

SARS & COVID-19

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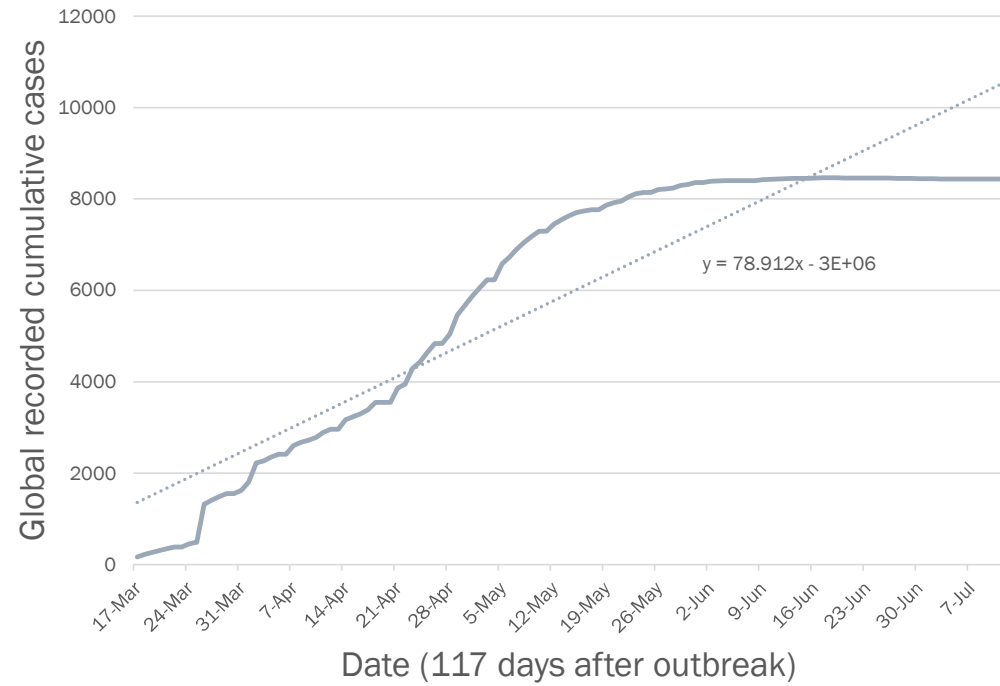
Objectives

1. Compare SARS and COVID-19 by:
 - How fast they spread
 - How fast people de cease from them
 - How deadly are they
2. Why they seem to be different?
3. What are some implications of the findings?

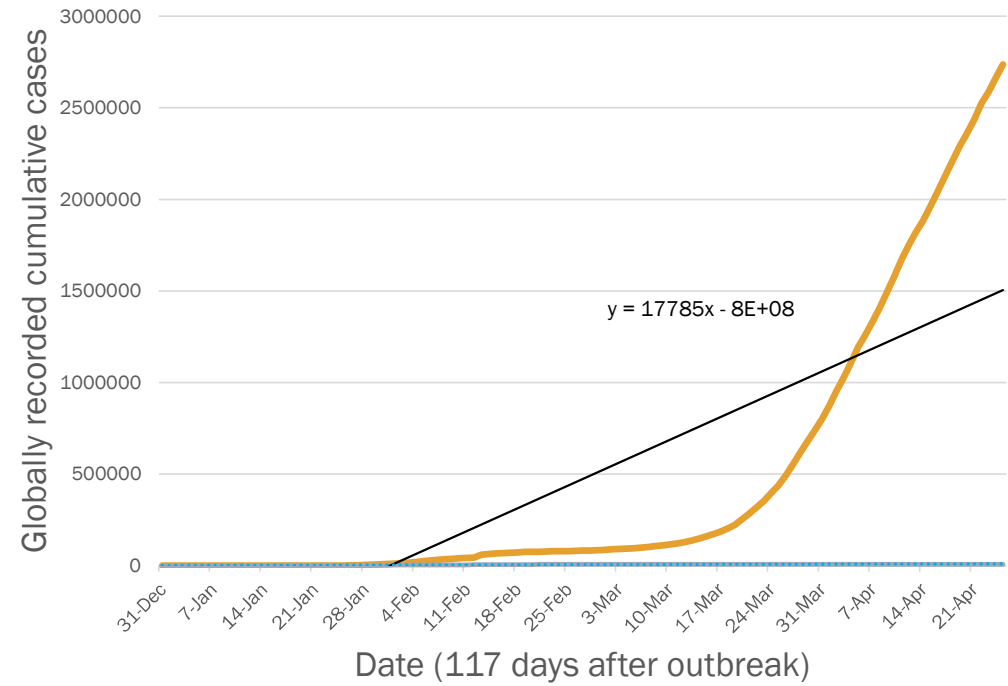
I originally thought that COVID-19 is deadlier because of its magnitude of infection and resulting deaths. We would now examine how the data agree or disagree with that.

