Similarities and differences between

SARS-CoV-2 and Influenza

Lennie Derde – EMA meeting

UMC Utrecht

(potential) COI	
For meeting potential relevant relationships with companies	**drugs REMAP-CAP trial** Roche Products Ltd Sanofi (Aventis Pharma Ltd) Swedish Orphan Biovitrum AB (Sobi™) Faron Pharmaceuticals Dimerix
Sponsoring and grants	**ECRAID-Base** HORIZON-Health (2021-2026) ZonMw **Pandemic Preparedness** (2023-2028) ZonMw **IMPRINT** (2024 – 2028)
Honoraria and Stocks	none
Academic COI	**SSC** steering committee, ESICM co-vice chair, patient panel and INF IAB **Sepsis Canada** **Ecraid** Coordinating Committee (NGO under Dutch law) **PANTHER** TSC **EMPRESS** DSMB

Introduction

Influenza and SARS-CoV-2

have pandemic potential

can cause severe illness and strain hospital resources

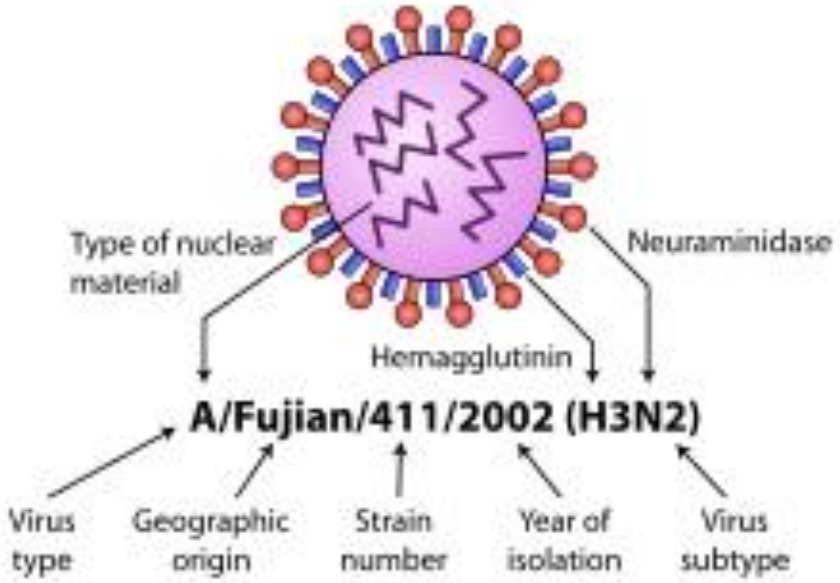
antivirals (and other therapies) not well investigated in severe illness

