



Corona Virus Report

Brendi Ang

XXX

Yan Ma

BSc

XXX XXX

XXX

Report for
Australian Government COVID19

21 May 2020

Our consultancy
add names &
add names

📞 (03) 9905 2478
✉️ questions@company.com

ABN: 12 377 614 630

Country Singapore and United States of America

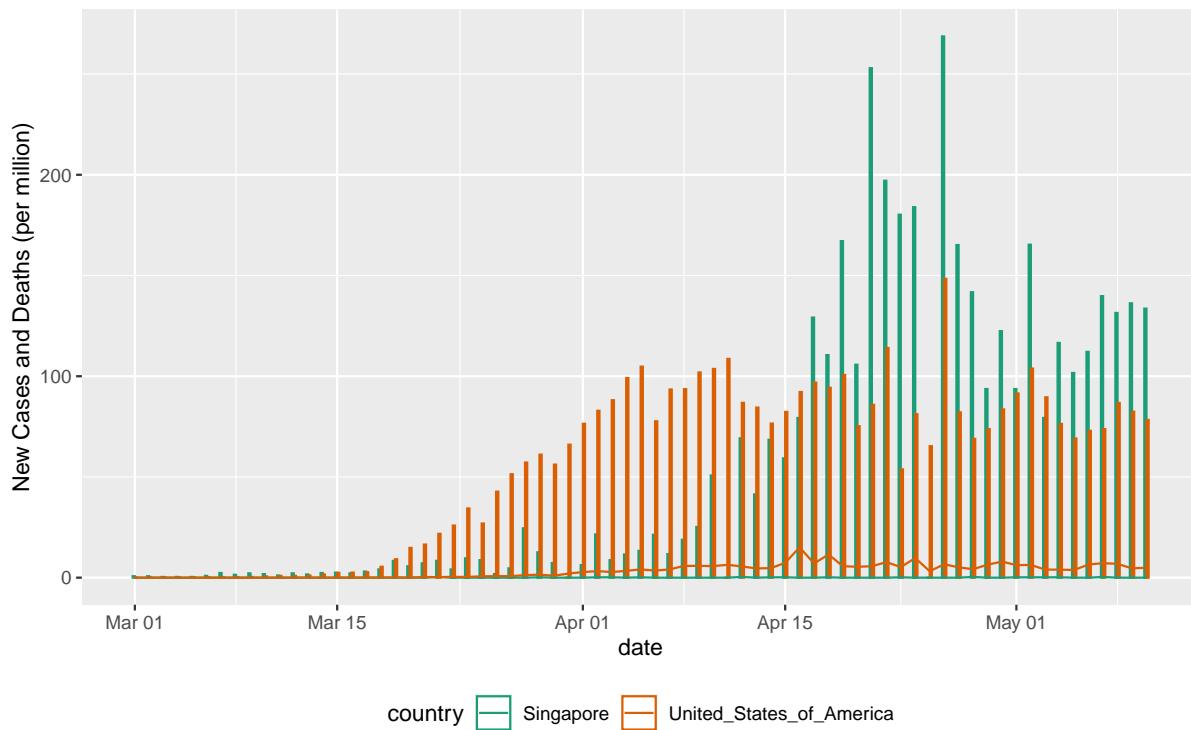


Figure 1: Total Deaths and Cases in SGP and USA from 01/03/2020 to 10/05/20

1 Analysis

This report examines the confirmed COVID-19 cases and deaths recorded in Singapore and the United States (*US*) from the start of March to 10 May 2020. Due to the significant difference in population size, the cases and deaths are scaled to per million people of each country's population for better comparison.

Figure 1 displays the number of new cases in Singapore and *US*. The x-axis shows the number of new cases and deaths on a given day and the y-axis represents each date. It is manifest that confirmed cases in both countries started to pick up in mid-March 2020. There was a gradual increase in new cases in *US* in the last two weeks of March, where it stayed relatively constant to mid-May. In Singapore, an exponential increase in confirmed cases can be observed in mid-April', where the new confirmed cases overtook the *US* in relative terms (*i.e.* per 1 million). Although the confirmed cases were higher in Singapore, the death rates in the *US* were evidently greater, with Singapore staying relatively constant at 0%.

