



A Survey of Innovative
Financing Mechanisms
and Instruments:
Opportunities for
Malaria Elimination
Financing

The **Malaria Elimination Initiative (MEI)** at the University of California San Francisco (UCSF) Global Health Group believes a malaria-free world is possible within a generation. As a forward-thinking partner to malaria-eliminating countries and regions, the MEI generates evidence, develops new tools and approaches, disseminates experiences, and builds consensus to shrink the malaria map. With support from the MEI's highly-skilled team, countries around the world are actively working to eliminate malaria—a goal that nearly 30 countries will achieve by 2020.

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Background

Significant progress against malaria has been achieved in the last decade and a half with global reductions in morbidity and mortality of 37 and 60 percent respectively.¹ These successes can be attributed in part to increased political and financial commitment to malaria control and elimination programs. Total funding for malaria increased from under US\$100 million in 2000 to US\$960 million in 2005 and US\$2.5 billion in 2014—a 25-fold increase in 15 years.^{1,2} Donor funding represented the largest increase in malaria financing, growing at an impressive 43 percent per year between 2005 and 2009.

However, external financing for malaria has plateaued and in some cases decreased. Between 2009 and 2013, overall donor support for malaria fell by an average of 4 percent per year.³ Such declines were more severe among low-burden, higher income countries attempting to eliminate malaria. In many instances, domestic financing in these countries has not caught up with reductions in aid.^{3,4} Competing national health priorities, coupled with a lower priority given to malaria as a result of low transmission rates, lead governments to withdraw funding at a critical juncture. As a result, malaria programs are downsized, which can cause costly and deadly resurgences in highly receptive areas.⁵

The World Health Organization (WHO) estimates that US\$6.8 billion per year will be required to achieve global

malaria targets,⁶ leaving an annual gap of nearly US\$5 billion. Similarly, a joint report by the Bill & Melinda Gates Foundation (BMGF) and the United Nations (UN) Special Envoy for Health in Agenda 2030 and for Malaria identified a financial gap of US\$1.1 to 2.3 billion annually to achieve malaria eradication by 2040.⁷ Stagnating donor support and stark gaps in malaria funding highlight the urgent need to develop new and innovative mechanisms of financing implemented at the global, regional, and country levels.

Innovative financing (IF) mechanisms can help meet the financial needs of malaria control and elimination. IF mechanisms include both instruments to generate additional revenue and mechanisms of deploying domestic and international funds to promote efficiency and impact.^{8–10} IF mechanisms may provide a more predictable source of financing to support multi-year planning and budgeting. When properly designed and implemented, IF approaches can also complement funding from traditional sources such as official development assistance, donor contributions, loans, and grants.^{8,11,12}

In this report, we summarize various IF mechanisms and instruments and present examples of their application to global health and social welfare initiatives. In the final section, we analyze salient features of IF mechanisms and instruments and assess their feasibility and utility for financing malaria elimination.

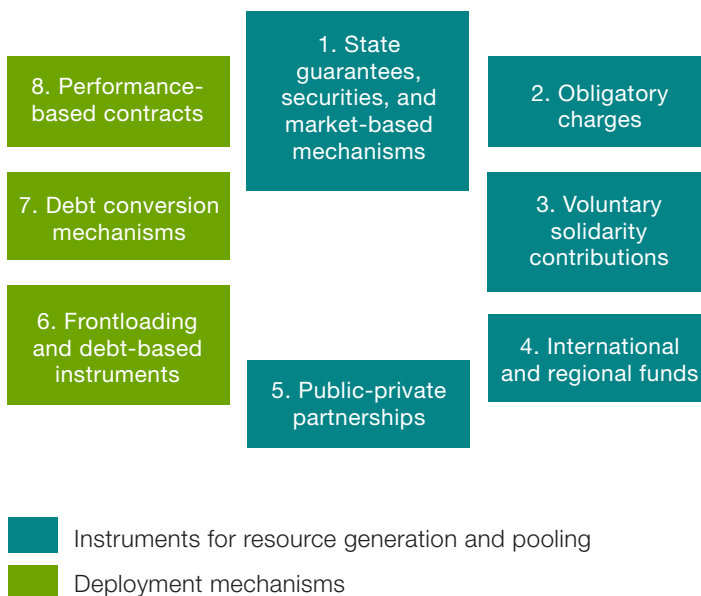
Classifying Innovative Financing Mechanisms and Instruments

Though IF mechanisms and instruments vary significantly by approach and design, many share common features such as pay-for-performance structures and the use of debt instruments; thus, any attempt at classifying them may not be clear-cut. In this report, we adopted the UN Development Programme's classification system for IF.¹³ Drawing from this framework and other published documents, we developed the following categories for IF mechanisms and instruments:

