COVID-19 (SARS Co-V-2):
UPDATE AND FOCUS ON COLLEGES AND UNIVERSITIES

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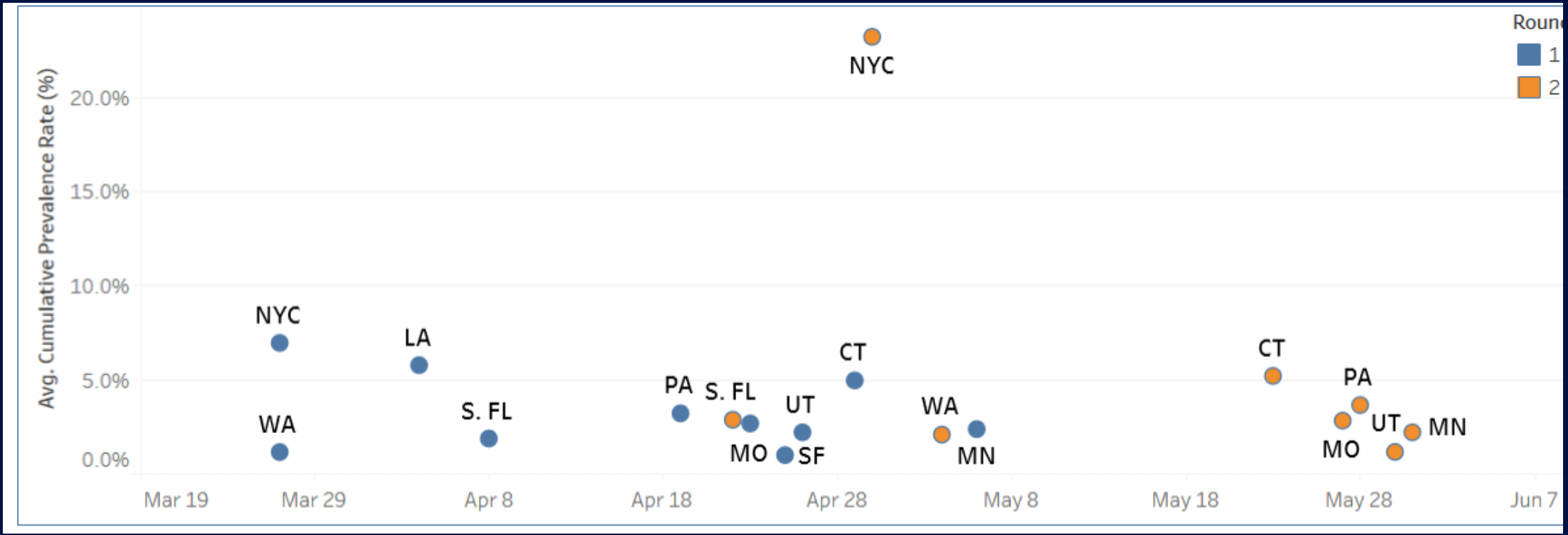
Disclosures: Consultant-PDI, Germitec, Pfizer; Past Consultant-Merck, Lumagenics

