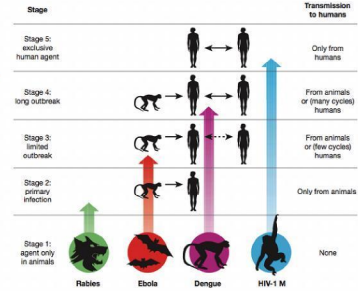




KONINKLIJKE NEDERLANDSE
AKADEMIE VAN WETENSCHAPPEN

*NIEUWE INZICHTEN IN PATHOGENESE,
IMMUUNRESPONS EN TRANSMISSIE*

Wetenschappelijke bijdragen
(10|2e) (10|2e), hoogleraar virologie, Erasmus MC Rotterdam



1. Wat is de oorzaak?
2. Waar komt het vandaan?
3. Hoe ver is het verspreid?
4. Hoe ernstig is de ziekte?
5. Is het besmettelijk?
6. Zijn mensen (deels) beschermd?
7. Hoe is het te stoppen?

Coronavirus: Italy towns in lockdown after COVID-19 deaths

Several Italian towns have taken urgent measures to stop the virus from spreading following the deaths of two people and more than 100 infections. Venice has called off its Carnival celebrations due to the outbreak.

23-2-2020



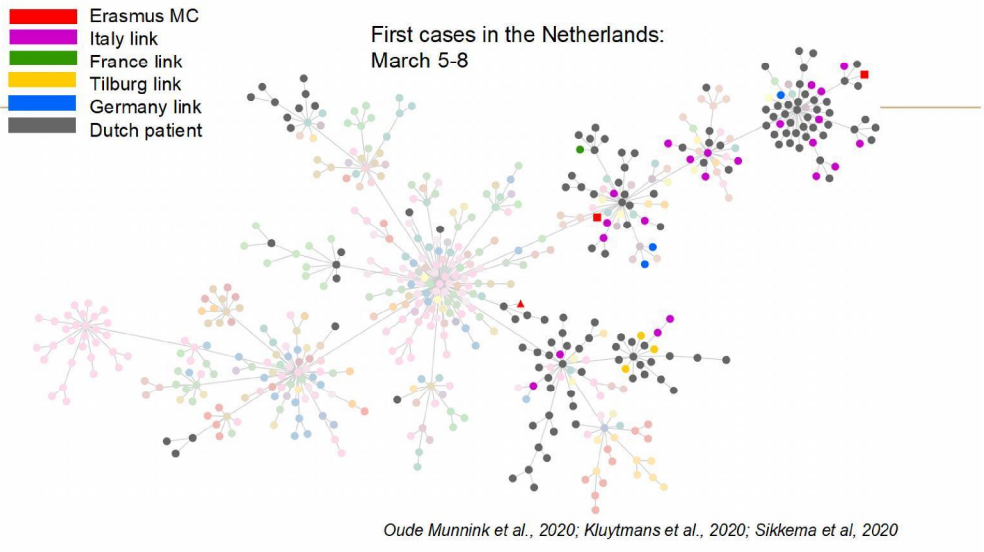


Wintersports Austria, Switzerland, Italy
North of the country: 15 – 22/2
Middle / South of the country: 22/2 – 2/3



Carnaval South of the country
24/2 – 26/2

Saglietto et al., 2020



Infection and pneumonia in rhesus, more in older animals

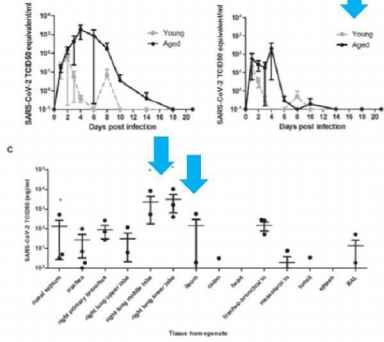
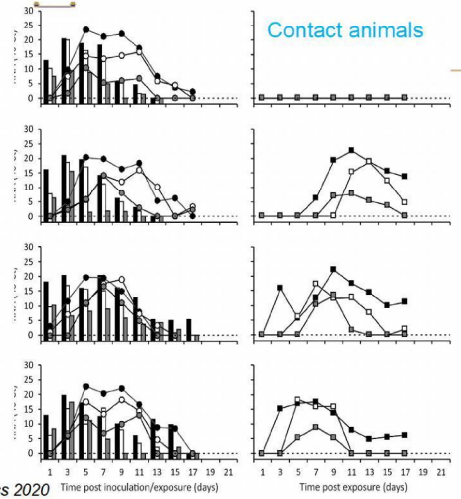


