

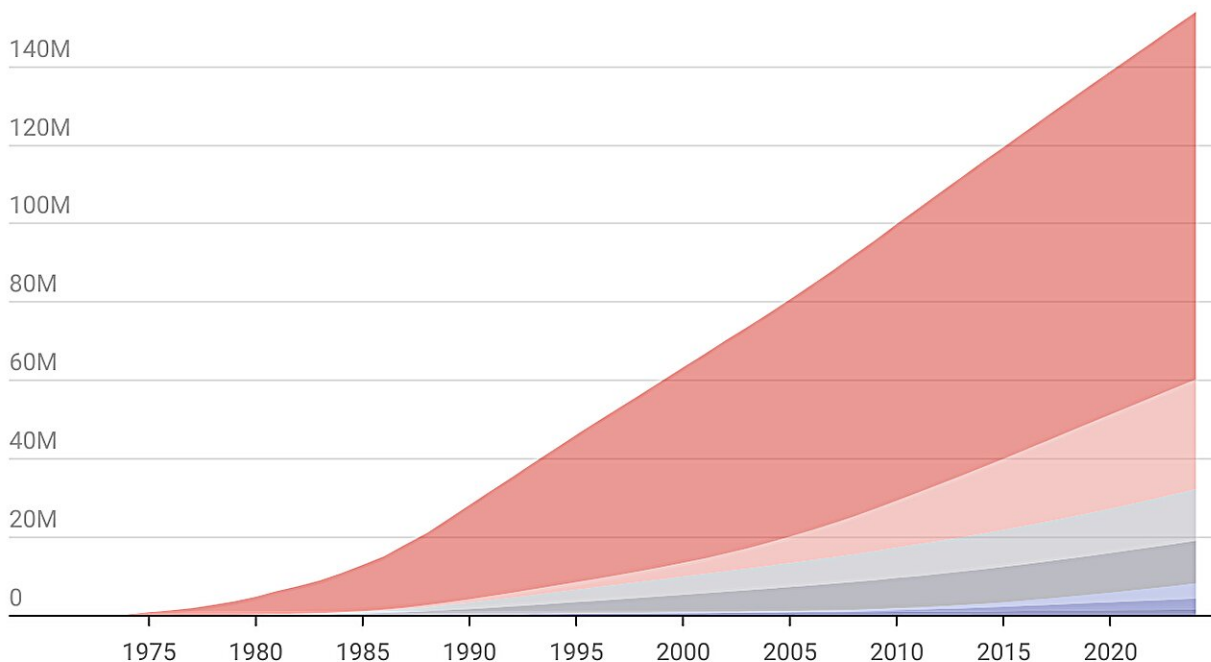
154 million lives saved in 50 years: Five charts on the global success of vaccines

May 14 2024, by Meru Sheel and Alexandra Hogan

Cumulative deaths averted due to vaccination, in millions

More than 154 million lives* have been saved because of vaccines since the start of the Expanded Program on Immunization in 1974

Measles Tetanus Pertussis Tuberculosis Other pathogens Haemophilus influenzae type B Poliomyelitis



* From select diseases and vaccines

Chart: The Conversation • Source: A. Shattock, H. Johnson, So Yoon Sim, et al. • Created with Datawrapper

Credit: The Conversation

We know vaccines have been a miracle [for public health](#). Now, [new research](#) led by the World Health Organization has found vaccines have saved an estimated [154 million lives](#) in the past 50 years from 14 different diseases. Most of these have been children under five, and around two-thirds children under one year old.

In 1974 the World Health Assembly launched the [Expanded Program on Immunization](#) with the goal to vaccinate all [children](#) against diphtheria, tetanus, pertussis (whooping cough), measles, polio, tuberculosis and smallpox by 1990. The program was subsequently expanded to include several other diseases.

The modeling, marking 50 years since this program was established, shows a child aged under ten has about a 40% greater chance of living until their next birthday, compared to if we didn't have vaccines. And these positive effects can be seen well into [adult life](#). A 50-year-old has a 16% greater chance of celebrating their next birthday thanks to vaccines.

What the study did

The researchers developed mathematical and statistical models which took in [vaccine coverage](#) data and [population numbers](#) from 194 countries for the years 1974–2024. Not all diseases were included (for example smallpox, which was eradicated [in 1980](#), was left out).

The analysis includes vaccines for 14 diseases, with 11 of these included in the Expanded Program on Immunization. For some countries,

additional vaccines such as Japanese encephalitis, meningitis A and [yellow fever](#) were included, as these diseases contribute to major disease burden in certain settings.

