Box 1.1

GLOBAL EPIDEMIOLOGICAL DEVELOPMENTS

The COVID-19 pandemic has entailed a world health emergency, without precedent in the past century, that has already cost more than three million lives.[1] This box briefly describes how the disease has developed since its beginnings, the international differences observed in its incidence and the outlook for its future course.

The origin of the disease is still uncertain, but the first cases were documented in the Chinese city of Wuhan in mid-December 2019. During the first two months of 2020, when China was already tackling a first-order health crisis, the virus spread progressively through the rest of the northern hemisphere. Infections having surpassed 100,000 in more than 100 countries, the World Health Organisation declared the disease a pandemic on 11 March 2020 (see Chart 1.1).

In March and April, its rapid spread posed a huge challenge to highly saturated health systems, leading to the introduction of stringent containment measures, practically unprecedented in peacetime, such as home confinement (see Chart 1.2).[2] As a consequence, the spread of the virus slowed progressively, leading to a gradual easing of restrictions in most advanced economies from the second half of the second quarter. Meanwhile, the virus was spreading through the emerging economies, with particular virulence in Latin America.

In the summer, the incidence of the pandemic was relatively limited in the northern hemisphere, but infections and deaths rose progressively from September with much greater geographical heterogeneity than in the first wave. At global level, this new wave, which has cost many more lives than the first one, peaked in February 2021 (see Chart 1.3). Since then, the pandemic containment measures, which had been strengthened again during the autumn, have been intermittently eased, as progress has been made with vaccination. In recent weeks there has been a rise in fatalities in the emerging economies, especially in India, where vaccination is lagging.

Against a background of notably heterogeneous containment measures, the incidence of the pandemic across geographical areas, as regards its timing, magnitude and persistence, has been very uneven, as can be seen, for example, in deaths per capita (see Chart 2). In the first few months, given the initial experience of China,[3] the most widespread approach in the advanced economies was to impose general lockdowns and severe restrictions on personal mobility and on activity in certain sectors.[4] However, some countries, such as South Korea, decided to focus their efforts on mass testing and thorough contact tracing.[5] Subsequently, other countries (such as Japan, New Zealand and Australia) have followed a similar strategy and, with very strict controls on spread in the community, have managed to recover some degree of normal social activity. By contrast, certain other economies (such as Sweden, the United States and Brazil) opted for less restrictive containment measures from a normative perspective.[6]

Generally speaking, after the experience of the first wave, a broader range of measures was used to address the health crisis, and these tended to be more focused on specific areas or activities to try to minimise social and economic disruption. In any event, even in the most extreme episodes, the tightening of the pandemic containment measures during the second wave did not reach the level of stringency seen in the first phase. At the same time, regardless of the reaction of the authorities, there was also notable adaptation by households and firms. Indeed, the general public have been adapting their habits; for example, there has been a voluntary reduction

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1 The number of deaths in other recent respiratory disease epidemics, such as SARS (2002-2004) and MERS (2012), did not reach even 0.1% of those caused by COVID-19 as at the cut-off date of this report.

2 See N. Haug, L. Geyrhofer, A. Londei, E.Dervic, A. Desvars-Larrive, V. Loreto, B. Pinior, S. Thurner and P. Klimekg (2020), "Ranking the effectiveness of worldwide COVID-19 government interventions", *Nature Human Behaviour;* and J. Dehning, J. Zierenberg, P. Spitzner, M. Wibral, J. Pinheiro, M. Wilczek and V. Priesemann (2020), "Inferring change points in the spread of COVID-19 reveals the effectiveness of interventions", *Science,* vol. 10. The Oxford Stringency Index, shown in the chart, has certain limitations. For example, the way that provincial and municipal measures are included in the index means that they have a considerable effect on its level, causing very marked rises that may not reflect the situation at national level.

3 China applied stringent localised lockdowns, which, at their peak, affected 10% of the population. See A. Buesa (2020), "China: Impact of the pandemic and economic recovery", Analytical Articles, *Economic Bulletin,* 4/2020, Banco de España.

