SSC-advies dd. 2/1/2023

Focus: covid-19 epidemiological situation in China and possible consequences for public health in Belgium

Present:

Marc Van Ranst, Steven Van Gucht, Karine Moykens, Dirk Wildemeersch, Lode Godderis, Geert Molenberghs, Erika Vlieghe, Mathias Dewatripont, Pierre Van Damme, Steven Callens, Niel Hens, Philippe Beutels, Jorgen Stassijns

Disclaimer: these recommendations have been written in a very restricted time frame, updates and additional references may be added in the upcoming days.

1. Epidemiological situation

We refer to the RAG reports dd. 22/12/2022 and 28/12/2022 for current details on the Belgian epidemiology. In summary, we observe a 'relatively stable' virus circulation at level 2 (positivity rate 15%, with increase among 65+ and elderly, including in nursing homes), with increase in number of hospitalizations. Together with the ongoing intense transmission of influenza and RSV during this winter season, this has lead to a highly- saturated health care system.
The majority (> 60%) of the current infections in Belgium is due to the BQ.1/BQ.1.1-variant[1].
However, it must be noted that a decrease in testing over the past months has led to a decrease in the potential to observe potential VOCs. A new variant might thus not be quickly picked up for genomic surveillance until it has spread substantially among the population and/or until it has generated sufficient clinical impact to warrant testing

According to the scarcely available information, China is currently experiencing a steep wave of cases, hospitalizations and deaths since the country abolished its 'zero COVID policy' early December 2022. There is international scientific concern on the potential for selection of new variants/VOCs within the context of large scale viral circulation. Unfortunately, as of December 25th, 2022, China's National Health Commission (NHC) stopped publishing data on COVID-19.
The (scarcely) available genomic surveillance data suggest that the current circulating strains are within the omicron/BA.5-strain (i.e. B.A.5.2, Bf7)[2] [3]

2. Is there a (new) public health risk?

The combination of intense viral transmission in China, lack of epidemiological data-transparency and the upcoming liberalization of travel restriction for Chinese citizens (January 8th, 2022) leads to international concern on the potential for new VOCs to be selected out and quickly spread across the globe.
Three elements set the situation in China apart from other countries experiencing a new COVID-peak:

(1) the sudden transition from 'zero-COVID policy' into fewer restrictions against a background of a less solid vaccination status, in particular among the elderly and vulnerable population (although this lower immunizations status may lower the likelihood of selection

of an immune-evasive VOC with clinically significant impact for the highly vaccinated Belgian population
(2) the sheer size of the country, with the world's highest population (1.4 billion inhabitants)
(3) the international connectedness of China with many other parts of the world. For instance, in June 2022, Brussels airport received the fourth highest number of arrivals from China (i.e. 1597), after Schiphol, Paris and Frankfurt[4]. In addition, recent studies have shown that the impact of returning/incoming travelers on the domestic epidemiology is sub-exponential, but super-linear (i.e., faster than merely linear increase[5] [6] [7]), as a function of the transmission level and the number of travelers.

Annex 1 summarizes the recent experiences in other countries that changed their former 'zero COVID-policy' into a less restrictive policy, i.e. Australia, New Zealand, Taiwan and Hong Kong. As can be seen form this preliminary exercise, countries with high vaccine coverage rates prior to policy change experienced an intense peak and intense yet manageable strain on their health care system, whereas lower vaccination rates among elderly and vulnerable populations have led to dramatic collapses of the health care system (e.g. Hong Kong, or in 2021 India during the delta wave)

Therefore, the most important pressing public health concern is clearly situated within China. Given the fact that the current circulating strains are within the known omicron-family with limited impact on a well-immunized society, the first objective is not per se to avoid all import cases, but rather to survey and detect in time possible new variants/VOCs. Given the potential of viral mutation, recombination and selection, solid genomic surveillance worldwide seems necessary to:
(1) complement the scarcely available Chinese data
(2) ensure optimal preparedness to pick up new variants/VOCs at an early stage, as part of a genuine 'VOC-preparedness', to be prepared for a worst case 'delta-like' phenomenon. The early detection of significant variants/VOCs is not just an academic exercise, but is an essential part of pandemic preparedness, as it could lead to timely adaption of vaccines, the implementation of non-pharmaceutical interventions and the fast scaling up into a more intense monitoring and testing strategy. Such a 'VOC-preparedness' should aim to be useful on a generic base, i.e. for 'virus X' and should therefore be sustainable over a long period and internationally embedded.

