

**Adviesaanvraag**

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Adviesverstrekking t.a.v. het Overlegcomité

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Executive summary (21/12/2021)

a. **Epidemiology (pg 5-6): potential triple problem, but acknowledge lessons learned**

- i. The current delta wave in Belgium is slowly decreasing but the healthcare system is still heavily saturated. From an international benchmark perspective, our situation has somewhat improved but remains worrisome.
- ii. The rapidly emerging **Omicron** variant brings a lot of uncertainties. The total amount of Omicron cases on 20/12/21 was above 20% and doubles every 3 days. We expect a rise in cases over the next few weeks, as Omicron will gain dominance in our virological landscape. Although information on Omicron's virulence is still accumulating, experiences from other countries show that a rapid increase in cases will inevitably lead to a new increase in hospitalisations - the net magnitude of which is still difficult to estimate and may be influenced by the level of NPIs applied to slow down transmission and on the coverage of the booster-vaccination among the population to mitigate the impact on severe illness.
- iii. In addition, there are concerns on emerging influenza on top of the 'regular' non-COVID health care problems and emergencies.
- iv. With a rapidly emerging new wave of cases, a major risk may be that [essential \(frontline\) services](#), including the healthcare system, will be strained severely in their 'business continuity'. Given the important uncertainties around the virulence of Omicron, the healthcare system and society as a whole should be clearly informed, warned and prepared for a 'worst case scenario' at all levels, including contingency plannings.
- v. On the other hand, the coverage of (booster)-vaccinations within the group of vulnerable (and general) population is advancing quickly, and investments over the past year by several sectors in making activities safer for covid-19 transmission (e.g. ventilation, CIRM/CERM, protocols, masks), have to be acknowledged as part of the **mid-long term solution**.

b. Motivation and mental health (pg 7-8): The general **mental health** is under pressure especially in periods with increasing restrictive measures and uncertainty, particularly among younger people. Since the end of September 2021 the GHQ-12 has taken a turn for the worse, especially in students and adults < 45 y old. On a larger, worldwide level, the OECD urges to respond effectively to the impact of the COVID-19 crisis on population mental health, integrated and cross-sectoral policies to improve mental health support are needed.

c. The most recent Motivation Barometer reveals that 70% of both vaccinated and unvaccinated people indicate they would meet with 10 or less persons during the year-end events. Young adults and highly educated persons plan to meet with a larger number of people. Only 44% of the vaccinated persons and 19% of the unvaccinated persons plan to do a self-test for the upcoming year-end events. More highly educated persons plan to use self-tests more frequently. Half of the vaccinated persons are (very) concerned with the omicron variant, while only 10% of the unvaccinated persons are worried about this new variant

d. **Economic sectors, occupation health, economic and social considerations.** There seems to be a small increase in burnout risk. The amount of short sick leave in different sectors is increasing since September 2021. When implementing measures the virus circulation as well as the inequalities of families should be taken into account. Some precarious households are not able to offer youth activities to their children, which results in more children at home but also more parents who can not go to work. Concrete actions could include providing low threshold access to support mechanisms (e.g. temporary unemployment), self-tests and masks.

- e. **Recommendations.** Given the limited knowledge on the true impact of the Omicron variant it is difficult to already predict how the volume of cases will evolve in the coming days and weeks. We need to remain vigilant; the situation in the UK and DK shows that case numbers can rapidly evolve, with the body of knowledge growing every day (*'when the facts change, we need to change our recommendations'*). That is why we propose to introduce a 2-step approach:
- i. A set of stricter measures should be taken immediately to allow for further decrease of the actual viral transmission, and thus a partial recovery for the health system, the (booster)-vaccination campaign to be further completed and the vaccination of the 5-11 year to be started.
 - ii. Daily follow-up of the epidemiological status, and impact of the Omicron variant is needed, and may warrant additional measures in due time when cases/incidence would start increasing, Rt value would again exceed 1,... This could be assessed at regular RAG reassessment which takes a broad set of criteria into account (*).

f. **Proposed measures (detailed description and rationale on pg. 12)**

	Measures to be taken <u>now</u> (in addition to <u>measures dd. 6/12/21</u>), to allow health care system to recover and to slow down spread of omicron	Additional measures to take <u>when epidemiological evolution is unfavourable(*)</u> (i.e., when cases start to increase (to be evaluated as a function of epidemic evolution))
Private life	Reduce contacts +++ max. 2-3 households together Prior self-testing Ventilation and CO2 monitoring (where possible) FFP2 available for medically vulnerable	Avoid indoor gatherings with other households Give preference to outdoor meeting
Work	Telework 100% (where possible) and reinforcement of the generic guide	Telework 100% (where possible) and reinforcement of the generic guide
Mass gatherings (indoor, crowded outdoor)	Indoor already canceled. Close crowded outdoor places unless they can provide a proven track record of a strict prevention plan (e.g. CERM/CIRM, protocols, ventilation, mask use) Closing time 8 pm	Cancel all types of gatherings
Indoor seated gatherings	Up to 200 persons + mask + safe distance + ventilation	Cancel all kind of gatherings
Group activities (sports, youth, associations)	Avoid overnight activities, look for alternative solutions Cancel indoor activities unless proven track record of rigorous preventive procedures and investments in ventilation Funerals: see 'indoor seated gatherings', suspend 'koffietafels' > 2-3 households	Cancel all kind of gatherings

	Weddings: see 'indoor seated gatherings', suspend parties > 2-3 households	
Horeca	Maintain the closing hour of 11pm Strictly eating and seated Strict enforcement of ventilation and other preventive standards	Close
Public transport	50% capacity reduction Consider FFP2 for vulnerable passengers/staff	50% capacity reduction FFP2 for vulnerable passengers/staff
Shops	Strict implementation of no-crowding measures Max 2 people together (>12 years) or max 1 household	Solo shopping with exceptions for young families and persons with specific needs Contact professions limited to medical contact professions
Schools	In-school teaching should be aimed for, under protection of optimal ventilation, masks, vaccination, prospective and reactive testing	(to be discussed upon re-evaluation)
Higher education	Exams can be organized on site distance, optimal ventilation, crowd control, mask wearing	
Logistics	Self tests should be made available in sufficient amounts (e.g. 3 free self tests per person) and their (correct) use should be strongly promoted for pro-active use by the general public with adapted educational materials FFP2 masks should be made available and affordable for use giving priority to medically vulnerable persons, health care workers and other emergency services' frontline workers	

1. Assessment of de epidemiological situation: potential triple problem

- The current delta wave in Belgium is slowly decreasing but the healthcare system is still heavily saturated. The situation has been improving with a decreasing trend of new infections since last week in Flanders, Wallonia and Brussels, although the positivity ratio remains high, highlighting the ongoing very high viral circulation. Incidences are still the highest among the lowest age group (0 to 9 years old). The number of new hospitalisations and hospital beds occupied are decreasing too, but only slowly and not everywhere. The ICU occupancy is still very high (> 700 beds occupied by COVID-19 patients) with most of the patients requiring a long hospitalization (age range 55-65 years old). We refer to the latest [RAG advice \(15/12\) for full information](#).
- Also from an international benchmark perspective, our situation has somewhat improved but remains worrisome: among the 211 ECDC regions in week 2021/49 (week of 6/12/2021), Flanders ranks 11th, Wallonia 23rd, and Brussels 31st.
- In addition, the threat of the rapidly emerging Omicron variant brings a lot of uncertainties. The total amount of Omicron cases on 20/12/21 was above 20% and doubles every 3 days. Based on the more rapid proliferation as compared to Delta, and based on the observed trends in several other countries (e.g. South Africa, UK, Denmark), we expect a rise in cases over the next few weeks, as Omicron will gain dominance in our virological landscape. Preliminary evidence shows that Omicron has a significant growth advantage over Delta, related to immune escape (allowing for more reinfections) possibly together with increased intrinsic transmissibility. Although information on Omicron's virulence is still accumulating, experiences from other countries show that a rapid increase in cases will inevitably lead to a new increase in hospitalisations - the net magnitude of which is still difficult to estimate and may be influenced by the level of NPIs applied to slow down transmission and on the coverage of the booster-vaccination among the population to mitigate the impact on severe illness. Also, even if an average omicron case is only 1/4th as severe as an average delta case, but omicron cases double every 2 days as they do in SA and UK, then it takes only 4 days to cancel out decreased severity by increased spread. For more in depth information on omicron we refer to the reports of the National Reference Centre (NRC) and the Risk assessment group (RAG).
- The latest [joint ECDC-WHO report](#) mentions that influenza (mainly H3N2) is already found in 12% of sentinel samples across Europe (for Week 49/2021: 06 December – 12 December 2021), including in countries with restrictive measures in place for COVID-19 (such as France). Also in Belgium, occasionally the diagnosis of influenza is found. We refer to our [advice dd. 30/6/2021](#) with an estimation on the additional burden of influenza on the height of the influenza-peak (up to 225 hospitalisations per day extra, up to 12 ICU-admissions per day extra - which is obviously influenced by the presence of NPI's (such as masks and ventilation) and influenza vaccination rates. Within this context, we stress the importance of a good reimbursement base of influenza PCR testing (absent at present).
- Taken together, we risk as a society to be tangled up in a triple (or even quadruple) epidemiological burden: (1) declining but still high level of transmission of Delta, which has caused the actual saturation of the healthcare system, (2) the rapid increase of the Omicron share, foreseen for the month ahead of us, (3) influenza (and other pathogens circulating predominantly in the winter season), in addition to the 'regular' non-COVID health care problems and emergencies (cardiovascular, metabolic, oncological, neurological/mental health disease, traumata, all postponed elective surgery for major morbidity,...). In addition, with a rapidly emerging new wave of cases, a major risk may be that essential (frontline) services, including the healthcare system, will be strained severely in their 'business continuity'. Given the important uncertainties around the virulence of Omicron, the healthcare system and society as a whole should be clearly informed, warned and prepared for a 'worst case scenario' at all levels, including contingency plans. Several other countries are sharing similar uncertainty and concerns, and have taken or are taking

bold decisions such as, for example, the new lockdown in the Netherlands, additional measures in Denmark, Germany, Austria, the United Kingdom,...

