### Air pollution in Pakistan

**Note: (Add all aspects as discussed today in lecture)**

Each category corresponds to a different level of health concern. The six levels of health concern and what they mean are:

* "Good" AQI is 0 to 50. Air quality is considered satisfactory, and air pollution poses little or no risk.
* "Moderate" AQI is 51 to 100. Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people. For example, people who are unusually sensitive to ozone may experience respiratory symptoms.
* "Unhealthy for Sensitive Groups" AQI is 101 to 150. Although general public is not likely to be affected at this AQI range, people with lung disease, older adults and children are at a greater risk from exposure to ozone, whereas persons with heart and lung disease, older adults and children are at greater risk from the presence of particles in the air.
* "Unhealthy" AQI is 151 to 200. Everyone may begin to experience some adverse health effects, and members of the sensitive groups may experience more serious effects.
* "Very Unhealthy" AQI is 201 to 300. This would trigger a health alert signifying that everyone may experience more serious health effects.
* "Hazardous" AQI greater than 300. This would trigger a health warnings of emergency conditions. The entire population is more likely to be affected.

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Air pollution in its most basic definition is the introduction of harmful substances into the Earth’s atmosphere. These substances linger and cause many adverse effects. As you know, humans and other living creatures rely on the atmosphere for respiration. When air quality is dampened by pollution, immediate and longer term consequences take place.

Pollution has been known to cause allergies, disease, damage to crops, and in extreme cases, even death. In addition, air pollution creates an imbalance in the natural gases that make up our Earth’s atmosphere. These imbalances slowly aid in the depletion of the [Ozone layer](http://www.ozonelayer.noaa.gov/science/basics.htm), an essential region of the stratosphere that soaks up most of the sun’s damaging ultraviolet (UV) rays.

As the Ozone depletes, the rate of global warming increases. If enough air pollution clutters our environment, it creates the danger of more rapid deterioration of the Ozone layer. It’s important that we, as citizens of the world, fully understand the causes, effects, and possible solutions of air pollution so that we can make an educated [decision for Earth’s future](https://www.renewableresourcescoalition.org/future-renewable-energies/).

### Causes

There are many causes of air pollution. For sanity’s sake, we’ve done our best to categorize them at a more general level.

Before we get into the different causes, let’s take a quick step back and look at the different variations of air pollution. First, there’s [invisible and visible air pollution](http://nationalgeographic.org/activity/visible-and-invisible-pollutants/). The smog you see lingering over a city is a good example of visible pollution.

Invisible pollutants aren’t as noticeable, but they can be just as deadly, if not more so. Examples of invisible pollutants include nitrogen oxides, sulfur dioxide, and carbon monoxide, to name a few. Carbon monoxide inhaled and introduced into the human blood stream spells trouble if the pollution is a high enough concentration.

Digging down even deeper, air pollution can be split into primary and secondary pollutants.

Primary pollutants, such as sulfur dioxide, are ones directly released into the atmosphere. Secondary pollutants, like smog for example, are the result of primary pollutants intermingling with the already existing particles in the atmosphere.

Following are the causes of air pollution.

#### 1. Vehicle Exhaust Fumes.

The number one source of air pollution in city environments is vehicle exhaust fumes, which happen to release high amounts of carbon monoxide. It’s no surprise then that carbon monoxide also happens to be the largest air pollutant in Pakistan.

Millions of vehicles are operated on a daily basis in Pakistan alone, each one leaving its own carbon footprint on the environment. This is why hybrid and fully electric vehicles are making a splash in the automobile marketplace. People are looking to rely less on fossil fuels to power their cars, leading to less toxic emissions into the environment.

#### 2. Fossil Fuel-Based Power Plants.

In addition to vehicle exhaust pollution, fossil fuels also present a wider scale problem when they’re burned for energy in power plants. Chemicals like sulfur dioxide are released during the burning process, which travel straight into the atmosphere. These types of pollutants react with water molecules to yield something known as acid rain.

This is one of the reasons that alternative energy sources, such as nuclear, solar, and wind are being explored in greater detail. They tend to release much less pollutants into the environment to produce equivalent amounts of energy.

#### 3. Exhaust from Industrial Plants and Factories.

Similar to exhaust being released from vehicles, heavier machinery located inside big factories and industrial plants also emit pollutants into the air.

Industrial plants can be found pretty much everywhere in the world, so the spreading of air pollution is basically global.

#### 4. Construction and Agricultural Activities.

On a daily basis, dirt and dust is kicked up into the atmosphere from excavating and demolition type construction activities.

