



## PRESS RELEASE

### **SARS-Cov-2 RNA Found on Particulate Matter of Bergamo in Northern Italy. SIMA propose to use it worldwide as “indicator” of COVID-19 relapses**

**Milan, April 24<sup>th</sup>.** Just one month after the release of a Position Paper on the “Evaluation of the potential relationship between Particulate Matter (PM) pollution and COVID-19 infection spread in Italy”,<sup>1,2,3</sup> **the Italian Society of Environmental Medicine (SIMA) announces** from the pages of the *International Journal of Environmental Research and Public Health* **that the coronavirus SARS-Cov-2 has been found on particulate matter (PM).**<sup>4,5</sup> **“This first evidence opens the possibility of testing in every city the presence of the virus on particulate matter in next months as an “indicator” to early detect SARS-COV-2 reappearance, and adopt proper preventive measures before new epidemic start”**<sup>5</sup> says the SIMA President Prof. Alessandro Miani (University of Milan).

The research group involves a number of scientists from different Universities and institutes: Leonardo Setti and Fabrizio Passarini (University of Bologna), Gianluigi De Gennaro, Jolanda Palmisani, and Alessia Di Gilio, (University of Bari), Pierluigi Barbieri, Massimo Borelli, Valentina Torboli, Alberto Pallavicini (University of Trieste), Maurizio Ruscio (University Hospital of Trieste), Maria Grazia Perrone (Tecora Environmental Research Division), Prisco Piscitelli (UNESCO Chair on Health Education and Sustainable Development of Naples) and Alessandro Miani (University of Milan).

Prof. Alessandro Miani clarifies that “This first part of the research was explicitly aimed at confirming or excluding the presence of the SARS-CoV-2 RNA on particulate matter. The first evidence concerning the presence of the coronavirus on particulate matter comes from analyses performed on 34 PM10 samples of outdoor/airborne collected in industrial sites of Bergamo Province with two different air samplers over a continuous 3-weeks period, from February 21<sup>st</sup> to March 13<sup>th</sup>”.<sup>4</sup>

**“We can confirm to have reasonably demonstrated the presence of SARS-CoV-2 viral RNA by detecting highly specific genes, representing molecular markers of the virus, in two parallel genetic analyses.** Positive results were confirmed on 12 different samples for all the three molecular markers, namely the E gene, N gene and RdRP gene, with this latter being highly specific for the presence of SARS-CoV-2 viral RNA.<sup>4</sup> **explains Leonardo Setti (University of Bologna),** who has coordinated the scientific Research Group together with Prof. Alessandro Miani and **Prof. Gianluigi De Gennaro (University of Bari “Aldo Moro”).**



“This is the first preliminary evidence that SARS-CoV-2 RNA can be present on outdoor particulate matter, thus suggesting that – in conditions of atmospheric stability at temperature of 0–5 °C, with relative humidity of 90–100% and high concentrations of PM – SARS-CoV-2 could create clusters with outdoor PM and the persistence of the virus in the Therefore, the mandatory adoption of face masks would be desirable during both the lockdown and phase 2, when the progressive return to normal life is expected. Face masks represent a barrier useful to contain viral droplets nuclei exhaled by infected people as well as adequate to reduce probability of inhalation of such droplets by the surrounding healthy persons. But more extensive distancing measures up to 10 meters should be adopted inside indoor environments when face masks are not used. **In the case of the common use of face masks, the distance among persons could be reduced to 2 meters**”<sup>6</sup>, says De Gennaro.

According to **Prof. Prisco Piscitelli** (epidemiologist and SIMA vice-president): “At the present, epidemiological observations available for Italy, China and U.S. show that COVID-19 outbreak progression is more severe in those areas characterized by higher levels of outdoor particulate matter. Air pollution could influence the COVID-19 outbreak progression also by enhancing the host susceptibility to viral infection by independently increasing the baseline risk of cardiovascular events and complications, chronic obstructive pulmonary diseases (COPD), and other conditions that are known to increase the severity of the infections especially in elderly people. Therefore, particulate matter concentrations should be maintained at low levels even after the end of the lockdown as crucial measure of primary prevention”.

