

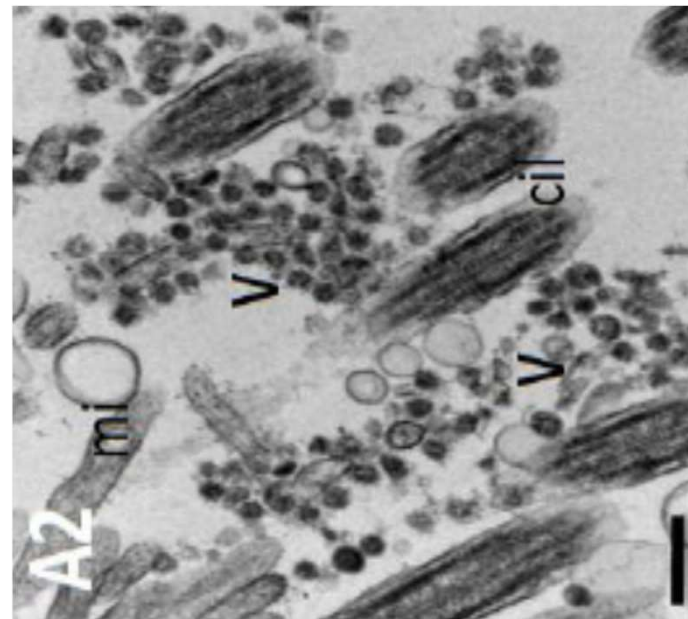
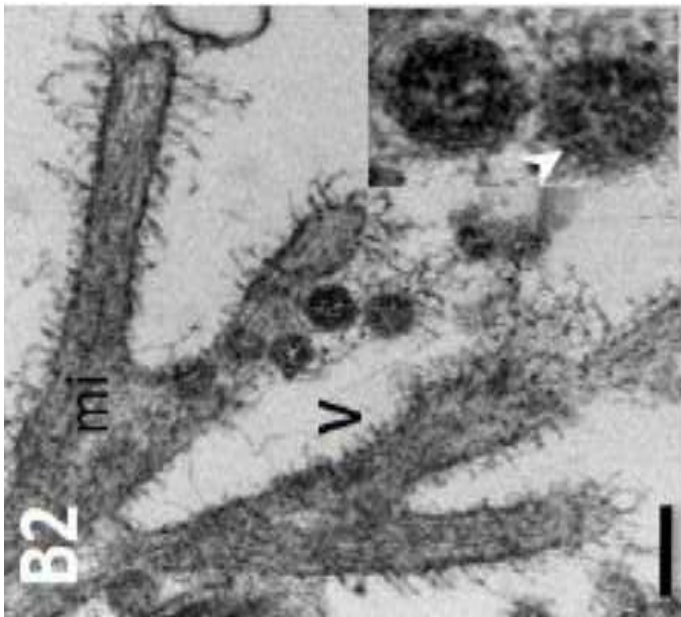


Émergence et diffusion du SARS-CoV-2 en France, bilan de la première vague

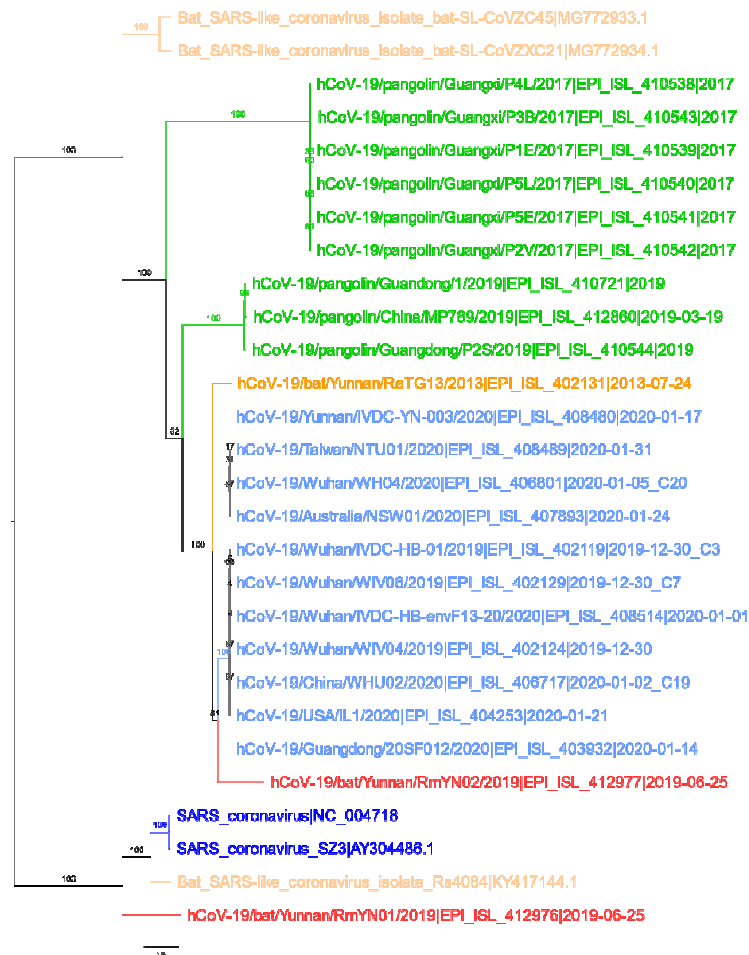
Bruno LINA

CNR des virus respiratoires, HCL,
Virpath, CIRI, U1111, UMR 5308, ENS, UCBL,
Lyon, France

A - Le Virus, le diagnostic et la clinique



Phylogénie genome entier des précurseurs de SARS-CoV-2



- New nearest bat precursor from Yunnan 2019 (high identity in Orf1ab, greatest difference in Spike protein, recombination or mixed viruses in metagenomic sample, not yet peer-reviewed)
- Nearest pangolin precursors from Guangdong (Southern China)
- Previous closest bat precursor also from Yunnan (Southern China) but sample from 2013

Light Orange ... previous bat CoVs

Orange ... previous closest bat precursor (Yunnan 2013)

Red ... new bat CoVs (Yunnan 2019)

Light blue ... hCoV-19 2019-2020

Green ... pangolin CoV (Southern China 2019)

Blue ... SARS CoV

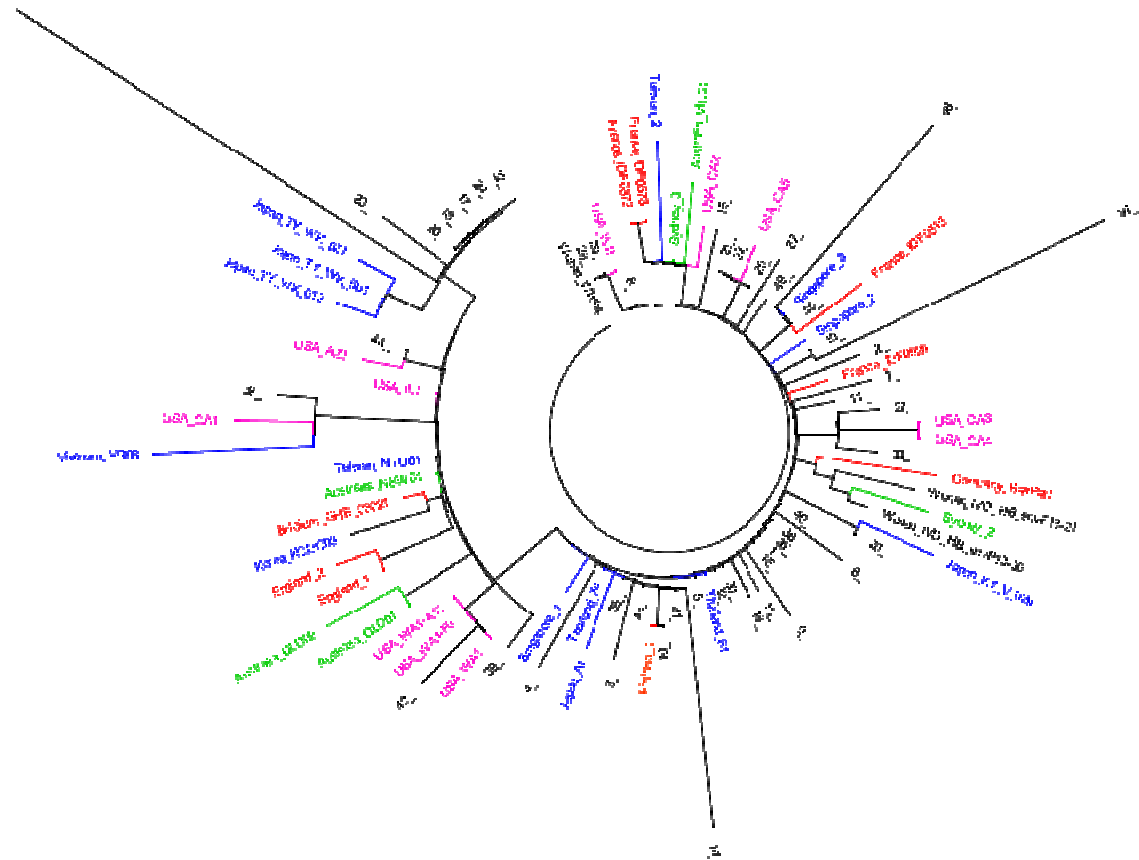
We gratefully acknowledge the Authors from Originating and Submitting laboratories of sequence data on which the analysis is based.