COVID-19: NEW INFORMATION

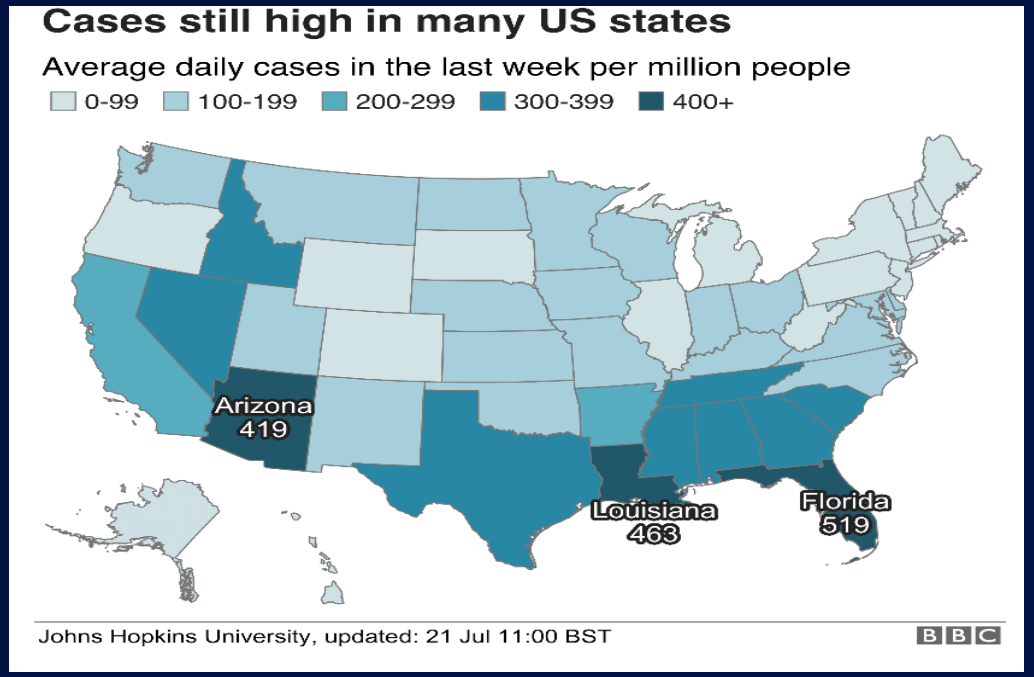
- Increasing cases in US; largest increase in the 18-45 year age range
- Percent of population that has had COVID-19 (CDC): 2% TO 5% (outlier, NYC = 23%)
- Percent of asymptomatic infections: 20% to 80% (depends on study population)
- Among symptomatic persons: mild disease, 80%; severe disease, 15%; critical disease, 5%
- Data suggests that airborne (>6 feet) transmission does NOT occur
- Duration of infectiousness: Ambulatory patients, <11 days (5 studies); hospitalized patients, <20 days (2 studies)
- Viral mutations: Mutations with increased transmissibility reported; but similar virulence
- Likely effective therapies: Remdesivir, Dexamethasone, prone ventilation
- Vaccine: Likely not available in 2020
- Masks very effective in preventing transmission when worn by infected persons, and in preventing acquisition when worn by uninfected persons
- Continued challenges: Limited testing capacity; shortages of Remdesivir

