



COVID-19 VACCINES: The tool to end the pandemic

Oct, 2021

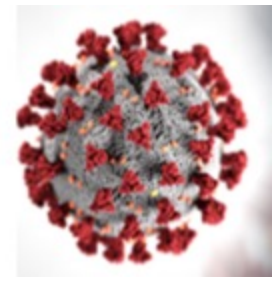
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COVID-19

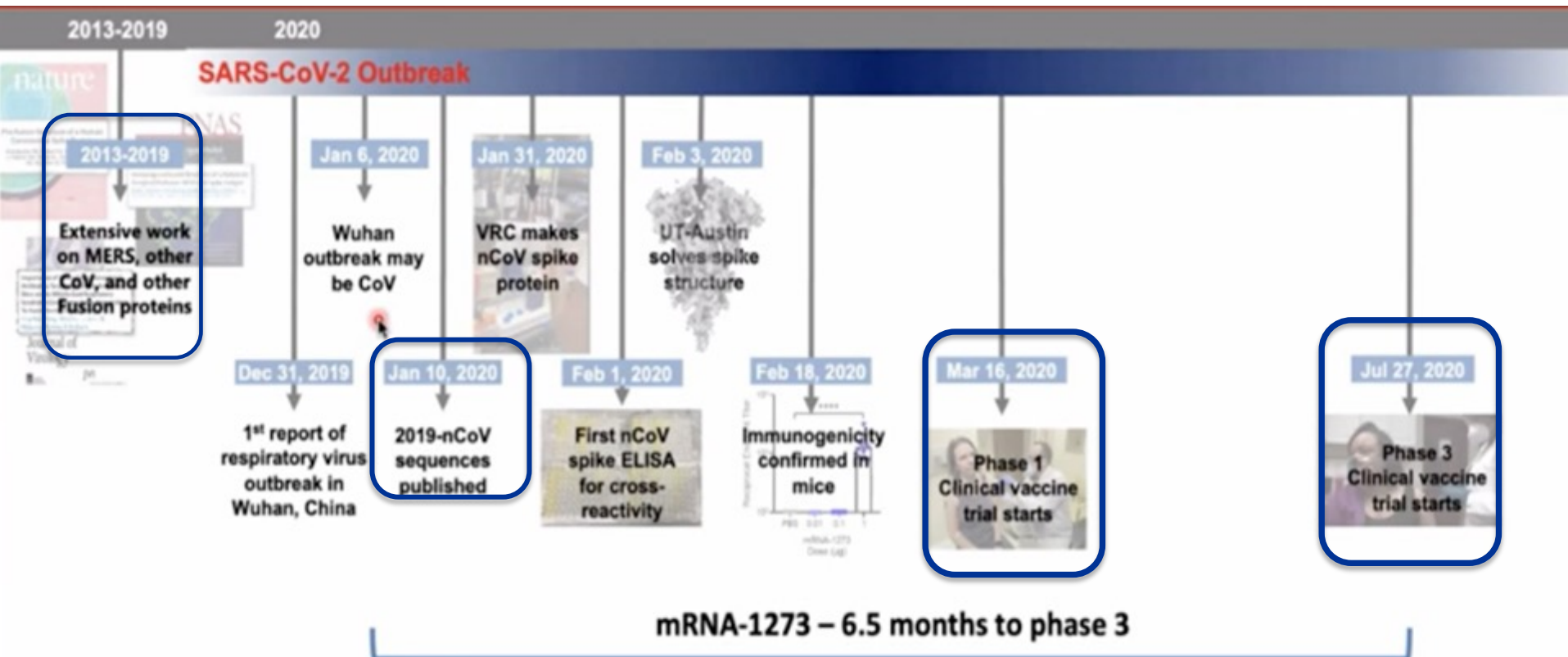
What have we Learned: selected thoughts

- Virology (SARS-CoV-2; different from SARS-COV)
 - Endemic vs novel coronaviruses
 - Variants
- Transmission (-2 to day 5); droplets and aerosols (less)
 - Contagion
 - Risk factors: **Obesity**, DM, CKD, Chronic lung/heart Disease; Immunosuppressed RX; HTN
 - **Asymptomatic spread**
- Manifestations
 - Expansion of symptoms (from fever, cough SOB)
 - Pathophysiology
 - Virologic vs immune/inflammatory/hypercoagulation
 - **'long-term' effects**
- Therapeutics (evidence vs opinion)
 - Antivirals; monoclonal antibodies; anti-inflammatories
- Control/Prevention
 - Masks (distancing, crowd avoidance)
 - **VACCINE (the tool to end the pandemic)**

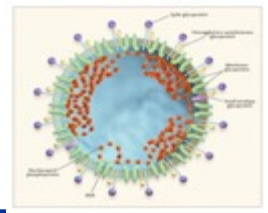
COVID-19 mRNA VACCINE DEVELOPMENT



- Rapidity of development due to advances in science; methodology
- Studies conducted under strict scientific criteria; no cutting of corners.



