

# HEALTH FORUM OF WEST MICHIGAN

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## ROUTES OF TRANSMISSION OF RESPIRATORY VIRUSES



**A Direct contact transmission:**  
A susceptible individual is exposed to infectious viruses by direct physical contact with the infected patient.



**B Indirect contact transmission:**  
A susceptible individual is exposed to infectious viruses by physical contact with objects contaminated with infectious viruses (fomites) released by an infected patient.



**C Droplet and airborne transmission:**  
The infected patient releases infectious agents via droplets to susceptible individuals in close proximity and via droplet nuclei suspended in air to other individuals who are farther away.



**D Aerosol transmission during aerosol-generating procedures (AGPs).**  
During AGPs, infectious virus-laden aerosols are released into the environment with the potential to cause infection if inhaled by a susceptible individual.

## Aerosol Generation

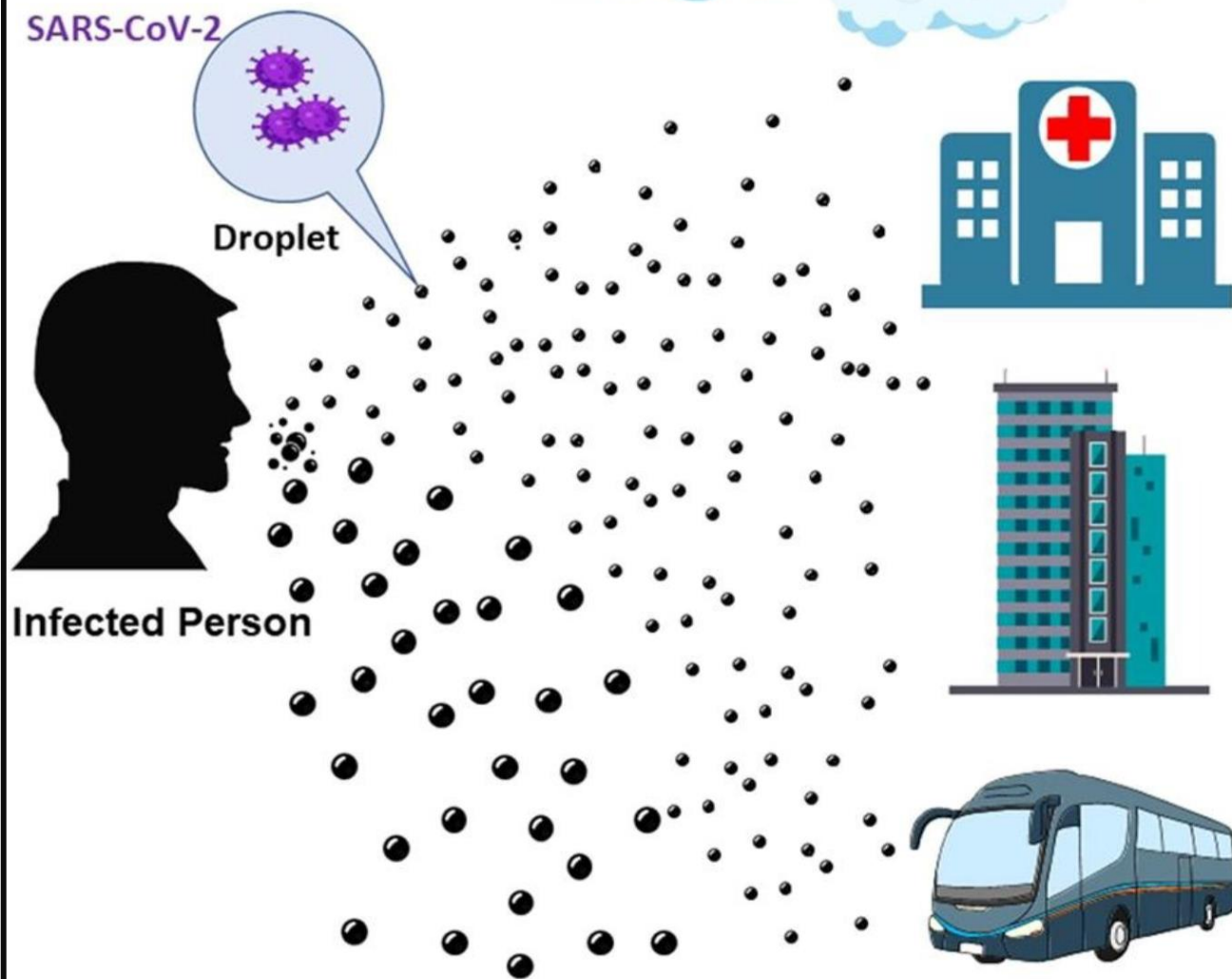
## Aerosol Transmission

## Precaution and Control

SARS-CoV-2

Droplet

Infected Person





A handkerchief in time