How fast the viruses spread?

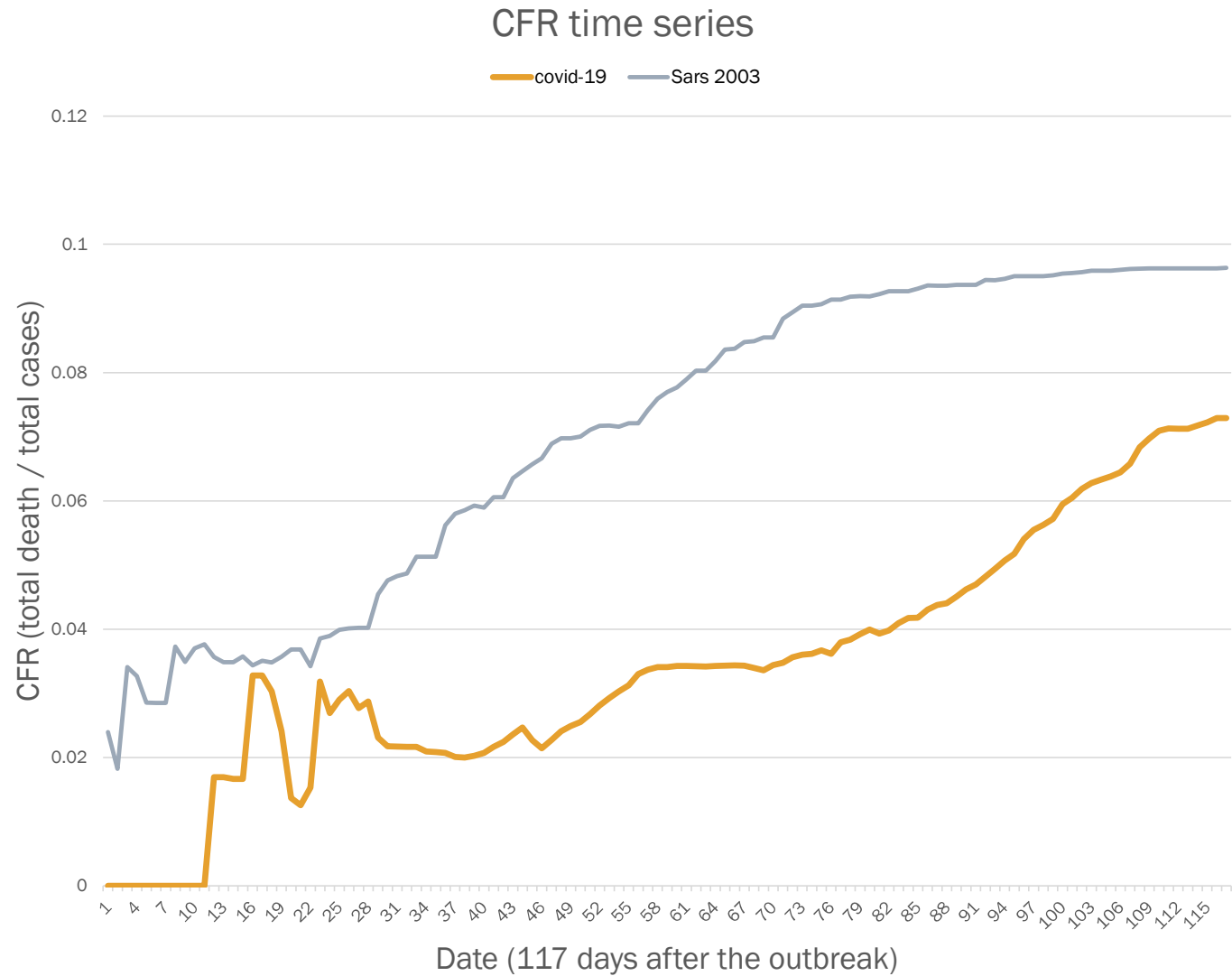
Sars 2003 (blue, WHO data)



