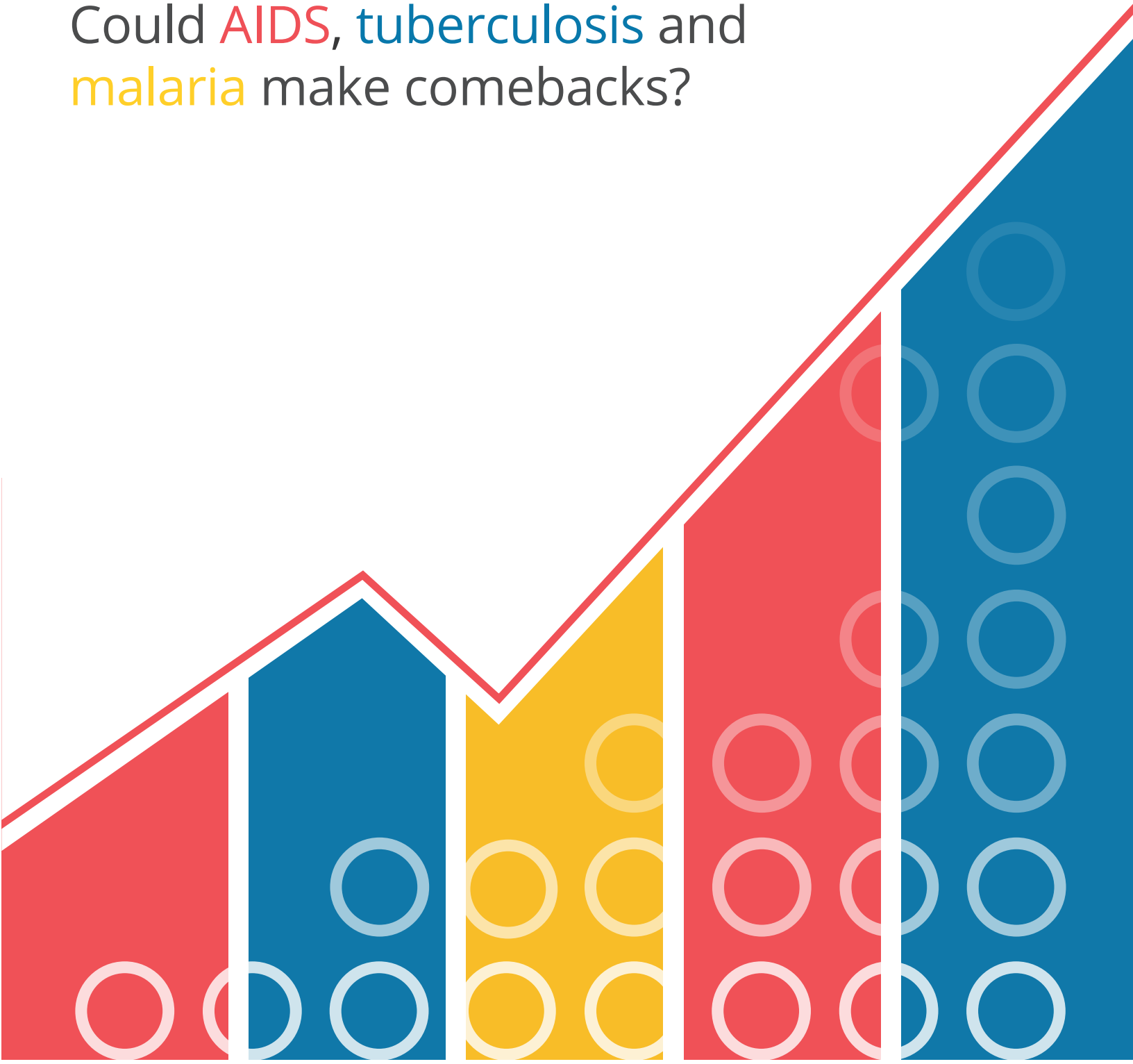
RESURGENCE

Could AIDS, tuberculosis and malaria make comebacks?



Issue Brief
September 2019

FRIENDS OF THE GLOBAL FIGHT
AGAINST AIDS, TUBERCULOSIS AND MALARIA

Over the last two decades, U.S. investments have helped achieve dramatic progress in the fight against three of the world's deadliest infectious diseases: HIV, tuberculosis (TB) and malaria. Since 2000, global malaria death rates have decreased by 60 percent, and the number of deaths from TB have fallen by 37 percent. AIDS-related deaths have been cut in half since their peak in 2005.[1]

Despite these achievements, progress is beginning to slow.

