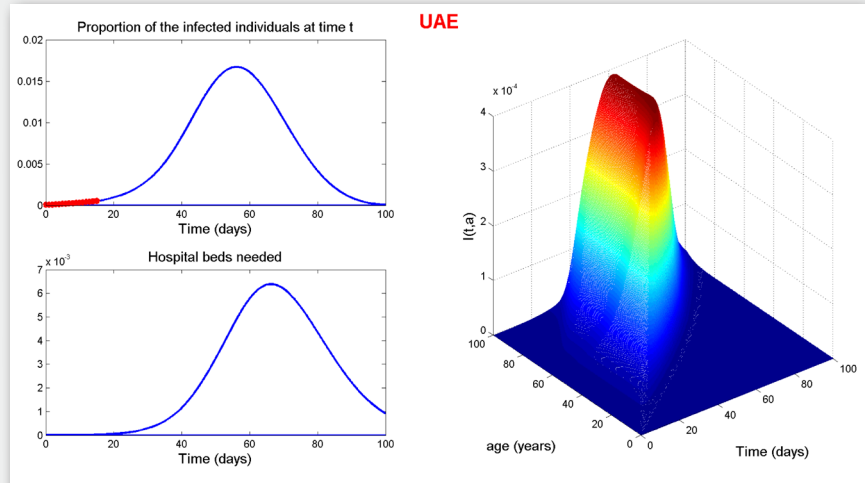# COVID-19 RESEARCH NEWSLETTER

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Aged-structured Modeling of COVID-19 pandemic in USA, UAE and Algeria

This study considered the distribution of the age per country and number of hospital beds needed for COVID-19 patients. Using WHO data from the beginning of the pandemic until 20 April 2020, the team calculated the basic reproduction number R0 for each country. They estimated the time peak for each country and the number of cases and hospital beds needed. By looking at the current data of each country the team found that the number of cases, the time of the peak and the number of beds needed had been overestimated. In fact, these estimations did not consider the measures that each country had taken after 20 April 2020 to contain the pandemic. The outcomes show the possible impact of the COVID-19 pandemic if governments did not take any measure to protect public health.

Assuming that the three countries started non-pharmaceutical interventions measures after 20 April 2020, the researchers fitted their model to the data between 21 April 2020 and 14 May 2020 to re-estimate the main parameters of the model. Compared to the previous scenario, the main conclusions were: (a) the three countries made substantial efforts to reduce the spread of COVD-19 disease, which show clearly the reduction of the basic reproduction numbers, (b) the non-pharmaceutical interventions measures were able to reduced the size of the pandemic and delayed its peak.

They then investigated the impact of a full lockdown, if applied, on the population to contain the spread of the disease. They assumed that each country applied the full lockdown starting from April 20. Under this scenario, they found that the UAE would benefit the most from a 30-day full lockdown as the number of infected people would drop to 24% from the original estimation. The number of infected people in Algeria would drop to 43.3%. USA would benefit less from this measure with a drop to only 72.2%. Similarly, for hospital beds, with a full lockdown, hospital bed needs in the UAE would drop to 13.1%, 23.8% in Algeria and 44.7% in the USA. The team also investigated the effect of the unavailability or improper use of the personal protective equipment (PPE) on the spread of COVID-19 among healthcare personals (HCP). By assuming that the infection could be transmitted to HCP via patients in acute and critical conditions, their simulation showed that such a scenario would double the number of infected people and number of hospital beds needed at the peak of the pandemic. This revealed the importance of providing enough stock of PPE to HCP and care givers in long-term care facilities.

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If you are interested in sharing your COVID-19 releated research, please send your contribution to research.office@uaeu.ac.ae