

**HUMAN HEALTH AND BIODIVERSITY: MECHANISMS AND
EVIDENCE SUPPORTING THE POSITIVE EFFECTS OF
DIVERSITY IN NATURE, PARTICULARLY IN GREEN SPACES,
ON HUMAN HEALTH**

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Abstract:

Over the past three or four decades, there have been important advances in the understanding of the actions, exposure-response characteristics, and mechanisms of action of many common air pollutants. A multidisciplinary approach using epidemiology, animal toxicology, and controlled human exposure studies has contributed to the database. This review will emphasize studies of humans but will also draw on findings from the other disciplines. Air pollutants have been shown to cause responses ranging from reversible changes in respiratory symptoms and lung function, changes in airway reactivity and inflammation, structural remodeling of pulmonary airways, and impairment of pulmonary host defenses, to increased respiratory morbidity and mortality. Quantitative and qualitative understanding of the effects of a small group of air pollutants has advanced considerably, but the understanding is by no means complete, and the breadth of effects of all air pollutants is only partially understood.

1 INTRODUCTION

Temperature has a wide range and constant impact on public health. As for the daily temperature distribution, it is migrating northward due to climate change, and there may be an increase in the number of unseasonal temperature

events (Hartmann, D.L., A.M.G. Klein Tank, M. Rusticucci, L.V. Alexander, S. Brönnimann, Y. Charabi, F.J. Dentener, E.J. 2013). Numerous research (Braga, Zanobetti, and Schwartz 2002, 859-863; Analitis et al. 2008, 1397-1408; Zanobetti and Schwartz 2008, 563-570;

Curriero et al. 2002, 80-87; Kaiser et al. 2007, S158-62) have looked at the relationship between severe temperatures and human health and death. These methods, in general, focused on dose-response connections across a full year. Previous research has shown that the impacts of temperature change depending on the location, with distinct threshold temperatures as a result of weather adaptation (Curriero et al. 2002, 80-87; Ye et al. 2012, 19-28; Anderson and Bell 2009, 205-213). This begs the issue of whether both geographical and temporal acclimation to temperature are important. Is there a seasonal variation in the dose-response? Additionally, some research suggests that the duration of exposure to extreme heat affects how severe the negative health effects are (Anderson and Bell 2011, 210-218; Baccini et al. 2008, 711-719). It has been discovered that being exposed to a heat wave early on has a greater effect than experiencing it later. Nevertheless, those studies were limited to severe occurrences, the definition of time was descriptive, and early heat waves were often not comparable to later ones in terms of length and severity. In this work, we systematically examined the impact of the time of exposure to warm and cold temperatures,

which were considered as continuous predictors. We specifically looked at the dose-response connection for each city and month, using enough years (2003–2006) to guarantee the reliability of the estimations.

Among all chemical components, water is without a doubt the most prevalent, easily available, and extensively researched. Its pervasiveness, vitality to humankind, and ease of transition from liquid to solid and gaseous phases have guaranteed its significance in human thought from the beginning of time. Due to its many unique chemical characteristics, water is essential to all life as we know it on Earth. Dihydrogen monoxide, or water, makes up 70.9% of the Earth's surface and is essential to all known forms of life. Oceans contain 96.3 percent of the planet's water, ground water contains 1.7%, glaciers and ice caps on Antarctica and Greenland include 1.7%, and there are little amounts in other big bodies of water as well as 0.001% of air in the form of clouds and vapour, which are made of solid and liquid water particles hanging in the atmosphere. There is just 2.5 percent fresh water, and 98.8% of it is in the form of groundwater and ice. A lesser portion of the freshwater on Earth

(0.003%) is found in living entities and manufactured goods, whereas less than 0.3% of it is found in rivers, lakes, and the atmosphere. In the ancient Mesopotamian religion, of which written records date back to 2000 BC. "The mother who gave birth to heaven and earth" was the name of the Nammu deity of the primordial sea. In addition, she was the mother of the water deity. According to the Judaic-Christian narrative, Enki, one of the four entities in charge of the universe's primary realms, "moved upon the face of the waters" and created "a firmament in the midst of the waters," which separated heaven and earth. Once again, the flood plays a significant role, just as it does in the tales of many other peoples. Muslims also wash their hands before prayers, which is another example of the profound ceremonial importance of water. "Water, in its various forms, constitutes the earth's atmosphere, sky, mountains, gods and men, beasts and birds, grass and trees and animals, down to worms, flies, and ants," said the Greek philosopher Thales of Miletus. There are only several types of water. Think about water as you meditate. Along with earth, air, and fire, Aristotle recognized four elements, including water.