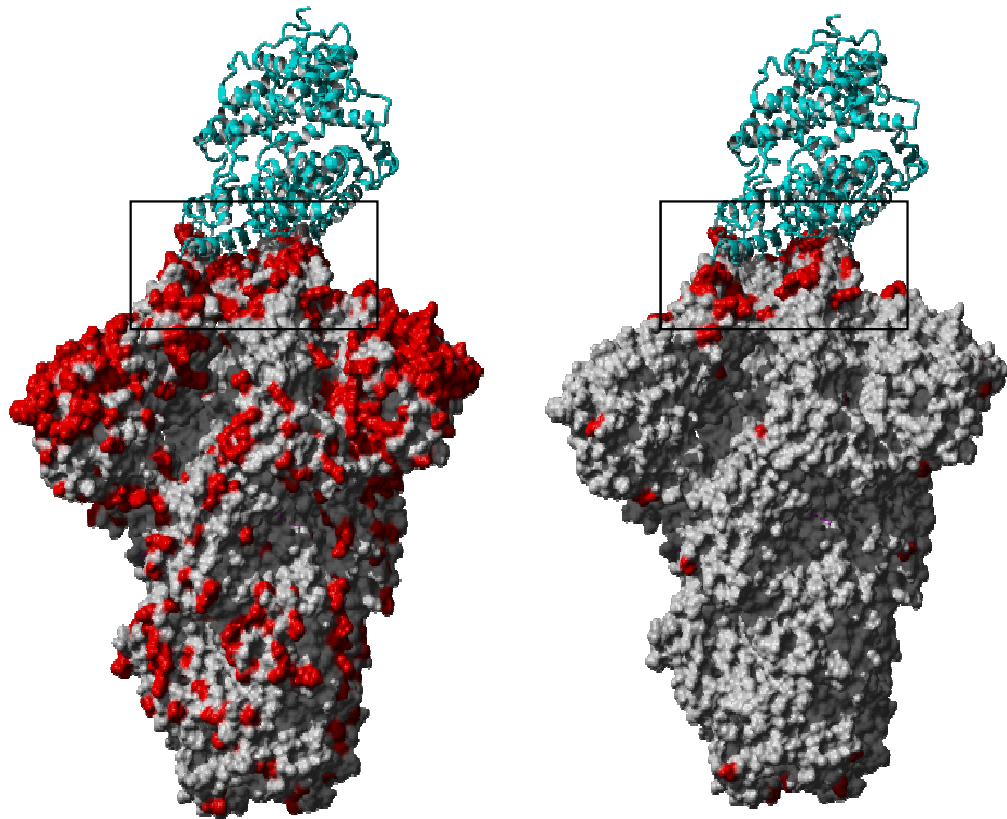
Le virus (émergence)

- 11-2-2020

We gratefully acknowledge the Authors from Originating and Submitting laboratories of sequence data on which the analysis is based.



Site d'attachement au recepteur cellulaire : differences entre le SARS, le precurseur chez la chauve-souris (RaTG13) et le SARS-CoV-2



Cyan ... ACE2 human host receptor

Gray ... CoV spike glycoprotein

Red ... mutations between either SARS (left side) or bat precursor

RaTG13 (right side) vs human outbreak WIV04 CoV

- Surface proteins are 76% and 98% identical, respectively
- Antigenic surface highly divergent compared to SARS
- Bat precursor differences in receptor binding interface indicative of changes that allowed host switch

SARS vs SARS-CoV-2

RaTG13 vs SARS-CoV-2

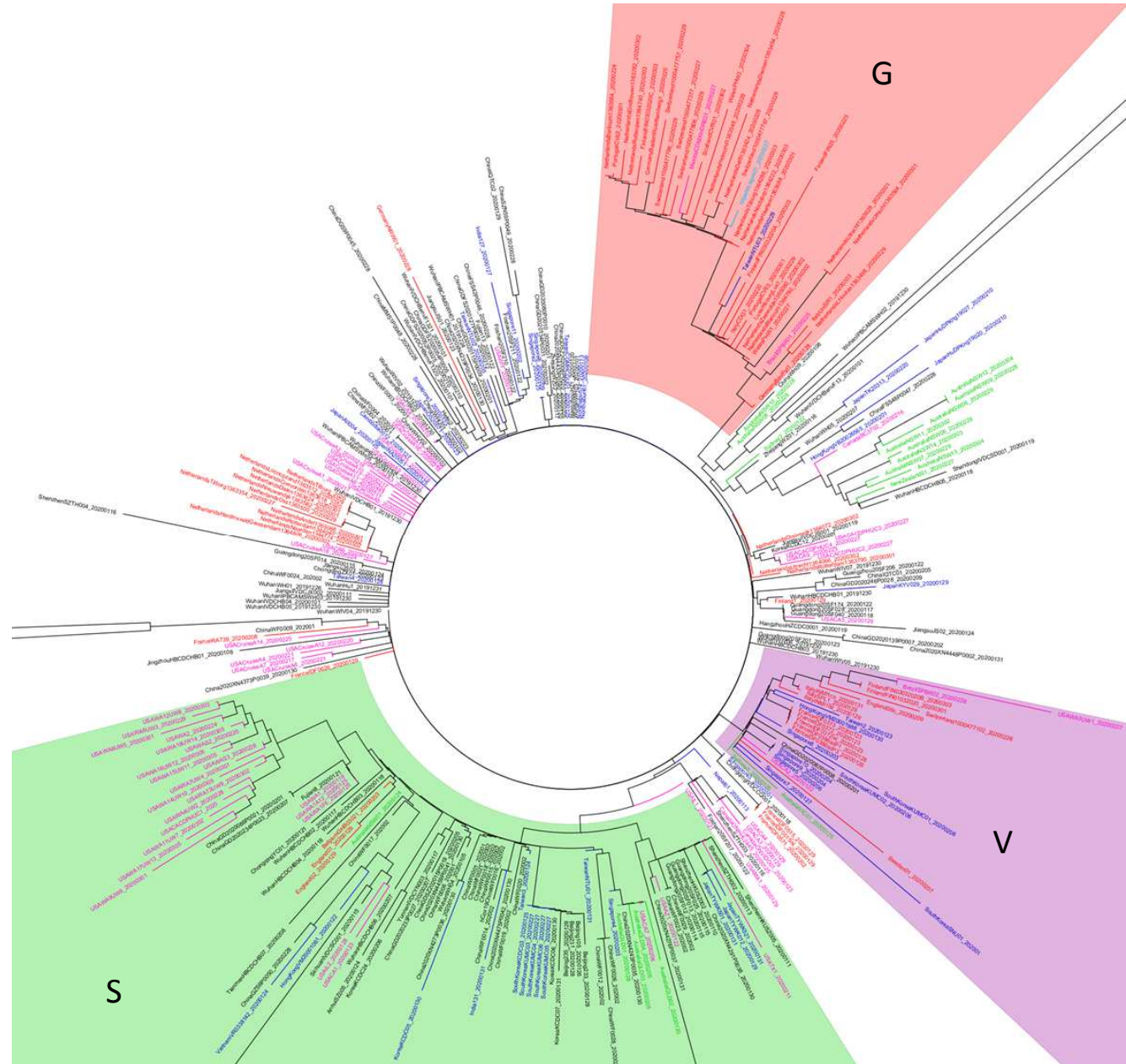
by BII, A*STAR Singapore



Le virus (diffusion)

