



UNIVERSITÉ  
DE GENÈVE

FACULTÉ DE MÉDECINE  
Institut de santé globale



ETH zürich EPFL

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MÉDECINE TROPICALE ET HUMANITAIRE

FÉVR.  
18

Jeudi d'Unisanté - Point situation COVID-19 :  
vaccination et autres enjeux

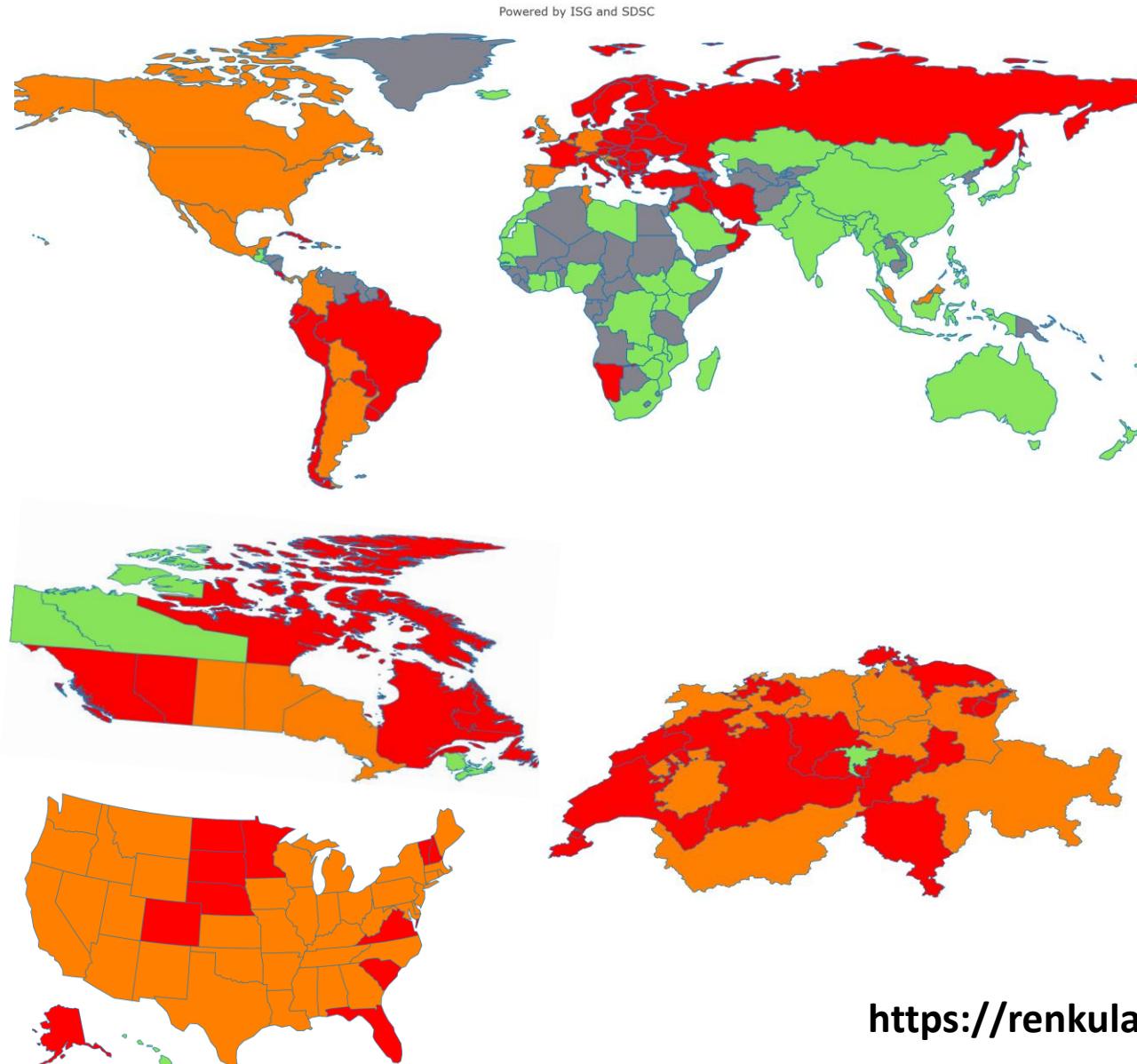
# COVID-19

*Que nous réserve le printemps ?*

Antoine Flahault

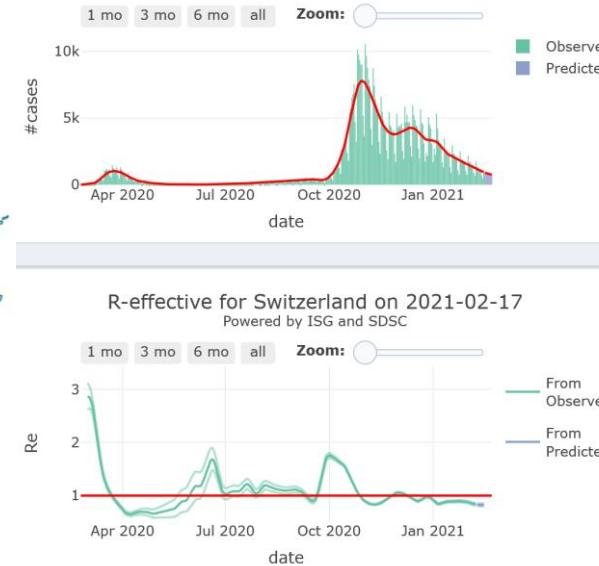


# COVID-19 prévisions quotidiennes



## Suisse

Daily cases for Switzerland on 2021-02-17  
Powered by ISG and SDSC



R-effective for Switzerland on 2021-02-17  
