A sustainable exit strategy:

Managing uncertainty, minimising harm

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Policy Futures

Executive Summary

Lockdown saves lives but isn't sustainable

Lockdown saves lives, buying time...

- Across Europe, only full lockdown has worked to reduce the reproduction number below 1, slowing the rate of spread.

...but the UK now needs a sustainable strategy for Covid-19

- OBR anticipates a 35% fall in GDP in Q2 if lockdown continues through June.

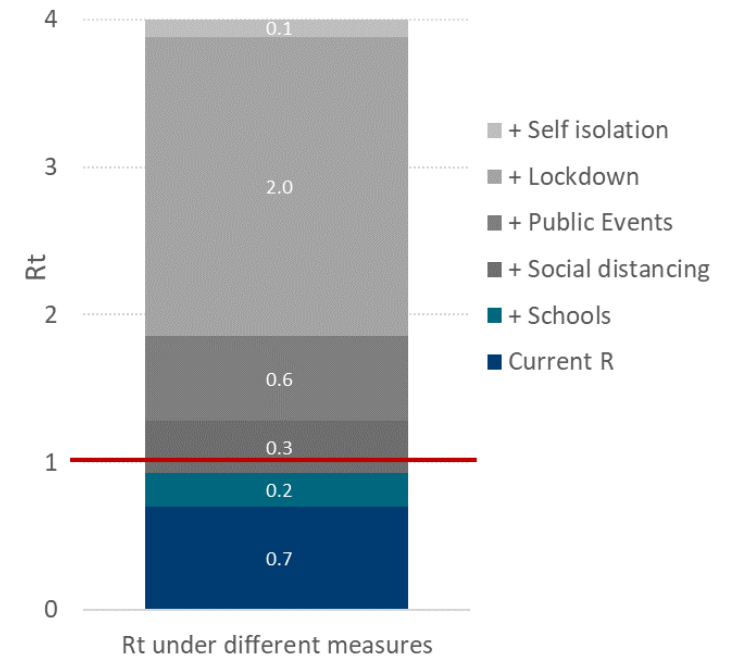- Data on other conditions suggests that the health costs of lockdown are high.

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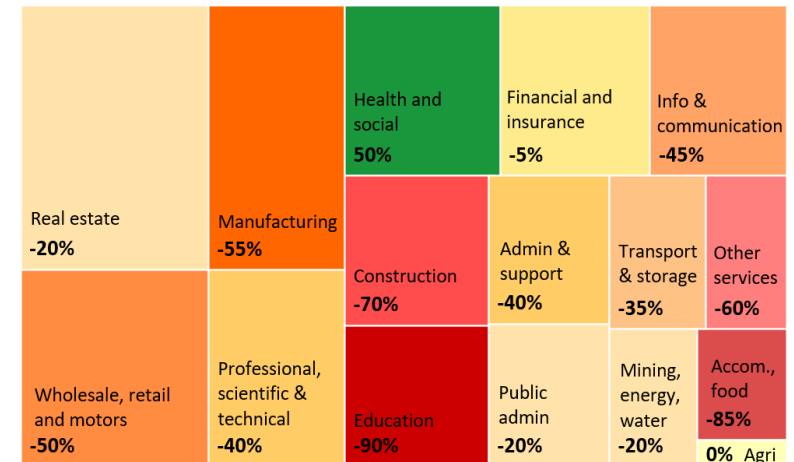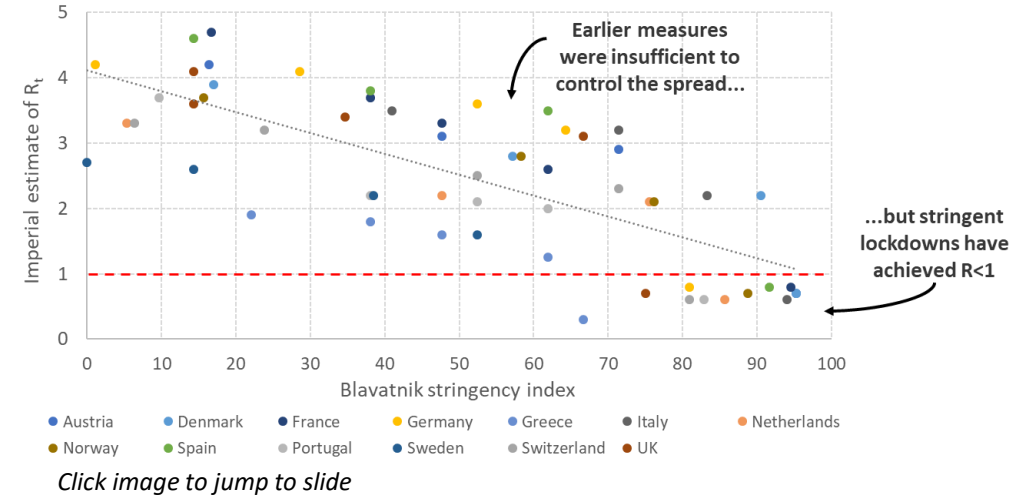
Little scope to ease without new measures

