

Lesson 1 Build a Better World

Two Heroes Who Fought a Deadly Disease

One evening in late November 1932, a bitterly cold wind blows fiercely as two figures emerge from a laboratory. Darkness begins to fall as they set out into a world of failed banks, collapsed industry, and widespread despair—a world ruined by three years of the Great Depression. The workday has come to an end, but for Pearl Kendrick and Grace Eldering, a different kind of work is about to begin. They are on their way to visit the homes of children suffering from a deadly disease called pertussis. The two women go from home to home collecting samples from the sick children by the faint light of their lamps. They listen to the tragic stories of desperate and unemployed parents as the children, coughing uncontrollably and struggling to breathe, barely hold on to life. When we think about science, we might consider it as a domain reserved exclusively for scientists in long, white lab coats who spend their days conducting experiments and analyzing data. They seem to have very little in common with ordinary people like us. However, this perception is far from the truth. In reality, science belongs to everyone, and we all have the ability to play a role in the advancement of science.

There have been numerous citizen science projects in which ordinary people have made contributions to remarkable scientific accomplishments. Let's take a look at two of them.

Pertussis is a bacterial disease characterized by serious coughing, breathing difficulties, and the high-pitched "whooping" sound that people with the disease make as they try to breathe in. Because of this distinct sound, people started to call the disease "whooping cough." For a long time, this terrible illness was one of the greatest terrors of families with young children, because babies who contracted it had a high chance of dying. In the 1930s, an average of 6,000 people died of whooping cough in the United States each year. Ninety-five percent of them were children under five years of age. The cause of the disease had been identified in 1906, but the vaccines that had been developed were ineffective. Scientists and researchers worked for more than 20 years to produce an effective one, but their efforts were fruitless — until Kendrick and Eldering came along.

Pearl Kendrick studied bacteriology in university and was recruited by the Michigan Department of Health in 1920. It was there that she met fellow bacteriologist Grace Eldering. The two quickly bonded, and in 1932 they started working together on a vaccine for whooping cough. Personal experience served as motivation for both of them, as they had each survived whooping cough as children themselves and remembered the severe pain of the disease. Both scientists were also eager to promote children's health.

Unfortunately, research funding was extremely limited due to the Great Depression. Also, Kendrick and Eldering had to develop the vaccine as a side project. It was like having a second job for which they never received any payment. Still, when they finished their normal duties each day, they would get started on the work that they were enthusiastic about. The difficulties they faced did not stop them from persisting toward their goal. They did not do the work to make extra money; instead, they worked to relieve the suffering of innocent children and their families.

They began the process of developing their vaccine by gathering samples of the bacteria that cause whooping cough. To support them, local doctors and nurses provided "cough plates" from their patients. The patients coughed onto a petri dish, which was then put into an incubator. This allowed the bacteria to grow into colonies that Kendrick and Eldering could analyze. When they collected samples on their own, they would go to the homes of sick children. Each time, they were reminded once again of the dreadful suffering caused by the disease. The sight of these innocent young victims coughing and struggling to breathe was a powerful reminder of the urgent need for an effective vaccine.

Kendrick and Eldering spent many long nights studying the bacteria and finally produced a potential vaccine. Before they performed any clinical trials, though, they had to be certain that it would not have any negative side effects on the subjects. They ran many laboratory tests, and they even injected it into themselves to confirm that it was safe. From 1934 to 1935, they conducted their first field test with 1,592 children. In the group of 712 vaccinated children, only four developed whooping cough, and none of these cases were serious.

Despite the apparent success of the vaccine, Kendrick and Eldering wanted further confirmation of its effectiveness. They became determined to expand their research and run more tests with larger groups of children. However, they were unable to proceed because they were facing a severe lack of funds. With thousands of children continuing to suffer from the disease, they found themselves in a desperate situation.

Luckily, they got help from an unexpected figure. In 1936, First Lady Eleanor Roosevelt herself visited the laboratory and saw with her own eyes the efforts that Kendrick and Eldering were making in their battle against whooping cough. Eleanor Roosevelt, whose husband suffered from polio, was interested in fighting infectious diseases. She spent time with the women and came to realize the enormous importance of their work. With her help, Kendrick and Eldering were able to secure enough funding to conduct a large-scale trial.

By 1937, Kendrick and Eldering were able to include more than 4,200 children in their trial. Just as in their first field test, the vaccinated group demonstrated a high level of immunity against the disease. The scientific community was amazed at the results, and, in 1940, the vaccine started being distributed all across the United States. Four years later, it was added to the American Medical Association's list of recommended immunizations, and soon after, there was a dramatic decline in whooping cough infections. In the mid-1970s, the number of annual deaths caused by whooping cough, which had reached 7,518 in 1934, dropped to under 10. Kendrick and Eldering were often told that they could have become very wealthy if they had patented their vaccine. However, they replied that it had not been created by them alone, but with the help of many others. They also avoided personal interviews, not wanting to reveal the great contribution they had made. They said that they had genuinely enjoyed the challenge of creating the vaccine, so the excessive praise that they received made them uncomfortable. In the end, knowing that so many lives were being saved thanks to their hard work was enough of a reward for these remarkable and modest heroes.