From 2006 to 2012, there were an average of 100,000 fewer AIDS-related deaths each year, but, between 2012 and 2018, that number fell to 40,000.[2] Similarly, from 2000 to 2007, the number of deaths from TB (in HIV-negative individuals) decreased by an average of 36,000 per year, but, between 2010 and 2018, the decrease fell to 26,000.[3] Additionally, in 2018, the World Health Organization (WHO) reported that the number of malaria cases was on the rise globally.[4]

To reduce the risks of disease resurgence, we must understand and avoid the factors that have led to previous HIV, TB and malaria comebacks. We must also encourage donors around the world to increase funding for the Global Fund to Fight AIDS, Tuberculosis and Malaria (The Global Fund) and push for increased U.S. investment in the President's Emergency Plan for AIDS Relief (PEPFAR), the President's Malaria Initiative (PMI) and the U.S. Agency for International Development's (USAID) TB Program. Stepped-up funding for the Global Fund and U.S. bilateral programs are our best defense against future disease resurgence.

Source: The Global Fund

If global progress against these epidemics remains stagnant or slows, AIDS, TB and malaria could make comebacks.

Disease Resurgence

Disease resurgence is defined as "the reappearance of new infections in significant numbers after a disease has subsided owing to the measures applied to reduce or interrupt its transmission." [5]

Common causes for a resurgence include social factors, such as war or natural disasters; political dynamics, such as reduced funding and the ending of programs before elimination is achieved; and biological factors, such as drug and vector resistance.

TUBERCULOSIS

TB is treatable and curable, but has become the world's leading infectious disease killer, with more than one-third of TB cases missed or misdiagnosed.[6]

These "missing" cases are the result of a variety of factors, such as under-diagnosis, under-reporting, insufficient access to services, gaps in health system surveillance and inadequate links between the private and public health sectors. TB is also extremely contagious. Someone with untreated TB can spread the disease to up to 15 other people in a year,[7] making the disease a major global health security threat.

The primary risk factors for TB resurgence include drug resistance, co-infections with HIV and limited access to care.

Deaths from drug-resistant TB account for around one-third of all antimicrobial resistance deaths worldwide.

DRUG RESISTANCE

Antimicrobial resistance is one of the biggest public health challenges of our time. Deaths from drug-resistant TB account for around one-third of all antimicrobial resistance deaths worldwide.[8] Drug-resistant TB is much more expensive to treat than drug-susceptible TB. It can also take three to four times as long to treat and has a lower success rate. To compound this challenge, patients with drug resistance can also spread resistance to others. By 2050, 2.6 million people are projected to die from drug-resistant TB every year, costing the global economy an estimated $16.7 trillion.[9]

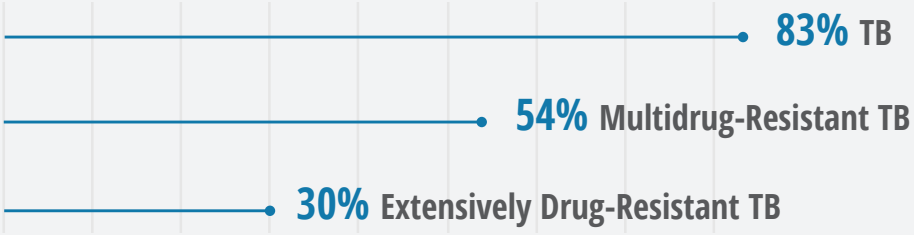
CO-INFECTION WITH HIV

An estimated one-quarter of the world's population has latent TB, but only five to 15 percent will develop active TB—which is infectious and can be spread to others. However, people living with HIV are up to 30 times more likely to develop active TB. The proportion of TB patients who know their HIV status varies widely from country to country. Many TB prevention tools do not test for co-infection with HIV. Approximately 40 percent of deaths among people living with HIV are due to TB.[10]

ACCESS TO CARE

The two greatest challenges in TB treatment are initiation and completion. TB disproportionately affects people living in poverty. Low-income communities with limited access to health systems are often under-diagnosed. Many people do not seek treatment until the disease is in advanced stages, when treatment is less effective. Stigma and other factors associated with TB can also lead patients to delay seeking a diagnosis and treatment.

TB treatment success declines rapidly with increasing drug resistance.



