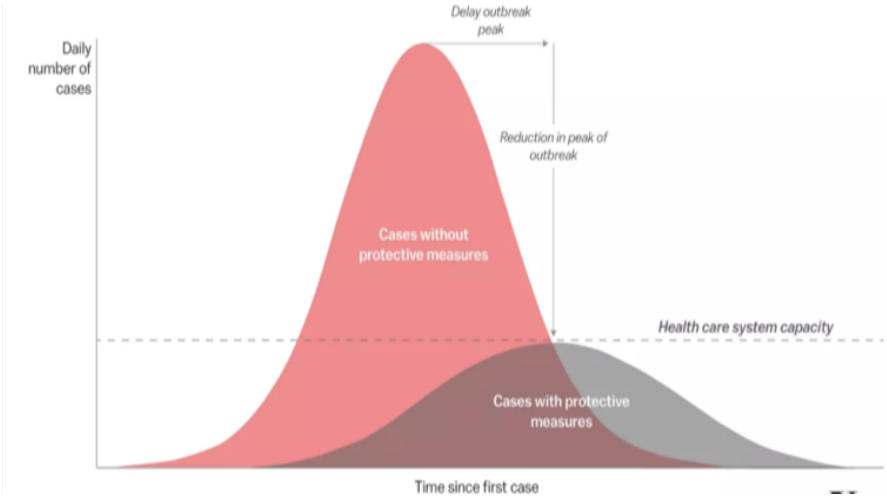
What does coronavirus mean for health care system ?

As the new Coronavirus Disease (COVID19) cases continue to increase rapidly across the world, everyone is beginning to wonder about one set of numbers: How many people have died? How many confirmed cases? And in which countries? Answers to previous questions are heavily influenced by the health care system and crisis management. Weak diagnostic capabilities lead to an increase in cases (increase in infection), which leads to a saturation of the absorptive capacity of the health care system. As the health care system begins to saturate, it will become difficult to detect, track, and contain and provide the necessary care for the patient. So we should be concerned about another set of numbers. How many Anesthetists, Pneumologists, Interns? What does an avalanche of uncharacteristically severe respiratory viral illness cases mean for the health care system? How much excess capacity currently exists, and how quickly could COVID19 cases saturate and overwhelm the number of available hospital beds, face masks, ECOMs(extra-corporeal oxygenation), how many sick people can they all treat at the same time? And other resources. The primary goal with the coronavirus outbreak at this point is to slow the spread so patient numbers and needs do not exceed the system's capacity.



Source :https://www.vox.com/policy-and-politics/2020/3/16/21173766/coronavirus-covid-19-us-cases-health-care-system

If the country failed to flatten the curve, even hospitals with the world's best health care risk becoming overwhelmed and doctors have to make extraordinary decisions about who may live and who may die. Italy is facing a version of that nightmare already.

Chart 1 and 2 show the first countries that were infected with COVID19 coronavirus, which had the highest number of cases and highest death rate. As of March 21, 2020, the number of cases in China - more than 81,000 - is much higher than Italy, Spain, the United Kingdom and the rest of the world. However, the mortality rate in Italy, Spain and the United Kingdom was 8.57%, 5.07% and 4.44%, respectively, eclipsing the coronavirus-related deaths in China. This is due to the gap between resources