- On the other hand, as a country we have advanced quite well in the implementation of booster-vaccination for the vulnerable and general population (29.2% to date; 28% in Wallonia, 32% in Flanders, 16% in Brussels) which could hopefully serve as a partial buffer to mitigate the public health impact of a new wave. In addition, it is essential to apply a sufficiently strict level of NPIs to try to prevent or slow down the expected rapid re-emergence of cases and hospitalisations over the next weeks, and to attempt to 'buy' as much time as possible to bring down the saturation levels of the hospital system and by extension the entire health care system. As mentioned above, even a rapid rise in cases only would already have a profound impact on the 'continuity' of the healthcare system and many other essential societal activities (e.g. shops/distribution, emergency and safety services, education, public transport,...), as was observed in the recent Delta wave.
- Also, the societal experience of living within the pandemic over the past 2 years has brought along important insights on transmission prevention and safer functioning of diverse sectors (e.g. ventilation, mask wearing, crowd control and density reduction through application of specific protocols such as CERM and CIRM, Generic Guide at workplaces,...). Several sectors have invested importantly in making activities safer in terms of covid-19 transmission prevention, which has to be acknowledged as part of the mid-long term solution. In other circumstances, investments have been minimal until date, or remaining protocols have been abolished with the last relaxations (e.g; CERM/CIRM). Faced with this new viral challenge, it is important to be able to build further on the investments made, to return to safety protocols, and to seek sustainable ways to control viral transmission in society. In this respect, an ambitious 'national ventilation' plan seems essential, to stimulate the various sectors (horeca, culture/events, sports, education, public transport,...) to evolve stepwise into state-of-the-art indoor air quality.
- The particular time of the year (X-mas holiday period) comes with opportunities but also important challenges: it may allow for less work/school-related contacts and mobility but numerous unsafe private contacts and parties can help spread Omicron quickly under the radar. The restart of schools and companies and the returning travelers in the second week of January will be at a particularly critical moment which could refuel the epidemic and should take place with the greatest caution (see below). In the meantime, important societal concerns (social impact, mental health, motivation, mid-to-long term perspective, consistency and evidence base of NPI's should be taken into account clearly).

2. Major societal concerns

2.1. Mental health and motivation assessment

Mental health. Based on the latest [MAG report](#), during the COVID-19 crisis, our mental health is under pressure especially in periods with increasing restrictive measures and uncertainty, particularly among younger people. In October 2021, the findings of long-term studies (Motivation Barometer and the Great Corona Study) showed that after a steady increase in well-being since the relaxation of measures just before summer, **mental well-being** has leveled off from September onwards. Since the end of September 2021 the GHQ-12, a standard score for mental wellbeing the GCS has monitored since March 2020, has taken a turn for the worse, especially in students and adults < 45 y old. Apart from the students, people working in the culture & event sector, as well as education and health care workers are badly affected by the sequence of events that took place between the penultimate GCS wave in late September and early December 2021. Younger individuals, females and those suffering from co-morbidity report lower well-being (as was also the case in pre-COVID times). Given the selective nature of sampled participants in these large-scale questionnaires, vulnerable groups may be under-represented, and we lack data for 2021 from panel surveys with representative samples.

Despite good follow-up data on **mental disorders** are lacking, we can estimate the impact of the crisis by using data from agencies and care providers. For children, young adolescents, and their families the “Opgroeien” agency provides consultations in crisis and urgent care is needed. The dispatch for crisis situations has been receiving more questions every month, and even more so since the beginning of the COVID-19 crisis. The number of consults has known a steep rise in 2021 and since September 2021 numbers are rising again due to a rise in questions concerning mental health. Since March 2021 the applications for crisis youth aid has never been higher, with in March an all-time high of 588 unique minors that were referred to crisis youth aid. Most cases are about mental health problems, with a lot of questions about suicide. Especially complex situations that have been difficult for a while, seemed to go into crisis. In July and August 2021 the numbers stabilized, but seem to be rising again since September 2021. There are especially more requests for crisis help in mental health care facilities for young adolescents.

Similar notices and indications arrive from the field, reporting **a shortage of beds to treat eating disorder patients and young people with general psychiatric disorders**, with waiting lists being 4 times longer than during pre-corona times (5-8 months). Also, child psychiatric services (for ambulatory care and hospitalization) as well as students psychological support services report getting saturated, with long waiting lists as a consequence. The situation in the child psychiatric mental health sector is currently again very worrying. It takes up to two or even three months to get an appointment for a consultation with a child psychiatrist and a similar period for hospitalization in a child psychiatry department¹. Consequently, it is essential to take measures to avoid overcrowding and to slow down the emergence of new requests for care. On a larger, worldwide level, OECD urges to respond effectively to the impact of the COVID-19 crisis on population mental health, integrated and cross-sectoral policies to improve mental health support

¹ Personal communication dr. Sophie Maes, ULB

are needed. A recent article published by The Lancet² supports these findings and states that taking no action to address the burden of major depressive disorder and anxiety disorders should not be an option.

However, taking into account the mental health burden is not to be translated as loose or absent pandemic management. When the proposed measures and their implementation don't align in a timely fashion with measures expected by the majority of the population in view of the evolution of the pandemic threat, uncertainty, anxiety and anticipation of yet harsher measures to correct inertia in policy making and its implementation have a negative effect on overall mental health, too. This has been observed for example in Belgium in September and October 2020 in the lead-up to the second lockdown. **Timely consistent policy making and implementation of preemptive policies to control the pandemic** and as a consequence make the pandemic evolution more controllable and predictable over time can also have a positive impact on overall motivation and mental health. In addition, the needs of people who are socio-economically most disadvantaged, per se and as a consequence of the measures, need to be well attended to (e.g. financial compensation in case of quarantine when telework is not possible), as these people are at increased risk of mental health problems.

Motivation and adherence. During the latest wave, from 2021-12-15 to 2021-12-20, 14276 people (57.39% from Flanders; 42.61% from Wallonia) completed the Motivation Barometer, which addressed a variety of topics. Four key messages can be drawn from the data. First, the autonomous or voluntary motivation among vaccinated persons has slightly increased since the beginning of December, with 57% and 25% of vaccinated individuals being, respectively, somewhat or highly motivated (figure 1). Second, when asked for the maximum group size during the largest social event in the coming weeks, almost 70% of both vaccinated and unvaccinated people indicate they would meet with 10 or less persons during this event (figure 2). Young adults and highly educated persons plan to meet with a larger number of people. Third, when asked whether people plan to take a self-test during this social event, only 44% of the vaccinated persons and 19% of the unvaccinated persons plan to do so (figure 3). More highly educated persons plan to use self-tests more frequently. Fourth, half of the vaccinated persons are (very) concerned with the omicron variant, while only 10% of the unvaccinated persons are worried about this new variant. For more information, please refer to annex 1.

These findings suggest that the motivational support level for the measures is still fairly high (at least among vaccinated persons) and that a substantial portion of the population (both vaccinated and unvaccinated individuals) plans to limit their social contacts (i.e., < 10 persons) over the upcoming celebration period. At the same time, it is critical to communicate a clear set of guidelines ('manual') about how people can organize these social gatherings safely by for instance using self-tests and ventilation.

2.2. Considerations from economic sectors, occupational health and social impact

Occupational health. Based on the above mentioned [MAG report](#), when looking at the working population, data of Group Idewe suggest an impact of COVID-19 on the different indicators of well-being in workers. Hence, there seems to be a small increase in burnout risk, while intention to stay and satisfaction seem to decrease. Regarding the psychological well-being of health care workers, especially

² Global prevalence and burden of depressive and anxiety disorders in 204 countries and territories in 2020 due to the COVID-19 pandemic. Lancet. 2021 Nov 6;398(10312):1700-1712.

those working in ICU-departments, the evidence of their being at risk of exhaustion and moral distress was well documented in 2020. On the other hand, the psychological well-being of mental and social health workers remains an under investigated issue.

With increasing circulation of the virus, more and more workers drop out. When looking at data of ACERTA, the alarming signals about short sick leave in the healthcare sector are supported by the numbers, with a noticeable peak in numbers since September 2021. This peak can be noticed across all sectors. These data support the reports of closing classes, schools, departments of hospitals, workplaces and institutions due to a lack of personnel. This is an important issue to consider when considering not to take measures. Hence, the continuity of economic continuity can be put in danger when appropriate measures are not being taken to prevent the further transmission of the virus among the working populations. This puts additional strain on the remaining workers.

Re-enforcement of measures at the workplace. Occupational risk to SARS-CoV-2 depends on several factors including the type of industry and occupation and whether there is frequent or extended close contact with people infected (usually defined within two meters) with SARS-CoV-2. The crisis has learned that by taking appropriate measures in the workplace (telework, ventilation, physical distances...), you can contain the spread of the virus through the workplace. Therefore, taking preventive measures, monitoring and adjusting is one of the most important measures a government can take in the control strategy. The employers, committees and services for prevention and protection at work play a crucial role here, in order to work out and implement the necessary safety and organizational measures at company level.

This does not require additional legislation, but the implementation and re-enforcement of it. Enforcement is very important, hence a lot of companies, agencies and institutions perform well in terms of risk control and implementation of measures. Unfortunately, some companies, agencies and institutions do not implement measures nor respect the basic rules and bring an entire sector in danger. In order to avoid harsh lockdown measures closing sectors, it is important that sectors take all initiatives to motivate their members to follow the rules and at the same time the government should enforce these measures by targeted inspections followed by sanctions if measures are not properly implemented.

Consequently, the government should make full use of those existing structures and empower companies to implement them together with the committees and services for prevention and protection at work. This way you involve people and give them the opportunity to help bring the pandemic under control. This requires public health and occupational health and safety authorities to work together at both the local and national level to prevent the spread of COVID-19 in the workplace and in the general population.

Particularly affected sectors (please refer to [version 20 of the 2-weekly report: Monitoring Belgian COVID-19 infections in work sectors in 2021](#)). The data show that the incidences are starting to *decrease* in most sectors, thanks to *telework* and other measures. In addition, we see first signs of the effect of booster vaccination and efforts to increase vaccination among others in healthcare.

The 14-day incidence rate in the working population is 1944 compared to 1980 (per 100,000) in the general population. The highest incidences (>2200) are in sectors with frequent *high-risk contacts* and contacts with *young people*, such as child care, primary and secondary education, youth care and work, mental and residential health care. In most industrial and commercial sectors, the incidence is below or close to the

average of the general population, with the exception of a few sectors such as for example Wholesale and Retail Trade and also Supply of electricity, gas, steam and air conditioning. In addition, we see a remarkable and worrying increase in incidences in fitness centers and also in the performing arts and recreation sector.

It is encouraging that the incidences in the transportation sector, hospitality sector, sales sector and most manufacturing sectors are doing equivalent or better compared to the working population, given that workers in these sectors often cannot telecommute. Also encouraging is the *decrease* in the last 6 weeks in the number of *high-risk contacts* that index cases report, especially under a sharply rising and more contagious omicron variant of concern. Given the still very high numbers and the sharply rising and more contagious omicron variant, combined with the current and future mass staff attrition due to quarantine and illness, it is crucial to continue to adhere to measures, including telework, and to strictly implement and adhere to the recommendations of the *generic guide* in all companies.

