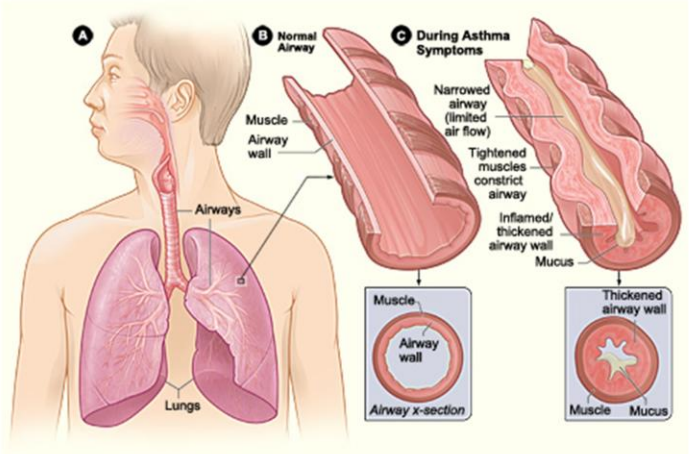
Asthma, the Environment and Your Health

Environmental
Public Health and
Chronic Disease

Photos: Dottie Mae, CDC

Asthma: What is it?



- Asthma is an inflammatory disorder of the airways, which causes attacks of wheezing, shortness of breath, chest tightness, and coughing.

Image: NIH

Students will likely be familiar with various asthma symptoms and a number of students may have asthma or know someone that does. Since the focus of the lesson is not on specific individuals with asthma or specific symptoms, but rather on the link between asthma and environmental conditions review of this slide should be brief to provide students with a general overview of the disease and its symptoms.

How do you get asthma?

- We don't know for sure how someone develops asthma. It is believed to be caused by a combination of genetic and environmental factors.
- Scientists are studying asthma to learn more about its causes and how it might be prevented.

Photo: Pedro Szekely

What is an asthma attack?

- Asthma attacks (wheezing, tightness of chest, coughing) can be very mild or sometimes can be very severe.

Many students may have either experienced an asthma attack themselves or observed someone else having one. The photo in this picture shows a child using an inhaler. An inhaler delivers medication to your lungs. A variety of asthma inhalers are available to help relieve or control asthma symptoms. The lesson focus is on the link between asthma and environmental conditions. Thus, presentation of this slide should be brief and provide students a basic understanding of an asthma attack.

Asthma attack triggers

Air Quality Index (AQI) Values	Levels of Health Concern
0 to 50	Good
51-100	Moderate
101-150	Unhealthy for Sensitive Groups
151-200	Unhealthy
201-300	Very Unhealthy
301 to 500	Hazardous

- Asthma attacks can be caused by things (triggers) in the environment, such as air pollution, dust, mold, tobacco smoke, pollen, pet hair or dander.

EPA

Individuals can have different triggers for asthma attacks. This photo is of the Air Quality Index (AQI) which informs people about outdoor air quality. The AQI allows people with asthma to adjust their activity levels as necessary (i.e., reduce outdoor activity on poor air quality days) to help control their asthma. Additionally, government agencies and communities alter activities on poor air quality days to reduce air pollution. Are students aware of the AQI? Do they do anything different on Code Red "AQI" days? If time allows, there can be discussion of what actions individuals, governments and communities can do to improve air quality. Discussion could provide a springboard to a group project (see lesson plan for evaluation options and additional information).

Is there a cure for asthma?

- Unfortunately, there is no known "cure" for asthma, but there are ways to keep asthma under control, such as taking medications, staying indoors on poor air quality days, and avoiding tobacco smoke.
- Scientists continue to seek a "cure" for asthma

Photos: RDECOM

What questions/information do they think are needed to find a "cure" for asthma?
For more information on efforts to find a cure for asthma see:
American Lung Association, Finding Cures: http://www.lungusa.org/finding-cures/
See the lesson plan for additional resources and references

Who has asthma?

- Asthma affects people of all ages, races, backgrounds and geographic locations
- In 2009 in the United States
  - 17.5 million (7.7%) adults have asthma
  - 7.1 million (9.6%) children have asthma

Photo: Christiana Care

U.S. Census: Total U.S. population in 2009: 305,529,237
Children Under 18 24.3%

Important to note in this discussion that asthma affects all types of people and in particular children.

