

## A note on macroeconomic impact of “contain & mitigate” SARS-CoV-2 strategies

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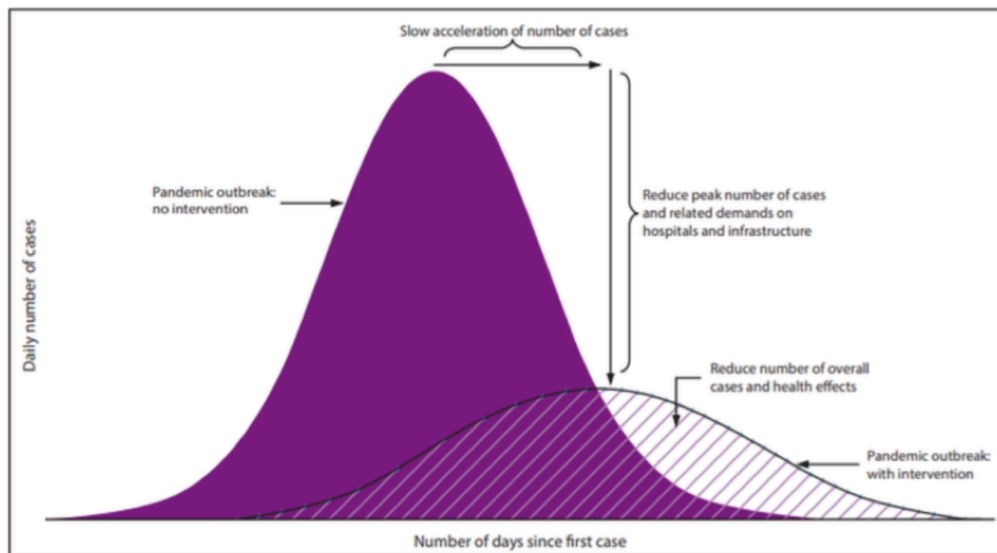
Some opinion makers worry that “contain & mitigate” strategies for SARS-CoV-2 have disproportional impact on the economy. Their argument may gain weight over time through the luxury of hindsight on the severity of COVID-19, policy makers (in China or anywhere else) did and do not have.

There are three main reasons to continue to try to stop the spread of SARS-CoV-2: (1) flatten the epidemic peak (see Figure 1) to enable health care systems to cope with potential surge capacity (and all ripples a high peak will cause through the health care system, on essential supplies and in society); (2) buy time to avoid cocirculation with influenza and for antiviral and vaccine candidates to become available for treatment of the majority of cases to come in a likely second wave; (3) we owe to future generations to do our utmost in avoiding a new virus causing substantial additional disease and death through the ages (even if uncertainty persists how much additional disease and death exactly), as long as the chance of still being able to avoid SARS-CoV-2 becoming endemic, exceeds zero.

The third argument needs continuous re-evaluation, related to the probability, severity and lethality of COVID-19 per average SARS-CoV-2 infection, and to understanding the causes (eg role of asymptomatic spread) and extent of its global spread. The sometimes heard “it’s similar to seasonal flu, mainly killing the weak and the elderly” is not just unethical when it is used to justify doing less than all we can do to try to stop a pandemic at the source, but also factually still uncertain.

At this stage (about 2 months after SARS-CoV-2 was sequenced), the first argument is by far the most important one.