While certain measures (such as mandatory telecommuting) may weigh on productivity for some companies, especially in the long run, a coronary pandemic that is not brought under control is a major economic blow. *Enforcement* is also very important here. Many companies, agencies and institutions are performing well in terms of risk management and implementation of measures. Unfortunately, there are also companies, agencies and institutions that do not implement the measures and do not respect the ground rules. Thus, companies have a strong interest in controlling the pandemic. It is important that together with the social partners an unambiguous motivating message is sent out to all companies, institutions and authorities to take the measures and to do everything together to further control the pandemic.

(Macro)-economic considerations on the (re)-implementation of strong NPI's (see Annex 2 for complete text). The closure of businesses and disruptions of value chains leads to a mechanical loss of production, employment and personal income. However, if they are successful in containing the spread of the disease and thus improving the population's health, such non-pharmaceutical interventions can limit the economic disruption associated with the disease itself, usually triggered by precautionary behavior from consumers and producers.

It has in fact been quickly established (i.e. since the first months of this pandemic) by economists, both in academia and in international organizations, that it is the fear of the virus (i.e. the risk perception) that kills the economy much more than the confinement measures themselves.

Especially since, in comparison with the first lockdown, one has learned to 'fine-tune' these closures and keep large parts of the economy open. From the early stages of the pandemic, we can learn that on average, countries that implemented non-pharmaceutical interventions in the early stages of the pandemic appear to have better short-term economic outcomes and lower mortality, compared with countries that imposed non-pharmaceutical interventions during the later stages of the pandemic.³

This being said, even if smart lockdowns are an investment in the *aggregate economy*, a number of *individual actors/sectors* are of course hurt in the process, because their businesses critically evolve

³ Demirgüç- Kunt, A., Lokshin, M., & Torre, I. (2021). The sooner, the better: The economic impact of non-pharmaceutical interventions during the early stage of the COVID- 19 pandemic. *Economics of Transition and Institutional Change*, 29, 551– 573. <https://doi.org/10.1111/ecot.12284>

around organizing or accommodating social interactions that are influential for epidemic spread (eg large festive events, hospitality, horeca, tourism). It is to be expected that employers and employees in these sectors feel stigmatized, unrightfully affected, and in addition to their financial stability it may also affect their mental health (as is also observed for students, workers in education, and in health care, see MAG report in appendix). The proper way to address such suffering is **through financial support, targeted** as much as possible to address the amount of suffering (through temporary unemployment, help for non-labour fixed costs like rent, etc), **rather than through insufficient closures or an excessively fast reopening**: these decisions should be taken without unnecessary closures or undue reopening delay but public health and a functioning health care system should take priority until the pandemic has become manageable and prospects on economic activity in these most affected sectors have become less subject to fundamental uncertainties related to new Variants of Concerns and the (medium term) characteristics of vaccination, when a sufficiently high proportion of the population has had an opportunity to be protected by vaccination or by previous exposure(s) to the virus.

The importance of public health as a key determinant of the health of the economy is underlined once again in the latest economic projections of the National Bank of Belgium, where it is stated that the international resurgence of the pandemic, together with supply bottlenecks and high energy prices, should lead to a clear slowdown of the economy, which will barely grow until the spring of 2022.⁴

The conclusion is therefore that the package of measures best suited to manage the public health impact, remains also the package that can best help the aggregate economy (and can best address its societal impact if adequate financial compensation is provided to those whose economic activities are impacted the most).

Social impact of measures. When implementing measures the virus circulation as well as the inequalities of families should be taken into account. Some precarious households are not able to offer youth activities to their children, which results in more children at home but also more parents who cannot go to work.

The main measure offered by the government to face school closure is temporary unemployment. The lack of communication and long administrative delays leads to underuse of this measure. Note that this measure is not available to the civil servants (fonctionnaires/ambtenaars).

To ensure the effectiveness of the measure (a mask that is not adapted or worn too much) and to avoid reinforcing inequalities, every school should be provided with enough (adapted) masks to hand out to children whose families cannot afford them.

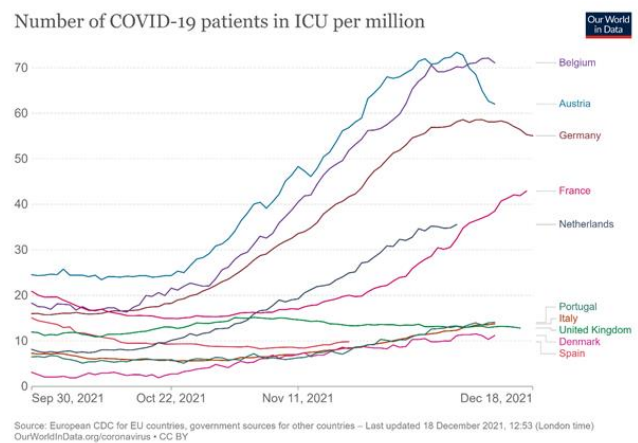
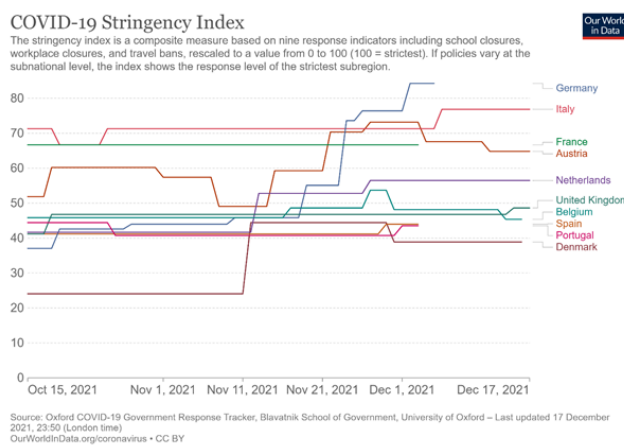
To support people in their efforts and willingness to reduce transmission, and to enhance accessibility, a certain amount of free self-tests should be provided to every citizen. By providing some free self-tests, the amount of HRC will be reduced.

⁴ See "NBB, [The macroeconomic impact of the Easter break is limited, despite the sharp drop in turnover in certain sectors](#)"

3. Proposed packages of measures

The current **stringency index in Belgium** for NPI's appears to be relatively low as compared to our neighboring countries (see figure below), which is in contrast with the very high incidence and number of ICU-hospitalisations per million people. Obviously, the 'real-life' stringency depends not only on the officially taken measures but also on their field implementation and enforcement, and has anyhow been quite dynamic over the past weeks.

While aware of an index' limitations, it is nonetheless essential to apply a sufficiently strict level of NPIs to try and slow down the rapid re-emergence of cases and hospitalisations over the next weeks, and to attempt to 'buy' as much time as possible to bring down the saturation levels of the hospital system and by extension the entire health care system, in particular also the first line, in view of testing and tracing.



Obviously, the 'stringency index' is only one summary metric to quantify and benchmark national packages of NPI's, whereas a lot of their impact lies in their implementation, communication, and where needed enforcement. Unfortunately, too many epidemiological inconsistencies persist in the implementation of measures (we refer, for example, to the absence of distance between viewers in cinemas as compared to concert halls, to ongoing sports youth camps with sleepovers while schools have been closed, to dangerous levels of crowding in public transport, shops, at Christmas markets, at funerals, in football stadia,...). Especially for measures to be understood and respected over a longer period, it is important that packages of NPIs are logical, consistent, based as much as possible on available evidence and repeatedly communicated.

Given the limited knowledge on the true impact of the Omicron variant it is difficult to already predict how the volume of cases will evolve in the coming days and weeks. We need to remain vigilant, the situation in the UK and DK shows that case numbers can rapidly evolve, with the body of knowledge growing every day ('when the facts change, we need to change our recommendations'). That is why we propose to introduce a 2-step approach:

- a. A set of stricter measures should be taken immediately to allow for further decrease of the actual viral transmission, and thus a partial recovery for the health system, the (booster)-vaccination campaign to be further completed and the vaccination of the 5-11 year to be started.

- b. Daily follow-up of the epidemiological status, and impact of the Omicron variant is needed, and may warrant additional measures in due time when cases/incidence would start increasing, Rt value would again exceed 1,... This could be assessed at regular RAG reassessment which takes a broad set of criteria into account.

Suggested additional package of measures

- a. **As a basis, we refer to our earlier [advice dd. 2/12/2021](#)**, in particular to our recommendations on indoor and crowded outdoor gatherings and meetings, and private life.
- b. **Basic measures should be communicated and enforced repeatedly, using compelling visuals:**
 - Reduce all social contacts to a strict minimum
 - Keeping 1.5 m distance at all times and wear masks in indoor and crowded outdoor settings (at least for most vulnerable persons and for all those working in critical jobs that do not permit telework, an FFP2-mask should be recommended and made available at low cost and easy access)
 - ensure proper ventilation up to recommended standards (possible means to be differentiated between private versus professional context)
 - apply low threshold for self-testing when one plans to meet with other people outside one's household (propose free tests and provide a multilingual manual or video in easy language with concrete guidelines)
 - when feeling ill, self-isolate, perform self-assessment, plan an official test
 - when testing positive, respect isolation and quarantine rules. When testing requirements would exceed the offer at peak moments, reinstatement of quarantine for vaccinated high risk contact needs to be strongly considered as a temporary measure.
- c. **Personal life/private meetings:**
 - Very clear guidelines should be given: limit and stabilize your contacts (not too frequently meeting people outside the household; not too many different people), and protect contacts (outdoor if possible, apply ventilation and consider monitoring CO2, do and propose self tests prior to meeting).
 - For end-of-year celebrations: give rule of thumb for numbers, e.g. maximum 2-3 households meeting together, with maximum ventilation and prior testing of all participants (including children). See example from UK⁵. Research from the Motivation Barometer shows that a large number of the population has spontaneous plans to reduce group sizes during the upcoming celebrations (see Annex 1 and chapter 2).
 - Guidelines on personal life should be communicated repeatedly (verbally, pictograms, clips and movies, online information,...) and easily retrievable online and spread further

⁵ <https://www.independentsage.org/wp-content/uploads/2021/12/Household-Mixing-Plan-FINAL.pdf>

through all channels (TV, radio, active screens in waiting rooms or bus stops)... It should be simple and easy-to-remember.