1. State guarantees, securities, and market-based mechanisms
2. Obligatory charges
3. Voluntary solidarity contributions
4. International and regional funds
5. Public-private partnerships
6. Frontloading and debt-based instruments
7. Debt conversion mechanisms
8. Performance-based contracts

These categories can be broadly grouped as (a) instruments for resource generation and pooling (1–5) and (b) deployment mechanisms (6–8) (Figure 1)

Figure 1. Innovative financing mechanisms and instruments



Instruments for resource generation and pooling

State guarantees, securities, and market-based mechanisms

State guarantees are secondary or contingent commitments in which a government agrees to bear some or all of the credit and financial risks associated with a beneficiary or borrower defaulting on its financial obligations.^{14,15} State guarantees are often employed when creditors are unwilling to lend due to credit risk or potential loan losses.¹⁵ Securities such as bonds and equities are sold by governments in the capital market to generate revenue for immediate priorities including health and development programs.^{11,16}

Public funds generated from government bonds can be leveraged to incentivize the private sector to produce certain goods and commodities for health and development. The International Finance Facility (IFF), originally proposed in 2003 by HM Treasury and the Department for International Development (DFID) in the UK, is one successful example.¹⁷ IFF issues bonds to generate immediate capital from investors whose repayments are guaranteed by donor commitments. Proceeds from the bonds are used to finance development programs through grants.

The capital generated through IFF allows frontloading of committed donor funding to increase and expedite aid flow to recipient countries. The IFF and similar mechanisms such as the Advance Market Commitments (AMC) for pneumococcal vaccines (discussed below) also have the ability to identify new sources of funding, including private investments. However, these market-based financing mechanisms often require high set-up and transaction costs. In addition, frontloading is best used to finance one-time investments rather than recurrent expenditures.

Obligatory charges

Obligatory charges in the form of taxes or levies are important fiscal policy instruments to generate additional revenue, and several examples have been introduced at the national and international levels.¹⁸ Taxes on pollution or emissions and “sin” taxes on tobacco and alcohol products are examples of such initiatives. Taxes on financial transactions in the international market have also been proposed. Large volumes of financial assets are traded daily, and even very low tax rates on such transactions could be a large source of revenue to fund development.¹⁹ Taxation of foreign exchange has also been found to be technically feasible at the global level.⁹

The large revenue base and the long-term nature of taxes make such instruments reliable and sustainable sources of funding. However, imposition of additional taxes may be politically unattractive because of public opposition towards such measures.

Voluntary solidarity contributions

Voluntary contributions, either from individuals or private organizations, are important sources of funding, particularly for social causes. At the individual level, initiatives that allow consumers to donate a small percentage of the total value of their purchase at the point of sale (also known as retail donations) have been shown to be successful fundraising tools for a variety of causes and organizations. Collaborations with private corporations, such as product manufacturers, credit card companies, or retail stores may improve donation collection efforts through purchase- or action-triggered donation schemes where a company directs monetary or in-kind contributions to an organization when a consumer buys a product or service, or performs a specific action (e.g., forwarding an e-mail to 10 friends). Such partnerships can be established by public or private organizations, which can lead to greater publicity and awareness of a given cause, organization, or campaign. National lotteries are another common example of voluntary contributions; in most countries, revenues from lotteries are used to fund social programs such as education and health.

Beyond retail or consumer-driven donations, private corporations are an important source of financing for health and development.¹⁸ Increasingly, companies are implementing corporate social responsibility (CSR) programs and allocating a fraction of their profits to selected initiatives. While CSR programs are typically connected with a company's operations and their impact on the environment and surrounding communities, effective engagement with private corporations can bring attention to causes that they have not yet considered.

Voluntary contributions can also take the form of endowment funds. Established by individuals or institutions (including foundations), endowment funds are a type of investment fund in which capital is invested in the financial market. While the fund's principal is kept intact, returns from the capital investment are used to finance projects, including health and development initiatives.

The capital required for an endowment must be large enough to generate revenues that can support its beneficiaries; because of this, the initial investment can be prohibitive for most investors. However, endowments typically provide a sustainable and predictable source of funding and are a suitable option for investors who are more risk-averse.

International and regional funds

Development institutions, in collaboration with other private or public institutions, establish funds to support

specific causes. These funds mobilize resources from various sources including governments, private foundations, private corporations, and individuals. The pooled resources are then used to finance various projects serving a common goal. Such funds often reflect a shared commitment to fight specific problems at the local, regional, or global levels.

