

Evolution of outcomes for patients hospitalized during the COVID pandemic

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As SARS-CoV-2 continues to spread in France, a thorough characterization of hospital care needs and of the trajectories of hospital patients, as well as how they have changed over time, is essential to support planning. This led scientists from the Mathematical Modeling of Infectious Diseases Unit at the Institut Pasteur and the University of

Cambridge to develop a probabilistic model that can be used to analyze detailed patient trajectories based on 198,846 hospitalizations in France during the first nine months of the pandemic (from March to November 2020). These findings were published in *The Lancet Regional Health Europe* on March 20, 2021.

This model takes into account variations in the age and sex of the patients over time, and explores changes in probabilities of ICU admission, death and hospital discharge, as well as variations in the length of hospital stays.

The scientists observed major changes in the age and sex of the patients hospitalized during the study period. In particular, the proportion of hospitalized patients aged over 80 varied between 27% and 48% during the epidemic and was lower during the two waves. The proportion of women among the hospitalized patients varied between 45% and 53% during the epidemic.

The scientists also demonstrated that the outcome of hospitalized patients varied substantially during the pandemic. For example, the probability of [hospitalized patients](#) being admitted to an ICU fell from 25.4% (24.4%-26.4%) to 12.6% (11.6%-13.6%) during the first four months (from March to June) in parallel with the decrease in case numbers, before rising to 19.3% (18.9%-19.7%) during the second wave. The probability of death followed a similar path, falling from 24.9% (24%-25.9%) to 10% (8.7%-11.3%) after the first wave before increasing again to 18.6% (18.1%-19%) during the second wave. These trends were similar for both men and women.

"These major variations in the probabilities of ICU admission and death need to be taken into account when planning [hospital](#) care needs," explains Simon Cauchemez, Head of the Mathematical Modeling of Infectious Diseases Unit at the Institut Pasteur and last author of the

study.

"The reasons for these [large-scale changes](#) in patient mortality since the start of the pandemic remain unclear but are likely to represent a combination of changes in healthcare seeking behavior by patients, changing strains on healthcare centers, as well as improvements in treatments as physicians have learnt more about the disease," concludes Noémie Lefrancq, a Ph.D. student in the Department of Genetics at the University of Cambridge and first author of the study.

More information: Noémie Lefrancq et al, Evolution of outcomes for patients hospitalised during the first 9 months of the SARS-CoV-2 pandemic in France: A retrospective national surveillance data analysis, *The Lancet Regional Health - Europe* (2021). [DOI: 10.1016/j.lanepe.2021.100087](#)

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