Powered by ISG and SDSC

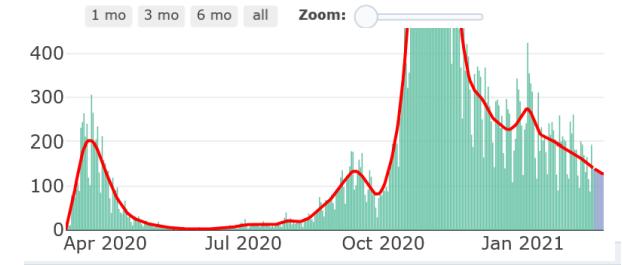


Daily deaths for Switzerland on 2021-02-17  
Powered by ISG and SDSC

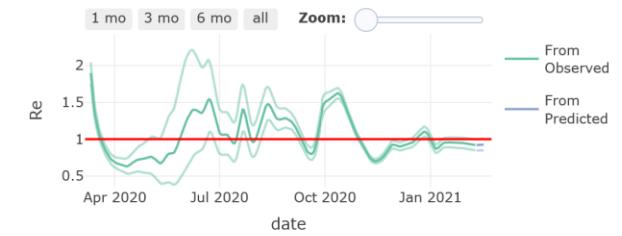


## Vaud

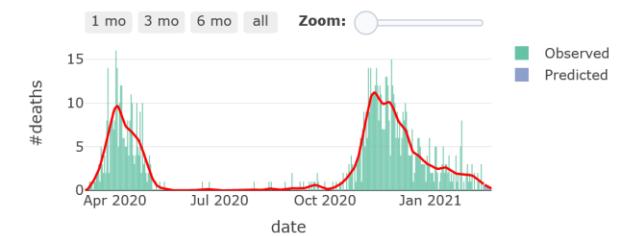
Daily cases for Vaud on 2021-02-17  
Powered by ISG and SDSC



R-effective for Vaud on 2021-02-17  
Powered by ISG and SDSC



Daily deaths for Vaud on 2021-02-17  
Powered by ISG and SDSC



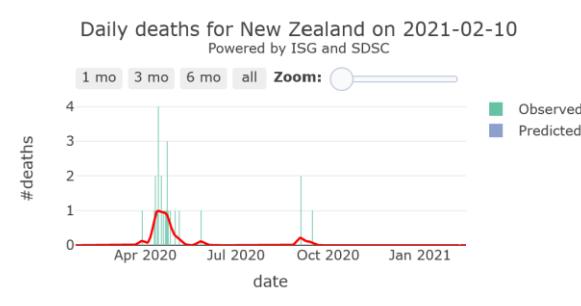
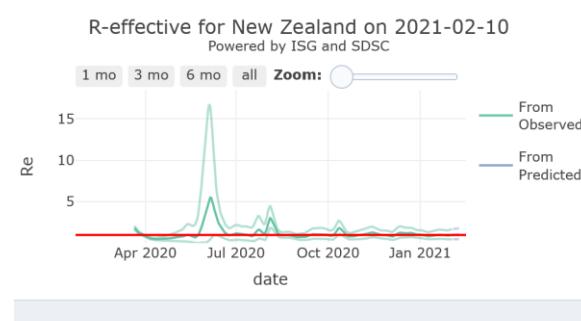
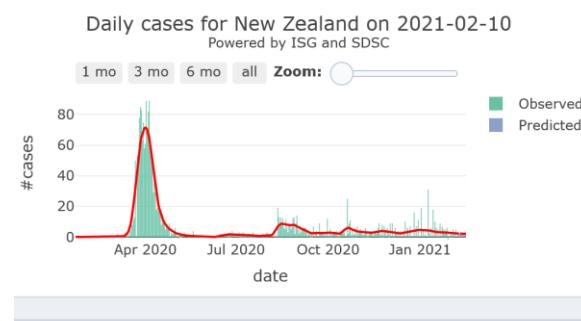
<https://renkulab.shinyapps.io/COVID-19-Epidemic-Forecasting/>