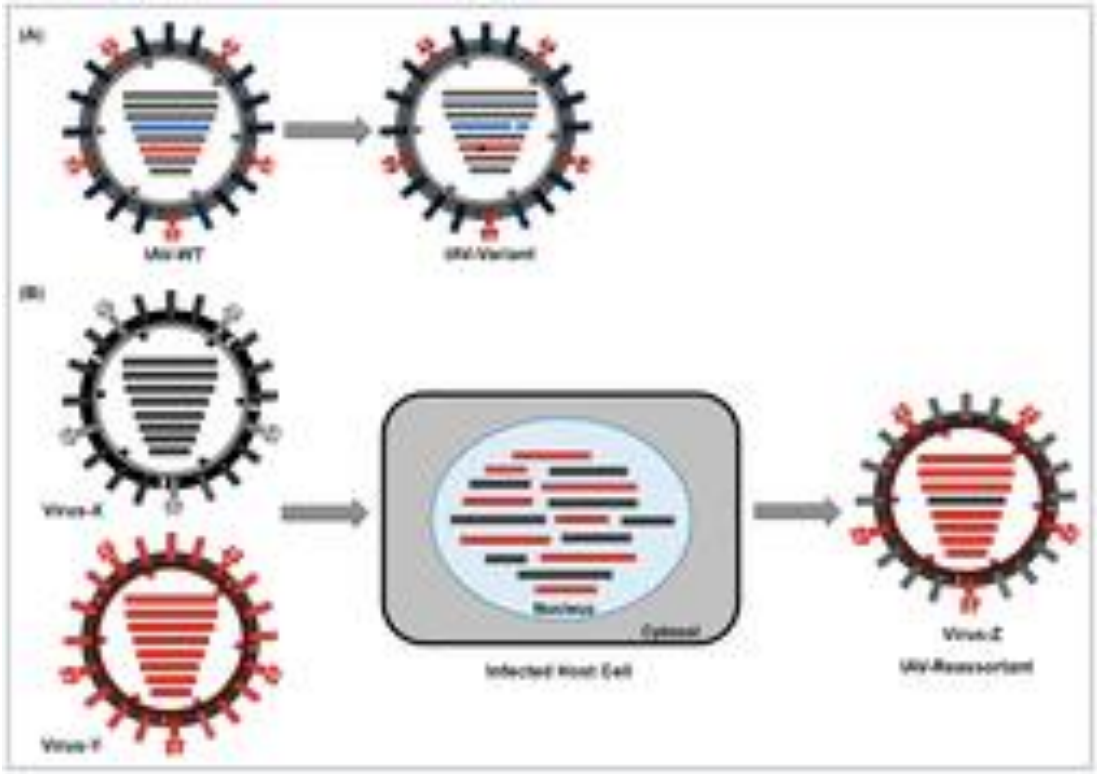
Understanding relevant for pandemic (research) preparedness - **trial design**,

regulatory strategy, and future development of (**antiviral) drugs** (and vaccination)

Influenza virus

Orthomyxovirus; A, B, C, (D)