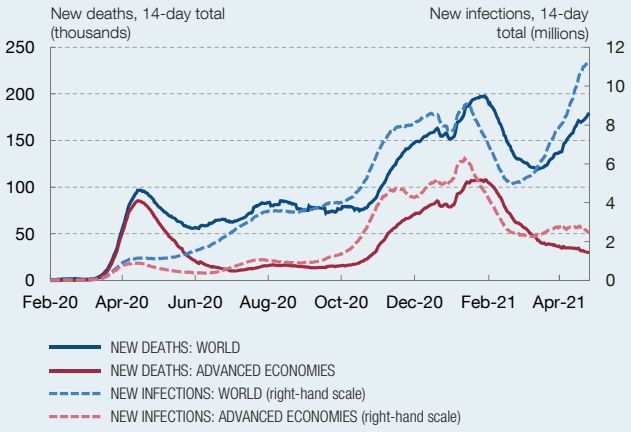
4 See S. Flaxman, S. Mishra, A. Gandy, H. Juliette T. Unwin, T. A. Mellan, H. Coupland, C. Whittaker, H. Zhu, T. Berah, J. W. Eaton, M. Monod, A.C. Ghani, C. A. Donnelly, S. Riley, M. A. C. Vollmer, N. M. Ferguson, L. C. Okell and S. Bhatt (2020), "Estimating the effects of non-pharmaceutical interventions on COVID-19 in Europe", *Nature,* 257-261.

5 See B. Égert, Y. Guillemette, F. Murtin and D. Turner (2020), *Walking the tightrope: avoiding a lockdown while containing the virus*, OECD Economics Department Working Papers, No 1633.

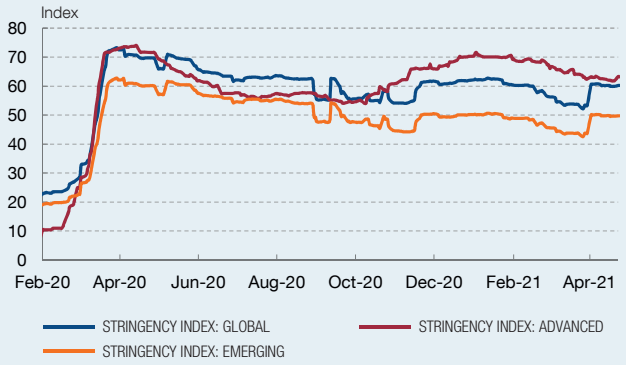
6 See I. A. Moosa (2020), "The effectiveness of social distancing in containing Covid-19", *Applied Economics,* 52:58, pp. 6292-6305.

Chart 1
COURSE OF COVID-19, VACCINATION AND EPIDEMIOLOGICAL PROSPECTS

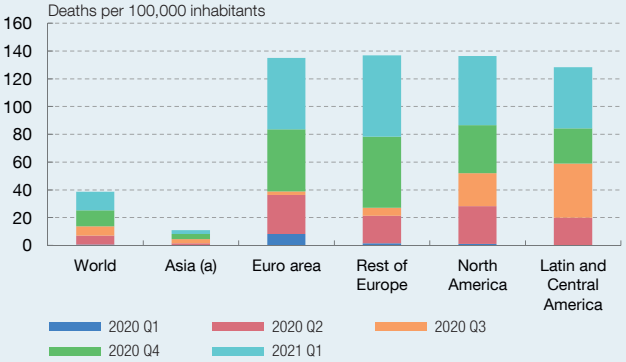
1 DEATHS AND INFECTIONS SINCE THE START OF THE PANDEMIC