Fig. 1. Virus shedding and virus detection in organs of SARS-CoV-2 inoculated cynomolgus macaques. Viral RNA was detected in nasal (A) and throat (B) swabs and tissues (C) of SARS-CoV-2 infected animals by RT-qPCR. Samples from four animals (days 1-4) or two animals (days >4) per group were tested. The error bars represent the standard error of the mean. Virus was detected in tissues from two young, and two aged animals on day 4 by RT-qPCR. * = infectious virus was isolated.

Rockx et al, Science, 2020; Richard et al, Sci Rep in press 2020

Efficient transmission between ferrets



Outbreaks in dutch healthcare settings

- ▲ Patient
- Healthcare worker
- Other

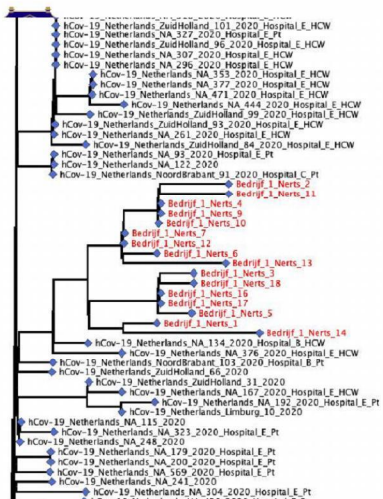
- A
- B
- C
- D
- E
- F
- G

■ Dutch patient

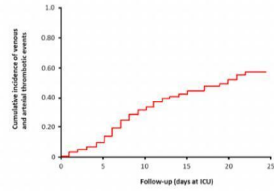
<2 nucleotide
distance invisible

Nieuwenhuijse et al, unpublished



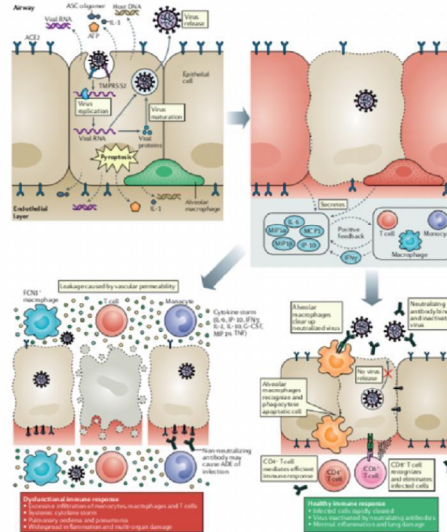


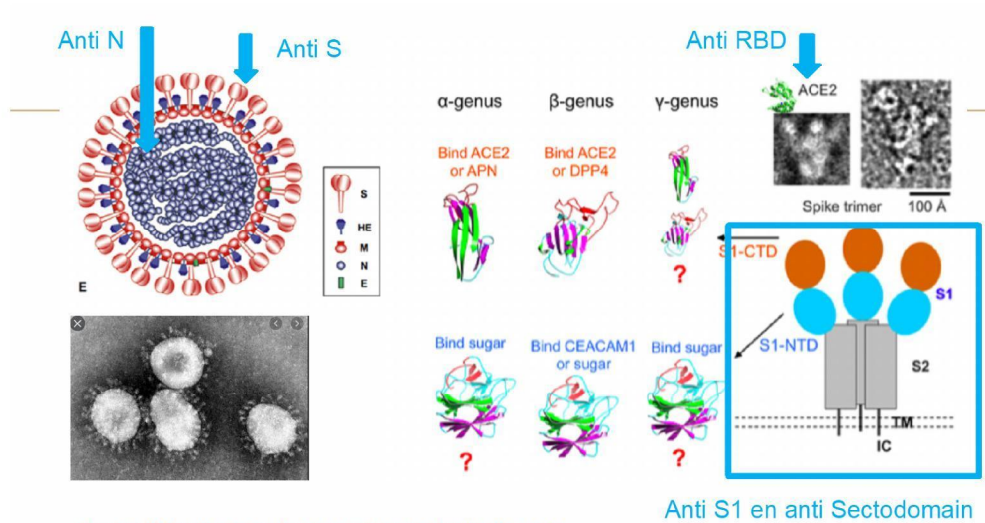
Downregulatie ACE2 > longschade, vaatwand permeabilisatie, trombi?