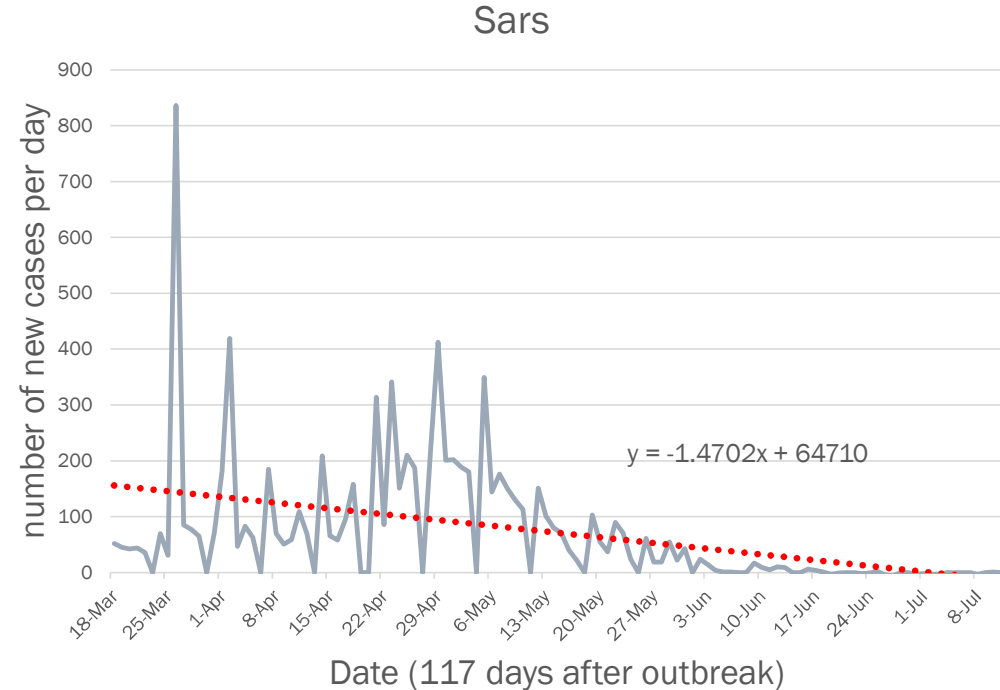
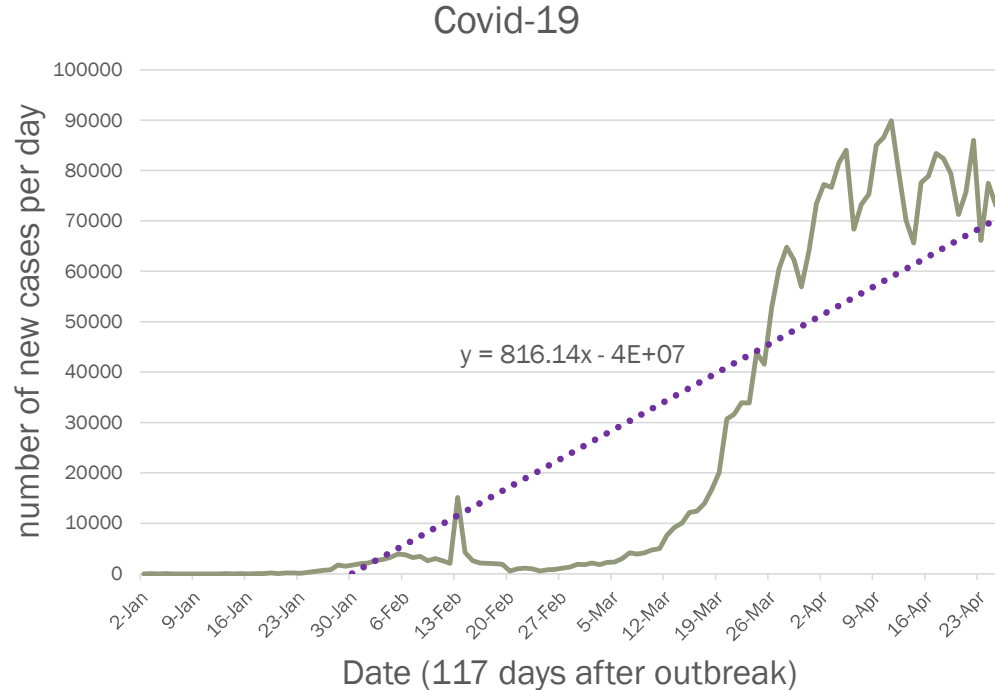
Covid-19 (orange, ECDC data)