Establishing regional funds provides an opportunity to mobilize resources to address regional or cross-border issues such as climate change or calamity and pandemic preparedness. Contributions from various countries (usually within the region of focus), as well as other private foundations or donor agencies, are combined. This pooling of resources can encourage existing donors to contribute and attract a new network of funders with an interest in the region.

Public-private partnerships

Public-private partnerships (PPPs) are a way for governments to attract private financing in support of public initiatives. By partnering with governments, private investors face less barriers to entry and less risks in investing in a new market.²⁰ In PPPs, public and private sectors share financial, technical, and operational risks.

PPPs have been used most commonly in the transportation sector. One such example is the Eurotunnel, the world's largest privately financed infrastructure project that connects the UK to mainland Europe.²¹ Private banks provided credit to the UK government for the Eurotunnel, and bond proceeds were used to frontload future financing requirements on the basis of future revenue generation.

Deployment mechanisms

Frontloading and debt-based instruments

As the term implies, frontloading involves mobilizing resources at the start of a program or intervention; returns such as cost savings are realized at a later time and used to repay the funding provided. Frontloading and other similar mechanisms do not generate new revenue streams; rather they shift fund availability from the future to the present, allowing programs to meet immediate needs. Frontloading mechanisms typically have complex structures and depend on firm donor commitments.

Frontloading can be accomplished by issuing bonds and other debt instruments in the international capital market. The IFF (discussed previously) is one such mechanism developed to disburse aid based on future commitments from donors.

Debt conversion mechanisms

Debt conversion mechanisms allow countries to lower or write off foreign debt in exchange for investments in development or infrastructure.^{13,22} One mechanism is called debt buy-down where parts or the entirety of an eligible country's debt is paid by a donor, typically at a deep

discount, in exchange for achieving predetermined goals or results.¹⁸ This type of agreement frees up fiscal space for the debtor country to spend on development projects.²³

A debt swap or debt-for-development swap is a way to refinance debt in favor of development by channeling a country's resources away from debt servicing towards high-impact investments. The process usually involves a bilateral or multilateral donor writing off a country's debt in exchange for commitment from government to spend a certain amount on a specific program. One type of debt swap requires governments to issue bonds and to use the revenue for social and economic development projects.²⁴ Another type involves a non-governmental organization (NGO) buying a country's debt using its foreign currency resources and reselling the debt to the original debtor country at the local currency equivalent which creates savings. The NGO then uses the revenue on a project selected in collaboration with the debtor country.²³

Debt swaps have the potential to relieve poor countries from never-ending repayments and provide additional funds for development programs. However, the partial cancellation of debts typically requires countries to generate counterpart financing immediately, which could be more expensive in the near-term. Thus, only countries capable of producing adequate counterpart financing benefit from this mechanism.

Performance-based contracts

Performance-based contracts, also known as results-based financing (RBF), are results-oriented contracting schemes that incentivize recipients to achieve certain goals by tying payments to the delivery of predefined results. By emphasizing outcomes and outputs instead of processes, these contracts encourage innovation and strengthen accountability among implementing agencies. Performance-based contracts may also promote more efficient use of development resources.

An example of performance-based contract is cash-on-delivery (COD), an agreement between a donor and a recipient country wherein the latter receives funding only after achieving pre-agreed indicators of progress. This mechanism strengthens the accountability of the grantee to its stakeholders and encourages innovation. Under COD, donors are essentially paying for measurable and verifiable progress with specific outcomes, which could eliminate large transaction costs and increase efficiency. The Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund) implemented its first COD grant in Central America for malaria elimination. COD has also been piloted by DFID for an education grant.

Social impact bonds (SIBs) are an RBF mechanism designed to harness partnership between government, nonprofits, and the private sector to address social problems. In establishing an SIB, the public and private sectors agree on and define measurable outcomes. The government then enters into a contractual agreement with a bond-issuing organization that is responsible for raising capital from private investors. By purchasing bonds, investors provide upfront funding for the government to implement its programs. The government repays investors upon delivery of predetermined outcomes.

Key strengths of SIBs include their ability to frontload resources to fill proximate needs and to attract new sources of funding from investors in capital markets. In addition, SIBs are built within the existing government funding structure and can improve the quality of public services without requiring the government to assume all financial risk.^{25–27}

Similar to SIBs, development impact bonds (DIBs) are an RBF mechanism set up by governments in collaboration with nonprofits and the private sector. DIBs are a product of donor agencies' experimentation with RBF approaches. DIBs are promoted as a new business model for delivering public services and as an effective way to achieve efficiency in aid and development finance.²⁷

With DIBs, investors finance the program while service providers, generally a combination of public and private agencies, manage delivery of services. A distinguishing feature of DIBs is that when predetermined outcomes or results are met, investors are paid by external funders such as development agencies or charitable foundations. Intermediary organizations that coordinate among investors, service providers, and funders are optional in DIBs.

