Teterboro User's Group

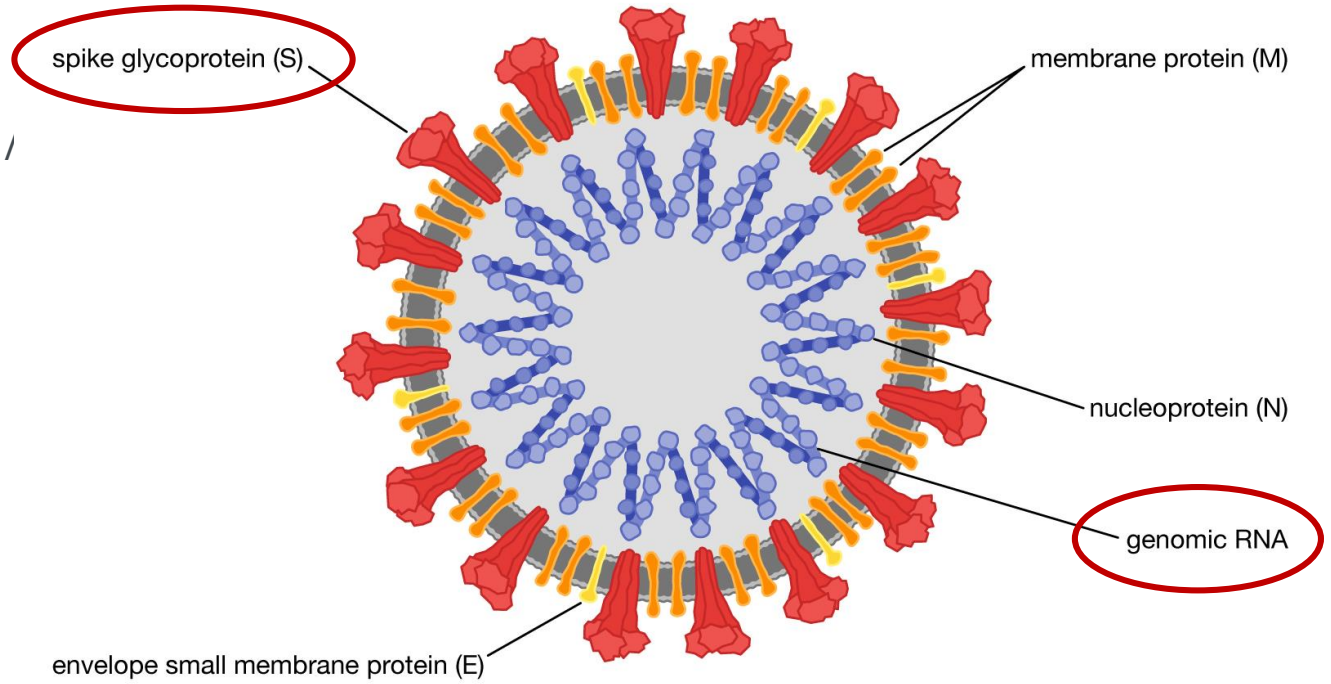
Dr. Paulo M. Alves
Global Medical Director, Aviation Health