- Self-tests should be made available in sufficient quantities and their (correct) use should be strongly promoted for pro-active use by the general public. Dedicated communication should be made available on how to use them, their value/non-value, relationship with other safety measures (e.g. self-test highly recommended as extra safety layer, not as justification to remove all other barriers). Consider offering freely, for example, 3-4 self-tests to all citizens to stimulate their use over the celebration period. See below section on communication.
 - FFP2-masks should be made available at low cost, and should be prioritized for personal protection of all medically vulnerable persons in addition to their use of professional protection of health care workers and other emergency services' frontline workers, as they protect much better the individual wearer against infection. FFP2 masks have been introduced for the same reason in other countries such as Spain, Germany, Austria,... Nevertheless, surgical masks remain effective in reducing the spread of large droplets hence transmission to other persons, and given their actual broader availability at large scale, their use should equally remain stimulated.
 - Social measures and access: particularly for the socially vulnerable, care should be given to keep thresholds for obtaining adapted masks (FFP2, children's mask) and self-tests but also work arrangements such as temporary unemployment within reach
- d. **Work:** telework should certainly be maintained and extended to 5/5 days at least until the end of January 2022 in this critical period of increasing omicron infections and increasing booster adult and childhood vaccinations. The more people telework, the less HRC are generated. Communication on how to organize temporary unemployment should be improved as this is underused by those most in need.
- e. **Education**
- **Primary/secondary:** even though schools are semi-closed at present, the modalities of restart after the end-of-year holidays will have to be defined to keep schools open in a stable manner and to avoid hybridisation or temporary closure. The experiences and analysis of the past months can be very instrumental to support the maintenance of a set of measures until a higher level of vaccination has also been reached in the younger age ranges (see Annex 3). This will include the continuation of measures taken at the OCC of 3/12/21, including temporary continuation of use of masks + optimal ventilation + vaccination 5-11 (and 12-18) y old + preventive testing + testing of HRC. Preventive testing could include, for example, regular self-test (examples from Germany, Greece, Canada⁶ can be used as inspiration) in an affordable manner for schools (it is important that the budgetary implications be discussed. Extra-curricular activities such as entire class travel should be avoided throughout the month of January 2022. Prior to restarting the school year, an epidemiological assessment should be done.

⁶ <https://www.quebec.ca/education/directives-specifiques-education-covid/tests-rapides>

- **Higher education:** give priority to the safe organization of the exams (on site). Discuss later in January on modalities of restart semester 2.

f. **Events and gatherings**

- Certain types of events (large scale, without respect for measures and with a lot of crowding) have the capacity to serve as superspreading events and should be stopped immediately in the current circumstances. On the other hand, there is evidence that small scale, well-organized and seated events induce a much lower risk, especially in the presence of adequate ventilation and respected protocols managing density (e.g. CERM/CIRM). Nevertheless, also performing-arts companies were found to have higher than average incidences in RSZ/ONSS data.
- **All (outdoor, semi-outdoor) mass-events** where enforcement of existing measures is not carried out should be stopped immediately.
 1. In concreto, as advised earlier, football competitions should continue without fans in the stadia, as this is not a purely outdoor event, but attracts high numbers of people crowding in public transport and horeca before and after.
 2. Other activities attracting large crowds in indoor and outdoor settings (e.g. Christmas markets, other sports events) should be stopped immediately unless they can prove and enhance very strict crowd control and respect of measures. Activities beyond 8 pm should be stopped.
- **Remaining indoor events and performances, including religious services or church-based events**
 1. Should strictly take place with respect to prior set measures (= with mask, optimal ventilation, safe distance between households, maximum capacity of 200 people). On the mid long term prior existing standardized protocols should be reinstalled
- **Group activities (youth, sports, including camps:** consider to suspend activities with overnight stay until at least the end of January, as this would imply long standing mixing of numerous households. Indoor group activities (sports, other) should be suspended unless organizers have a proven track record on investments made in air quality and the correct application of safety protocols (CERM/CIRM, sector protocols)
- **Funerals and wedding:**
 1. Funerals should be allowed to take place, the maximum allowed capacity of 200 people should not be exceeded and organizers should respect the social distancing rules of 1,5m, mask wearing, ventilation,... (idem: reinstall protocols and apply the same rules as for the cultural and event sectors, who are working with audiences).The organisation of large scale 'coffee tables' and mourning meals (> 2-3 households) is deemed not safe at the moment.
 2. Weddings: seated celebrations can continue under the same conditions as religious and cultural events (masks, optimal ventilation, distance seating, max 200 p), however wedding eating, drinking and dancing parties for large groups (= > 2-3 households) are deemed not safe at the moment (see: private life).

g. **Horeca:**

- Several owners made already important investments in CO2 measurement, ventilation, reduced density,... which needs to be acknowledged as they are part of the mid to long

term solution and have reduced transmission risk (as can be seen also from the most recent RSZ/ONSS/IDEWE-report).

- In contrast, places which do not respect the actual rules should be stopped from working; therefore more controls should be organised and corrective action taken.
- We propose to maintain the closing hour of 11 pm and concentrate on strictly seated service in small, well spaced companies (max 6 p)
- If the epidemiological situation should worsen, temporary closure of these activities is needed

h. Shopping: anti-crowding measures in shops, shopping centres and shopping streets are absolutely essential over the entire holiday period (fun shopping, sales in early January 2022,...). To reduce 'fun shopping' we suggest to restrict to maximum 2 persons shopping together (exception: single parent families). If the situation worsens then solo-shopping will be needed.

i. Public transport: Crowding is a real risk, especially when schools will restart. Advice to reduce capacity to 50% and add autocar (as was done last year). Safe ways of travel to be recommended (see: private life). More control and enforcement on correct mask wearing is needed.

j. International travel

- although international travel has not been forbidden or banned, it remains important to stress ways of safer travel (own car, making as few additional social contacts as possible; non-crowded and well ventilated public transport, with FFP2 mask as a potential additional barrier) and to stress respect/enforcement of the existing regulations when returning from international travel (i.e., tests upon return and quarantine where applicable).

k. Communication

- Communication remains needed on measures themselves and rationale for it, but also on how to apply them. In concreto:
 1. need for dedicated communication on specific topics (e.g. why and how to perform a self-testing, how to organize a safe private gathering, when to use FFP2-masks, role of ventilation, role of booster-shot with omicron, role of vaccination 5-11 y old, how/when to apply for temporary unemployment,...)
 2. need for concrete instructions, preferably in a video to be broadcasted on TV, bus stops, waiting rooms (e.g. correct use of mask, self-test,...)
 3. need to find back concrete measures in an easy manner (website info-coronavirus not up to date and not user-friendly).
- Specific recommendations on communication style/methodology:
 1. Language: war- (e.g., enemy, beating the virus, battle) and sport-related (e.g., marathon, cycling up hill, endurance) metaphors need to be avoided as they create the false impression that virus circulation can be reduced to zero and that the duration of the effort is completely predictable. Instead, narratives need to highlight the need to develop a safe living style with respect and care for other people (prosocial motives) and the necessity to preserve operational activity of critical societal sectors (health care, schools, work, culture, ...). To facilitate a shift in the narrative, it is critical to increase the population understanding in terms of probabilities rather than in binary terms. To illustrate, the probability of infection

after vaccination, after a booster injection or after entering with a Corona Pass is reduced, but not reduced to zero.

2. Targeted, visual communication is required such that people easily understand the what, how, and why of measures. To illustrate, different visual scenarios can be presented that indicate how different social contact behaviors come with a different risk level.
3. Vaccination: make it concretely (graphically) clear what the incremental value is of a third dose among vaccinated, even if they got infected since vaccination. Similarly, clarify graphically how a first and second dose are even critical for previously infected, unvaccinated persons. The corona pass creates the impression that infections serve as an equivalent for vaccination.
4. Testing and quarantine: communication is a big issue; different feedback from GP and contact tracing: issue with people living under the same roof; when vaccinated and tested negative they can leave quarantine which is an issue given that transmission can still take place

Annex 1. Motivational issues

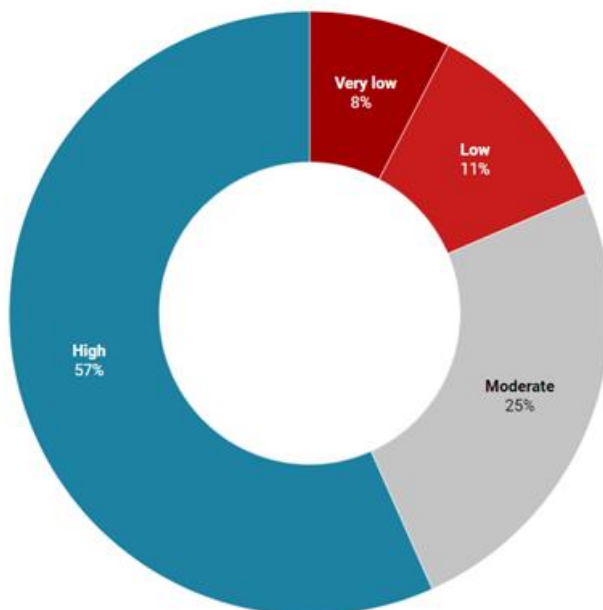
During the latest wave, from 2021-12-15 to 2021-12-20, 14276 people (57.39% from Flanders; 42.61% from Wallonia) completed the Motivation Barometer, which addressed a variety of topics. Four key messages can be drawn from the data. First, the autonomous or voluntary motivation among vaccinated persons has slightly increased since the beginning of December, with 57% and 25% of individuals being somewhat or highly motivated (figure 1). Second, as for the number of social contacts during the largest social event in the coming weeks, almost 70% of both vaccinated and unvaccinated people indicate to meet with 10 or less persons during this event (figure 2). Young adults and highly educated persons plan to meet with a larger number of people. Third, when asked whether people plan to take a self-test during this social event, only 44% of the vaccinated persons and 19% of the unvaccinated persons plan to do so (figure 3). More highly educated persons plan to use self-tests more frequently. Fourth, half of the vaccinated persons are (very) concerned with the omicron variant, while only 10% of the unvaccinated persons are worried about this new variant.

These findings suggest that the motivational support level for the measures is still fairly high (at least among vaccinated persons) and that a substantial portion of the population (both vaccinated and unvaccinated individuals) plans to limit their social contacts (i.e., < 10 persons). At the same time, it is critical to communicate a clear set of guidelines ('manual') about how people can organize these social gatherings safely by for instance using self-tests and ventilation.

Motivation among vaccinated participants

The Motivationbarometer
N= 11 977
15 - 20 December, 2020

Very low Low Moderate High



Percentages are weighted for age group, gender, education level and region

Figure 1: Levels of autonomous or voluntary motivation among vaccinated individuals (percentages)

Think about the moment during the Christmas holidays when you will meet the highest number of people.

