DOI:10.31557/APJEC.2020.3.1.15

EDITORIAL

The Effect of Ambient Air Pollution on Severity of COVID-19: Hospitalisation and Death

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Asian Pac Environ Cancer, **3 (1)**, 15-16

Submission Date: 05/09/2020 Acceptance Date: 05/14/2020

The advent of a new Corona virus, SARS-CoVi-2, causing COVID-19, which first began in Wuhan, China, and then spread worldwide, has created a global public health crisis [1]. The sudden and far-reaching pandemic has raised many immediate questions. A very important goal of public health is to identify environmental factors that affect the spread and severity of the disease. Air pollution is one of the most well-known causes of long-term inflammation, which ultimately leads to increased immune system hyperactivity [2]. Air pollution is one of the leading causes of death and is estimated to play a role in nearly 5 million premature deaths worldwide in 2017 alone. Numerous scientific studies have linked air pollution to a variety of health concerns, including premature death in patients with heart or lung disease, non-fatal heart attacks, irregular heartbeats, and severe asthma [3]. Acute and chronic exposure to chemicals, such as air pollutants, can lead to an increase in diseases such as cancer and allergies, and can exacerbate major respiratory disorders and infections in children and adults [4]. On the other hand, severe COVID-19 infection is characterized by a high inflammatory load and can cause viral pneumonia with additional manifestations and extrapulmonary complications, including acute respiratory distress syndrome (ARDS) [5-6]. Patients with severe COVID-19 disease can suffer from respiratory and other vital systems failure that can eventually lead to death [7-8]. Particulate air pollution exposure is associated with increased risk of severe outcomes in patients with certain infectious respiratory diseases, including influenza, pneumonia, and SARS [5]. Therefore, prolonged exposure to environmental pollution with a negative impact on the functioning of the respiratory and cardiovascular systems carries the risk of severe COVID-19 symptoms and death. Thus, chronic exposure to particulate air pollution might render the respiratory tract more vulnerable to infection by COVID-19 and also increase the risk of severe outcomes (hospitalization, intensive care, or death) in case of infection. But also, short-term air pollution episodes could interact with the virus either by prolonging the viability of the virus in the environment or by interfering with the local innate immunity of the respiratory mucous membranes [9].

Since the risk of environmental pollution in urban and industrial polluted areas is higher than rural areas, COVID-19 intensity should be higher in urban and crowded areas. On the other hand, acute and chronic exposure of chemical industry workers to occupational pollution can have similar results [4-10]. Therefore, in addition to public health measures to fight COVID-19, measures to prevent non-communicable diseases caused by air pollution should be considered to improve the immune system and create host resistance against COVID-19. Therefore, studies are needed to determine the impact of air pollution (environmental or occupational exposure) on the prevalence of the disease and its severity and mortality. And its results can be used to manage the activities of infected processes and industries and to create appropriate guidelines and rules to control environmental and occupational exposure. General messages in the fight against COVID-19 should also include avoiding toxic substances in order to strengthen the immune system.

Governmental actions all over the world in fighting the spread of the COVID-19 pandemic have been surprisingly swift and strong (e.g. [11]) even though they caused severe interruption of the economy and led to numerous constraints on global trade and production. Measures against air pollution have so far not been observed even in much less intensity although air pollution as a cumulative threat causes a much higher death toll than SARS-CoVi-2. Or, but to name one other example: Climate change is with good reason termed the worst public health crisis of the 21st century [12]. Fighting climate change would not

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only require national governmental measures but global trust and cooperation between countries, virtues that would have been needed in the current COVID-19 crisis as well but have been lacking so far.

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