

Deaths and infections from HIV, tuberculosis, and malaria plummet globally

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Today, fewer people are dying from HIV/AIDS, tuberculosis, and malaria, according to a new, first-of-its-kind analysis of trend data from 188 countries. The pace of decline in deaths and infections has accelerated since 2000, when the Millennium Development Goals (MDGs) were established to stop the spread of these diseases by 2015.

HIV interventions – including [antiretroviral therapy](#) (ART), prevention of mother to [child transmission](#) (PMTCT), and HIV prophylaxis - have been successful. HIV is increasingly a condition people live with rather than die from, and the world has added nearly 20 million life years as a result of these programs.

About 70% of those years of life were in the developing world. In terms of age, 14% of the years of life saved were in children under age 15, 50% were in 15- to 49-year-olds, and 36% were in people age 50 and over. But despite considerable progress, more must be done to reduce deaths and infections further.

In the case of HIV, researchers note that the comparatively low price per year of life saved is one of the major achievements in global health in the past decade. Comparison of the total amount invested in HIV prevention and treatment to the years of life saved during 2000–11 yields in developing countries a ratio of \$4498 per life-year saved. In 2011, all donors combined spent US\$7.7 billion on HIV/AIDS.

Published in *The Lancet* on July 22, the study, "Global, regional, and

national incidence and mortality for HIV, [tuberculosis](#), and malaria during 1990-2013: a systematic analysis for the Global Burden of Disease Study 2013," was conducted by an international consortium of researchers led by the Institute for Health Metrics and Evaluation (IHME) at the University of Washington.

The findings were released at the International AIDS Conference in Melbourne. Dr. Christopher Murray, director of IHME and a co-founder of the Global Burden of Disease (GBD) study, presented the findings at an event where he was joined by Richard Horton, Editor-in-Chief of *The Lancet*; Michel Sidibé, Executive Director of UNAIDS; Deborah Birx, United States Global AIDS Coordinator, PEPFAR; and Mark Dybul, Executive Director, Global Fund to Fight AIDS, Tuberculosis and Malaria.

"The global investment in HIV treatment is saving lives at a rapid clip," said Dr. Murray. "But the quality of antiretroviral programs varies widely. In order to reduce HIV-related deaths even further, we need to learn from the best programs and do away with the worst ones."

Researchers found that greater access to treatment is needed as well. Globally, in 2013, there were nearly 30 million people living with HIV, 1.8 million new infections, and 1.3 million deaths from the disease. At the peak of the epidemic in 2005, HIV caused 1.7 million deaths. Global HIV incidence peaked in 1997 with 2.8 million new infections and has declined since the peak at 2.7% per year.

The study reveals substantial changes to previous understanding of HIV epidemics. In Latin America and Eastern Europe, HIV epidemics are substantially smaller than previously estimated – while in some countries, like the Philippines, the crisis is actually much bigger.

This updated analysis shows some notable differences when compared to

the GBD 2010 study and new estimates were found to be lower than previous estimates. Estimated HIV deaths in Latin American countries such as Peru, Venezuela, and Colombia were reduced by more than two-thirds in the year 2010. In the same year, the population of people living with HIV in Eastern and Central Europe was found to be over 60% smaller than previously estimated, highlighted by a 69% decrease in Russia.

Improvements in IHME's methodology revealed that cumulatively, countries identified as having concentrated epidemics had 39% fewer deaths and 53% fewer people living with HIV. In contrast, deaths in countries with generalized epidemics increased by 23%, and the HIV-infected populations were slightly higher by 3%.

Success in reducing HIV has had an impact on tuberculosis as well. Since 2000, global progress in reducing TB prevalence and mortality has accelerated.

Prevalence rates rose slightly between 1990 and 2000 at an annual rate of 0.4% but declined by 1.3% per year from 2000 to 2013.

TB rates globally have declined between 2000 and 2013, due largely to progress in two regions: East and South Asia. In South Asia, which accounts for almost half of TB deaths, mortality rates declined annually by 4.2% during this period. In East Asia, death rates fell annually by 7.5%.

In 2013, there were 7.5 million new TB cases, and the disease caused 1.4 million deaths worldwide.

Earlier and more effective treatment has helped shorten the duration of TB infections, but the authors note that as the world ages, higher numbers of cases and deaths will occur. When looking at death rates that

are age-standardized, meaning they were adjusted for differences in population size and ages over time and across countries, the countries within Latin America and the Caribbean with the highest TB rates are Bolivia, Peru, and Haiti. The countries with the highest death rates from TB are in sub-Saharan Africa: Somalia, Central African Republic, South Sudan, Zambia, and Mozambique.

The most significant reductions in TB deaths – declining at a rate of 3.7% between 2000 and 2013 – occurred among people who are HIV-negative. Men and boys make up the majority of TB cases among people who are HIV-negative and die at higher rates (64.7%) than HIV-negative women and girls with TB. In 2013, 83.2% of cases and 58.8% of deaths in HIV-negative people with TB occurred under age 60.