Switching the focus to agricultural activities, ammonia is a frequent byproduct that just so happens to be one of the most dangerous gases in our environment.

There are also plenty of nasty chemicals that get placed into the atmosphere from pesticides and fertilizers, which are being used at increasingly higher rates.

#### 5. Natural Causes.

When people think pollution, they almost always blame other people. Let’s not forget that the Earth is one of the biggest polluters itself, though.

Volcanoes, forest fires, and dust storms are nature-born events that dump massive amounts of air pollution into the environment.

#### 6. Household Activities.

Forget about outdoor pollution. What about the pollution that takes place inside our own homes? Common household chemicals, notably bleach, without proper ventilation is a primary source of indoor air pollution.

Smoking tobacco through the use of cigarettes and cigars also releases toxic pollutants into the air.

It’s often easier to think of outdoor pollution as the primary danger on a wide scale level, but don’t dismiss the little everyday activities that also impact our health.

### Effects

Now that we know the culprits of air pollution, let’s start discussing the harmful effects.

There are many different types of effects that air pollutants can cause. For one, there’s the human health factor to consider.

If humans are at risk, then other forms of wildlife and organic creatures are in danger as well.

Then there are the effects on the planet and its atmosphere.

In the paragraphs to follow, we’ll take a closer look at all of air pollution’s effects.

#### 1. Accelerated Global Warming.

This is a green energy discussion, so let’s tackle this one first.

Air pollution directly accelerates the rate at which global warming happens by depleting the Ozone layer.

Global warming refers to the increased temperatures Earth continues to experience. These higher temperatures lead to the melting of the polar ice caps and icebergs, which elevates sea levels and creates concern for the human race.

#### 2. Human Respiratory and Heart Concerns.

Air pollution is known to cause irritation in the eyes, lungs, nose, and throat. It creates respiratory problems and exacerbates existing conditions such as asthma and emphysema.

When continually exposed to air pollution, humans become at higher risk for cardiovascular disease. Air filled with toxins can have a number of adverse effects on the arteries, and have even been a contributor to heart attacks.

#### 3. Wildlife Endangerment.

Most diseases and conditions that humans are susceptible to, animals are as well. Air pollution creates many of the same issues that humans face.

Heavily polluted areas force inhabitants to seek new homes, which can negatively impact the ecosystem.

Toxic chemicals, which we’ll discuss in the next bullet, also deposit over surfaces of water that can lead to the endangerment of marine life animals.

#### 4. Acid Rain.

When air pollution, specifically sulfur oxides and nitrogen oxides, are released into sky through fossil fuel burning, it creates the phenomenon known as acid rain.

Water, high in the atmosphere, combines with these chemicals and becomes acidic in nature. It then scatters the ground, disguised as normal rainfall.

### Solutions

Let’s dig a little deeper into common solutions for preventing and minimizing air pollution.

#### 1. Minimize the Use of Fossil Fuel Powered Automobiles.

As a leading contributor to air pollution, it only makes sense that a vehicle-based solution appears first on this list.

One way to do this is by switching to a hybrid vehicle, or better yet, one that runs on [fully electric](https://www.tesla.com/).

Other ways include taking public transportation, carpooling with friends and colleagues, or even riding a bike to your destination.

#### 2. Be Mindful of Energy Consumption.

When you’re leaving home, be sure to turn off the lights, TV, and any other electronic appliances.

Fossil fuel plants are a major cause of air pollutants, and the less energy you need, the less we have to rely on those plants to generate electricity.

This also means turning to energy efficient devices when possible. Fluorescent lightbulbs over the course of their lifespan can reduce energy consumption while adding significant savings to your pocket.

#### 3. Become an Advocate for Clean Energy.

Every day, technology continues to advance that improves the efficiency and cost of clean energy such as solar, wind, and geothermal. These types of energy sources create much less air pollution.

Even nuclear is leaps and bounds better than traditional fossil fuel plants when it comes to air pollution.

Find ways to promote and educate the public on clean energy alternatives. A small contribution goes a long way in the grand scheme of things.

#### 4. Recycle.

Another topic of heated debates. Wherever you stand on the matter, recycling can help reduce air pollution.

Instead of throwing away used containers and material, try reusing them or recycling them to be used again by someone else.

### Conclusion

With air pollutants being such a widespread epidemic, it’s imperative that we come together as Earth’s inhabitants to become part of the solution, instead of continuing to be the problem.

We can make the choice to drive less toxic automobiles. We can choose how much energy we consume on a daily basis. We can also choose to reuse our old materials instead of dumping them into the environment.

Air pollution can have some devastating impacts on our bodies and the planet if left untouched.