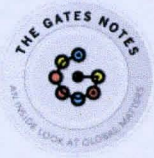


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Vaccine Miracles

Bill's Annual Letter: Vaccine Miracles

Posted 02/16/2011

Global vaccination programs and vaccine research fight disease and save millions of lives. In his 2011 letter as co-chair of the Bill & Melinda Gates Foundation, Bill explains how vaccines can ultimately help eradicate poverty and overpopulation, boost education and protect the environment.

In the same way that during my Microsoft career I talked about the magic of software, I now spend my time talking about the magic of vaccines. Vaccines have taken us to the threshold of eradicating polio. They are the most effective and cost-effective health tool ever invented. I like to say **vaccines are a miracle**. Just a few doses of vaccine can protect a child from debilitating and deadly diseases for a lifetime. And most **vaccines are extremely inexpensive**. For example, the polio vaccine costs 13 cents a dose.

This year 1.4 million children will die from diseases for which there are already vaccines—diseases like measles, pneumonia, and tetanus. Those lives can be saved if we can reduce the costs of vaccines and raise enough money to buy and distribute them. If we simply scale up existing vaccines in the five countries with the highest number of child deaths, **we could save 3 million lives** (and more than \$2.9 billion in treatment costs alone) over the next decade. In addition, researchers are inventing new vaccines for malaria, AIDS, and tuberculosis, and these would save millions more lives. But generous aid is required to realize the true lifesaving potential of vaccines. The most direct way of saying this is that **every \$2,000 cut in the most effective aid spending causes a child to die**.

A few years ago I was looking into the history of vaccination coverage. In 1980 less than 20 percent of children worldwide received the vaccinations for diseases including measles, diphtheria, tetanus, and whooping cough (pertussis) that children in rich countries were receiving. Less than 15 years later, in 1995, vaccination rates had been raised to over 70 percent. Just this year I finally got around to learning why there was such a huge increase. The head of **UNICEF** at the time, Jim Grant, led the way. The book Jim Grant—UNICEF Visionary tells his amazing story. Since there are only a few used copies of this in circulation UNICEF recently made a free version available [here](#).

I'm surprised by how little attention his story gets and how long it took me to find out about it. I was inspired by reading how he drove global progress even during the tough economic decade of the 1980s. We can draw lessons from his leadership now, in our own tough economic times.

As is often the case with courageous efforts, many people resisted Jim Grant's push, viewing it as too top-down. However, he managed to enlist a number of countries to lead the way, and **as the number of deaths in those countries dropped dramatically he was able to persuade almost every country to run strong vaccination campaigns.** It is especially amazing that he did this in an age when there was no Internet and no email. Jim Grant's achievement is the greatest **miracle** of saving children's lives ever.

The benefits of widespread vaccination are mostly explained in terms of the **lives vaccines save, and based on that measure alone, vaccines are the best investment to improve the human condition.** However, there are two other equally important benefits that are not as widely known partly because they are harder to quantify.

The first is the reduction in sickness. I don't mean just the acute sickness where a child is clearly suffering from the disease, but also the permanent disabilities caused by the disease. This is most noticeable when the disability presents with a clear symptom such as being paralyzed by polio or going deaf because of a pneumococcal infection. However, the largest disability is the effect on mental development. For example, severe cerebral malaria damages your brain even if you survive. When children have lots of diarrheal episodes or parasites in their intestines, they don't get enough nutrition for their brains to develop fully.

The **huge infectious disease burden in poor countries** means that a substantial part of their human potential is lost by the time children are 5 years old. A group of researchers at the University of New Mexico conducted a study, covered in The Economist, showing the correlation between lower IQ and a high level of disease in a country. Although an IQ test is not a perfect measure, the dramatic effect you see is a huge injustice. It helps explain why countries with high disease burdens have a hard time developing their economies as easily as countries with less disease.

The second great benefit of vaccination is that as the childhood death rate is reduced, within 10 to 20 years this reduction is strongly associated with families choosing to have fewer children. **While it might seem logical that saving children's lives will cause overpopulation, the opposite is true.**

I mention this amazing connection often, since I remember how I had to hear it multiple times before the full implications of it became clear. It is the reason why childhood health issues are key to so many other issues, **including having resources for education, providing enough jobs, and not destroying the environment.** Only when Melinda and I understood this connection did we make the full commitment to **health issues, especially vaccination.**

The connection of health to education, jobs, and the environment points back to the tremendous value of high-quality international aid—and why it's essential that donor nations not cut their spending on it. Melinda and I have committed \$10 billion from the foundation over the next 10 years to help make this the Decade of Vaccines. However, this will fall well short of what is needed.

The group which helps poor countries purchase vaccines and increase vaccine coverage is the GAVI Alliance and like the polio campaign its success will depend on donor generosity.