"As the world's population grows older, tuberculosis will remain a major health threat," said Dr. Nobhojit Roy of the BARC Hospital in India and a co-author of the study. "TB presents unique challenges across different countries and regions, and better data will help drive the most effective strategies to address it."

Similar to HIV and TB, researchers found that an increased focus due to the Millennium Development Goals has helped drive down malaria infections and deaths.

Globally, malaria cases and deaths grew rapidly from 1990, reaching a peak of 232 million cases in 2003 and 1.2 million deaths in 2004. As with HIV, the burden of malaria is concentrated in sub-Saharan Africa. Two of the three countries – Nigeria, Democratic Republic of the Congo (DRC), and India – that accounted for roughly half of all malaria deaths in 2013 are in Africa. DRC is also among four countries, three of them in Africa, that have more than 5 million malaria cases a year. DRC and Mozambique both have 6 million, Nigeria has 30 million, and India has more than 60 million.

Since 2004, child deaths from malaria in sub-Saharan Africa have declined 31.5%. Since 2000, the vast majority of countries – including those in sub-Saharan Africa – saw declines in age-standardized malaria death rates. Annual malaria deaths began to decline from a peak of 1.2 million in 2004 to about 855,000 in 2013, having increased from 888,000 in 1990. The highest rates of age-standardized malaria deaths were in Mozambique, Burkina Faso, Guinea-Bissau, Mali, Sierra Leone, The Gambia, and Guinea.

Outside of Africa, malaria mortality has been steadily declining since 1990 as well, but Yemen, India, Myanmar, and Papua New Guinea all have malaria death rates over 7.5 per 100,000. By contrast, certain countries in Southeast Asia (Thailand and Malaysia) have achieved very low [death](#) rates.

"Great progress has been made in reducing malaria deaths and infections, but we need more success stories throughout Africa in particular for us to eliminate malaria," said Dr. Corine Karema, of the Malaria & Other Parasitic Diseases Division, Ministry of Health Rwanda, and a co-author of the study. "Malaria is notoriously difficult to early diagnose, treat promptly using efficacious drugs, and track, and part of the strategy in fighting it is to invest in gathering better evidence through a robust surveillance system."

With progress in reducing HIV at the global level, success in particular countries and regions varies as the HIV epidemic has peaked and declined at different times.

Regionally, the burden of HIV is concentrated in sub-Saharan Africa. Prevalence levels are highest in Botswana, Lesotho, and Swaziland (above 12,000 per 100,000 people). HIV rates in Botswana, for example, are 15 times higher than in the DRC and 40 times higher than Niger.

Researchers found similar variation in other regions. In Southeast Asia, HIV rates are substantially higher in Thailand and Papua New Guinea. HIV rates are relatively high in parts of Europe and Central Asia (Portugal, Spain, Ukraine, Russia, and Kazakhstan) and in Latin America and the Caribbean (Panama, Honduras, Belize, Guatemala, Guyana, Suriname, Haiti, Dominican Republic, Jamaica, and the Bahamas), where prevalence levels exceed 220 per 100,000.

The annual number of new infections has declined by almost one-third between the global peak in 1997 and 2013. New infections in children have decreased by more than 7% each year since 2000, compared to a 2.4% annual decrease in adults – demonstrating the impact of interventions in reducing transmission between mothers and their children.

New infections in children declined from 340,000 in 2000 to 134,000 in 2013, at an annual rate of 7.2%, while new infections in adults declined from 2.3 million to 1.7 million, falling at 2.4% per year, on average, over this period.

Great progress has been achieved in reducing HIV infection in children (62.4% reduction since the incidence peak in 2002) due to the scale-up of interventions. However, the continued 1.7 million new infections per year in adults, while down 32.7% from the peak of the epidemic at the global scale, is a stark reminder of the continuing epidemic.

In 2013, new cases of HIV occurred equally in men and women, and HIV incidence in children as well as older adults is similar for both genders. However, there were more infections in women than there were for men at ages 15-24 years, and more HIV deaths occur in males (53.9%) than in women and girls.

"This massive new study, on the eve of the end of the MDG era,

documents impressive recent progress against HIV and malaria, in particular, but it also shows that much more needs to be done. HIV, TB, and [malaria](#) each currently cause about 1 million deaths a year," said Dr. Alan Lopez, Melbourne Laureate Professor at the University of Melbourne and co-founder of the GBD study. "All three are major causes of health loss in poor countries, and all three should be a key focus of concerted global health action and support. Without it, we risk stagnation, or even worse, unconscionable reversal of recent gains."

More information: Global, regional, and national incidence and mortality for HIV, tuberculosis, and malaria during 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013, Published online July 22, 2014.

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