May 1st, 10:00 AM - 11:00 AM

The Effect of Climate Change on Respiratory Diseases

Sarah Arvidson
Colby College

Eda Reed
Colby College

Follow this and additional works at: https://digitalcommons.colby.edu/clas

Part of the Environmental Sciences Commons

https://digitalcommons.colby.edu/clas/2014/program/378

This Poster is brought to you for free and open access by Digital Commons @ Colby. It has been accepted for inclusion in CLAS: Colby Liberal Arts Symposium by an authorized administrator of Digital Commons @ Colby. For more information, please contact mfkelly@colby.edu.
Respiratory diseases include, but are not limited to, chronic bronchitis, emphysema, asthma, and chronic obstructive pulmonary disorder (COPD). (Figure 2)

Data

- Studies suggest that in the future, heat related hospital admissions from respiratory diseases will jump from 11,000 during the reference period in Europe to 26,000 annually (5).
- Plants growing at higher temperatures and in CO2 enriched atmosphere have an increase in allergen content in the produced pollen (6).
- The changes in distribution and concentration of ambient pollen will increase morbidity of asthma and allergic diseases, as well as number of ER visits (6).
- Resulting from the increase in temperature over the last century, the burden of pollen results in impaired work fitness, sick leave, and prescription drugs (6).
- Short term exposure to extreme high temperatures increases the risk of respiratory ER visits for patients with comorbid respiratory diseases, as a result of high temperatures affecting airways and inducing systemic inflammation (7).
- Increased exposure to atmospheric levels of iodine, cause a decrease in lung function and higher reactivity to bronchoconstrictor agents associated with exacerbation of asthma (8).

“More than 50% of the population of the United States live in areas where levels of ozone, nitrogen dioxide, sulphur dioxide, and particulates exceed current National Ambient Quality Standards” (2)

Policy

- Under the Clean Air Act, the Environmental Protection Agency is required to establish ambient air quality standards for certain pollutants including particulate matter, ozone, sulfur dioxide, nitrogen dioxide, carbon monoxide and lead (9). Current nationwide greenhouse gas emissions are seen in Figure 3.
- One of the purposes of this act is to minimize pollution resulting from the growing number of motor vehicles and industrial plants. Despite action of the Clean Air Act, air pollution continues to harm the health of people and the environment. Greenhouse gases trap heat and cause more intense heat waves that increase death rates, especially among the poor and elderly (9).
- In 2013, President Obama announced a series of executive actions to reduce carbon pollution, in order to lead international efforts to address climate change. The president is directing the EPA to establish carbon pollution standards for power plants, as well as increasing funding for clean energy technology (9). (Figure 4)

Section 111 of the Clean Air Act issues standards, regulations or guidelines to address carbon pollution from new and existing power plants, by reducing national limits of emission (1).

Future Research and Action

- Because there is no set standard for measuring health effects, and climate change is unpredictable, a method of how best to analyze potential negative impacts on respiratory due to climate change needs to be implemented (10).
- Ensembles of models that take into account multiple possible future climate scenarios will be most beneficial.
- Physicians will need to adapt to patients experiencing different environmental conditions and having increased illness burdens due to climate change (11).
- The current regulations and standards set in place in the United States and across the globe to combat climate change are not sufficient. As population size and temperature continue to grow, so does energy consumption.
- The best way to fix this issue is to create higher standards and devote more time and money into renewable energy resources. President Obama’s Action Plan on Climate Change also outlines many steps that need to be taken in the coming decades, including doubling the generation of wind and solar energy by 2020, and reducing fuel consumption by heavy-duty vehicles (9).
- The US, along with other nations, must work to cut energy waste, reduce subsidies that encourage wasteful consumption of fossil fuels, reduce emissions from deforestation, and finance cleaner energy. Without removing these harmful practices, respiratory disease will continue to affect lives both nationally and globally (Tables 1 and 2).

Conclusions

- The release of greenhouse gases and other pollutants into our atmosphere is causing a global climate change that is not only warming the planet and harming the environment, but also having a negative effect on human health. The occurrence of respiratory issues, and the comorbidity of various respiratory diseases is on the rise, impacting the ability to function properly, increasing medical costs, and decreasing the ability to work. Stricter government regulation needs to be implemented within a relative short time frame in order to protect the health of humans as the climate warms.

Bibliography