Investment in research saves lives and money

facts about:

Vaccines

Today

- An estimated 1.5 million people died globally from vaccine-preventable diseases in 2013.¹
- In 2014, 667 cases of vaccine-preventable measles were recorded in 27 U.S. states, a concerning resurgence after measles was declared eliminated from the U.S. in 2000.¹
- The 48,000 reported cases of vaccine-preventable whooping cough in the U.S. in 2012 was the highest prevalence in over 50 years.¹
- In 2015, 72.2% of children in the U.S. between 19 and 35 months had received the complete vaccine series that protects against measles, mumps, rubella (MMR), diphtheria, tetanus, whooping cough (pertussis) (DTaP), hepatitis A and B virus, and rotavirus.*

* WORLD HEALTH ORGANIZATION <WWW.WHO.INT>
† CENTER FOR DISEASE CONTROL AND PREVENTION <WWW.CDC.GOV>
‡ PHADKE, VK ET AL. JAMA, 2016. 315: 1149-1158

The Cost

- The U.S. economic burden of vaccine-preventable diseases in 2015 was $9 billion, 80% of which can be attributed to unvaccinated individuals.*
- In 2011, there were 16 individual outbreaks of measles in the U.S., each of which cost local and state public health institutions between $2.7 million and $5.3 million to address.⁰
- In the U.S., vaccine-preventable pneumococcal disease among adults over 50 has an economic burden of $5.5 billion in combined direct and indirect costs annually.⁰

* ORTEGA-SANCHEZ IR ET AL. VACCINE, 2014. 32: 1311-1317.
† OZAMA S ET AL. HEALTH AFF, 2016.
‡ WEYCKER, D ET AL. VACCINE, 2010. 28: 4955-4960.

How research saves lives:

- Vaccines currently prevent up to 3 million deaths per year worldwide.*
- For thousands of years smallpox was one of the major health threats in the world, killing 300 million people in the 20th century alone. However, due to the development of an effective smallpox vaccine and widespread vaccinations, smallpox was successfully eradicated in 1980.*
- In the late 1940s and early 1950s, polio crippled approximately 35,000 people annually. Thanks to the polio vaccine, the U.S. has been considered polio-free since 1979.†
- Between 2010 and 2012, the seasonal flu vaccine reduced the risk of hospitalization for seniors by 57% and flu-related pediatric intensive care admissions by 74%.‡

How research saves money:

- Vaccinations among Americans born in the last 20 years will prevent 322 million illnesses, 21 million hospitalizations, 732,000 fatalities and $1.4 trillion in direct and indirect costs over the course of their lifetime.¹*
- Among those Americans born in 2009 alone, the savings associated with avoided illnesses results in $10 saved for every $1 spent on vaccine use.*
- If every American received the recommended vaccinations, 33,000 deaths, 14 million illnesses and $43.3 billion in direct and indirect costs would be avoided annually.†
- Between 2020 and 2030, an AIDS vaccine could prevent 5.2 and 10.7 million new HIV infections, saving between $46 billion to $95 billion from the averted costs of current HIV/AIDS treatments alone.*

† C. D. C. (2016). "Vaccines." <WWW.CDC.GOV>

Saving Lives
Saving Money

Perspective:

NAME: Peter Hotez, M.D Ph.D.
TITLE: Dean for the National School of Tropical Medicine, Baylor College of Medicine; President, Sabin Vaccine Institute

For the past 30 years, Dr. Peter Hotez has been at the forefront of vaccine and neglected tropical disease (NTD) research. He currently serves as president of the Sabin Vaccine Institute and is also the Dean for the National School of Tropical Medicine and professor of pediatrics at Baylor College of Medicine and an endowed chair in tropical pediatrics at Texas Children’s Hospital. Over his career, Dr. Hotez has authored over 400 original papers, co-founded the Global Network for Neglected Tropical Diseases which has led to treatments of more than 400 million people for their NTDs, and authored two books, including the recently released 'Blue Marble Health: An Innovative Plan to Fight Diseases of the Poor amid Wealth' (Johns Hopkins University Press). Since 2015, Dr. Hotez has served as United States Science Envoy for the State Department and White House Office of Science and Technology Policy.

Through the Sabin Vaccine Institute Product Development Partnership (PDP) at Texas Children’s Hospital in the Texas Medical Center in Houston, Dr. Hotez, together with Dr. Maria Elena Bottazzi, led research into the development of vaccines for NTDs such as Chagas disease, leishmaniasis, schistosomiasis, hookworm, and coronavirus infections (SARS and MERS). NTDs affect more than one billion people worldwide, and there is an urgent need for effective vaccines to treat these diseases. Currently, the Sabin Vaccine Institute is conducting clinical trials to study the safety and efficacy of vaccines to combat hookworm infection and schistosomiasis. The Sabin PDP is also exploring the development of new vaccines to address neglected diseases endemic to the state of Texas, where the institute is located.

In the U.S., and across the world, vaccines are a critical tool in preventing deadly and disabling diseases. Dr. Hotez explains the need for continued research coupled with increased vaccine utilization: "It is important that we expand the use of existing interventions while in parallel doing R&D to develop new and improved control tools, diagnostics, drugs and vaccines. You have to do both. If you just do one without the other, the impact will be far less. We need a parallel, two-system approach to maximize the use of existing interventions but keep that R&D pipeline going."
Hope for the Future:

- A Pfizer-developed *Staphylococcus aureus* vaccine, currently in phase II clinical trials, could aid in decreasing the nearly 300,000 hospitalizations that are caused by staph infections each year.*

- A large-scale phase III clinical trial of an HIV vaccine was approved this past July and is slated to begin in November. The trial is a follow-up to the groundbreaking clinical trial from 2009 led by the U.S. Military HIV Research Program in which this vaccine was the first successful attempt to provide protection against HIV through vaccines.†

- Early research at Emory University and the Yerkes Primate Center for a common cold vaccine took a major step forward when researchers were able to create an antibody capable of binding to and helping build immunity against 50 different forms of human rhinovirus, the cause of the common cold.‡

- Fast-tracked NIH-funded Zika vaccine research has produced a promising DNA vaccine. In preliminary testing, the vaccine protects against infection after exposure to the Zika virus.¶

The Bottom Line:

Vaccines are proven to prevent a host of deadly and disabling diseases, saving lives and treatment costs. The U.S. should invest in research on development of vaccines, which will improve the health of Americans and people worldwide.

Percentage of children (6 months-17 years) who received their Seasonal Influenza Vaccine, 2015-2016

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†Kowd DA et al. Science, 2016; 354: 237-240
‡Giersing BK et al. Vaccine. 2016; 34: 2962-2966
§National Institute of Health <www.nih.gov>