

clearing the air

LORIE KARNATH FI'89, PAST PRESIDENT

Founder, President, Next Breath

As explorers, our oftentimes peripatetic endeavors provide opportunity to observe the earth's phenomena and singularities from a unique perspective. Regrettably one does not have to be especially insightful nor venture far to recognize that the buffer that serves to protect and sustain the planet itself and all living beings is in dire circumstance. This thin atmospheric blanket affords shelter from the sun's hazardous rays, helps to mitigate extreme shifts in temperature, runs interference from errant meteors, and provides the oxygen essential to breathe.

The emergence of the Covid-19 pandemic and its ability to transmit through the air has arguably propagated more focus on how and what we breathe than ever before. Increased study has led to improved understanding of the breakdown of pollutants that now occupy the air that surrounds us. Of particular concern are the levels of particulate matter, complex mixtures comprised of liquid droplets and extremely small particles, found to permeate the air that we all share. It is especially the pollutants classified as fine particles, attributed primarily to waste released by industrial output, forest fires, power plants and vehicle emissions, that have now been irrevocably linked to significant health problems. Their small size enables them to bind and pass through the nose and throat to the small airways, lungs and bloodstream. Particulate matter also enables airborne travel of viruses, bacteria and other harmful infectious agents, facilitating these pathogens entry into human and other living hosts.

As is oftentimes the case, it is those with the most limited resources who are presently bearing the brunt of impurities in the air. Harmful breathing conditions are catastrophically impacting poorer nations which, as a result, are experiencing a great majority of acute respiratory illness and early death. The WHO estimates that annually there are already over 7 million premature deaths linked to inferior air quality, and under the current existing scenario this number will continue to grow. There is increasing evidence that levels of air contaminants can cause significant harm at substantially lower quantities than previously believed. Most recently WHO released a report indicating that nearly the entire global population, 99% of the world, is breathing unhealthy air.

Despite marked improvements in the ability to measure impurities in the air, as well as a better understanding of how harmful its effects, actions undertaken to alleviate the situation have yielded negligible impact. The COP26 goal of zero emission target by 2050, hopefully attainable, will come far too late for many alive today as well as for those who will be born in the interim. Children are especially vulnerable to dirty air conditions. For the over 1.6 billion children presently living in hardship conditions, respiratory illness is the primary cause of disease and death. Clearly the transition away from fossil fuels towards cleaner energy solutions needs to be accelerated; however, for a safe weaning from these an unprecedented level of global

concerted, coordinated agreement, effort and investment will be required. Furthermore, effects due to climate crises have provoked catastrophic weather changes which serve to exacerbate the already detrimental air conditions. Many parts of the world are experiencing unprecedented heat and drought. Water is an important tool in combatting air contamination. Lack of water can inhibit flora from some of their beneficial abilities to remove and contain certain air pollutants; in humans and other animals this can lead to dehydration. When dehydrated the body's natural defenses which help protect against disease and other airborne contaminants are impaired, drying out the larynx, trachea and main bronchi which serve as a natural filter to cleanse air as it is inhaled. As a scarce and finite resource going forward water will have to be especially efficiently and equitably managed and allocated.

It is difficult to grasp how we as a species have permitted our earthly envelope, which shelters and provides, to become a source of contamination and demise. Perhaps it is in part the air's ubiquitous nature that makes it this vulnerable: its ability to flow without boundaries or possessor, being in its most pristine state invisible, yet no longer so, once it becomes perceptible.

CORRESPONDING AUTHOR, EDITORIAL: HYDRATION FOR CLEAN AIR TODAY: MOLECULAR FRONTIERS JOURNAL, VOL. 5; NO. 1 & 2, 2021. <[HTTPS://WWW.WORLDSCIENTIFIC.COM/DOI/EPDF/10.1142/S252973252101001X](https://www.worldscientific.com/doi/epdf/10.1142/S252973252101001X)>