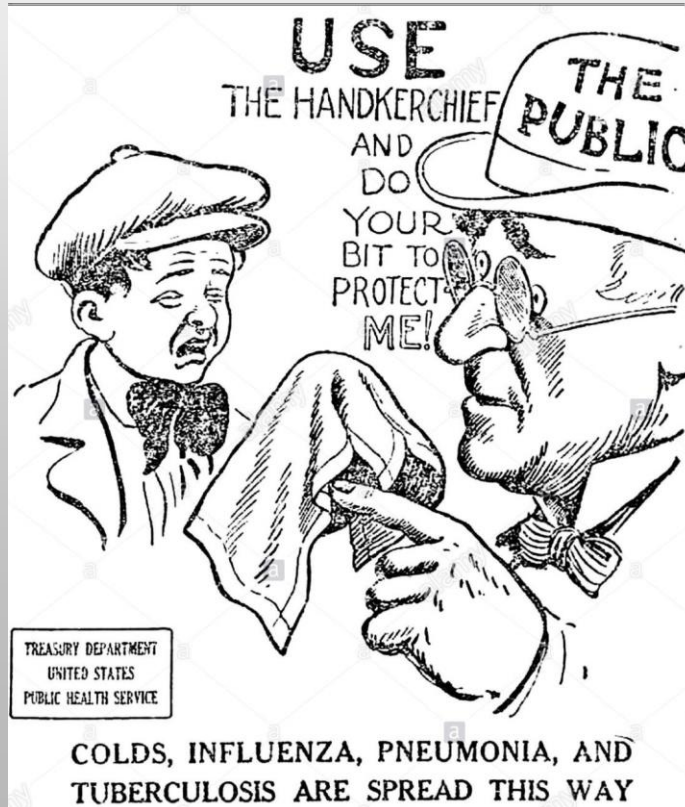
saves nine



*and helps to keep the nation fighting fit*

**COUGHS and SNEEZES  
SPREAD DISEASES**

ISSUED BY THE MINISTRY OF HEALTH

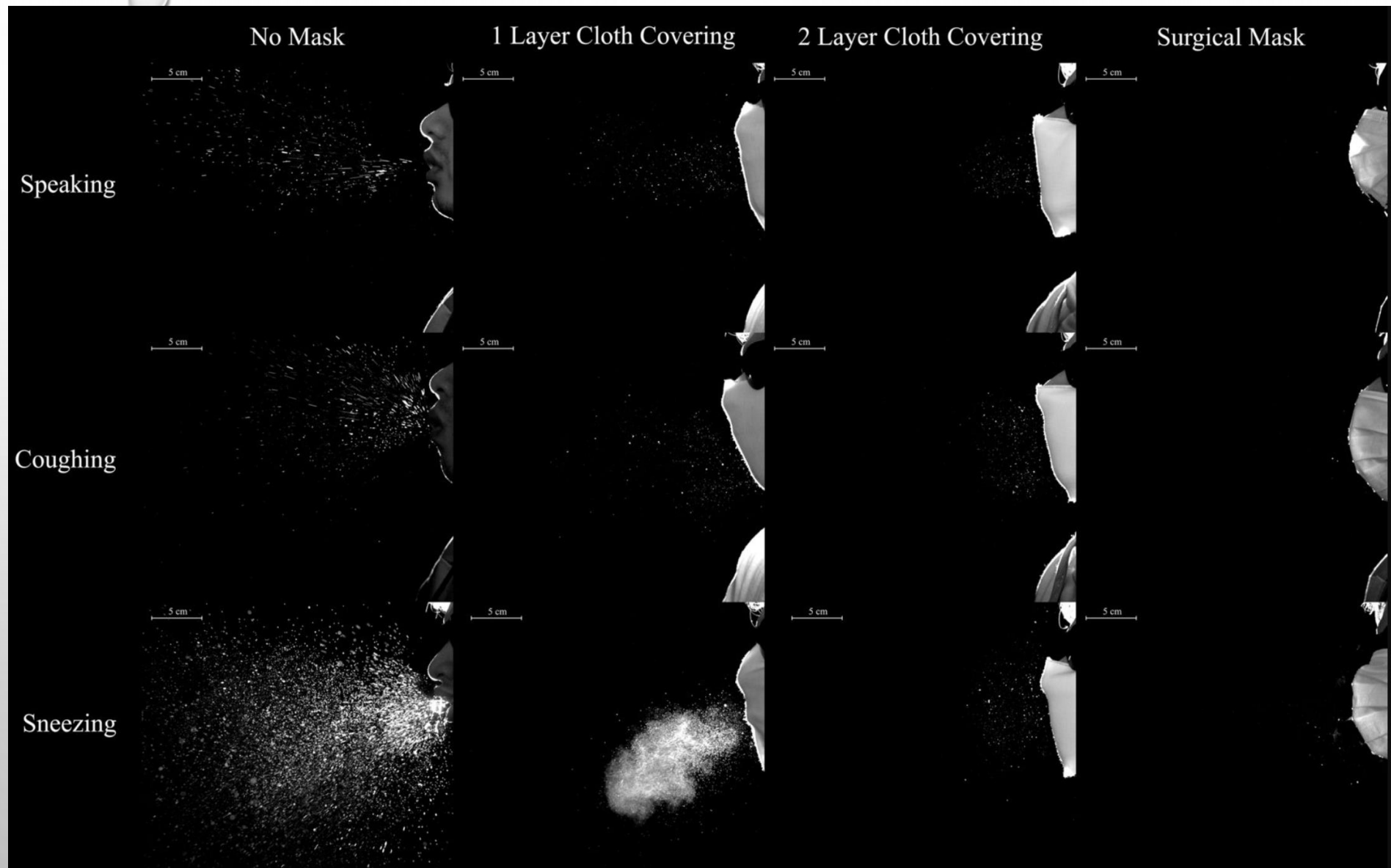


# SPANISH FLU 1918-1920

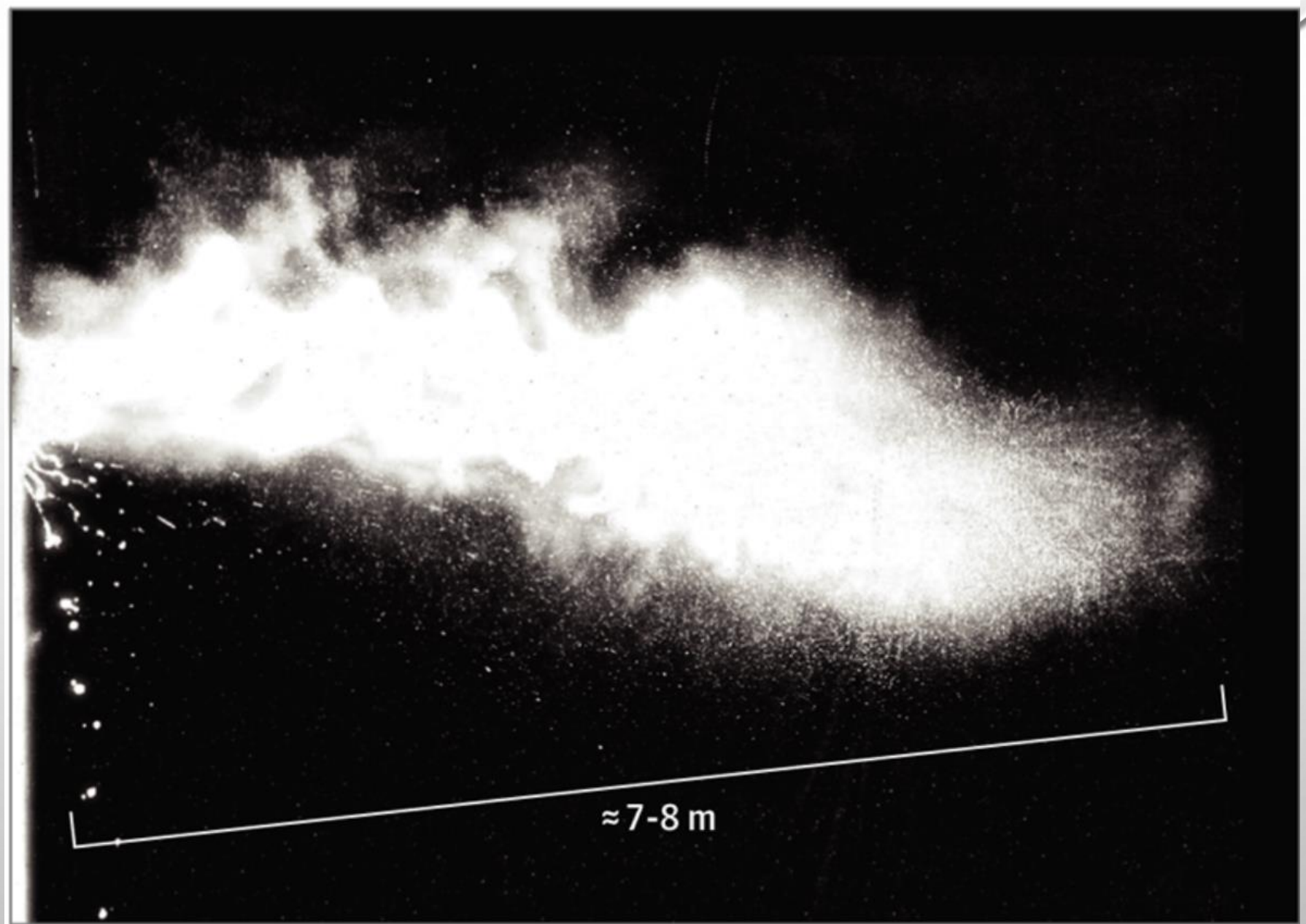
- COUGH PRODUCES 3000 DROPLETS
- SNEEZING PRODUCES 40,000 DROPLETS

Bahl P, Bhattacharjee S,  
de Silva C, et al. Face  
coverings and mask to  
minimize droplet  
dispersion and  
aerosolization: a video  
case study Thorax  
Published Online First:  
24 July 2020. doi:  
10.1136/thoraxjnl-  
2020-215748