This surveillance should be carried out within an EU, and even global context. Nevertheless, given the lengthy decision making process, it is important that Belgium strengthens its own surveillance activities with focus on international travelers.

3. Possible measures for incoming travelers from China, with considerations and priorities (according to the objectives to be reached)

a. Decrease burden of incoming infected travelers?

- Testing before departure: has limited and short-lived epidemiological impact when used as single measure (i.e. without quarantine and follow up testing[8]) in a single European country, given the lack of quality control, the potential for incubating travelers becoming contagious upon or shortly after arrival. This would also require reinstalling the PLF-system – none of these is directly implementable for Chinese vaccines.
- Vaccination certificate: limited added value when implemented as only measure, given potential of vaccinated persons to transmit disease. Could be considered however, to prevent large numbers of travelers developing severe disease after arriving in Belgium to overburden an already saturated health care system. Content of the mandate to be discussed (type of vaccine, number of shots, maximum delay etc)

b. Gather more samples for genomic surveillance?

- Testing upon arrival of all travelers: including asymptomatic cases makes sense from epidemiological point of view for COVID, but very labor intensive and costly, difficult to be sustained over longer time. Quid legal framework, would require new collaboration agreement? Logistics to be further clarified with Saniport
- Testing symptomatic cases, via mass-temperature screening upon arrival and targeted testing of those with clear fever and/or in clinical cases during the stay in Belgium. Gives fragmented epidemiological information, but yield may be higher hence more efficient. Legal framework more clear (via authority of airport medical services), PCR on RAT could be done. Logistics to be further clarified with Saniport, airport medical services and first line health care partners
- Testing wastewater of planes: technical feasibility and validity probably OK (in place in UK and US[9]) but workflow to be further worked out and piloted,… in collaboration with handling companies and Saniport. Is least disruptive for travelers' flow.

c. What would be the consequences of the knowledge on new variant circulating?

It is important to foresee a decision framework on consequences of new circulating variants (see considerations above on 'VOC-preparedness'), even though for the present circulating strains, a positive test does not lead to a stringent system of isolation and contact tracing.
We would recommend to strengthen already now the earlier mentioned 'Winterplan', i.e. not to wait until a VOC has been signaled.

d. Suggested priorities

1. Good communication on current situation (no need to panic, but a reason to strengthen further surveillance and to make pandemic preparedness more concrete)
2. Strengthen/repeat current Winterplan advice (see SSC-advice dd. 1/12/2022)
3. We would suggest to give priority to strengthened genomic surveillance in general, and on wastewater samples from long haul flights from China in particular
4. In addition, genomic surveillance on clinical samples from (symptomatic) travelers could yield complementary information
5. We suggest to collaborate maximally within the EU, in particular with other countries with strong track records in surveillance. A sentinel-approach (i.e. with sentinel EU-countries) such as for influenza should be considered. Other (non EU) airports e.g. Bangkok, Delhi, Istanbul,.. should be included as well. Travel-related surveillance should be considered as a proxy of worldwide genomic surveillance.

Annex 1.

Situation in Former Zero-Covid Countries
(Primary source: Our World in Data; secondary sources: Johns Hopkins Covid-19 world map; IHME; note that IHME projections should be used with great caution.)

Consider countries that relaxed measures after a long period of very high stringency (zero covid): Hong Kong, Taiwan, Australia, New Zealand, and China. Some basic data are given below (vaccination data on 31 December 2022, or most recent data available.)