CDC SEROPREVALENCE DATA FROM COMMERCIAL LABS, 10 SITES IN THE US

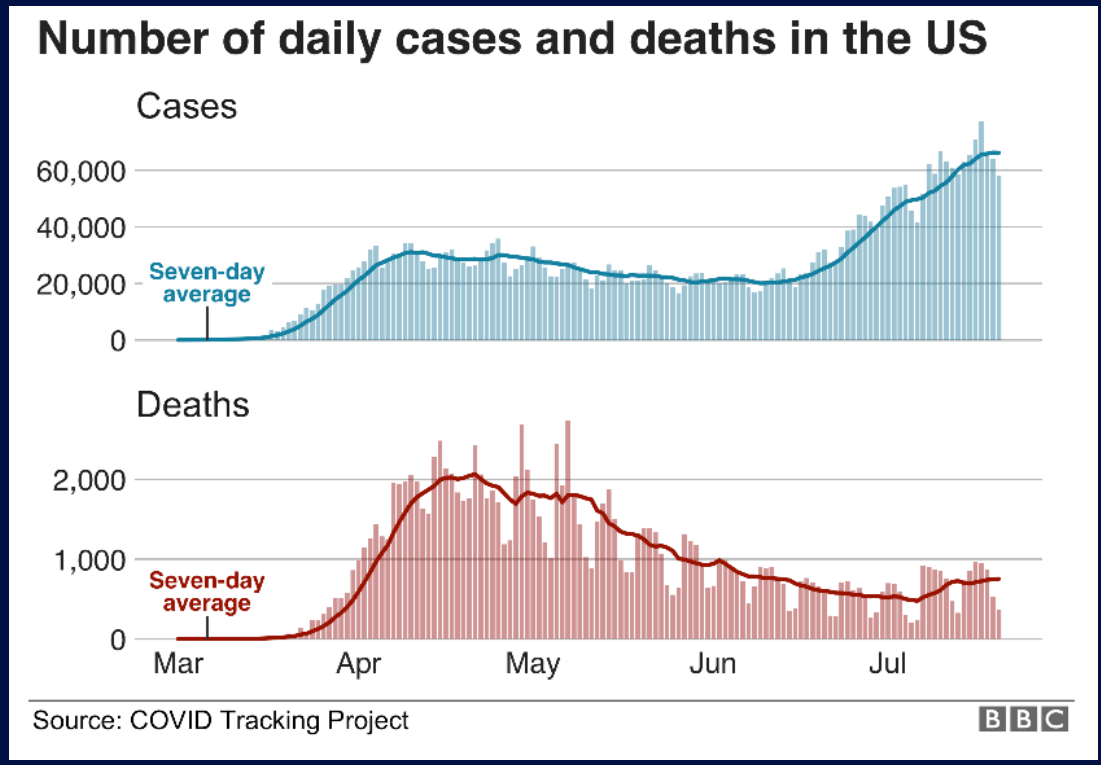


https://www.cdc.gov/coronavirus/2019-ncov/cases-updates/commercial-lab-surveys.html

COVID-19, US



Outbreak curve in US substantially increasing



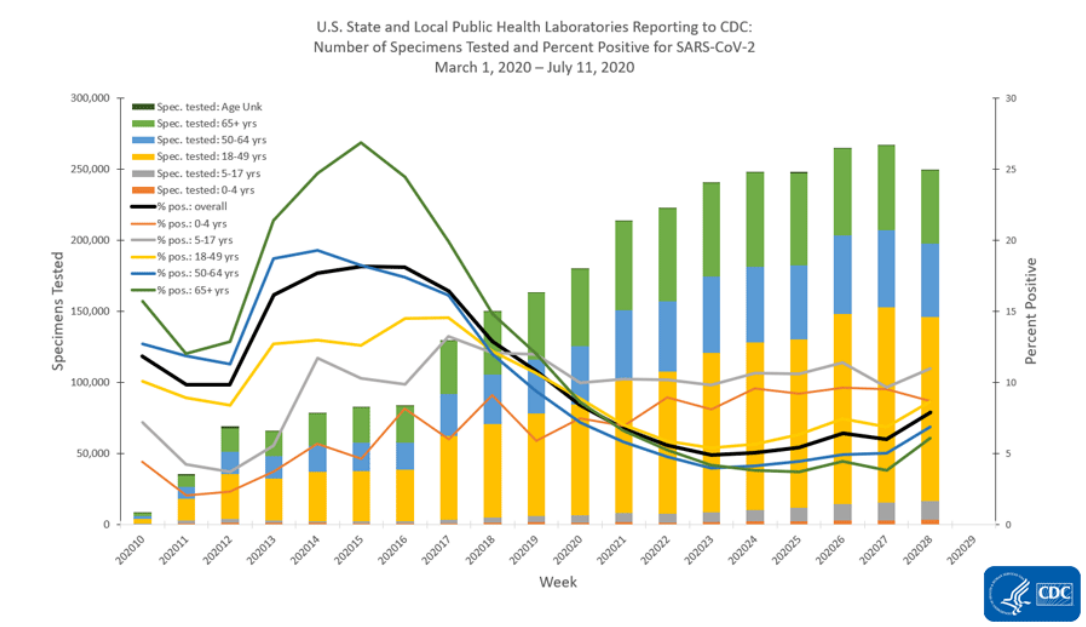
Worldwide >14,700,000 cases (>609,000 deaths)
US >3,844,000 cases, 25% of world's total (>140,000 deaths):
- **deaths undercounted; leading cause of death in the US**

NC >101,000 cases (>1,670 deaths; 1,086 hospitalized)
NC >1,423,000 COVID-19 tests (~10% positive)