SEIZE THE MOMENT

MedAire
An International SOS Company

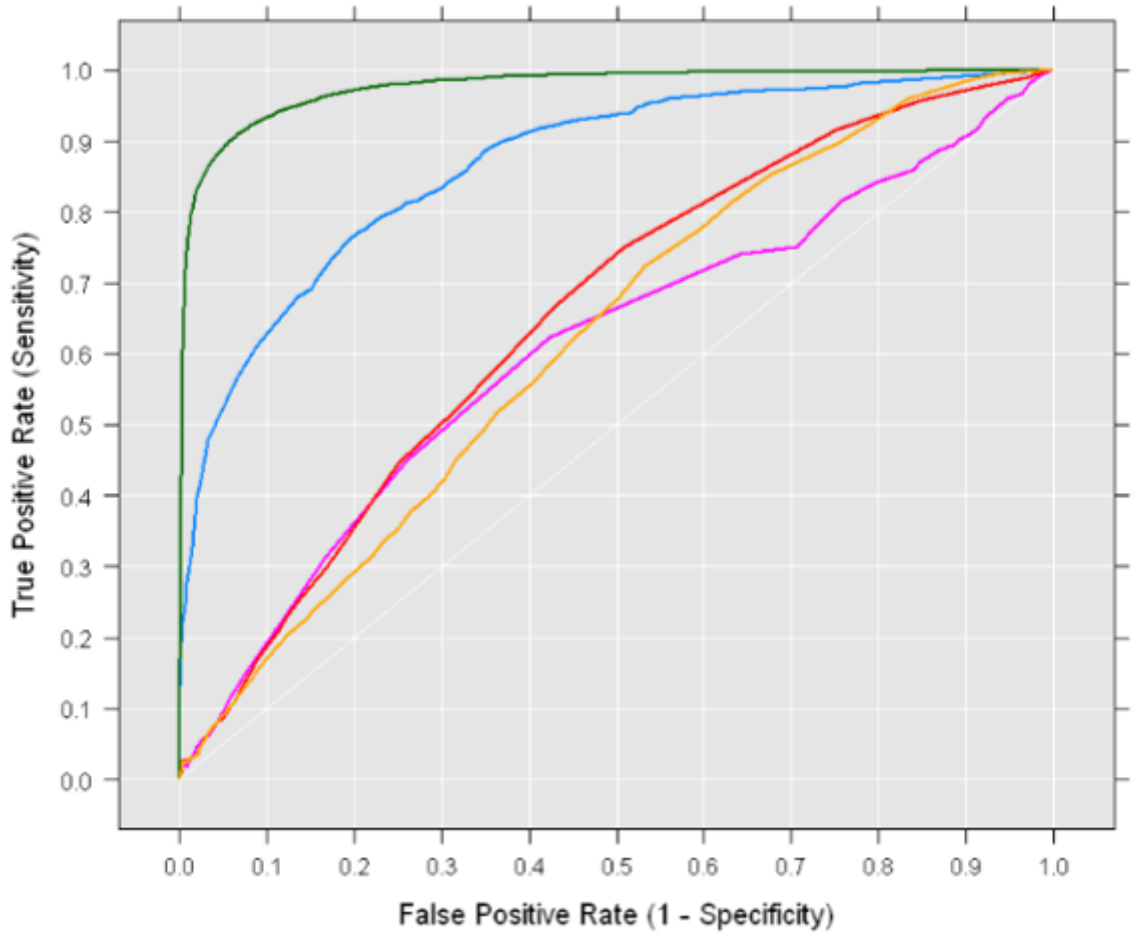
COVID-19 Test Types

- Genetic
  - Tests for the virus genetic material
    - PCR / LAMP
    - Nasal / naso-pharyngeal secretions / saliva
- Antigen
  - Tests for a specific protein (CoV spike protein
    - Nasal / naso-pharyngeal secretions
- Antibody
  - Tests for antibodies developed against viral particles