“Searching for SARS-COV-2 coronavirus could be useful also to assess contamination of indoor environment such as hospitals, ambulatories, restaurants, shopping malls, shops, factories, pubs etc. Further confirmations of this preliminary evidence about considering **PM as a “carrier” for the viral droplet nuclei** are ongoing in different sites, and are aimed at including real-time assessment about the vitality and virulence of the SARS-CoV-2 adsorbed on particulate matter. At the present, **we have evidence to consider as safe the inter-personal distance of 2 meters only if everybody is wearing a face mask.**<sup>6</sup> Other issues to be specifically addressed are the average concentrations of PM eventually required for a potential “boost effect” of the contagion or even the theoretic possibility of immunization consequent to minimal dose exposures at lower thresholds of PM” – states Professor Miani – highlighting that SIMA is in close contact with the World Health Organization for sharing the results of the ongoing researches.

## Bibliography

1. Italian Society of Environmental Medicine (SIMA), Position Paper Particulate Matter and COVID-19, available online at: [http://www.simaonlus.it/wpsima/wp-content/uploads/2020/03/COVID\\_19\\_position-paper\\_ENG.pdf](http://www.simaonlus.it/wpsima/wp-content/uploads/2020/03/COVID_19_position-paper_ENG.pdf)
2. Leonardo Setti; Fabrizio Passarini; Gianluigi De Gennaro; Pierluigi Barbieri; Maria Grazia Perrone, Andrea Piazzalunga, Massimo Borelli; Jolanda Palmisani, Alessia Di Gilio, Prisco Piscitelli, Alessandro Miani. **The potential role of particulate matter in the spreading of COVID-19 in Northern Italy: First evidence-based research hypotheses.** 2020. The pre-print of the study is available online at (submitted for publication 15 April 2020): <https://www.medrxiv.org/content/10.1101/2020.04.11.20061713v1>
4. Leonardo Setti, Fabrizio Passarini, Gianluigi De Gennaro, Pierluigi Barbieri, Maria Grazia Perrone, Massimo Borelli, Jolanda Palmisani, Alessia Di Gilio, Prisco Piscitelli, Alessandro Miani. **Is there a Plausible Role for Particulate Matter in the spreading of COVID-19 in Northern Italy?** *British Medical Journal Rapid Responses*, available online at: <https://www.bmj.com/content/368/bmj.m1103/rapid-responses>.
4. Leonardo Setti, Fabrizio Passarini, Gianluigi De Gennaro, Pierluigi Barbieri, Maria Grazia Perrone, Massimo Borelli, Jolanda Palmisani, Alessia Di Gilio, Valentina Torboli, Alberto Pallavicini, Maurizio Ruscio, Prisco Piscitelli, Alessandro Miani, **SARS-Cov-2 RNA Found on Particulate Matter of Bergamo in Northern Italy: First Preliminary Evidence.** The pre-print of the study is available online at (submitted for publication 13 April 2020): <https://www.medrxiv.org/content/10.1101/2020.04.15.20065995v1>
5. Leonardo Setti, Fabrizio Passarini, Gianluigi de Gennaro, Pierluigi Barbieri, Alberto Pallavicini, Maurizio Ruscio, Prisco Piscitelli, Annamaria Colao, Alessandro Miani. **Searching for SARS-COV-2 on Particulate Matter: A Possible Early Indicator of COVID-19 Epidemic Recurrence?** Accepted for publication on *Int. J. Environ. Res. Public Health*, 23 April 2020
6. Leonardo Setti, Fabrizio Passarini, Gianluigi De Gennaro, Pierluigi Barbieri, Maria Grazia Perrone, Massimo Borelli, Jolanda Palmisani, Alessia Di Gilio, Prisco Piscitelli, Alessandro Miani. **Airborne Transmission Route of COVID-19: Why 2 Meters/6 Feet of Inter-Personal Distance Could Not Be Enough.** *Int. J. Environ. Res. Public Health* 2020, 17, 2932, available online at: <https://www.mdpi.com/1660-4601/17/8/2932>

## Value Relations

Cristina Depaoli, [c.depaoli@vrelations.it](mailto:c.depaoli@vrelations.it)