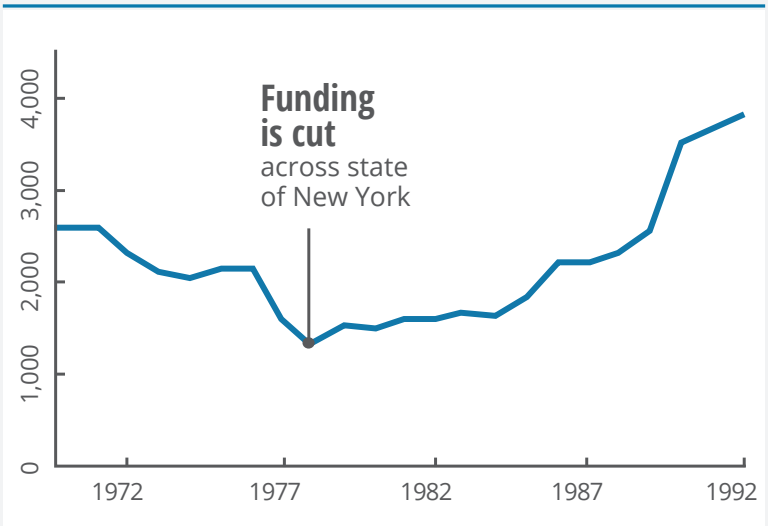
Source: World Health Organization. 2018.

TB RESURGENCE IN NEW YORK CITY

Between 1968 and 1973, $40 million was spent annually on TB in New York City, but New York City's fiscal crisis in the mid-1970s led to a drastic cut in appropriations for all public health programs, including TB. The State of New York also cut back its support, which had accounted for 50 percent of New York City's TB control activities. After these cuts, in 1978, only $23-$25 million was directed to the TB response in New York City. As a result, the number of health department chest clinics shrank, and the average number of people identified who had been in contact with a TB patient dropped as well. At the same time, the HIV epidemic was emerging in the city.

The TB resurgence started with a localized epicenter in Manhattan in the early 1980s and became more challenging to contain as additional epicenters in the Bronx and Brooklyn arose in the mid-1980s. As a result, the number of TB cases continued to increase in New York from just over 1,300 in 1978 to more than 3,800 in 1992. New York City only contained the resurgence by significantly changing its TB treatment programs and investing more than $1 billion.[11]

NYC TB INCIDENCE, 1968 TO 1992



Sources: Bureau of Tuberculosis Control New York City Department of Health. 1994. "Information Summary 1994."

Once a patient initiates treatment, it is critical that she remain on the treatment program until successfully cured. But completion is expensive and time-consuming. Standard TB treatment requires up to six months of drug therapy,[12] and the regimen can be difficult to administer. The duration and side effects lead some patients to abandon their treatment, which puts them at greater risk of transmitting the disease to others and developing drug resistance.

The Global Fund provides 69 percent of all international financing for TB.

In 2018, Stop TB Partnership's Global Plan to End TB estimated that $10.4 billion was needed annually to fight TB in low- and middle-income countries around the world. Yet only $6.9 billion was available for TB prevention, diagnosis and treatment in that year. There is concern that this $3.5 billion shortfall will increase: Stop TB projects that an annual investment of $12.3 billion will be needed by 2020.[13] The Global Fund provides 69 percent of all international financing for TB.[14] Additional donor funding and increased domestic resource mobilization are needed to get back on track and prevent a future TB resurgence.

MALARIA

Today, nearly half of the world's population is at risk of malaria, and the number of malaria cases is on the rise globally.[15]

While several low- and middle-income countries are progressing toward malaria elimination, many high-burden malaria countries are experiencing setbacks. Approximately 70 percent of the world's malaria burden is concentrated in just 11 countries—10 in sub-Saharan Africa (Burkina Faso, Cameroon, Democratic Republic of the Congo, Ghana, Mali, Mozambique, Niger, Nigeria, Uganda and United Republic of Tanzania) and in India.

The primary risk factors for malaria resurgence include drug resistance, insecticide resistance and lack of political commitment.

DRUG RESISTANCE

Resistance to anti-malarial drugs, especially artemisinin, is undermining treatment efforts. Resistance can arise from poor treatment practices, non-adherence to treatment regimens, and the presence of sub-standard and counterfeit drugs in the market. As of March 2018, artemisinin resistance was confirmed in five countries across the Greater Mekong region: Cambodia, Laos, Myanmar, Thailand and Vietnam.[16] If drug resistance continues to spread across borders or arises in new areas, the result could be a substantial loss of life and higher economic costs as countries look for drug regimens to treat millions of people.

In a review of 75 malaria resurgence events, withdrawal of funding was the most commonly cited reason for resurgence.

INSECTICIDE RESISTANCE

Insecticide-treated nets and indoor residual spraying (IRS) are the two primary approaches to malaria prevention and have driven much of the success achieved against the disease. However, in 2018, insecticide resistance was detected in 85 percent of the malaria-endemic countries[17] that reported standard monitoring data to the WHO, including three countries that detected insecticide resistance for the first time. Nets and spraying continue to be essential tools to fight malaria, but, in absence of innovation, their effectiveness could be greatly reduced by growing resistance.