**Figure 1: Postponing and decreasing the peak of a rising pandemic**

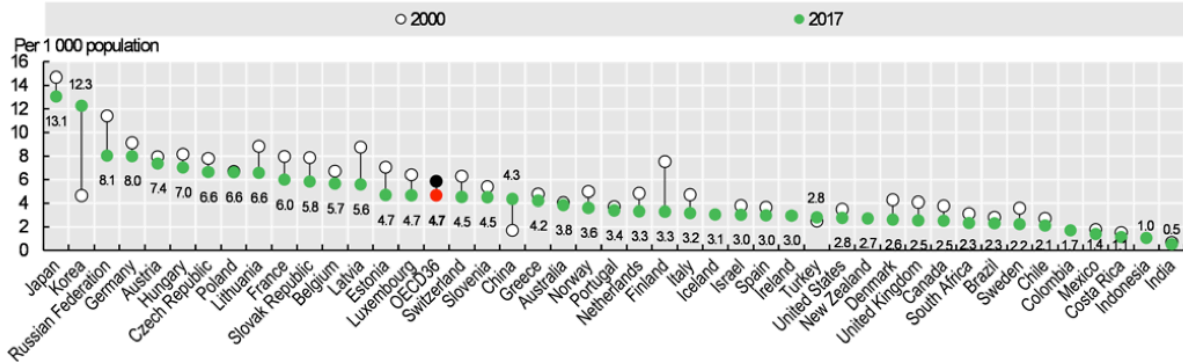


Source: Adapted from: CDC. Interim pre-pandemic planning guidance: community strategy for pandemic influenza mitigation in the United States—early, targeted, layered use of nonpharmaceutical interventions. Atlanta, GA: US Department of Health and Human Services, CDC; 2007. <https://stacks.cdc.gov/view/cdc/11425>.

Hospitalisation might be required for as much as 10-25% of clinically presenting adult patients (these are currently more “guesstimates” than estimates as this depends on many contextual and health care system related factors). It is expected that about 15% of these expected hospitalisations would be critical, the majority of which require mechanical ventilation (about 70% of patients). In a specific Chinese study, the median duration of intensive care unit (ICU) admission to death was 7 (IQR 3–11) days for non-survivors and at 28 days, 12 out of 20 surviving critical patients were still in hospital (Yang et al, Lancet Resp Med, 24<sup>th</sup> Feb 2020). The time to recovery for severe cases seems in the order of 3 to 6 weeks. It is easy to see

that the duration of care required and the possibility of a multitude of cases arising in parallel will cause capacity problems, especially in countries where medical care capacity in general, and hospital bed capacity in particular, is low and/or there are limited resources to create additional emergency capacity at short notice. It should be equally clear that in strained health care systems, the additional burden will cause health care for other diseases to become temporarily displaced, with knock on health consequences (not least because health care workers will be at an increased risk of (severe) COVID-19 through repeated exposures). Currently, it is expected that Italy will be the first country to start reporting shortages of ICU beds. In short, lowering local epidemic peaks is a key concern in order to manage a rising pandemic.

**Figure 2: Hospital beds per 1000 population in OECD countries (2000 and 2017 (or nearest year))**



Source: OECD 2019

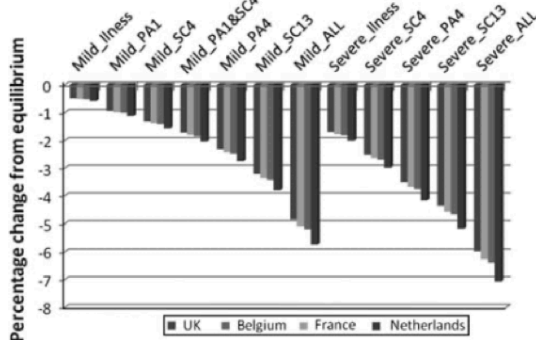
Macroeconomic models estimated that the economic impact of prophylactic absenteeism (ie not telework) from work and general (ie not local, as currently in Italy) school closure can be large, so these are measures that should not be taken lightly. The 2020 impacts on the global economy are till now mainly a consequence of China’s unprecedented containment efforts, and the fact that it had become the second largest economy in the world.

Current recommended measures in EU countries with low numbers of COVID-19 cases detected, including Belgium, is handwashing, social distancing (“if you are sick, stay home and PHONE your GP if you want to consult”), and – till now occasional - isolation, which have all limited economic impacts, but when sustained and complied with, can be important to flatten the epidemic curve. WHO advice to work environments is also generally of low impact, see <https://www.who.int/docs/default-source/coronaviruse/getting-workplace-ready-for-covid-19.pdf>

Current impact on air travel outside China seems till now more a consequence of voluntary behavioral change and reduced demand, rather than an imposed government policy on supply (though this might be subject to rapid change as the pandemic rises to more and more localities).