# Les champions

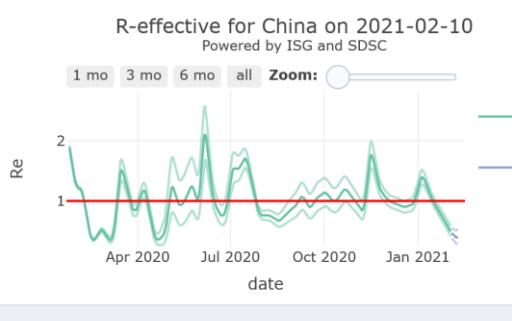
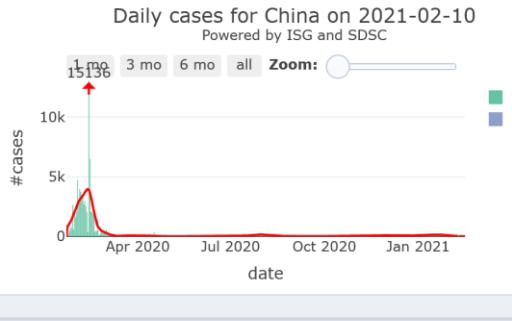
## Norvège



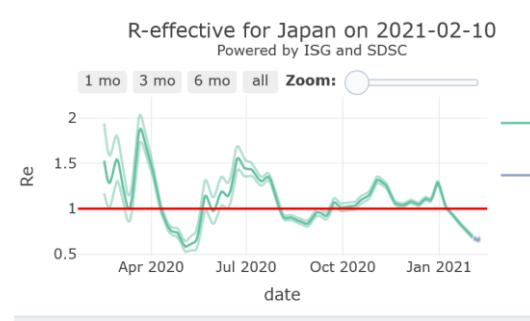
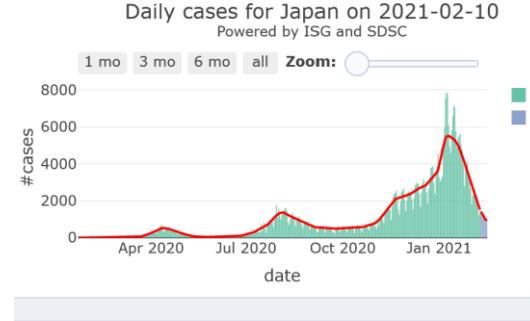
## Nouvelle-Zélande



## Chine



## Japon



# L'Europe

## Belgique

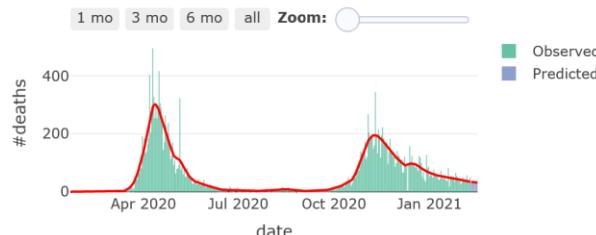
Daily cases for Belgium on 2021-02-10  
Powered by ISG and SDSC



R-effective for Belgium on 2021-02-10  
Powered by ISG and SDSC

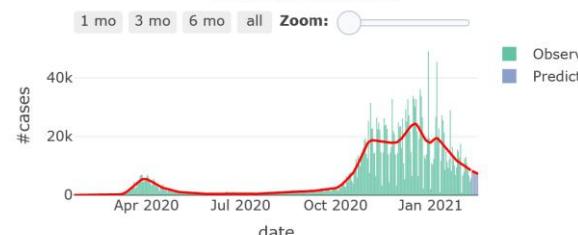


Daily deaths for Belgium on 2021-02-10  
Powered by ISG and SDSC



## Allemagne

Daily cases for Germany on 2021-02-10  
Powered by ISG and SDSC



R-effective for Germany on 2021-02-10  
Powered by ISG and SDSC



Daily deaths for Germany on 2021-02-10  
Powered by ISG and SDSC



## Royaume-Uni

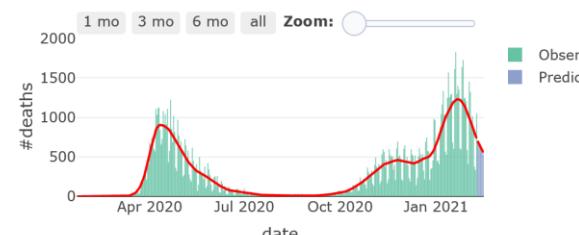
Daily cases for United Kingdom on 2021-02-10  
Powered by ISG and SDSC