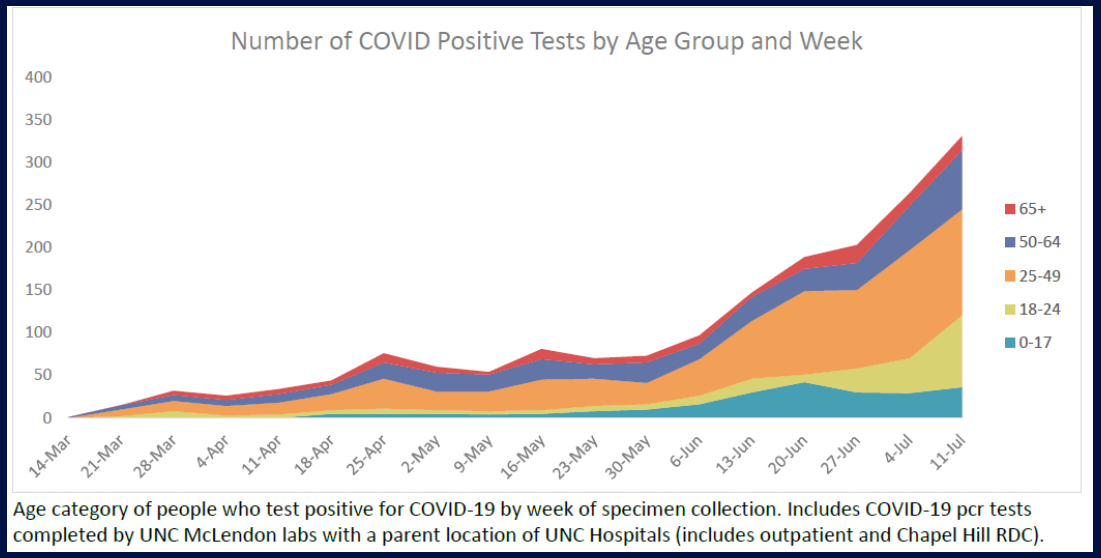
https://www.bbc.com/news/world-51235105
https://www.cdc.gov/coronavirus/2019-ncov/cases-updates/cases-in-us.html

COVID-19 EPIDEMIOLOGY: INCREASING CASES IN PERSONS 18-49 YEARS OF AGE

US



UNC MEDICAL CENTER



Age category of people who test positive for COVID-19 by week of specimen collection. Includes COVID-19 pcr tests completed by UNC McLendon labs with a parent location of UNC Hospitals (includes outpatient and Chapel Hill RDC).

