



Webinar

# Sessions Tècniques del CSC 2021

*Respostes a la pandèmia des de les polítiques i serveis sanitaris: Què es podria millorar per a una nova pandèmia?*

17 de juny de 2021



Consorti de Salut i  
Social de Catalunya



## La respuesta política en España

Beatriz Gonzalez Lopez-Valcarcel

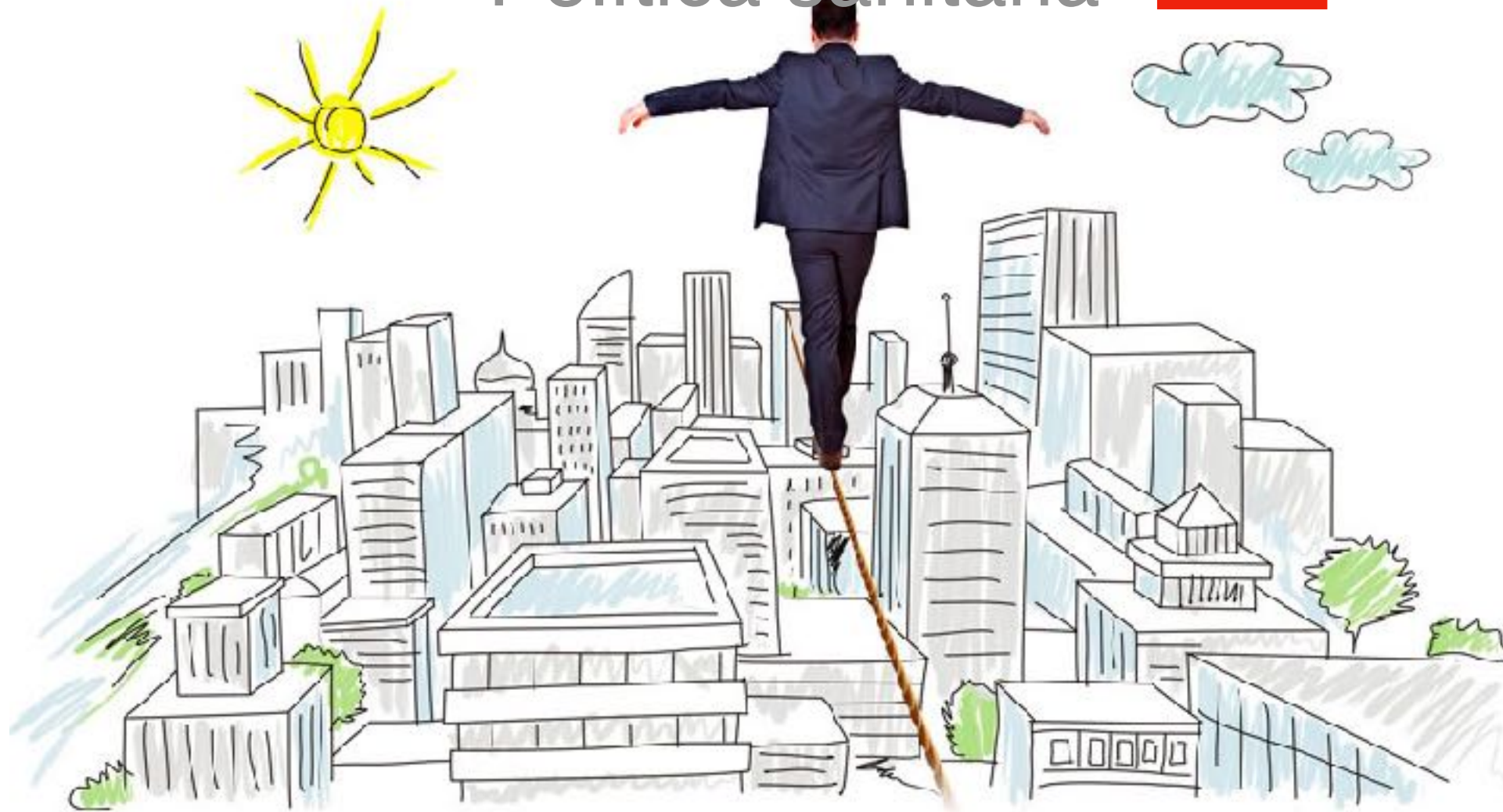
Universidad de Las Palmas de GC

# Policy vs Politics

Política económica

Políticas sociales

Política sanitaria



Nunca las **políticas económicas** habían sido tan **sanitarias**,  
nunca las políticas de **salud** habían tenido tanto **impacto económico**



# Red Zone Strategy

Ideología, ciencia y políticas

Liberal: la declaración Great Barrington

Solidaria: John Snow Manifesto



“As infectious disease epidemiologists and public health scientists we have grave concerns about the damaging physical and mental health impacts of the prevailing COVID-19 policies, and recommend an approach we call **Focused Protection**”

## Scientific consensus on the COVID-19 pandemic: we need to act now

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has infected more than 35 million people globally, with more than 1 million deaths recorded by WHO as of Oct 12, 2020. As a second wave of COVID-19 affects Europe, and with winter approaching, we need clear communication about the risks posed by COVID-19 and effective strategies to combat them. Here, we share our view of the current evidence-based consensus on COVID-19.

SARS-CoV-2 spreads through contact (via larger droplets and aerosols), and longer-range transmission via aerosols, especially in conditions where ventilation is poor. Its high infectivity,<sup>1</sup> combined with the susceptibility of unexposed populations to a new virus, creates conditions for rapid community spread. The infection fatality rate of COVID-19 is several-fold higher than that of seasonal influenza,<sup>2</sup> and infection can lead to persisting illness, including in young, previously healthy people (ie, long COVID).<sup>3</sup> It is unclear how long protective immunity lasts,<sup>4</sup> and, like other seasonal coronaviruses, SARS-CoV-2 is capable of re-infecting people who have already had the disease, but the frequency of re-infection is unknown.<sup>5</sup> Transmission of the virus can be mitigated through physical distancing, use of face coverings, hand and respiratory hygiene, and by avoiding crowded and poorly ventilated spaces. Rapid testing, contact tracing, and isolation are also critical to controlling transmission. WHO has been advocating for these measures since early in the pandemic.

In the initial phase of the pandemic, many countries instituted lockdowns (general population restrictions, including orders to stay at home and work from home) to slow the

rapid spread of the virus. This was essential to reduce mortality,<sup>6,7</sup> prevent health-care services from being overwhelmed, and buy time to set up pandemic response systems to suppress transmission following lockdown. Although lockdowns have been disruptive, substantially affecting mental and physical health, and harming the economy, these effects have often been worse in countries that were not able to use the time during and after lockdown to establish effective pandemic control systems. In the absence of adequate provisions to manage the pandemic and its societal impacts, these countries have faced continuing restrictions.

This has understandably led to widespread demoralisation and diminishing trust. The arrival of a second wave and the realisation of the challenges ahead has led to renewed interest in a so-called herd immunity approach, which suggests allowing a large uncontrolled outbreak in the low-risk population while protecting the vulnerable. Proponents suggest this would lead to the development of infection-acquired population immunity in the low-risk population, which will eventually protect the vulnerable.

This is a dangerous fallacy unsupported by scientific evidence.

Any pandemic management strategy relying upon immunity from natural infections for COVID-19 is flawed. Uncontrolled transmission in younger people risks significant morbidity<sup>8</sup> and mortality across the whole population. In addition to the human cost, this would impact the workforce as a whole and overwhelm the ability of health-care systems to provide acute and routine care. Furthermore, there is no evidence for lasting protective immunity to SARS-CoV-2 following natural infection,<sup>4</sup> and the endemic transmission that would be the consequence of waning immunity would present a risk to vulnerable populations for the indefinite future.

Such a strategy would not end the COVID-19 pandemic but result in recurrent epidemics, as was the case with numerous infectious diseases before the advent of vaccination. It would also place an unacceptable burden on the economy and health-care workers, many of whom have died from COVID-19 or experienced trauma as a result of having to practise disaster medicine. Additionally, we still do not understand who might suffer from long COVID.<sup>3</sup> Defining who is vulnerable is complex, but even if we consider those at risk of severe illness, the proportion of vulnerable people constitute as much as 30% of the population in some regions.<sup>9</sup> Prolonged isolation of large swathes of the population is practically impossible and highly unethical. Empirical evidence from many countries shows that it is not feasible to restrict uncontrolled outbreaks to particular sections of society. Such an approach also risks further exacerbating the socio-economic inequalities and structural discriminations already laid bare by the pandemic. Special efforts to protect the most vulnerable are essential but must go hand-in-hand with multi-pronged population-level strategies.