- 10-3-20

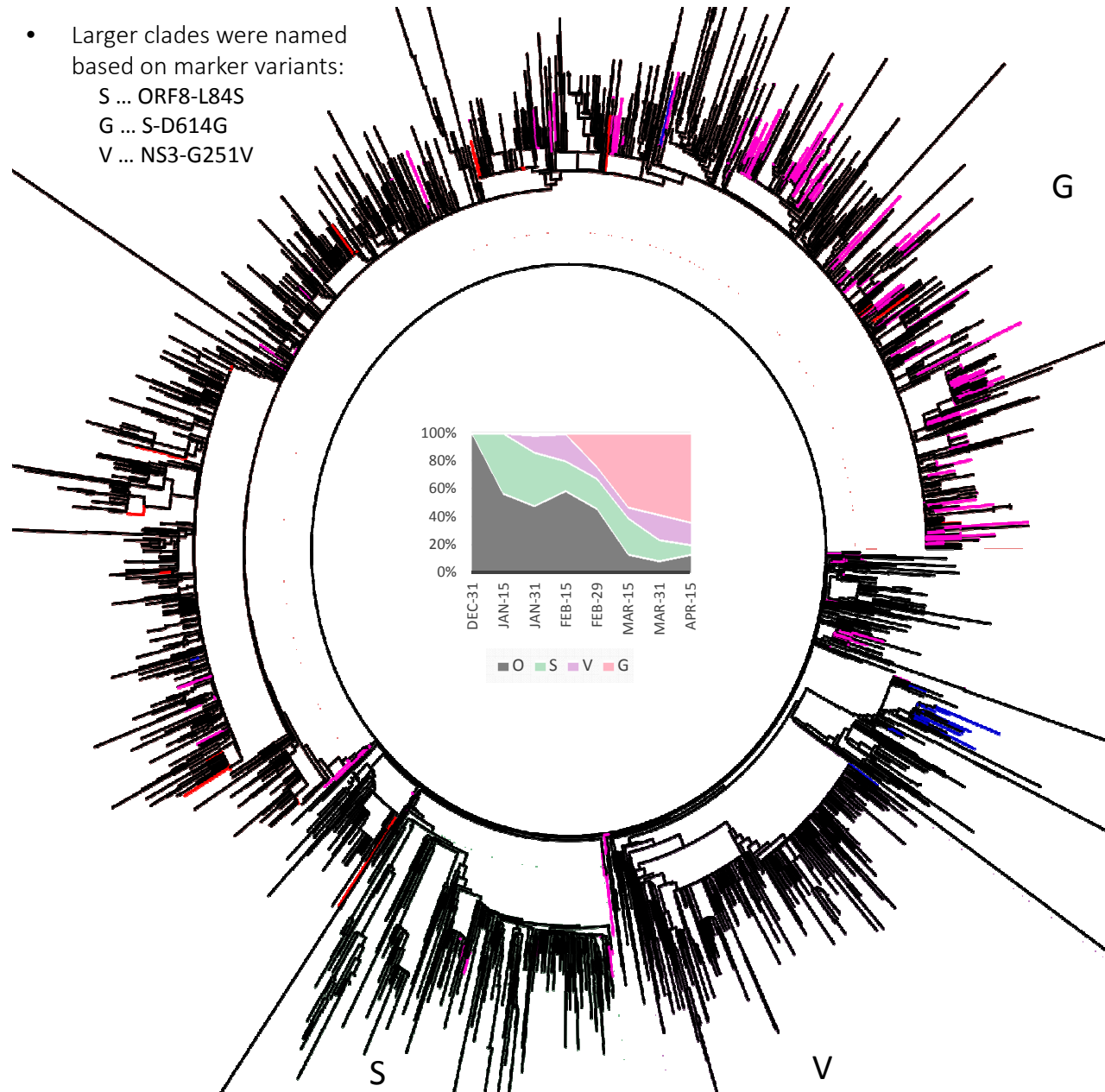
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Originating and Submitting laboratories of
sequence data on which the analysis is based.



Le virus

- 30-4-20

- Larger clades were named based on marker variants:
S ... ORF8-L84S
G ... S-D614G
V ... NS3-G251V



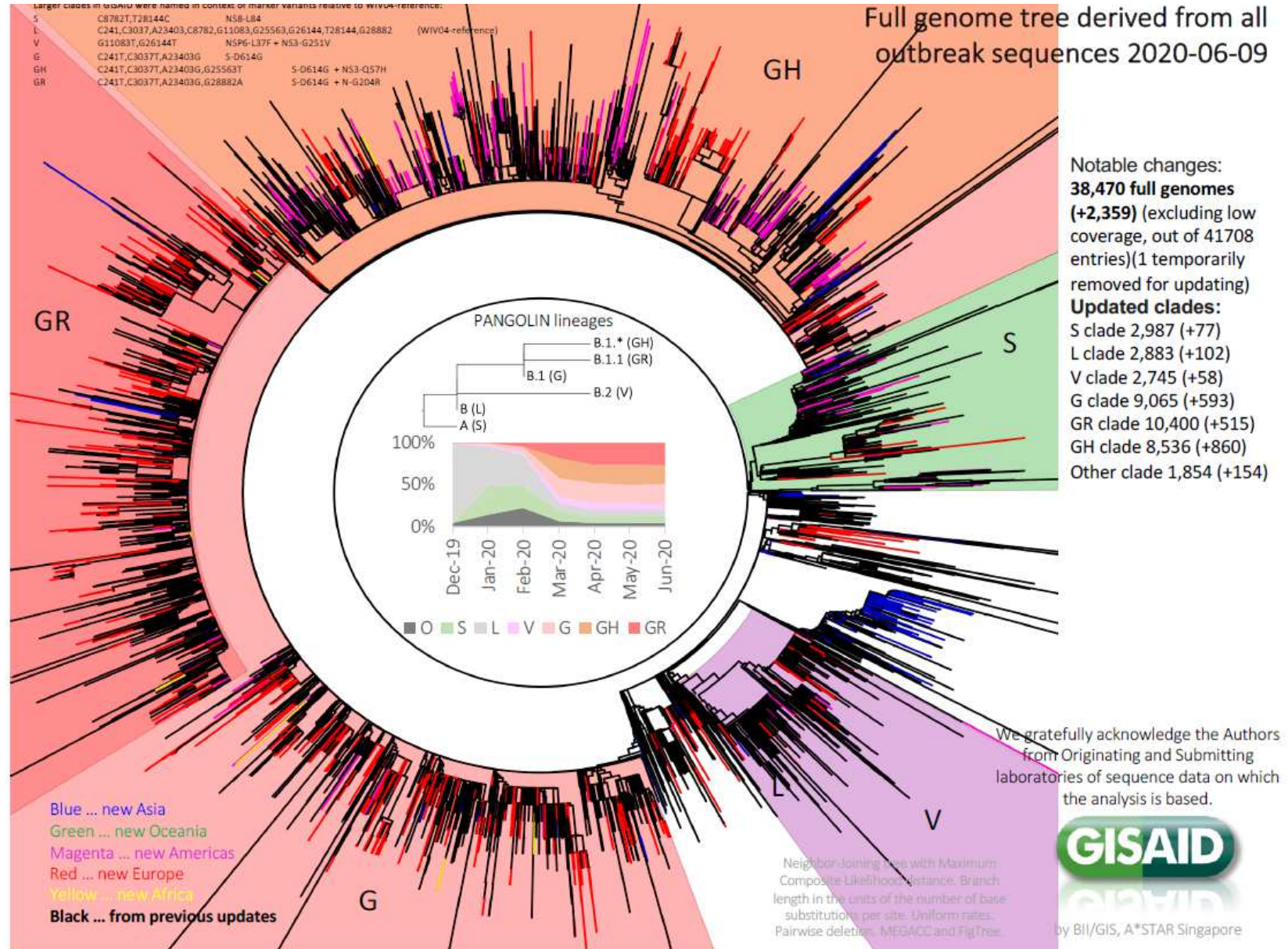
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Le virus

• 9-6-20

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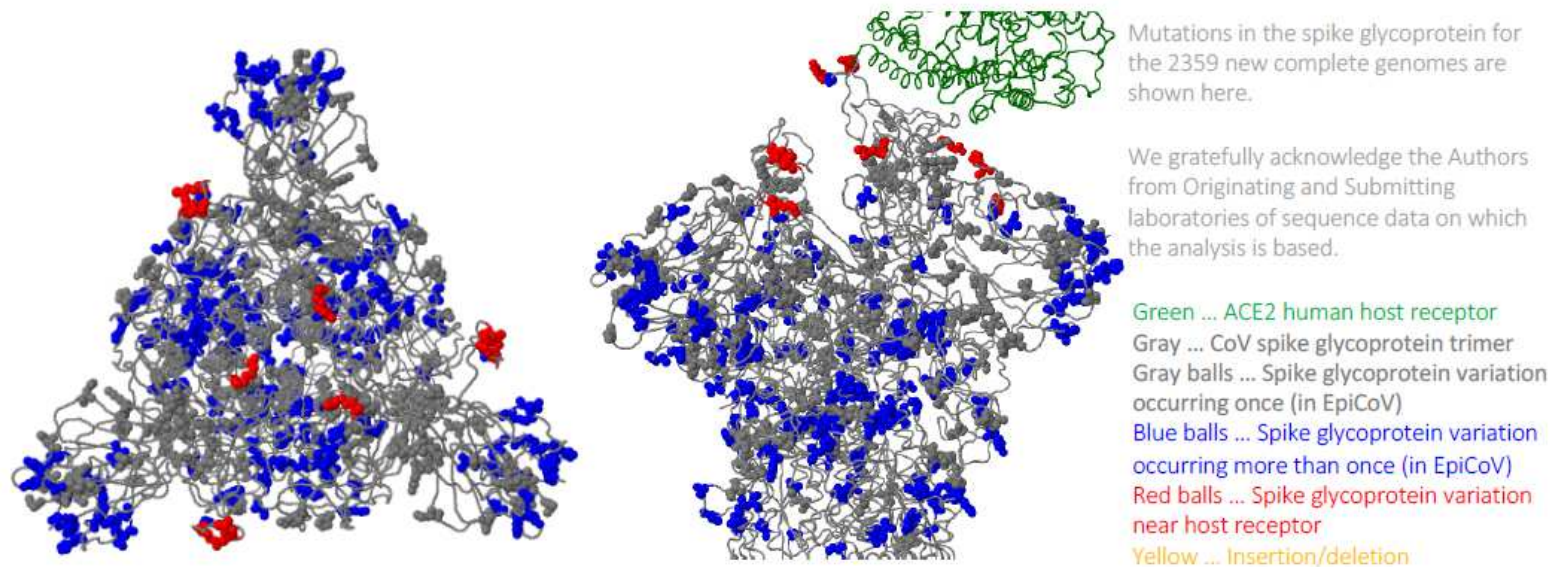