https://www.cdc.gov/coronavirus/2019-ncov/covid-data/covidview/index.html

“DROPLET” VERSUS “AIRBORNE” TRANSMISSION

AEROSOL TRANSMISSION INCLUDES DROPLET AND AIRBORNE

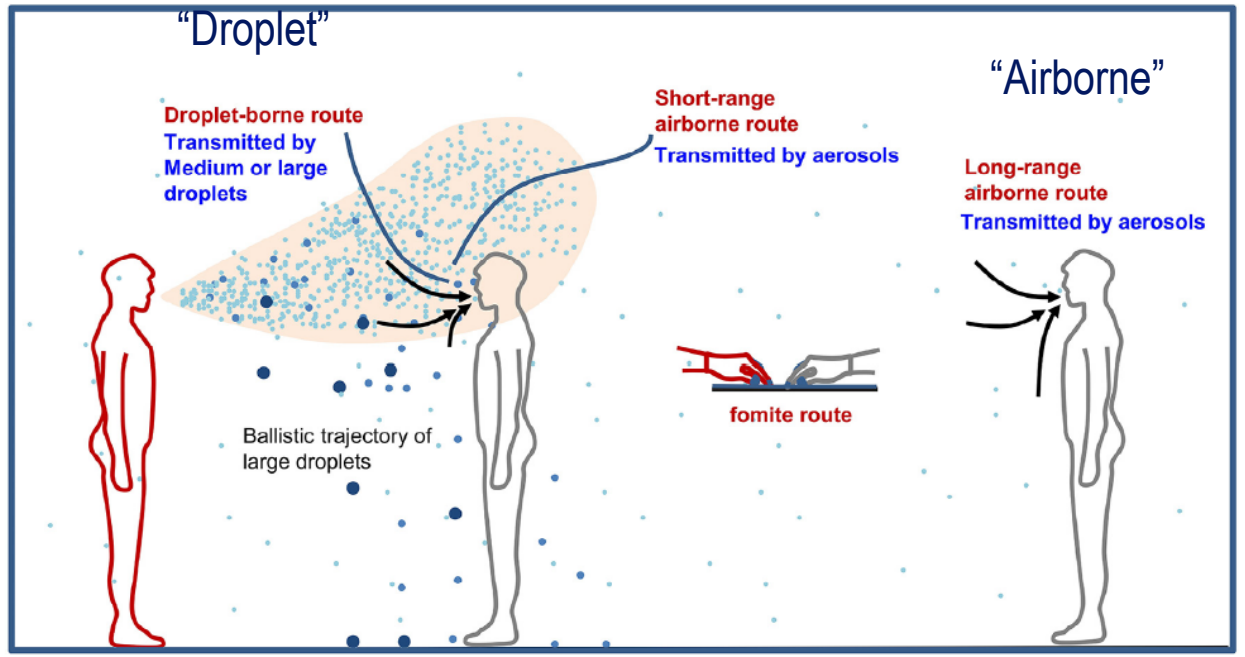
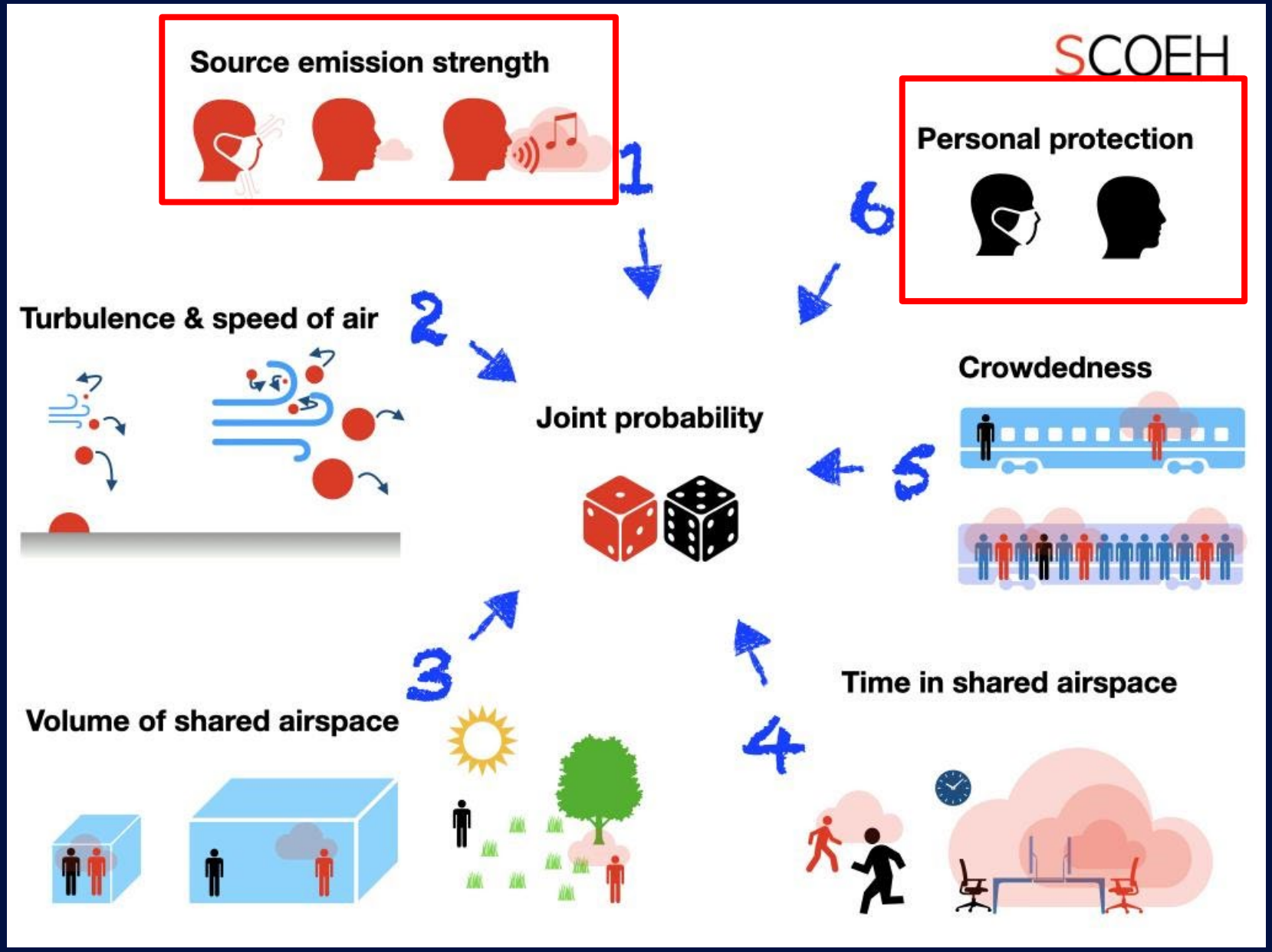


