

Vaccination

Summary

Vaccines are a fantastic global health investment, cost-effectively preventing millions of deadly and debilitating illnesses every year.

The United States is the global leader both in groundbreaking research for vaccine development and for ensuring their delivery to resource-poor countries.

United States leadership in global health requires sustained political and financial support for vaccine development and delivery.



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Overview

- Vaccines are responsible for major public health gains over the last century, leading to the eradication of smallpox and putting diseases like polio and measles on the brink of eradication.
- Vaccines are a great global health investment. A UN calculation projects that the United States recoups the \$23 million it spent on smallpox eradication programs in the latter part of the 20th century once every 26 days because it no longer has to vaccinate against or treat the disease.¹
- Vaccines are fantastic tools for promoting health equity. The past 30 years have seen global vaccination programs drastically reduce diseases like pertussis, diphtheria and Hib meningitis across the developing world, mirroring coverage and prevention rates in high-income countries.² Global mortality attributed to measles, one of the top five diseases killing children globally, declined by 74 percent between 2000 and 2010 thanks to expanded immunization.³
- In spite of these incredible accomplishments, nearly 900,000 children continue to die every year from rotavirus, Hib meningitis, pneumococcal pneumonia and other vaccine-preventable diseases.⁴
- Research and development holds the promise to extend the power of vaccines to other global health challenges such as malaria, tuberculosis and HIV/AIDS.
- Global vaccination programs save lives abroad and protect Americans at home and abroad. Infectious diseases recognize no borders. Through effective immunization efforts, the United States massively reduces the risk that those diseases will cause harm to U.S. citizens and military personnel abroad, as well as become a threat here at home.

Making Progress

- Until recently, new vaccines did not reach people in the developing world until many years after they were licensed in high income countries. Cases of pneumonia and diarrheal disease, which are especially threatening to children, have been greatly reduced due to programs that ensure distribution of new vaccines soon after licensure.⁵

Reported cases of vaccine-preventable diseases over time

	1980	1990	2011	Change 1980-2011
Global population (thousands)	4,424,952	5,275,431	6,930,571	57%
Diphtheria Cases	97,511	23,864	4,887	-95%
Measles Cases	4,211,431	1,374,083	344,276	-92%
Pertussis Cases	1,982,355	476,374	139,382	-93%
Polio Cases	52,795	23,390	716	-99%
Tetanus Cases	114,251	64,983	14,132	-88%

Source: World Health Organization

- A recently released vaccine against the human papillomavirus (HPV) added to global immunization programs has the potential to prevent new cases of cervical cancer in areas where women's access to care is extremely limited.⁶
- **Investments in expanded vaccine delivery in 72 low- and middle-income countries over the next decade are expected to prevent up to 6.4 million child deaths, saving \$6.2 billion in treatment costs and \$145 billion in lost productivity.**⁷
- Promising research has brought us closer than ever to vaccines against HIV/AIDS, malaria, tuberculosis and neglected tropical diseases, such as dengue fever.⁸
- **Research continues to improve upon existing vaccines, minimizing spoilage by reducing their vulnerability to heat⁹ and speeding up their manufacture through cutting-edge processes.**¹⁰

U.S. Response and Strategy

Immunization is woven throughout U.S. history, from mandatory smallpox inoculation of troops in the Continental Army¹¹ to Franklin Roosevelt's founding of the March of Dimes to combat and eventually eliminate polio in the United States.¹² For decades, the U.S. has invested in saving lives around the globe with vaccines through the World Health Organization's Expanded Programme on Immunizations, which has led to global access to DPT3 (diphtheria, pertussis and tetanus) and measles vaccines.¹³ Through USAID investments in the Global Alliance for Vaccines and Immunization (GAVI),¹⁴ a public-private partnership focused on increasing access to immunization in resource-limited countries, the United States has supported efforts that will avert almost 5.5 million vaccine-preventable deaths over the next decade.¹⁵ U.S. support for GAVI averaged \$133 million between 2007 and 2012, heavily outpacing other bilateral contributors.¹⁶ Working in collaboration with Ministries of Health, on-the-ground efforts by the Centers for Disease Control and Prevention (CDC) have strengthened country immunization systems and provided scientific and technical expertise to expand access to immunizations and save lives.¹⁷