Uganda is exploring a DIB for sleeping sickness disease. Under the agreement, payments are triggered by effective delivery of a mass treatment program and sustained reduction in infective parasite prevalence rates in cattle. Uganda is also exploring a DIB to increase access to quality secondary education. In Swaziland, a DIB is being rolled out of an HIV treatment-as-prevention program. Similarly, Pakistan is exploring a DIB for funding low-cost private schools operated by local entrepreneurs to ensure access to education for children. Donors recognize that lending improves school owners' access to capital for infrastructure development and expands access to quality education for children in low-income families.²⁷

Survey of Innovative Financing Mechanisms and Instruments

In this section, we present key examples of IF mechanisms and instruments that have been used in health and development.

State guarantees, securities, and market-based mechanisms

International Financing Facility for Immunization

The International Financing Facility for Immunization (IFFIm) was established in 2006 as a mechanism to accelerate the availability and secure the predictability of funds for immunization programs of Gavi, The Vaccine Alliance.²⁸ IFFIm mobilizes resources from donor government commitments and through the sale of vaccine bonds in the capital market. Investors who purchase these bonds provide upfront funding for immunization programs in exchange for a stream of payments over time with a borrowing cost. Since its inception, about US\$2.5 billion has been disbursed to support vaccine purchasing and delivery in 70 developing countries.²⁸

Global Financing Facility

Launched in 2015, the Global Financing Facility (GFF) is a financing platform to support the UN's Global Strategy for Women's, Children's and Adolescents' Health.²⁹ In this partnership, the International Bank for Reconstruction and Development (IBRD) of the World Bank Group raised funds to support countries wanting to scale up and sustain reproductive, maternal, neonatal, child, and adolescent health programs.²⁹ GFF uses IBRD's existing capital generation approach, which involves issuing development bonds in the capital market and leveraging their equity to bring in private financing. Furthermore, performance-based payment arrangements were put in place to reduce country borrowing costs and to incentivize performance.

Advance Market Commitment for pneumococcal vaccines

The AMC for pneumococcal vaccines is a resource pooling mechanism that was initiated by Gavi in 2009. AMC was established initially as a partnership among five developed countries, the BMGF, and multinational NGOs with the aim of making available effective and affordable pneumococcal vaccines to low-income countries.³⁰ In this initiative, donors committed funds that incentivized vaccine manufacturers to invest in research and development and to expand their manufacturing capacity. The donors also guaranteed the sale of vaccines after production. In return, vaccine manufacturers signed a contract to

provide vaccines long-term at a fixed price. Donor funding is only disbursed if manufacturers produce an effective vaccine at an affordable price.

Although the AMC remains a pilot, this model is being used to test whether AMCs can be generated for other applications in global health and development. In addition to vaccines, discussions are underway to use AMC to improve access to rural energy in Rwanda and Sri Lanka.

AMC mechanisms are especially useful when set-up costs and high demand-side risk render private companies reluctant to make initial investments. However, the legal and operational complexity of such partnerships may have limited applicability for some products that are in the very early stages of development.

Pandemic Emergency Facility

The Pandemic Emergency Facility (PEF) was developed by the World Bank Group in collaboration with the WHO and other public and private sector partners to protect the world against the spread of pandemics following the failed response to the Ebola outbreak in 2014.³¹ This facility was established to avoid and minimize any future crises by promptly mobilizing funding and expert teams to outbreak sites. All countries eligible to receive funding from the World Bank's International Development Association are eligible to receive funding from the PEF, given that an outbreak meets specific criteria and severity.

The PEF is financed through pandemic or catastrophe bonds issued by the World Bank, funding from reinsurance markets, and complimentary cash support from governments and organizations.^{31,32} The first two sources (referred to as the "insurance window") will provide coverage of up to US\$500 million for three initial years of an outbreak. Cash resources are more flexible and will be used to address emerging pathogens that do not yet meet the activation criteria set for the insurance window.

Diaspora bond

Diaspora bond is a debt instrument issued by a government and marketed to a country's expatriates.^{19,33} This type of security is an attractive and inexpensive way to secure stable revenue in countries with large numbers of citizens residing in middle- and high-income countries.³⁴ The success of a diaspora bond depends on a number of factors, including the size of a country's diaspora, expatriates' socioeconomic status, and the strength of their ties with the home country..

