

## Fear and the deadly return preventable childhood diseases

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Vaccinations represent one of the greatest achievements of biomedical science and public health. Over the past century, the marriage of clinical medicine and programs of population-wide vaccinations have resulted in the elimination of polio in the Americas and the control of measles, mumps, diphtheria, and other infectious diseases in the United States and other parts of the world.

Indeed, with the sole exceptions of improved sanitation and clean drinking water, no public health measure has enhanced the lives of more Americans than the widespread adoption of vaccinations. The New England Journal of Medicine recently reported that an estimated 103 million cases of childhood diseases have been prevented since 1924 by eight vaccines, including 26 million cases prevented in the past decade alone.

Moreover, the Centers for Disease Control and Prevention estimates that every dollar currently spent on vaccines and their administration yields \$10 in benefits to society in averted illnesses, clinical care and hospitalization, and premature death and disability.

Despite this remarkable track record of progress, multiple resurgences of measles, rubella, mumps, and pertussis have occurred over the past decade, causing needless illness, suffering, and death. In 2012, the largest pertussis outbreak since 1959 was reported in the US, with nearly 50,000 cases reported nationwide – pertussis or whooping cough is a highly infectious respiratory illness that causes convulsive coughing for weeks and can be fatal to infants. So far in 2014, the CDC has reported a dozen measles outbreaks – the most since 1996.

A key culprit in these outbreaks is the growing numbers of parents either delaying or refusing to vaccinate their children – a trend due in no small part to the constant barrage of misinformation peddled by “anti-vaxxers” challenging the safety and efficacy of vaccines. With vaccination rates falling, numerous diseases once close to eradication are making a deadly comeback.

Fear, mistrust, and opposition to vaccinations have been with us since Edward Jenner’s successful use of cowpox to create immunity to smallpox in the late 18<sup>th</sup> century – an innovation that eventually led to the eradication of smallpox and the birth of modern mass vaccination campaigns.

Today's opposition to vaccinations, however, represents a willfully dangerous misreading of the scientific evidence on vaccine safety and efficacy – a deadly trend compounded by innate American distrust of government agencies charged with testing, licensing, and recommending vaccines, and cynicism about pharmaceutical corporations who produce and market vaccines.

Overcoming this toxic brew requires renewed commitment by the medical community to address parental concerns about the value of immunization and communicate scientific evidence within the context of trusting clinician–parent relationships. A broader public education campaign on matters of basic scientific literacy at all educational levels will also be needed if we are to ever address the unfounded fears of vaccines.

Science writer Michael Specter warns that by choosing not to vaccinate their children, parents are not protecting them from autism and other feared risks of vaccines. “They are simply putting their children – and the children of their neighbors – at greater risk of contracting diseases that could send them to the hospital or worse.”

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