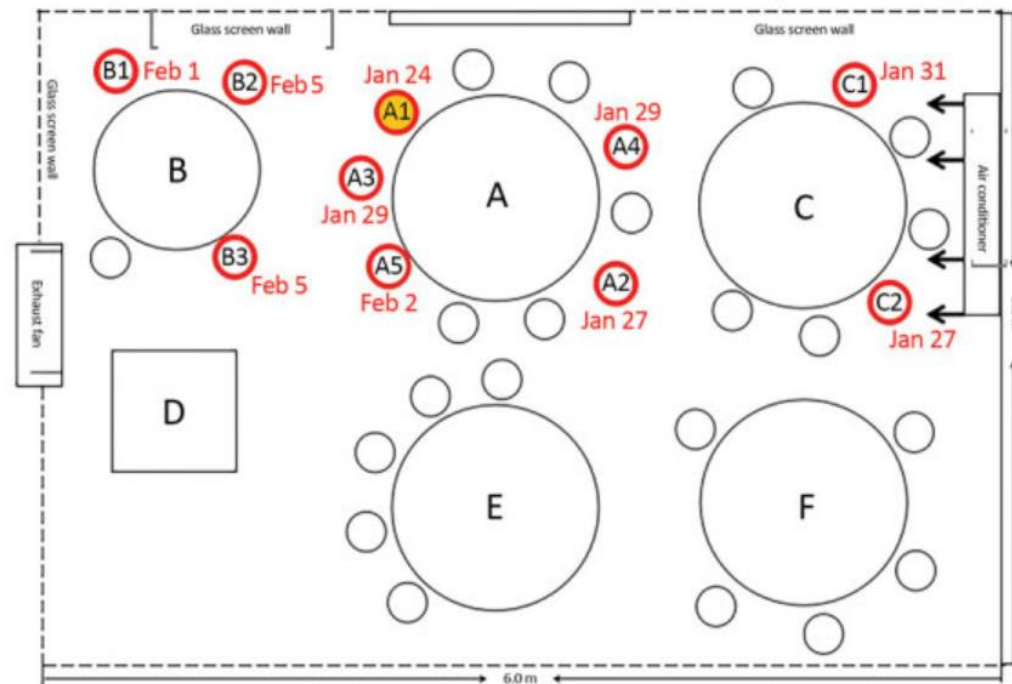
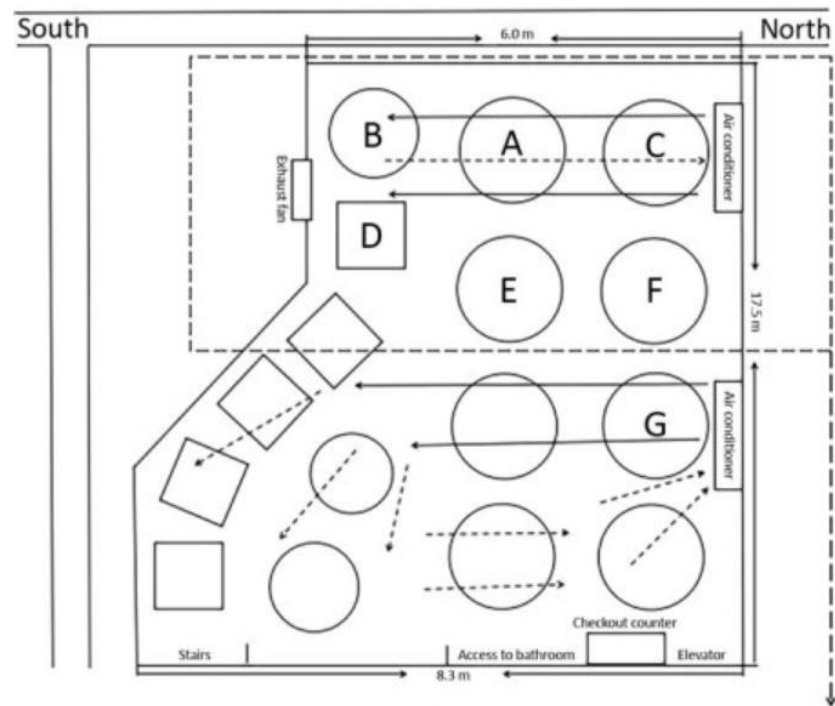
# Face Covering and Mask to Minimise Droplet Dispersion & Aerosolisation



Bahl P, Bhattacharjee S, de Silva C, et al Face coverings and mask to minimise droplet dispersion and aerosolisation: a video case study Thorax Published Online First: 24 July 2020. doi: 10.1136/thoraxjnl-2020-215748