R-effective for United Kingdom on 2021-02-10  
Powered by ISG and SDSC



Daily deaths for United Kingdom on 2021-02-10  
Powered by ISG and SDSC

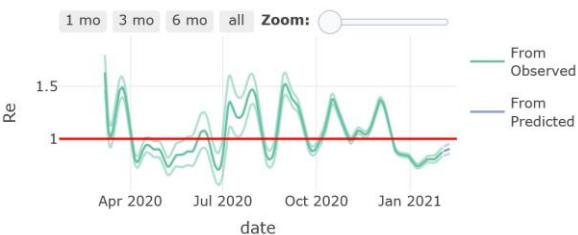


## Danemark

Daily cases for Denmark on 2021-02-10  
Powered by ISG and SDSC



R-effective for Denmark on 2021-02-10  
Powered by ISG and SDSC

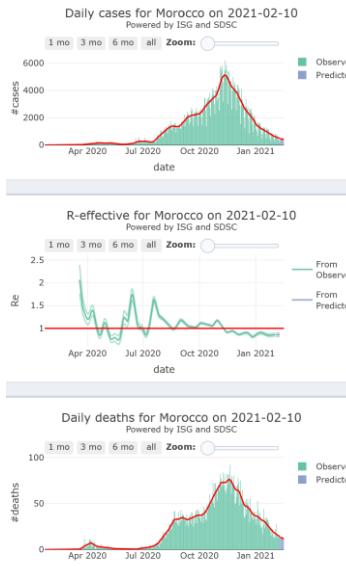


Daily deaths for Denmark on 2021-02-10  
Powered by ISG and SDSC

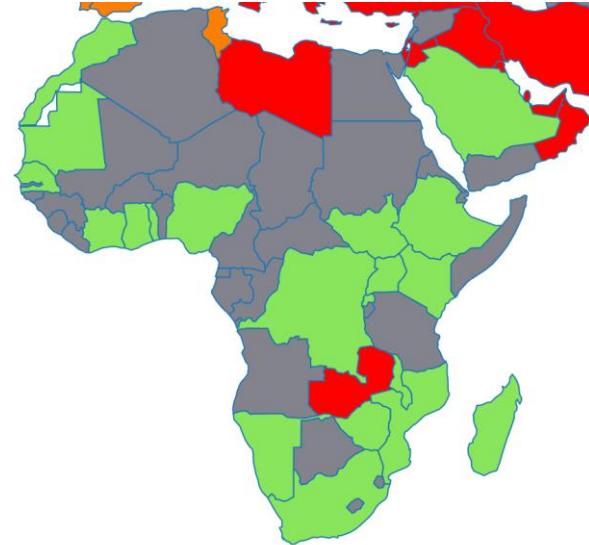
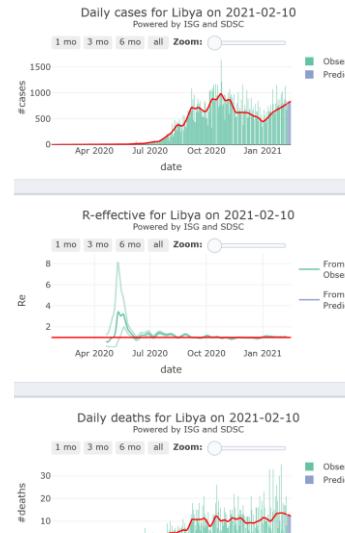


# Afrique : trois profils épidémiologiques

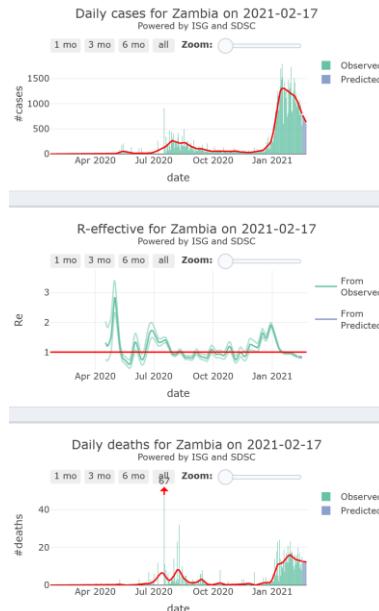
## Maroc



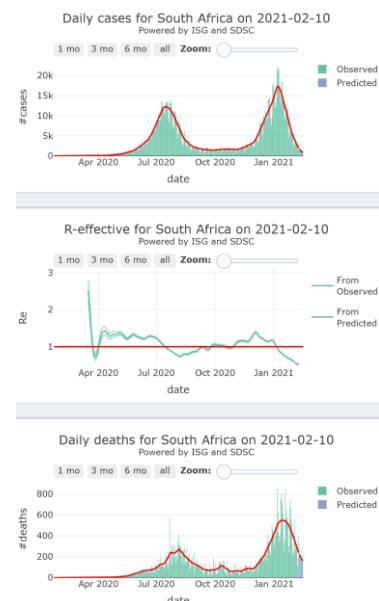
## Libye



## Zambie



## Afrique du Sud



- **Afrique du Nord :** reprise automno-hivernale de l'activité épidémique
- **Afrique sub-saharienne :** peu de tests, mais peu d'activité épidémique
  - Influence du climat (pas d'hiver) ?
  - Rôle de la démographie ? âge médian = 18 ans
  - Immunité croisée ?
  - Prédisposition génétique protectrice ?
  - Faible interconnexion ? Sous-notification ?
- **Afrique australie:** Vague hivernale (juin-septembre) et puis rebond, nouveau variant



# Nouveaux variants du SARS-CoV-2

The New York Times

ADVERTISEMENT



*The Coronavirus Is Mutating. What Does That Mean for Us?*



FINANCIAL TIMES

Hancock warns of tough restrictions for months amid new Covid strain

UK health secretary says latest fast-spreading variant of virus is 'out of control'



INTERNATIONAL 19/12/2020 17:43 CET | Actualisé il y a 11 heures

## Face à une nouvelle souche du Covid, le Royaume-Uni reconfine en partie

Londres, l'est, et le sud-est de l'Angleterre sont reconfinés alors que Boris Johnson et le Royaume-Uni s'inquiètent d'une nouvelle souche de coronavirus.