2 LITREATURE SURVEY

When it comes to heavy metal contamination, pollution is a serious issue everywhere. Both the public and commercial sectors operate in most nations to examine metal contamination and any potential health risks, as well as to provide cures or chelations. Thus, the primary distinctions are limited to the kinds of outcomes and how they are presented. This chapter discusses the physiochemical and biological conditions of drinking water throughout the globe. An operational set of concepts known as quality assurance. Data of known and reasonable quality will be produced throughout sample collection and analysis if strict adherence is maintained. There is a high degree of trust in the correctness of the data, which show that there are many possible and current sources of heavy metal and other chemical pollution. An estimated 90,000–1,000,000 compounds are regularly utilized, however just 3000 of them make up almost 90% of the total amount consumed. In their study, Walkley and Black [1] looked at the Digtjarff technique for determining soil organic matter and suggested a modified approach for long-term acid titration. The elements distribution in the same

main crust of the earth has been researched by Turekian and Wedepohl [2]. Goodman and Roberts [3] have explained that the same plants and features work as indicators of metals in the atmosphere. Millero [4] conducted research on the physical characteristics of samples of seawater. J. Clausen and S.C. Rastogi [5] conducted important research using a flameless atomic absorption spectrophotometer on entire blood samples from auto workers. They calculated the mg of Cd, Ni, Mn, Cu, and Cr per 100 ml. of blood samples as well as the air in the workplace. Tree bark has been explored as an indication in high-pollution regions by Lhotschert and Kohm [6]. The identical method for extracting different metals has been provided by Tessier et al. [7]. A substantial amount of study has been done in estuaries by Tomlinson et al. [8] to examine heavy metals and their relationship index with environmental contamination. AAS was used by Tinsley et al. [9] to demonstrate their important work on street dust for heavy metal contamination, particularly in the case of lead. Al in tissues was identified by B.J. Stevens [10].

Roadside vegetation's lead concentration was linked to air pollution by Onasanya

et al. [11]. Lead isotope ratios of airborne particle matter have been reported by Mukai et al. [12] as evidence of long-range air pollution transmission across Japan. Rodriguez et al. [14] devised a technique for the detection of lead in water samples using flame atomic absorption spectrometry, whereas Kesraour- Ouki et al. [13] examined the application to metal effluents by using natural zeolite use in pollution prevention.

3 METHODOLOGY

There is no need to discuss industrial effluents because the spread of infectious diseases through water pollution is a well-known risk that is managed by public health authorities in developed nations. However, it is important to note that microbial growth depends on the concentration of specific trace elements. It's uncertain whether weather and other factors have any bearing on how different regions have different rates of some infectious illnesses. Research is now underway, and findings may ultimately influence modifications to water treatment procedures, just as dental advice has sometimes resulted in fluoride dosage adjustments. Likewise, studies on blood vessel and cardiac disorders have shown

that they seem to be more common in areas with soft water [1]. Other forms of water contamination arise from the persistence of pollutants in the surroundings. Nowadays, an enormous amount of synthetic chemicals are produced and consumed; many of them, if released into the environment, are quickly broken down by microorganisms and do not pose a health risk unless they are present in high amounts. On the other hand, some do not disintegrate and remain, and if their discharge is allowed to continue, they may accumulate in concentration. Pesticides, some detergents, halogenated hydrocarbons, and certain plastics are a few examples of them. If the latter is let to accumulate to a point where it reduces the effectiveness of water treatment facilities, it may pose an indirect risk to public health. Every popular pesticide has at some point poisoned people fatally; this has happened when huge doses have been intentionally or unintentionally consumed. If just medical factors were taken into account, it would be generally believed that pesticides have significantly improved global health by reducing the presence of disease-carrying pests and increasing food production [2].

Water sources included lake water, hand-pumped water, dug wells, tube wells, tap water, and water samples that had evaporated up to ten times their concentration. These sources were almost all close to garages, car workshops, and painting studios. Using a spot test, a subset of samples from the sources mentioned above were examined further using additional parameters. Nine samples from the Bhagwanganj region, five samples from the Apsara Talkies area, two samples from Tilakganj area, five samples from each of the lake's five corners and one from the center, seven samples from drinking water sources nearby, and nine samples from the lake itself were chosen by spot test for more research. For the months of January 2009–December 2009 and July 2010–June 2011, all water quality parameters were routinely measured and recorded; only a subset of each perimeter's data were documented. In order to demonstrate the presence of heavy metals or to show that there may be a possibility of heavy metal contamination and a suitable environment, it is necessary to calculate the water quality parameters in this study project.

4 EVALUATION

All countries in the world today are concerned with protecting and preserving the environment. The current state of the environment serves as an illustration of how human activity is interconnected with nature and how people are unable to separate themselves from it after they have harmed it. Without a doubt, the current environment has an impact on human existence.

