

Predicting the severity of COVID-19 infection

The “Predi-COVID” study has been launched

The Research Luxembourg COVID-19 task force announces the start of “Predi-COVID¹”, a study that aims to identify important risk factors and biomarkers associated with COVID-19 severity and long-term health consequences of the disease in Luxembourg. Predi-COVID will contribute to better understanding why some patients infected by SARS-CoV-2 develop severe symptoms while others present only mild forms, which will ultimately lead to more personalized care recommendations. The study will also include household members of Covid-19 positive participants to study the transmission of the virus in this high-risk population. Overall, this unique project will provide important results and improve the understanding and management of the outbreak.

COVID-19 infection manifests itself through a diverse array of symptoms, varying in type and intensity and consequently resulting in very different outcomes for affected patients. The risk of more severe forms of Covid-19 increases with age. However, little is currently known about other clinical and biological characteristics that lead to the observed disparities in disease severity and prognosis.

In this context, the “Predi-COVID” project was launched with the goal of defining which patient profiles can be associated with a more severe prognosis. The study will identify the clinical, epidemiological and socio-demographic characteristics, as well as specific biomarkers from both the SARS CoV-2 virus and the patient, which can help predict the way the disease will evolve in a given individual according notably to his immune profile. Such predictors are important to personalize care by predicting as early as possible the risk of severe disease; they are also essential to support possible future strategies of de-isolation.

“In terms of biological markers, one of the factors that will be assessed in the study is whether the presence of other concurrent microbial infections – known as co-infections – could serve as an indicator of COVID-19 severity in the Luxembourg population”, explains Prof Paul Wilmes from the Luxembourg Centre for Systems Biomedicine (LCSB) of the University of Luxembourg, one of the partners implicated in the project.

“By improving our understanding of the heterogeneity observed in disease severity, our study will enable the accurate prognostic evaluation of people with Covid-19. This will in turn provide policymakers with an invaluable tool to effectively steer public health measures in response to the pandemic. This could include targeted isolation policies for the most vulnerable individuals”, states Prof. Laetitia Huiart, Director of the Department of Population Health at LIH and Principal Investigator of the study.

To this end, a cohort composed of people over the age of 18 positive for SARS CoV-2 is being established. All individuals newly tested positive and being followed through the national Covid-19 telemonitoring system (suivicovid.lu) since the launch of the Predi-COVID study can

¹ «Luxembourg cohort of positive patients for COVID-19: a stratification study to predict severe prognosis»

participate in this study if they agree to share their data for research purposes. Since the Predi-COVID study aims to capture the entire course of the disease, people that have previously been tested positive for SARS-CoV-2 cannot participate in the study, even if they still show symptoms.

More detailed clinical data and associated biological samples will be gathered from a subset of volunteers from the original study cohort, in order to better characterise symptoms and clearly define the different disease outcomes. Upon inclusion in the study and after three weeks, several biological samples — including blood, nasal and oral swabs, saliva and stool will be collected from participants to identify human and viral predictive markers.

The health evolution and symptoms of the enrolled patients will be followed daily through different remote digital tools, depending on whether patients are at home or at the hospital, for 14 days from the time of confirmation of diagnosis. Short additional evaluations will also be performed monthly for a period up to 12 months, to assess potential long-term consequences of Covid-19. Finally, innovative digital data will be collected. This comprises voice recordings, allowing researchers to identify “vocal biomarkers” of frequently observed symptoms in people with Covid-19. This can help identify signs of respiratory syndromes, fatigue, anxiety or negative emotions related to Covid-19, which could subsequently be used for the easy remote monitoring of Covid-19 patients at home.

“The strength of the project lies in its highly interdisciplinary consortium, which has mobilised a significant number of leading experts in virology, immunology, digital health, epidemiology, clinical practice, computer science, statistics and artificial intelligence. Pooling such a diverse expertise so rapidly has been made possible by the tight collaborative environment fostered by Research Luxembourg, which has resulted in an integrated and holistic study protocol”, concludes Prof. Ulf Nehrbass, Chief Executive Officer at LIH and spokesperson of the Research Luxembourg COVID-19 task force.

The “Predi-COVID” study is led by a consortium of Luxembourgish research institutions, including LIH, Integrated Biobank of Luxembourg (IBBL), the Laboratoire National de Santé (LNS), the University of Luxembourg, the Luxembourg Centre for Systems Biomedicine (LCSB), the Centre Hospitalier de Luxembourg (CHL) and Hôpitaux Robert Schuman (HRS). The study is co-financed by the Luxembourg National Research Fund (FNR) with an amount of EUR 1.85 million and the André Losch Foundation.

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Info for journalists

About Research Luxembourg

Research Luxembourg is a joint initiative of the main players in Luxembourg public research, namely Luxembourg Institute of Health (LIH); Luxembourg Institute of Socio-Economic Research (LISER); Luxembourg Institute of Science and Technology (LIST); Laboratoire national de santé (LNS); Luxinnovation; University of Luxembourg; Fonds National de la



Recherche (FNR), under the coordination of the Ministry of Higher Education and Research. The main aim of the initiative is to promote scientific cooperation in Luxembourg and to communicate the activities of the sector as a whole.