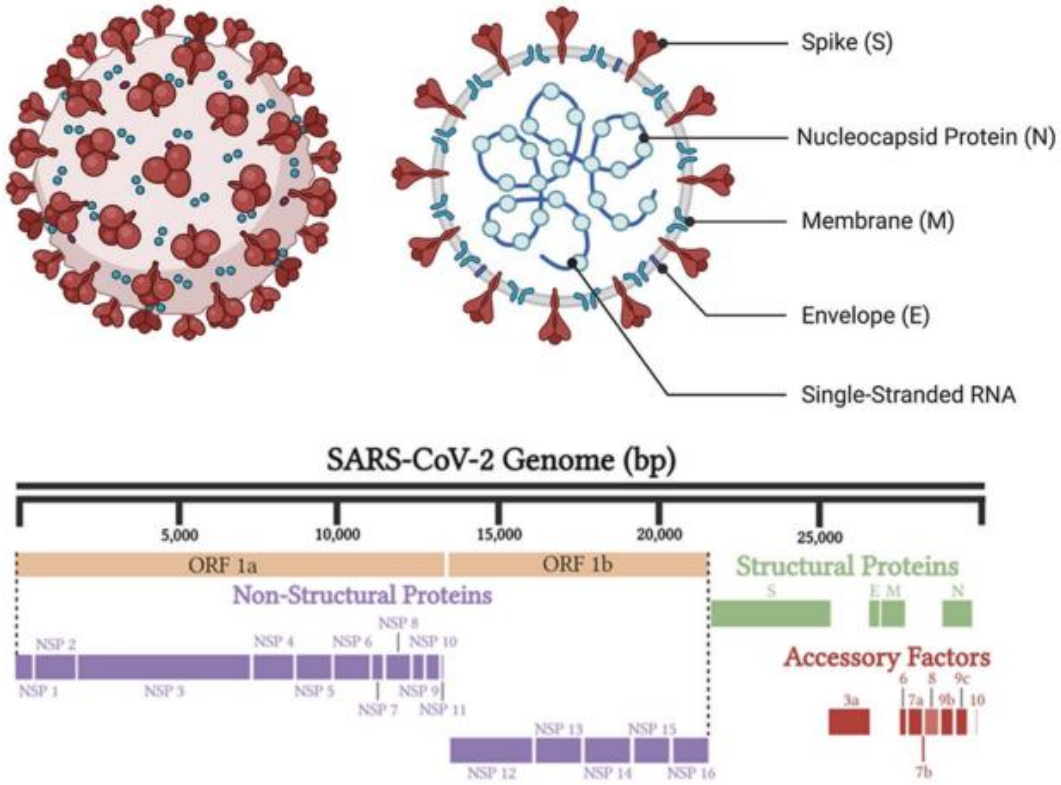


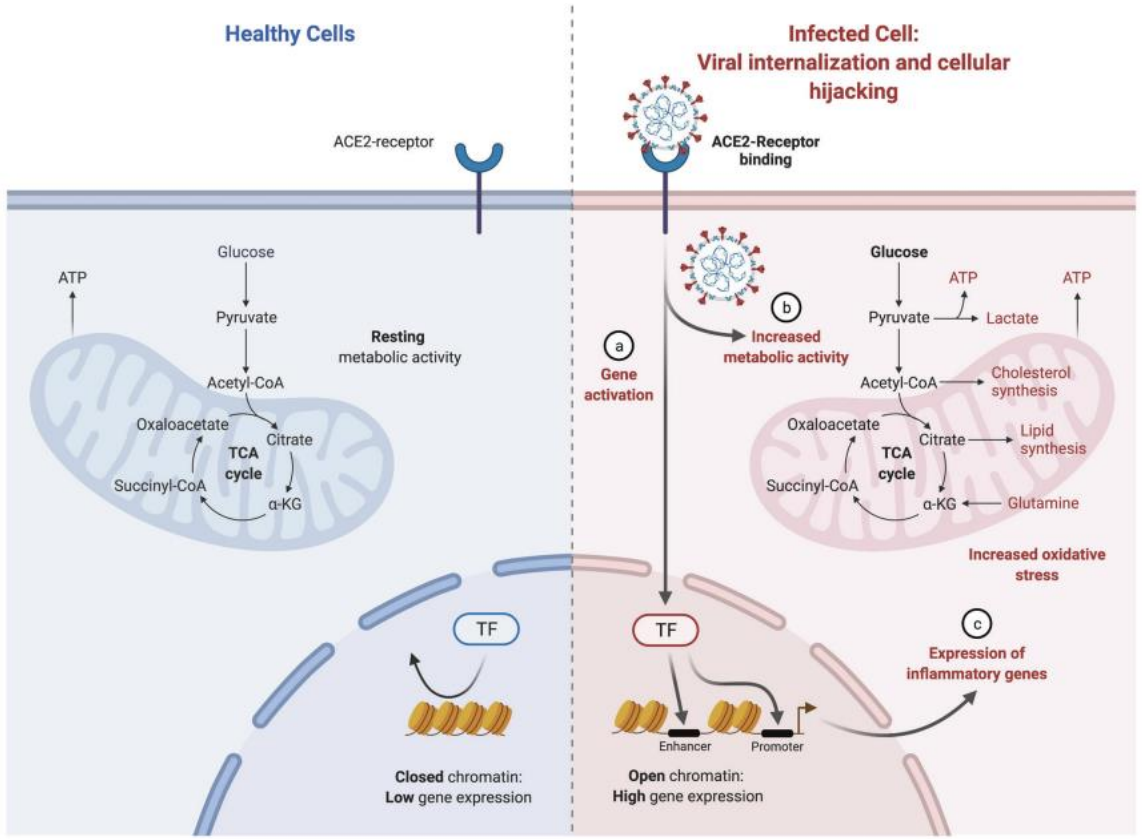
(A) antigenic drift – drives annual influenza epidemics
(B) antigenic shift – novel virus & zoonotic transmission

Review: Uyeki, TM et al., *Lancet* 2022; 400: 693–706

SARS-CoV-2 virus

Betacoronavirus





Jamison Jr, DA et al., *European Journal of Human Genetics* (2022) 30:889–898

Differences between viruses

Rates of co-infection (bacterial, fungal)