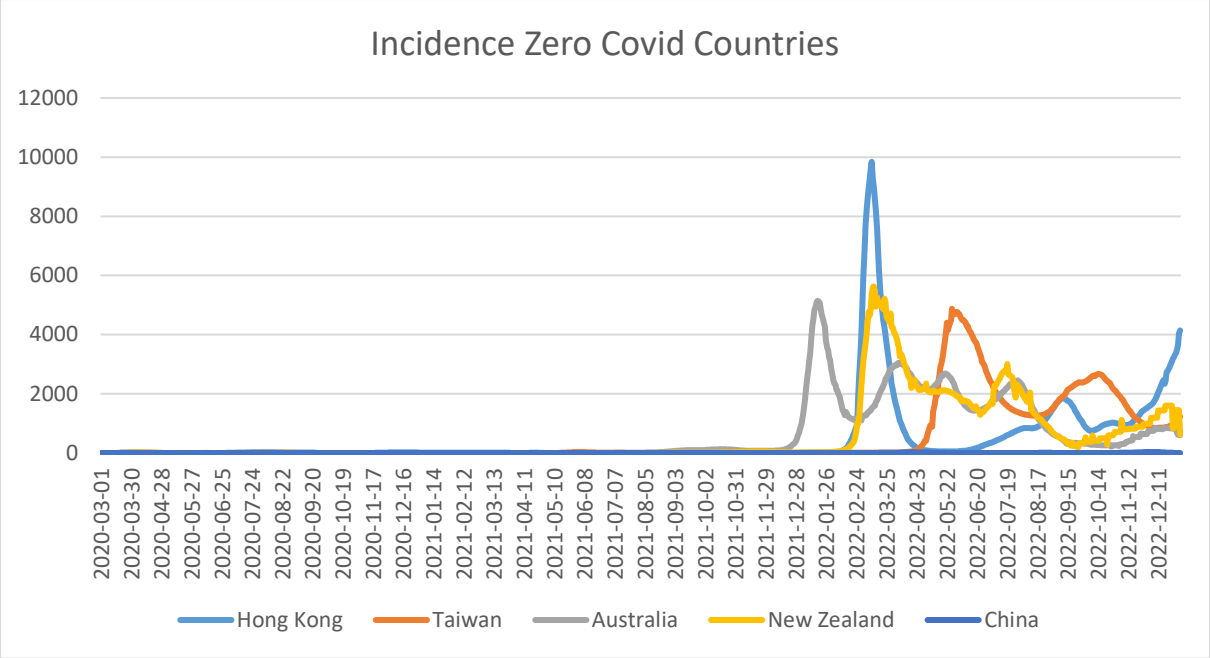
Population size and vaccination data				
Country	**Population size**	**Vaccinated at least one**	**Fully vaccinated**	**Received at least one booster**
Hong Kong	7.4 million	92%	91%	87%
Taiwan	23.6 million	91%	86%	93%
Australia	25.7 million	85%	83%	75%
New Zealand	5.1 million	83%	80%	67%
China	1412 million	92%	89%	57%

Changes in policy are reflected in the stringency index.

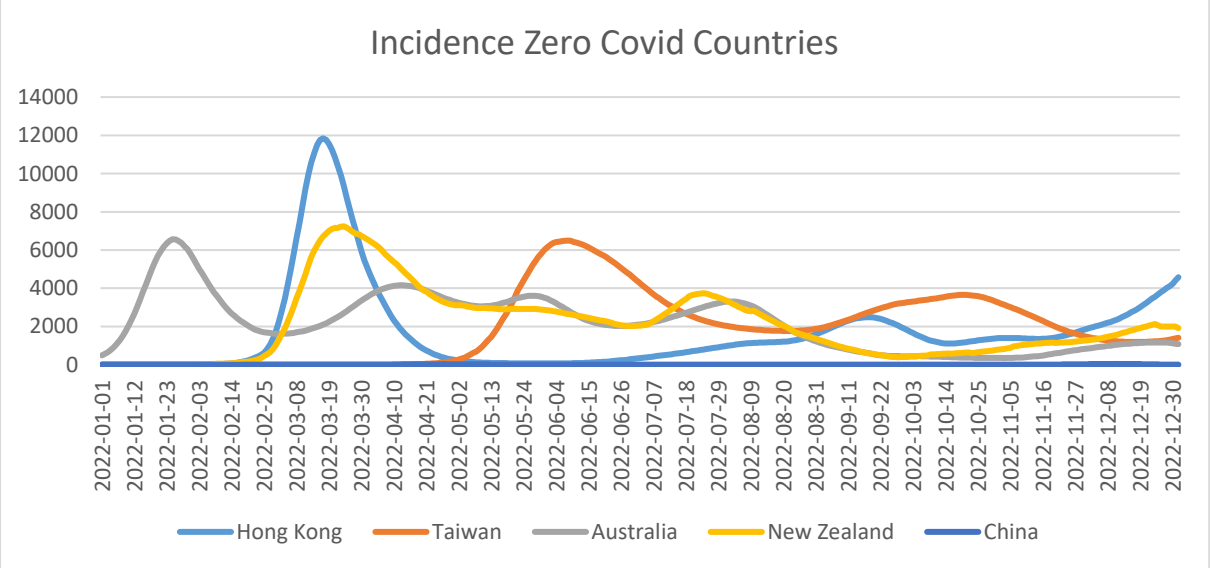
Stringency (0 – 100)		
Country	**Highest in 2022**	**Lowest in 2022**
Hong Kong	75	40
Taiwan	25	20
Australia	66	11
New Zealand	53	11
China	79	Stopped reporting on 5 December 2022

Of note is that Hong Kong, Australia, and New Zealand implemented gradual decreases from their highest stringencies in the first part of 2022 to their lowest levels at the end of the year. Note that Hong Kong still has a relatively high value. China was at level 71 when they suddenly dropped the large majority of their measures.