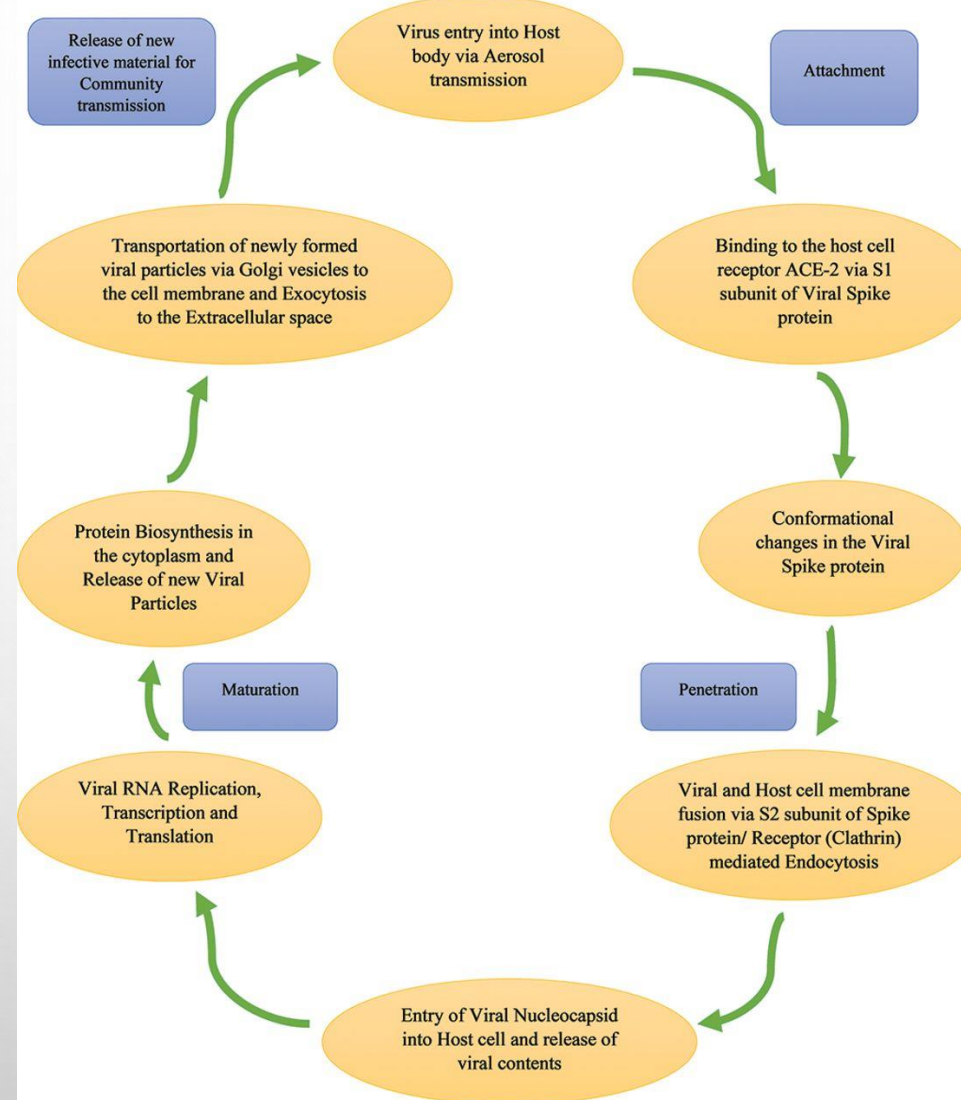




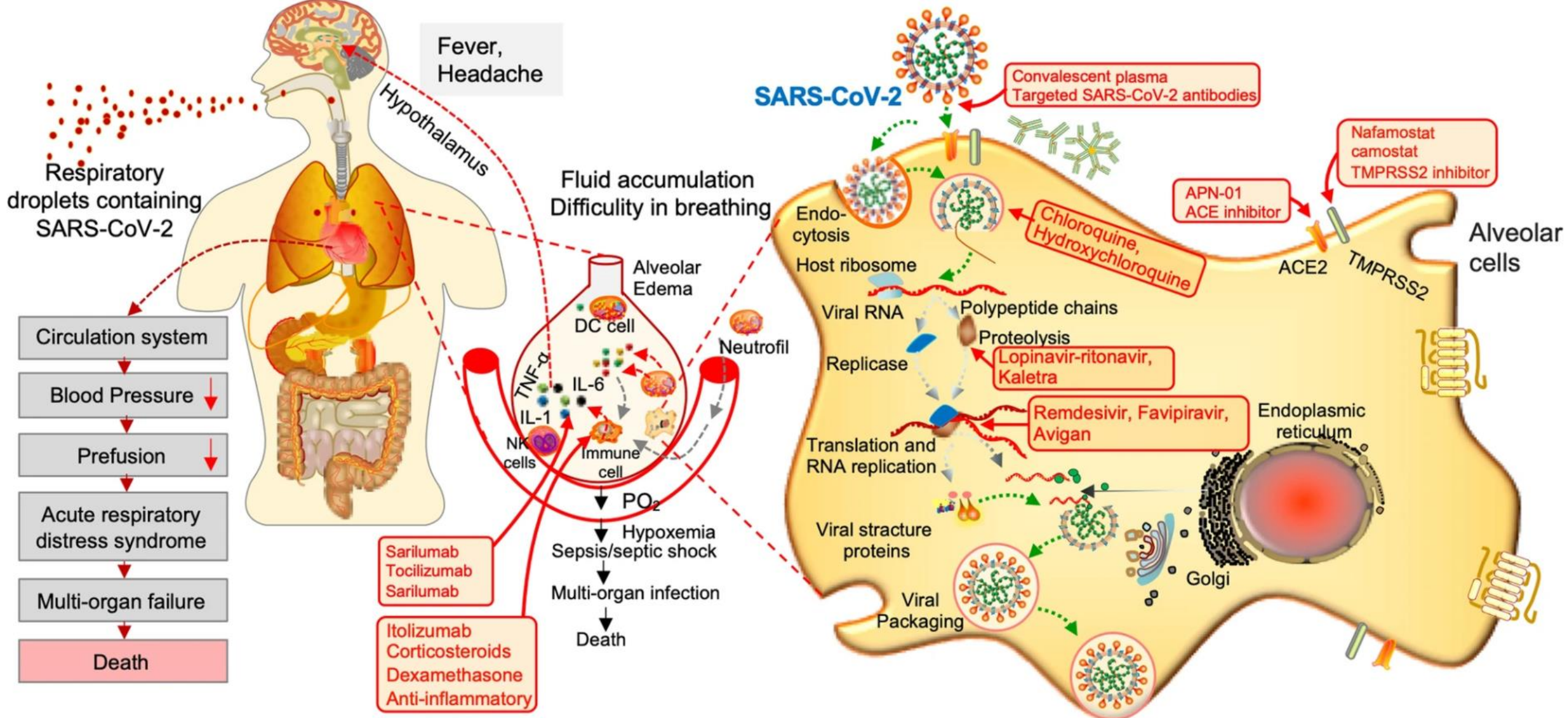




## The severe acute respiratory syndrome coronavirus-2 life cycle.

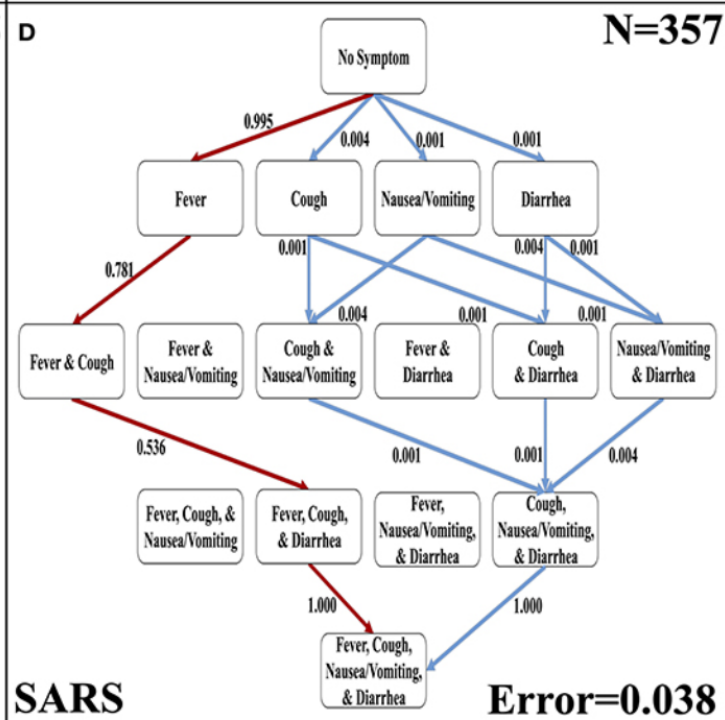
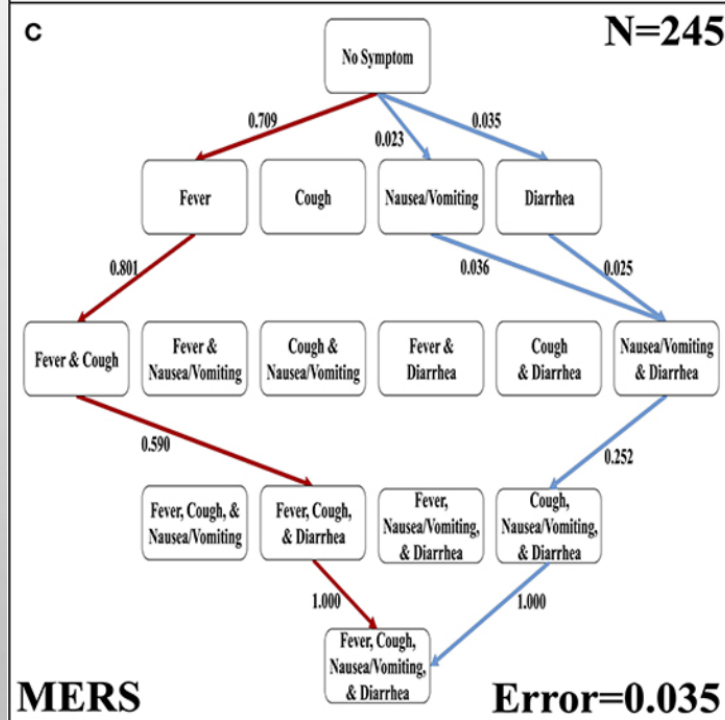