Le HuffPost avec AFP

Health secretary Matt Hancock said the new variant of the virus — which is estimated to spread 70 per cent faster than previous strains — was “out of control”, as he justified the government’s new restrictions in the south-east of England.

# Stratégies de testing

Sensibilité

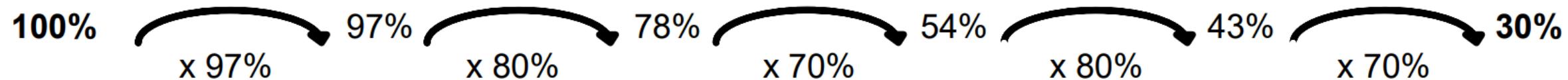
Disponibilité

Accessibilité

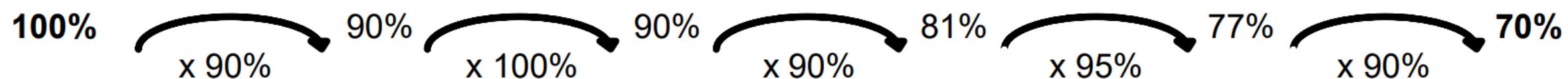
Adéquation

Acceptabilité

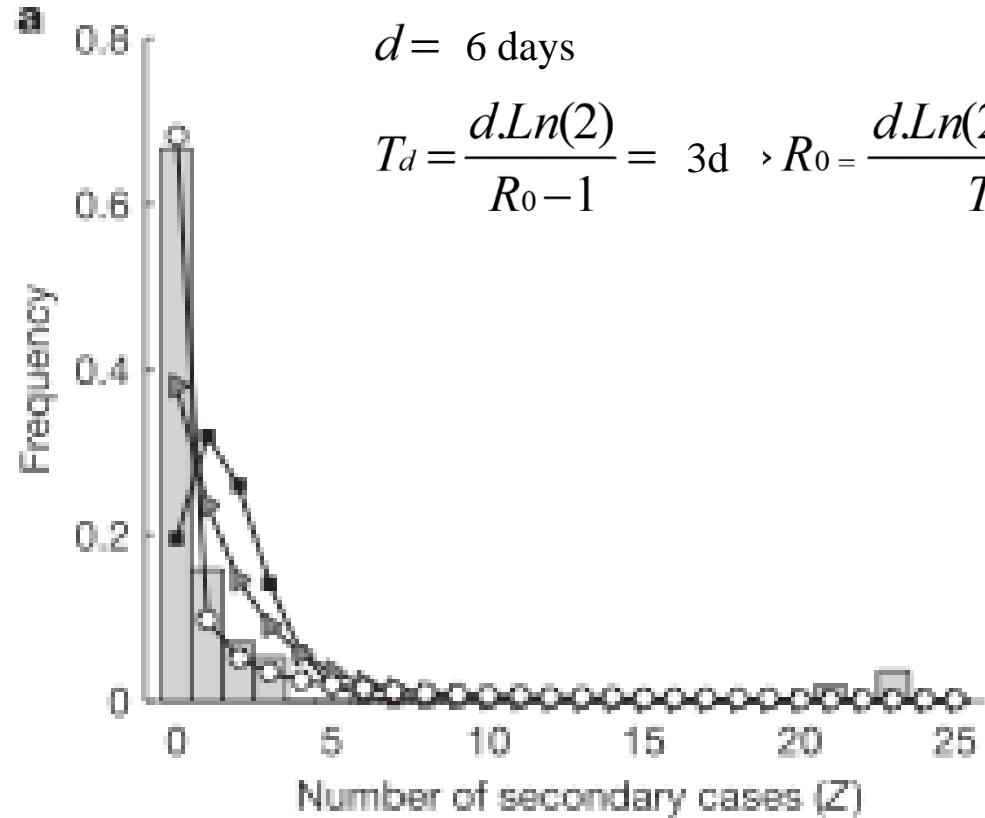
**Actuellement (avec PCR) :**



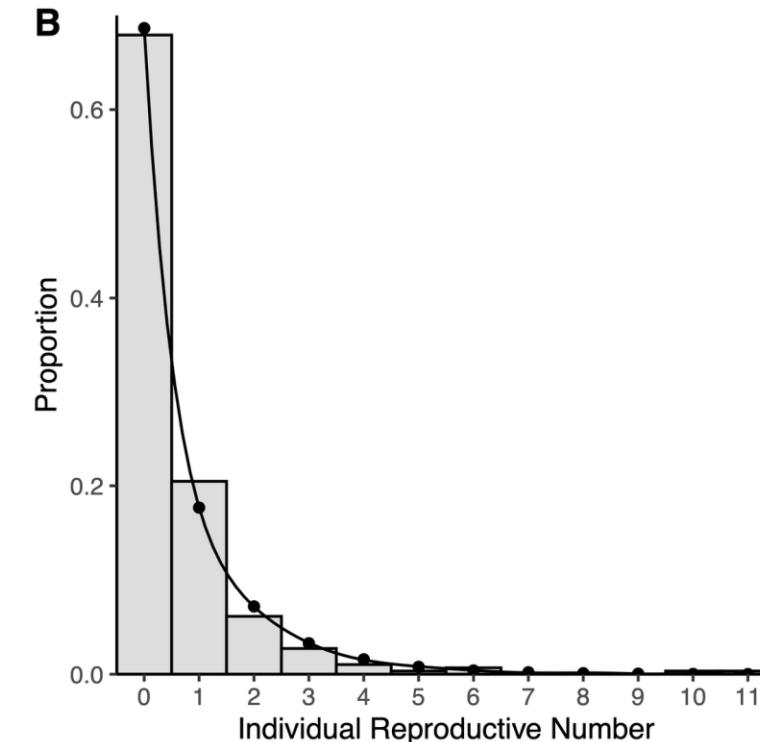
**Stratégie améliorée (avec TDR et autres optimisations) :**



# La surdispersion



Ro du SRAS à Singapour (Lloyd-Smith, 2005)