Données sur les évolutions liées au RBS

Receptor binding surveillance for complete genomes 2020-06-09

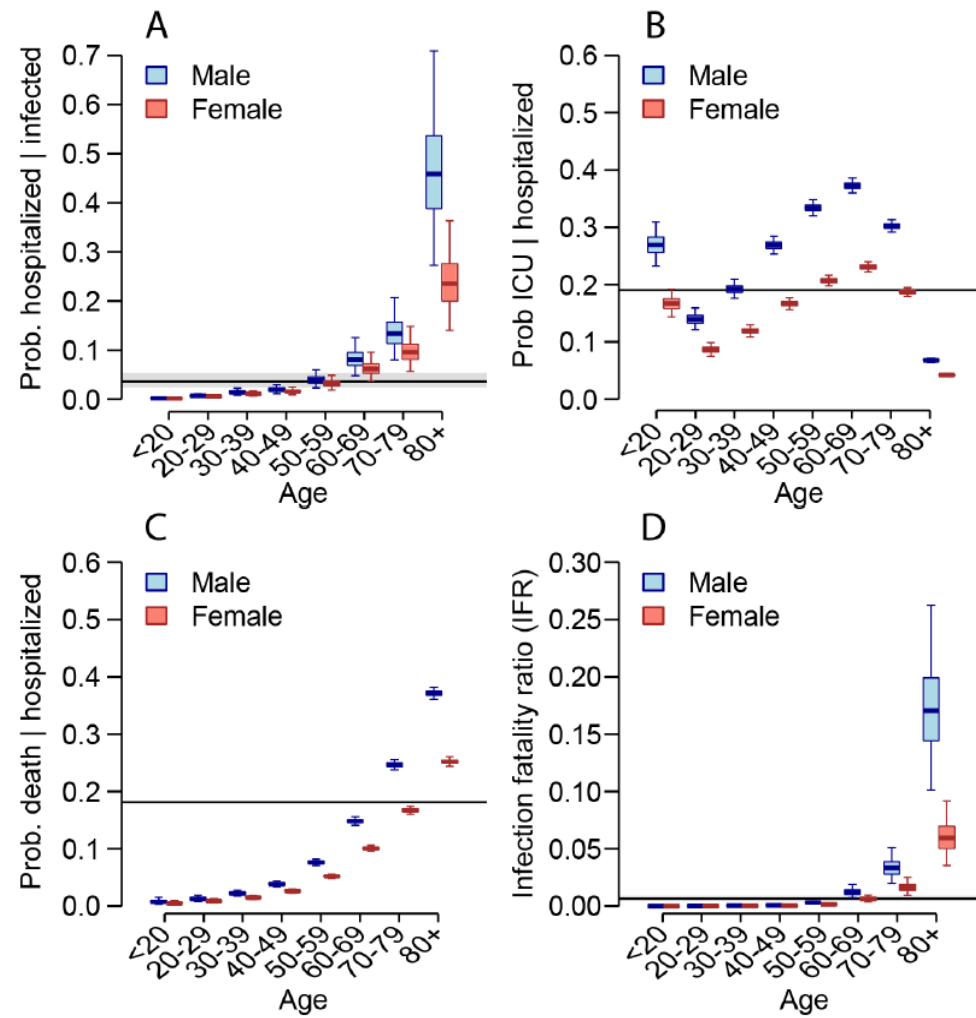
New occurrence of receptor binding mutations 33x N439K in Scotland, T478I in England, V483F in Belgium, E484K in England.

Total: 26 different rare variants near the binding interface not known to be linked to severity. 246x N439K (244 Scotland, England, Romania), 66x T478I in England, 30x V483A (26 USA/WA, 2 USA/UN, USA/CT, England), 10x G476S (8 USA/WA, USA/OR, Belgium), 7x S494P (3 USA/MI, England, Spain, India, Sweden), 6x V483F (4x Spain, England, Belgium), 4x A475V (2 USA/AZ, USA/NY, Australia/NSW), 3x G446V (2 Australia/Vic, England), 3x F490S in England, 2x V483I in England, 2x F490L (Australia/Vic, USA/LA), 2x Q493L in USA/WI, , 2x G446S in England, F456L in USA/TX, V445I in England, V503F in USA/NY, Y495N in Luxembourg, L455F in England, K444R in Spain, E484A in Spain, G476A in England, E484Q in India, E484D in Thailand, R403K in Australia/Vic, N501Y in USA/NY, E484K in England.



Impact Clinique

Impact de l'âge et du sexe



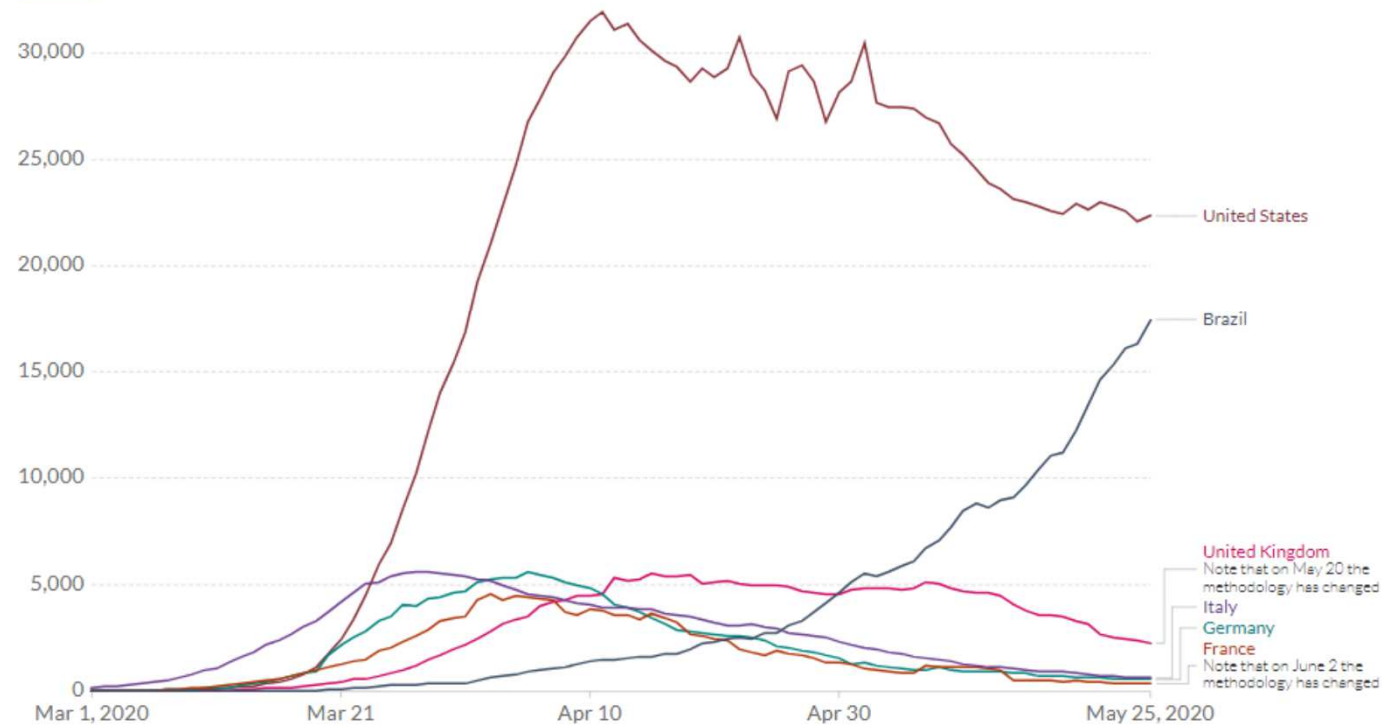
B – Situation Epidémiologique (nb de cas)

Daily new confirmed COVID-19 cases

Shown is the rolling 7-day average. The number of confirmed cases is lower than the number of actual cases; the main reason for that is limited testing.