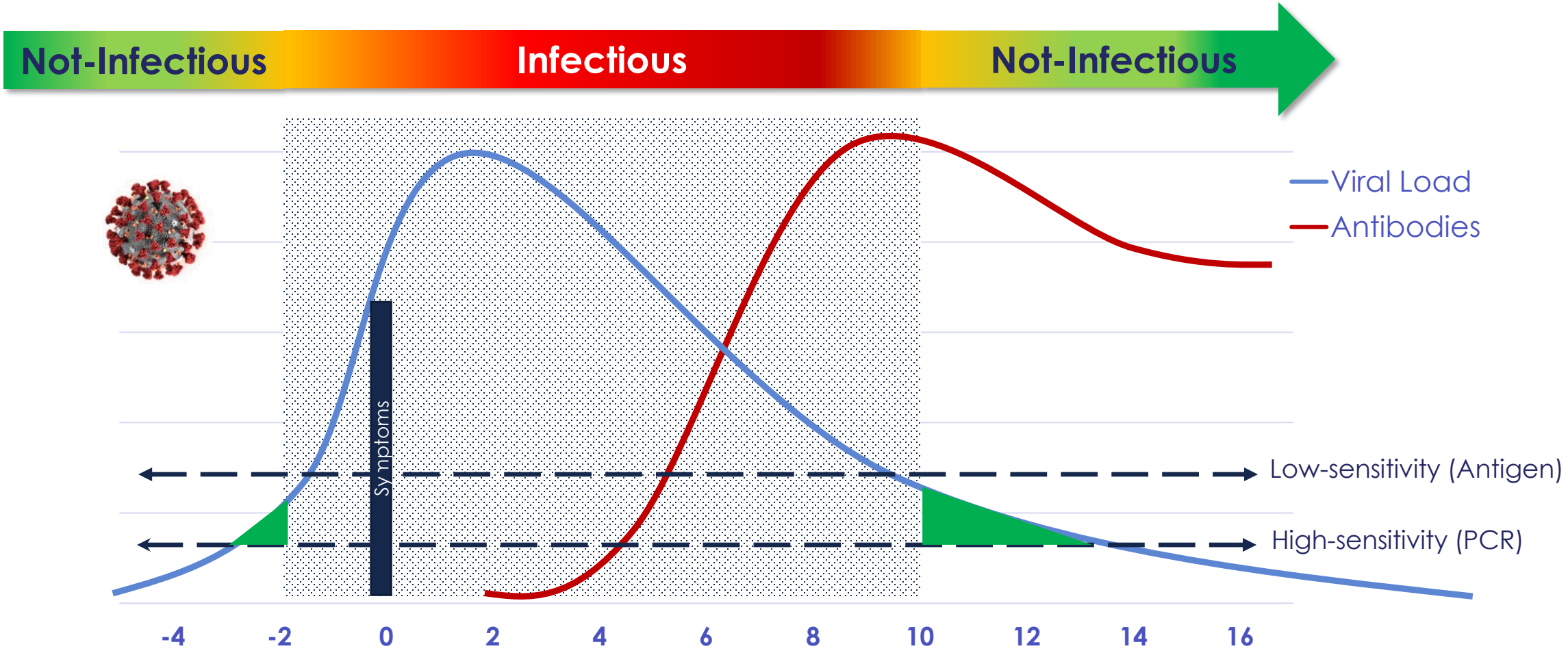


Test Performance

	True class: Positive	True class: Negative	Measures
Predicted class: Positive	True positive *TP*	False positive *FP*	Positive predictive value (PPV) $\frac{TP}{TP+FP}$
Predicted class: Negative	False negative *FN*	True negative *TN*	Negative predictive value (NPV) $\frac{TN}{FN+TN}$
Measures	Sensitivity $\frac{TP}{TP+FN}$	Specificity $\frac{TN}{FP+TN}$	Accuracy $\frac{TP+TN}{TP+FP+FN+TN}$



Viral load and antibody production



Reasons for Testing

- Diagnostic
  - High positive predictive value / High specificity
- Screening
  - High negative predictive value / High sensitivity
- Contact tracing
  - Good sensitivity / rapid turnover
- Compliance
  - Aligned with the regulatory requirements
- Surveillance
  - Long-lasting detection

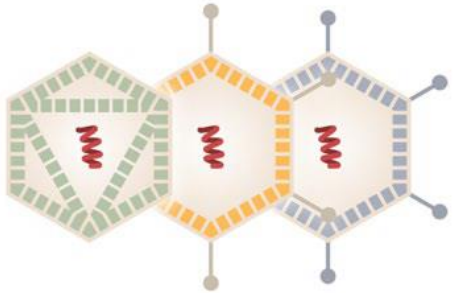
Types of vaccines

Whole-Virus Vaccines

Vaccines that use a weakened or inactivated version of the coronavirus to provoke an immune response.