Once new cases fall substantially, the UK could consider easing...

- **Schools** could open first: Children are at very low risk, and economic and education costs of school closure are high.

- **Age segmentation:** Younger people are at much lower risk, so could be allowed to return to work sooner.

- **Sector segmentation:** Some workplaces pose less risk and could return before others.

- **Geographic segmentation:** Caseload and NHS capacity vary across the country.

...but there's very little headroom to lift suppression measures

- Analysis suggests lifting even one current measure could take R above 1, accelerating the spread.

	Rt
+ Self isolation	0.1
+ Lockdown	2.0
+ Public Events	0.6
+ Social distancing	0.3
+ Schools	0.2
Current R	0.7

Rt under different measures
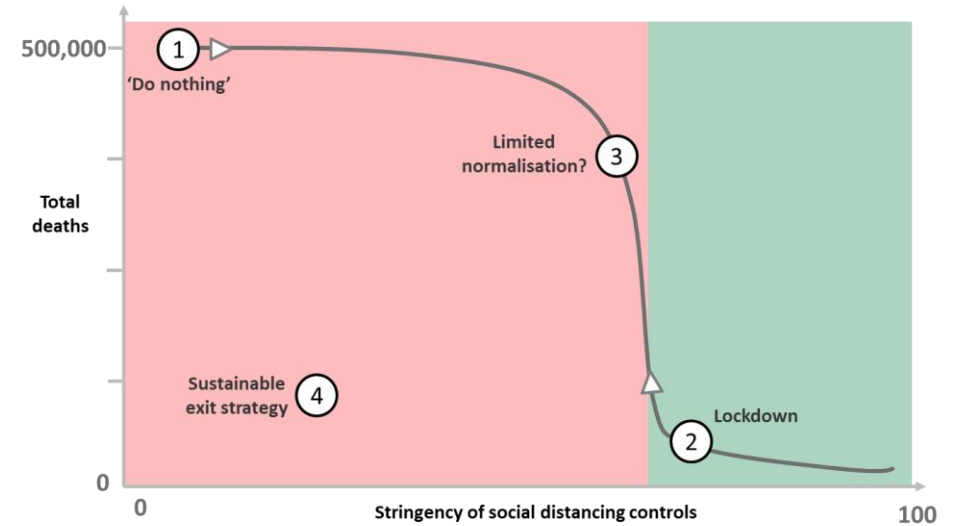
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Sustainable strategy: minimising the trade-off

Easing alone is risky...

Without effective countermeasures, easing the lockdown could push R above 1, quickly putting us on a path to a very high number of deaths.

...but we can minimise the trade-off

A twin-track strategy of containment and shielding can prevent deaths and stop the number of cases accelerating as suppression measures are eased.