Israel and India have successfully raised over US \$35 billion using diaspora bonds since its inception.³⁵ The funds generated have been integrated into government

budgets and were used for development projects and debt servicing. Other countries including Kenya, Nigeria, Eritrea, and Ethiopia, have also issued diaspora bonds. In recent years, the Greek government amidst its financial crisis has also explored the option of issuing diaspora bonds.

Green bonds

Green bonds or climate bonds are instruments used to raise resources exclusively dedicated to fund climate mitigation, adaptation, and other environment-focused projects. Governments or multinational banks issue these securities, whose revenues are earmarked for specific climate-related programs or assets. Since 2008, the World Bank and International Finance Corporation have issued billions of dollars' worth of green bonds.³⁶

Obligatory charges

Taxes

Several examples of special earmarked taxes exist, ranging from carbon emissions taxes to excise taxes on “sin” products such as alcohol, tobacco, and sugar-sweetened beverages. Experience from many countries shows that taxes can generate large sums for health and development. Sin taxes on tobacco products have already generated billions of dollars for countries such as the Philippines, Indonesia, and Vietnam.³⁷ For example, the Philippines generated US\$ 2.3 billion in additional revenue in the first two years of sin tax implementation in the country which expanded Department of Health budget by 63 percent in 2015 compared to a 2013 baseline.^{37,38}

UNITAID

UNITAID is a global health initiative established in 2006 and hosted by the WHO. It addresses HIV/AIDS, tuberculosis, and malaria in developing countries by improving the availability and accessibility of medicines and diagnostics.^{33,39} Aside from donor funding, UNITAID is primarily financed through revenues from airline ticket levies in ten countries, including developing countries like Madagascar and Niger. Norway contributes part of its revenue on carbon dioxide emissions tax to UNITAID.⁴⁰

Airline ticket levies are a viable and sustainable source of revenue that entails very low transaction costs. As evidenced by replication across low-, middle-, and high-income countries, airline ticket levies or similar “solidarity taxes” may be easier to implement than other IF mechanisms.

Voluntary solidarity contributions

Product RED

Established in 2006, Product RED is one of the most visible examples of private sector financing for health and development.⁴¹ Under this initiative, consumer products are branded with a trademark logo signifying that a portion of the profits from their sale will be donated to the Global Fund.³³

Many well-known brands have partnered with this initiative, marking their products with the Product RED logo. These companies benefit from recognition of their efforts to promote social good. At the same time, consumers take pride in purchasing these products knowing they have contributed to improving global health. The Product RED initiative has contributed more than US\$350 million to support the Global Fund's HIV/AIDS control initiatives in Africa.^{42,43}

International and regional funds

Lives and Livelihood Fund

In 2014 the Islamic Development Bank (IsDB), in partnership with the BMGF, announced a new fund called the Lives and Livelihood Fund (LLF) to fight poverty in low- and middle-income member states of the IsDB that are unable to finance development needs with domestic financing alone.^{44,45} LLF will provide up to US\$2.5 billion of concessional loans over five years for individual projects, making it the largest multilateral development initiative in the Middle East.

The LLF combines US\$500 million of grant funding and US\$2 billion of IsDB's ordinary capital resources. The BMGF has agreed to contribute US\$100 million (or up to 20 percent of the US\$500 million total grant pool), and the IsDB has also agreed to contribute an additional US\$100 million in grant funding through its Islamic Solidarity Fund for Development.^{44,45}

In 2017, the IsDB announced that it was providing US\$32 million to Senegal to support the country's malaria elimination program.⁴⁶ Resources will be used to train community workers, provide one million rapid diagnosis tests and more than 700,000 antimalarials, and distribute long-lasting insecticidal bednets to over two million people.^{47,48}

Health security fund

During the 11th replenishment of the Asian Development Bank (ADB), donors to the Asian Development Fund (ADF) recommended that ADB more strongly support regional health security by creating a health security fund.⁴⁹ This fund aims to incentivize developing country members to increase investments in health systems strengthening, regional collaboration, pandemic preparedness, and outbreak control.⁵⁰ Following ADB's concessionality framework, grants will be given to grant-eligible countries and loans to loan-eligible countries.

Australia recently announced an investment of A\$100 million over five years to establish and support the fund and to tackle emerging health security risks in the Asia Pacific region.⁵¹

The Adaptation Fund

The Adaptation Fund was established to finance projects that improve climate resilience among developing countries that are parties to the Kyoto Protocol and

are particularly vulnerable to adverse effects of climate change.⁵² The fund is supported primarily through a two percent share of proceeds from sales of carbon credits issued for emissions reductions projects in developing countries.^a The fund also accepts support from sovereign governments, foundations, NGOs, private corporations, and individuals. The World Bank—serving as trustee of the Adaptation Fund—conducts sales of carbon credits in global markets, keeps the proceeds in a trust, and disburses funds to climate projects and programs.

