Tuberculosis (TB) is one of the world’s leading causes of death and, despite being curable, remains a major public health threat. TB is a bacterial infection that can exhibit with or without symptoms while contagious. Multidrug-resistant TB (MDR-TB), a quickly growing global health threat, does not respond to the two best anti-TB drugs available, and extensively drug-resistant TB (XDR-TB) does not respond to the majority of available TB treatments. Due to our increasingly globalized world, TB remains a significant concern for our nation, especially in its drug resistant forms.

Today:
- One-third of the world’s population is infected with TB.¹
- In 2014, 9.6 million people became newly infected and 1.5 million people died of TB globally, surpassing the death rate of HIV.²
- In 2014, 9,412 new cases of TB were reported in the U.S.³
- An estimated 3.5% of new and 20.5% of previously treated TB infections were MDR, totaling 480,000 cases of MDR-TB worldwide in 2014.⁴
- It is estimated that only about 25% of people globally with MDR-TB are identified.⁴
- In the U.S., 63 cases of XDR-TB, the most dangerous form of TB, were reported between 1993 and 2011.⁴

**HOW RESEARCH SAVES LIVES:**
- Between 1992 and 2013, the number of TB deaths reported in the U.S. dropped by 69%. Additionally, an estimated 43 million lives were saved worldwide between 2000 and 2014. These impressive gains are due in part to improved diagnostic techniques that allow individuals with TB to be identified and treated before it becomes life threatening or spreads to other individuals.⁵
- The global incidence of TB has fallen on average 1.5% annually since 2000. Higher prevention treatment completion rates, using new, shorter regimens, means future cases of TB disease are avoided. ⁶
- Since 1995, 46 million people infected with TB have been successfully treated, and up to 6.8 million lives have been saved through directly observed therapy short-course (DOTS) internationally. The future effectiveness of the DOTS strategy hinges on research to advance lifesaving therapeutics, develop sensitive and accurate diagnostics, and carry out monitoring and analysis to confirm success.⁷
- A TB vaccine that was 60% effective and administered to just 20% of the at-risk population would avoid as many as 50 million new cases of TB by 2050.⁷

**HOW RESEARCH SAVES MONEY:**
- It is estimated that full establishment of the DOTS strategy would cut a country’s TB-related economic burden in half. ⁸
- Research published in 2015 concluded that testing several TB diagnostic samples at once, and then testing samples individually only if the group tests positive, cut variable costs by approximately 30% without sacrificing accuracy. Additionally, the staff burden of conducting the tests was cut by 60%, saving both time and money.⁹

**The Cost:**
- MDR-TB infections are estimated to increase the cost of care by more than hundredfold compared to individuals with non-drug resistant TB. Costs can reach up to $250,000 to treat a single individual with MDR-TB.³
- It is projected that drug resistant TB will kill 75 million people and cost $16.7 trillion globally by 2050.³
- On average, a TB-infected individual will lose three to four months of work and up to 30% of their income per year.³
- It is estimated that researching and developing a TB vaccine would cost just 1% of the current direct medical costs associated with TB globally.³

* CENTERS FOR DISEASE CONTROL AND PREVENTION <WWW.CDC.GOV>
* STOP TB PARTNERSHIP <WWW.STOPTB.ORG>
* WORLD HEALTH ORGANIZATION <WWW.WHO.INT>

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**Survivor:**

**NAME:** Scarlett Fritschy  
**AGE:** 4  
**CONDITION:** Tuberculosis

When Carrie Fritschy’s daughter, Scarlett, became sick at 18 months old, Carrie never imagined that it would take nearly five months to determine that tuberculosis (TB) was the cause of her illness. Scarlett’s doctors tested for Kawasaki disease, mononucleosis, pneumonia, and many other infections. The day they tested Scarlett for TB, one pediatrician who looked at her chest x-rays thought it looked like “chronic lung disease.” Her doctors were surprised when they found that she was positive for active TB.

That day, the Colorado Public Health Department ushered Scarlett to Children’s Hospital Colorado in Denver to begin treatment. After six months of intensive treatment, Scarlett was back to her healthy, playful self.

Carrie, who took six weeks off from work to care for Scarlett, refers to the treatment period as “lonely.” “There was nobody else that we could talk to who had gone through this before,” she said. “And even though Scarlett’s TB was not contagious, people were understandably nervous about being around us.” Carrie now volunteers for the National Tuberculosis Controllers Association and works to create a community of TB survivors as a support network for individuals and families dealing with TB. Her work helps to fill the gap for almost 10,000 new TB patients annually in the U.S. who otherwise wouldn’t have any social support.

After going through this year-long experience, Carrie stresses that more needs to be done to stop TB. “We need better diagnostics, we need better treatments, we need a vaccine, we need something to eradicate this,” she said. “Fortunately for Scarlett, she was able to be treated and lived, but 1.5 million people globally died of TB last year and it’s not acceptable when it can be cured if detected and treated appropriately.”
Hope for the Future:

The National Institutes of Health (NIH) continues to be the largest funder of TB research and development internationally, contributing on average 54% of the total investments. In 2014, the NIH invested $279 million in TB basic and clinical research to better understand the infection and develop effective interventions and diagnostic tools, and $31 million in funding to pursue a TB vaccine.

GlaxoSmithKline and Aeras began conducting a randomized, double-blind, phase II clinical trial in 2015 to evaluate the effectiveness of their vaccine candidate meant to prevent TB infections in adults. While there is a vaccine currently available, Bacille Calmette-Guerin (BCG), it is only recommended for children who are continuously exposed to TB and select healthcare workers. BCG provides a limited amount of protection, preventing childhood tuberculosis and miliary disease. A vaccine that could provide protection across the spectrum of TB infections for individuals of all ages is the first step towards complete eradication of this deadly disease.

With a survival rate of 30-50%, XDR-TB treatments are extremely limited. Treatment often spans more than two years and can cost hundreds of thousands of dollars for a single patient. The TB Alliance and Janssen Pharmaceuticals have begun the first clinical trial to test a novel treatment for XDR-TB, Nix-TB. If successful, this three drug regimen would provide a treatment for XDR-TB in 6 months or less and would be an affordable, more effective alternative to treat this deadly disease.

The Bottom Line:

TB is a deadly infectious disease that affects one-third of the world. To address the global TB epidemic, the U.S. must sustain investments in research to develop fast and accurate tools for diagnosis, new shorter and less toxic treatments to combat drug-resistant forms of TB, and a vaccine that provides full protection for both children and adults.