Our World
in Data

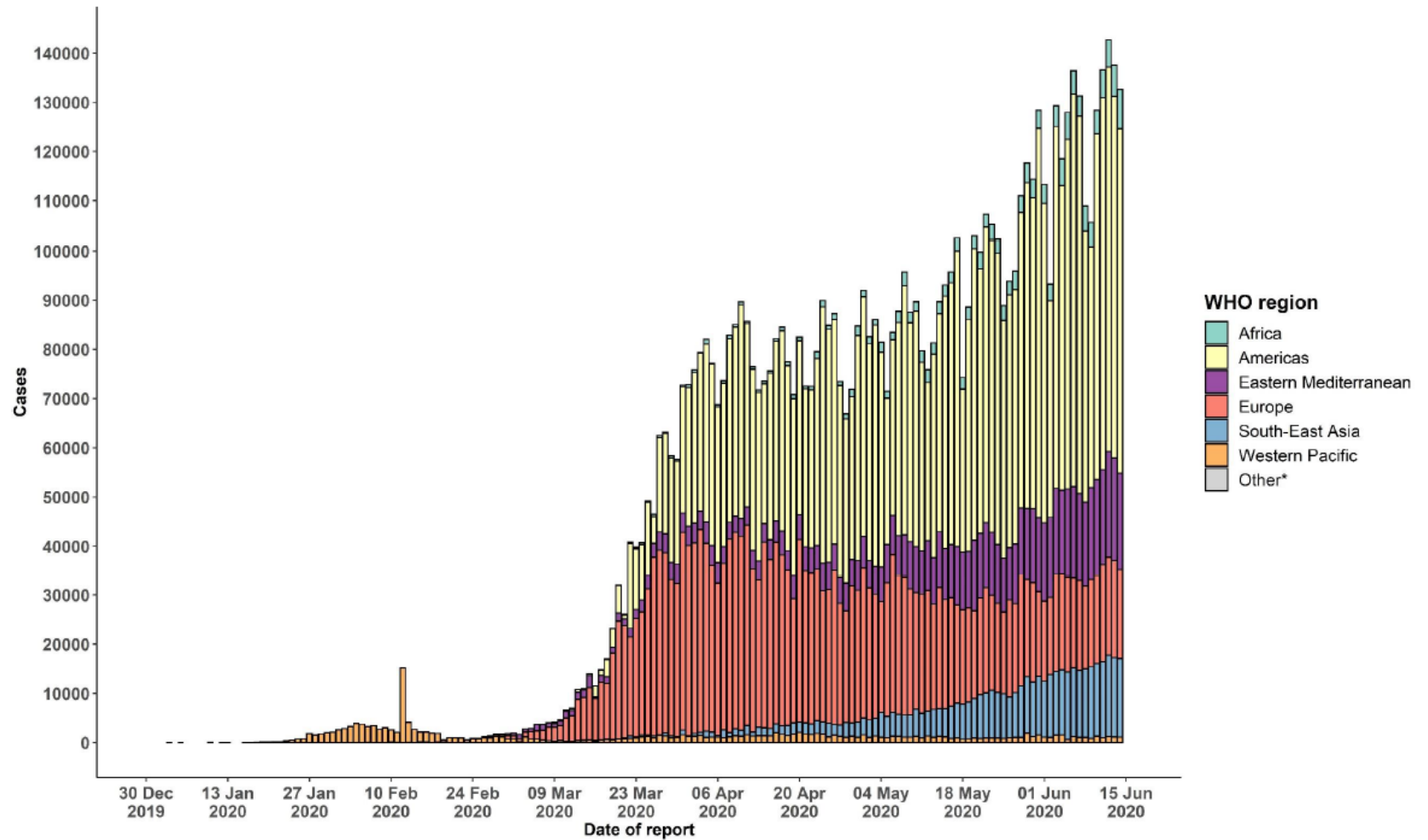
LINEAR LOG



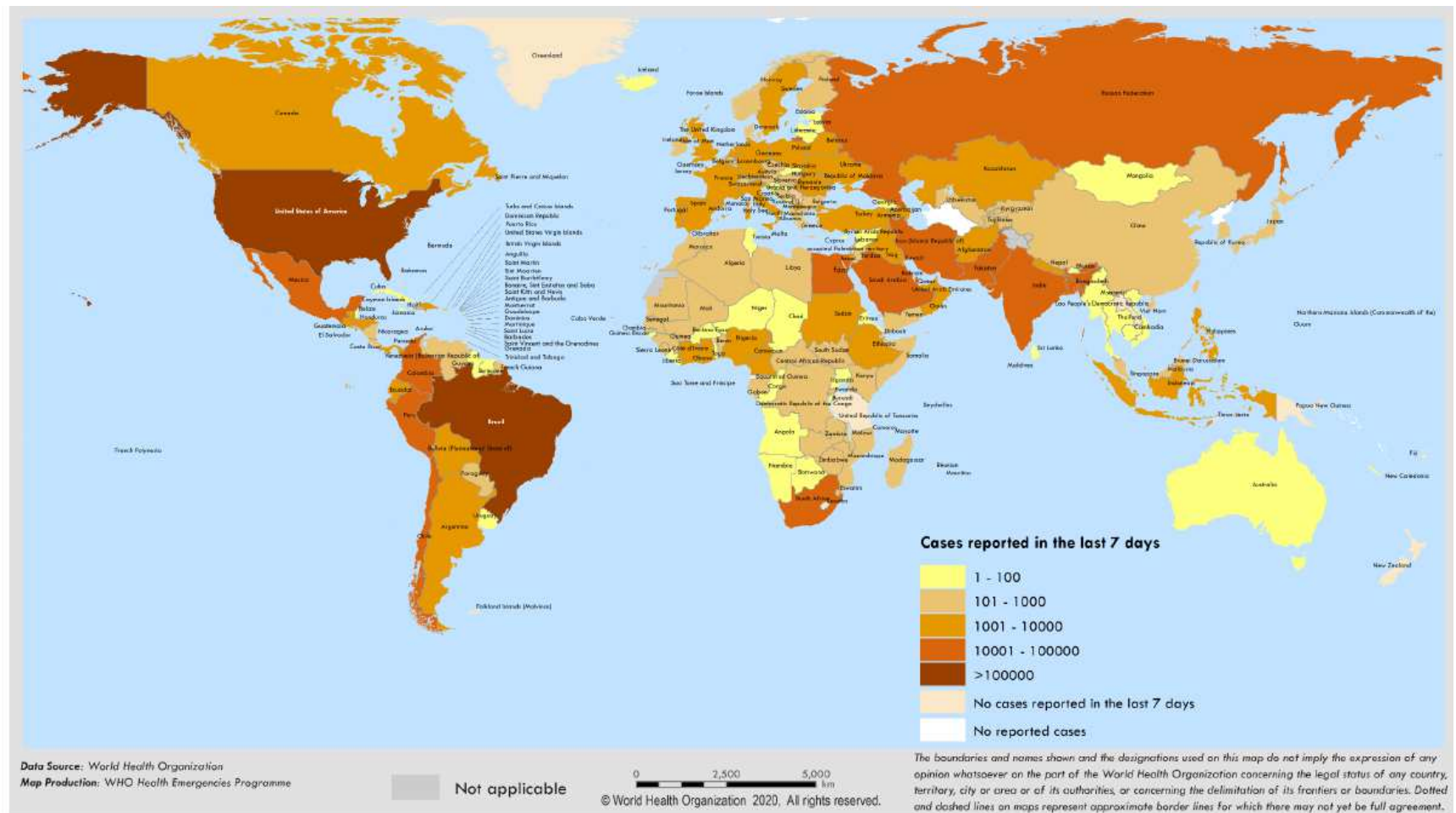
Source: European CDC – Situation Update Worldwide - Data last updated 15th Jun, 12:19 (GMT+02:00)

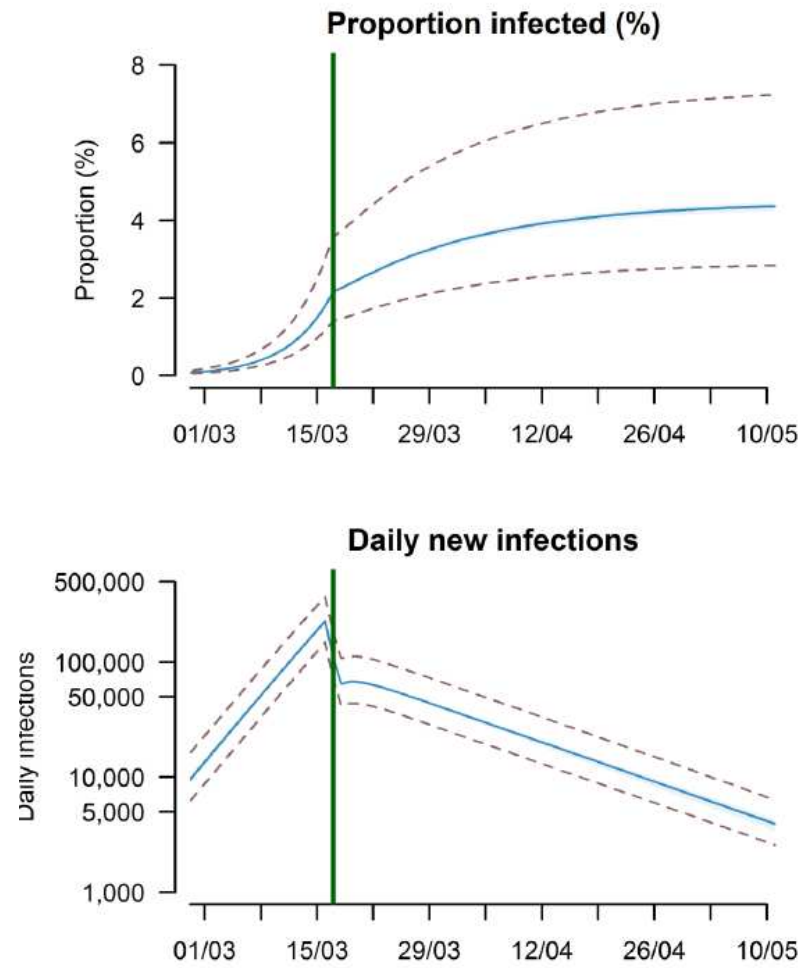
CC BY

Nombre de cas sur 7 jours glissés (Données OMS)