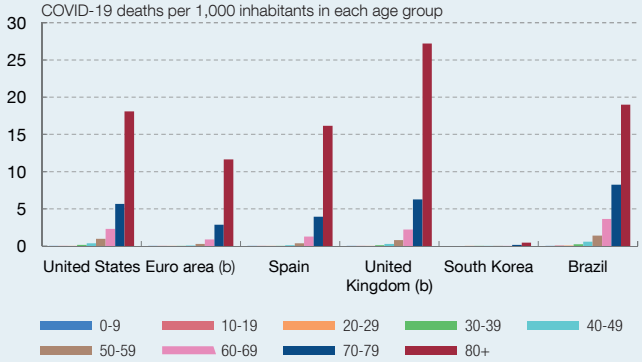
2 STRINGENCY OF CONTAINMENT MEASURES



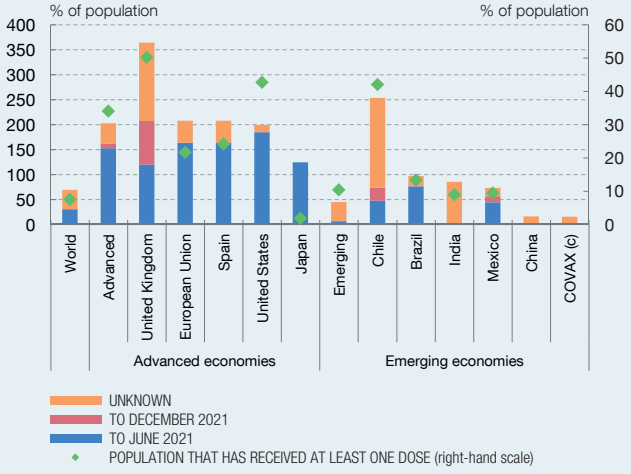
3 DEATHS IN THE DIFFERENT WAVES



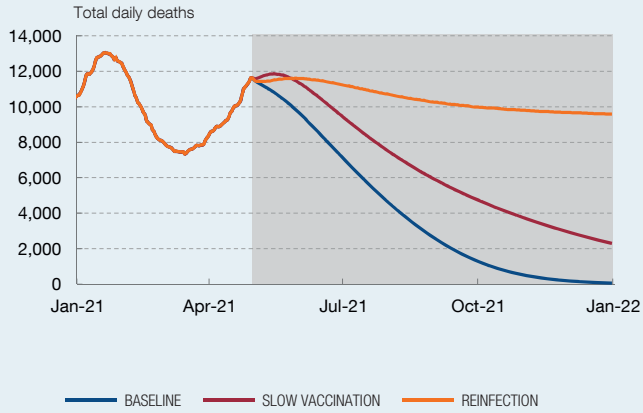
4 DEATH RATE FOR INFECTED, BY AGE GROUP



5 VACCINES ORDERED FROM PHARMACEUTICAL COMPANIES AND VACCINES ADMINISTERED



6 PANDEMIC DEVELOPMENT SCENARIOS (d)



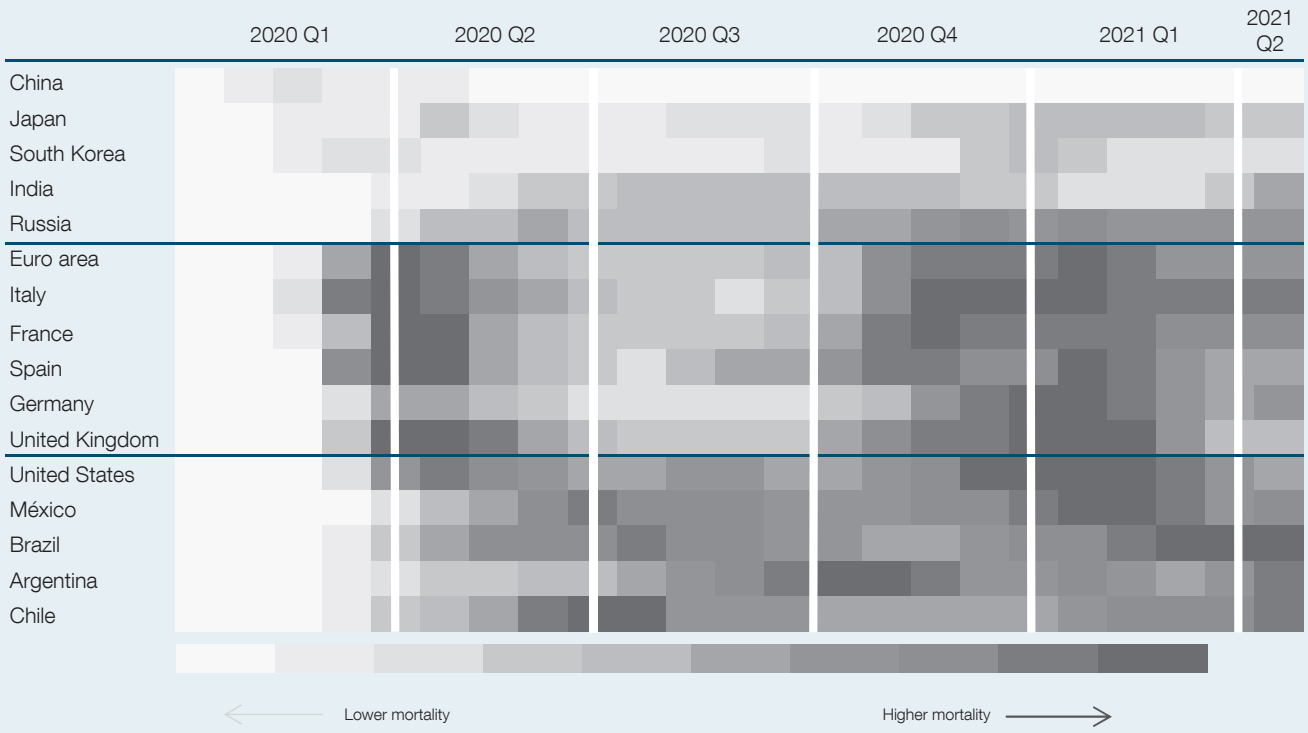
SOURCES: World Bank, Bloomberg, Duke Global Health Innovation Center, Johns Hopkins University - Coronavirus Resource Center, Our World in Data, COVID-19 INED, COVerAGE-DB, Reuters, Oxford COVID-19 Government Response Tracker and Rungcharoenkitkul (2021).

a Asia includes Russia.
b The United Kingdom data are for England and Wales; the euro area data are for Germany, Spain, France and Italy.
c Vaccines acquired under the COVAX initiative as a percentage of the population of emerging countries.
d Scenarios considered by Rungcharoenkitkul (2021). The "baseline" scenario assumes linear progress in the rate of vaccination until all the doses ordered have been exhausted at the end of 2021. Under the "slow vaccination" scenario vaccination proceeds at a third of the rate under the "baseline"scenario. The "reinfection" scenario assumes that people lose their immunity 60 days after infection or vaccination.

in social interaction and mobility,[7] in some economies with the support of firms, through their expansion of teleworking, digitalisation and e-commerce.

The determinants of the heterogeneity in the incidence of the virus and mortality across countries and geographical areas remain uncertain. The literature points to a set of factors that may partly account for it. For example, some studies associate greater spread of the disease with certain structural characteristics linked to personal interaction patterns, climate,[8] population concentration and the productive system (the latter on account of the different importance of the activities that can benefit from teleworking and of those that involve a high degree of human contact). Other possible reasons for the asymmetric impact of the pandemic by country include the demographic structure of the population, given the higher mortality in older age groups (see Chart 1.4), the quality of health systems[9] and the proportion of the population that has acquired immunity having recovered from the illness or been vaccinated. A second group of factors is more related to sociological characteristics. For example, societies with customs involving more physical contact can be expected to have greater difficulty containing the spread of the virus, while those with prior experience of this type of disease should be better prepared.[10] As already mentioned, the selection of the health strategy in each country may also have affected the heterogeneity observed in the incidence of the pandemic.

Chart 2
DEATHS PER CAPITA, BY COUNTRY (a)



SOURCE: WHO.

a Each shaded area corresponds to a 21-day interval.

7 See W. Maloney and T. Taskin (2020), "Determinants of Social Distancing and Economic Activity during COVID-19: A Global View", Policy Research Working Paper Series 9242, World Bank.

