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This week's issue:

ASTHMA: MORE THAN A MEDICAL PROBLEM?

Asthma is a respiratory disease that makes breathing difficult. Sometimes it is connected to plant and animal allergies. Asthma is not a contagious illness; it cannot be **transmitted** from person to person. Instead, asthma is a health condition that is triggered by environmental factors, such as indoor and outdoor pollutants that make the air dirty. But health experts are noticing a new **phenomenon**. Asthma appears to be getting worse in low-income, urban areas, affecting more and more children who live there.

Studies of rich and poor neighborhoods have shown big differences in asthma rates. In 2010, the low-income Bronx area of New York City—where 43% of children live in poverty—had the highest rate of child asthma. Out of every 10,000 children, 91 were hospitalized for asthma. The wealthiest region, Staten Island, had the lowest rate: only 22 cases per 10,000 children. Many asthma triggers like mold and cockroaches are far more common among low-income residential buildings. Factories, power plants, and other industrial facilities are major contributors to another asthma trigger: air pollution. Many poor residential communities are located near these industrial areas.

Low-income families often have little choice in where they live, so they may not be able to protect their children from power plants, factories, and traffic. But one major source of asthma that parents can control is smoking. Children who grow up in households where someone smokes are much more likely to develop asthma, and secondhand smoke is a trigger for acute, or severe, asthma attacks. There are many laws against smoking in public places, but people are free to smoke in their own homes. Asthmatic children frequently end up in emergency rooms to receive breathing **interventions** simply because their parents are unwilling to **suspend** smoking at home or in the car. Why don't these parents make asthma prevention a **priority**? Should there be a law against smoking in any confined space where children are present, even at home?

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DO THE MATH

There was a dramatic increase in the asthma rate in the 1980s and 1990s. Today, about 14% of children in the U.S. have been diagnosed with asthma. Researchers have been working to understand this **phenomenon**. Asthma is a complicated illness. Unlike HIV or the common cold, it is not **transmitted** from person to person. Rather, doctors think a combination of genetic factors and environmental factors, like pollution, determine who gets asthma. Asthma attacks can be life-threatening, and treating asthma is expensive. For these reasons, some say fighting asthma should be a national **priority**. But how can we fight asthma? Realistically, we cannot **suspend** all activities that cause pollution. To plan effective **interventions** we need to know which groups are most affected. Here are some statistics:

- 16% of boys have been diagnosed with asthma, as compared to 12% of girls
- 19% of children from poor families have been diagnosed with asthma, as compared to 12% of children from families that are not poor

Option 1: According to these statistics, which of the following groups would you expect to have the highest asthma diagnosis rate?

A. girls from poor families
B. girls from non-poor families
C. boys from non-poor families
D. boys from poor families

Option 2: Two boys are chosen at random. According to the statistics given above, what is the likelihood that they both have asthma?

Discussion Question: Childhood asthma places a real burden on families. An asthma attack is a frightening **phenomenon**. Normal life is **suspended** when a child suffers an attack, and helping the child breathe becomes the family's **priority**. Sometimes, using an inhaler helps relieve the symptoms. Other times, a more serious **intervention** is necessary, like a doctor visit or a hospital stay. Doctors and social workers try to **transmit** up-to-date medical knowledge to families to help them avoid asthma triggers like mold, pollen, and cigarette smoke. Should families pay for these kinds of services themselves? Or are the government and companies that pollute the air responsible? What about families that can't afford to pay?

UNIT 1.14

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THINK SCIENTIFICALLY

The students in Mr. Seemy's class are talking about air pollution because Victor is concerned about his asthma acting up. He has a track meet after school, but the pollution has been particularly bad this week.

"Smog is definitely one of the main triggers for my asthma, so I have to be careful," says Victor. "It's a hassle. I love competing, but I have to pay close attention to my breathing, **suspend** strenuous activity like sports if I start to have any trouble breathing, and be prepared to intervene by using my inhaler. It usually works out okay, but I wish people would do more to keep the air clean."

"I've heard that air pollution not only triggers asthma attacks for some people with asthma, it can also cause more people to develop asthma in the first place," says Jorge. "It's more than just a medical **phenomenon**, it's a social injustice because some people can't afford to move out of polluted areas and into more expensive neighborhoods with cleaner air."

"Yeah," says Victor. "There was a study done in Southern California where they looked at kids who live in communities with different levels of ozone pollution from traffic. Among kids who play a lot of sports, the ones living and going to school in places with more ozone were three times more likely to develop asthma than the ones in less polluted neighborhoods."

"Three times more?" said Jorge. "Man, it seems like it would be healthier to just not exercise if you live or go to school near a freeway. Who wants to develop asthma if you can avoid it?"

"No way," said Victor. "Air pollution is a problem, but exercise is a **priority** if you want to stay healthy."

With Mr. Seemy's encouragement, Victor and Jorge found a press release about the study Victor remembered from the California Environmental Protection Agency's Air Resources Board and the University of Southern California. Here is an excerpt from the press release:

Previous evidence has shown that ozone, one of the most health-damaging air pollutants, can aggravate existing cases of asthma. The new ARB-USC study, however, points strongly to ozone as a cause in the development of asthma in young people who did not previously have the disease.

The study compared new asthma cases in 3,535 children who were followed over five years in 12 Southern California communities to determine the potential health damage caused by growing up in polluted air. Six of the communities had higher than average ozone concentrations while six had lower than average concentrations.

Researchers further refined the study by looking at children who played up to three team sports. The study showed that children in the high ozone communities who played three or more sports developed asthma at a rate three times higher than those in the low ozone communities. Because participation in some sports can result in a child drawing up to 17 times the "normal" amount of air into the lungs, young athletes are more likely to develop asthma.

Data Source: http://www.arb.ca.gov/newsrel/nr013102.htm

Based on the press release excerpt above, does this study make any recommendations about how much exercise children in polluted communities should get?

*Who do you think is right: Jorge, who thinks children in polluted communities should exercise less to avoid developing asthma; or Victor, who thinks exercise is a health **priority** that outweighs the risk of developing asthma?*