With respect to this moment, how many persons will be present?

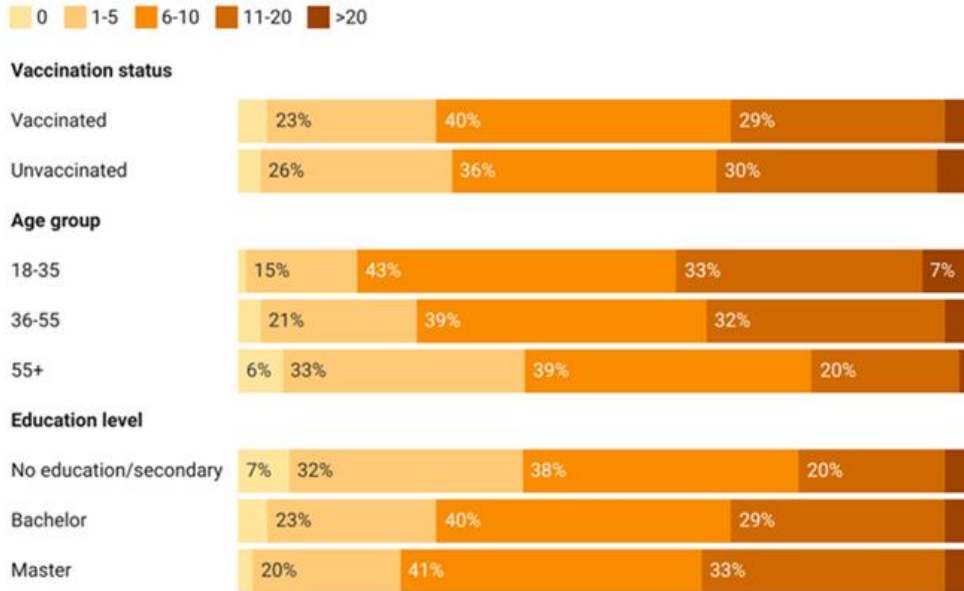


Figure 2: Number of planned social contacts (percentages) during largest social event during the Christmas Holidays

Are you planning to take a self-test?

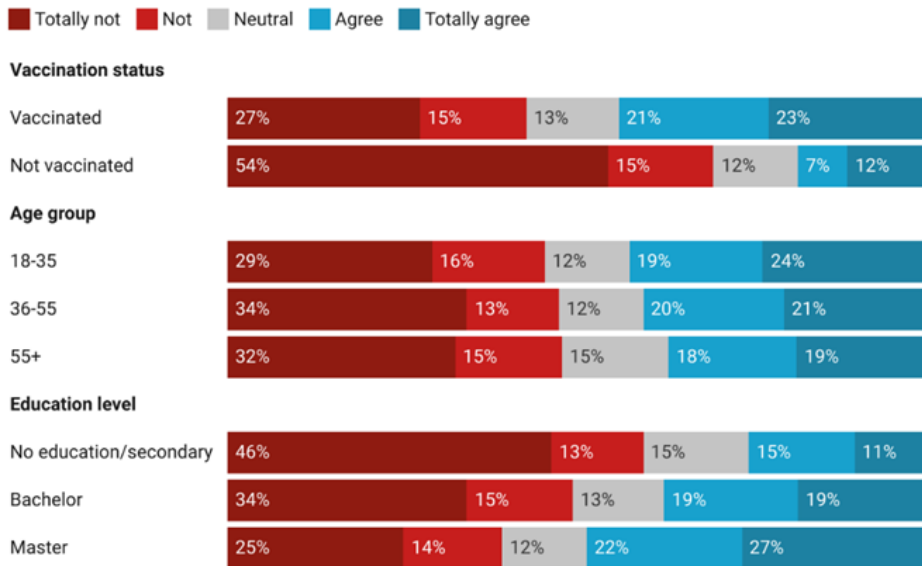
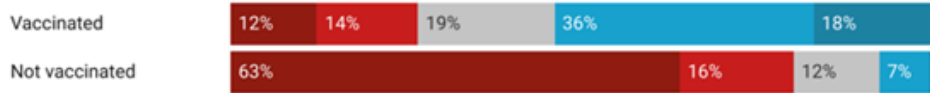


Figure 3: Planned use of self-tests during social gatherings (percentages)

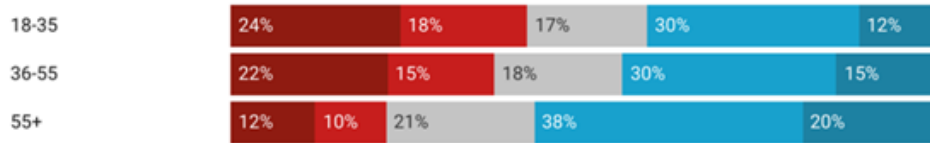
Concerns regarding Omicron

■ Totally not
 ■ Not
 ■ Neutral
 ■ Agree
 ■ Totally agree

Vaccination status



Age group



Education level

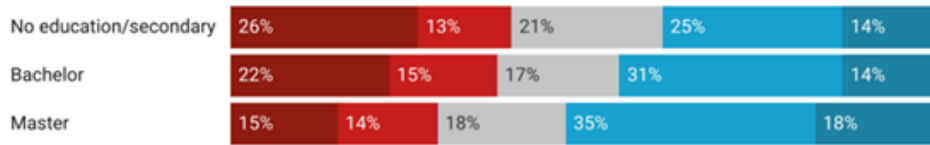


Figure 4: Concerns regarding omicron (percentages)

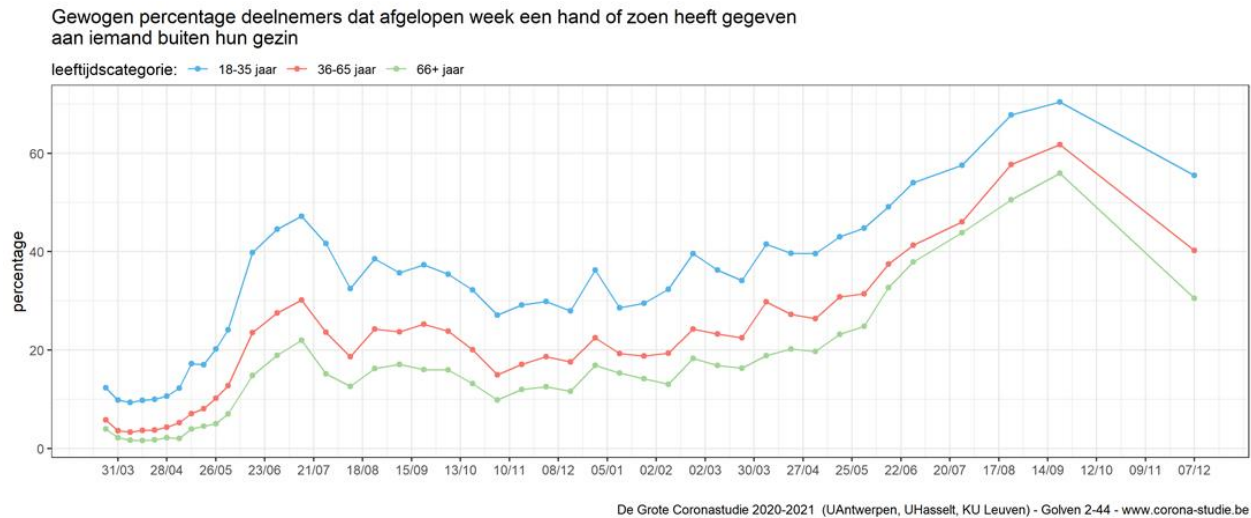


Figure 5: Age-specific weighted % of respondents shaking hands, kissing or hugging a non-household member ; 44 measurements: March 2020-December 2021 (Great Corona Study (GCS), Universities of Antwerp, Hasselt and Leuven)

Annex 2. Economic considerations

Members of the GEMS: Mathias Dewatripont, Philippe Beutels, Lode Godderis

The closure of businesses and disruptions of value chains leads to a mechanical loss of production, employment and personal income. However, if they are successful in containing the spread of the disease and thus improving the population's health, such non-pharmaceutical interventions can limit the economic disruption associated with the disease itself, usually triggered by precautionary behaviour from consumers and producers.

It has in fact been quickly established (i.e. since the first months of this pandemic) by economists, both in academia and in international organizations, that it is the fear of the virus (i.e. the risk perception) that kills the economy much more than the confinement measures themselves. See for example the studies performed in the US (Chetty et al.⁷) or on the comparison between Denmark and Sweden (Sheridan et al.⁸) showing that speeding up reopening does not help the economy if individuals fear the virus. The dominance of fear on economic activity (since it depresses general demand) is confirmed in an International Monetary Fund study on 128 countries (see IMF blog⁹). As summed up by Professor Charles Wyplosz, founding editor of the academic journal *Covid Economics* last month in 24th Congrès de Economistes Belges de Langue Française in the plenary lecture of this event : “il n’y a pas de tradeoff entre santé et économie”¹⁰. Which is to say that closures of economic activity should be dictated by sanitary considerations and seen as an **investment** in the economy too if virus circulation is getting out of hand.

Especially since, in comparison with the first lockdown, one has learned to ‘fine-tune’ these closures and keep large parts of the economy open. From the early stages of the pandemic, we can learn that on average, countries that implemented non-pharmaceutical interventions in the early stages of the pandemic appear to have better short-term economic outcomes and lower mortality, compared with countries that imposed non-pharmaceutical interventions during the later stages of the pandemic.¹¹

This being said, even if smart lockdowns are an investment in the **aggregate economy**, a number of **individual actors/sectors** are of course hurt in the process, because their businesses critically evolve around organizing or accommodating social interactions that are influential for epidemic spread (eg large festive events, hospitality, horeca, tourism). It is to be expected that employers and employees in these sectors feel stigmatized, unrightfully affected, and in addition to their financial stability it may also affect their mental health (as the MAG report indicates, like students, workers in education, and in health care). The proper way to address such suffering is through financial support, targeted as well as possible to address the amount of suffering (through temporary unemployment, help for non-labour fixed costs like rent, etc), rather than through insufficient closures or an excessively fast reopening: these decisions should be taken without unnecessary closures or undue reopening delay but public health and a functioning health care system should take priority until the pandemic disease and control burden has become more manageable (and prospects on economic activity in these most affected sectors have become less subject to fundamental uncertainties related to new Variants of Concerns and the (medium term) characteristics of vaccination, until a sufficiently high proportion of the population has had an opportunity to be protected by vaccination or by previous exposure(s) to the virus).