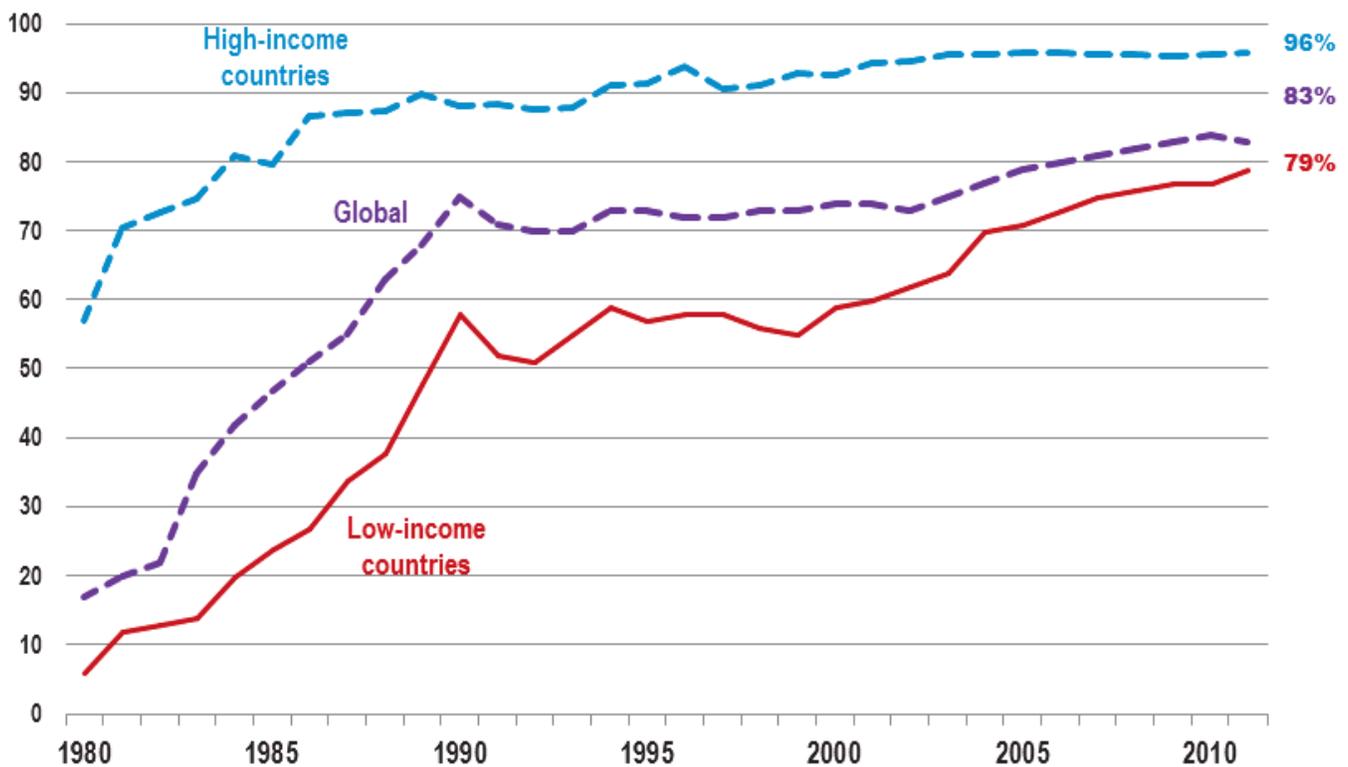
Public sector research investments through the National Institutes of Health (NIH), CDC, USAID, Department of Defense, and the Food and Drug Administration (FDA) have made the United States the foremost global funder of vaccine innovation, with an average annual vaccine R&D investment of \$1.36 billion between 2007 and 2012.^{18, 19} The United States has also leveraged the domestic expertise of the vaccine development industry, enlisting U.S. biopharmaceutical companies in the development of new vaccines against Meningitis A²⁰ and innovative vaccine vial monitors (VVMs) that indicate whether vaccines have been safely stored.²¹

U.S. investments in vaccine development and delivery are necessary not only to continue the battle against infectious diseases in resource-poor regions but also to ensure that those diseases pose minimal threat to U.S. citizens at home and abroad.