For earlier European work on macroeconomic impact of relatively severe flu-like pandemics see for instance Keogh-Brown (2009): <https://link.springer.com/article/10.1007/s10198-009-0210-1>

**Figure 3 GDP impact for different scenarios given mild and severe pandemics (Keogh-Brown et al, Eur J Health Econ 2009)**



“Overall, the economic impact of the disease itself...is likely ...small: 0.5% of GDP for a mild (clinical attack rate of 35% and CFR of 0,04%) pandemic to just over 2% for a severe pandemic (clinical attack rate of 50% and CFR of 2,5%). Main factors ...are behavioural changes to avoid infection, such as prophylactic absenteeism (PA) and policies such as school closure (SC). This is not to suggest that the economic impact should take precedence over saving lives and reducing infections when determining policy, but that the potential

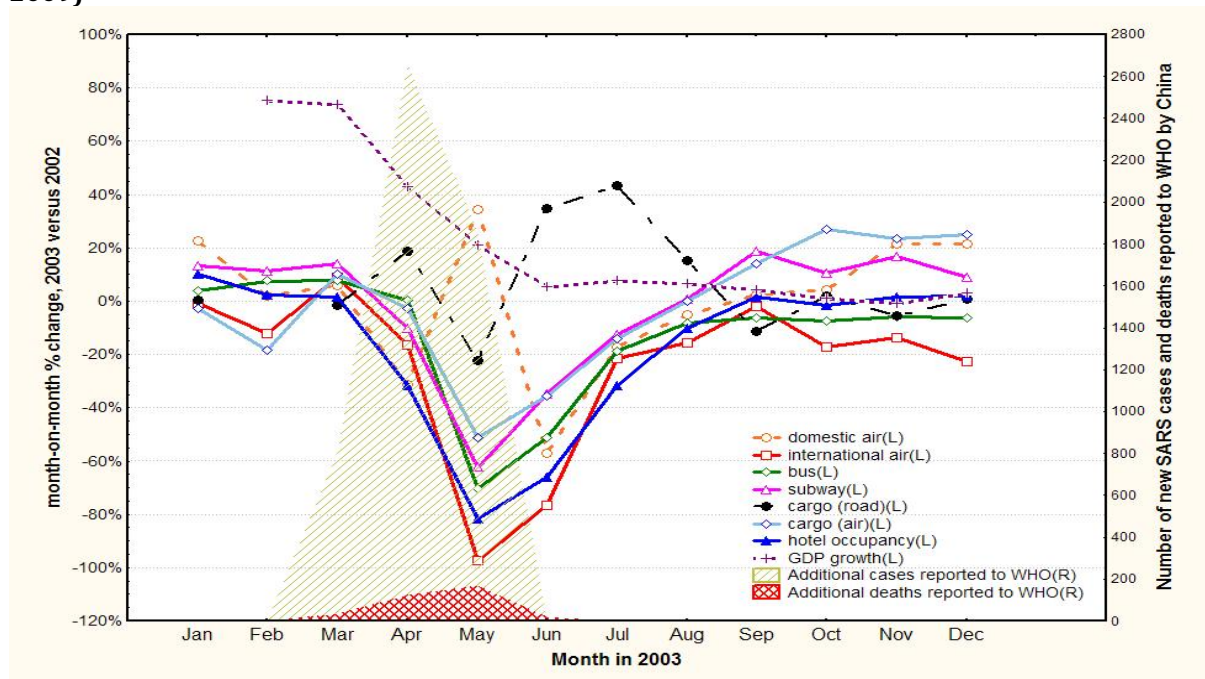
effectiveness of policies should be weighed against their economic impact.”

An important caveat here is that if SARS-CoV-2 becomes endemic, it will have health impacts in all future generations, so in the end even its accumulated future economic impact caused by disease (and associated routine prevention and treatment options) may outweigh the short term economic impact caused by behavioral changes and policy depicted here, as this is likely to rebound when certainty about consumption and investment prospects - and thence confidence - is restored. Although the SARS-CoV-1 pandemic in 2003 was much more restricted and China’s economic influence much smaller than today, it is noteworthy that the economy quickly recovered after uncertainty decreased, both locally (eg, in Beijing Figure 4 below) and globally (I invite students to speculate in financial stock market time series (eg, Dow Jones in Figure 5) on a noticeable impact from the SARS-CoV-1 pandemic in Feb-Jun 2003).