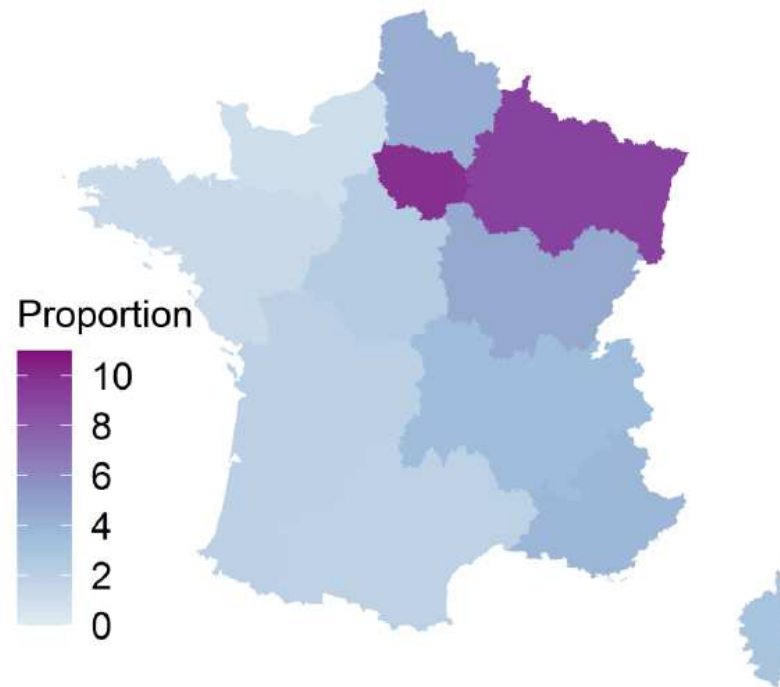


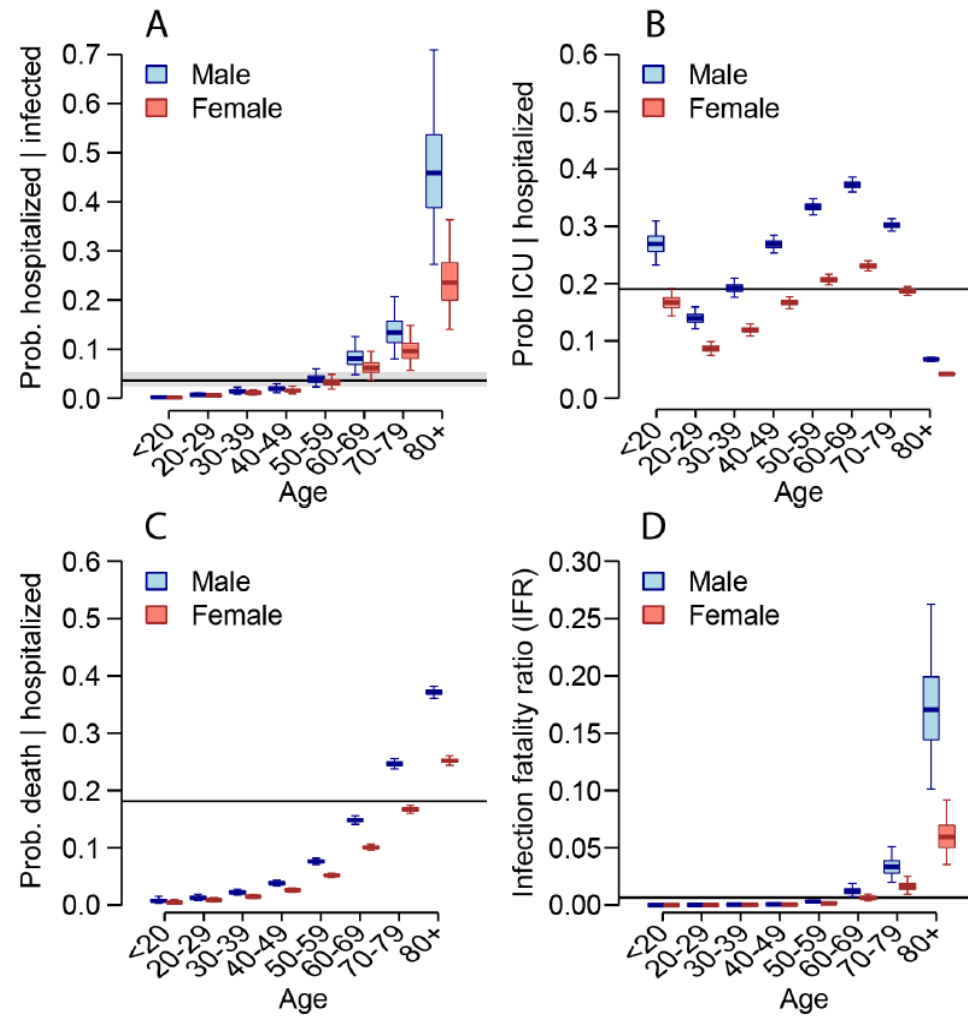
Nombre de cas sur 7 jours glissés (données OMS)



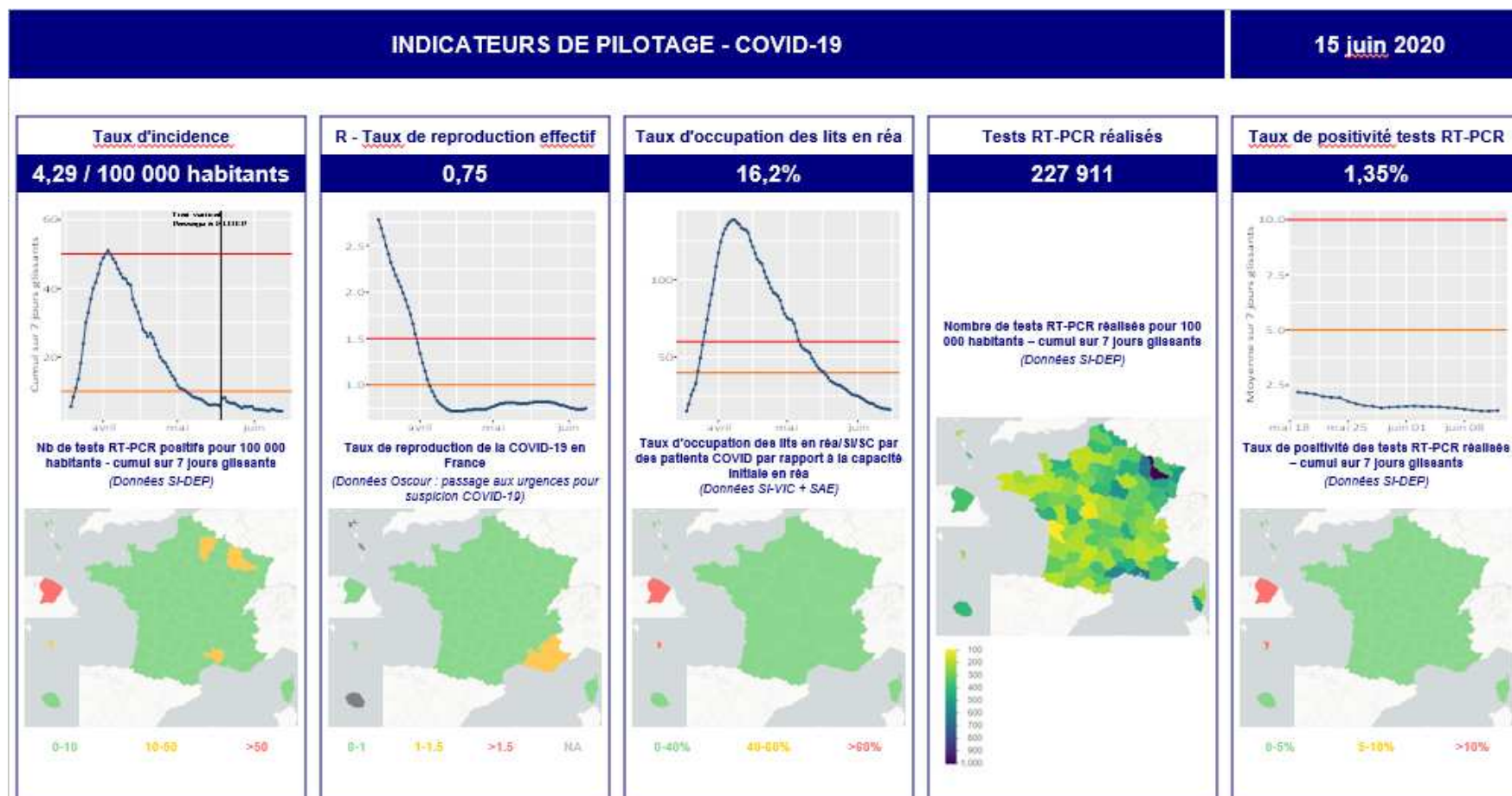


Proportion infected - May 11th (%)