Once again, we face rapidly accelerating increase in COVID-19 cases across much of Europe, the USA, and many other countries across the world. It is critical to act decisively and urgently. Effective measures that suppress and control transmission need to be implemented widely, and they must be supported by financial and social programmes that encourage community responses and address the inequalities that have been amplified by the pandemic. Continuing restrictions will probably be required in the short term, to reduce transmission and fix ineffective pandemic response systems, in order to prevent future lockdowns. The purpose of these restrictions is to effectively suppress SARS-CoV-2 infections to low levels



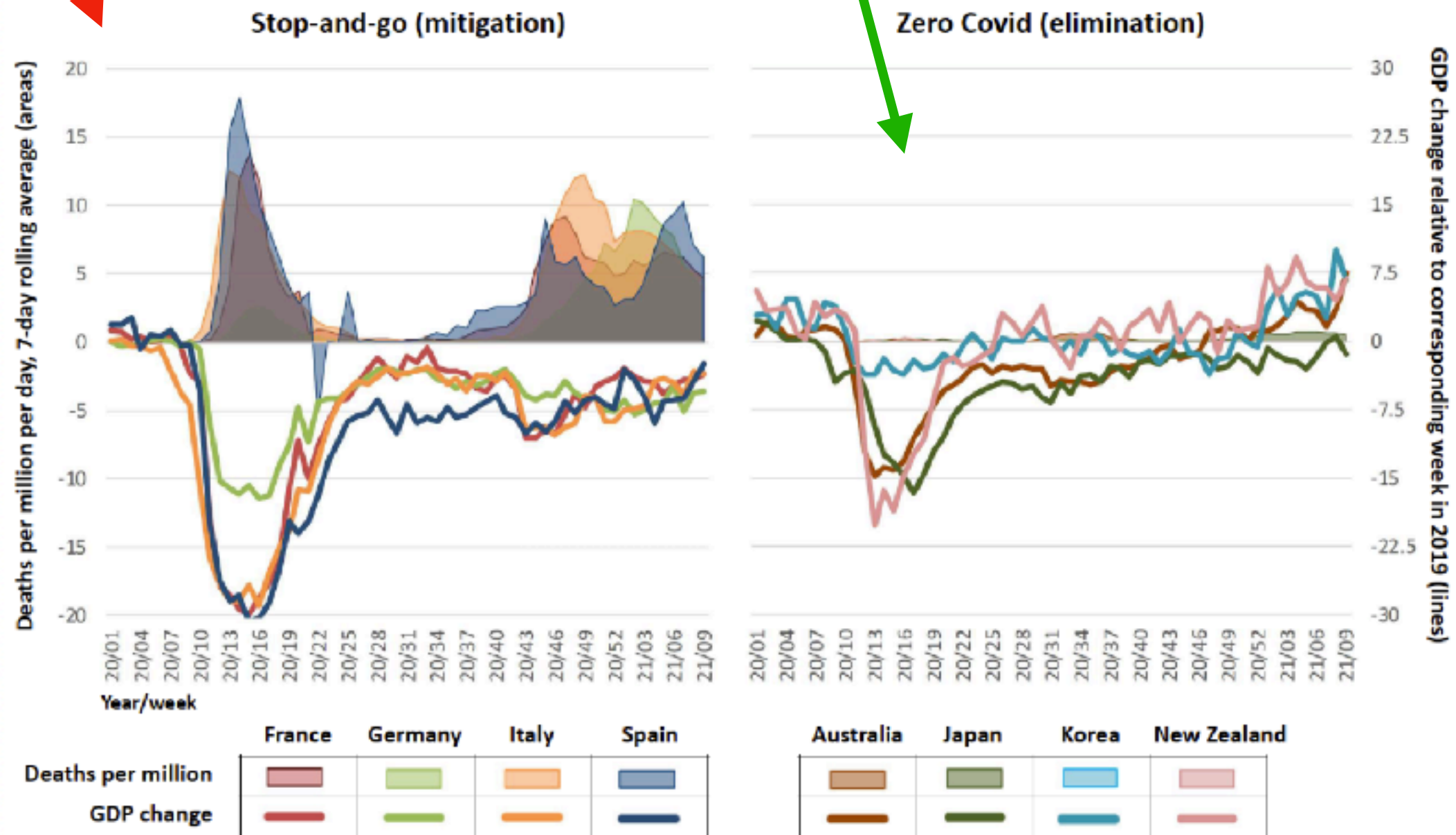
Published Online  
October 14, 2020  
<https://doi.org/10.1016/j.ijid.2020.105133>

For the WHO COVID-19  
Solidarity Task Force  
<https://www.who.int/news-room/feature-stories/2020/10/14/who-covid-19-solidarity-task-force>

Information should be made via contact with  
the editorial system at  
<http://www.elsevier.com/locate/ijid>

# Red Zone Strategy vs Green Zone Strategy

**Figure 1** Daily death per million (areas) and weekly GDP estimates (lines)



Sources: Areas: Roser et al. (2020); GDP estimates: [OECD Weekly Tracker of economic activity](https://www.oecd.org/economic-activity/), see also Woloszko (2020).

<https://voxeu.org/article/aiming-zero-covid-19-ensure-economic-growth>

<https://www.endcoronavirus.org/green-zones>



## COVID-19 GOVERNMENT RESPONSE TRACKER

Governments are taking a wide range of measures in response to the COVID-19 outbreak. This tool aims to track and compare policy responses around the world, rigorously and consistently.



The Oxford COVID-19 Government Response Tracker (OxCGRT) systematically collects information on several different common policy responses that governments have taken in response to the pandemic on 231 indicators such as school closures and travel restrictions. It now has data from more than 160 countries.

[View data API](#)

The data is also used to inform a set of four indices, including the stringency index which records the strictness of 'lockdown' policies on a scale from 0 to 100.

**PROJECT INFO**

March 2020 - December 2021



This tool aims to track and compare policy responses around the world, rigorously and consistently.

<https://github.com/OxCGRT/covid-policy-tracker/blob/master/documentation/codebook.md#containment-and-closure-policies>



OxCGRT collects publicly available information on **23 indicators** of government responses.

- 8** • **Containment and closure policies (indicators C1-C8)** record information on containment and closure policies, such as school closures and restrictions in movement.
- 4** • **Economic policies (indicators E1-E4)** record economic policies, such as income support to citizens or provision of foreign aid.
- 8** • **Health system policies (indicators H1-H8)** record health system policies such as the COVID-19 testing regime, emergency investments into healthcare and most recently, vaccination policies.
- 3** • **Vaccine policies (indicators V1-3)** record vaccination policies: a country's prioritisation list, eligible groups, and the cost of vaccination to the individual.

The data from the 23 indicators is aggregated into a set of four common indices, reporting a number between 1 and 100 to reflect the level of government action on the topics in question:

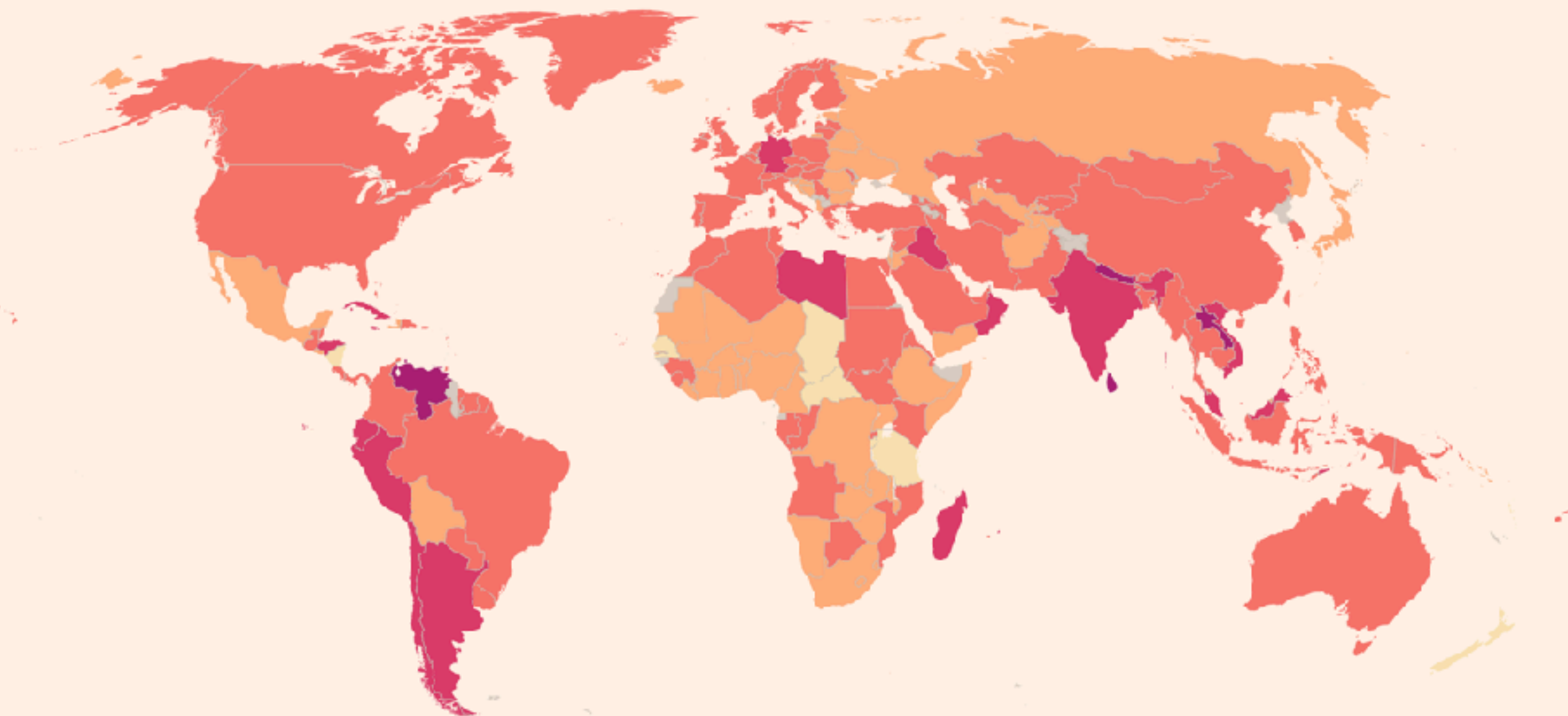
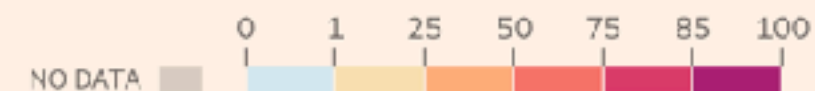
1. **an overall government response index** (which records how the response of governments has varied over all indicators in the database, becoming **stronger** or **weaker** over the course of the outbreak);
2. **a containment and health index** (which combines 'lockdown' restrictions and closures with measures such as testing policy and contact tracing, short term investment in healthcare, as well investments in vaccine)
3. **an economic support index** (which records measures such as income support and debt relief)
4. **as well as the original stringency index** (which records the strictness of 'lockdown style' policies that primarily restrict people's behaviour).



Jun 2 2021

## Lockdowns around the world

Oxford Covid-19 government response stringency index





# I. Introducción

## 2. Tipos de políticas

# 3. Coste COVID-19 y C.E. de intervenciones

# 4. Luces y sombras en España

# 5. Conclusión

▶ ◻ Mar 30 2020

▶ ◻ Jun 2 2021

Lockdowns around the world

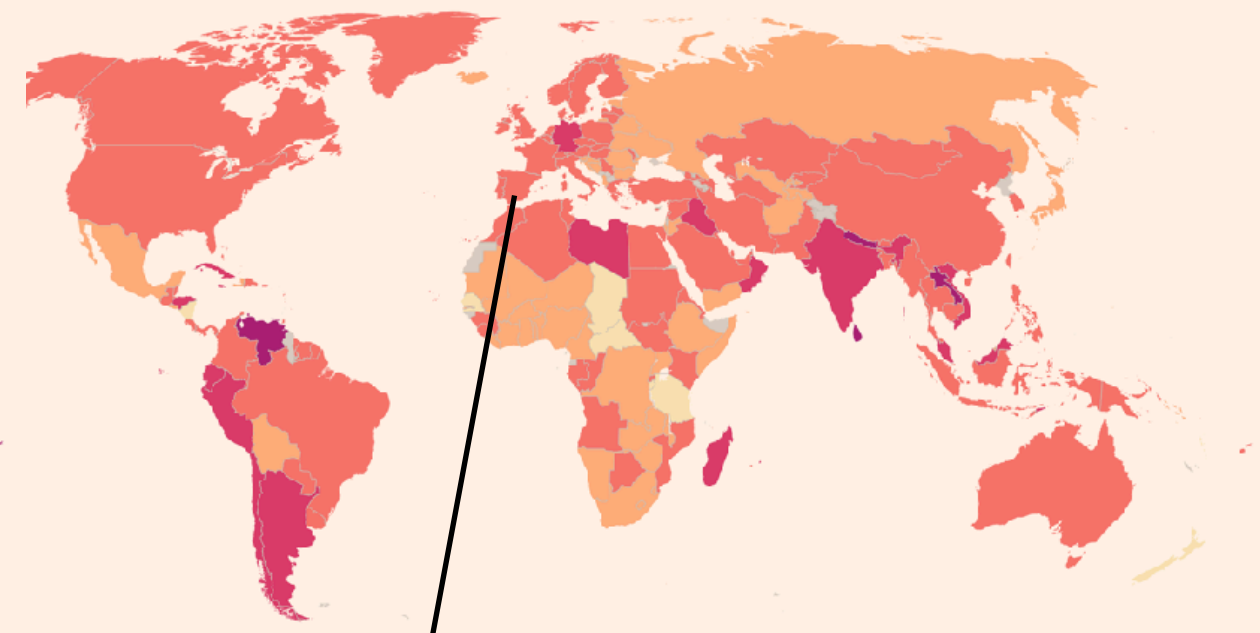
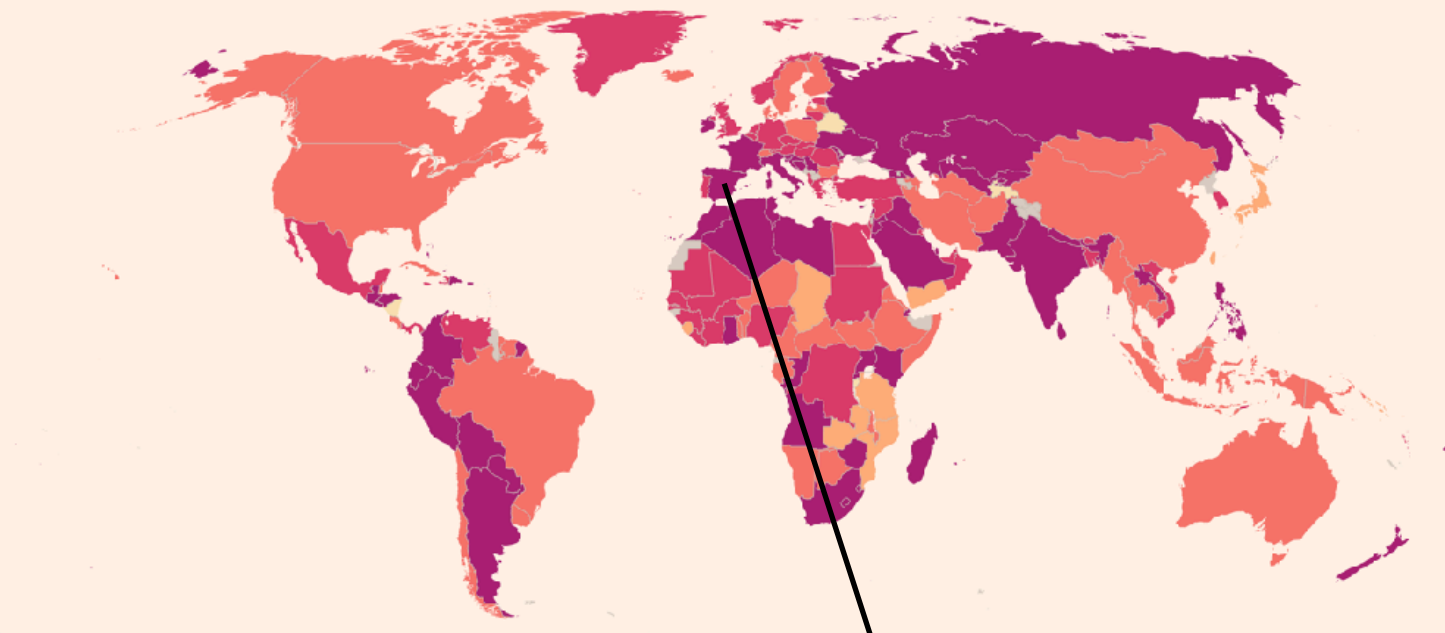
Oxford Covid-19 government response stringency index