Ro du COVID-19 à Hong-Kong (Adam D, 2020)



# Stratégies de tracing

- 1. La méthode prospective**, classique, occidentale : on recherche les contacts du cas rapporté
- 2. La méthode rétrospective**, japonaise : on recherche les contacts du cas (= parent) qui a contaminé le cas rapporté



# Quatre freins disponibles

**1. Les gestes barrières**



**4. L'immunité/  
traitements**

**2. Le confinement**

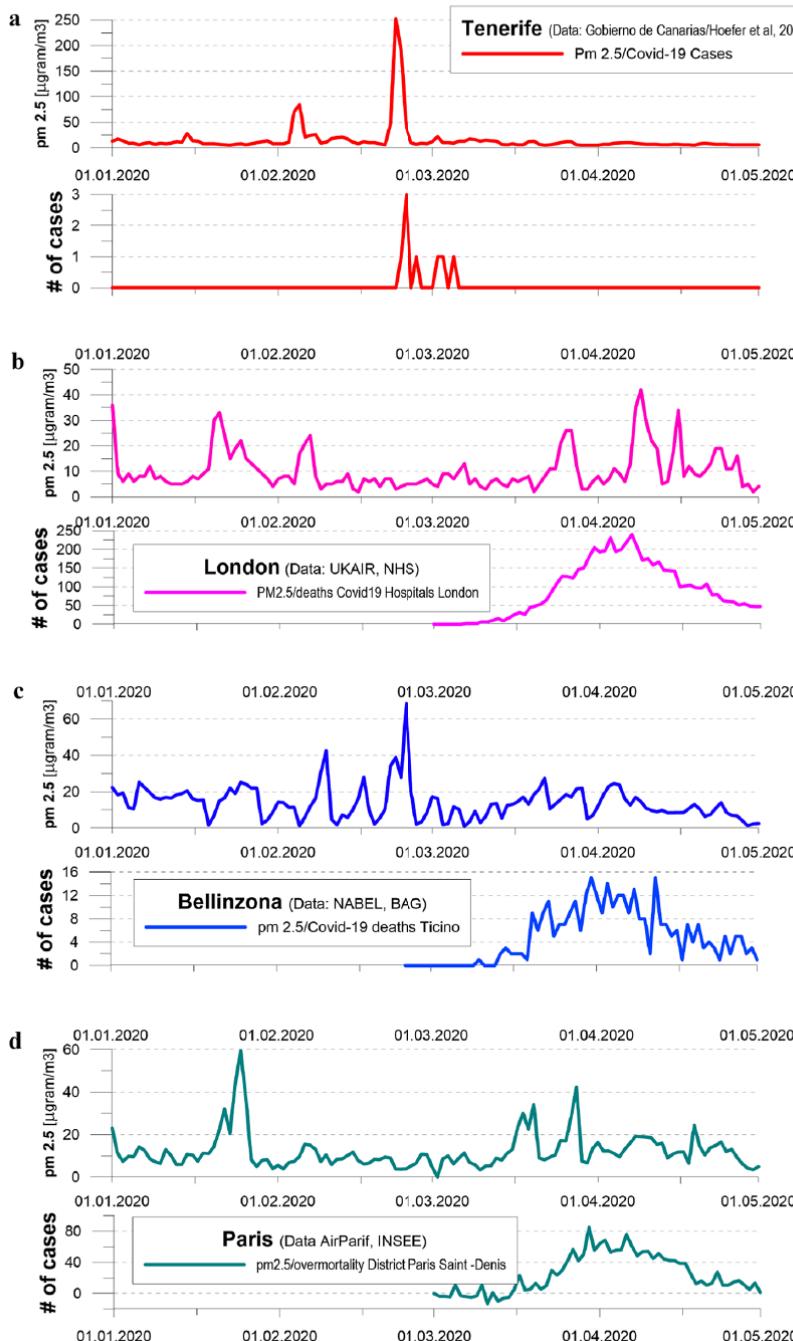
**3. Le frein estival/l'environnement**



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M. Rohrer et al.



