Challenges related to Air Quality and Impact on Local Communities

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According to the Collins dictionary Air quality can be referred to as degree to which air is suitable or clean enough for humans, animals, or plants to remain healthy. Therefore, good air quality is air that is clean and does not contain pollutants such as smog, smoke and other particulates.

In the past two weeks, I have learnt that air quality can be measured using air quality sensors which have diffusion tubes that measure pollutants over a period of time. Pollutants include nitrogen dioxide coming from the exhaust fumes in cars, PM 2.5 which are tiny fine particulates in the air that reduce visibility and causes the air to appear foggy when present in large amounts. I now understand that diesel engines play a large part in the air pollution and actually account for 40% of the polluted air in London

I believe it is very important for people to be educated about air quality because of the significant health impacts it can have on people such as stunt growth as well as inflammation within the lungs which can aggravate conditions such as asthma and also increase the risk of dementia and strokes. This can be especially harmful to vulnerable members of society such as the elderly, people with existing medical conditions and especially children who are actually quite often exposed to highly polluted air due to the increasing pollution outside their schools. This is caused by high numbers of parents driving their children to school which causes traffic and so more nitrogen dioxide from exhaust fumes are released. The parents also leaving their vehicles on while parked also adds to the pollution outside schools. Measuring air quality both in our homes and outside is very important because it provides the knowledge to people who are vulnerable and so can prevent further damage. This can be seen in the case of a nine year girl named Ella Kissi-Debrah who died as a result of her asthma, however there was a strong association between the times she was admitted to hospital and recorded spikes in nitrogen dioxide and PM10s on the South Circular Road and in Professor Stephen Holgate's report, he says the there is a "real prospect that without unlawful levels of air pollution, Ella will not have died". This shows the importance of being informed on air pollution and the impacts that it can have.

One of the main challenges of air quality in regards to local communities is being able to carry out their monitoring of air quality in their local areas and then accessing and understanding the results. This is why collaboration with Universities or community outreach programmes by Institutions are quite important and in the past 2 weeks, I have learnt about citizen scientists who seem to have great enthusiasm and interest in learning about their environment as well as understanding how they can improve it as well. The next challenge that I believe caters more to the government, is ways to actually reduce this pollution on a large scale. I have learnt about green infrastructure directly removing pollutants from the air by deposition and absorption on plant surfaces. Trees, green roof, open green spaces and green walls are examples of green infrastructure. The government can also set up more air quality monitoring stations or reopen the ones that have been closed. While I was monitoring the air quality in my home, I checked on the London Air website for the data on air quality, however I could not find any current as the closest ones to me were all closed and so was forced to look at data from at least 8 years ago which would be very outdated as air pollution in London is getting worse. Another way the government could help in the air quality crisis in London is to pay closer attention to the environmental impact predictions of construction. It should then be compared to the actual environmental impacts and so construction companies would be more cautious about their impacts on the environment which could then help decrease the amount of pollution released. However, maintaining good air quality still proves to be a big problem but some

small behaviour changes can help reduce this problems such as moving a bus stop to a slightly less polluted area or closing doors of shops to help keep the polluted air out rather than customers breathing polluted air both inside and outside of shops.

One concept that I learnt on this placement was the idea of Induced traffic. One may think that a way to reduce air pollution is to reduce traffic which is true, however if reducing traffic involves building or widening new roads or tunnels in busy areas, it may have the opposite effect and actually have negative air quality impacts. This is because more people will chose cars over public transport because the area is more easily accessible. This leads to more cars in the same area and so more exhaust gases therefore greater pollution.

While on my placement here, I learnt about some interesting and innovative ways people are trying to reduce air pollution. Having spoken to Leni, I got to learn a little bit about the research she was doing while on her PHD. One of which was a donor brick wall where the brick used was highly porous and made out of a hard ceramic material and titanium dioxide that was activated by light from the sun. The plan was for the wall to be built close to an already existing of a building and so when air passes through the brick wall, the air gets cleaned and so the space in between the brick wall and the established wall would have clean air where people can stand and breathe clean and fresh air. This is because when exposed to ultraviolet light titanium dioxide accelerates many chemical reactions including the oxidation of smog producing nitrogen oxides and volatile organic compounds.