



2019-nCoV Literature Situation Report (Lit Rep) February 13, 2020

Key Takeaways

- **Accounting for underreporting, new statistical modelling efforts indicate that there may have been closer to 100,000 COVID-19 cases in China before the end of January compared to official estimates under 20,000.**
- **Several potential drug candidates for treating COVID-19 infection have been identified and require further evaluation.**
- **Two studies have drawn attention to the potential effects of COVID-19 illness on renal function via ACE2 cell receptors and one has highlighted the potential vulnerability of testicular tissues.**

Transmission and Global Spread

- To better understand transmission dynamics, researchers attempted to quantify the serial interval for 2019-nCoV - the time from illness onset in a primary case to illness onset in the secondary case. They compiled a dataset of 30 known pairs of infector-infectee and estimated an average of 2.6 days which is substantially less than for SARS (8.4 days).
- When the serial interval is shorter than the average incubation period, it suggests that pre-symptomatic transmission is taking place and could even be more frequent than symptomatic transmission. This analysis suggests that there may be asymptomatic transmission of 2019-nCoV and that further research is needed to confirm.

Nishiura et al. (Feb 13, 2020). Serial interval of novel coronavirus (2019-nCoV) infections.

Pre-print downloaded Feb 13 from

<https://www.medrxiv.org/content/10.1101/2020.02.03.20019497v1>

- The first known case of 2019-nCoV (labeled here as SARS-CoV-2) local transmission in Taiwan is reported along with CT chest imaging. The case occurred after close contact (spouse) with a known imported case.

Liu et al. (Feb 12, 2020). A Locally Transmitted Case of SARS-CoV-2 Infection in Taiwan.

<https://www.nejm.org/doi/full/10.1056/NEJMc2001573>

Clinical Characteristics and Health Care Setting

- Researchers evaluate 8,274 people with Wuhan close contacts who were tested for 2019-nCoV, of whom 33.2% had been infected. For 3% of cases (232) diagnosis was not definitive (only one target gene was positive out of two). The results of secondary testing are described along with recommendations for how to handle cases who test positive for only one target gene.
- 104 COVID-19 cases had multiple respiratory infections.
- Authors emphasize the need for a test that can screen for multiple pathogens simultaneously along with sample pre-processing considerations.

Wang et al. (Feb 13, 2020). *Clinical diagnosis of 8274 samples with 2019-novel coronavirus in Wuhan*. Pre-print downloaded Feb 13 from <https://www.medrxiv.org/content/10.1101/2020.02.12.20022327v1>

- Clinical data from three previous studies on COVID-19 patients were reviewed for reports of abnormal renal function or kidney damage. Around 10% of patients had abnormal renal function. The 2019-nCoV virus is known to bind to ACE2 cell receptors, and researchers have determined previously that ACE2 cell receptor expression is relatively higher in kidney cells and the testes than other human tissues
- The authors call for follow up and evaluation of reproductive functions among young male patients post recovery.

Fan et al. (Feb 13, 2020). *ACE2 Expression in Kidney and Testis May Cause Kidney and Testis Damage After 2019 2019-nCoV Infection*. Pre-print downloaded Feb 13 from <https://www.medrxiv.org/content/10.1101/2020.02.12.20022418v1>

- Authors report on a case study of 59 COVID-19 patients tracking kidney function. A prior study of SARS-CoV patients found that acute renal impairment was uncommon but associated with high case fatality. Preliminary evidence indicates elevated risk of kidney impairment among COVID-19 patients. They recommend vigilant monitoring of kidney function among these patients to facilitate earlier treatment, if needed.

Li et al. (Feb 12, 2020). *Caution on Kidney Dysfunctions of 2019-nCoV Patients*. Pre-print article downloaded Feb 12 from <https://www.medrxiv.org/content/10.1101/2020.02.08.20021212v1>

Public Health Policy and Practice

- In this JAMA commentary, Gostin and Hodge discuss the balance of public health protections and civil liberties in the U.S. and the legitimacy of quarantine powers outlined in the Public Health Services Act.

