



Ten principles for climate, environment and respiratory health

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Urgent policy action is needed to tackle climate change, improve our environment and promote lung health <http://ow.ly/WXPJ30gq7XQ>

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While not a meteorological fact, it is nonetheless commonly believed that every cloud has a silver lining. It seems they may also have a developed sense of irony as within days of announcing plans to pull the United States out of the United Nations Framework Convention on Climate Change (UNFCCC) Paris Agreement, President Trump moved to show his climate credentials by proposing to cover his Mexican border wall with solar panels. Despite such changes, The Lancet has noted that the response to the cloud of climate change could offer “...the greatest global health opportunity of the 21st century...” [1]. After all, while environmental and public health professionals are sensitised to the link between climate and health, key decisions on the necessary policy shifts in energy or transport are made elsewhere. These decisions must take health considerations into account [2] and health professionals have a key role to play in ensuring this connection between climate, environment and health. In such a complex space it can be difficult to see which position health professionals should take. In response to this question and, in particular, in support of the Marrakesh Ministerial Declaration on Health, Environment and Climate Change, a working group of the European Respiratory Society (ERS) Environment and Health Committee (EHC) has proposed ten principles for climate, environment and respiratory health. This editorial outlines these principles, which are as follows:

Climate change is real

Each of first 6 months of 2016 sequentially broke the record as the hottest month since records began. Two key climate change indicators, global surface temperature and Arctic sea ice, continue to break records driven by rising concentrations of heat-trapping carbon dioxide and other greenhouse gases in the atmosphere [3]. Preliminary data shows that 2016’s global temperatures are approximately 1.2 °C above pre-industrial levels according to an assessment by the World Meteorological Organization (WMO) [4]. In an aptly named Climate Change Factsheet, the European Commission warns that “...the polar ice caps are melting, sea levels rising and glaciers retreating. Sea level rise threatens the existence of low-lying island states and coastal communities. The melting of glaciers is putting millions of people at risk of floods and will eventually deprive them of fresh water resources...” [5]. Our climate is changing, not in a removed, abstract manner but in a way which has very concrete effects on our well-being.

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Health and environment are inextricably linked to climate change

Climate change cannot be regarded in isolation as it is a process which is inextricably linked to our health and as well as to our environment. The Marrakesh Declaration acknowledges that almost one quarter of the global burden of disease and approximately 12.6 million deaths each year are attributable to modifiable environmental factors. It outlines how global, environmental and social changes, including climate change, are driving many of these risks and impacting directly on human health. Making the point directly, it notes that despite the strengthening evidence of the effects that environmental and climate risk factors have on health, the political action and investment currently underway is not yet at a sufficient scale to address these challenges globally.

In Europe alone, Southern and Central Europe are seeing more frequent heat waves, forest fires and droughts, while the Mediterranean area is becoming drier making it even more vulnerable to drought and wildfires. Northern Europe is getting significantly wetter and winter floods could become common. Urban areas, where four out of five Europeans now live, are exposed to heat waves, flooding or rising sea levels but are often ill-equipped for adapting to climate change [6]. These tangible and visible changes to our environment go further and have impacts on our health and in particular our respiratory health. Increased concentrations of greenhouse gases in the earth's atmosphere, especially carbon dioxide, have already substantially warmed the planet causing more severe and prolonged heat waves, temperature variability, increased length and severity of the pollen season, air pollution, forest fires, droughts and heavy precipitation events and floods, all of which put respiratory health at risk [7].

Climate change has a direct effect on respiratory health

Climate change represents a massive threat to respiratory health [8]. Looking at climate change in terms of rising temperatures and heatwaves alone: 1) Increases in temperature see an increase in respiratory deaths, hospital admissions and the need for management [9]. 2) Extreme heat and high humidity trigger asthma symptoms. 3) Studies suggest chronic obstructive pulmonary disease (COPD) patients are at increased risk of exacerbation and hospitalisation during periods of high temperature [10]. 4) An increased frequency of thunderstorm asthma epidemics can be expected [8].

Climate change has an indirect effect on respiratory health

Beyond the direct effect of rising temperatures, climate change triggers an increased exposure to other risk factors for respiratory disease, including: 1) More frequent flooding will lead to greater dampness, moisture and mould in indoor spaces causing asthma, allergic rhinitis and some respiratory infections [11]. 2) Amplification of air pollution, in terms of higher levels of ozone, which reduces lung function and is responsible for several respiratory effects [7].

