Airborne Transmission of SARS-CoV-2:
A Virtual Workshop

COVID-19: Public Health and Scientific Challenges

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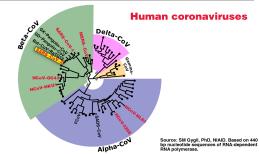
Science
Novel Human Virus?
Pneumonia Cases
Linked to Seafood
Market in China Stir
Concern
By Dennis Normile

China Identifies New Strain of Coronavirus as Source of Pneumonia Outbreak

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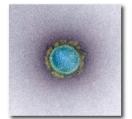
AS Fauci/NIAID

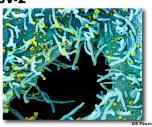
Coronavirus Phylogenetic Tree



Coronavirus Disease 2019 (COVID-19)

■ COVID-19 is the disease caused by the novel coronavirus SARS-CoV-2





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COVID-19 Globally: 22.2 Million Cases in 215 Countries and Territories



Reported COVID-19 Cases and Deaths in the United States



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SARS-CoV-2 Transmission

- Transmission between people in close contact
- Transmission via particles that remain in the air over time and distance
- Infected surfaces
- Virus found in stool, blood, semen and ocular secretions; role in transmission unknown
- Animals (including domesticated) not major source of human infection

Asymptomatic Transmission of SARS-CoV-2



The Journal of Infectious Diseases

A Familial Cluster of

Presumed
Asymptomatic
Carrier Transmission
of COVID-19

Y Bai, M Wang et al.

A Familial Cluster of Infection Associated With the 2019 Novel Coronavirus Indicating Possible Person-to-Person Transmission During the Incubation Period

P Yu, Y Han et al.

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Risk of Transmission

- Varies by the type and duration of exposure, use of preventive measures, and individual factors (e.g., the amount of virus in respiratory secretions)
- Secondary infections most common among household contacts, in congregate or health care settings when personal protective equipment not used, and in closed settings (e.g., cruise ships)
- Numerous clusters of cases after social or work gatherings highlight the risk of transmission through close, non-household contact



Respiratory Particles: A Spectrum of Sizes and Properties



Source: NEJI

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SARS-CoV-2 Transmission: Key Questions

- What is the role of various types of respiratory particles in SARS-CoV-2 transmission?
- At what concentration is infectious virus contained in various types of particles?
- How is the concentration of infectious virus affected by various environmental conditions?
- What is the dose of virus needed to establish infection at various anatomic sites?

Ventilation and Cleaning and Disinfection Masking Indoor Environmental **Practices** Conditions **Understanding mechanisms** of transmission is necessary to inform public health guidance **Healthcare Physical Distancing Settings** AS Fauci/NIAID

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