POLITICAL COMMITMENT

Malaria can rebound after one rainy season. Therefore, the "out of sight, out of mind" paradox presents a particular risk: When successful programs make a disease less visible, funding is often withdrawn. In a review of 75 malaria resurgence events in 61 countries from 1930 to 2010, withdrawal of funding was the most commonly cited reason for resurgence.[18] Since malaria programs around the world rely on a few major donors, any change in donor priorities could have significant negative consequences.

In 2017, only $3.1 billion[19] was available globally for malaria control and elimination efforts—$1.3 billion short of the estimated $4.4 billion annual investment needed to adequately fund these efforts. There are concerns this shortfall will grow, with the WHO projecting that $6.6 billion will be needed globally in 2020.

Cases of Malaria Resurgence

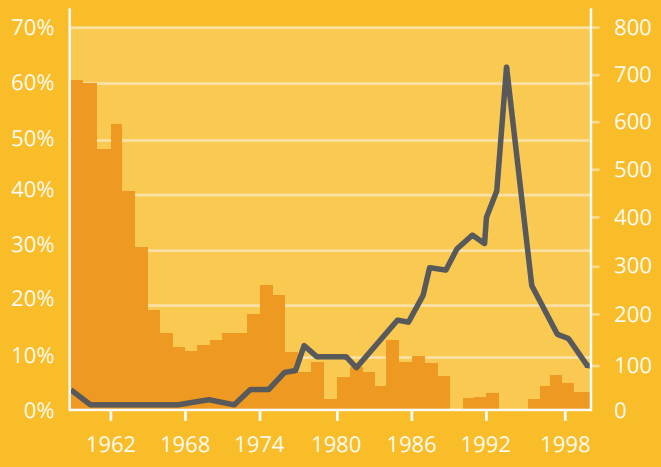
Increased funding for malaria control has led to considerable declines in the global malaria burden, but this progress is fragile.

Time and again, failure to maintain active, fully funded malaria interventions has led to resurgence. In the following graphs, malaria resurgence appears strongly correlated with the scaling-down of indoor residual spraying (IRS) programs.

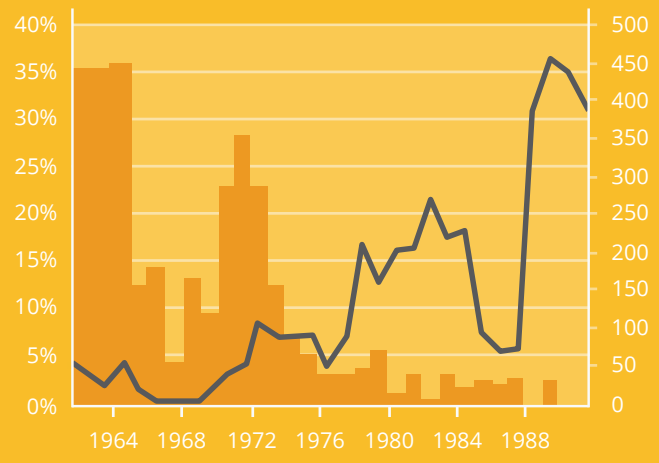
Number of homes sprayed with IRS per 1,000 population (right axis)

Rate of lab-confirmed malaria cases per 100 suspected cases (left axis)