⁷ « How did covid-19 and stabilization policies affect spending and employment ? », Working Paper n°27431, National Bureau of Economic Research, June 2020, and revised November 2020: Raj Chetty, John N. Friedman, Nathaniel Hendren, Michael Stepner, and the Opportunity Insights Team « [The Economic Impacts of COVID-19: Evidence from a New Public Database Built Using Private Sector Data](#)”.

Moreover, one should resist the ‘prisoner’s dilemma situation’ (which was highlighted in particular by Gert Peersman¹²) : of course any individual closure brings an individual actor an economic cost, but one should not forget that such a closure provides those actors that remain open a safety benefit, so that the aggregate economy can benefit as a whole. In fact, if we focused only on individual costs of closure without integrating its benefits elsewhere in the economy and thereby decided not to close anything, everybody would end up suffering due to a virus circulation that would get out of hand. This means that targeted closures and timely mandated teleworking can be ‘win-win’ with appropriate compensation for those who are forced to close or to work from home while having to care for children during school closure periods.

While more widespread telework has the potential to increase productivity, improve work-life balance and reduce emissions, its overall impact is ambiguous.¹³ Global Forum on Productivity (GFP) undertook an online survey among managers and workers in 25 countries about their experience and expectations, with a particular focus on productivity and well-being. Managers and workers had an overall positive assessment from teleworking both for firm performance and for individual well-being. Respondents, on average, find that the ideal amount of telework is around 2-3 days per week, in line with other recent evidence and with the idea that the benefits (e.g., less commuting, fewer distractions) and costs (e.g., impaired communication and knowledge flows) need to be balanced at an intermediate level of telework intensity. To meet the challenges of this “hybrid” working mode further changes from management are needed, such as the co-ordination of schedules to encourage a sufficient degree of in-person interaction, and further investment in ICT tools and skills as well as more soft skills to master online communication.¹⁴

The fact that it is the virus more than the measures that hurt the economy is visible in Belgium too, as indicated by the following Figure 1, taken from the last report on [the ERMG dashboard](#), in July 2021, where firms have regularly indicated reasons for their revenue loss from March 2020 until June 2021. Key insights are the following:

1. Lack of demand is consistently the most-frequently cited cause of revenue loss, even in times of (full or partial) lockdown, as data from March-April 2020, November 2020 and April 2021 show.
2. A short targeted lockdown as the Easter Break in April 2021, has moderate aggregate impact, since it has affected less than 20% of the firms, that is, less than half the number of firms which cite demand as a reason for their revenue loss.

⁸ «Social distancing laws cause only small losses of economic activity during the COVID-19 pandemic in Scandinavia.» *Proc Natl Acad Sci U S A*. 2020 Aug 25;117(34):20468-20473. Sheridan A, Andersen AL, Hansen ET, Johannesen N. doi: 10.1073/pnas.2010068117.

⁹ See « COVID’s Impact in Real Time: Finding Balance Amid the Crisis », Francesco Grigoli and Damiano Sandri, *IMF Blog*, 8 October 2020);

¹⁰ « La contribution des économistes à la compréhension de la pandémie du Covid », opening lecture of the Congress devoted to *Les leçons économiques de la crise COVID-19* (held on November 18, 2021 at the National Bank of Belgium (NBB) under the presidency of M. Dewatripont (Université libre de Bruxelles) and P. Wunsch (Gouverneur of the NBB).

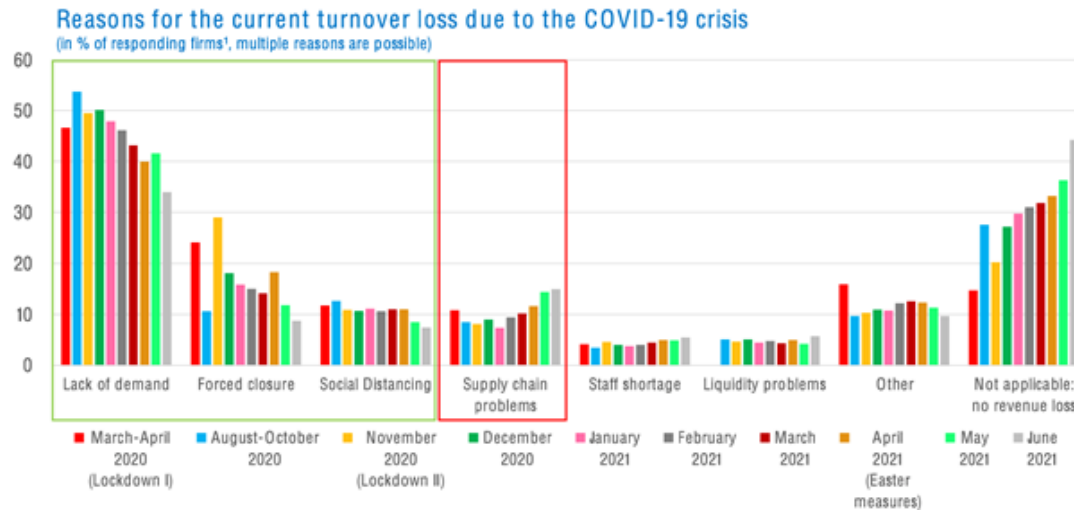
¹¹ Demirgüç- Kunt, A., Lokshin, M., & Torre, I. (2021). The sooner, the better: The economic impact of non-pharmaceutical interventions during the early stage of the COVID- 19 pandemic. *Economics of Transition and Institutional Change*, 29, 551– 573. <https://doi.org/10.1111/ecot.12284>

¹² « Kies de korte pijn, maar ga tot het gaatje », *De Standaard*, 27 oktober 2020.

¹³ OECD (2020), [Productivity Gains from Teleworking in the Post COVID-19 Era : How Can Public Policies Make it Happen?](#), OECD Publishing, Paris.

¹⁴ Criscuolo, C., et al. (2021), "The role of telework for productivity during and post-COVID-19: Results from an OECD survey among managers and workers", OECD Productivity Working Papers, No. 31, OECD Publishing, Paris, <https://doi.org/10.1787/7fe47de2-en>.

Figure1:



Source: [ERMG dashboard report, 7 July 2021](#)

This is also apparent from figure 2 where the impact on company turnover of different phases of restrictions in Belgium are shown up to the April Easter Break phase, when it was noted that loss of turnover was disproportionately higher for travel agents (93%), the arts, amusement and recreation sector (80%), horeca (67%), and transport of persons (41%).¹⁵

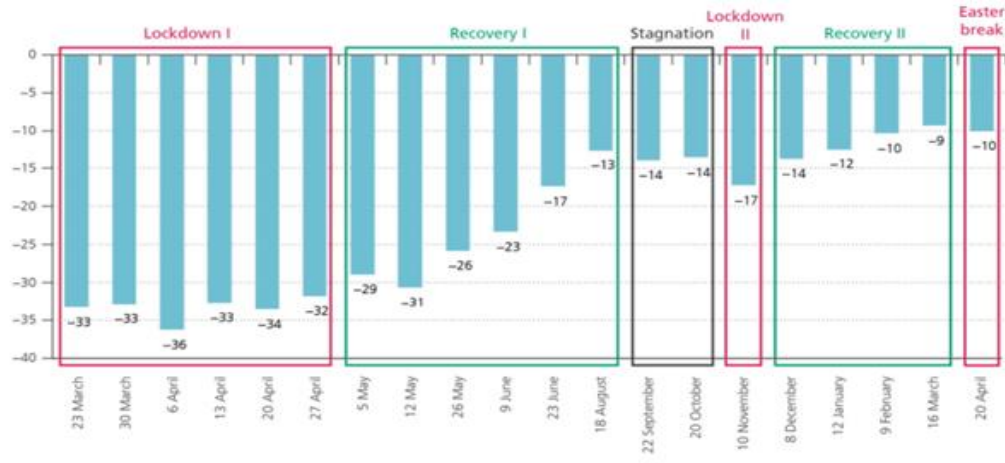
The importance of public health as a key determinant of the health of the economy is underlined once again in the latest economic projections of the National Bank of Belgium, where it is stated that the international resurgence of the pandemic, together with supply bottlenecks and high energy prices, should lead to a clear slowdown of the economy, which will barely grow until the spring of 2022.¹⁶

The conclusion is therefore that the package of measures best suited to manage the public health impact, remains also the package that can best help the aggregate economy (and can best address its societal impact if adequate financial compensation is provided to those whose economic activities are impacted the most).

¹⁵ See "NBB, [The macroeconomic impact of the Easter break is limited, despite the sharp drop in turnover in certain sectors](#)"

¹⁶ See Economic projections for Belgium, *NBB Economic Review*, December 2021.

Figure 2: Impact of the different stages of the Covid-19 pandemic on turnover of companies in Belgium ([source: NBB](#))



Sources: BECI, Boerenbond, NSZ/SNI, UCM, UNIZO, UWE, VBO/FEB, VOKA, NBB.

Annex 3. The Belgian education system during the pandemic, March 2020 – December 2021.

Erika Vlieghe, infectiologist, University of Antwerp, Belgium; chair of GEMS

Niel Hens, biostatistician and mathematical modeler, Hasselt University and University of Antwerp, Belgium; member of GEMS

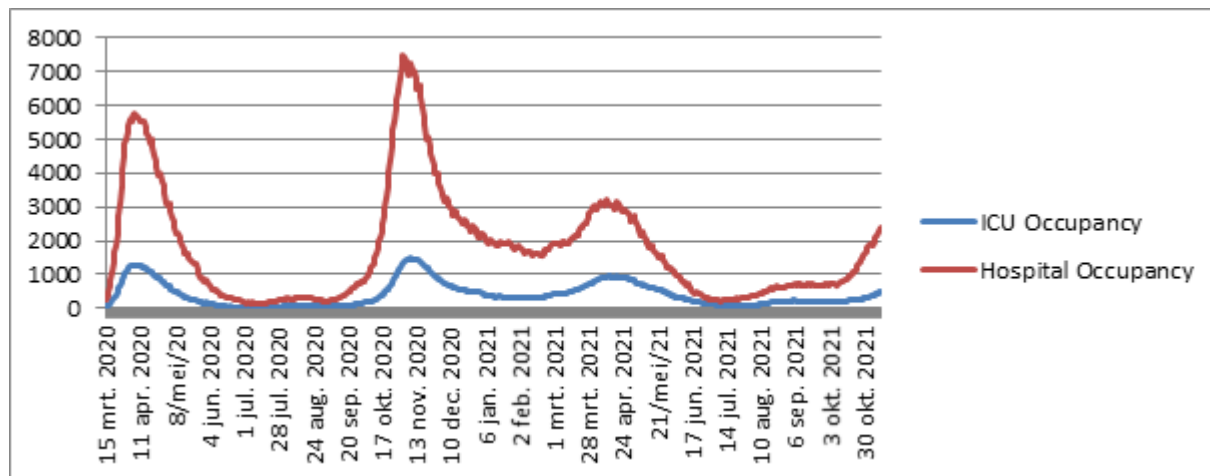
Geert Molenberghs, biostatistician, Hasselt University and KU Leuven, Belgium; member of GEMS 12 December 2021

The institutional context

In the Belgian federal system, education and higher education are competences that belong to the three Communities: the Flemish Community for the Dutch speaking system, the Federation Wallonia-Brussels for the French speaking system, and the German Community for the German speaking system.