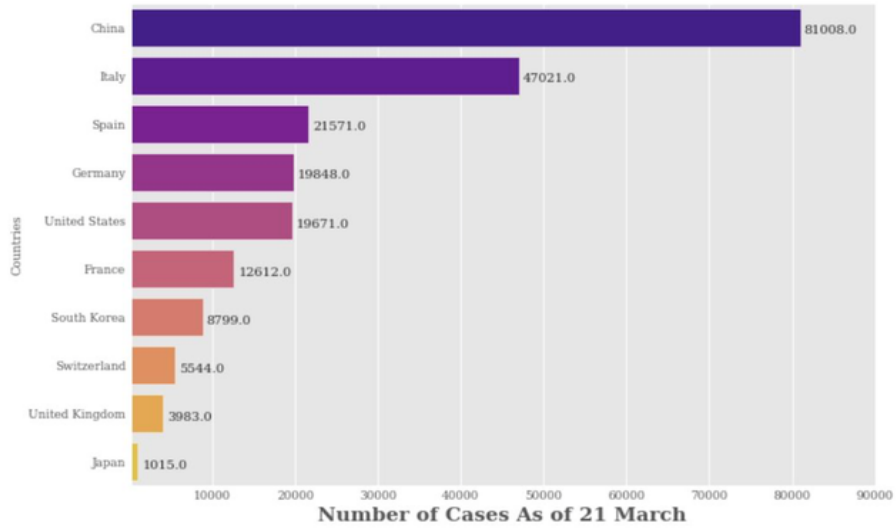


Chart 1: Number of Cases As of 12 March

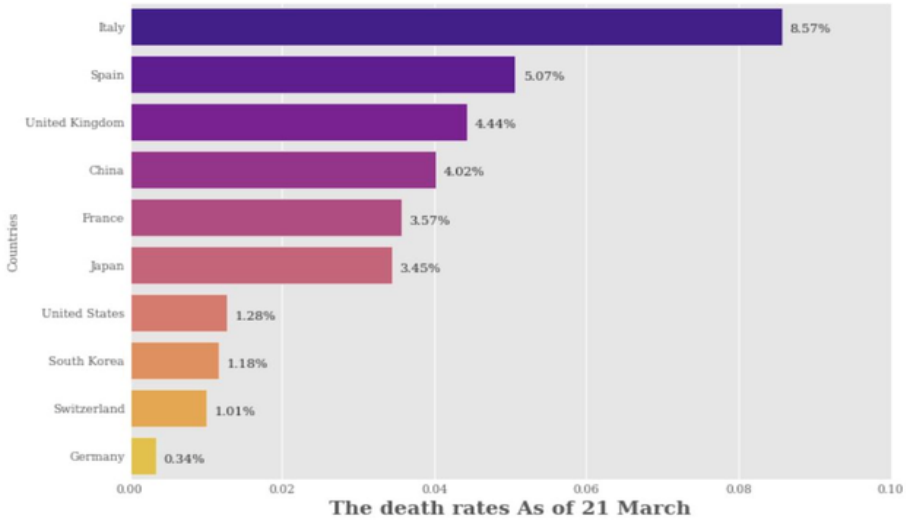


Chart 2: The Death Rates As of 12 March

and the enormous influx of patients. The majority of people with Covid-19 can be managed at home. but based on the Chinese Center for Disease Control and Prevention(Zunyou Wu, Jennifer M , 2020), about 20% required hospitalization, 5% of cases require the Intensive Care Unit (ICU) and around 2.5% require very intensive help, with items such as ventilators or ECMO (extra-corporeal oxygenation).Note: In Italy, the statistics so far worst: More than 50% of infected individuals require hospitalization and about 10% need treatment in the ICU.

What does a caseload of this size mean for the health care system? but by one resource — hospital beds per 1000 people — can gauge how Covid-19 will affect resources and vice versa.