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Containment
Containment measures allow us to reduce suppression measures without the spread of the virus accelerating. Masks, testing, tracing all help achieve containment.
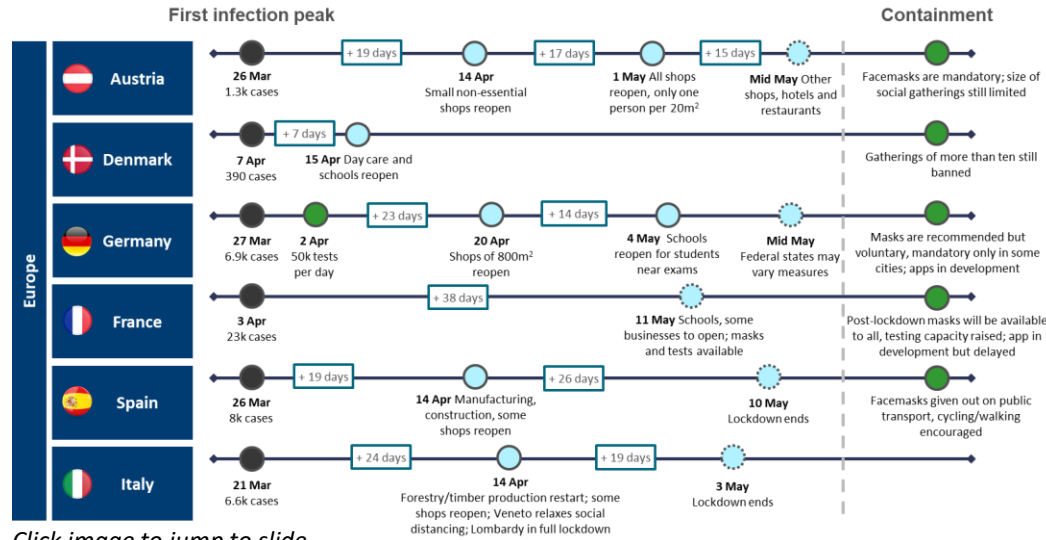
Shielding
Shielding the vulnerable allows us to reduce the death toll of the virus even if the spread of the virus does accelerate. Older people and people with relevant health conditions would be protected.

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How do other countries measure up?

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Europe is easing…

European countries are starting to ease, but containment and shielding capacity appears limited, risking acceleration of the virus. This may mean a return to lockdown.

… but East Asia has advanced containment capacity

East Asian countries tend to have better testing and tracing capacity and widespread use of masks.

Managing uncertainty: a contingent exit plan

Uncertainty accentuates the need for a clear plan

- Until vaccines or treatments become available, sustainable exit from lockdown requires an advanced strategy for containment and shielding.

- That will be a process of trial and error. There may be advances and reversals along the way.

- Uncertainty adds to the long-term economic damage, exacerbates mental health concerns and may erode support for lockdown.

- Government should therefore set out a **contingent exit plan**, involving carefully specified levels of lockdown, and the thresholds at which they would be triggered. This would allow businesses and people to plan, and begin to look to the future.

NB: Thresholds and measures are illustrative	Individuals	Hospitality, entertainment	Transport	Retail	Schools	Other business	Econ impact
Hard Lockdown if • Daily new cases > 500	Only leave home for exercise, medical need or essential supplies	Closed	Essential transport only	Closed	Closed	Only essential business to be done on site	**Economy around 65% (OBR)**
Soft Lockdown if • Daily new cases < 500 • Testing capacity > 100k • Tracing capacity > 50% • Shielding	Work if workplace open and clear app reading, masks where possible otherwise only leave home as for hard lockdown. Over-65s as per Hard Lockdown	Partially open with strict capacity limits. Patrons encouraged to show clear contact tracing app reading	Private transport, public transport with masks, social distancing and clear app readings for passengers	Social distancing enforced, entry to shops limited, patrons to wear masks and have clear app reading	Open	Open with social distancing enforced, masks, clear app readings for staff	**Economy around 90%**
Soft open if • Daily new cases < 100 • Testing + tracing as for Soft	Public gatherings < 100 allowed, travel to low-risk countries allowed	Open, patrons encouraged to show clear contact tracing app reading	Private transport, public transport with masks and clear app readings for passengers	Social distancing enforced, masks	Open	Open with social distancing enforced, clear app readings for staff	**Economy around 95%**