Recommendations

- **Congress and the Administration should maintain strong funding levels for global vaccination programs such as the GAVI Alliance through USAID and CDC.** Closing the gap in vaccine coverage will require a continuation of the United States' commitment to global immunization programs, working closely with country partners and other funders to extend the reach of those programs.
- **The Administration should sustain research and development investments in vaccines through the NIH, CDC, USAID, Department of Defense and FDA.** Continued support will be required to transform promising research into the lifesaving vaccines of the future and improve manufacturing and delivery techniques to expand the reach of existing vaccines.

DTP3 coverage 1980-2011, by income



Source: GAVI/WHO

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¹ "Smallpox and its eradication," World Health Organization. <http://whqlibdoc.who.int/smallpox/9241561106.pdf>.

² "Global and regional immunization profile, 2012," World Health Organization. http://apps.who.int/immunization_monitoring/en/globalsummary/GS_GLOProfile.pdf.

³ "Progress in Reducing Measles, Rubella, and CRS Worldwide," The Centers for Disease Control and Prevention. <http://www.cdc.gov/globalhealth/measles/progress/>.

⁴ "Global and regional mortality from 235 causes of death for 20 age groups in 1990 and 2010: a systematic analysis for the Global Burden of Disease Study 2010," Institute for Health Metrics and Evaluation. <http://www.healthmetricsandevaluation.org/gbd/publications/global-and-regional-mortality-235-causes-death-20-age-groups-1990-and-2010-sy>.

⁵ "Vaccines against major childhood diseases to reach 37 more countries," World Health Organization. http://www.who.int/immunization/newsroom/press/vaccines_to_reach_37_more_countries/en/index.html.

⁶ "GAVI recognised for work to accelerate introduction of HPV vaccines in developing countries," GAVI Alliance. <http://www.gavialliance.org/library/news/press-releases/2012/gavi-recognised-hpv-vaccines-in-developing-countries/>.

⁷ "Estimated Economic Benefits During The 'Decade Of Vaccines' Include Treatment Savings, Gains In Labor Productivity," Health Affairs. <http://content.healthaffairs.org/content/30/6/1021.full>.

⁸ "The Vaccine Landscape for Neglected Diseases: A Perspective from the Global Health Primer," BIO Ventures for Global Health. <http://www.bvgh.org/LinkClick.aspx?fileticket=amSwTv7ujUM%3d&tabid=91>.

⁹ "Protecting Vaccines from Extremes," PATH. <http://www.path.org/projects/vaccine-stabilization.php>.

¹⁰ "FDA Approves New Seasonal Influenza Vaccine Made Using Novel Technology," Infection Control Today. <http://www.infectioncontroltoday.com/news/2013/01/fda-approves-new-seasonal-influenza-vaccine-made-using-novel-technology.aspx>.

¹¹ "The History of Vaccines," College of Physicians of Philadelphia. <http://www.historyofvaccines.org/content/timelines/all>.

¹² Oshinsky, David. *Polio: an American Story*. New York: Oxford University Press, 2005. Pg. 65.

¹³ "Expanded Program on Immunization (EPI)," Pan American Health Organization. <http://www.paho.org/english/ad/dpc/cd/imci4-7.pdf>.

¹⁴ "Renewed Commitment to Global Vaccines and Immunizations Will Save Lives," White House Blog. <http://www.whitehouse.gov/blog/2011/06/15/renewed-commitment-global-vaccines-and-immunizations-will-save-lives>.

¹⁵ "Progress Report 2011," GAVI Alliance. <http://www.gavialliance.org/library/publications/gavi-progress-reports/gavi-alliance-progress-report-2011/>.

¹⁶ "A Commitment to Vaccination Index," Center for Global Development. http://www.cgdev.org/files/1426396_file_Glassman_et_al_Vaccination_FINAL.pdf.

¹⁷ "CDC Global Vaccines and Immunizations," The Centers for Disease Control and Prevention. <http://www.cdc.gov/globalhealth/immunization/>.

¹⁸ "A Commitment to Vaccination Index," Center for Global Development. http://www.cgdev.org/files/1426396_file_Glassman_et_al_Vaccination_FINAL.pdf.

¹⁹ "Neglected Disease Research and Development: A Five Year Review," Policy Cures. http://www.policycures.org/downloads/GF2012_Report.pdf.

²⁰ Meningitis Vaccine Project. <http://www.meningvax.org/>.

²¹ "WHO celebrates 10 year anniversary of VVM implementation," The World Health Organization. http://www.who.int/immunization_standards/vaccine_quality/vvm_10years/en/index.html.