81] However, it does not appear to leverage incentives in any of its contracts to cut costs, instead paying a fixed cost per unit.

[78] PMI (2012). "Evaluations of Impact." Accessed June 28, 2012 at http://www.pmi.gov/about/five_year_evaluation.html
[79] USAID (2009). "Lantos-Hyde United States Government Malaria Strategy: 2009-2014." Accessed March 18, 2012 at http://www.pmi.gov/resources/reports/usg_strategy2009-2014.pdf
[80] Correspondence with PMI staff.
[81] Correspondence with PMI staff.

Appendix: Full List of Planned Recipients (Estimates*), PMI Funding ($), FY2012

John Snow, Inc	178,900,424
Abt Associates	89,238,600
TBD	70,815,750
UNICEF	29,075,000
In-Country USAID/CDC Staffing and Administration Costs	26,705,476
AED	17,800,000
RTI International	14,283,500
CDC Programs	11,160,700
Johns Hopkins Center for Communication Programs	10,943,750
Management Sciences for Health	8,991,000
Chemonics	6,500,000
ICF International	6,275,800
University Research Co.	5,950,000
WHO	3,088,000
JSI Research and Training Institute, Inc.	2,950,000
Child Fund International	2,885,000
Population Services International	2,840,000
Jhpiego	2,200,000
U.S. Pharmacopeia	1,750,000
University of North Carolina	1,600,000
Walter Reed	1,400,000
KNCV	1,100,000
Save the Children	1,000,000
Society for Family Health	1,000,000
Makerere University	950,000
Ministry of Health	866,000
University of Bamako	840,000
Pathfinder	800,000
National Malaria Control Program, Liberia	700000
Columbia University	700,000
Medical Care Development International	700,000
Zanzibar Malaria Control Program	690,000
Mentor	650,000
Uganda Health Marketing Group LTD	650,000
PATH	600,000
IntraHealth	500,000
Zonal Training Centers	500,000
National Malaria Control Program, Senegal	450000
Université Cheikh Anta Diop	432,000
The Mitchell Group	386,000
Capacity	300,000
Deloitte	300,000
Ifakara Health Institute	300,000
Kenya Medical Supplies Agency	250,000
Peace Corps	223,000
National Malaria Control Program, Tanzania	214,000
Press	200,000
Futures Group	150,000
Voice of America	150,000
Centre de Recherche Entomologique de Cotonou	120,000

Emerging Markets Group	100,000
Maisha	100,000
Social and Scientific Systems, Inc	100,000
Global Enterics Multi Center Study (GEMS)	60,000
Girls' Education Monitoring System	40,000
Institut Pasteur	30,000
TOTAL	**511,504,000**

*****Figures based on FY2012 Malaria Operational Plans. Estimates were subject to human error during compilation by the author. Estimates may differ from updated figures provided by the PMI since publication of the FY2012 MOPs.