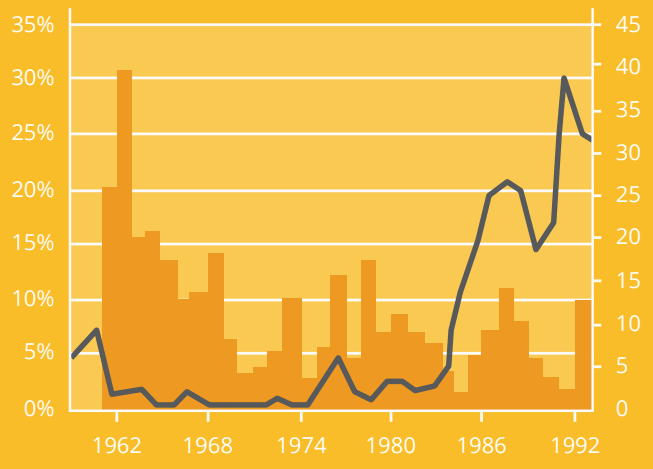
PERU



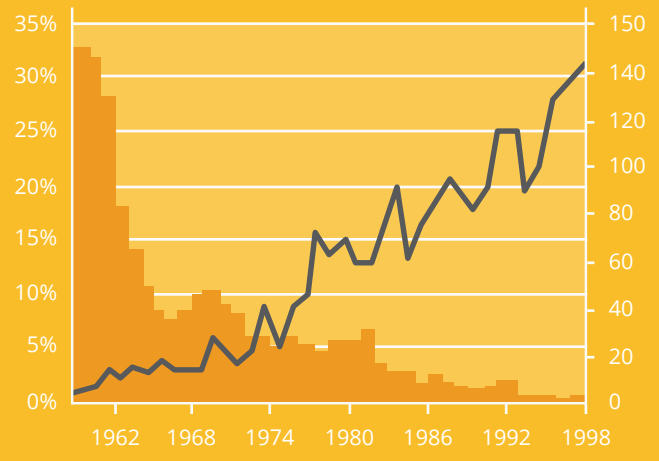
HAITI



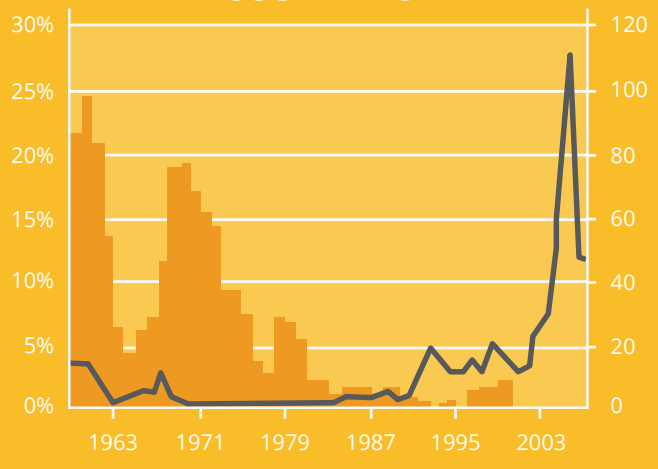
GUYANA



COLOMBIA



COSTA RICA



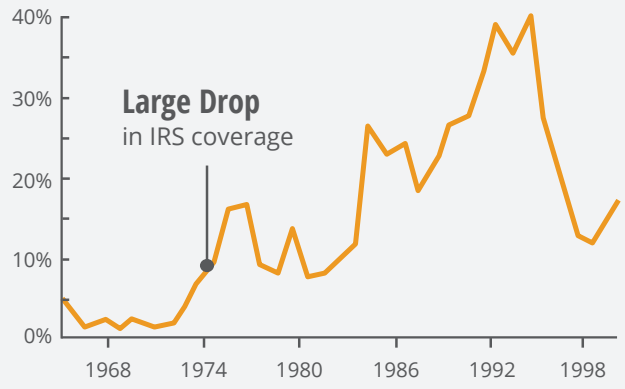
THE RISK OF INACTION

In India, an eradication effort led by USAID at the end of the 1950s helped to reduce the number of cases of malaria from 100 million annually in the early 20th century to around 100,000 cases in 1965. During this time, malaria was eliminated from large areas of the country, and India began to consider it possible to eradicate the disease.

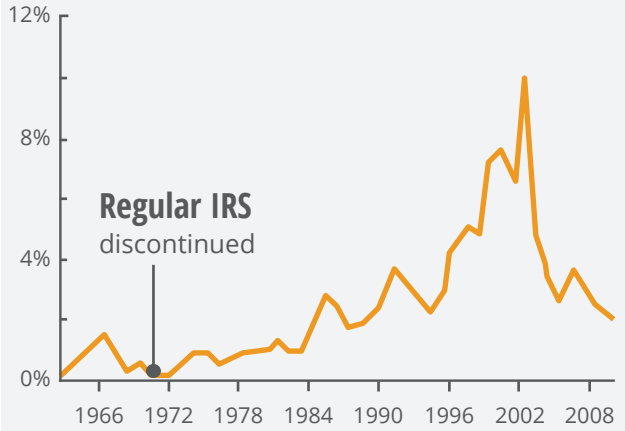
However, as the USAID commitment ended, India was unable to maintain the program alone. Shortages of the insecticide used to control mosquitoes ensued, and malaria began to resurge. As the number of cases continued to grow, malaria cases were identified in areas where it had previously been eliminated. Similar IRS-related resurgences were also occurring in neighboring Bhutan and Nepal.

Ultimately, the number continued to increase to more than six million by 1976. India had to abandon its efforts to eradicate the disease and shift to controlling the resurgence. After implementing a modified operational plan in 1977, India reduced the number of annual cases to two million by 1985.

