Deaths in Iran, including outpatients and asymptomatic cases, would decrease the proportion of severe cases. To increase the number of hospitalizations, as well as those admitted to ICU or under mechanical ventilation as more severe cases, the total number of hospitalized COVID-19 patients increases. Based on available data, we considered patients the sample size, analysis of death cases is done on the data in the last week.

13,600 new cases are assumed, leading to 0% isolation. This would yield an exponential growth of Minimum level of governmental intervention:

Scenario 1 (no interventions): Estimation of the Number of COVID-19 Hospitalized New Cases Per Day: A Dynamic Modelling

Five scenarios were considered in which different levels and durations of intervention lead to different isolation rates. In each scenario, the number of COVID-19 hospitalized new cases per day is modeled between January 21 and June 19, 2020.

Scenario I (no interventions): No intervention by the government and the public is assumed, leading to 0% isolation. This would yield an exponential growth of the number of hospitalized new cases, reaching a peak in June 19, 2020 with 13,600 hospitalized new cases/day (95% uncertainty level [UL]: 4,900-26,000 new cases/day). Cumulative number of hospitalized new cases will be about 966,000 (95% uncertainty level [UL]: 467,000-1,700,000 new cases/day).

Scenario II (only public attention): This would lead to 10% isolation, persisted uniformly throughout the aforementioned period. This would result in a gradual increase in the daily number of hospitalizations until May 3-6, with 2,900 new cases of hospitalization/day (95% UL: 1,100-5,700 new cases/day). The growth rate will then gradually, leading to 2,300 new cases of hospitalization/day by June 19, 2020 (95% UL: 600-5,400 cases/day). In this scenario, cumulative number of hospitalized new cases will reach in about 280,000 (95% uncertainty level [UL]: 119,000-528,000 new cases/day).

Minimum-level of governmental intervention: Community education by the government is assumed; leading to 10% isolation during January 21-February 20, 15% isolation during February 20-March 10, and 20% isolation from March 11 till June 20, 2020. In this scenario, peak of the number of hospitalizations/day would occur in April 7-10, with 1,600 new cases of hospitalization/day (95% UL: 600-3,000). Then the growth rate would slowly slow down till June 19, when an average number of 650 new cases of hospitalization/day would occur (95% UL: 100-1,800). In this scenario, cumulative number of hospitalized new cases will reach in about 147,000 (95% uncertainty level [UL]: 56,000-293,000 new cases/day).

Intermediate-level of governmental intervention: More intense interventions introduced by the government include social distancing, closure of sports, cultural and religious events, universities and schools, and the restriction of human mobility. The interventions lead to 10% isolation during January 21-February 20, 15% isolation during February 20-March 10, and 30% isolation from March 11 till June 20, 2020. In this scenario, peak of the number of new cases of hospitalization/day would occur in March 11, with 1,400 new cases/day (95% UL: 700-2,300). Then the growth rate would slowly slow down till June 19, when an average number of 200 new cases of hospitalization/day would occur (95% UL: 15-700). In this scenario, cumulative number of hospitalized new cases will considerably reduce and reach in about 99,000 (95% uncertainty level [UL]: 38,000-196,000 new cases/day).

High-level of governmental intervention: Interventions are more intense than scenario IV, but they still lack military interventions. The added interventions include ban of within/between city transportations, city quarantine, and isolation and contact tracing of suspected cases. The interventions lead to 10% isolation during January 21-February 20, 15% isolation during February 20-March 10, and 40% isolation from March 11 till June 20, 2020. In this scenario, peak of the number of new cases of hospitalization/day would occur in March 11, with 1,400 new cases/day (95% UL: 700-2,300). Then the growth rate would slowly slow down till June 19, when an average number of 70 new cases of hospitalization/day would occur (95% UL: 3-270). In this scenario, cumulative number of hospitalized new cases will considerably reduce and reach in about 75,000 (95% uncertainty level [UL]: 29,000-147,000 new cases/day) which is lowest among all previous scenarios.

Conclusions: Interventions leading to increased isolation rate have a profound effect on the new cases of hospitalization per day of infection and epidemic growth rate.

Maximum interventions require harmonized intra/inter sectoral collaborations. The more severe the interventions become, the slower the incidence of the disease and the slope of the epidemic curve will be. Furthermore, the number of new cases of hospitalization/day will show a declining trend.