"Track and Trace" is the latest COVID-19 catchphrase. It describes the process of identifying the ill and exposed, which then can make it safer for us to mingle socially once again. As a program gets underway in the U.S., what lessons can we learn from Asia?

The study comes from Taiwan, the country with the ambiguous “ownership.” The study is small, only 100 patients, but think of it as the pilot, not the definitive report – there is always something to learn.

The first 100 patients with nucleotide amplification proven (PCR) COVID-19 identified between January and March were studied along with all their close contacts. Close contacts were individuals not wearing protective equipment, engaged in face-to-face contact for 15 minutes, or more. They were categorized as members of the same household or family outside the home. In the case of health workers, close contact was defined as being within six feet without appropriate protective equipment for any time. [1] The contact period was from the onset of symptoms or, in the case of the asymptomatic, the date of testing.

All close contacts were quarantined for two weeks after their last exposure to the index patient; all were tested for COVID-19 and retested if symptoms developed. For the 100 index cases
  - Median age 44, 56% men, 2761 close contacts identified
5.5% were household members, 2.8% family members, and 25.3% healthcare workers
22 secondary cases were identified for an infection risk of 0.8%
4 of the 22 cases were asymptomatic
All 22 of the secondary cases were exposed within six days of symptom onset in the index case, but 68% of non-case contacts were seen in the same period.
An infection risk of about 1% was also identified for contacts within the pre-symptomatic period.
Attack rates were higher for household and family members and the older members of those groups
It appears that COVID-19 has a short infectious period, roughly five days, with a peak at the time of symptoms and then lessening over time.
The time frame seems to correlate with studies of viral load, suggesting that the virus peaks at the time of symptoms and then declines.

“To summarize the evidence, …strongly suggested high transmissibility of the disease near or even before the day of symptom onset. Because the onset of overt clinical symptoms, such as fever, dyspnea, and signs of pneumonia, usually occurred 5 to 7 days after initial symptom onset, the infection might well have been transmitted at or before the time of detection. This characteristic makes containment efforts challenging.”

This suggests that contact tracing should focus on the period just before and after the onset of symptoms when infectivity is most significant. The greatest limitation to the study was inconsistent contact tracing for contacts before the index case became symptomatic.

There are some lessons to be learned. First, is that contact tracing must extend backward by about four days. Second, an index case generates lots of close contacts, in this case, 26 people each, so we should not underestimate the exponential difficulty in tracing as we scale up. Third, we need to characterize exposure better; household members had a slightly lower rate of infections than and family members living apart from the index case – so it isn’t just a matter of duration, it is when and how close. Fourth, it seems that transmission is not as great as we once feared.

[1] PPE was defined as inadequate based on the situation, e.g., intubating a patient, which involves exposure to aerosolized lung secretions without an N95 mask and face shield would be considered insufficient PPE.