Global Digital Solidarity Fund

The Global Digital Solidarity Fund, created in 2003, is an initiative of the African Union. Under this fund, governments, local authorities, private institutions, and civil society are urged to donate one percent of the value of contracts related to information and communication technologies.^{54,55} The fund is used to finance development projects such as education, telemedicine, and reconstruction of information systems in developing countries.

Malaria control and elimination funds

In 2006, the Gulf Cooperation Council established a malaria control fund. The fund was created by ministries of health in the Gulf countries to prevent the reintroduction of malaria in malaria-free nations and to support elimination in the region. It received financial contributions from the governments of Saudi Arabia, Oman, Qatar, and Kuwait, and technical assistance from the WHO.

The Regional Malaria and other Communicable Disease Trust Fund was established in 2014 under the administration of the ADB, with an emphasis on regional cooperation in Asia Pacific. The fund particularly aims to help developing member countries reduce their malaria burden and to control the spread of drug-resistant malaria in the Greater Mekong Subregion by providing financial support for intervention scale-up. The trust fund mobilizes financing from development partner agencies, donors, the private sector, and countries in the region, and leverages ADB loans for health system strengthening.^{56,57}

Several other networks and regional initiatives specifically for malaria elimination have been established in recent years, most of which are supported by the Global Fund (See [box](#) on next page).

Private-public partnerships

Affordable Medicines Facility for malaria

Affordable Medicines Facility for malaria (AMFm), hosted by the Global Fund, was a private sector co-payment mechanism that aimed to expand access to artemisinin combination therapies (ACTs) and to crowd out ineffective antimalarials, particularly in the private healthcare sector.⁵⁹ The Global Fund subsidized the cost of ACTs purchased by eligible first-line buyers with the intention of passing

the cost savings down the supply chain, eventually lowering the cost of ACTs for consumers. Building on the success of AMFm, the Global Fund set up a co-payment mechanism to further expand access to ACTs in the private retail sector.⁶⁰

New York Municipal Bond Bank

The New York Municipal Bond Bank helps municipalities in the State of New York gain access to the capital market. The Bank issues bonds and uses the proceeds to purchase bonds and notes issued by local governments to finance public improvement projects. By purchasing bonds issued by local governments, the Bank is able to create cost efficiencies and interest rate savings for municipalities.

Debt conversion mechanisms

Debt2Health

Debt2Health is a debt swap initiative piloted by the Global Fund.³³ Under this scheme, a creditor government grants debt relief in exchange for a commitment by the beneficiary country to invest an agreed amount in their national health programs through an approved Global Fund grant.⁶¹ The Global Fund facilitates the debt conversion process. The beneficiary country makes the counterpart payment to the Global Fund, who then disburses funds for disease control, prevention, and treatment.

Since its inception in 2007, several Debt2Health agreements have been approved. For example, Germany and Australia as creditor countries have swapped close to €170 million of debt from beneficiary countries such as Indonesia, Pakistan, and Côte d'Ivoire. Recently, a similar payment scheme from an agreement between Germany and Egypt has benefited malaria control programs in Ethiopia.

Debt2Health and other debt swap mechanisms can benefit countries capable of meeting counterpart financing requirements. However, for countries struggling to manage their liabilities, mobilizing counterpart funding could prove more expensive in the short-term. Debt swap mechanisms are further limited by donors' willingness to cancel debt.

Performance-based contracts

Peterborough prison social impact bond

The Peterborough Prison SIB, launched in 2010, was the first of its kind, designed as a seven-year pilot to test whether offering comprehensive support interventions to short sentence prisoners would reduce recidivism.⁶² The UK government promised to pay external agencies if they were successful in reducing recidivism rates among prisoners leaving Peterborough prison. The “start-up” money required to finance the intervention was raised from investors. Investors then received a pre-agreed return if the outcome was achieved.

a Carbon credits are traded and sold to industrialized countries in order for them to meet their emission reduction targets under the Kyoto Protocol.^{52,53}

Following the Peterborough Prison SIB, several industrialized countries including the US, the UK, Ireland, Canada, Germany, and Australia are experimenting and exploring opportunities to apply SIBs, especially in the fields of criminal justice, homelessness, workforce development, youth services, and home care. Currently, there are more than 100 proposals of SIB and DIB variants worldwide.²⁷