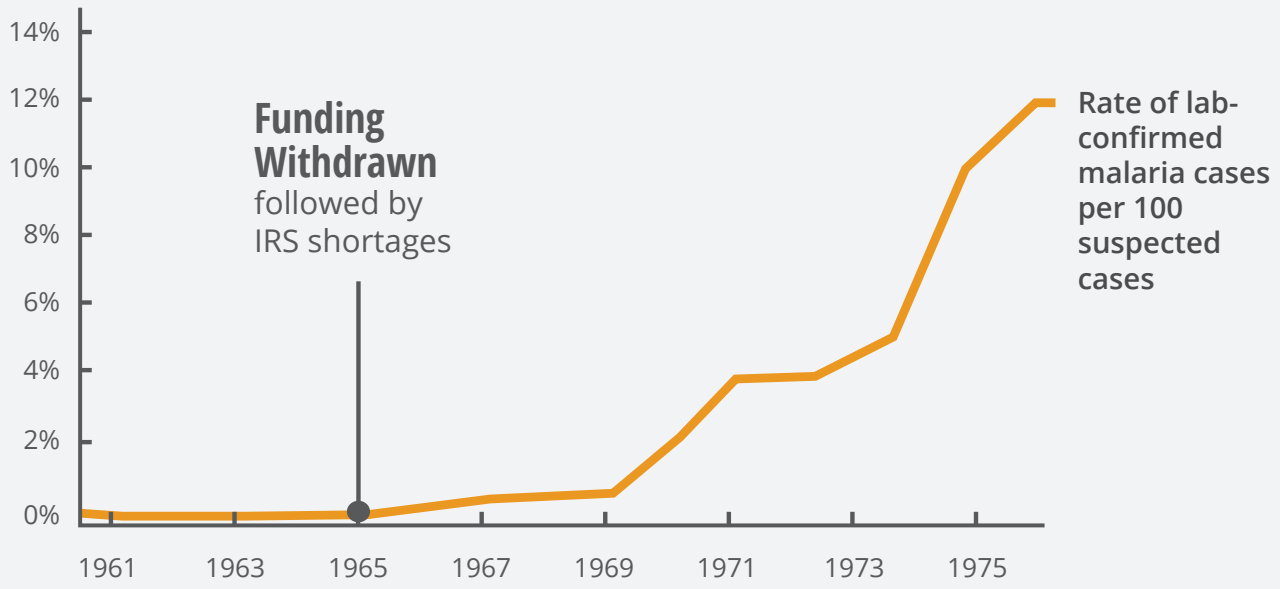
BHUTAN



NEPAL



INDIA



Source: Malaria Journal. 2012. "Malaria resurgence: a systematic review and assessment of its causes."

HIV/AIDS

There were an estimated 770,000 AIDS-related deaths in 2018, down from 1.2 million in 2010 and 1.7 million in 2005.[20] However, UNAIDS has warned that the pace of progress is not fast enough to reach 2020 targets.

The primary risk factors for a resurgence of HIV include the challenge of scaling up HIV treatment and prevention, drug resistance, and the critical importance of expanding services to reach a growing youth population and the socially marginalized.

PEOPLE NOT ON TREATMENT

In 2018, there were 37.9 million people living with HIV in the world, but only 23.3 million people accessing treatment.[21] This means that there are still 14.6 million people living with the virus who are not receiving antiretroviral therapy. Ensuring that everyone living with the virus knows their status and has access to treatment is crucial because it saves lives and reduces the risk of transmitting the virus to others by 97 percent.[22] Lack of access, social stigma and discrimination are among the reasons people do not pursue treatment.

There are still 14.6 million people living with the virus who are not receiving antiretroviral therapy.

Source: The Global Fund

DRUG RESISTANCE

Drug resistance is also a growing concern in the fight against HIV. It can be caused by treatment interruption, inadequate adherence to treatment regimens and the use of poor-quality drugs. People who have never been on treatment can also acquire drug-resistant HIV. Of the 18 countries that have reported data on pre-treatment HIV drug resistance, 12 reported that more than 10 percent of patients have developed drug resistance to the two most affordable and widely used drugs.[23] If drug-resistant HIV continues to spread, it will necessitate the use of second-line drugs that are more expensive, compounding the challenge of flat funding.

A GROWING YOUTH POPULATION

In Africa, 40 percent of the population is under 15, with a further 19 percent between the ages of 15 and 24.[24] As these individuals grow older,

their risk of exposure to HIV will increase. While the number of new HIV infections among children has declined by 50 percent since 2010, there has been no substantial decline in new infection rates among adults. As young people in Africa grow into adulthood, prevention programs focused on adults must be expanded to serve a larger population.

According to UNAIDS, $19 billion[25] was available for the AIDS response in 2018. An estimated $26.2 billion will be required to adequately fight AIDS in 2020, and UNAIDS warns that without significant increases in funding by both implementing countries and donors, current funding levels will not be sufficient.