Asthma is the most common chronic disease in children, the leading reason children are absent from school, and the most common cause for hospitalization in children (U.S. Centers for Disease Control and Prevention)

Some populations suffer more from asthma

- People living near factories and other types of industrial facilities have higher rates of asthma
- People living near highways or areas with lots of traffic have higher rates of asthma

Asthma disproportionately affects children from lower-income families and children from various racial and ethnic groups. If time allows, why these groups are disproportionately affected can be discussed. Health disparities, social determinants of health, and environmental justice can be touched on.

For more information specifically on asthma disparities
National Heart Lung and Blood Institute (NHLBI) Reducing Asthma Disparities:
http://www.nhlbi.nih.gov/health/prof/lung/asthma/naci/discover/disparities.htm

Additional information, resources and references are available in the lesson plan.

What can we do to help?

- Reduce pollution in the air:
  - Pass laws and regulations to protect air quality
  - Make behavior changes to help keep the air cleaner (bike to work, conserve energy, don't smoke)
  - Develop cleaner cars and factories

Photo: Rain Forest Action Network

Do the students have ideas of what can be done by individuals, by government, industry and by their community to help reduce pollution in the air? It time allows, perhaps brainstorm some ideas of potential actions and then look at the resources and references provided in the lesson plans, as well as have students research what is being done nationally and in their communities. See lesson plan for information on the Clean Air Act, as well as additional ideas, resources, and references.

What Are Researchers Doing ?

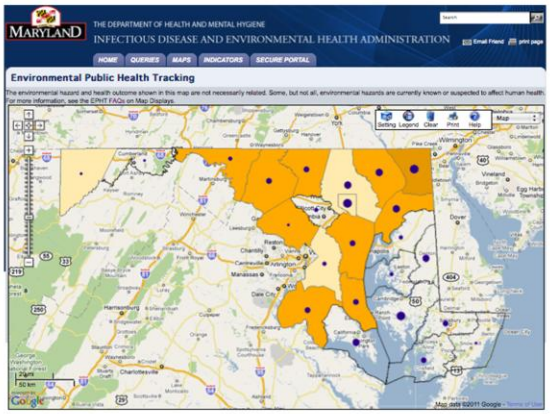
- Studying asthma to learn more about causes and ways to prevent it.
- Monitoring air quality and environmental conditions affecting people with asthma.

Photo: USFS

What types of information is needed to learn more about asthma and how to prevent it. Class discussion can be supplemented with information from the American Lung Association Epidemiology and Statistics Page at http://www.lungusa.org/finding-cures/our-research/epidemiology-and-statistics-rpts.html

Additional references and resources are available in the lesson plan.

Tracking Pollution



- Maryland monitors ozone and other pollutants and asthma rates by county.
- Surveillance of public health data involves continuous collection, analysis and interpretation of data and information to inform policies, track progress and serve as a warning system in case of emergencies.

In the above map, from the Maryland Environmental Public Health Tracking Program site, orange shading depicts ozone* levels (darker orange indicates higher ozone levels and translucent indicates no data available. Blue dots depict asthma rates (bigger dots indicate higher asthma rates). What does this map tell them about asthma rates and ozone levels in Maryland? Are they surprised at any of the information on the map? Does it seem that asthma rates and ozone levels might be linked? What other information might be needed before being able to determine if ozone and asthma rates are connected? If time allows, as a class or in small groups, further explore the Maryland asthma data on the M-EPHT site with particular attention to the maps and queries section.

*Ozone: in the lower level of the atmosphere (troposphere) ozone is a chemical oxidant and a major component of air pollution. Ozone is regulated under the Clean Air Act.

Maryland Environmental Public Health Tracking Program (M-EPHT):
http://ideha.dhmh.maryland.gov/eh/tracking/Default.aspx

Discussion

- What kind of information or research do you think would be helpful for reducing asthma rates?
- What are things that your school, community, or local businesses can do to help prevent asthma and reduce symptoms?

Photo: Steven Yeh

What are their ideas for what might be done to help prevent and control asthma? Do they have additional questions? Or interest in doing further research? See the lesson plan for evaluation options as well as additional resources and references.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