NO DATA 0 1 25 50 75 85 100

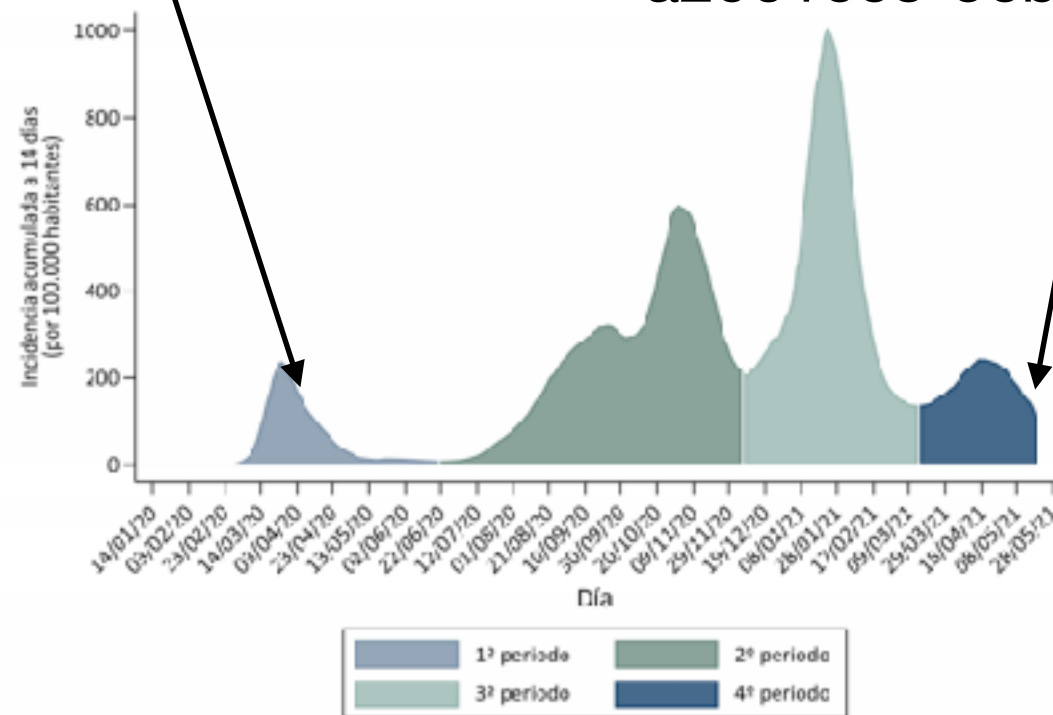
nd the world

ent response stringency index

NO DATA 0 1 25 50 75 85 100



Periodos epidémicos de COVID-19 en España



Fuente: UNE, ISCIII, Red Nacional de Vigilancia Epidemiológica.

<https://www.ft.com/content/a2901ce8-5eb7-4633-b89c-cbdf5b386938>

La COVID pudo haber matado a 10 millones de personas en el mundo(1)



(1) The Economist "Ten million reasons to vaccinate the world (15 mayo 2021)

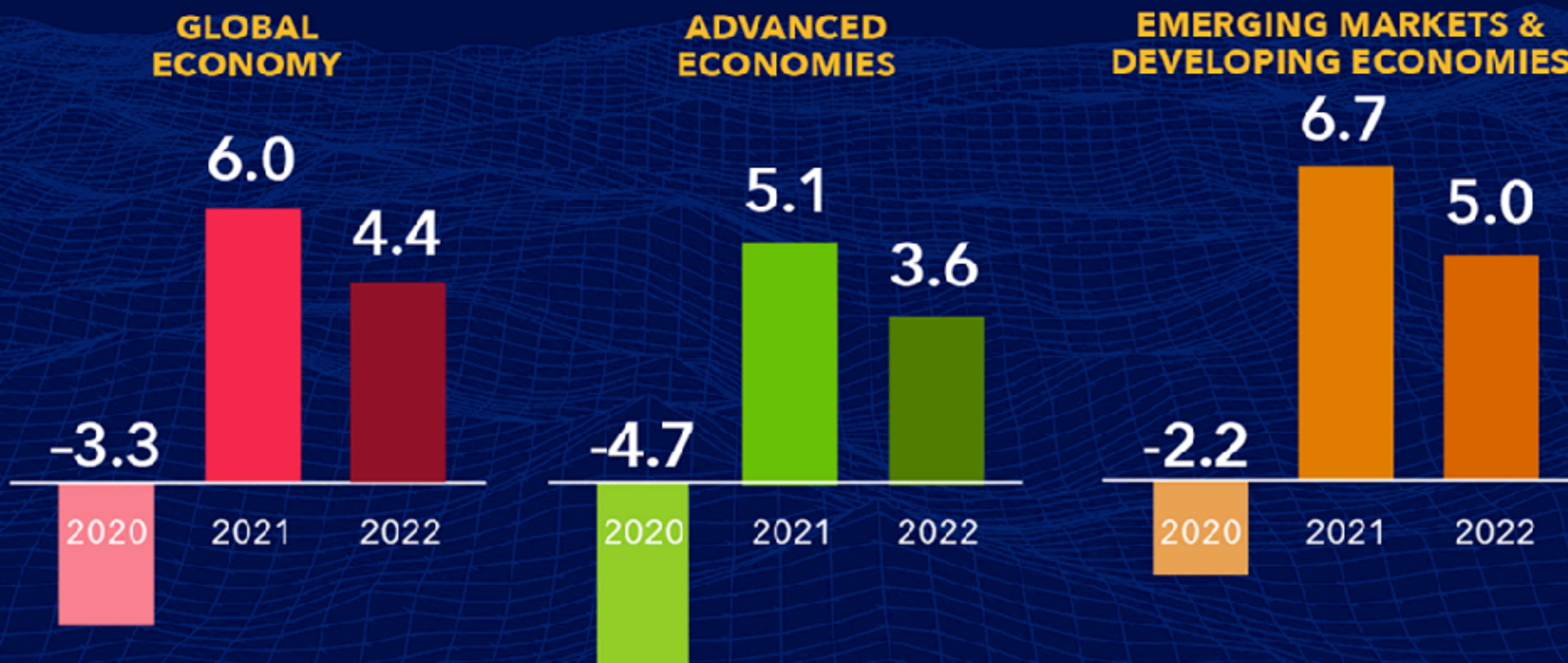
Importa el coste macroeconómico  
(PIB) atribuible a la COVID pero  
también su distribución(\*)

(\*) <https://inequality-tracker.caixabankresearch.com/>



## WORLD ECONOMIC OUTLOOK APRIL 2021

# GROWTH PROJECTIONS



## Latest World Economic Outlook Growth Projections

(real GDP, annual percent change)	PROJECTIONS		
	2020	2021	2022
<b>World Output</b>	<b>-3.3</b>	<b>6.0</b>	<b>4.4</b>
<b>Advanced Economies</b>	<b>-4.7</b>	<b>5.1</b>	<b>3.6</b>
United States	-3.5	6.4	3.5
Euro Area	-6.6	4.4	3.8
Germany	-4.9	3.6	3.4
France	-8.2	5.8	4.2
Italy	-8.9	4.2	3.6
<b>Spain</b>	<b>-11.0</b>	<b>6.4</b>	<b>4.7</b>
Japan	-4.8	3.3	2.5
United Kingdom	-9.9	5.3	5.1
Canada	-5.4	5.0	4.7
Other Advanced Economies	-2.1	4.4	3.4
<b>Emerging Market and Developing Economies</b>	<b>-2.2</b>	<b>6.7</b>	<b>5.0</b>
Emerging and Developing Asia	-1.0	8.6	6.0
China	2.3	8.4	5.6
India	-8.0	12.5	6.9
ASEAN-5	-3.4	4.9	6.1
Emerging and Developing Europe	-2.0	4.4	3.9
Russia	-3.1	3.8	3.8
Latin America and the Caribbean	-7.0	4.6	3.1
Brazil	-4.1	3.7	2.6
Mexico	-8.2	5.0	3.0
Middle East and Central Asia	-2.9	3.7	3.8
Saudi Arabia	-4.1	2.9	4.0
Sub-Saharan Africa	-1.9	3.4	4.0
Nigeria	-1.8	2.5	2.3
South Africa	-7.0	3.1	2.0
<i>Memorandum</i>			
Emerging Market and Middle-Income Economies	-2.4	6.9	5.0
Low-Income Developing Countries	0.0	4.3	5.2

El coste de la pandemia es mayor (contrafactual: dejar de crecer)

España es el país más afectado de Europa. Europa, peor que las economías avanzadas



**En España 2020, mas del 90% del coste total de la COVID-19 ha sido por caída de PIB**

Table 2. Estimate of the total cost of the COVID-19 crisis for Spain in 2020

Cost component	Cost in 2020 (millions €)	%
Direct health and non-healthcare costs	5,350	2.1%
Lost GPD due to COVID-19 outbreak and outbreak responses	236,914	94.8%
Cost due to premature mortality and long-term morbidity consequences	7,805	3.1%
<b>Total</b>	<b>250,069</b>	<b>100%</b>