The evolution of the Belgian pandemic

The following graph depicts the evolution of the pandemic in Belgium, in terms of hospital and ICU occupancy, with four major peaks (Spring and Autumn 2020 and 2021), a Summer 2020 flare-up, a plateau phase between December 2020 and March 2020, and an ongoing fourth wave at this time.



School year 2019-2020

At the start of the first wave, schools (16 March 2020) were closed and higher education (9 March 2020) moved to full online education.

Mathematical modeling indicated that opening schools in full in Spring and early Summer 2020 would provoke a surge. Precisely, Coletti et al. (BMC Infectious Diseases 2021) found that opening schools for the 18- population could create a surge in hospitalisations, albeit smaller when compared to restarting leisure activities and re-opening of the workplace. In the same vein, Willem et al. (Nature Communications 2021) found that opening of schools could produce a surge in hospitalizations. Evidently, assumptions regarding the susceptibility of children affect the estimated impact of school reopening. Also these authors found that work and leisure related social mixing patterns had more impact on COVID-19 burden of disease.

Against this background, compulsory education opened in a very restrictive mode in May-June 2020.

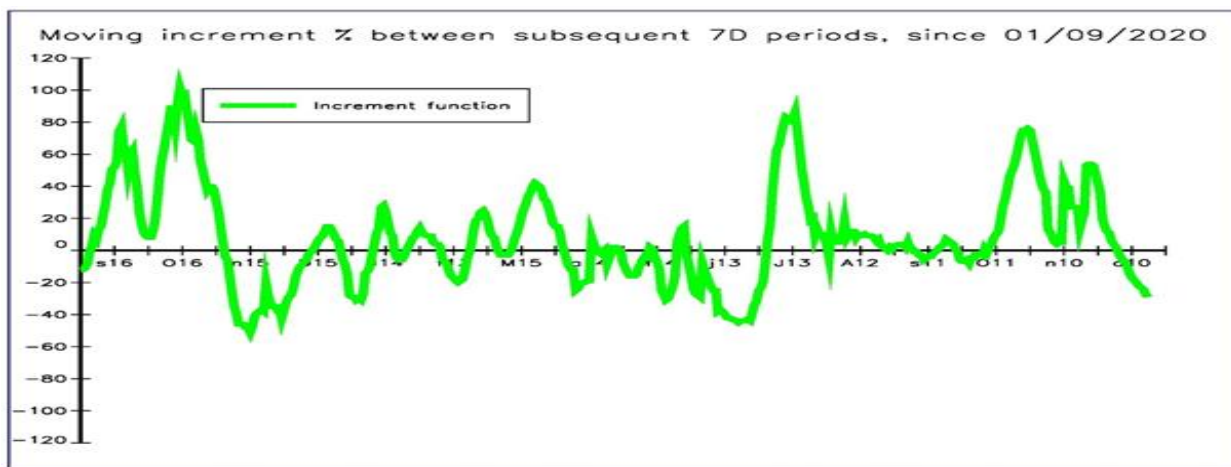
Higher education finished the academic year fully in distance learning mode, apart from the exams in Flanders. The French language higher education system canceled exams.

School year 2020-2021

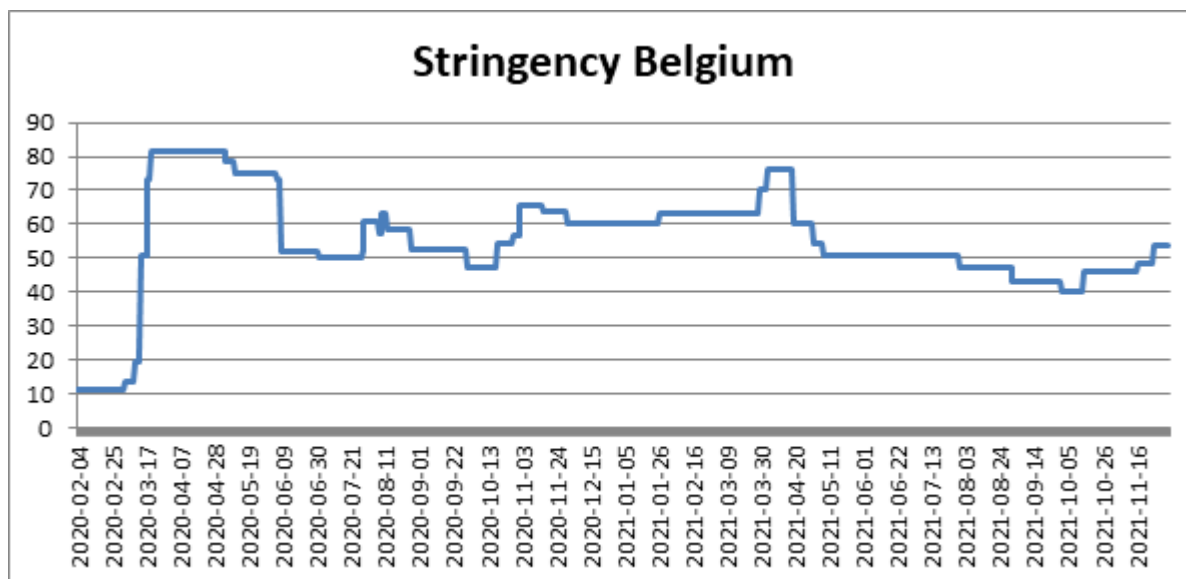
The resurgence over the Summer of 2020 was counteracted with stringent non-pharmaceutical interventions. This notwithstanding, owing to a combination of international travel and relaxations, numbers were increasing at the start of the school year 2020-2021. The following measures were taken at the start of the school year:

- Schools opened fully on-site on 1 September 2020, but with a mask mandate in secondary education.
- Higher education opened in the second half of September 2020 in so-called code yellow (lecture halls on half of their capacity, i.e., hybrid).

Over the month of September and further into October 2020, incidence went up rapidly, as is clear from the following increment curve (for any given day displaying the increment or decrease of the number of confirmed cases of the most recent 7-day period relative to the immediately preceding one). The curve starts on 1 September 2020 and runs through 11 December 2021. It is clear that a rapid increase early in September, is followed by a deceleration until the end of September 2020, at which time a new period of acceleration starts.



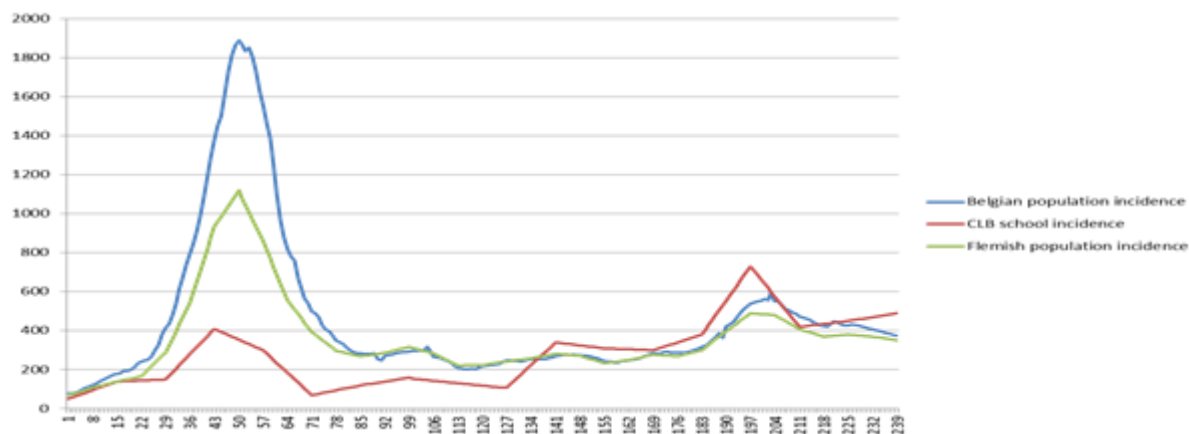
The first acceleration is commonly ascribed to seeding by a massive influx from incoming travelers, the second one to the start of the academic year. Natalia et al. (revised version under review with PLoS One, 2021) provides evidence for this assertion. A compounding factor is the relatively low stringency over this period in Belgium:



While the incidence at the peak of the Autumn 2020 wave rose above 1800 in Belgium and above 1000 in Flanders, the incidence in the Flemish school system increased considerably less. The following graph depicts these three incidences throughout the school year 2020-2021 (1 September 2020 – 30 June 2021).

Around the Autumn break of 2020 (first week of November), additional measures were taken:

- The 3rd to 6th year of secondary education moved to a hybrid format (half of the time homeschooling, half of the time on-site).
- A cooling-down week was introduced, extending the regular one-week vacation to two weeks.
- Protocols were established to reduce contacts between class bubbles, and to restrict access by third parties to schools.



At this time, higher education moved to ‘code red,’ meaning that all teaching took place online, apart from practical sessions that could only take place in on-site mode. The January 2021 exams took place on-site. For Flanders, this had happened in both June and September 2020, but for the French speaking system, these were the first higher-education exams in on-site format since the start of the pandemic.

School incidences remained well below that of the general population until mid-February 2021, at which time the alpha variant was rapidly spreading – its spread started early December 2020, reached 50% mid-February 2021, and attained its peak 90% early April 2021.

At this time, additional measures were taken:

- No fundamental changes to secondary education, apart from a full homeschooling week preceding the regular one-week Spring break.
- Mask mandate for the 5th and 6th years of primary education. This was implemented only in the Dutch speaking schools.

Due to the spread of alpha, and in spite of the progressing vaccination campaign, incidences and hospitalizations continued to rise. A general cool-down week was added to the regular two-week Easter vacation, coinciding with the peak of the third wave.

After Easter, the situation gradually improved in the general population, but there was a rise in the incidences of the Flemish school system. At this time, the delta variant was rapidly progressing. Indeed, the first cases of delta were identified in Belgium in early April 2021, with the variant reaching 50% on 1 July 2021, and finally 100% on 1 August 2021.

Measures were relaxed in June 2021. Hybridization in secondary school was abandoned, but masks were maintained. Higher education moved back to on-site teaching.