New health impacts are emerging of which we have little understanding

Climate change will also bring an increase in the frequency of complex events [12]. Here the adverse health effects are less well understood and require further research, in particular the effects of extreme natural phenomena. Of particular note are: 1) The lengthening and strengthening of the pollen season [13] with an increase in exacerbations of allergic respiratory diseases [14]. 2) The increasing impact of natural particulate matter from wildfires, desertification and sandstorms, which is less monitored or not considered at all to date and not taken into account in evaluating whether particulate matter concentrations are exceeding standards or not. This will also be responsible for various health effects beyond the respiratory system, including cardiovascular, metabolic and neurodegenerative conditions, as well as premature birth and cancer. 3) The association between dust storms and the risk of hospitalisation due to COPD [15] and asthma [16]. Recent studies have also shown the same association with pneumonia [17]. 4) The insufficient knowledge base available on the implications of respiratory infections for respiratory health, despite vector-borne diseases and infections being amongst the most well studied of the diseases associated with climate change.

The impact on health is not always equal

Some 30% of the world's population is at risk from "lethal heat events" [18]. These vulnerable populations are living in areas subject to climate events and experience an undue burden from climate change. The impact is felt even more acutely by those already susceptible to and suffering from respiratory disease [2].

The challenge is to change

Anthropogenic greenhouse gas emissions are mainly driven by population size, economic activity, lifestyle, energy use and land use patterns. Combatting climate change requires a combination of mitigation to address the causes and adaptation to address the impact. Both types of action are necessary and achievable

but are of course not without their challenges and indeed their challengers. This challenge is set against the latest United Nations (UN) predictions that the Earth's population will reach 9.8 billion in 2050.

Act to mitigate

We must make smarter policy choices to reduce the production of greenhouse gases and decrease air pollution (including short-life pollutants and pollen) as recognised by the World Health Organization (WHO). Some 10 years ago, an Intergovernmental Panel on Climate Change (IPCC) report [19] outlined technologies and policy measures which, if pursued, would reduce greenhouse gas levels. In the energy field, the reduction of fossil fuel subsidies and taxes or carbon charges on fossil fuels were suggested, while in transport the use of cleaner diesel, more fuel-efficient vehicle fleets and investment in public transport and non-motorised transport options were touted as solutions.

Today, while not widespread, the prioritisation of clean energy and the phasing out fossil fuels is possible if the political will to do so exists. For example, Canada, France, Germany, The Netherlands, Austria, Finland and Portugal have already committed to phasing out coal-fired power plants. Furthermore, Paris, Madrid, Athens and Mexico City have all pledged to ban diesel cars by 2025.

Act to adapt

Adaptation options require dealing with the impact of climate change. From local heat-health action plans, emergency medical services and improved climate-sensitive disease surveillance and control to safe water and improved sanitation, there are numerous ways to improve our response [20]. While perhaps more pragmatic, the approach nonetheless implies acceptance of pollution along the lines of the "polluter pays principle", where pollution itself is met with fines but is, in essence, tolerated. Policy makers should move away from such a position and no longer accept that the polluter pollutes in the first place, since less harmful alternatives are an option.

Above all, act now

Much has been made of the United States' withdrawal from the Paris agreement. However, it should be remembered that it represents withdrawal from a non-binding text. More impactful are the proactive positions taken, such as Sweden's pledge to be carbon neutral by 2045 and the promise of President Macron to "...make our planet great again..." through promoting and fostering the elements needed for research and climate progress. The Lancet Countdown, an international, multidisciplinary research collaboration between academic institutions and practitioners, is a case in point. European Heads of State recently reiterated their commitment "...to continue to lead in the fight against climate change..." [21]. However, to do so Europe needs to: 1) Divest from fossil fuels and invest in green fuels and technologies. 2) Take policy measures to reduce diesel emissions. 3) Adopt and enforce WHO standards on air quality as European Union (EU) limits. This includes acting on short-lived air pollutants so as to reduce greenhouse effects in the short term. 4) Follow through with infringement proceedings against those who breach EU legislation. 5) Ensure the EU emissions trading scheme currently being revised contains the proposed mechanism to bring shipping sector emissions into the scheme. 6) Push for a stronger EU energy package than that which is currently on the table, with more ambitious targets for energy efficiency and a continued prioritisation of renewables with the exception of bioenergy.

Medical societies such as the ERS have a continued role to play in supporting the health message and advocating for policies that will achieve its objectives. The twenty-second session of the Conference of the Parties (COP 22) Marrakech Declaration was a vast improvement on the twenty-first session (COP 21) [2] with health finally being given a strong focus in the discussions. The twenty-third session (COP 23) moves to Germany, home of Johann Wolfgang von Goethe. A master of many disciplines, Goethe founded a meteorological station to observe the clouds and weather and was even inspired to pen poems in honour of Luke Howard, the creator of our classification of clouds. Let us hope the discussions in Bonn are similarly emboldened.

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