Mozambique Malaria Performance Bond

The Mozambique Malaria Performance Bond (MMPB) is the first DIB designed to increase funding for delivering

multiple malaria interventions.⁶³ This bond is raising money from “outcome funders” such as private foundations, corporations, and governments interested in both financial and social return.^{64,65} Over 12 years, MMPB aims to protect up to eight million people from malaria through improved prevention, diagnosis, and treatment of the disease.⁶⁵ As a DIB, MMPB uses a pay-for-performance scheme where returns are made to investors only when the malaria program meets its targets.⁶³ If interventions are ineffective, investors are paid only 50 percent of their principal with no interest.^{64,65}

Regional Initiatives for Malaria Elimination

The **WHO-EURO initiative** was formalized in 2005 under the Tashkent Declaration. Shortly after, six of the nine signatory countries—Armenia, Georgia, Kazakhstan, Kyrgyzstan, Turkmenistan, and Uzbekistan—interrupted local transmission for at least three years. In 2016, the European region was declared malaria-free by the WHO, the first in the world.⁵⁸

The **Malaria-Free Arabian Peninsula Initiative** focused on the two peninsular countries with continued transmission, Saudi Arabia and Yemen, and prioritized cross-border coordination of surveillance and vector control. Saudi Arabia reported only 83 local cases in 2015.

The **Asia Pacific Malaria Elimination Network** was launched in 2009 as a network of countries, institutions, and stakeholders working together to eliminate malaria by facilitating collaboration and knowledge sharing, conducting training and research, and increasing malaria program capacity. The network consists of 17 countries; it added India in March 2015.

The **Asia Pacific Leaders Malaria Alliance** is an affiliation of heads of government formed in 2013 to accelerate progress toward regional elimination in 22 countries. In 2014, regional leaders endorsed a goal of a malaria-free Asia Pacific by 2030; the following year, they signed a strategic roadmap emphasizing the need for evidence-based responses to artemisinin and insecticide resistance, support for vulnerable groups, and IF mechanisms. Though not financing facility itself, APLMA supports resource mobilization by advocating for sustained financial commitments from governments and donors and elevating the malaria elimination agenda in national, regional, and global policy circles.

The **WHO Strategy for Malaria Elimination in the Greater Mekong Subregion** outlines a phased approach to elimination, including interruption of *Plasmodium falciparum* transmission in all six countries (i.e., Cambodia, Lao People’s Democratic Republic,

Myanmar, Thailand, Vietnam, and China’s Yunnan Province) by 2025 and elimination of all forms of malaria by 2030. These efforts are supported, in part, by the Regional Artemisinin Initiative grant from the Global Fund, which allocated US\$100 million over three years to halt the spread of artemisinin resistance.

In southern Africa, **Elimination 8 (E8) Initiative** prioritizes data-sharing across countries at the frontline of malaria elimination (i.e., Botswana, Namibia, South Africa, and Swaziland) and their northern neighbors working to reduce transmission and achieve subnational elimination (i.e., Angola, Mozambique, Zambia, and Zimbabwe). In 2016, the Global Fund committed US\$17.8 million to the E8.

Two regional initiatives in West Africa—the **Malaria Elimination Initiative of the Economic Community of West African States** and the **Sahel Malaria and Neglected Tropical Diseases Project**—are bringing neighboring countries together for malaria elimination, but time-limited goals have not yet been stated.

The **African Leaders Malaria Alliance (ALMA)**—a high-level coalition of 49 African heads of state—recently adopted a malaria elimination goal by 2030. This has been further endorsed by the African Union. Similar to APLMA, ALMA is not a financing facility, though it aims to mobilize resources and political commitment for malaria elimination in Africa.

The **Elimination of Malaria in Mesoamerica and Hispaniola (EMMIE)** was formed in 2013 to push for malaria elimination by 2020 in the ten member countries: Belize, Costa Rica, the Dominican Republic, El Salvador, Guatemala, Haiti, Honduras, Mexico, Nicaragua, and Panama. EMMIE receives support through a grant from the Global Fund that uses a performance-based, COD model. Additional assistance comes from a new consortium, Malaria Zero, which is supporting Haiti and the Dominican Republic to implement a collaborative strategy for elimination by 2020.

Opportunities for Financing Malaria Elimination

In this section, we review the applicability of IF mechanisms and instruments on resource generation for malaria elimination. We strongly believe that the feasibility and utility of any IF mechanism or instrument are dependent on country context and are determined largely by a country's overall health financing strategy. This premise notwithstanding, we evaluated select IF mechanisms and instruments based on adapted criteria used to examine financing models in global health (Table 1).^{10,13,41} This assessment is purely qualitative and draws from the authors' judgments; therefore, it should not be considered conclusive.