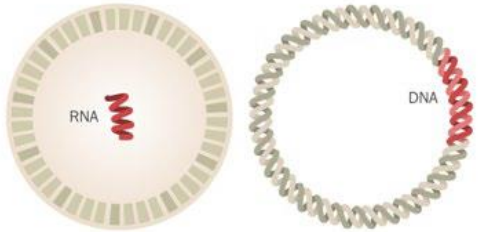
Viral Vector Vaccines

Vaccines that use a virus to deliver coronavirus genes into cells. The cells make viral proteins, provoking an immune response, but the virus cannot replicate.



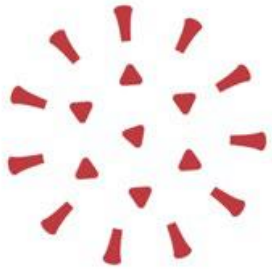
Genetic Vaccines

Vaccines that use one or more of the coronavirus's own genes to provoke an immune response.

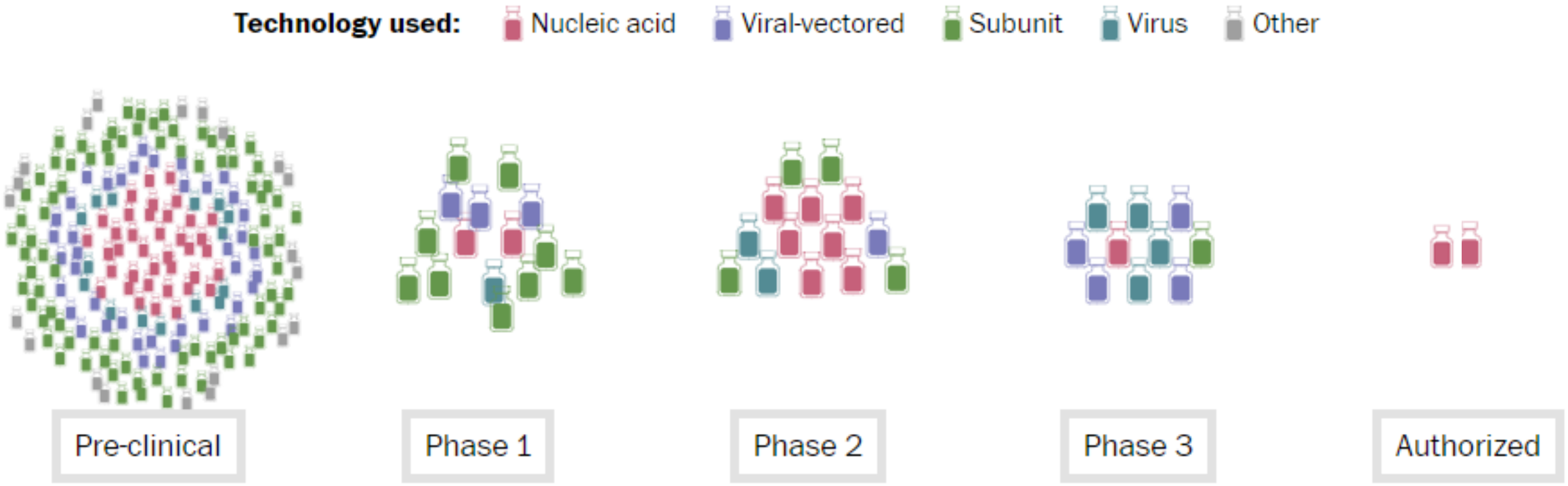


Protein-Based Vaccines

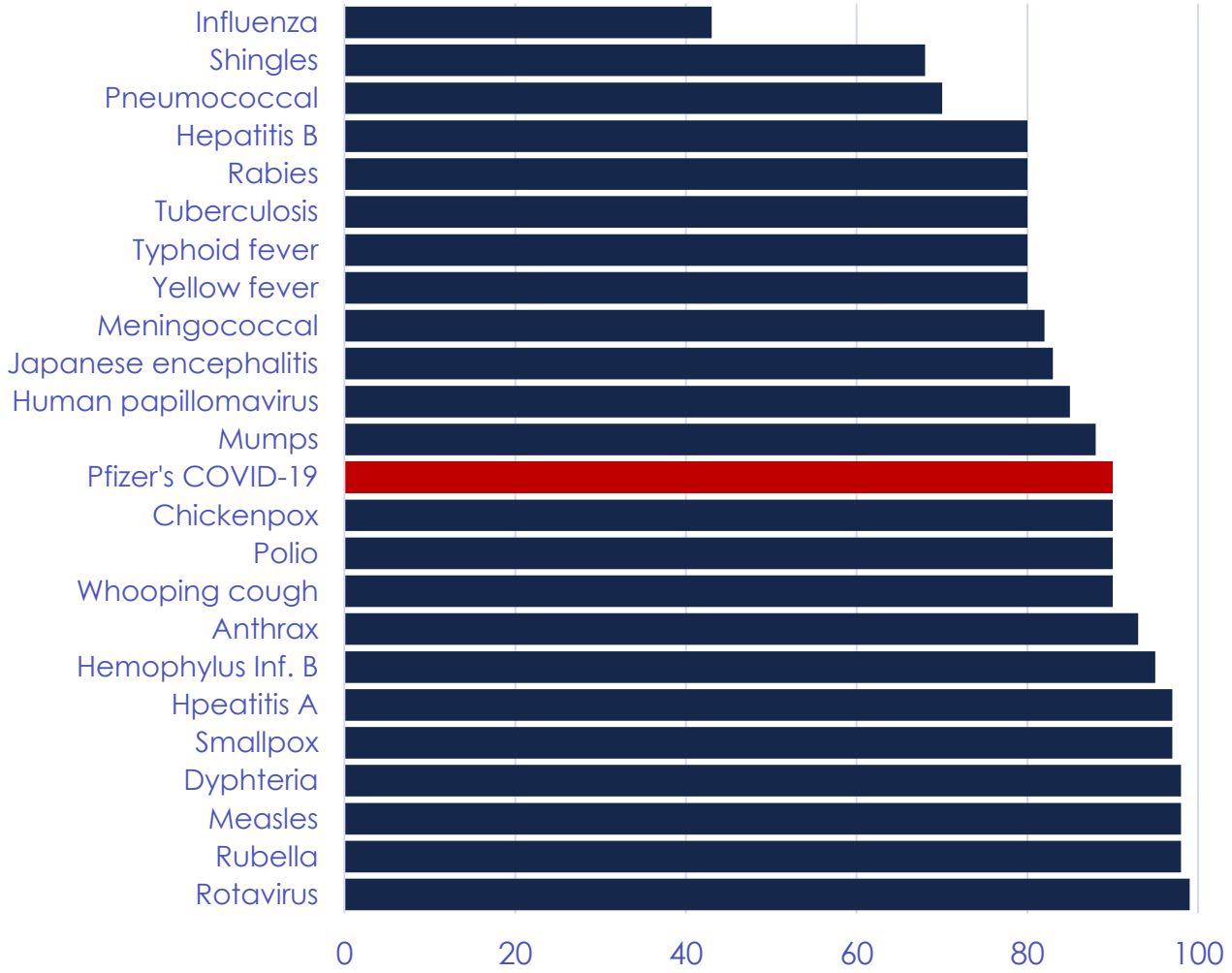
Vaccines that use a coronavirus protein or a protein fragment to provoke an immune response.



