

## COVID-19, AIR POLLUTION AND MENTAL ILLNESS: HEADS OF THE SAME “BEAST”?

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### SUMMARY

*The Covid-19 outbreak are generating relevant consequences under several aspects. Covid-19 pandemic together with air pollution and a dysfunctional anthropization/urbanization might affect public and mental health with a synergistic effect. The current paper explore hypothesis about existing links among Covid-19, air pollution and mental illness.*

**Key words:** COVID-19 - air pollution - mental illness – migration – environment - urbanization

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The Covid-19 health emergency was officially declared as a pandemic on March 11<sup>th</sup> 2020 by the World Health Organization.

Heterogeneous plans were provided by Governments and Public Health authorities worldwide in order to contain the epidemic spread. Restrictions to social life habits, physical distancing and compulsory isolation at home have been widely implemented. The “lock-down” strategy, limiting most human activities, extensively applied all around the globe. The Covid-19 outbreak and the imposed countermeasures are generating relevant consequences under several aspects. First, an increase in psychological distress as a consequence of the fear of contagion and social isolation (World Health Organization 2020). Second, we assist to a consistent reduction of environmental pollution because of the reduction of anthropogenic activity, leading to a significant improvement of air quality.

Is it possible to hypothesize boundaries among Covid-19, air pollution and mental illness?

The aforementioned impact of Covid-19 on human activities is relevant if we think about the sudden reduction of nitrogen dioxide and carbon dioxide emissions, with the decrease of the latter up to 6% worldwide (CarbonBrief 2020). These pollutants are two of the most common tracers of industrial activity and, together with other agents, are indirectly responsible for millions of deaths each year attributable to poor air quality (Cohen et al. 2017). In fact, the present pandemic condition might have decreased the number of awaited deaths due to air pollution (Dutheil et al. 2020).

A further element is also emerging: air pollution seems to be linked to significantly higher rates of death in people with Covid-19 (Conticini et al. 2020, Zhu et al. 2020). The prominent role of some pollutants in inducing systemic and respiratory system inflammation is ascertained, possibly due to a dysregulated host

immunity exacerbating the susceptibility and the severity of viral infections (Conticini et al. 2020). Moreover, atmospheric particulate matter seems to create a unique ambient allowing the virus to survive for hours, possibly being widespread via airflows over large distances (Setti et al. 2020). This “combination” could contribute to the fast degree of diffusion, especially in high polluted regions such as part of China and northern Italy. Here, anthropization profoundly changed ecosystems with deforestation and related uncontrolled urbanization, reducing biodiversity and possibly facilitating spillover phenomenon. Moreover, anthropization resulted in migration flows towards strategic urban areas where population is highly concentrated and lives in such close proximity, thus facilitating contagion. This could generate a potential vicious cycle where more human activity leads to more pollution and enhances infections spread, with possible severe repercussions for global health. The current pandemic might represent a clear example of this mechanism and highlights the consequences of unsolved long-standing issues related to uncontrolled urbanization. Another concern related to urban environment is represented by the disentanglement of social ties, with disparities in access to care, that has been exacerbated by the present situation. Covid-19 stressed the capacity of healthcare systems, testing the resilience of professionals and uncovering already existing gaps in pathways to care. Hence, it is possible to expect an increase in stress-related diagnoses among the general population, especially health workers in first line against Covid-19 as well as a deterioration in subjects already affected by mental disorders. Patients with mental illness may have the worst outcome in this pandemic also because of lacking of adaptive cope and, in some cases, for a low sense of awareness exposing themselves to risky behaviors (Yao et al. 2020). Furthermore, emerging evidence exists that air pollution is a risk factor for

central nervous system disorders and mental diseases (Block et al. 2012, Attademo et al. 2017). Therefore, Covid-19 pandemic together with air pollution and a dysfunctional anthropization/urbanization might affect public and mental health with a synergistic effect. Urban agglomerates represent the benchmark of development level, so big cities should endorse the best of the human achievement in all fields, thus promoting a better life quality. A sustainable urbanization means an easy access to resources, in the attempt to foster integration over stigma and improve social adhesion. Awareness to collaborative models should arise as a response to a common threat. At the same time, there is an urgent need to encourage sustainable strategies over aggressive policies in order to discipline human interaction with the environment. Virus outbreak revealed the limit of anthropization as we know so far and the repercussions over world environment especially related to air quality and global health have been here reported. This may be a call to push forward green economy perspectives where environment and climate protection should represent the main achievements. Preserving natural barriers to limit the spillover, reducing fuel fossil dependency to reduce air pollution, promoting an easy access to health care services for the general population are just few of the urgent points needing a global action.

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Pierfrancesco Maria Balducci: conception and design of the letter and drafting the manuscript;

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