Table 1: Total Cases and Deaths, and Proportion of Deaths per week

country	week	month	cases_per_week	deaths_per_week	deaths_prop
Singapore	1	3	1.77	0.00	0.00
Singapore	2	3	9.22	0.00	0.00
Singapore	3	3	14.72	0.00	0.00
Singapore	4	3	47.17	0.35	0.61
Singapore	5	3	59.41	0.18	0.23
Singapore	6	4	94.17	0.53	0.60
Singapore	7	4	273.65	0.53	0.13
Singapore	8	4	903.76	0.35	0.07
Singapore	9	4	1136.61	0.53	0.06
Singapore	10	4	216.01	0.00	0.00
Singapore	10	5	556.34	0.71	0.13
Singapore	11	5	652.99	0.35	0.05
United_States_of_America	1	3	0.11	0.02	22.30
United_States_of_America	2	3	1.99	0.06	4.53
United_States_of_America	3	3	11.94	0.18	1.46
United_States_of_America	4	3	127.71	1.54	1.21
United_States_of_America	5	3	361.22	7.89	2.15
United_States_of_America	6	4	622.24	23.90	3.85
United_States_of_America	7	4	655.32	38.70	5.92
United_States_of_America	8	4	627.07	57.74	9.18
United_States_of_America	9	4	613.44	41.89	7.19
United_States_of_America	10	4	157.28	14.43	9.15
United_States_of_America	10	5	430.13	24.35	5.62
United_States_of_America	11	5	394.01	30.14	7.71

To investigate further, we observe the start dates of the lockdown policy in each country. In Singapore, the lockdown started at the end of the first week of April, 07/04/2020 (Wong and Tan (2020)). In USA, the effective dates were different in each state, California was the first to enforce it on 19/03/2020 while South Carolina was the last to carry it out on 07/04/2020 (Fowler et al. (2020)).

Based on Table 1, Singapore's cases increased by a staggering 1103.91% from the first week to the last week of April although lockdown and social distancing protocols were in effect. This surge is attributed to the surge in infections among migrant worker population staying in dormitories, which accounted for most of the confirmed cases (Sim and Kok (2020)).

On the other hand, US cases nearly doubled (0.72%) from approximately the end of March to the start of April. In contrary to Singapore's cases, confirmed cases in US seemed to subside at the end of April 2020 after all states implemented lockdown policies. However, Table 1 demonstrated that the proportion of death rates in US was not proportionate to the decrease in the cases per week.

Table 2: Total cases and deaths in China and Japan

countryterritoryCode	total_cases	total_deaths
CHN	83991	4637
JPN	15747	613

Country China and Japan

This section would do some analysis on China and Japan.

Table 2 shows the total cases and deaths of COVID-19 in China and Japan from December 2019 to May 2020.