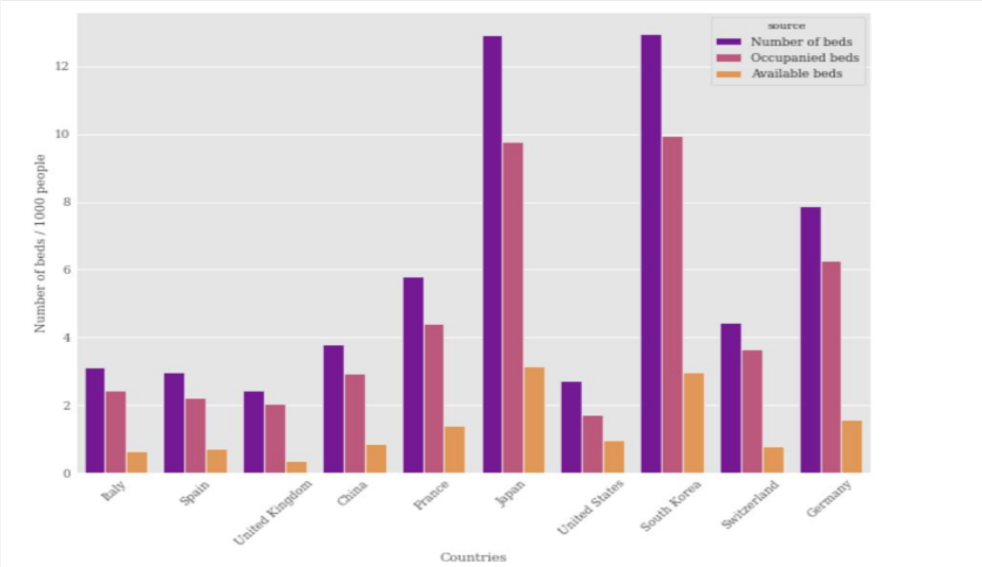


Chart 3: The number of hospital beds per 1,000 people.

The chart 3 shows the number of hospital beds per 1,000 people. Take into account, more than half of these beds are already occupied, the number of beds available to receive COVID19 patients is very low. And with many COVID19 patients requiring weeks of care, turnover will slow to a crawl as beds fill with Covid-19 patients. Note that South Korea and Japan, two countries that have seemingly thwarted the exponential case growth trajectory, have the highest number of beds per 100,000 people, more than 12 hospital beds per 1,000 people

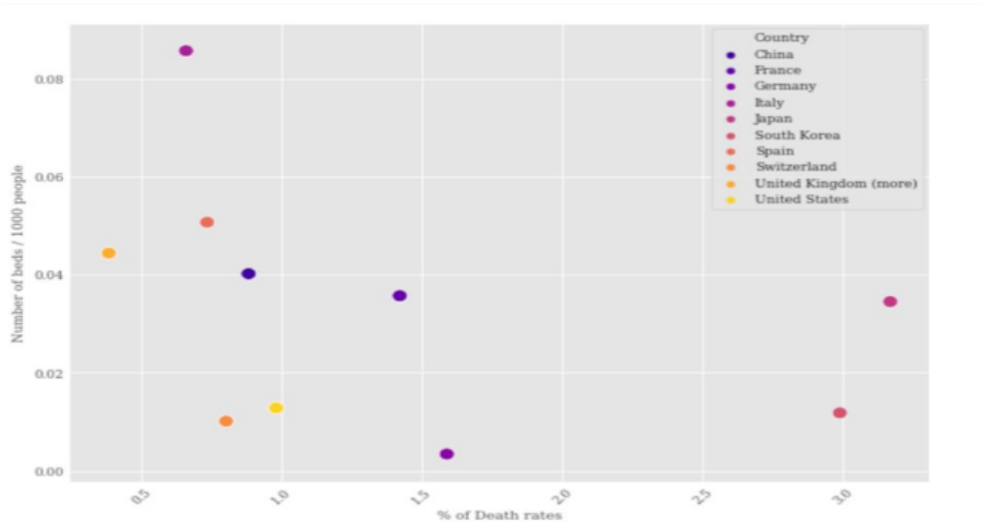
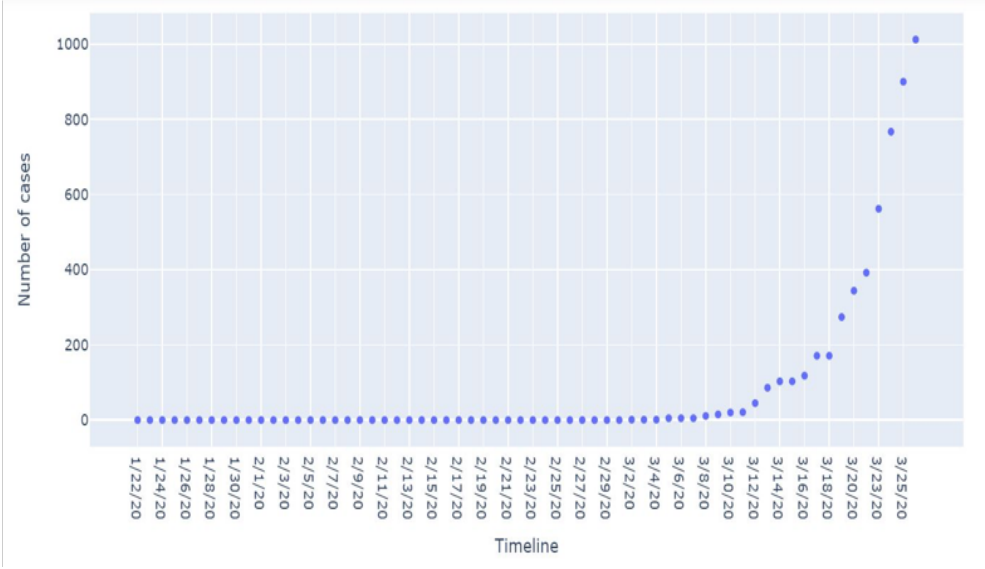