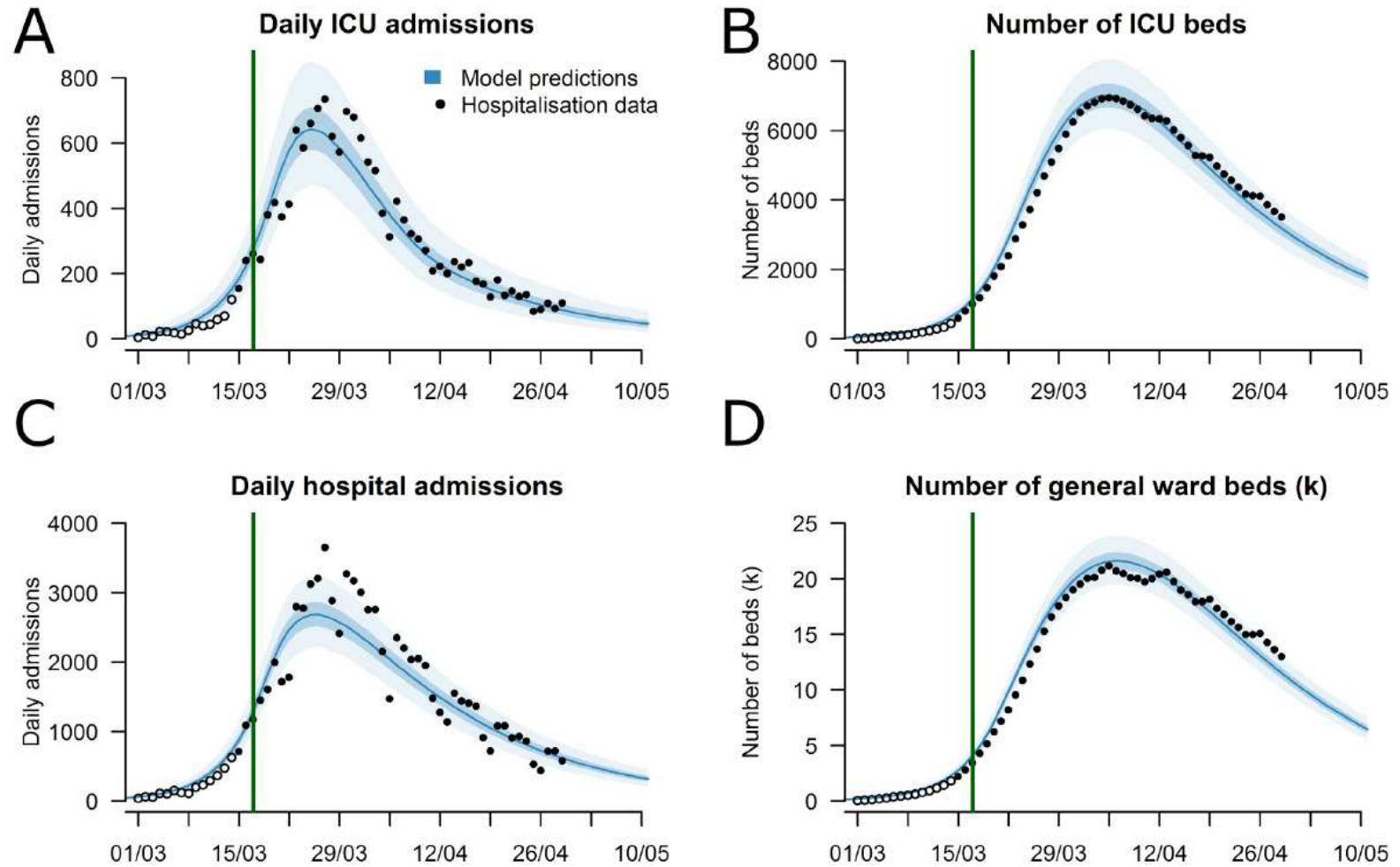




Evolution de la situation

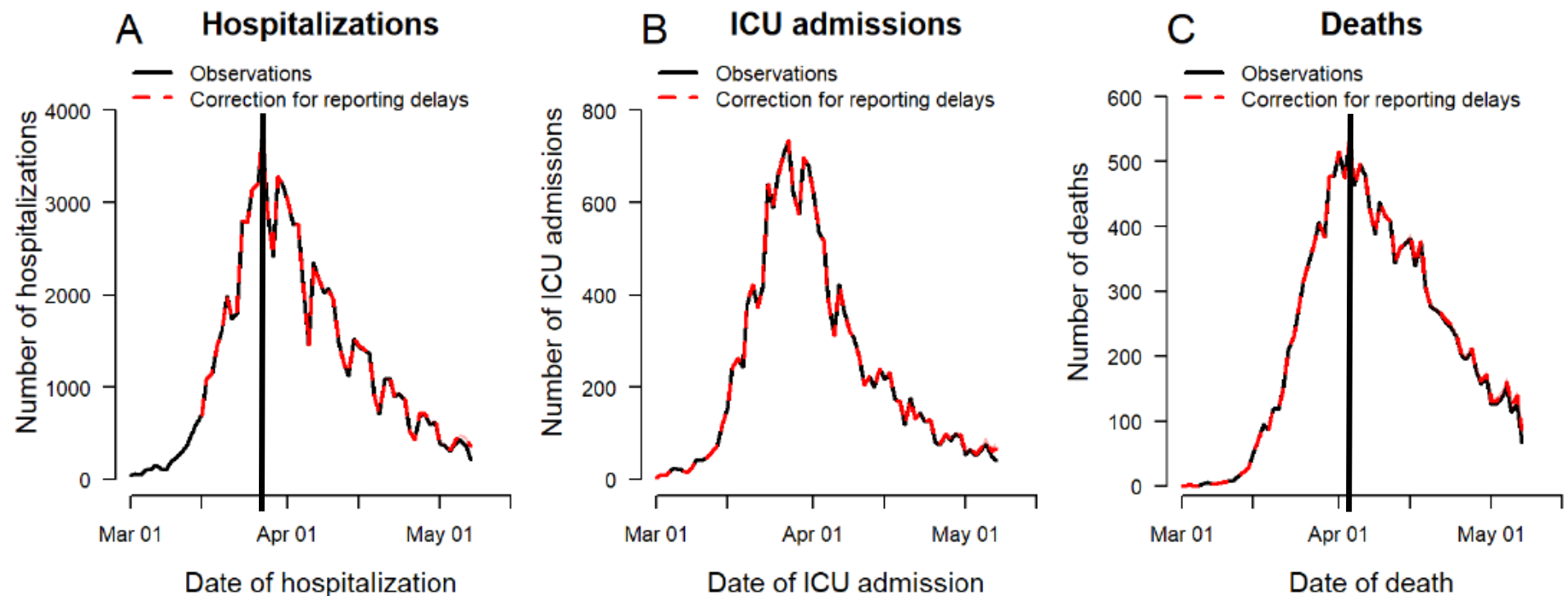


situation COVID-19 au 5 mai 2020

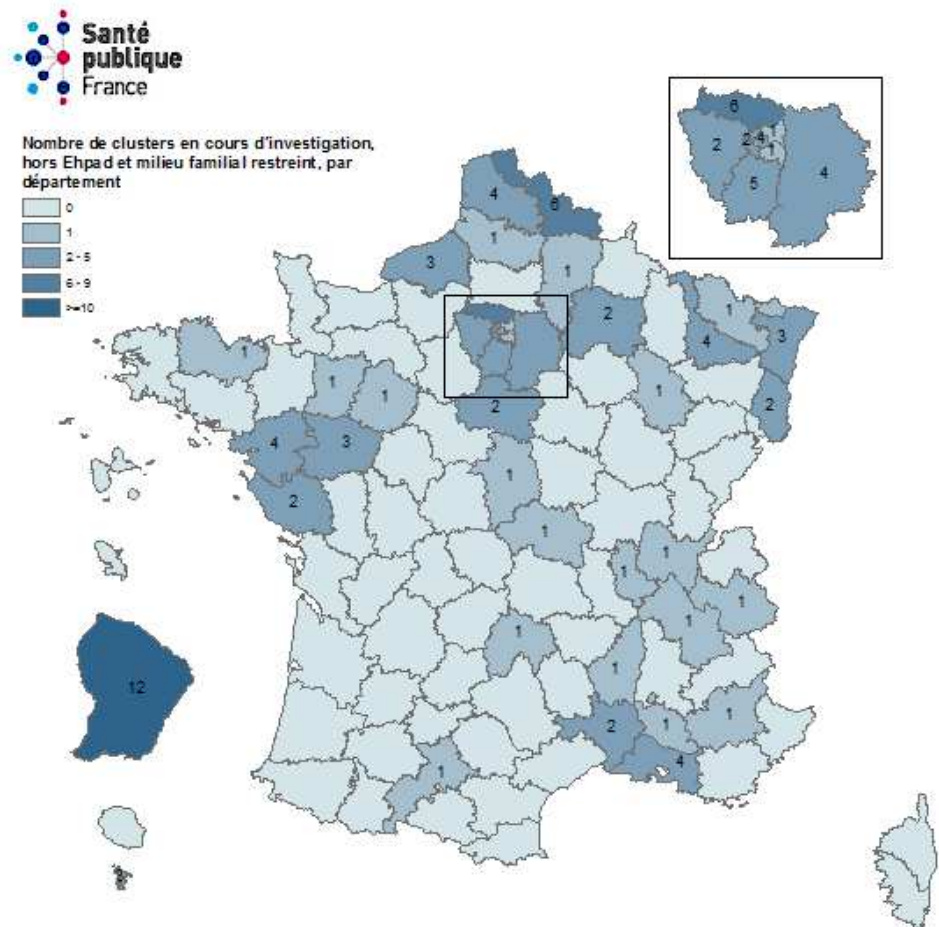
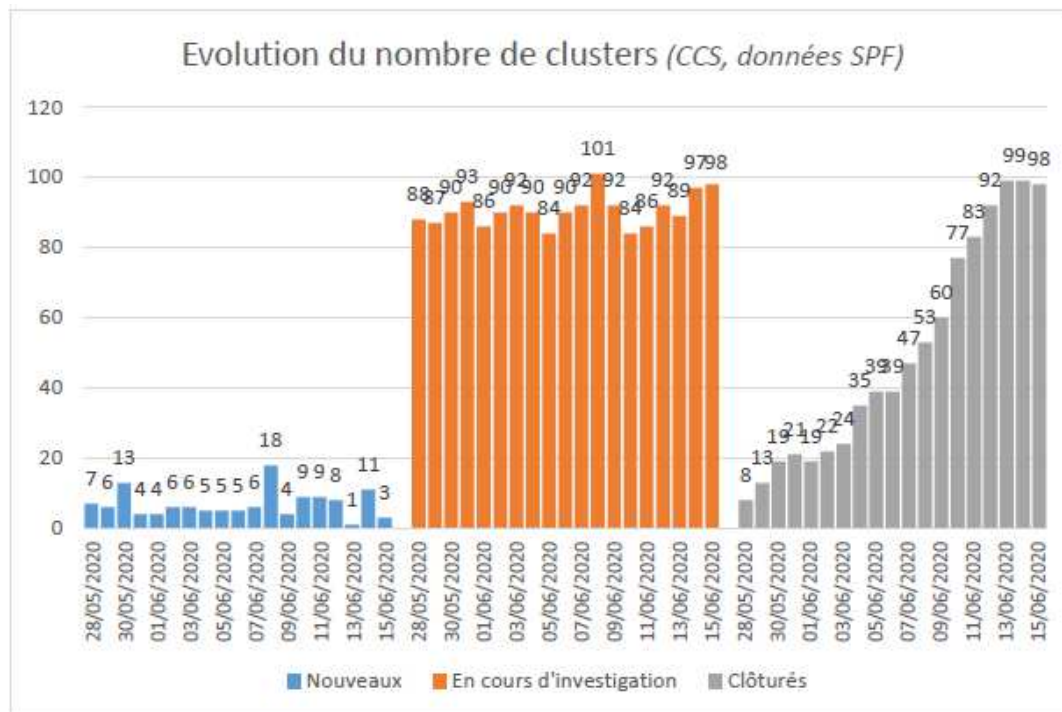


situation COVID-19 au 05 mai 2020

Figure S15 : Time-series of hospitalizations, ICU admissions and deaths corrected for reporting delays



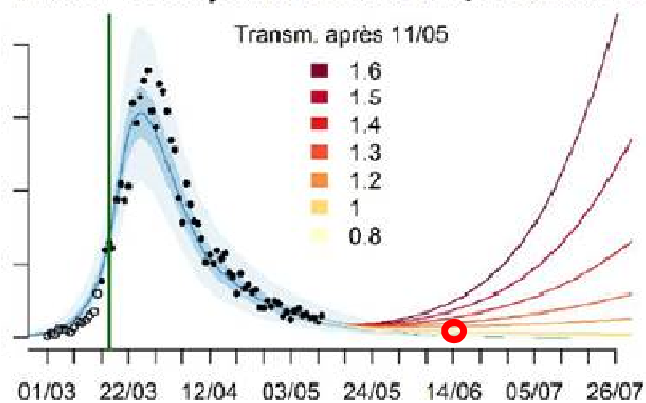
situation COVID-19 au 15 juin 2020



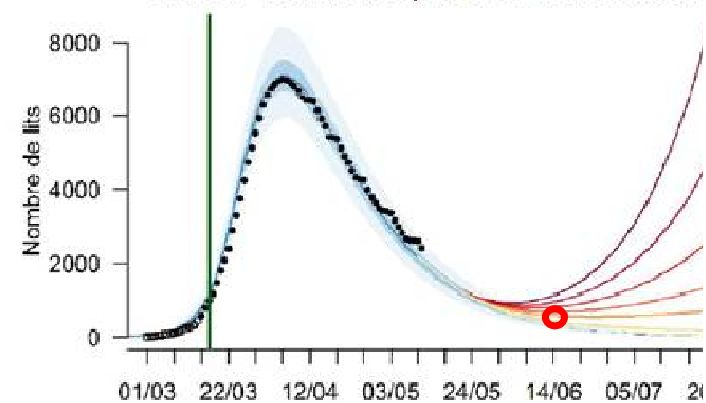
Source : Santé publique France

Hypothèses d'évolution épidémique

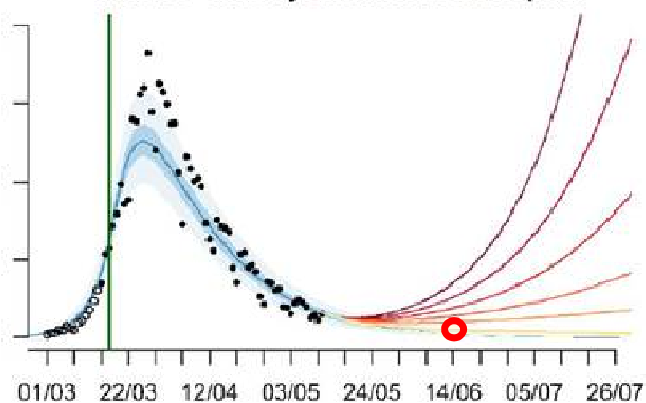
France - Adm. journalières en hosp. réanimatoire



