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Harvard School of Public Health Study Finds Vaccines Boost Economies of Poor Countries

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BOSTON, MA —Immunization programs in impoverished countries not only save lives, they boost economies, finds a study by researchers with the Harvard School of Public Health (HSPH) published in the current edition of *World Economics*.

The study determined that previous measurements of the benefits of immunization have generally underestimated their economic value by focusing solely on health-related impacts such as averted illnesses, hospitalizations, deaths, disability, and medical costs. The study provides a more thorough investigation of the impacts of vaccination by looking at its effects on cognitive development, educational attainment, labor productivity, income, savings, investment, and fertility. The article is authored by David E. Bloom and David Canning of HSPH, and Mark Weston of River Path Associates, a knowledge consultancy based in the UK.

“Our study finds that the benefits of vaccination have been greatly underestimated. The economic impacts of immunization stem from the fact that immunization protects individuals not only against getting an illness per se, but also against the long-term effects of that illness on their physical, emotional, and cognitive development,” said David E. Bloom, who is Clarence James Gamble Professor of Economics and Demography at HSPH. “When kids grow up healthier, they do better in school and, later, as adults, are more productive, earn more, and save more. Overall, we found powerful new sources of economic returns from immunization.”

The study broadens the analysis of immunization’s benefits by looking at two case studies. The first study estimates the rates of return in a model program of the Global Alliance for Vaccines and Immunization (GAVI) and finds that spending on immunization earns a rate of return of 18 percent. The second case study looks at children born in the Philippines in 1983-84 and compares the IQs of immunized children to their non-immunized counterparts. The study controls for variables such as education yet still finds that immunization is associated with significantly improved scores on IQ, language, and math tests.

Both case studies demonstrate that as well as improving health, vaccines have long-term effects on the development of an individual. These individual effects, which are produced at a remarkably low cost, add up to lasting impacts on economies.

“We found that that the rate of return on investments in immunization is about the same as for primary education, which also increases the wages of children when they enter the workforce,” said David Canning, Professor of Economics and International Health at HSPH. “But this was just one component of the rates of return on vaccination. If we had calculated the value of savings, averted medical costs, welfare benefits associated with averted deaths or other effects—

in addition to productivity gains—vaccination would likely blow the socks off other forms of development aid. The returns on investment in vaccination are at least as large, and possibly much larger, than the returns on basic education.”

The new information on the economic returns of vaccination is particularly timely in light of the just-announced International Finance Facility for Immunization (IFFIm). Through IFFIm, the United Kingdom, France, Italy, Spain, and Sweden committed nearly US\$4 billion to support and scale up the work of the GAVI over the next decade.

The Harvard study on immunization investment was funded by GAVI.

Methodology

Case Study 1 - The Global Alliance for Vaccines and Immunization

The study carried out an analysis of GAVI’s program to extend the use of the traditional basic childhood vaccination package; increase coverage of the under-used Hib, hepatitis B, and yellow fever vaccines; and help finance the introduction of anticipated vaccines covering pneumococcal disease, rotavirus, and meningococcal A/C conjugate. The model case is a program that costs \$638 million in 2005, rising to around \$748 million in 2020. The study estimates the rates of return on one of GAVI’s prospective investments and finds that:

- The rate of return is estimated to be 12.4 percent in 2005, rising to 18 percent in 2020 as coverage increases and vaccine costs decline.

- Children born in 2005 are projected to earn 0.78 percent higher wages on average, while those born in 2020 will receive 2.39 percent higher wages when they start working, with the increase over time being due to higher coverage rates as the program rolls out.

Case Study 2 - Philippines Study

This analysis examined the effects on children’s cognitive development of efforts in the Philippines to immunize children with DTP, TB, polio, and measles vaccines. Cognitive development is an important determinant of adult earnings. The study involved a sample of 1,975 children from a longitudinal survey of Filipino women and their children born in the year following 1 May, 1983.

The researchers compared the test scores of children who had received the basic six vaccines (DTP, polio, measles, and TB) in the first two years of life with those who had received no vaccinations. They controlled for other variables that might also affect test scores. They found that immunization was associated with significantly improved scores on IQ, language, and mathematics tests. The effect was stronger for IQ and language than for mathematics.

Harvard School of Public Health is dedicated to advancing the public's health through learning, discovery, and communication. More than 300 faculty members are engaged in teaching and training the 900-plus student body in a broad spectrum of disciplines crucial to the health and well being of individuals and populations around the world. Programs and projects range from the molecular biology of AIDS vaccines to the epidemiology of cancer; from risk analysis to violence prevention; from maternal and children's health to quality of care measurement; from health care management to international health and human rights.

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