Chart 4: relationship (correlation) between mortality and the number of be

Chart 4 show the relationship (correlation) between mortality and the number of beds, we can notice that there is an inverse relationship between them. Countries with more resources (beds here) will be more able to contain and provide the necessary care for the patient. The same analysis applied to thousands of medical devices, supplies, and services — like ventilators or ECMO (extracorporeal oxygenation) devices - to measure efficiency in healthcare systems.

What does coronavirus mean for the Saudi health care system?



As of March 26, about 1012 cases of Covid-19 had been diagnosed in Saudi Arabia. According to a Chinese modeling study (Prof Joseph T Wu et al,2020), We can expect a doubling of cases every six days. Note: The number of cases may increase rapidly or slowly depending on the strength of the diagnostic capabilities. That means we are looking at about more than 500,00 Saudi cases by the mid of April; 1 million by the end of April; 2 million by the beginning of May, and so no. The Saudi has about 2.7 hospital beds per 1,000 people (Remember the hospital bed's graph: South Korea and Japan were able to thwart the exponential growth of cases, have more than 12 hospital beds per 1,000 people;). With a population of 34 million, this is about 90,000 hospital beds. At any given time, about more than 50% of them are occupied. That leaves about 40,000 beds available. The majority of people with Covid-19 can be managed at home. based on the Chinese Center for Disease Control and Prevention(Zunyou Wu, & Jennifer M , 2020), about 20% required hospitalization and 5% ended up in critical care. In Italy, the statistics so far are even more dismal: More than half of infected individuals require hospitalization and about 10% need treatment in the ICU. For this analysis, I'm conservatively assuming that only 10% of cases warrant hospitalization, in part because the Saudi population is younger (with median age 27.5) than both China (with median age 37.4) Italy (with median age 45.5) and has lower rates of smoking (with 15.40% total smoking rate) which may compromise lung health and contribute to poorer prognosis than both China(with 24.70% total smoking rate) and Italy(with 24.00% total smoking rate). At a 10% hospitalization rate, all hospital beds in Saudi. will be filled by mid of May. But that's assuming all other causes of hospitalization remain constant and there is no uptick in demand for beds from non-Covid-19 causes. Therefore, it is possible that we lose the beds before the expected time. however, we engage in social distancing, proper quarantining and proper hygiene, we can slow the rate of spread, and make sure there are enough resources to properly care for everyone.

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