## ¿Por qué cae el PIB?

### Tipología de causas relevantes para la evaluación

- 1. **Exógenas** al país. Dependen de la pandemia en otros países con los que se tiene más conectividad
- 2. **Inevitables**. Causadas por las restricciones a la movilidad y a la actividad económica incluso con la política óptima dado el conocimiento del momento
- 3. **Evitables** con una mejor gestión de la pandemia (intervenciones óptimas de los gobiernos)

En la práctica, no se puede diferenciar claramente entre (2) y (3)

# Estrategia TTQ es sumamente coste-efectiva

AEA

	Quantity	Unit cost	Total costs
TTQ strategy daily costs			
Tests (unit cost per test)	187,760	40 €	7,510,400 €
Tracers (unit cost per day)	9,388	129 €	1,206,358 €
Health consequences prevented daily			
COVID-19 total cases	53,286		
COVID-19 cases treated at home	48,615	280 €	13,612,174 €
Hospitalizations	2,931	8,500 €	24,911,191 €
ICU stays	213	33,400 €	7,118,703 €
Cases suffering long-term morbidity	1,048	14,754 €	15,461,009 €
Deaths	480		
QALY gains			
QALY gain from avoided morbidity	2,908		
QALY gain from avoided mortality	1,398		
Total monetary costs			8,716,758 €
Total monetary savings			61,103,076 €
Incremental costs			-52,386,318 €
Incremental QALYs			4,306
Cost per QALY gained			Dominating
Benefit-to-cost ratio (excluding health and morbidity)			7.0
Benefit-to-cost ratio (including health and morbidity)			19.4

7/1!

**Table 3.**  
Economic and health  
consequences of the  
TTQ strategy in  
Spain

03 de mayo de 2021

## El GTM explica los puntos clave para establecer una estrategia de rastreo eficiente

El Grupo de Trabajo Multidisciplinar (GTM), que asesora al Ministerio de Ciencia e Innovación y apoya al Gobierno en materias científicas relacionadas con el COVID-19 y sus consecuencias futuras, analiza en un [nuevo informe los puntos clave para establecer una estrategia de rastreo eficiente](#), cuya implementación dependerá del modelo y la organización del rastreo y de las condiciones locales de la epidemia. Este informe se ha elaborado a solicitud de los Ministerios de Ciencia e Innovación y Sanidad.

Un sistema de rastreo óptimo, explica el informe, sería aquel que investigara "el 100% de las personas que han estado en contacto estrecho con un COVID positivo y las pusiera en cuarentena o aislara antes de que se volvieran contagiosas".

Para mejorar los sistemas de rastreo, el GTM propone:

1. Estabilidad del personal rastreador.
2. Motivación. Además de estrategias de motivación y prevención del burnout en el puesto de trabajo, la rotación con otras actividades COVID puede prevenir la fuga de talento de los equipos.
3. Flexibilidad. Se requieren profesionales formados en salud pública como engranaje esencial en la coordinación de cualquier sistema de rastreo. La experiencia en vigilancia epidemiológica de brotes anteriores ha demostrado ser muy valiosa en el seguimiento COVID.
4. Colaboración ciudadana, y sistema ágil de notificación y sanción de incumplimientos.
5. Escalable, aceptabilidad, progresividad. La capacidad debe poder adaptarse a aumentos exponenciales de casos. El número de rastreadores activos ha de ser variable según la evolución de la epidemia. Esto requiere disponer de una reserva de personas formadas.
6. Con tasas de incidencia muy altas, como en algunas regiones durante la tercera ola, más que rastrear, el objetivo sería aislar en un cuasi confinamiento a toda la población, y preparar el sistema de rastreo, mejorándolo, para cuando baje la incidencia. En caso de desbordamiento, la prioridad sería detectar y aislar el mayor número de casos posible, pudiendo incluso encomendar a las personas con resultado positivo, en el momento de la llamada, que identifiquen y avisen ellos mismos a sus contactos.
7. Idealmente, el rastreo "manual" podría complementarse con otro basado en algoritmos y apps (radar COVID en España). De cara al futuro, particularmente en situaciones de alta densidad de población y baja incidencia de la epidemia, sería recomendable que los sistemas de trazado manual incluyeran de forma efectiva la información de la APP en sus procedimientos. También que la información sobre las APPs, su funcionamiento y código, y los resultados obtenidos se hicieran públicos abiertamente. También sería interesante una reflexión sobre la incapacidad de Europa y sus gobiernos para ofrecer un modelo integrado y organizar una reflexión informada de la sociedad sobre los conceptos de confidencialidad y bien social.
8. Unos sistemas de información bien articulados tienen gran potencial para mejorar la eficiencia del sistema TRA. Una herramienta centralizada de rastreo, como la que han desarrollado y utilizan en algunas áreas del país, podría ser muy útil.
9. Un sistema de rastreo efectivo y de alta calidad tendría que ser equitativo (facilitar el aislamiento a quien no pudiera y ayudar económicamente a las personas aisladas por las rentas perdidas en su caso), efectivo en cuanto a adherencia a los aislamientos y cuarentenas, y aceptado por la ciudadanía.



## INFORME DEL GTM<sup>1</sup> SOBRE ¿CUÁNTOS RASTREADORES SON NECESARIOS?

Fecha: 26/03/2021

### Estructura del informe

1. Resumen Ejecutivo
2. Introducción
3. ¿Qué es/Qué hace un rastreador?
4. Indicadores de la eficacia del rastreo
5. Protocolos de rastreo
6. Aspectos críticos de la organización del rastreo
7. Rastreo mediante APPs
8. ¿Cuántos rastreadores hay?
9. ¿Cuántos rastreadores hacen falta?
10. ¿Qué podría hacerse para mejorar?

### Referencias y notas

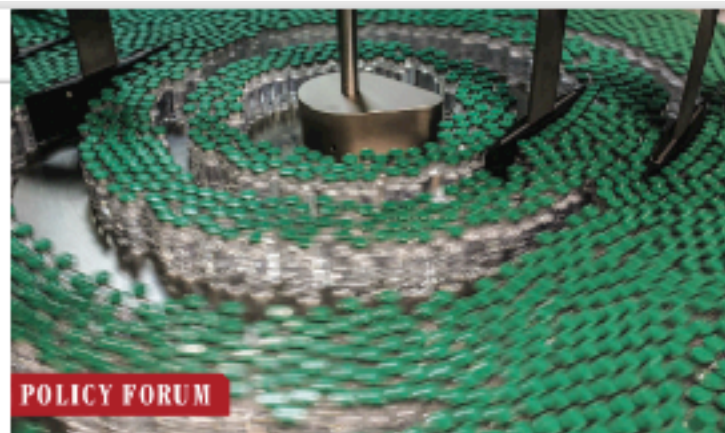
[https://www.ciencia.gob.es/stfls/MICINN/Ministerio/FICHEROS/Informe\\_GTM\\_sobre\\_rastreadores.pdf](https://www.ciencia.gob.es/stfls/MICINN/Ministerio/FICHEROS/Informe_GTM_sobre_rastreadores.pdf)



## Según el FMI (mayo 2021):

- La COVID le cuesta al mundo **500.000 millones \$ mensuales**
- Los gobiernos gastan **1.5 billones\$** mensuales en gastos fiscales por la COVID

# La **vacunación COVID de la humanidad** es todavía **más coste-efectiva** que la estrategia TRA



COVID-19: ECONOMICS Clave: capacidad de producción

## Market design to accelerate COVID-19 vaccine supply

Build more capacity, and stretch what we already have

By Juan Camilo Castillo<sup>1</sup>, Anrita Ahuja<sup>2</sup>, Susan Athey<sup>3,4</sup>, Arthur Baker<sup>5</sup>, Eric Budish<sup>6,7</sup>, Tasneem Chippy<sup>8</sup>, Rachel Glenister<sup>9</sup>, Scott Duke Kominers<sup>10,11</sup>, Michael Kremer<sup>12</sup>, Greg Larson<sup>13</sup>, Jean Lee<sup>14</sup>, Carice Prendergast<sup>15</sup>, Christopher M. Snyder<sup>16,17</sup>, Alex Tabarrok<sup>18</sup>, Brandon Joel Tan<sup>19</sup>, Witold Witek<sup>20</sup>

Each month, COVID-19 kills hundreds of thousands of people, reduces global gross domestic product (GDP) by hundreds of billions of dollars, and generates large, accumulating losses to human capital by harming education and health (2–4). Achieving widespread immunization 1 month faster would thus save many lives and mitigate short- and long-run economic harm. Although the value of vaccines may seem obvious, government action and investment in vaccines have not been commensurate with the enormous scale of benefits, with many countries not likely to achieve widespread immunization until the end of 2023.

