

Traveling to SARS, MERS, COVID (& What's Next?)

Origins of 3 Coronavirus Epidemics

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27 October 2023

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Examples of Searching for Origins of Viral Pan-Epidemics

- AIDS (1982) then HIV (1983): San Francisco
- Anthrax: 2001 USA (travel in 2011 to Russia for 1979 anthrax)
- SARS 2003: Travel to Hong Kong, Guangzhou, and Toronto
- H5N1 avian flu: Indonesia 2008
- MERS Coronavirus: 2013: Zarqua, Jordan; Doha, Qatar
- Zika 2015-2016: NW Brazil
- COVID-19: February 2020: Hong Kong, Shanghai...
- Alaskapox: July 2020: Fairbanks, Alaska

“OUTBREAK: Epidemics in a Connected World”
Smithsonian Museum 2018-2022 Washington, DC
3.3 million visitors



30 International and US Friends and Colleagues Who Gave a Personal Perspective in the Smithsonian Exhibition on Epidemics



Where in the World Are Outbreaks Occurring?

*"What's next is already here;
we just haven't recognized it yet."*

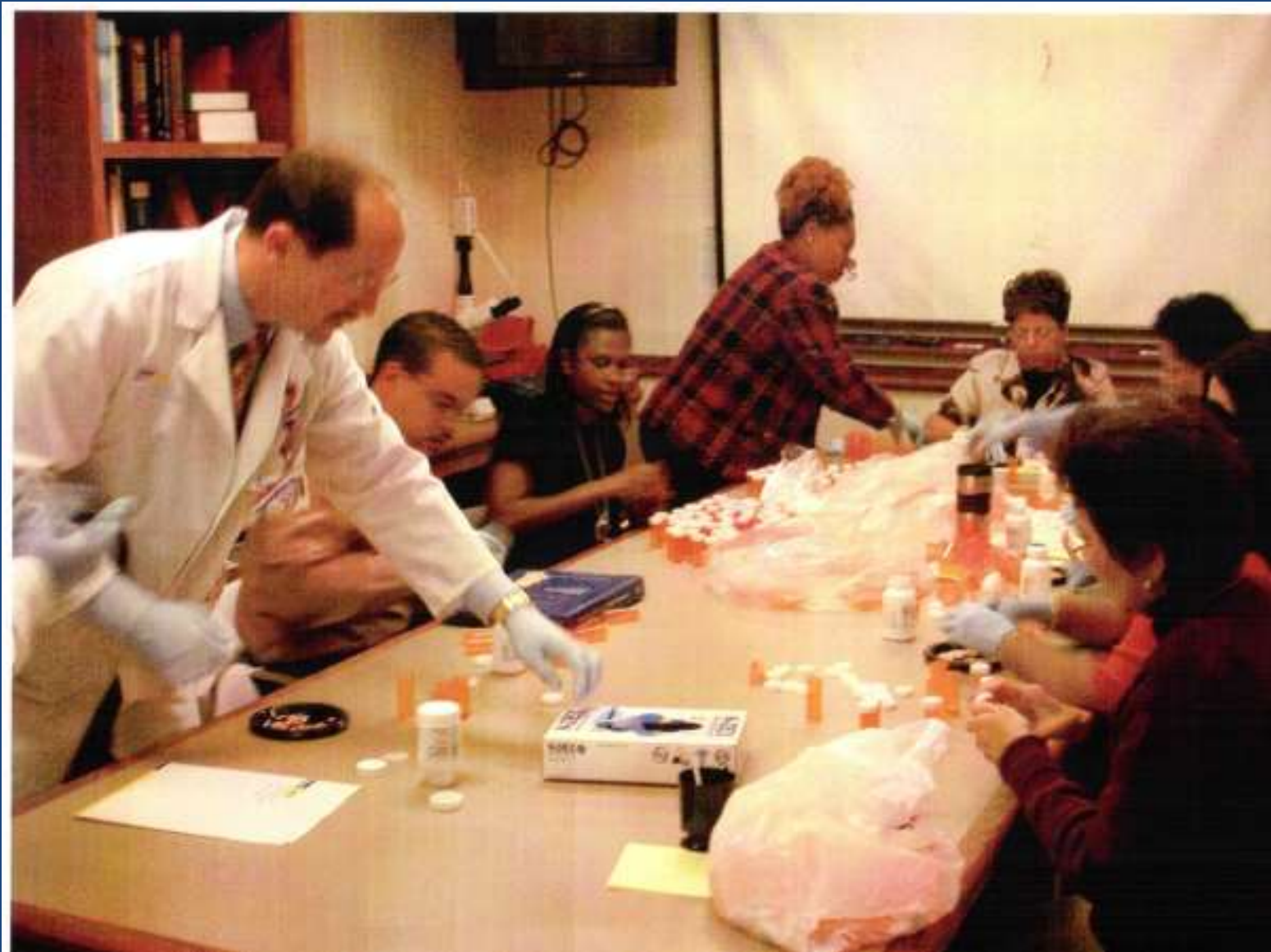
— Daniel Lucey, Public Health Physician, 2016