COVID-19 VACCINES

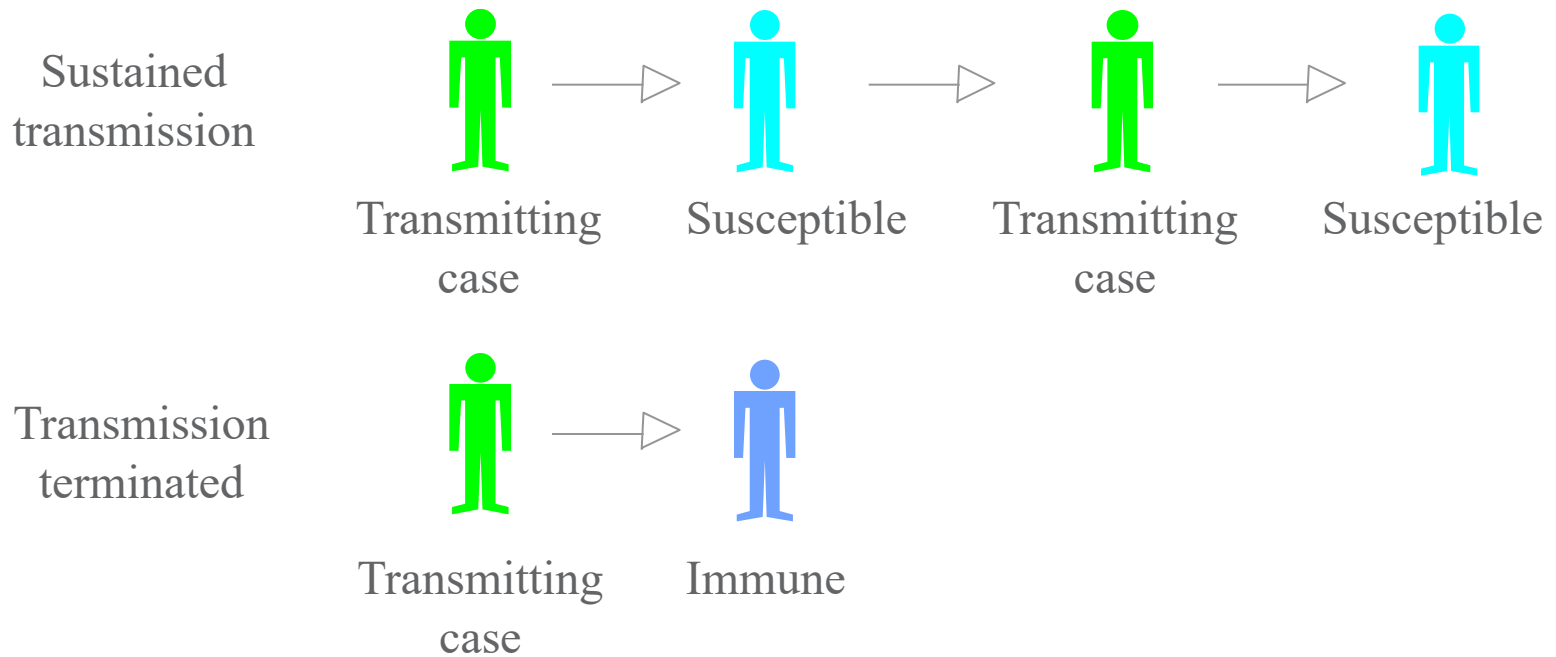


	Moderna*	Pfizer**	J&J*
Target	Spike protein	Spike protein	Spike protein
Technology	mRNA	mRNA	Adenovirus vector
Efficacy-overall disease (clinical trials)	94%	95%	66% overall (72% US; 64% S Africa)
Efficacy-Prevent Severe disease (Hospital/Death)	YES	YES	YES
Efficacy-Infection (asymptomatic)	Preliminary Data: Suggestive (Swab)	Indirect Data: Suggestive (Israel)	Preliminary Data: Suggestive (seroconversion)
Side Effects-expected; transient	Local discomfort; fatigue, Headache, myalgia, low fever, lymph node; myocarditis	Local discomfort; fatigue, Headache, myalgia, low fever; myocarditis	Local discomfort; fatigue, Headache, myalgia, low fever. Thrombosis