We estimate below that installed capacity for 3 billion annual vaccine courses has a global benefit of \$17.4 trillion, over \$5900 per course. Investing now in expanding capacity for an additional annual 1 billion courses could accelerate completion of widespread immunization by over 8 months, providing additional global benefits of \$676 to \$589 per course. This dwarfs prices of \$8 to \$40 per course seen in deals with vaccine producers, indicating the wide gap between social and commercial incentives. We urge govern-

ments and international organizations to contract with vaccine producers to further expand capacity and encourage measures described below to “stretch” existing capacity (such as lower-dose regimens) and efficiently allocate courses (such as a cross-country vaccine exchange).

Our analysis involves two exercises, first estimating the global benefits from vaccine capacity already in place, then estimating the benefits of undertaking additional capacity investment starting now (see supplementary materials for all data and methods). The enormous estimates from both exercises provide a wake-up call relevant for the current pandemic—that it is not too

Vaccine capacity equals speed, which has enormous value in a pandemic. Vials of the COVID-19 vaccine developed by AstraZeneca move along the production line at the Serum Institute of India plant in Pune, India.

late to invest in more capacity—and future pandemics—that preparations to shorten delays in rolling out vaccines, treatments, and other countermeasures at global scale could prevent enormous harm.

### VALUE OF CAPACITY IN PLACE

In our model, a unit of capacity is defined as the fixed investment needed for one course per year of a regulatory-approved COVID-19 vaccine, including production lines as well as complementary investments necessary to get shots into arms (e.g., input-supply chains, transportation logistics, and medical staff at administration sites). Our discussion focuses on production capacity because it involves the most economic risk and lead time, so may be the rate-limiting step.

Capacity already in place, some of which was installed “at risk” before clinical trials were completed, is more valuable than capacity that comes online later because it can produce vaccine courses without delay. Some credit for the extent of capacity in place can be ascribed to advance contracts that many countries signed with firms. Typically, firms only install capacity at commercial scale once a vaccine is proven safe and effective, creating a delay of at least 8 months between clinical approval and large-scale vaccination. Signing contracts in advance of clinical approval, governments should share some of this risk and incentivize firms to install capacity earlier.

It is difficult to pin down the level of capacity currently in place precisely. We take 3 billion courses of annual capacity as our baseline, with half coming online in January and half in April. This baseline is high relative to current production but low relative to best-case production plans for 2021 announced by firms succeeding in phase 3 clinical trials (table S1). We trace out global benefits for a range of capacities around this baseline, from 1 billion to 5 billion annual courses.

The International Monetary Fund (IMF) estimates global GDP losses from COVID-19 of \$12 trillion during 2020–2021 (2), an average monthly GDP loss of \$500 billion. More comprehensive harm estimates—including education and health losses—are multiples larger. For example, comprehensive harm in the United States has been estimated (3) to be over five times the projected GDP loss. We use \$1 trillion (double the IMF estimate of GDP losses) as a conservative measure of comprehensive global monthly harm.

### Global value of vaccine capacity

GLOBAL CAPACITY (BILLION COURSES)	GLOBAL BENEFIT (TRILLION \$)		TIME TO 70% VACCINATION (MONTHS)	
	GDP ALONE	COMPREHENSIVE	HIGH-INCOME COUNTRIES	WORLD
1	5.3	10.5	31.5	66.0
2	7.5	15.0	16.5	33.7
3	8.7	17.4	11.5	23.0
4	9.4	18.8	9.0	17.6
5	9.8	19.7	7.5	14.4

Vaccine capacity assumes ramp-up such that half of the indicated capacity is available starting January 2021 and the remainder starting April 2021. First two columns estimate global benefit in monetary terms from specified capacity over a 24-month period. Last two columns estimate time until 70% of high-income countries or world population is vaccinated using available capacity. Allocation of capacity to countries of different income levels is based on reported bilateral deals and assumes that global capacity is fully utilized until the target of 70% of world population is vaccinated. Calculations are based on the model outlined in the text and detailed further in the supplementary materials.

## Global value of vaccine capacity

GLOBAL CAPACITY (BILLION COURSES)	GLOBAL BENEFIT (TRILLION \$)		TIME TO 70% VACCINATION (MONTHS)	
	GDP ALONE	COMPREHENSIVE	HIGH-INCOME COUNTRIES	WORLD
1	5.3	10.5	31.5	66.0
2	7.5	15.0	16.5	33.7
3	8.7	17.4	11.5	23.0
4	9.4	18.8	9.0	17.6
5	9.8	19.7	7.5	14.4

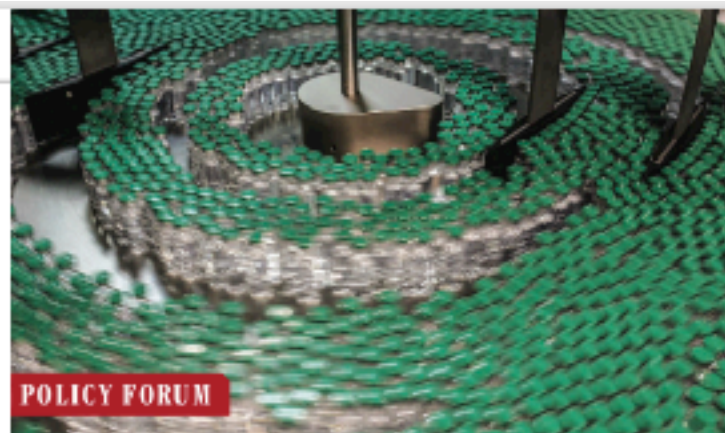
Vaccine capacity assumes ramp-up such that half of the indicated capacity is available starting January 2021 and the remainder starting April 2021. First two columns estimate global benefit in monetary terms from specified capacity over a 24-month period. Last two columns estimate time until 70% of high-income countries or world population is vaccinated using available capacity. Allocation of capacity to countries of different income levels is based on reported bilateral deals and assumes that global capacity is fully utilized until the target of 70% of world population is vaccinated. Calculations are based on the model outlined in the text and detailed further in the supplementary materials.

El valor de una dosis es **5.800\$**

Unas 316 veces el precio de una dosis de pfizer (15€) y **2.370 veces** el precio de una dosis de AZN  
Ergo: **El precio es lo de menos**, lo importante es **acelerar....**



# La **vacunación COVID de la humanidad** es todavía **más coste-efectiva** que la estrategia TRA



POLICY FORUM

COVID-19: ECONOMICS Clave: capacidad de producción

## Market design to accelerate COVID-19 vaccine supply

Build more capacity, and stretch what we already have

By Juan Camilo Castillo<sup>1</sup>, Anrita Ahuja<sup>2</sup>, Susan Athey<sup>3,4</sup>, Arthur Baker<sup>5</sup>, Eric Budish<sup>6,7</sup>, Tasneem Chhedy<sup>8</sup>, Rachel Glennerster<sup>9</sup>, Scott Duke Kominers<sup>10,11</sup>, Michael Kremer<sup>12</sup>, Greg Larson<sup>13</sup>, Jean Lee<sup>14</sup>, Carice Prendergast<sup>15</sup>, Christopher M. Snyder<sup>16,17</sup>, Alex Tabarrok<sup>18</sup>, Brandon Joel Tan<sup>19</sup>, Witold Witek<sup>20</sup>

Each month, COVID-19 kills hundreds of thousands of people, reduces global gross domestic product (GDP) by hundreds of billions of dollars, and generates large, accumulating losses to human capital by harming education and health (2–4). Achieving widespread immunization 1 month faster would thus save many lives and mitigate short- and long-run economic harm. Although the value of vaccines may seem obvious, government action and investment in vaccines have not been commensurate with the enormous scale of benefits, with many countries not likely to achieve widespread immunization until the end of 2022.

We estimate below that installed capacity for 3 billion annual vaccine courses has a global benefit of \$17.4 trillion, over \$5900 per course. Investing now in expanding capacity for an additional annual 1 billion courses could accelerate completion of widespread immunization by over 4 months, providing additional global benefits of \$676 to \$589 per course. This dwarfs prices of \$8 to \$40 per course seen in deals with vaccine producers, indicating the wide gap between social and commercial incentives. We urge govern-

ments and international organizations to contract with vaccine producers to further expand capacity and encourage measures described below to “stretch” existing capacity (such as lower-dose regimens) and efficiently allocate courses (such as a cross-country vaccine exchange).