Anthrax September 18, 2001

900-Bed Washington Hospital Center Sept. 17, 2001





SARS 2022 Origin? Guangdong Province: SE China

SARS-CoV-1 virus-infected Palm Civets found in Shenzhen and Guangdong (140km apart). 1st Human cases (4) Foshan City on Nov 16, 2002



Animal Intermediate Host of SARS:
The “Masked Palm Civet”
Later: Bats found to be reservoir host



Masked Palm Civet (*Paguma larvata*)

SARS in Toronto, Canada 2003

Scarborough General (“SARS”) Hospital Infection Prevention and ICU work (photo)

SARS Toronto-ICU 2003



Ebola MSF 2014 Monrovia, Liberia



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Drug Clinical Research Center Of The State

广东省病毒性肝炎临床与实验研究中心

Virual Hepatitis Clinical and Experimental Research Center

广东省新药(化学药)临床研究中心

New Drug (Chemical) Clinical Research Center

广东省



SARS 2003: Travel to Hong Kong, Toronto, Guangzhou

“What’s Next?” Is Already Here We Just Haven’t Recognized it Yet

**Guangzhou Sept. 2003: No Civets in Market
But Avian H5N1 Flu = “What’s Next”**



**Saudi Arabia 2011: MERS from Camels
is “What’s Next” in 2012 in JORDAN & KSA**





April 2012 Earliest Known Lab-Confirmed Patients with MERS: ICU/CCU outbreak in Zarqua, northern Jordan



Camels as Intermediate Hosts for MERS-CoV (Bats likely reservoir host)



MERS 2013 with Colleagues in Doha, Qatar @Hamad General Hospital



MERS 2015 in Seoul, South Korea

Like Toronto SARS 2003 Triage Areas in Parking Lot near Hospitals





Beijing Institute of Microbiology, Chinese Academy Sciences July 20

Invited by Dr. George Fu Gao, China CDC Director 2017-2022





Wuhan: A huge city 10 million people with long history,
Museums, Yangtze River, Botanic Garden

- THE high-speed train hub for all of China
- Bus center for China inside the Hankou Train station
- Subway Line # 2 has stops at this train station
- Northern terminus of Line # 2 is international airport
- The Huanan South China Seafood Market is ~ 7 minutes walk from this Hankou Train station/bus station/Subway station
- (~ 10,000 people enter this Market each day, per China-WHO)

Wuhan City



Wuhan Hankou Train (and bus) Station near the Market and Subway to Airport



Huanan Seafood Market still closed since 1/1/2020 and boarded up



永红特菜商行

Sign on Xinhua Road (that divides the Market into West and East) 650 meters from the Huanan Market



Across the Street (Fazhan & Xinhua Roads) from the Huanan Seafood Market: Wuhan Financial Street (see sign)



Wuhan's Iconic Yellow Crane Tower



Search for the Origin of SARS-CoV-2

- After 4 years (47 months):
- Where is the infected intermediate animal host?
- In contrast, the palm civet for SARS-CoV-1 and the
- Dromedary Camel for MERS-CoV found sooner
- The origin of the virus itself still not found, even in bats in China, Laos, Cambodia, Thailand...