

Video: Hygiene Hypothesis

Millions of people suffer from the sneezing and wheezing of allergies and asthma, diseases that have suddenly become epidemic in some parts of the world. Initially, scientists blamed increasing air pollution for the surge in respiratory diseases.

In the late 1990s, Dr. Erika Von Mutius, a health researcher, compared the rates of allergies and asthma in East and West Germany. Her hypothesis was that children growing up in the poorer, dirtier, and generally less healthful cities of East Germany would suffer more from allergy and asthma than youngsters in West Germany, with its cleaner and more modern environment.

When the two regions were reunified in 1999, von Mutius compared the disease rates. "What we found was exactly the opposite" of her hypothesis, she recalls. Children in the polluted areas of East Germany had lower allergic reactions and fewer cases of asthma than children in the West. What was going on? As sometimes happens to scientists, von Mutius was forced to abandon her original hypothesis and rethink the question based on her new observations.

For one thing, von Mutius realized, there are many lifestyle differences between the former two Germanys, including family size and the more prevalent use of daycare for young children in East Germany. Today, her new hypothesis, dubbed "The Hygiene Hypothesis," is that children who are around numerous other children or animals early in life are exposed to more microbes, and their immune systems develop more tolerance for the irritants that cause asthma. She is now researching the levels of allergy and asthma in children who live in villages as compared with children who live on a farm and are exposed to livestock.

According to this "hygiene hypothesis," the human immune system evolved two types of biological defenses. When one defensive system lacks practice fighting bacteria and viruses, perhaps from an overly sanitary lifestyle, the other system becomes too powerful and overreacts - as an allergic reaction -- to harmless substances like pollen.