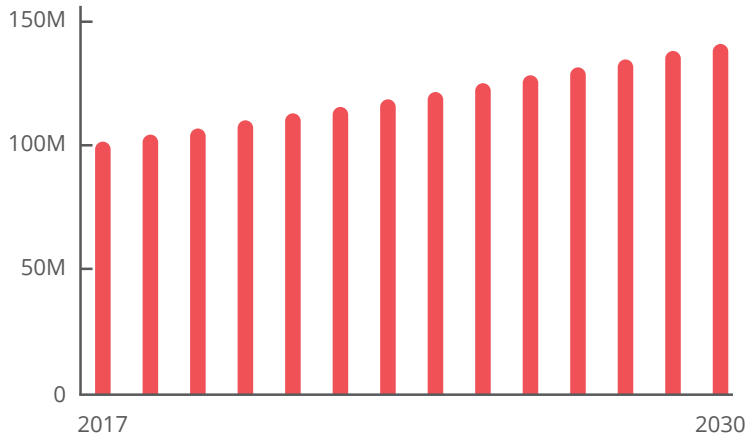
HIGH RISK FOR YOUNG WOMEN AND GIRLS

Adolescent girls and young women continue to be disproportionately at risk of new HIV infections. In sub-Saharan Africa, twice as many girls and young women are infected with HIV as their male counterparts. In the hardest-hit countries, it is six times more.

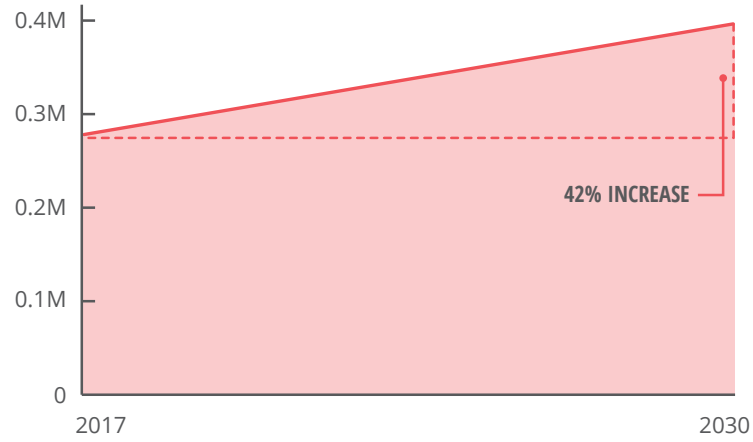
If nothing changes, new HIV infections among girls and young women age 15 to 24 are projected to increase by 42 percent by 2030, simply due to population growth. Failure to act decisively could lead to a resurgence of HIV, with numbers of new infections close to those seen in the early 2000s.

Failure to act decisively could lead to a resurgence of HIV, with numbers of new infections close to those seen in the early 2000s.

POPULATION
Women Age 15-24, Sub-Saharan Africa



NEW HIV INFECTIONS
Women Age 15-24, Sub-Saharan Africa



Source: The Global Fund to Fight AIDS, Tuberculosis and Malaria. 2019. "Focus On Ending HIV Among Adolescent Girls and Young Women."

RECOMMENDATIONS

Flat funding has contributed to slowed global progress against these diseases.

To reduce the risk of widespread disease resurgence for HIV/AIDS, TB and malaria, donors and implementing countries alike should scale up prevention and treatment, strengthen surveillance systems and invest in innovation.

SCALE UP PREVENTION AND TREATMENT

U.S. investments in bilateral global health programs and the Global Fund are critical for catalyzing contributions from other donors and scaling up access to treatment and prevention. New investments in data collection and utilization are needed to optimize program efficiency and ensure that resources and services flow to where they are needed most. Increased funding should also be made available to civil society groups that play a crucial role in identifying and addressing the economic, social and political factors that hinder people from accessing prevention and treatment services.

STRENGTHEN SURVEILLANCE SYSTEMS

Global disease outbreaks remind us that a public health event in a single location can rapidly become a global crisis. Control of infectious diseases can therefore be considered a global public good, and public health surveillance is a tool that helps achieve it. As progress is made against each of these diseases, it is essential to improve and maintain strong surveillance systems to reduce the risk of resurgence. These systems provide an important first line of defense in identifying potential epicenters of resurgence events and enabling a more rapid response to prevent the spread of disease. However, surveillance systems are often left underfinanced as progress against a disease is achieved and new health threats arise.

> **"All infectious diseases will revert and come back. We have seen through multiple experiences over the years; we cannot stop until it's over."**
>
> **- Dr. Anthony Fauci**

INVEST IN INNOVATION

We cannot wait for a disease resurgence to invest in improved approaches. As resistance to primary treatments and prevention efforts grows, we need innovation and cost-effective second-line approaches. For example, the Global Fund and Unitaid are developing the first-ever mosquito net to use two different classes of insecticide.[26] Recognizing the risk factors that could drive a disease resurgence, and addressing them beforehand, can help to reduce the financial and humanitarian costs that accompany a resurgence.