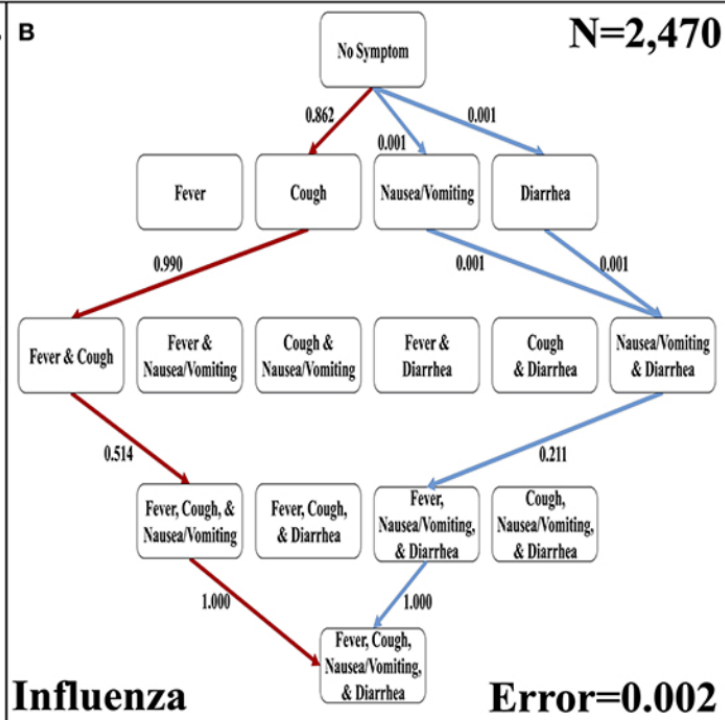
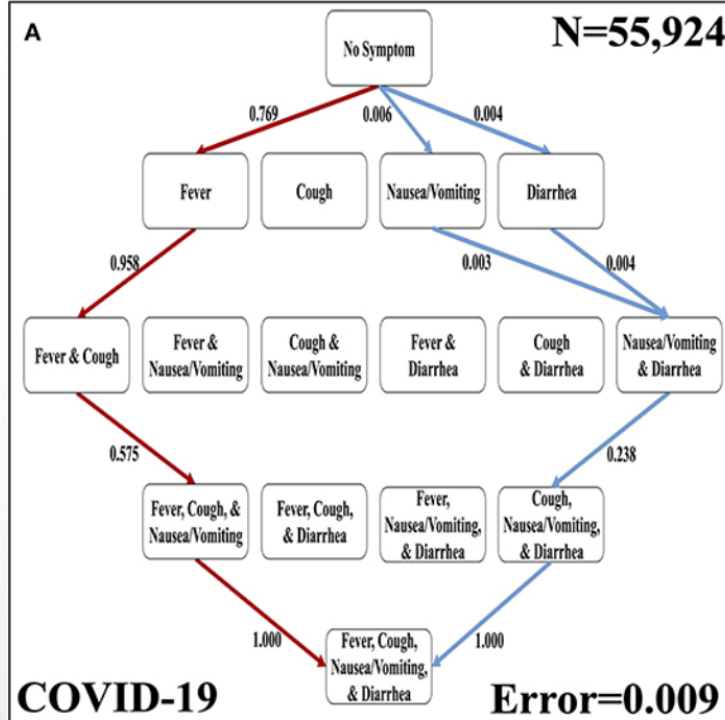


Anant Parasher Postgrad Med J doi:10.1136/postgradmedj-2020-138577



Kumar, M., Al Khodor, S. Pathophysiology and treatment strategies for COVID-19. J Transl Med 18, 353 (2020)