Our analysis involves two exercises, first estimating the global benefits from vaccine capacity already in place, then estimating the benefits of undertaking additional capacity investment starting now (see supplementary materials for all data and methods). The enormous estimates from both exercises provide a wake-up call relevant for the current pandemic—that it is not too

Vaccine capacity equals speed, which has enormous value in a pandemic. Walls of the COVID-19 vaccine developed by AstraZeneca move along the production line at the Serum Institute of India plant in Pune, India.

late to invest in more capacity—and future pandemics—that preparations to shorten delays in rolling out vaccines, treatments, and other countermeasures at global scale could prevent enormous harm.

### VALUE OF CAPACITY IN PLACE

In our model, a unit of capacity is defined as the fixed investment needed for one course per year of a regulatory-approved COVID-19 vaccine, including production lines as well as complementary investments necessary to get shots into arms (e.g., input-supply chains, transportation logistics, and medical staff at administration sites). Our discussion focuses on production capacity because it involves the most economic risk and lead time, so may be the rate-limiting step.

Capacity already in place, some of which was installed “at risk” before clinical trials were completed, is more valuable than capacity that comes online later because it can produce vaccine courses without delay. Some credit for the extent of capacity in place can be ascribed to advance contracts that many countries signed with firms.

Typically, firms only install capacity at commercial scale once a vaccine is proven safe and effective, creating a delay of at least 8 months between clinical approval and large-scale vaccination. By signing contracts in advance of clinical approval, governments shoulder some of this risk and incentivize firms to install capacity earlier.

It is difficult to pin down the level of capacity currently in place precisely. We take 3 billion courses of annual capacity as our baseline, with half coming online in January and half in April. This baseline is high relative to current production but low relative to best-case production plans for 2021 announced by firms succeeding in phase 3 clinical trials (table S1). We trace out global benefits for a range of capacities around this baseline, from 1 billion to 5 billion annual courses.

The International Monetary Fund (IMF) estimates global GDP losses from COVID-19 of \$12 trillion during 2020–2021 (2), an average monthly GDP loss of \$500 billion. More comprehensive harm estimates—including education and health losses—are multiples larger. For example, comprehensive harm in the United States has been estimated (3) to be over five times the projected GDP loss. We use \$1 trillion (double the IMF estimate of GDP losses) as a conservative measure of comprehensive global monthly harm.

### Global value of vaccine capacity

GLOBAL CAPACITY (BILLION COURSES)	GLOBAL BENEFIT (TRILLION \$)		TIME TO 70% VACCINATION (MONTHS)	
	GDP ALONE	COMPREHENSIVE	HIGH-INCOME COUNTRIES	WORLD
1	5.3	10.5	31.5	66.0
2	7.5	15.0	16.5	33.7
3	8.7	17.4	11.5	23.0
4	9.4	18.8	9.0	17.6
5	9.8	19.7	7.5	14.4

Vaccine capacity assumes ramp-up such that half of the indicated capacity is available starting January 2021 and the remainder starting April 2021. First two columns estimate global benefit in monetary terms from specified capacity over a 24-month period. Last two columns estimate time until 70% of high-income countries or world population is vaccinated using available capacity. Allocation of capacity to countries of different income levels is based on reported bilateral deals and assumes that global capacity is fully utilized until the target of 70% of world population is vaccinated. Calculations are based on the model outlined in the text and detailed further in the supplementary materials.

## Global value of vaccine capacity

GLOBAL CAPACITY (BILLION COURSES)	GLOBAL BENEFIT (TRILLION \$)		TIME TO 70% VACCINATION (MONTHS)	
	GDP ALONE	COMPREHENSIVE	HIGH-INCOME COUNTRIES	WORLD
1	5.3	10.5	31.5	66.0
2	7.5	15.0	16.5	33.7
3	8.7	17.4	11.5	23.0
4	9.4	18.8	9.0	17.6
5	9.8	19.7	7.5	14.4

Vaccine capacity assumes ramp-up such that half of the indicated capacity is available starting January 2021 and the remainder starting April 2021. First two columns estimate global benefit in monetary terms from specified capacity over a 24-month period. Last two columns estimate time until 70% of high-income countries or world population is vaccinated using available capacity. Allocation of capacity to countries of different income levels is based on reported bilateral deals and assumes that global capacity is fully utilized until the target of 70% of world population is vaccinated. Calculations are based on the model outlined in the text and detailed further in the supplementary materials.

Si se consigue ampliar la capacidad mundial de producción en 1000 millones de dosis en 2021, cada nueva dosis fabricada tendrá un valor adicional entre **600\$ y casi 1000\$**



Por tanto, el objetivo  
**económico**

es acelerar la producción y  
distribución de vacunas en todo  
el planeta

## The need for an independent evaluation of the COVID-19 response in Spain

Spain has been hit hard by COVID-19, with more than 300 000 cases, 28 498 confirmed deaths,<sup>1</sup> and around 44 000 excess deaths, as of Aug 4, 2020.<sup>2</sup> More than 50 000 health workers have been infected, and nearly 20 000 deaths were in nursing homes.<sup>3</sup> With a population of 47 million, these data place Spain among the worst affected countries. Spain is also reported to have one of the best performing health systems in the world<sup>4</sup> and ranks 15th in the Global Health Security index.<sup>5</sup> So how is it possible that Spain now finds itself in this position?

Potential explanations point to a lack of pandemic preparedness (ie, weak surveillance systems, low capacity for PCR tests, and scarcity of personal protective equipment and critical care equipment), a delayed reaction by central and regional authorities, slow decision-making processes, high levels of population mobility and migration, poor coordination among central and regional authorities, low reliance on scientific advice, an ageing population, vulnerable groups experiencing health and social inequalities, and a lack of preparedness in nursing homes. These problems were exacerbated by the effects of a decade of austerity that had depleted the health workforce and reduced public health and health system capacities.

A comprehensive evaluation of the health and social care systems is now needed to prepare the country for further waves of COVID-19 or future pandemics, identifying weaknesses and strengths, and lessons learnt. We are calling for an independent and impartial evaluation by a panel of international and national experts, focusing on the activities of the Central Government and of the governments of the 17 autonomous communities. This evaluation must include three areas:

governance and decision making, scientific and technical advice, and operational capacity. Moreover, the social and economic circumstances that have contributed to making Spain more vulnerable, including rising inequalities, must be considered.

Specific concerns include public health functions, leadership and governance, financing, health and social workforce, health information systems, service delivery, access to diagnosis and treatment, the role of scientific research, and the experience and values of individuals, communities, and vulnerable groups.

This evaluation should not be conceived as an instrument for apportioning blame. Rather, it should identify areas where public health and the health and social care system need to be improved. Although this type of evaluation is not usual in Spain, several institutions and countries, such as WHO<sup>6</sup> and Sweden,<sup>7</sup> have accepted the need for such a review as a means towards learning from the past and preparing for the future.

We encourage the Spanish Government to consider this evaluation as an opportunity that could lead to better pandemic preparedness, preventing premature deaths and building a resilient health system, with scientific evidence at its core.

AA has advised the Spanish and Catalan Governments. BGAV is a member of the multidisciplinary working group on COVID-19 for the Ministry of Science and Innovation of Spain, a member of the scientific committee on COVID-19 for the Government of the Canary Islands, Spain, and a member of the COVID-19 group of the Medical Council of Spain. BH has assessed two regional Spanish Governments on COVID-19. All other authors declare no competing interests.