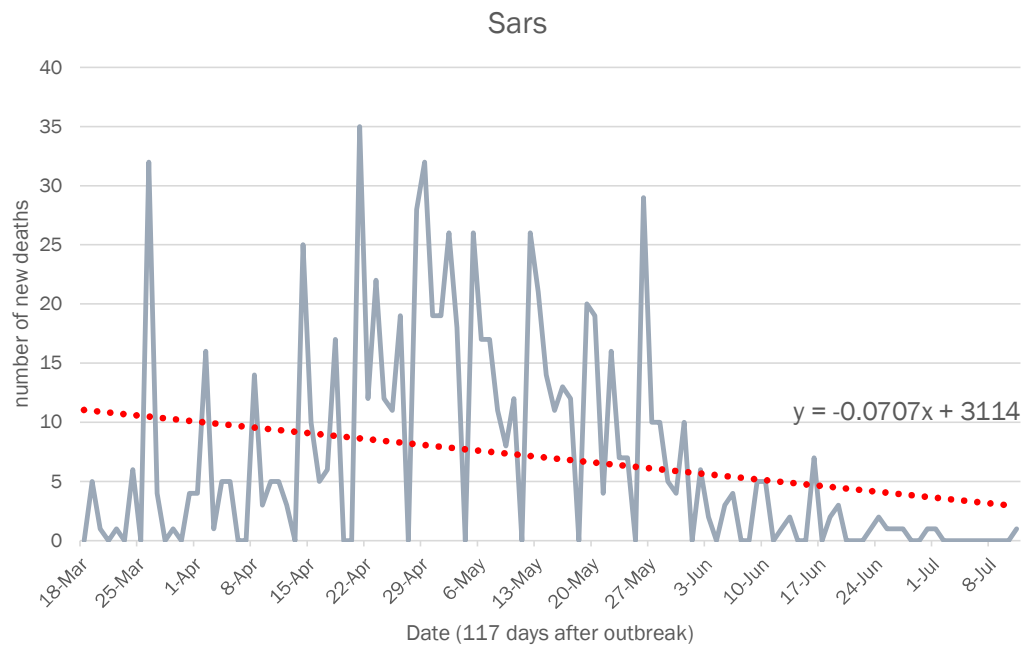
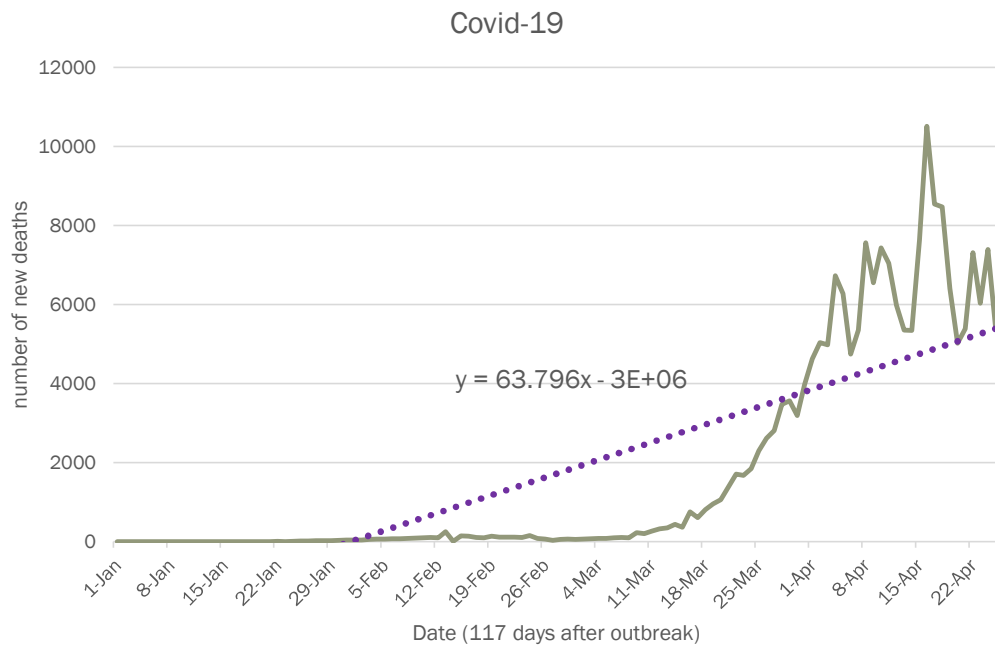
This data show a trend indicating that Sars in 2003 was more deadly, what are some factors that contribute to such difference?