The strengths and weaknesses of each IF mechanism and instrument listed in Table 2 were used to generate a score for each criterion. Scores are denoted using pluses (+) and minuses (-) that respectively denote positive and negative qualities. The number of pluses or minuses (1 to 3) reflects the relative extent that an instrument or mechanism meets or fails to meet each criterion. In instances where not enough information was available to support our assessment, or when a specific criterion was not applicable, the cells were left blank.

Table 1. Criteria used for evaluating innovative financing mechanisms

Characteristics	Description
Scale	Extent to which a mechanism or instrument raises resources enough to meet its intended purpose (also referred to as sufficiency)
Predictability	Certainty with which the revenues from a mechanism or instrument can be generated (also referred to as reliability)
Sustainability	Extent to which a mechanism or instrument produces a sustainable stream of resources
Additionality	Degree to which a mechanism or instrument raises additional resources after offsetting all associated costs
Acceptability	Degree to which a mechanism or instrument is acceptable to relevant stakeholders
Transaction costs	Extent to which costs associated with establishing and maintaining a mechanism or instrument can be minimized
Equity	Extent to which both the costs and benefits of a mechanism or instrument are distributed across various population groups
Adverse effects	Extent to which adverse effects from a mechanism or instrument can be minimized

Table 2. Innovative financing mechanisms and instruments and their applicability to malaria elimination

IF mechanism and instrument	Criterion								Opportunities and challenges
	Scale	Predictability	Sustainability	Additionality	Acceptability	Transaction cost	Equity	Adverse effects	
State guarantees, securities, and market-based mechanisms: government bonds	+++	+++	++	-	+	+++	++		<p>Opportunities:</p> <ul style="list-style-type: none"> Generates immediate revenues from future commitments Produces a stable source of funding Identifies new sources of private sector funding Greater potential when financial markets are developed <p>Challenges:</p> <ul style="list-style-type: none"> Heavy set-up and transaction costs Does not necessarily generate new revenue Involves heavy discounting; burden of payment is handed off to future generations <p>Limited applicability</p>
State guarantees, securities, and market-based mechanisms: diaspora bonds		-	+++	+++		--	+++		<p>Opportunities:</p> <ul style="list-style-type: none"> Generates revenues from private sources Frontloads funds for immediate use Potential for funding depends on size of diaspora and other factors <p>Challenges:</p> <ul style="list-style-type: none"> Entails high transaction cost Success depends on interest rates in the capital market Difficult to implement in countries in conflict and with poor governance structures Earmarking funds for malaria may be politically challenging and costly <p>Limited applicability</p>
Obligatory charges: taxes	+++	+++	+++	+++	---	-	+++	-	<p>Opportunities:</p> <ul style="list-style-type: none"> Large potential for revenue generation from private sector Once established, ensures stable, predictable, and sustainable source of revenue Low transaction cost Proven to work across multiple settings (e.g., airline levies) <p>Challenges:</p> <ul style="list-style-type: none"> Requires strong political buy-in May take a long time to implement due to need for changes in legislation and policies <p>Applicable</p>

Voluntary solidarity contributions: private sector contributions	+	+	+++	++	++	--	++	<p>Opportunities:</p> <ul style="list-style-type: none"> Increases social awareness among individuals and private organizations Pooling of resources from may attract additional contributions <p>Challenges:</p> <ul style="list-style-type: none"> Advocating for malaria elimination among private corporations, industries, and individuals may be resource-intensive May not be a stable source of revenue <p>Applicable</p>
Voluntary solidarity contributions: endowment funds	++	+	+++	++	+++	--		<p>Opportunities:</p> <ul style="list-style-type: none"> Provides sustainable funding since only returns are spent and principal is left intact Suitable for risk-averse investors <p>Challenges:</p> <ul style="list-style-type: none"> Large upfront funding required to yield returns that can sustain programs May be difficult to find donors <p>Applicable</p>
International and regional funds	+++	+	++	++		-	++	<p>Opportunities:</p> <ul style="list-style-type: none"> Has potential to raise resources from donors and entities with interest in a specific region Provides opportunity to fund cross-border activities <p>Challenges:</p> <ul style="list-style-type: none"> Faces inherent challenge of countries free-riding; requires proper incentives and governance mechanisms in place Achieving consensus among multiple countries may be challenging <p>Applicable</p>
Debt conversion mechanisms		++	+	-	+	---	+++	<p>Opportunities:</p> <ul style="list-style-type: none"> Helps reallocate resources from debt repayment to social development Fund is predictable since it is predetermined <p>Challenges:</p> <ul style="list-style-type: none"> Depends on creditors' willingness to cancel debt Funds from debt relief may be difficult to earmark for malaria elimination <p>Limited applicability</p>

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