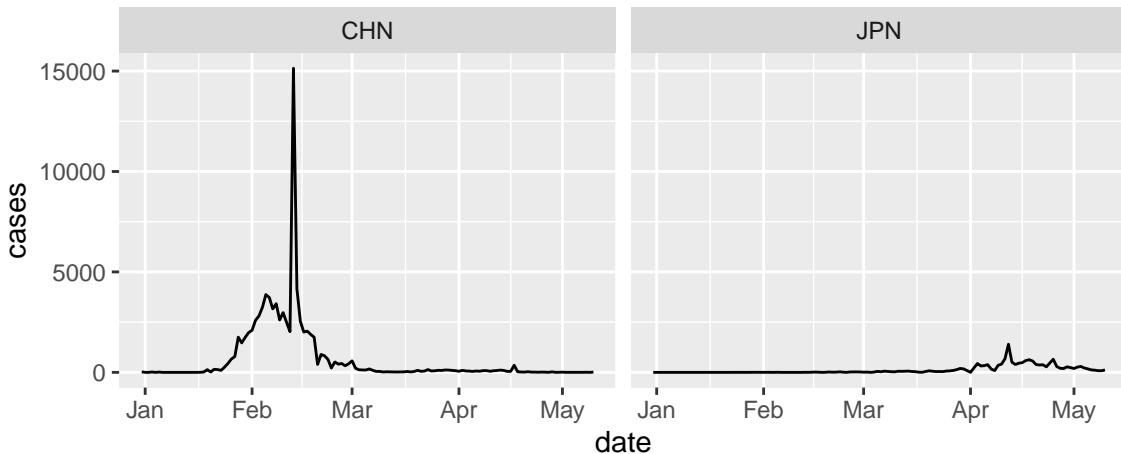


Figure 2: Cases by time

Figure 2 Shows the trend of cases reported every day in China and Japan.

For China, there is a large increase from February 12 to February 13. The reason is that 13,332 of these 15141 new cases are clinically (rather than laboratory) confirmed cases, reported for the first time as an effect of a change in how cases are diagnosed and reported in Hubei province starting on February 12. See more information [here](#). If we ignore this outlier, there's an increasing trend from January 18 to February 5, and then the count of cases decreases till May. It can be seen that for China, the large-scale outbreak of the COVID-19 occurred between the end of January and the beginning of March.

For Japan, the peak of cases appeared in April 12 with a count of 1401. And the large-scale outbreak of the COVID-19 occurred between the end of March. The cases in Japan began to increase in early February, this is because an outbreak among passengers and crew on a cruise ship led to quarantine of approximately 3,700 passengers and crew that began on February 3, and lasted for nearly 4 weeks at the Port of Yokohama. By February 9, 20 cases had occurred among the ship's crew members. By the end of quarantine, approximately 700 cases had been laboratory-confirmed among passengers and crew Kakimoto et al. (2020) .

Country XX3 and YY3

2 Citations

1. Wickham et al. (2019)
2. Wickham, Hester, and Francois (2018)
3. Zhu (2019)
4. Xie (2020)
5. Xie (2016)
6. Grolemund and Wickham (2011)

References

- Fowler, JH, SJ Hill, R Levin, and N Obradovich (2020). The effect of stay-at-home orders on COVID-19 infections in the United States. *arXiv preprint arXiv:2004.06098*.
- Grolemund, G and H Wickham (2011). Dates and Times Made Easy with lubridate. *Journal of Statistical Software* **40**(3), 1–25.
- Kakimoto, K, H Kamiya, T Yamagishi, T Matsui, M Suzuki, and T Wakita (2020). Initial investigation of transmission of COVID-19 among crew members during quarantine of a cruise ship—Yokohama, Japan, February 2020.
- Sim, D and X Kok (2020). How did migrant worker dormitories become Singapore’s biggest coronavirus cluster? *The South China Morning Post*.
- Wickham, H, M Averick, J Bryan, W Chang, LD McGowan, R François, G Grolemund, A Hayes, L Henry, J Hester, M Kuhn, TL Pedersen, E Miller, SM Bache, K Müller, J Ooms, D Robinson, DP Seidel, V Spinu, K Takahashi, D Vaughan, C Wilke, K Woo, and H Yutani (2019). Welcome to the tidyverse. *Journal of Open Source Software* **4**(43), 1686.
- Wickham, H, J Hester, and R Francois (2018). *readr: Read Rectangular Text Data*. R package version 1.3.1. <https://CRAN.R-project.org/package=readr>.
- Wong, C and C Tan (2020). Coronavirus: Empty trains and quiet streets as Singapore enters day 1 of ‘circuit breaker’ mode. *The Straits Time*.
- Xie, Y (2016). *bookdown: Authoring Books and Technical Documents with R Markdown*. ISBN 978-1138700109. Boca Raton, Florida: Chapman and Hall/CRC. <https://github.com/rstudio/bookdown>.
- Xie, Y (2020). *bookdown: Authoring Books and Technical Documents with R Markdown*. R package version 0.19. <https://github.com/rstudio/bookdown>.
- Zhu, H (2019). *kableExtra: Construct Complex Table with ‘kable’ and Pipe Syntax*. R package version 1.1.0. <https://CRAN.R-project.org/package=kableExtra>.