Initial SARS-CoV-2 variants more thrombo-inflammation

Risk factors for severe disease

Patterns of circulation

Long-term sequelae

Host-pathogen interaction

Also differences between variants of Influenza and SARS-CoV-2

‘ hyperinflammatory response’

Differences (IL-1 higher in severe influenza compared to COVID-19)

Similarities - elevated levels of IL-6, IL-8, MCP-1, MIG, IP-10, IL-12, and MIP-1β in both

Different from moderate influenza and controls

Reynolds et al., *J Immunol*. 2021; 207(5): 1229–1238


YELLOW
SUN

Regulatory/ research needs

Broad inclusion of acute respiratory illness

- Rapid testing, including for influenza and SARS-CoV-2

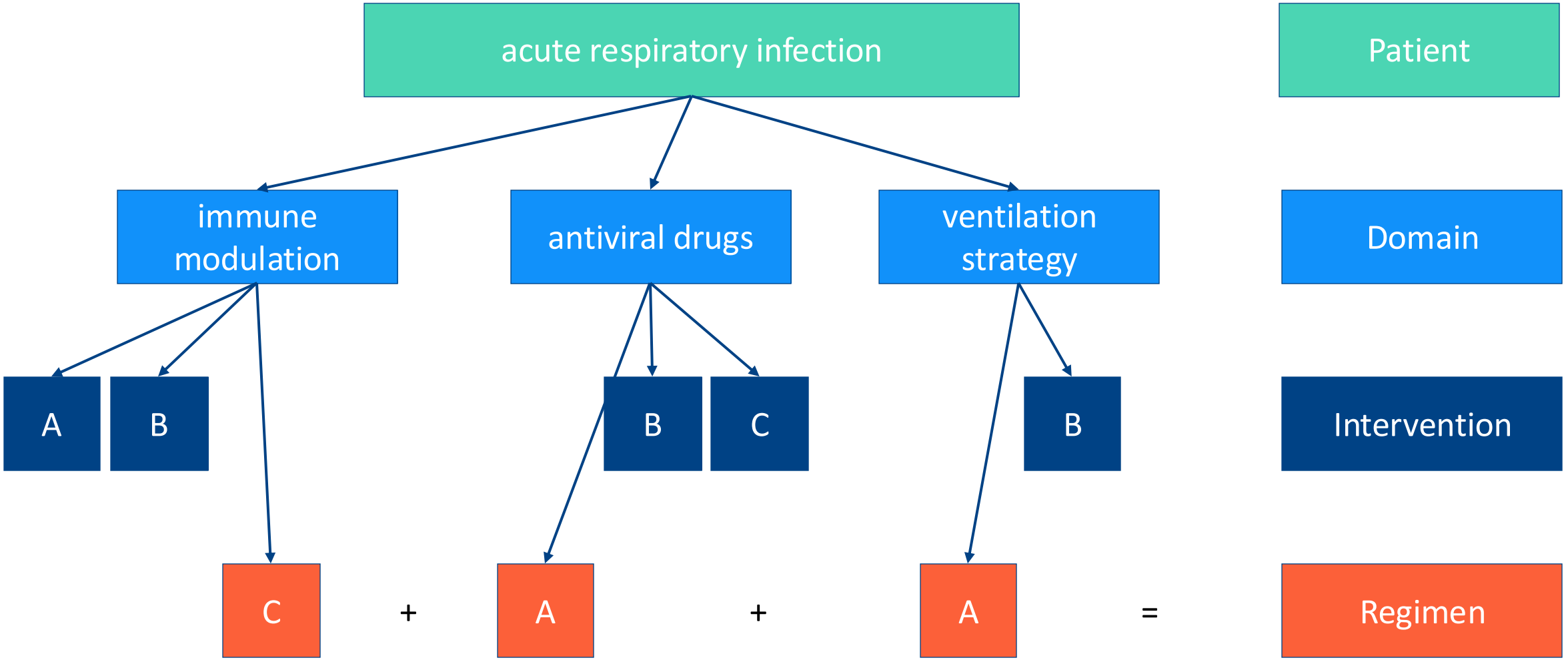
Testing therapies as they become available