The incidence curves throughout the pandemic are as follows (incidence = reported cases per 100,000 population over a 14-day period).



There were little to no cases in these countries in 2020 and 2021. Focusing on 2022 gives the following picture.



A very high incidence in Hong Kong can be observed, in March 2022. Australia, Taiwan, and New Zealand had high peaks as well after releasing measures, of half the size of the one in Hong Kong. Between their primary peak and the current point in time, these countries entered a plateau phase with secondary peaks.

Peak incidences are:

Peak incidences		
Country	**Date**	**Primary peak incidence**
Hong Kong	17 March 2022	11894
Taiwan	8 June 2022	6491
Australia	25 January 2022	6569
New Zealand	24 March 2022	7244

Data on hospital use and mortality around the peaks is summarized as follows:

Data on hospital use and mortality				
Country	**Hospital beds in use per million**	**Notes on hospitalization**	**Deaths per day per million**	**Notes on deaths**
Hong Kong	-	-	40	
Taiwan	153		9	
Australia	195		6	In secondary peak end July 2022: 4 deaths per day per million
New Zealand	194		3	In secondary peak mid-July 2022: 4 deaths per day per million
China				(see below)

For China, IHME reported hospital beds in use on 4 December 2022 was 32; a peak was reported as well for 23 March 2022, at 20 beds in use per million. The IHME projection for 31 March 2023 is at about 70. These numbers appear to be relatively low, but they are likely unreliable, and one should also account for the limited Chinese hospital beds capacity.

For China, Hopkins reported deaths per day per million on 30 December 2022 are 0.04. In contrast, IHME reported 0.75 deaths per day per million on 22 December 2022. IHME also reported 0.20 deaths per day per million on 14 March 2022. IHME projects 3 deaths per day per million on 23 April 2023 (corresponding to a total death count of about 4000). Clearly, these figures are very variable and their reliability should be questioned.

[1] Genomic surveillance of SARS-CoV-2 in Belgium | UZ Leuven

[2] Search ProMED Posts - ProMED-mail (promedmail.org)

[3] GISAID - hCov19 Variants

[4] Data Eurostat

[5] Natalia, Y.A., Molenberghs, G., Neyens, T., Hens, N., and Faes, C. (2022).
Empirical association between COVID-19 cases, hospitalization, vaccination, and travel: Comparison among different regions and provinces in Belgium between
April-July 2021. Manuscript submitted for publication.

[6] Nguyen, M.H., Nguyen, T.H.T., Molenberghs, G., Abrams, S., Hens, N., and Faes, C. (2022).
The impact of national and international travel on spatio-temporal transmission of SARS-CoV-2 in Belgium in 2021. Manuscript submitted for publication.

[7] Martina L Reichmuth, Emma B Hodcroft, Julien Riou, Richard A Neher, Niel Hens, Christian L Althaus. Impact of cross-border-associated cases on the SARS-CoV-2 epidemic in Switzerland during summer 2020 and 2021 Epidemics 2022 Dec;41:100654. doi: 10.1016/j.epidem.2022.100654. Epub 2022 Nov 17

[8] Mathew V Kiang, Elizabeth T Chin, Benjamin Q Huynh, Lloyd A C Chapman, Isabel Rodríguez-Barraquer, Bryan Greenhouse, George W Rutherford, Kirsten Bibbins-Domingo, Diane Havlir, Sanjay Basu, Nathan C Lo. Routine asymptomatic testing strategies for airline travel during the COVID-19 pandemic: a simulation study Mathew V Kiang, Elizabeth T Chin, Benjamin Q Huynh, Lloyd A C Chapman, Isabel Rodríguez-Barraquer, Bryan Greenhouse, George W Rutherford, Kirsten Bibbins-Domingo, Diane Havlir, Sanjay Basu, Nathan C Lo. Lancet Infect Dis 2021; 21: 929–38

[9] See for instance Wastewater Surveillance for SARS-CoV-2 Variants | FDA