8 See C. Ghirelli, A. González, J. L. Herrera, and S. Hurtado (2021), *Weather, mobility and the evolution of the Covid-19 pandemic,* Working Papers, No 2109, Banco de España.

9 See Sussman (2020), "Time for Bed(s): Hospital Capacity and Mortality from COVID-19", *Covid Economics,* 11.

10 See A. Buesa, J. J. Pérez and D. Santabárbara (2021), "Awareness of pandemics and the impact of COVID-19", *Economics Letters,* forthcoming and Working Papers, Banco de España, forthcoming.

Box 1.1
GLOBAL EPIDEMIOLOGICAL DEVELOPMENTS (cont'd)

The availability of various effective vaccines for COVID-19, within months of the pandemic emerging, is considered a medical milestone and key to overcoming the health crisis.[11] In particular, gradual immunisation of the population is expected to be accompanied by a reduction in mortality, the lifting of containment measures and a gradual return to normal of social and economic activity. The worldwide vaccination campaign was launched in December 2020 and, so far, 2% of the global population has been immunised. In addition, there are those who have some natural immunity as a result of having had the disease. Also, medical treatments have been developed that are reducing mortality and the after effects of the disease. Countries have already acquired sufficient vaccines to vaccinate more than 60% of the world population, which could be compatible with control over the disease this year, as long as they do not lose their effectiveness.[12] However, access to vaccines in advanced economies is much greater than in other countries despite the initiatives taken to boost the supplies to developing countries[13] (see Chart 1.5). Vaccine roll-out at global level is highly uneven across countries, owing to the supply contracts with pharmaceutical companies, the logistical challenges of the different types of vaccines acquired and the capacity of health systems to administer them to the most vulnerable groups.

This baseline scenario, under which the disease is controlled this year, is uncertain, however, and a global medical solution may be delayed (see Chart 1.6). Thus, on one hand, it is possible that the vaccination plans are optimistic and may not be fulfilled. On the other hand, of particular concern is a possible loss of immunity due to the emergence of new variants of the virus – some of which may be more contagious or lethal – that reduce the effectiveness of the current vaccines and naturally acquired immunity. In this respect, virus mutations that result in a loss of immunity may be encouraged by excessively cautious vaccination strategies that delay complete immunity or that cover only part of the world population.[14] This scenario of heightened persistence of the pandemic may entail the need for intermittent containment measures.[15] Finally, when the pandemic is over, the disease could become seasonal, requiring regular prevention and vaccination drives.

Against this background, it is crucial that the authorities continue to strengthen health systems, in particular their preventive and rapid response capabilities, as well as the supply of vaccines and other medical equipment. In a global setting, for personal mobility to return to normal, international cooperation is also required, to ensure universal access to vaccines and the medical treatments available.

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11 Several effective COVID-19 vaccines have been developed and clinically tested in record time (less than a year). This rapidity, facilitated by the financing available and the speeding up of approval processes, has also been a consequence of past experience in the development of vaccines against other recent diseases (e.g. SARS and MERS). For further information, see S. Su, L. Du and S. Jiang (2020), "Learning from the past: development of safe and effective COVID-19 vaccines", *Nature Reviews Microbiology,* 19, 211–219.

12 See Rungcharoenkitkul (2021), "Macroeconomic consequences of pandexit", Working Papers, No 932, BIS.

13 Notably, the *COVAX (Covid-19 Vaccines Global Access)* initiative, which aims for fair access to vaccines through a joint purchase mechanism for distribution among the emerging countries.

14 See O. J. Wouters, K. C. Shadlen, M. Salcher-Konrad, A. J. Pollard, H. J. Larson, Y. Teerawattananon and M. Jit (2021), "Challenges in ensuring global access to COVID-19 vaccines: production, affordability, allocation, and deployment", *The Lancet.*

15 Experience with other diseases suggests there is a risk it will become chronic. See D. Morens and A. Fauci (2020), "Emerging Pandemic Diseases: How We Got to COVID-19", *Cell* 182(5).