School year 2021-2022

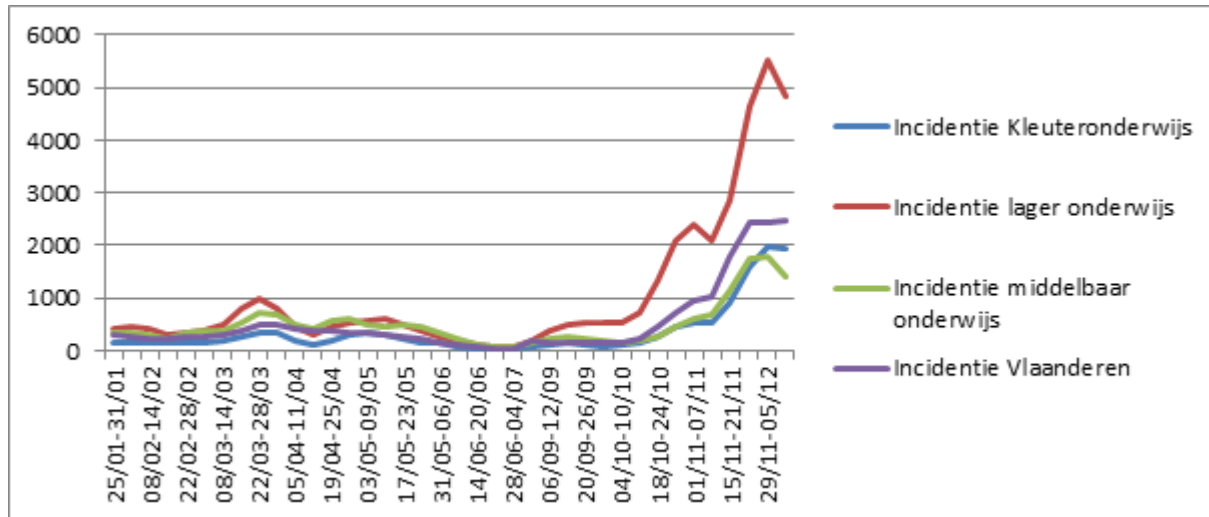
The school and academic years opened against the background of 100% delta circulation, and on-going vaccination in the 12-15 years age bracket, with vaccination far advanced in the 16+ population:

Region	Fully vaccinated on 1 September 2021 in 12-17 years	Fully vaccinated on 8 December 2021 in 12-17 years
Flanders	67%	86%
Wallonia	50%	67%
Brussels	17%	43%

The decision was taken to start the school year fully on-site, for all levels, even though incidences were increasing. For Brussels, with a higher incidence on 1 September 2021 and a much lower vaccination rate (especially in younger age brackets), masks were maintained. Higher education started fully on-site (code green), a mask mandate was maintained in the French speaking higher education system, with this measure optional (i.e., to be decided by the individual HEIs) in Flanders.

In September and October 2021, stringency was lowered in society at large as well.

From the start of the school year, incidences were much higher in primary school than in all of the following: secondary school, kindergarten, and society at large (figures for Flanders), with only recently a noticeable decline in the primary and secondary school system incidences:

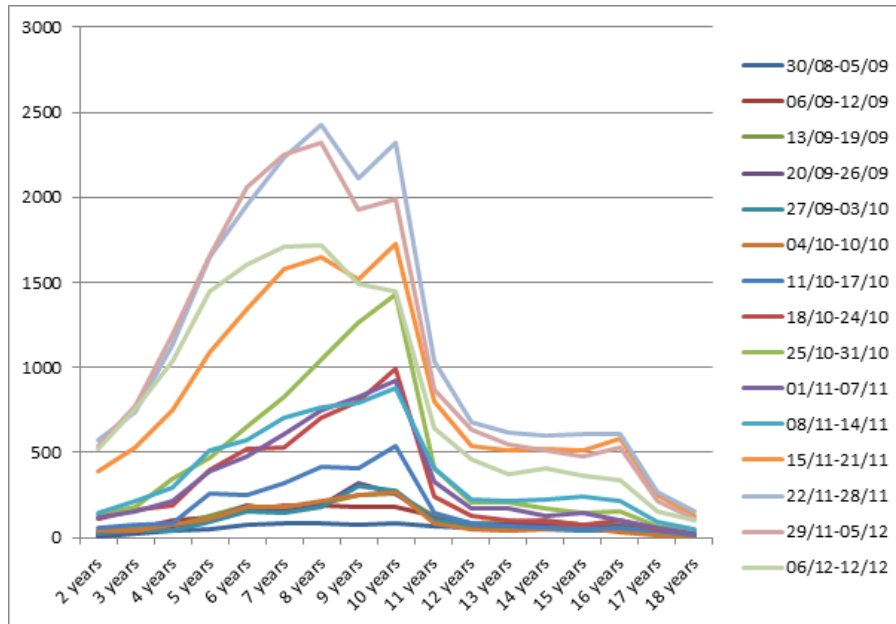


When incidences are considered for the 0-9 and 10-19 years age brackets in the general population, a similar picture emerges.

GEMS experts have insisted on the following measures:

- **Mask mandates in primary school.** Even though they were applied from February to June 2021 in the 5th and 6th year of primary schools, it took until November 2021 before they were applied again in these grades (only in Flanders). The mask mandate has been extended to the entire Belgian primary school system, as well as in other public places as of the age of 6 years, starting 8 December 2021.
- **Ventilation.** There has been a remarkable procrastination in policy makers responsible for schools to enforce, for example CO2 measurement. As of December 8, 2021, it is mandatory, with the mandate to ventilate, air, or leave the room when 900 ppm is reached;
- **Testing and tracing.** With rapidly increasing incidences, testing has become very difficult and the testing policy was in fact relaxed. At the onset of the school year, a class was quarantined as soon as 2 cases tested positive; at the start of November 2021, the threshold was increased to 4 cases, to go down again to 3 cases near the end of the month, and back to two cases as of 8 December 2021. Modeling work by Torneri et al. (preprint <https://www.medrxiv.org/content/10.1101/2021.11.15.21266187v1>) has shown that major gains are possible with frequent preventive testing (e.g., using saliva tests or other child-friendly tests, as is the case in many European countries).
- **Vaccination.** It is clear that vaccination rates are high in Flanders in the 12-17 years age bracket, while the rate is lower in Wallonia and problematic in Brussels. The advisory process for vaccination in the 5-11 years age bracket is currently ongoing. Following the green light by EMA, the Superior Health Council is currently preparing an advice. Upon approval, the Interministerial Conference on Health (federal plus regional ministers of health) will take a decision. If positive, the three regions (Flanders, Wallonia, Brussels) will integrate this group in the vaccination campaign.

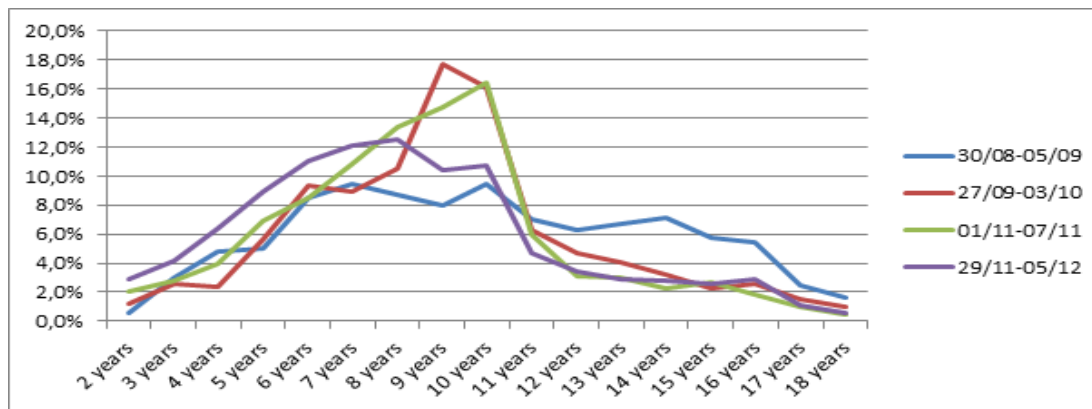
The effects of vaccination is clear in the following graph, where the number of confirmed infections in Flemish schools, per age and per week since the start of the current school year, is given.



In the light of what was said earlier, it is clear that the curves rise with time. In every individual curve, the secondary school ages (11-12 years and over) exhibit a sharp drop relative to primary schools. There is another important phenomenon: whereas in earlier weeks the curves nearly monotonically rise with age until 10 years, to then sharply go down, this peak is leveled off in the two most recent weeks, i.e., the effect of the mask mandate in the 5th and 6th year of primary school.

Of note, the very last curve, for 06/12-12/12 shows a decline relative to the previous ones.

We can see this more clearly by plotting the relative contribution to the infections for a selection of four weeks (the ones containing the first day of every month), per year of age:



In the first week, there are slightly more infections in primary than secondary schools in Flanders, the effect of progressing vaccination. In the weeks of 27/09-03/10 and 01/11-07/11 the situation is dramatically different, with a clear shift towards primary schools, and a gradual build up from younger to older ages within the kindergarten-primary system. Yet, in the most recent week 29/11-05/12, the oldest ages within the primary school system no longer exhibit the higher fractions.

The stochastic transmission model for Belgium shows that vaccination of children between 5 and 11 years of age can have an important impact on waves of COVID-19 infections, hospital admissions and ICU load, by delaying the rise of such a wave, and flattening its peak. The number of hospital admissions in the youngest age group is low in our age-structured model, hence the added benefit of vaccine uptake in children is mainly a consequence of its capacity to reduce transmission to and therefore between older age groups in the community. This might change if properties of future VOCs (in particular Omicron) change with regards to immunity and infectivity.

For a hypothetical wave in 2022, with specified risk behavior, VOC and vaccine assumptions in place, simulations with vaccination coverage of 95% in the complete Belgian population over the age of 18 years would prevent at least 30% of hospitalizations. Improving vaccination coverage to at least 90% in each age cohort for 18+ has similar potential compared to introducing widespread vaccination of children between 5 and 11 years old, through adapted social contact behavior and/or modified viral or vaccine characteristics could substantially impact this finding. A combined strategy, through which both universal vaccination of children is introduced and vaccine uptake in adults is increased, has substantial added benefit relative to either strategy by itself. Furthermore, such a combined strategy is likely to reduce uncertainty related to modified transmission dynamics associated with the rise of a new VOC.

A retrospective scenario, in which children between 5 and 11 years old would have been vaccinated in July and August 2021, shows a relative constant level of hospital admissions and ICU load from September until December 2021.