**Alberto García-Basteiro, Carlos Álvarez-Dardet, Alex Arenas, Rafael Berenguer, Carme Borrell, Margarita Del Val, Manuel Franco, Montserrat Gea-Sánchez, Juan Jesús Gestal-Otero, Beatriz González López Valcárcel, Ildefonso Hernández-Aguado, Joan Carles March, José M Martín-Moreno, Clara Menéndez, Sergio Minué, Carlos Muntaner, Miquel Porta,**

**Daniel Prieto-Alhambra, Carmen Vives-Cases,**

**\*Helena Legido-Quigley**

helenalegido-quigley@isglobal.org

ISGlobal, Hospital Clínic, Universitat de Barcelona, Barcelona, Spain (ALG-B); Centro de Investigação em Saúde de Manhiça, Maputo, Mozambique (ALG-B); Institut d'Estadística de la Salut, Universitat de Alicante, Alicante, Spain (CA-D); Agència de Salut Pública de Barcelona, CIBER de Epidemiologia y Salud Pública, Barcelona, Spain (CA-D, CB, CV-C); Departament d'Enginyeria Informàtica i Matemàtiques, Universitat Rovira i Virgili, Tarragona, Spain (AA); Formerly Ministry of Health, Basque Government, Basque Country, Spain (BB); Viral Immunology, Centre de Biologia Molecular Severo Ochoa (MVCV), Interdisciplinary Platform on Global Health at the Spanish National Research Council, Madrid, Spain (MDV); Universidad de Alcalá de Henares, Madrid, Spain (M); Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, USA (MF); Department of Nursing and Physiotherapy, University of Lleida, Lleida, Spain (MG-S); Epidemiology and Public Health, Universidad de Santiago de Compostela, Galicia, Spain (JGG); Department of Quantitative Methods in Economics and Management, University of Las Palmas de Gran Canaria, Las Palmas de Gran Canaria, Spain (BGAV); Department of Public Health, Universidad Miguel Hernández, Elche, Alicante, Spain (BH); Escuela Andaluza de Salud Pública, Granada, Spain (JCM, SM); Department of Preventive Medicine & INCLIVA, University of Valencia, Valencia, Spain (JMM-M); Barcelona Institute for Global Health, Barcelona, Spain (CNE); Lawrence S Bloomberg Faculty of Nursing, University of Toronto, Toronto, ON, Canada (DM); Instituto Hospital del Mar de Investigaciones Médicas, Barcelona, Spain (MF); Haffner Department of Orthopaedics, Rheumatology, and Musculoskeletal Sciences, University of Oxford, Oxford, UK (DP-A); Department of Community Nursing, Preventive Medicine and Public Health and History of Science, Alicante University, Alicante, Spain (CV-C); CIBER of Epidemiology and Public Health, Madrid, Spain (CV-C); London School of Hygiene & Tropical Medicine, London WC1E 7HT, UK (HL-Q); and Saw Swee Hoek School of Public Health, National University of Singapore, Singapore (HL-Q)

1. Ministerio de Sanidad. Actualización no 177. Enfermedad por el coronavirus (COVID-19). Aug 4, 2020. [https://www.mscbs.gob.es/cv/profesionales/sauidPublica/cayes/alertasActual/nCov-China/documentos/Actualizacion\\_177\\_COVID-19.pdf](https://www.mscbs.gob.es/cv/profesionales/sauidPublica/cayes/alertasActual/nCov-China/documentos/Actualizacion_177_COVID-19.pdf) (accessed Aug 4, 2020).
2. Instituto de Salud Carlos III. Vigilancia de los excesos de mortalidad por todas las causas MoMo. July 29, 2020. [https://www.isciii.es/QuelBarranco/Servicios/VigilanciaSaludPublica/RINPV/InformeMedidasTransmisibles/MoMo/Documentos/InformeMoMo2020/MoMo\\_Situacion\\_19\\_de\\_julio\\_CN\\_Epd.pdf](https://www.isciii.es/QuelBarranco/Servicios/VigilanciaSaludPublica/RINPV/InformeMedidasTransmisibles/MoMo/Documentos/InformeMoMo2020/MoMo_Situacion_19_de_julio_CN_Epd.pdf) (accessed July 24, 2020).
3. Ministerio de Sanidad. Actualización no. 169. enfermedad por el coronavirus (COVID-19). July 28, 2020. [https://www.mscbs.gob.es/profesionales/sauidPublica/cayes/alertasActual/nCov-China/documentos/Actualizacion\\_169\\_COVID-19.pdf](https://www.mscbs.gob.es/profesionales/sauidPublica/cayes/alertasActual/nCov-China/documentos/Actualizacion_169_COVID-19.pdf) (accessed July 24, 2020).

in men) we believe would ensure a successful

Notes: scores shown in the made via our electronic submission system at <http://ees.elsevier.com/thelancet/>

# Necesidad de una evaluación independiente

Published Online  
August 6, 2020  
[https://doi.org/10.1016/S0140-6736\(20\)31111-1](https://doi.org/10.1016/S0140-6736(20)31111-1)

## Evaluation of the COVID-19 response in Spain: principles and requirements

A resurgence of COVID-19 infections is occurring in Spain, with some of the worst figures in Europe.<sup>1,2</sup> In August, 2020, we urged the Spanish Central Government and regional governments to independently evaluate their COVID-19 response to identify areas where public health and the health and social care system need to be improved.<sup>3</sup>

Although we received widespread support from more than 50 scientific societies and associations representing public health, medical, and nursing professional communities; there is now a need to define such an evaluation in terms of its timing, scope, and leadership. Here, we suggest three major requisites and four guiding principles, adapted from McKee and colleagues,<sup>4</sup> which

the members of the evaluation team, and the members themselves, should be independent from government, not have worked in government, and have no competing interests. Independent Spanish academics, working both in Spain and abroad, and international experts could take part in the selection committee and the evaluation team. Second, a no-blame culture is needed, focusing on providing recommendations that can improve the situation without apportioning blame. Third, the evaluation team should be gender balanced and multidisciplinary to promote broader critical evaluation. Fourth, the evaluation should have a broad scope, analysing the health, economic, and social effects with input from both the Central Government and the autonomous communities, given the high level of decentralised competencies.

The organisation of the evaluation can be chosen from existing models, such as the evaluation proposed by WHO,<sup>5</sup> the All-Party Parliamentary

Copyright: © 2020 The Author(s). Published by Elsevier Ltd. This is an Open Access article under the CC BY-NC-ND 4.0 license.

**\*Alberto L García-Basteiro, Helena Legido-Quigley, on behalf of the 20 signatories†**  
[alberto.garcia-basteiro@isglobal.org](mailto:alberto.garcia-basteiro@isglobal.org)

†Signatories include Carlos Álvarez-Dardet, Alex Arenas, Rafael Bengoa, Carme Borrell, Margarita Del Val, Manuel Franco, Montserrat Gea-Sánchez, Juan Gestal, Beatriz González López Valcárcel, Ildefonso Hernández-Aguado, Joan Carles March, José M Martín-Moreno, Clara Menéndez, Sergio Minué, Carlos Muntaner, Miquel Porta, Daniel Prieto-Alhambra, and Carme Vives Cases (see details in appendix).

ISGlobal, Hospital Clínic, Universitat de Barcelona, Barcelona 08036, Spain (ALG-B); Centro de Investigação em Saúde de Manhiça, Maputo, Mozambique (ALG-B); London School of Hygiene & Tropical Medicine, London, UK (HL-Q); and Saw Swee Hoek School of Public Health, National University of Singapore, Singapore (HL-Q)

1. Ministerio de Sanidad. Actualización no 193: enfermedad por el coronavirus (COVID-19). Aug 26, 2020. [https://www.mscbs.gob.es/profesionales/sauidPublica/cayes/alertasActual/nCov-China/documentos/Actualizacion\\_193\\_COVID-19.pdf](https://www.mscbs.gob.es/profesionales/sauidPublica/cayes/alertasActual/nCov-China/documentos/Actualizacion_193_COVID-19.pdf) (accessed Sept 15, 2020).
2. European Centre for Disease Prevention and Control. COVID-19 situation update for the EU/EEA and the UK, as of 16 September 2020.

# Luces

Avances hacia la **Co-gobernanza**

**CESP**

Flexibilidad y **aprendizaje**  
rápido (**meso**)

**Datos** en abierto  
**compartidos** (ej. Asturias  
municipales, por barrios  
Barcelona)

Papel de la **UE**

# Sombras

**Arquitectura institucional.**

Problemas de **coordinación**  
y competencias niveles  
estatal, autonómico, local

Residencias

Restricciones institucionales  
condicionantes (ej. **CISNS**)

Falta de preparación  
(EPIs, test,...)

**Contaminación política**



# Conclusión



## RESUMEN

1. Nunca la **política económica** había sido tan sanitaria, ni la **política sanitaria** tan económica
2. Básicamente, hay dos tipos de estrategias para enfrentar la pandemia, la de mitigación (**Red Zone Strategy**) y la de eliminación (**Green Zone Strategy**). Europa, y España, han optado por la primera
3. La mayor parte (>90%) del **coste** de la COVID-19 es el **económico** (PIB). Las **estrategias de Test, Rastreo y Aislamiento** son sumamente **coste-efectivas (7/1)**. Las **vacunas**, mucho más (hasta **1.370/1**)
4. La **respuesta política** en España: **luces y sombras**. Necesaria **evaluación independiente**
5. Problemas de **gobernanza**, restricciones institucionales, **contaminación política** en las decisiones de *policy*
6. Pero también luces: **flexibilidad** y aprendizaje, más **colaboración** (compartir datos), cambios de gobernanza en ciernes, nueva **dimensión europea**

Muchas gracias!



[beatriz.lopezvalcarcel@ulpgc.es](mailto:beatriz.lopezvalcarcel@ulpgc.es)