Fig 4. Illustration of different transmission routes. Small droplets (<5 μm), sometimes called aerosols, are responsible for the short-range airborne route, long-range airborne route, and indirect contact route; large droplets are responsible for the direct spray route and indirect contact route.

Wei J, Li Y. Am J Infect Control 2016;44:S102-S108



Factors affecting acquisition of a viral respiratory infection

1. Virus must survive drying and UV
2. To cause infection, virus must be delivered in infectious dose (i.e., survive dispersal/dilution)

Risk reduced by:

1. Physical distancing
2. Infected persons wearing a mask
3. Non-infected persons wearing a mask

DISPERSAL OF DROPLETS AND REDUCTION BY FACE COVERINGS

- Goal: Assess ability of face coverings to reduce droplet dispersal
- Methods: Qualitative visualizations of emulated coughs and sneezes to reduce droplet-laden respiratory jets
- Conclusion: Well-fitted homemade masks with multiple layers of quilting fabric, off-the-shelf cone style masks, proved to be the most effective in reducing droplet dispersal

Verma S, et al. Phys Fluids 2020, 31 May

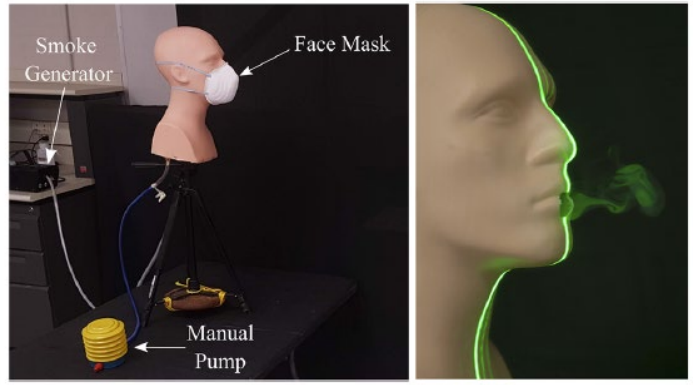


FIG. 1. Left—experimental setup for qualitative visualization of emulated coughs and sneezes. Right—a laser sheet illuminates a puff emerging from the mouth.

TABLE I. A summary of the different types of masks tested, the materials they are made of, and their effectiveness in impeding droplet-dispersal. The last column indicates the distance traveled by the jet beyond which its forward progression stops. The average distances have been computed over multiple runs, and the symbol "~" is used to indicate the presence of high variability in the first two scenarios listed.

Mask type	Material	Threads/in.	Average jet distance
Uncovered	...	...	~8 ft
Bandana	Elastic T-shirt material	85	~3 ft 7 in.
Folded handkerchief	Cotton	55	1 ft 3 in.
Stitched mask	Quilting cotton	70	2.5 in.
Commercial mask[a]	Unknown	Randomly assorted fibres	8 in.

[a]CVS Cone Face Mask.