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1

Lockdown lessons so far

Lockdowns have got the virus under control
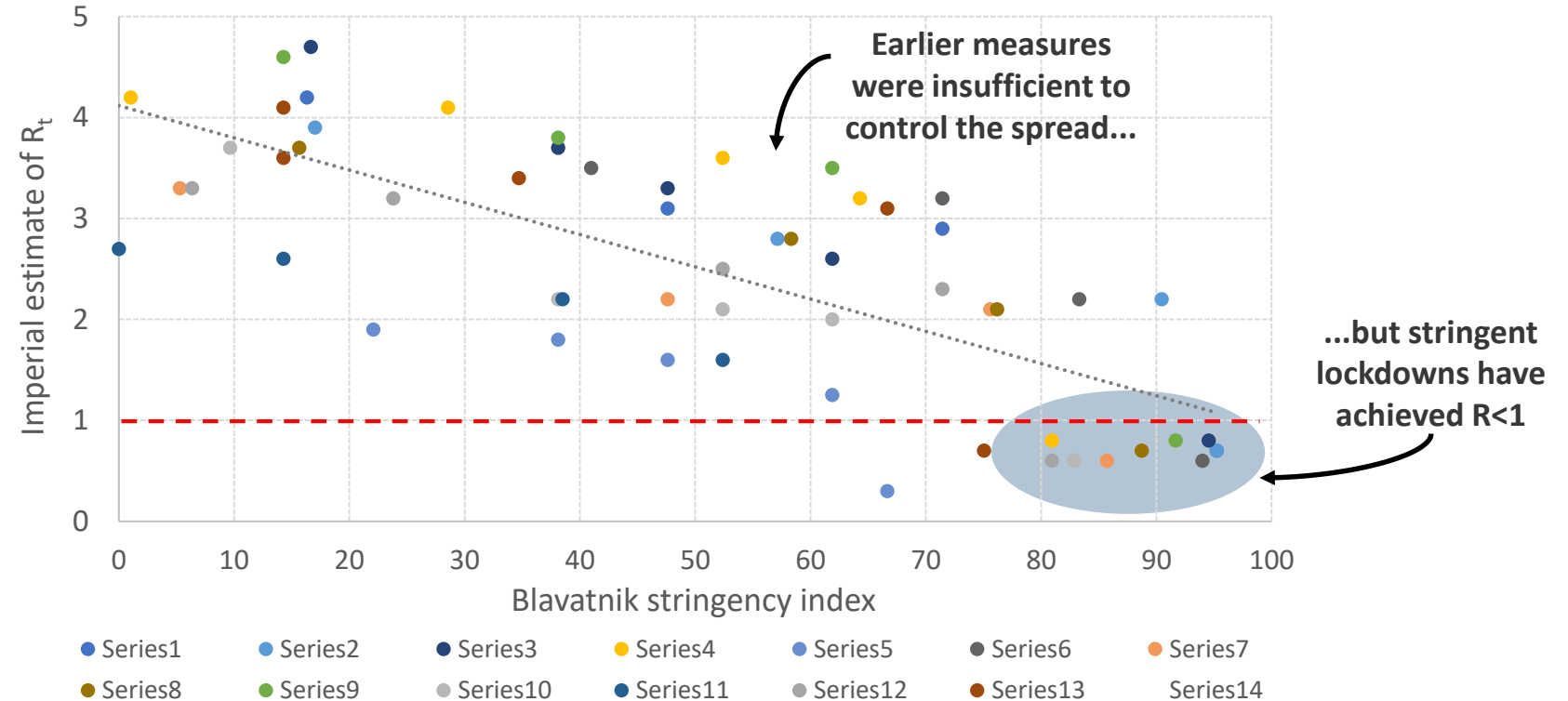
So far nothing short of complete lockdown appears to have been able to arrest the accelerating spread of the virus and stop the epidemic. The lockdown isn't a sustainable strategy for dealing with the virus – but it buys time to develop one.