Judging from the time series of their daily new cases (daily increase), covid-19 increases in an increasing rate, while sars seemed to increase in a decreasing rate, meaning that it is being contained. This can be a reason why sars had a higher CFR (new cases < death)



In contrast, covid-19's rate of increase in new cases is faster than its rate of increase of death rate, which could cause CFR to become smaller when calculated (growing denominator, about 1 new death per 12 new cases, each day, according to the line of best fit). This is different for sars in 2003, in which the ratio is much greater (about 1 new death per 2 cases, each day, according to the line of best fit). This suggests that covid-19 had a higher infection rate.



Related Concluding Findings

Few parameters:

1. Basic reproductive rate, R_0 , the average number of secondary transmissions from one infected person:
 - SARS-CoV-2 (covid-19): about 2.5 / SARS-CoV (SARS 2003): about 2.4
2. Viral load peak time :
 - SARS-CoV-2 (covid-19): symptom onset / SARS-CoV (SARS 2003): 6-11 days after symptom onset
3. Viral airway tropism
 - SARS-CoV-2 (covid-19): High / SARS-CoV (SARS 2003): Low
4. Proportion with mild symptoms:
 - SARS-CoV-2 (covid-19): High / SARS-CoV (SARS 2003): Low
5. Infection-prone age:
 - Mortality due to SARS-CoV-2 and SARS-CoV is strongly skewed towards people older than 70 years



Questions

Thank you