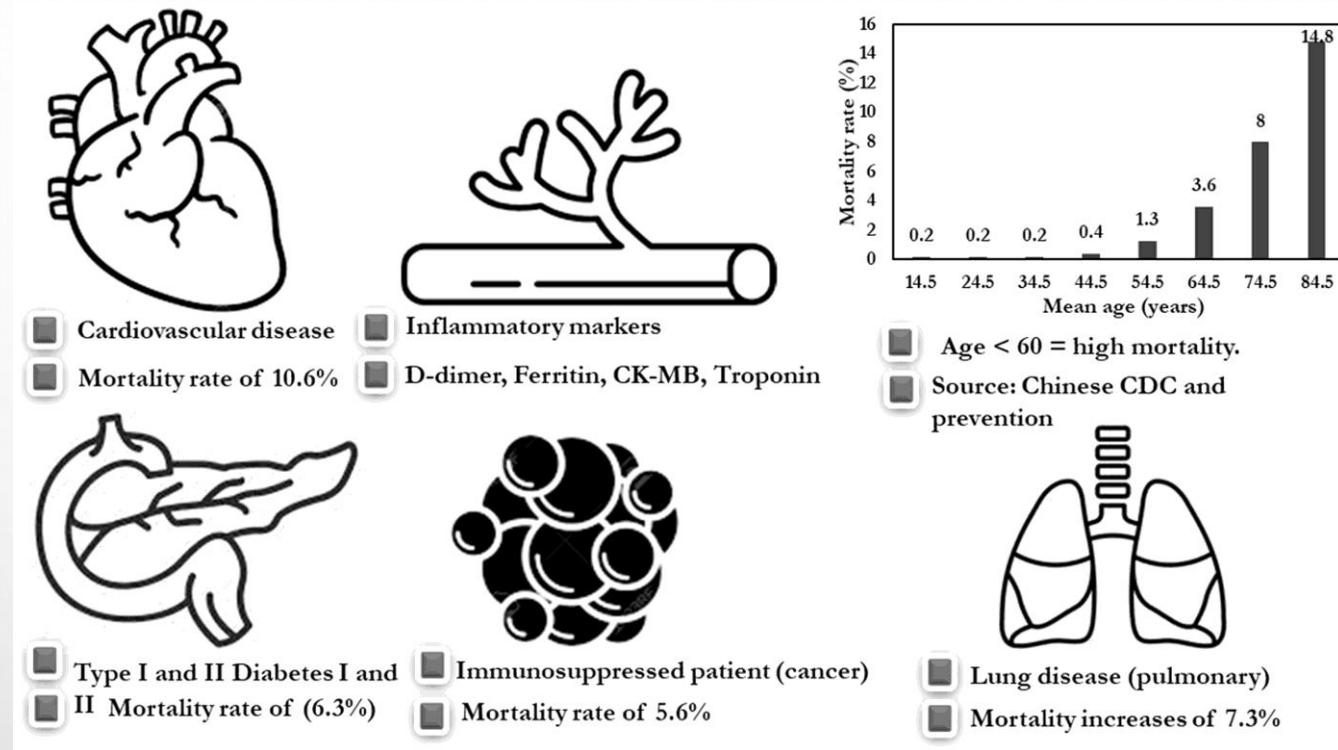


Figure 10. Potential prognosis of COVID-19 and associated mortality rates. Prognoses are shown for patients with (a) cardiovascular diseases, (b) inflammatory blood markers, (c) ageing, (d) pulmonary diseases, (e) immunosuppression (e.g., cancer patients), and (f) diabetes.



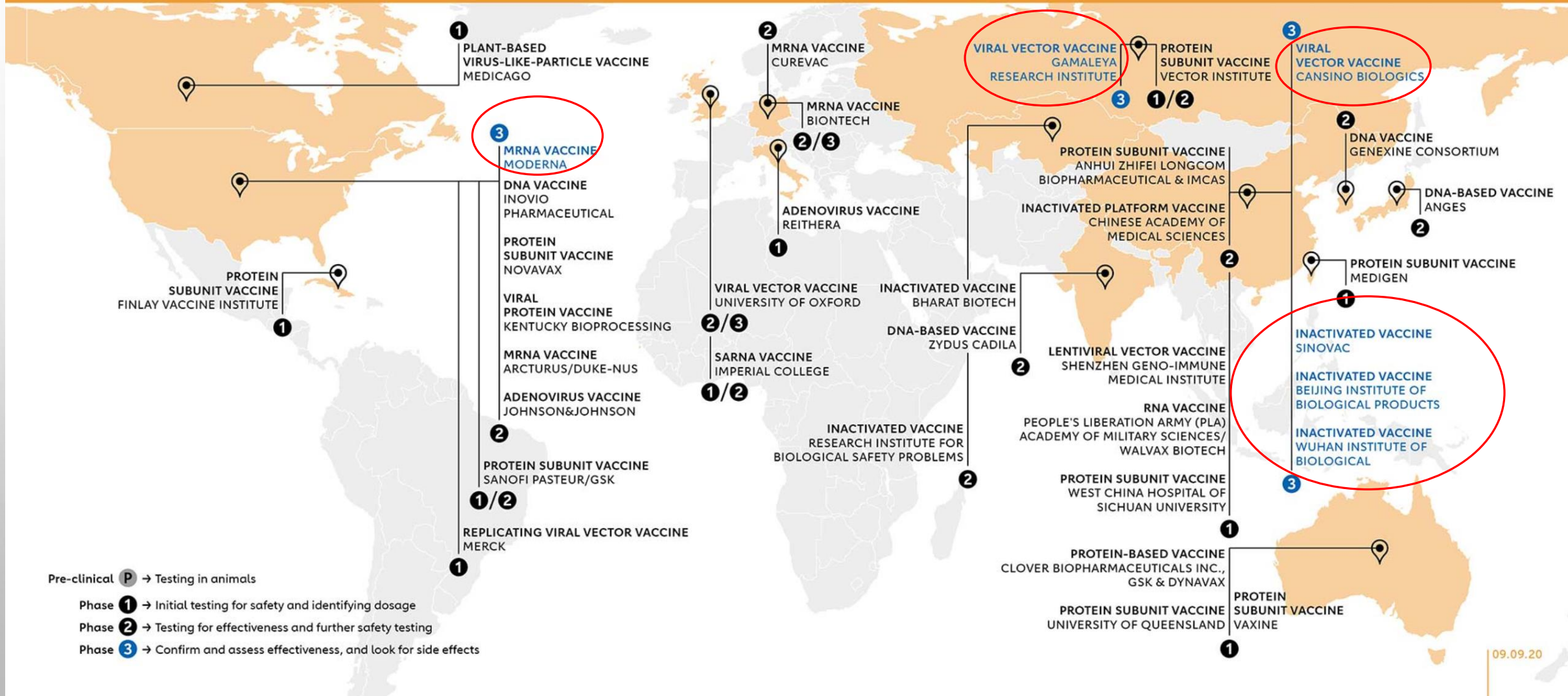
# THERAPIES RECOMMENDED OR HAVING FAVORABLE DATA