# Saison, climat, pollution, environnement et COVID-19 ?

Des pics de particules fines (PM 2.5) survenant  
avant des pics épidémiques de COVID-19



Source : Rohrer M, Flahault A, Stoffel M.  
Earth Systems and Environment, 2020

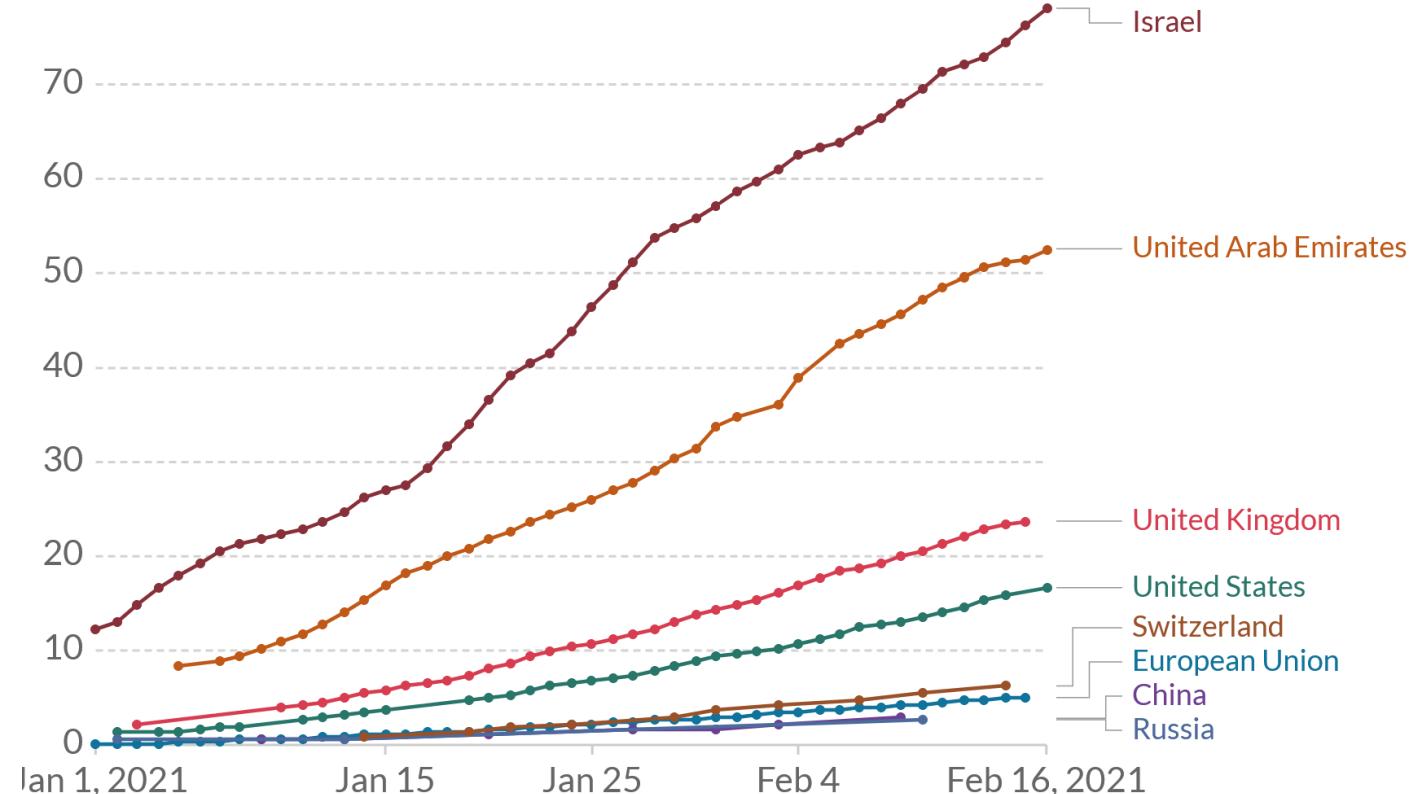
# Vaccins, où en sommes-nous ?

Cumulative COVID-19 vaccination doses administered per 100 people

Our World  
in Data

This is counted as a single dose, and may not equal the total number of people vaccinated, depending on the specific dose regime (e.g. people receive multiple doses).