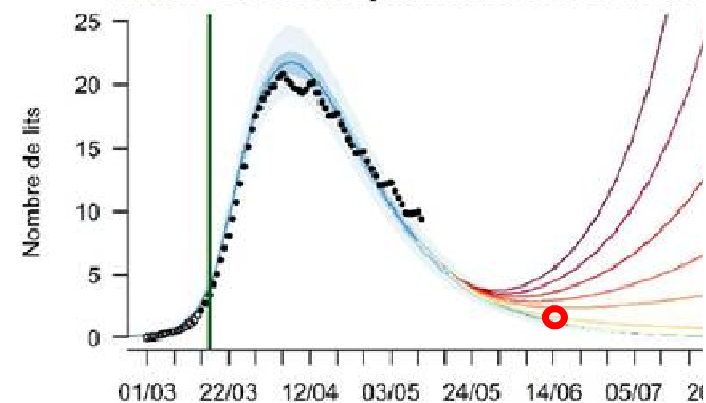
France - Lits en hospitalisation réanimatoire



France - Adm. journalières à l'hôpital



France - Lits en hospitalisation conventionnelle



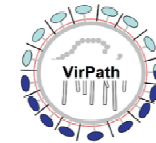
Questions ?

- Anticorps facilitateurs
 - Reponse anticorps autres coronavirus
- Durée immunité
 - Plus de 2 ans?
- Différents serotypes
 - Genogroupes S, V et G
- Autres...

L'avenir ???

- Cet été
- Cet automne
- Cet hiver
- Les autres virus

En fait, il faut bien comprendre que tout dépend de nous, rien que de nous



Remerciements

- CNR et labo IAI
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