Drug	Mechanism	Current state
Remdesivir	RNA-dep RNA Polymerase inhibitor	<b>FDA EUA</b> , recommended for use
Corticosteroids	Down regulates immune activation	1 / 3 decrease in mortality in critically ill patients, recommended
Convalescent Plasma	Antibodies promote destruction	<b>FDA EUA</b> , recommended for use (limited randomized trials)
EIDD-2801	Viral mutagenesis	Early studies promising
Favipiravir	Viral mutagenesis, viral polymerase inhibitor	Approved in Japan for flu, early data promising
INF-B	Protects cells from damage, inhaled/IV	Significant improvement in 1 randomized trial

## Hydroxychloroquine: RCT evidence

Setting	Randomized, Controlled Trial	OUTCOME
<i>Hospitalized</i>	<b>HCQ vs. Placebo x 10 days</b> RECOVERY (MedRXIV preprint, 7/15/2020)	No difference in 28 day mortality HCQ associated with increased hospital stay, progression to intubation/death
	<b>HCQ vs Placebo x 5 days</b> ORCHID (press release 6/20/2020)	Stopped early due to lack of benefit. No negative safety signal
	<b>HCQ vs standard of care</b> SOLIDARITY (press release 7/4/2020)	Stopped early due to "little or no reduction in mortality"
	<b>HCQ vs standard care, 2-3 weeks (mild-moderate)</b> Tang et al (BMJ 5/2020)	No difference in conversion to negative COVID PCR by day 28
<i>Outpatient</i>	<b>HCQ vs Placebo x 5 days</b> Skipper et al (AIM 7/16/2020)	No difference in symptom severity at day 14
	<b>HCQ vs. HCQ/Azithromycin vs Placebo x 7 days</b> Coalition COVID-19 (NEJM 7/23/2020)	No difference in clinical status at day 15
<i>Prophylaxis</i>	<b>HCQ vs Placebo x 5 days, within 4d of exposure</b> Boulware et al (NEJM, 6/3/2020)	No difference in incidence of new illness
	<b>HCQ vs no treatment x 7d,</b> Mitja et al (MedRXIV 7/26/2020)	No difference in incidence of new PCR(+) COVID infection

# COVID-19 vaccines in clinical development around the world





# VACCINES (US TRIALS)

MODERNA (MRNA)

PFIZER (MRNA)

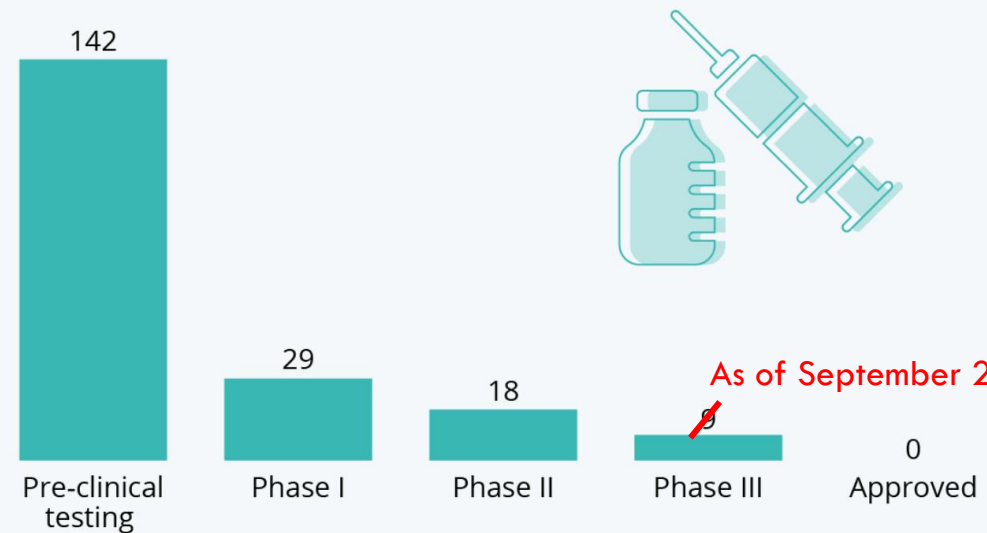
JOHNSON/JOHNSON (ADENOVIRUS VECTOR)

ASTRA-ZENECA (CHIMPANZEE ADENOVIRUS VECTOR)

NOVAVAX (PROTEIN)

## How Close Is The World To A Coronavirus Vaccine?

Number of Covid-19 vaccine candidates by developmental phase\*



\* As of September 8, 2020.

Source: World Health Organization via The Guardian



statista