LINEAR LOG





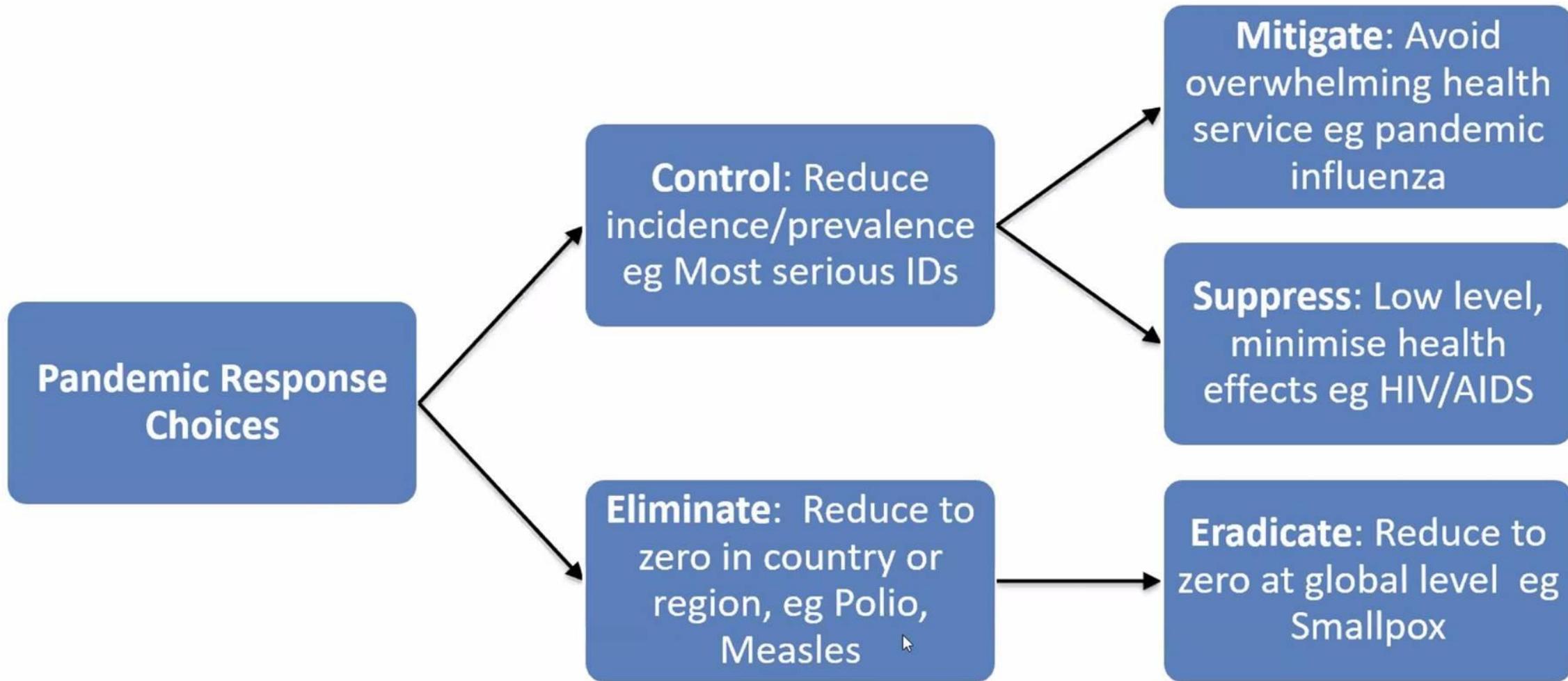
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# Quelles stratégies pour ce printemps ?



# Strategic Choices for Pandemic Response



Source: Dowdle, MMWR Supple. December 1999 / 48 (SU01);23-7



# 1. Stratégie occidentale (réactive)

- **Trois scénarios**

1. Baisse de la pression du virus sur l'épidémie ( $R < 1$ )
  - Relâchement progressif des mesures
2. Poursuite d'un plateau ( $R = 1$ , nouvelles infections constantes)
  - Poursuite des mesures actuelles
3. Augmentation de l'incidence et  $R > 1$  (croissance exponentielle)
  - En cas de saturation des lits de soins intensifs
    - Renforcement des mesures de confinement
  - En dernier recours
    - Fermeture des écoles



## 2. Stratégie Asie-Pacifique : proactive (= zéro Covid)

- **Zones vertes**

- Circulation du virus (< 1 cas/100K hab./jour)
- Déconfinement avec réouverture des bars, restaurants, écoles, spectacles, commerces non-essentiels, libre circulation intra zones vertes
- Réorganisation de la stratégie de Testing/Tracing/Isolating :
  - Backward tracing
  - Hôtels de confinement
- Usage (plus intrusif) des **traces digitales**
- Sécurisation des espaces clos (**ventilation**, capteurs CO2)
- **Cordons sanitaires**, reconfinements localisés
- Contrôle strict aux **frontières** des zones vertes
  - Coordination européenne

- **Zones rouges**

- Appelées à devenir vertes !



# Oui, mais ce sont des îles...