- Antiviral, immune modulation, supportive care

Include diverse patient groups

- Including children, pregnant women, immune compromised

Can evolve with changing variants and treatments



Angus, DC et al. *Ann Am Thorac Soc* 2020;17(7):879–891

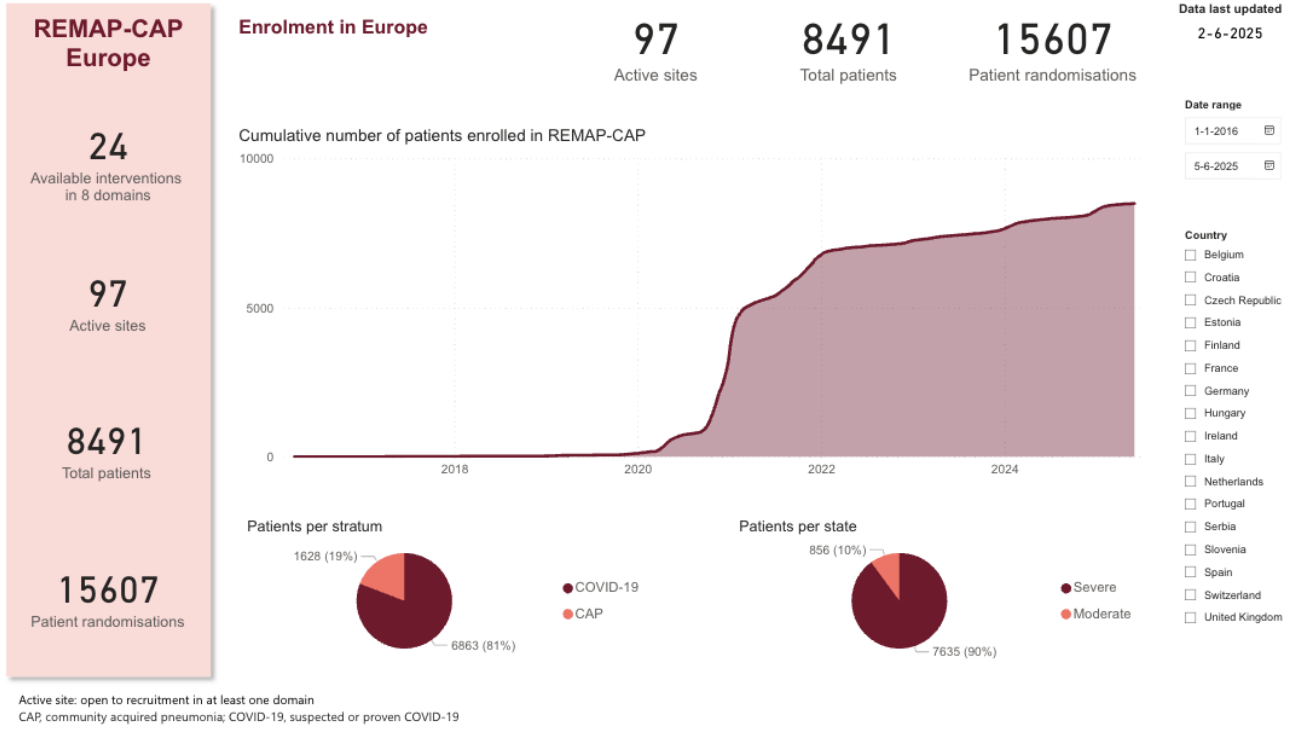
RECOVERY and REMAP-CAP

9
countries in continental Europe

14
active sites

100
patients enrolled

Patient enrolment data



> 49,000 participants in UK, Asia and Africa, 13 current or completed interventions

>25,000 randomizations in 298 sites globally, 66 current or completed interventions

Conclusion

Prevention of spread is key

Vaccination research is important

For those with severe illness:

clinical presentation is undifferentiated acute respiratory illness

trials need to include diverse populations, be multifactorial and flexible

actively recruiting studies are key

Thank you

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