Gostin and Hodge (Feb 13, 2020). *US Emergency Legal Responses to Novel Coronavirus Balancing Public Health and Civil Liberties*. *JAMA Viewpoint*. doi:10.1001/jama.2020.2025

- Clifford et al. examine the effectiveness of air travel-related intervention at preventing 2019-nCoV outbreaks in previously unaffected regions. They examine screening for symptoms at departure or arrival, sensitization of arrivals to signs of illness, and a combination of both practices. This information is combined with R_0 estimates and number of infected travelers arriving on a weekly basis to assess time until a region reaches the “outbreak threshold.”
- Air traveler-targeted interventions can delay 2019-nCoV outbreaks for weeks and potentially months, when the number of infected travelers remains low. With more infected travelers, the delay in onset of a local outbreak declines rapidly. Combining syndromic screening with traveler sensitization has the greatest potential to effectively delay outbreak onset.

Clifford et al. (Feb 13, 2020). *Interventions targeting air travellers early in the pandemic may delay local outbreaks of SARS-CoV-2*. Pre-print downloaded Feb 13 from <https://www.medrxiv.org/content/10.1101/2020.02.12.20022426v1>

- Researchers reviewed 1,465 FDA-approved drugs for potential efficacy in treating COVID-19, quantifying binding affinity and using machine learning methods. The highest scoring options were Bortezomib, Flurazepam, and Ponatinib.

Nguyen et al. (Feb 5, 2020). Potentially highly potent drugs for 2019-nCoV. Pre-print downloaded Feb 13 from <https://www.biorxiv.org/content/10.1101/2020.02.05.936013v1>

Mental Health and Personal Impact

Today we revisit two recent publications with expert insight from Dr. Tona McGuire, clinical psychologist, co-lead of the DOH Behavioral Health Strike Team, co-founder of the Health Support Team, and instructor in disaster behavioral health.

- In Japan, economic and social impacts have been reported related to COVID-2019, including increased public anxiety, and some social stigmatization. The authors believe that COVID-2019 adds to previous traumatic events in Japan involving frightening unseen agents. These include the Sarin attack, pandemic H1N1, and radiation release from the Fukushima event.
- It is anticipated that public health concerns will continue to increase, as the COVID-2019 outbreak continues. The population may exhibit increased stress responses, risky social behaviors such as increased smoking and consumption of alcohol, social isolation, and concerns about health. All of these concerns may be exacerbated by rumors and sensational media reports. In some parts of the population there may be increases in mental health disorders such as depression and PTSD.
- The authors encourage preparation and mental health support for impacted individuals, their families, healthcare workers and vulnerable populations such as Chinese individuals and their families.

Shigemura et al. (Feb 8, 2020). Public responses to the novel 2019 coronavirus (2019-nCoV) in Japan: mental health consequences and target populations. Psychiatry and Clinical Neurosciences. <https://doi.org/10.1111/pcn.12988>

- Healthcare workers in Wuhan have been facing enormous pressure including a high rate of infection, inadequate protection from contamination, overwork and exhaustion, social isolation, lack of contact with their families, and negative interactions with their patients. These issues are creating mental health issues of stress, depression, fear, denial and anger.
- The government of Wuhan has implemented a number of steps to address the issues pertaining to healthcare workers. These include identifying infected individuals as having work related injuries. Additionally, the officials have sent healthcare workers from other provinces to help, rotating shifts in terms of high and lower pressure roles, increasing access to information on how to mitigate risk of transmission.
- Four psychological intervention teams have been set up. These teams have a variety of roles. One team coordinates management and press. Senior psychological experts formulate psychological intervention materials and rules and provide technical guidance and supervision. Medical teams participate in psychological interventions for healthcare workers and patients. Finally, psychological hotline teams composed of volunteers who had received training in dealing with COVID-2019 provide telephone guidance.
- Results from these initial mental health interventions are reported to be positive and may inform future planning for crisis intervention.

Kang et al. (Feb 5, 2020). The mental health of medical workers in Wuhan, China dealing with the 2019 novel coronavirus. The Lancet. [https://doi.org/10.1016/S2215-0366\(20\)30047-X](https://doi.org/10.1016/S2215-0366(20)30047-X)

In addition to the articles described here, there are several editorials, commentaries, and technical (e.g., drug trial) papers available to view via the [2019-nCoV SharePoint site](#) along with previous Lit Reps.