Global relative increase in probability of living to your next birthday

Showing the likelihood of living one more year in 2024 compared with the hypothetical scenario of no historical vaccination, based on your age

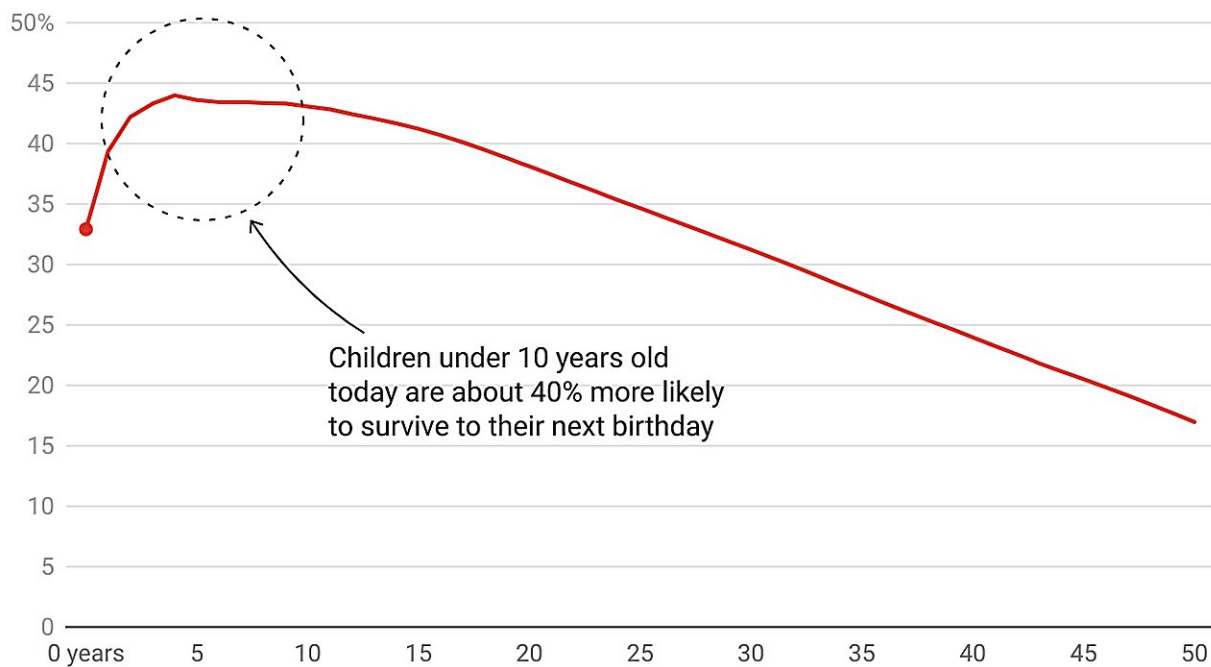


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The models were used to simulate how diseases would have spread from 1974 to now, as vaccines were introduced, for each country and age group, incorporating data on increasing vaccine coverage over time.

Children are the greatest beneficiaries of vaccines

Since 1974, the rates of deaths in children before their first birthday has more than halved. The researchers calculated almost 40% of this reduction is due to vaccines.

The effects have been greatest for children born in the 1980s because of the intensive efforts made globally to reduce the burden of diseases like measles, polio and whooping cough.

Some 60% of the 154 million lives saved would have been lives lost to measles. This is likely due to its ability to spread rapidly. One person with measles can spread the infection to [12–18 people](#).

Infant mortality rate since 1974

The **red shaded area** shows the effect vaccines have had on the falling infant mortality rate. The rate has also fallen due to improvements in other areas, like nutrition and medical care.

