

## COVID-19, a special case

**The SARS-CoV-2 virus can cause severe pneumonia which is different from other pneumonia common seen in the hospital, explains Professor Didier Cataldo, a lung specialist at the CHU de Liège. The long term effect is huge. Besides, the COVID-19 pandemic forces us to rethink the way we produce life-saving medicines and tools.**

The SARS-CoV-2 virus can cause severe pneumonia in some patients. Also, some patients with COVID-19 develop Acute Respiratory Distress Syndrome (ARDS) with characteristic pulmonary ground-glass changes on imaging, in quite a different pattern than we normally see. Professor Cataldo explains: 'In a quite typical ARDS and other conditions, when the oxygen in the lung is decreased, the body reacts with vasoconstriction in that part of the lung to reduce the circulation. This mechanism is less pronounced in COVID-19 patients. The consequence is that less non-oxygenic blood crosses the lung and enters the circulation which causes serious problems, often leading to the intubation of these patients.'

Sure is that the mortality linked to ARDS caused by COVID-19 is more severe as compared with ARDS caused by other lung diseases. Besides the lung problems, the virus can induce multi-organ failure, deterioration of the coagulation system, alter the endothelium, and impair kidney function. Also, co-infection with influenza and bacteria can occur and CT-lung shows a typical pattern.

### COVID-19, air pollution and tobacco

Is there a link to the severity of COVID-19 symptoms and tobacco use, vaping, or air pollution? 'An early report published in The Lancet suggests that the disease is more severe in smokers, but other cohorts don't prove this. There is also some debate about a putative protective effect of nicotine. It would be logical that when you start from an impaired lung function (e.g. COPD) the disease runs more severe. In Italy, they made some calculations on the correlation of the pollution of the area and the severity of illness due to COVID-19' says Professor Cataldo. We know that pollution and tobacco use cause inflammation in the lung, and this might influence defense mechanisms in the lung. In asthma, for example, it is well described that when the inflammation is quite high, the epithelial cells are producing less interferon and the interferon is one of the responses of the cells against viruses. Further investigation is certainly needed to assess the exact role of pre-existing conditions and lung exposure to pollutants (incl. cigarette smoke). The SARS-CoV-2 virus targets the ACE-receptor which is present in the lung parenchyma but also in other organs.

Severely ill patients can develop partial necrosis in some parts of the lung and the potential long term consequences are under investigation. Certainly, for people in intensive care under intubation, rehabilitation may take a long time, because of the loss of lung function and muscle mass. For these patients, it is a great challenge to fully recover and rehab centers will have to deal with a new population of patients.

### What will be the longterm impact?

The direct impact of COVID-19 is tremendous, all caregivers have to follow strict rules to protect themselves and other patients. A lot of investigations in pneumology produce aerosols, for instance lung function tests, provocation tests, and bronchoscopy and the recommendation during COVID-19 is not to perform these investigations except when the absolute requirement is obvious. Knowing this crisis might last well into next year, that we might even have to wait for a vaccine before we can return to normal and operate under standard conditions, is a huge challenge.

### Conclusion

'The impact of outsourcing our industries to other continents is now becoming a threat to life-saving medicines and products. Solvents and raw materials are becoming even scarcer. Very often these raw materials are only supplied by factories in India or China. It is a strange situation that we can no longer order these products in the EU. The problems we have seen now in the context of the COVID-19 pandemic should be a wake-up call that the EU has to foresee in the production of essential products we need for the production of medicines', remarks Pr. Cataldo.





With support of  
the eu.reca partners :



Point of View

Article written by: Prof.dr. Didier CATALDO



Prof. dr. Didier Cataldo

Didier Cataldo is a clinician pneumologist and ordinary Professor at the University of Liege. He manages a research lab at university of Liege focused on the mechanisms of asthma, COPD and lung cancer/mesothelioma progression. Many different tools are available in his lab to study mechanisms of action of various experimental drugs in vitro and in animal models. He is the chairman of the scientific advisory board at Aquilon and member of the Académie Royale de Médecine de Belgique. He is the president-elect of the Belgian Respiratory Society.

#### Join eu.reca today

The European Respiratory Cluster Antwerp (eu.reca) is a dynamic knowledge platform with a focus on the lung. In order to improve therapies and quality of life of patients, develop new products, reduce societal costs and deal with the challenge of air pollution, we believe it is necessary to connect and unite all stakeholders in an expert community.

"As a catalyst for innovation, we want to bring promising start-ups into contact with leading companies, pharma with product designers, academics with entrepreneurs, and investors with patients. That is why our approach is based on interaction. Our extensive network ensures a quality pool of participants. Our workshops and symposia encourage in-depth dialogue." Frank Pieters, Founder and Chairman of the Board.

Interested? Find us at [www.eureca.world](http://www.eureca.world).

eu.reca gold sponsors



eu.reca - Galileilaan 15, 2845 Niel, Belgium  
+ 32 3 443 04 00 - [info@eureca.world](mailto:info@eureca.world) - [www.eureca.world](http://www.eureca.world)