Ontspoorde immuunresponse > ernstige longschade en multi orgaan falen

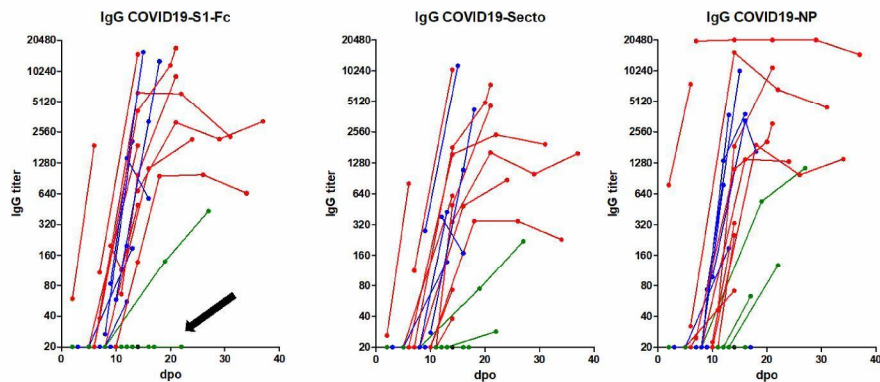
Klok et al., 2020
 Van de Veerdonk et al., *Elife*, 2020
 Matthew Zirui Tay et al,
Nature Immunology 2020



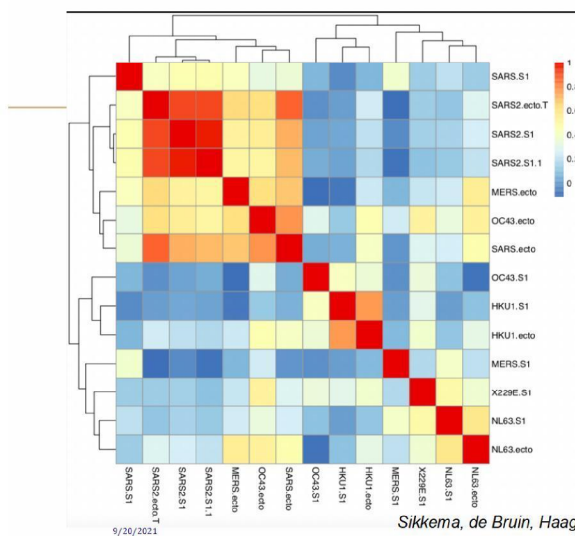


Fang Li, 2015; https://talk.ictvonline.org/ictv-reports/ictv_9th_report

Responses in relation to disease severity



Okba et al., 2020; Sikkema et al., unpublished; Geurts van Kessel et al., 2020



Sikkema, de Bruin, Haagmans, Fraaij, Westerhuis et al.

Patienten hebben een mix van specifieke en kruis reagerende antistoffen

Spelen deze patronen van (kruis)reactiviteit een rol in bescherming?

> Onderzoeken voor leeftijdsgroepen en patiënten met milde, matige en ernstige infectie



CONCLUSIES

- SARS-CoV-2 is gemakkelijk overdraagbaar
- Epidemische verspreiding gebeurt door gemiste milde- en vroegsymptomatische personen
- Uitbraken bij groepsbijeenkomsten met onvoldoende bescherming
- Stollingsstoornissen en / of immuunpathogenese zijn oorzaak van ernstig ziektebeeld
- Inzicht in immuunresponse and kruisreacties essentieel

Acknowledgement



ErasmusMC



SITEMA

KONINKLIJKE NEDERLANDSE
AKADEMIE VAN WETENSCHAPPEN



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