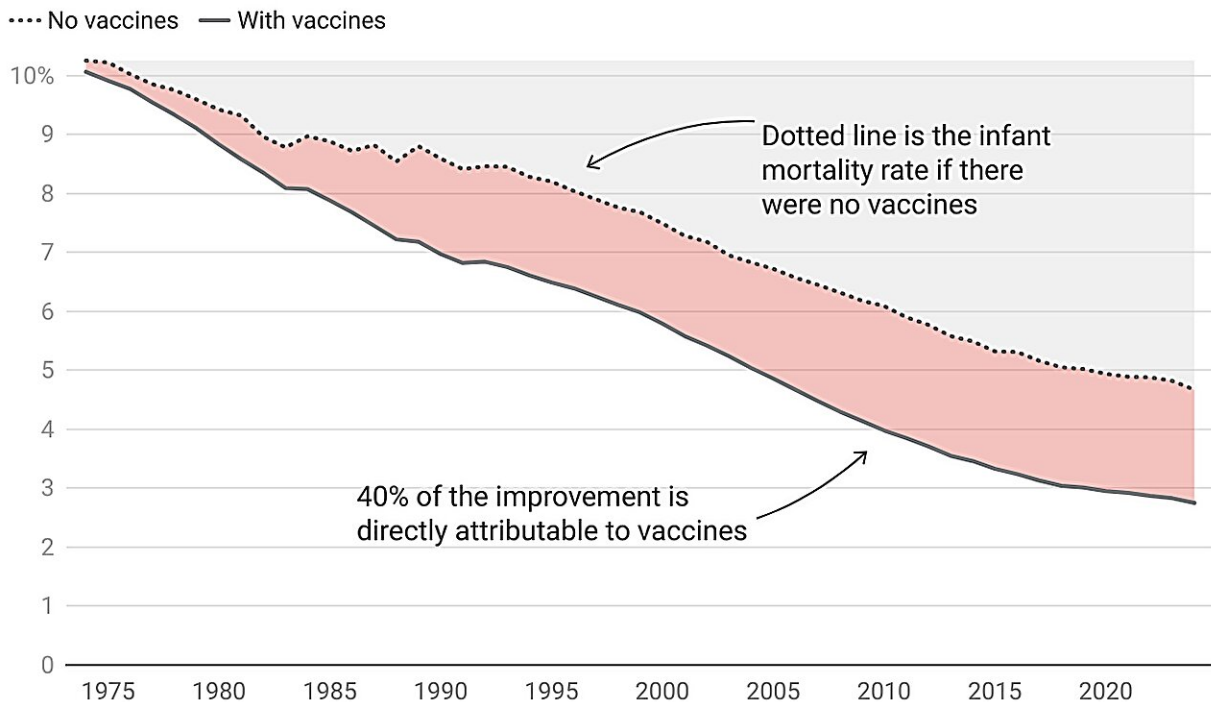


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The study also found some variation across different parts of the world. For example, vaccination programs have had a much greater impact on the probability of children living longer across low- and [middle-income countries](#) and settings with weaker health systems such as [the eastern Mediterranean and African regions](#). These results highlight the important role vaccines play in promoting [health equity](#).

Vaccine success is not assured

Low or declining vaccine coverage can lead to epidemics which can [devastate communities and overwhelm health systems](#).

Notably, the COVID pandemic saw an overall decline in [measles vaccine coverage](#), with 86% of children having received their first dose in 2019 to 83% in 2022. This is concerning because very high levels of vaccination coverage ([more than 95%](#)) are required to achieve herd immunity against measles.

Absolute increase in survival probability in 2024 by age and region

In terms of absolute impact, the Eastern Mediterranean and African regions have seen the largest vaccine-induced gains in life course survival probability since 1974