ABSENCE OF TRANSMISSION OF SARS-CoV-2 FROM COVID-19 INFECTED HAIR STYLISTS WITH A UNIVERSAL FACE COVERING POLICY

- Exposure evaluation of clients to 2 hair stylists who had COVID-19
  - Stylist A worked for 8 days while ill; stylist B worked 5 days while ill (she acquired infection from A)
  - 139 clients seen by stylists A and B while they were symptomatic
  - There was a citywide ordinance recommending face coverings for both stylists and clients during their interactions
- Results
  - None of the 139 clients or their secondary contacts developed COVID-19

Hendrix MJ, et al. MMWR 2020;69:1-4

TABLE 2. Hair salon clients' (N = 104) responses to interview questions* about their interactions with two stylists with COVID-19 during salon appointments — Springfield, Missouri, May 12–20, 2020

Interview question	Response	No. (%)
Did you wear a face covering?	Yes, for the entire appointment	102 (98.1)
	Yes, for part of the appointment	2 (1.9)
	No, not at all	0 (—)
	Did not know	0 (—)
What type of face covering did you wear?	Cloth face covering	49 (47.1)
	Surgical mask	48 (46.1)
	N95 respirator†	5 (4.8)
	Did not know	2 (1.9)
	Did not answer question	0 (—)
Did the stylist wear a face covering?	Yes, for the entire appointment	101 (97.1)
	Yes, for part of the appointment	0 (—)
	No, not at all	0 (—)
	Did not know	3 (2.9)
What type of face covering did the stylist wear?	Cloth face covering	39 (37.5)
	Surgical mask	25 (24.0)
	N95 respirator	0 (—)
	Did not know	35 (33.7)
	Did not answer question	5 (4.8)
Did you have a respiratory illness in the past 90 days?	Yes	7 (6.7)
	No	87 (83.7)
	Did not know	1 (1.0)
	Did not answer the question	9 (8.7)

Abbreviation: COVID-19 = coronavirus disease 2019.

* All interviews were conducted via telephone by the Greene County Health Department.

† Particulate-filtering facepiece respirators that filter ≥95% of airborne particles (https://www.cdc.gov/niosh/npptl/topics/respirators/disp_part/n95list1.html).

PHYSICAL DISTANCING AND FACE MASKS PROTECTING AGAINST ACQUISITION OF COVID-19

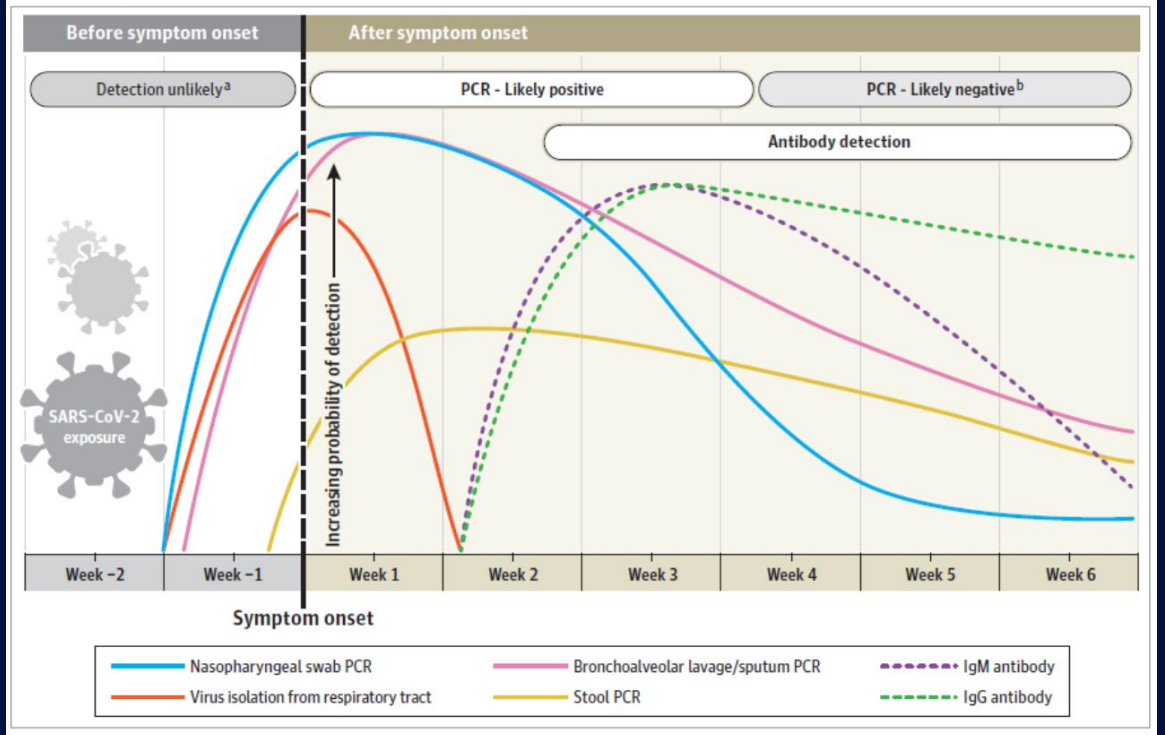
	Studies and participants	Relative effect (95% CI)	Anticipated absolute effect (95% CI), eg, chance of viral infection or transmission		Difference (95% CI)	Certainty*	What happens (standardised GRADE terminology)[29]
			Comparison group	Intervention group			
Physical distance ≥1 m *vs* <1 m	Nine adjusted studies (n=7782); 29 unadjusted studies (n=10736)	aOR 0·18 (0·09 to 0·38); unadjusted RR 0·30 (95% CI 0·20 to 0·44)	Shorter distance, 12·8%	Further distance, 2·6% (1·3 to 5·3)	−10·2% (−11·5 to −7·5)	Moderate†	A physical distance of more than 1 m probably results in a large reduction in virus infection; for every 1 m further away in distancing, the relative effect might increase 2·02 times
Face mask *vs* no face mask	Ten adjusted studies (n=2647); 29 unadjusted studies (n=10 170)	aOR 0·15 (0·07 to 0·34); unadjusted RR 0·34 (95% CI 0·26 to 0·45)	No face mask, 17·4%	Face mask, 3·1% (1·5 to 6·7)	−14·3% (−15·9 to −10·7)	Low‡	Medical or surgical face masks might result in a large reduction in virus infection; N95 respirators might be associated with a larger reduction in risk compared with surgical or similar masks§