As noted by Dr. Anthony Fauci, director of the National Institute of Allergy and Infectious Diseases, "All infectious diseases will revert and come back. We have seen through multiple experiences over the years; we cannot stop until it's over."[27] If we are not driving toward ending these epidemics, we face a risk for resurgence.

For more than 15 years, America has led the fight against the AIDS, TB and malaria epidemics. We now stand at a tipping point: We can end these diseases for good or risk disease comebacks.

For more than 15 years, America has led the fight against the AIDS, TB and malaria epidemics. We now stand at a tipping point: We can end these diseases for good or risk disease comebacks.

With more than 300 active grants in over 100 countries,[28] the Global Fund plays an indispensable role in preventing disease resurgence, and must be fully funded to end these diseases once and for all. The Global Fund is the world's largest global health funder, investing nearly $4 billion a year in programs run by local government, public health and civic partners to accelerate the end of the world's deadliest infectious diseases. Additional investments in U.S. bilateral programs and stepped-up domestic resource mobilization from implementing countries will also be critical to preventing sustained and future resurgence of these deadly diseases.

Source: The Global Fund.

SOURCES

[1] *The Global Fund to Fight AIDS, Tuberculosis and Malaria. 2018. "2018 Results Report."*

[2] *UNAIDS. 2019. "AIDSinfo." http://aidsinfo.unaids.org/*

[3] *World Health Organization. 2018. "WHO TB Burden Estimates."*

[4] *World Health Organization. 2018. "World Malaria Report 2018."*

[5] *Cohen, Smith, Cotter, Ward, Yamey, Sabot and Moonen. Malaria Journal. 2012. "Malaria resurgence: a systematic review and assessment of its causes."*

[6] *World Health Organization. 2018. "World Tuberculosis Report 2018."*

[7] *The Global Fund to Fight AIDS, Tuberculosis and Malaria. 2018. "Tuberculosis." https://www.theglobalfund.org/en/tuberculosis/*

[8] *TB Alliance. 2018. "Drug Resistance: A response to antimicrobial resistance includes tackling TB."*

[9] *The Global Fund to Fight AIDS, Tuberculosis and Malaria. 2018. "2018 Results Report."*

[10] *The Global Fund to Fight AIDS, Tuberculosis and Malaria. 2018. "Tuberculosis."*

[11] *Brudney and Dobkin. Journal of Public Health Policy. 1992."Resurgent Tuberculosis in New York City: Human Immunodeficiency Virus, Homelessness, and the Decline of Tuberculosis Control Programs."*

[12] *World Health Organization. 2018. "World Tuberculosis Report 2018."*

[13] *Ibid.*

[14] *The Global Fund to Fight AIDS, Tuberculosis and Malaria. 2019. "Step Up the Fight: Investment Case 6th Replenishment."*

[15] *World Health Organization. 2018. "World Malaria Report 2018."*

[16] *World Health Organization. 2019. "Q&A on Artemisinin Resistance." https://www.who.int/malaria/media/artemisinin_resistance_qa/en/*

[17] *World Health Organization. 2018. "World Malaria Report 2018."*

[18] *Cohen, Smith, Cotter, Ward, Yamey, Sabot and Moonen. Malaria Journal. 2012. "Malaria resurgence: a systematic review and assessment of its causes."*

[19] *World Health Organization. 2018. "World Malaria Report 2018."*

[20] *UNAIDS. 2019. "AIDSinfo." http://aidsinfo.unaids.org/*

[21] *Ibid.*

[22] *Ibid.*

[23] *World Health Organization. 2019. "HIV drug resistance report 2019."*

[24] *United Nations. 2019. "World Population Prospects 2019." https://population.un.org/wpp/*

[25] *UNAIDS. 2019. "Global HIV & AIDS statistics — 2019 fact sheet." https://www.unaids.org/en/resources/fact-sheet.*

[26] *The Global Fund to Fight AIDS, Tuberculosis and Malaria. 2018. "What's new about the new nets project." https://www.theglobalfund.org/en/blog/2018-10-31-what-s-new-about-the-new-nets-project/*

[27] *O'Neill Institute for National & Global Health Law Georgetown University. 2017. "Reorganization and the Future of PEPFAR: Implications of State and USAID Reform."*

[28] *The Global Fund to Fight AIDS, Tuberculosis and Malaria. 2019. "The Global Fund Data Explorer." https://data.theglobalfund.org/home*

FRIENDS
OF THE GLOBAL FIGHT

AGAINST AIDS,
TUBERCULOSIS
AND MALARIA

Advocacy to end epidemics.

1634 Eye Street, NW Suite 1100
Washington, DC 20006

theglobalfight.org