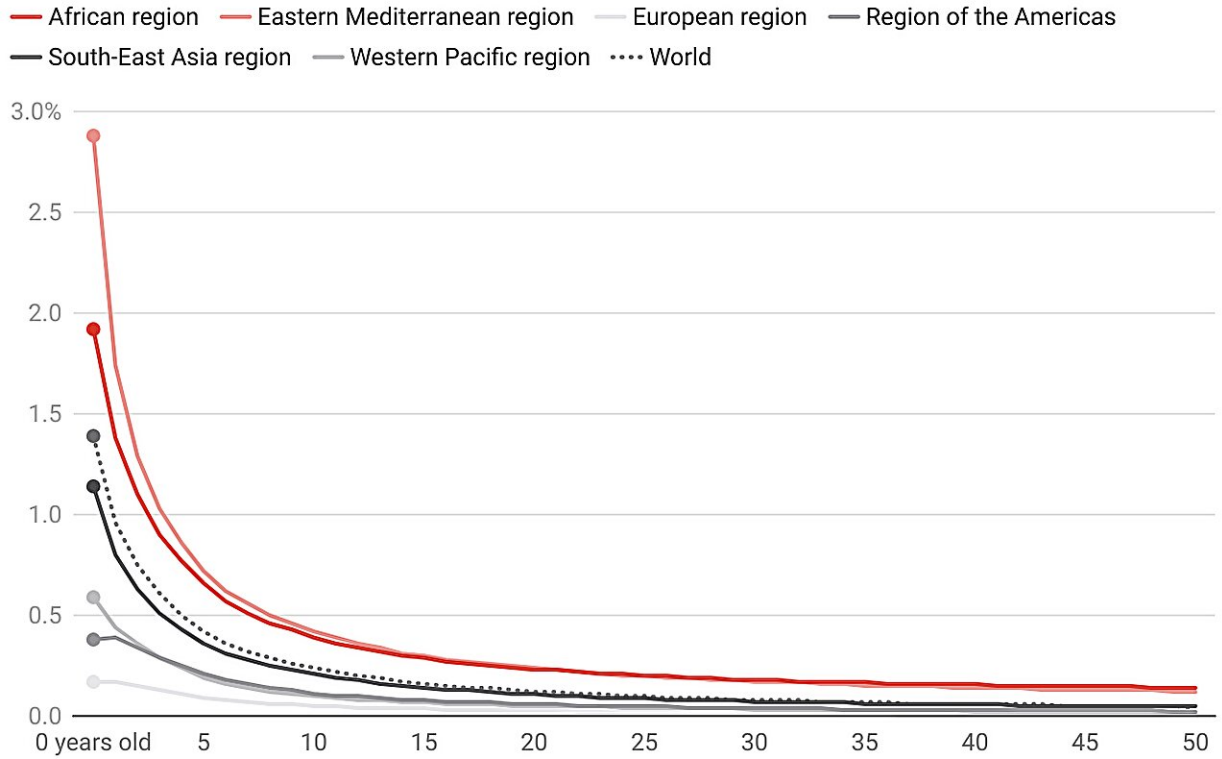
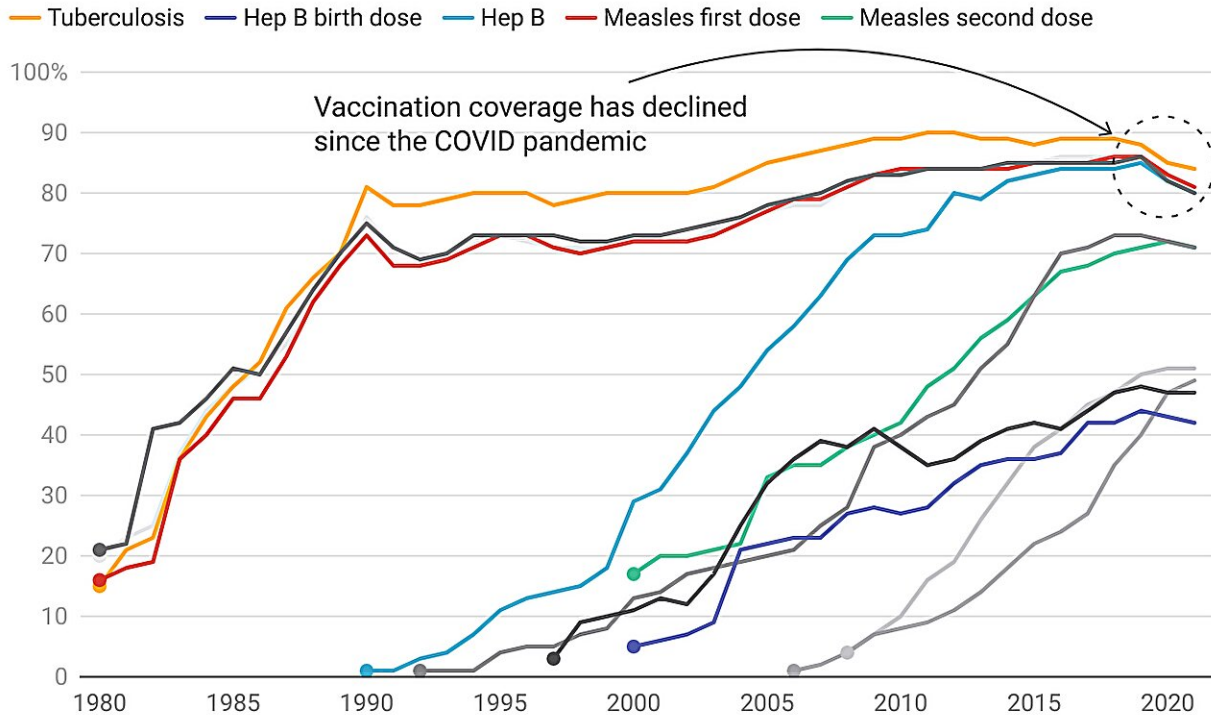


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Global vaccine coverage

While vaccine coverage has made huge strides since the World Health Assembly launched the **Expanded Programme on Immunisation** there has been a recent stall in vaccination coverage growth



DTP=diphtheria–tetanus–pertussis/ PCV=pneumococcal conjugate vaccine.

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In [Australia](#), the coverage for childhood vaccines, including measles, mumps and rubella, has declined compared to before the pandemic.

This study is a reminder of why we need to continue to vaccinate—not just against [measles](#), but against [all diseases](#) we have safe and effective vaccines for.

The results of this research don't tell us the full story about the impact of vaccines. For example, the authors didn't include data for some vaccines such as COVID and HPV (human papillomavirus). Also, like with all modeling studies, there are some uncertainties, as data was not available for all time periods and countries.

Nonetheless, the results show the success of global vaccination programs over time. If we want to continue to see lives saved, we need to keep investing in vaccination locally, [regionally](#) and globally.

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