Evaluating a potential tradeoff between the costs now and those occurring in future generations is in turn related to societal expressions of intergenerational time preference (i.e. societal discounting, see also course slides), which is also key in, for instance, climate change policy decisions. Note that generations younger than those who are currently 70 years and older, will probably have a better prepared immune system when they reach that vulnerable age of >70 years, and they will have the prospect of COVID-19 therapies being available.

It is also noteworthy that at least some negative externalities from economic activity, such as air pollution, drastically declined since early 2020.

**Figure 4: % change in economic activity comparing the same month in 2003 vs 2002, with cases and deaths (shaded area) simultaneously occurring in Beijing (Beutels et al, Trop Med & Int Health 2009)**

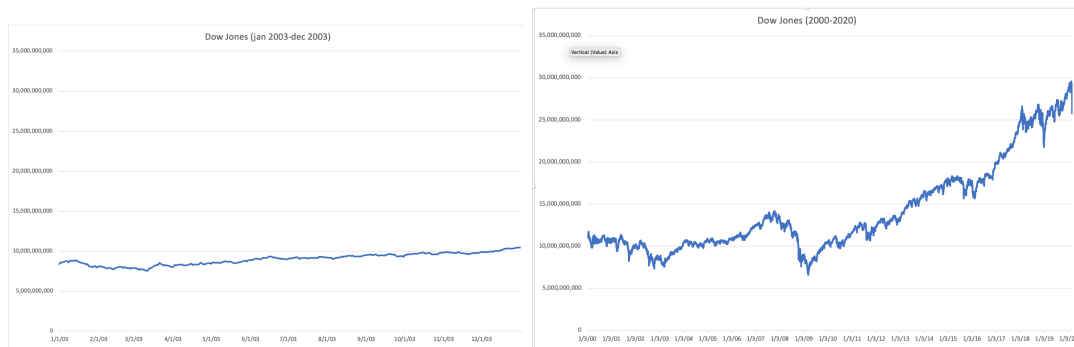


Many costs are compensated later, as they are due to postponed consumption, rather than irrecoverable. The irrecoverable costs of SARS-CoV-1 to tourism and consumption for leisure alone was estimated in Beijing at US\$ 1.4 bn, and “the losses to the tourist sector alone were about 300-fold that of the cost of treatment for SARS-CoV-1 cases in Beijing” (see Beutels et al (2009)). Keogh-Brown & Smith (2008) reviewed the global costs of SARS-CoV-1 and observed, amongst others, attributable declines in GDP exceeding 3% in Hong kong, Singapore and Canada. During SARS-CoV-1 the Iraq conflict had an additional impact on the global economy, and it can be expected that a new trade agreement following Brexit could also have a specific additional effect to be reckoned with for 2019-nCoV, especially in the EU context.

These estimates were made independent of waves of anxiety influencing investors on the global stock markets. Stock market sentiments for SARS-CoV-2 seemed initially mainly driven by reports of detecting COVID-19 cases rather than anticipating shortages in supplies of Chinese goods and services, and decreased

consumption of a range of products in China. Therefore an adjustment following China's sustained containment efforts was overdue when transmission started to be detected in Europe and the USA in late February, and companies started to explicitly communicate downward expectations. Furthermore, the above macroeconomic impact estimates were based on international trade activities from an era when China carried less weight in the global economy, and the economic cost of earlier large scale measures in other countries like China were largely ignored. (i.e. that analysis focused on the economic impact, were a pandemic to rise in Europe). The global macroeconomic impact of SARS-CoV-2 is expected to be larger than that of any pandemic the world has seen in the last 100 years.

**Figure 5 Dow Jones index, Jan-Dec 2003 (left) and Jan 2000-27 Feb 2020 (right)**



For further insights and macroeconomic estimates of public health emergencies of international concern, see the (completely optional) reference list below.

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