https://www.thelancet.com/pdfs/journals/lancet/PIIS0140-6736(20)31142-9.pdf

COVID-19 TESTING

- A negative COVID-19 RT-PCR test does NOT exclude COVID-19 infection if the person is within the 14 day incubation period
- A positive antibody test does NOT exclude infectious COVID-19 if the person is symptomatic
- A positive antibody test does not necessarily indicate immunity to re-infection
- The rapid point-of-care antigen test is only 80% sensitive and has NOT been validated for testing asymptomatic persons
- Current turnaround time for commercial tests is 5-10 days

Figure. Estimated Variation Over Time in Diagnostic Tests for Detection of SARS-CoV-2 Infection Relative to Symptom Onset



Estimated time intervals and rates of viral detection are based on data from several published reports. Because of variability in values among studies, estimated time intervals should be considered approximations and the probability of detection of SARS-CoV-2 infection is presented qualitatively. SARS-CoV-2 indicates severe acute respiratory syndrome coronavirus 2; PCR, polymerase chain reaction.

[a] Detection only occurs if patients are followed up proactively from the time of exposure.

[b] More likely to register a negative than a positive result by PCR of a nasopharyngeal swab.

SUMMARY OF CDC RECOMMENDATIONS FOR INSTITUTIONS OF HIGHER LEARNING

- COVID prevention: Physical distancing, masks when in public, hand hygiene, and surface disinfection
- Key recommendations
  - Maintain physical distancing in classrooms and cafeterias
  - Provide face coverings, hand hygiene products, and disinfectants
  - Provide messaging to students to achieve compliance with physical distancing, masks, and reporting illness (on campus and off campus)
  - If ill with symptoms consistent with COVID-19, do NOT come to campus or attend classes – report to Campus Health (students) or call Occupational Health (faculty and staff)
  - Plan for testing symptomatic faculty/staff and students; persons exposed to COVID-19 case
  - Plan to rapidly perform exposure evaluations with appropriate testing (may involve asymptomatic persons), and dorms for exposed but asymptomatic, COVID-19 infected, and healthy
  - Ability to track COVID-19 cases: Testing of symptomatic students, faculty, staff; testing of athletes participating in contact sports; testing as part of exposure evaluations
- No recommendation for testing of all arriving students or routine testing of asymptomatic persons