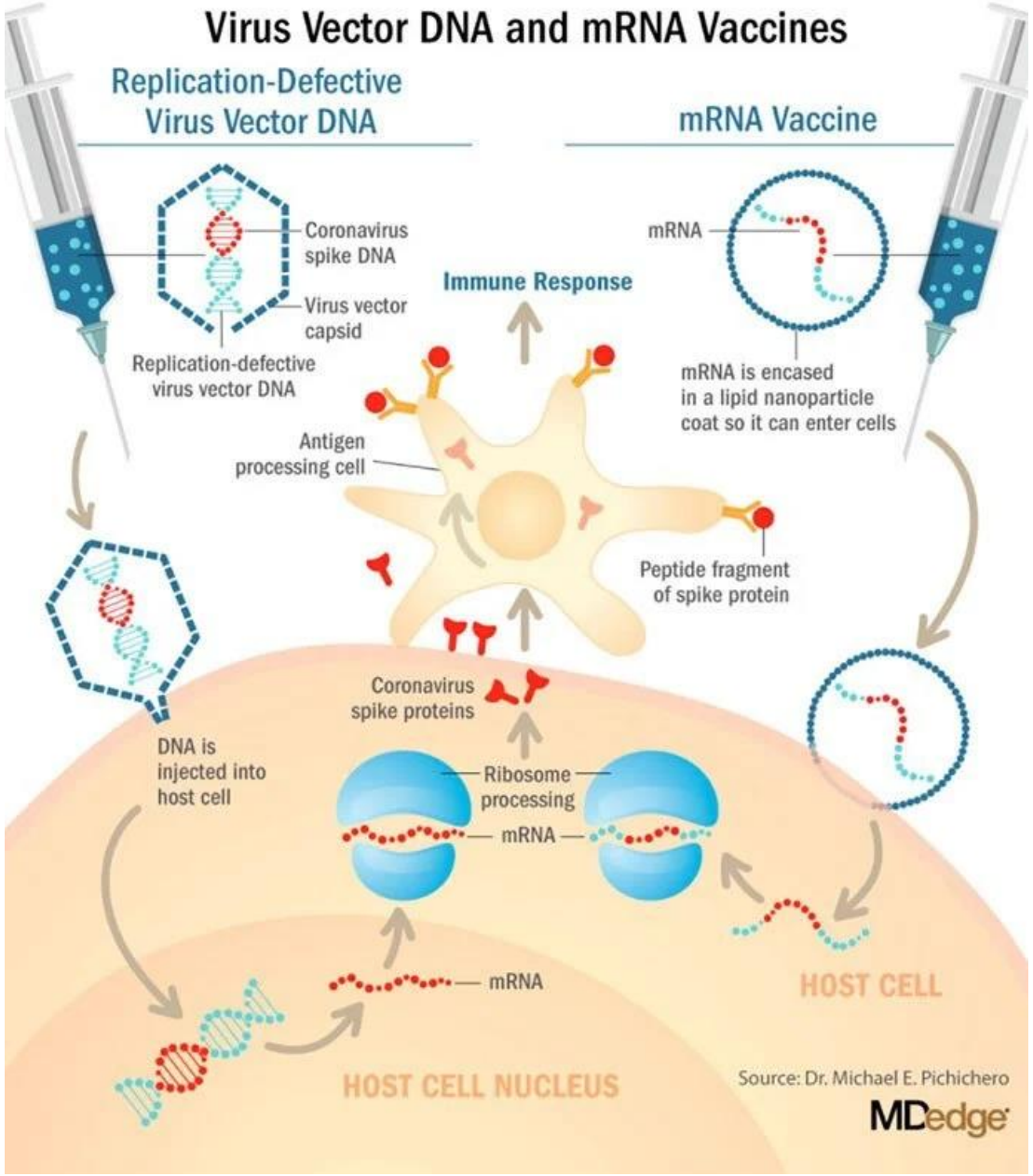
Vaccine life cycle in the US



Vaccine effectiveness (%)



Nucleic Acid Vaccine Mechanism



Vaccines Phase III (WHO)

Developer/Manufacturer	Vaccine Platform	Doses	Timing
Sinovac	Inactivated	2	9, 14 days
Sinopharm	Inactivated	2	0, 21 days
Bharat Biotech	Inactivated	2	0, 28 days
Oxford / Astra Zeneca	Non-replicating viral vector	2	0, 28 days
CanSino Biological	Non-replicating viral vector	1	0
Gamaleya	Non-replicating viral vector	2	0, 21 days
Janssen	Non-replicating viral vector	1 2	0 0, 56 days
Novavax	Protein Subunit	2	0, 21 days
Moderna	mRNA	2	0, 28 days
Pfizer / BioNTech	mRNA	2	0, 28 days