2019 novel coronavirus (2019-nCoV)
Overview of transmission and infection in humans

This is a dynamic situation with rapidly changing morbidity and case fatality rates. The websites of the Centers for Disease Control and Prevention (CDC), World Health Organization (WHO), and Johns Hopkins Center for Systems Science and Engineering (CSSE) should be reviewed for the most up-to-date information.

Global
As of February 3, 2020 at noon, 17,496 cases, including 362 deaths have been confirmed worldwide. Of these confirmed cases, 17,308 are in mainland China. Note that these are only confirmed cases. China, by itself, is reported to be tracing approximately 65,000 individuals who have had contact with individuals confirmed to be ill with the virus. On January 30, 2020, the director-general of the WHO declared the 2019-nCoV outbreak a public health emergency of international concern (PHEIC), accepted the emergency committee’s advice, and issued this advice as temporary recommendations under International Health Regulations (IHR).

USA
As of February 3, 2020, in the United States, 11 cases are confirmed to be positive, 167 negative, and 82 pending testing for 2019-nCoV. The Chicago Tribune also reported person-to-person transmission from a woman (who visited Wuhan) to her spouse (who did not).

Perspective
In comparison, the CDC reports that during this season in the United States there have been at least 19 million illnesses, 180,000 hospitalizations, and 10,000 deaths caused by infection with the influenza virus (flu). Another potentially useful comparison is to the 2003 coronavirus severe acute respiratory syndrome (SARS-CoV) pandemic. From November 2002 through July 2003, 8,098 people worldwide became sick with SARS-CoV, according to WHO. Of these, 774 died. By late July 2003, no new cases were being reported, and the WHO declared the global outbreak to be over.

Origin
Although we will undoubtedly learn more in the coming days, weeks, and months, scientific manuscripts are beginning to be published that include whole genome sequencing data of novel coronavirus 2019 (2019-nCov) isolated from humans. At this time, laboratory and medical personnel conducting this sequencing work are reporting:

- Phylogenetically, the sequence homology of samples currently available from nine clinically affected people are:
  - very similar to each other
  - different enough from previous human coronavirus sequences in GenBank to represent a unique clade or branch of the beta group of coronaviruses distinct from MERS and SARS coronaviruses
  - most similar to SARS-like bat coronavirus sequences (up to 96% sequence identity)
Another investigator concludes, “The levels of genetic similarity between the 2019-nCoV and RaTG13 suggest that the latter does not provide the exact variant that caused the outbreak in humans, but the hypothesis that 2019-nCoV has originated from bats is very likely.”

Although one publication implicates snakes as a potential virus host for the 2019-nCoV, that conclusion is based on relative codon usage analysis rather than genome sequencing comparisons. The potential species of origin for 2019-nCoV, bat as compared with snake, will presumably be an area of further investigation.

The Wuhan Municipal Health Commission has reported human-to-human transmission, and evidence is growing for human-to-human transmission elsewhere, including from one of the cases in the United States (transmitted from a woman who had traveled from China to her spouse, who had not).

**Incubation period**
The incubation period in people for 2019-nCoV is not yet known with confidence, but initial estimates are approximately five to seven days. In 2003 the incubation period for SARS was typically two to seven days, although it was 10 to (rarely) 14 days in a very small proportion of cases. Given this estimated incubation period for 2019-nCoV, the next two to three weeks will provide important information about how widespread an outbreak this may ultimately become.

**Travel**
The U.S. Department of State has issued a travel advisory of level 4: Do not travel to China. The CDC’s level 3 health advisory also recommends avoiding all non-essential travel to China. Airlines and other carriers have reduced or cancelled flights to or from China, and businesses have also adopted protective measures addressing travel and operations in affected areas.

**Exposure**
The infective viral dose; shedding of an infective dose prior to, or following, onset of clinical signs; route of exposure (oral, inhalation of droplets, inhalation of aerosolized virus); and potential for an intermediate host (like civet cats in SARS) have not been established for 2019-nCoV. The USDA, CDC, and U.S. Fish and Wildlife Service do not appear to have altered animal import requirements.

**Additional information**
WHO situation reports and course on emerging respiratory viruses, including nCoV: methods for detection, prevention, response and control
CDC frequently asked questions and answers
FAQ on bats, coronaviruses, and zoonotic disease
Return of the coronavirus: 2019-nCoV

Wikipedia: Coronavirus
Timeline of the 2019–20 Wuhan coronavirus outbreak
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Novel coronavirus (2019-nCoV)