India's environmental issues are becoming worse very quickly. The nation's natural resources, infrastructure, and environment are all under stress due to the country's fast population growth—from 300 million people in 2007 to over one billion today—and rising economic development. Worsening issues include industrial pollution, deforestation, soil erosion, fast industrialization, urbanization, and land degradation. The Ministry of Environment and Forests (MoEF) is the government organization in charge of environmental matters. Managing industrial pollution in India is perhaps the agency's main focus. When implementing and upholding the nation's environmental laws and regulations, MoEF is aware of the necessity to strike a balance between development and

environmental protection. The Environment Protection Act of 2006 was passed by the government, increasing the Ministry's authority. The 42nd amendment to the Indian Constitution, which granted the government the authority to intervene and safeguard public health, forests, and wildlife, was expanded upon by this legislation in 2006. This amendment's language declaring it unenforceable in court gave it little legal impact, nevertheless. The world's first nation to change its constitution in a way that purports to safeguard the environment is India.

Its over dependence on coal for electricity production exacerbates environmental issues. Almost three-quarters of the power generated in the nation comes from coal, which also provides more than half of its energy demands. India is lucky to have an abundance of coal reserves to fuel economic growth, but burning this resource has come at a cost in terms of increased public danger and environmental damage, particularly considering the high ash content of India's coal. Carbon emissions have increased nine times in the last forty years due to the country's reliance on coal as its primary energy source. The

cost of environmental deterioration has been estimated by the government to be 4.5% of GDP in recent years. One issue is the poor energy efficiency of coal-burning power plants. India's coal-fired power facilities are outdated and lack modern pollution controls. These outdated coal-fired power facilities will continue to run for a while due to a lack of producing capacity and public funding. As part of the energy efficiency initiative, power plant modernization to increase the plant load factor, subtransmission and distribution enhancements to reduce distribution losses, and new laws to promote end user energy saving were all suggested. In order to solve its environmental issues, the government has taken action. As of right present, all power plants must utilize cleaned coal.

Seventy percent of the air pollution in the nation is caused by vehicle emissions. Not a lack of legislation, but rather local enforcement has been the main obstacle to government attempts to protect the environment. India's air pollution issue is becoming worse due to industrial and automobile emissions. Compared to twenty years ago, car exhaust has grown eight times, while industrial pollution has increased four

times. Over the last 20 years, the economy has expanded by 2.5 times, but civic services and pollution control have not kept up. Large cities like Kolkata, Mumbai, New Delhi, Chennai, etc. have the worse air quality. These cities are among the most polluted in the world according to the World Health Organization. The issue is exacerbated by untreated water, untreated smoking, and vehicle exhaust. Pollution will continue to rise as a consequence of ongoing economic expansion, urbanization, a rise in the number of automobiles, and a lackadaisical application of environmental regulations. The Supreme Court recently intervened and set a ban on the quantity of new automobile registrations in the capital due to severe air quality concerns.

What will India's environment look like in the twenty-first century? is a subject that many journalists have been posing. Given that India is now among the most polluted nations in the world, it is crucial to ask when and if India will ever be able to reduce pollution.

To just a few, the majority of Indian rivers—Bhadar, Sabarmati, Yamuna, Damodar, Chaliyar, Betwa, Noyyal, and Bhawani—are now poisonous sewers.

Another important source of drinking water, groundwater, is also being contaminated, and the majority of it is consumed untreated. Let us now get into further depth on air pollution. The amount of air pollution in Indian cities is also rapidly increasing. What does the 2007 air quality data for 70 cities, issued by the Central Pollution Control Board (CPCB), reveal? Shillong is the only town in India where there is year-round pure air for suspended particles, the most dangerous air pollutant in Indian cities, and where there isn't a single day when the air is even somewhat contaminated. The CPCB used adjectives like "moderately," "highly," or "critically" to describe the air quality in all 69 other cities during the year. In some places, the year-round air quality was only moderately bad, but on several days of the year, the pollution levels rose to high or dangerous levels. There were days when the air quality was really terrible in 33 cities, or over half of the cities under observation, when the air was severely polluted year-round.

5 CONCLUSION

There will also be negative effects on human health. Heat stress and other climate-related illnesses have increased throughout Central, East, South, and

Southeast Asia due to rising temperatures and unpredictable rainfall. rises in sickness and death brought on by diarrhea! In Southeast and South Asia, illness is predicted. In South Asia, rising coastal water temperatures might increase the prevalence and/or toxicity of cholera. Climate change will make Asia's already-existing difficulties much more intense. Since climate change exacerbates the stresses on natural resources and the environment brought on by fast urbanization, industrialization, and economic growth, it is expected to have an impact on the sustainable development of the majority of emerging Asian nations, according to the research.

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