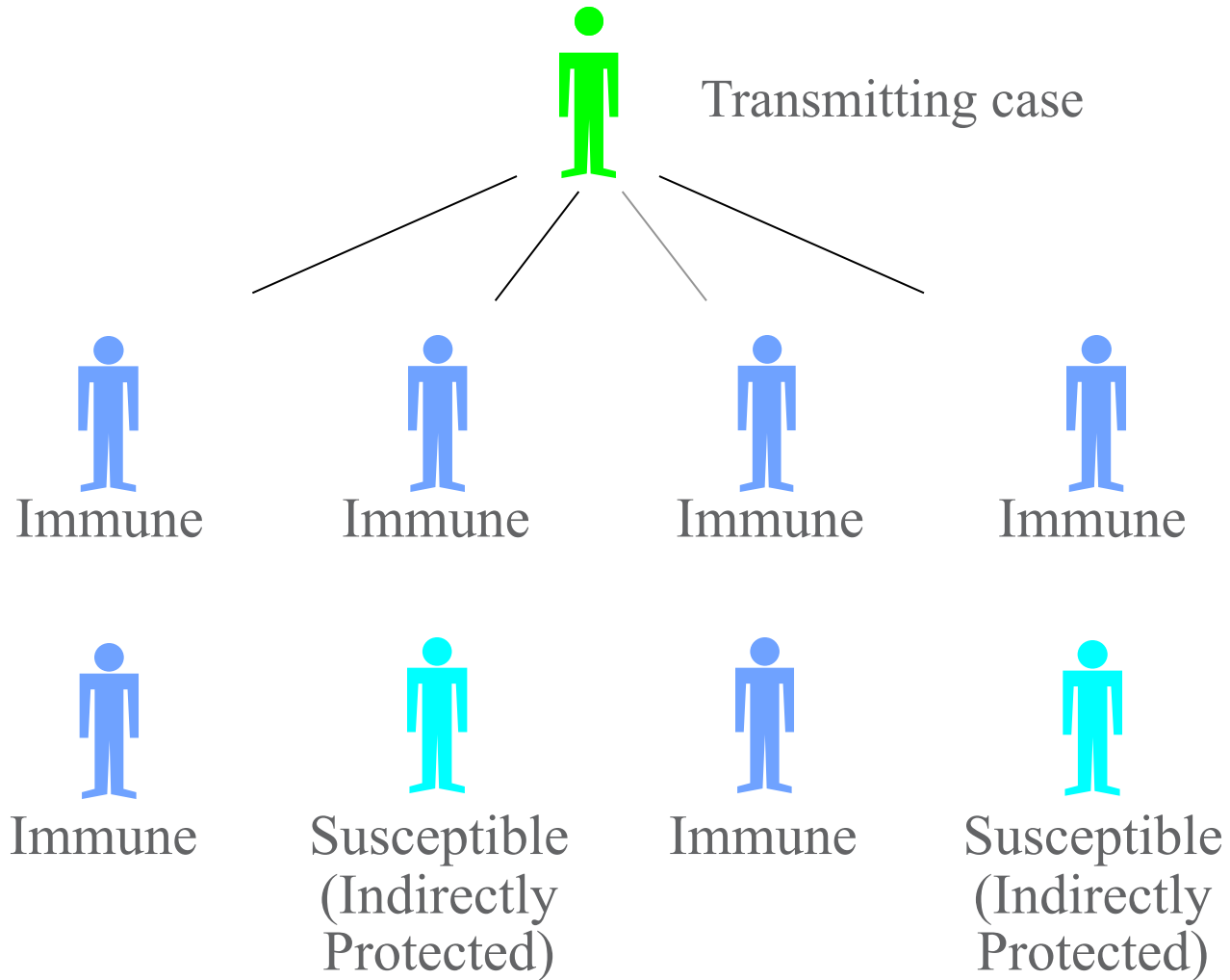
COVID VACCINE SAFETY

- COVID-19 vaccines are **safe and effective**
 - Serious problems are rare
 - Thrombosis after J&J vaccine (7/million women 18-49)
 - Myocarditis after mRNA vaccines (8/million men 30-49)
 - Both more likely with COVID-19
 - Long term effects unlikely
 - Historically shown that side effects generally happen within six weeks of receiving a vaccine dose. For this reason, the FDA required each of the authorized COVID-19 vaccines to be studied for at least two months (eight weeks) after the final dose
- Continued safety monitoring
 - VAERS (Vaccine Adverse Event Reporting System)
 - CISA (Clinical Immunization Safety Assessment)
 - VSD (Vaccine Safety Datalink)
 - v-safe (smartphone-base tool)

Herd Immunity - #1



Herd Immunity - #2



Herd Immunity thresholds for common vaccine-preventable diseases

Infection	Reproduction number (Ro)	Herd immunity threshold (%)
Influenza	1.4-4	30-75
Measles	12-18	92-94
Pertussis	12-17	92-94
Polio	1-15	50-93
Diphtheria	6-7	85

From: Fine PEM, et al. Community Immunity in Plotkin SA, Orenstein WA, Offit PA, Vaccines 5th edition, Elsevier, 2008, pp 1573-1592