Economic consequences are severe

- The OBR anticipates a 35% fall in GDP in Q2 if lockdown continues through June. Unemployment is expected to rise by 2 million, to 10%.
- The big unknown: how big will be the permanent hit to living standards? The longer the lockdown goes on, the greater is the chance of significant permanent damage to the economy.

The UK economy mapped

Size of tile represents each sector's proportion of normal GDP; percentages represent change in activity under lockdown

Real estate **-20%**	Manufacturing **-55%**	Health and social **50%**	Financial and insurance **-5%**	Info & communication **-45%**
		Construction **-70%**	Admin & support **-40%**	Transport & storage **-35%** / Other services **-60%**
Wholesale, retail and motors **-50%**	Professional, scientific & technical **-40%**	Education **-90%**	Public admin **-20%**	Mining, energy, water **-20%** / Accom., food **-85%** / **0%** Agri

Source: OBR
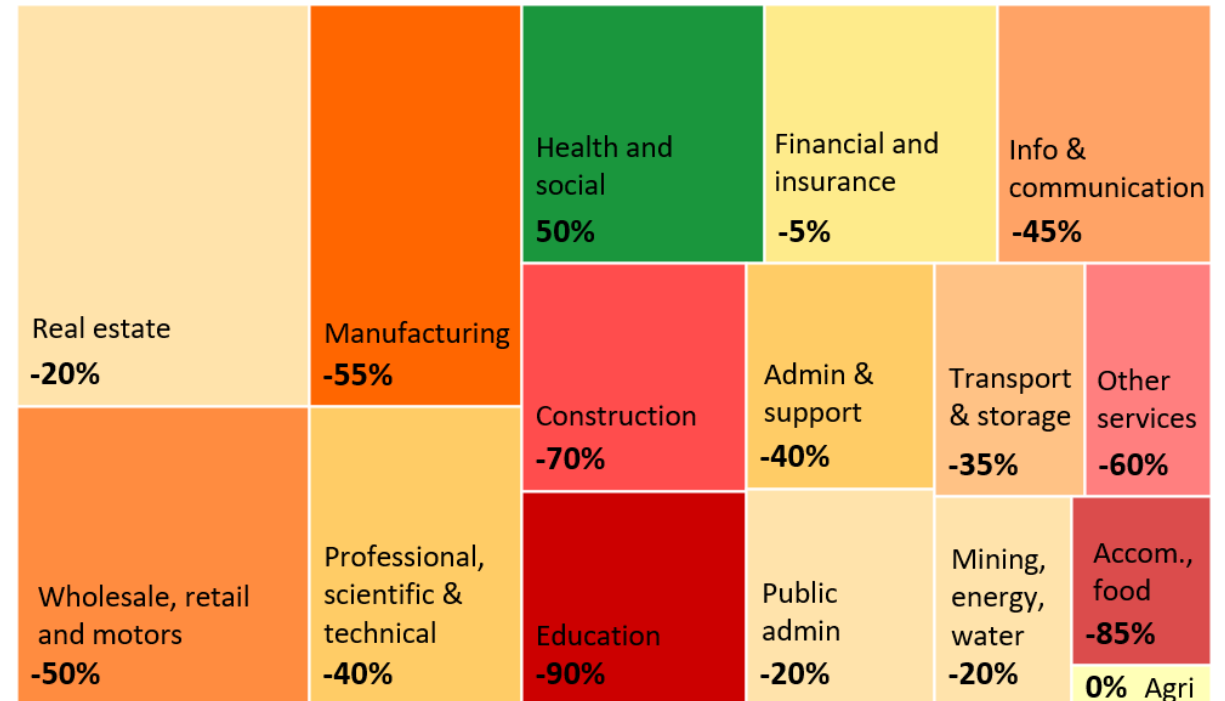
Lockdown hits lower-income people hardest

- Lower-paid sectors tend to be harder hit by the lockdown.

- The **IFS estimates** that around one-third of employees in the lowest-earning decile of the income distribution work in sectors that have been largely or entirely shut down by suppression measures, compared to around 5% of those in the top three deciles.
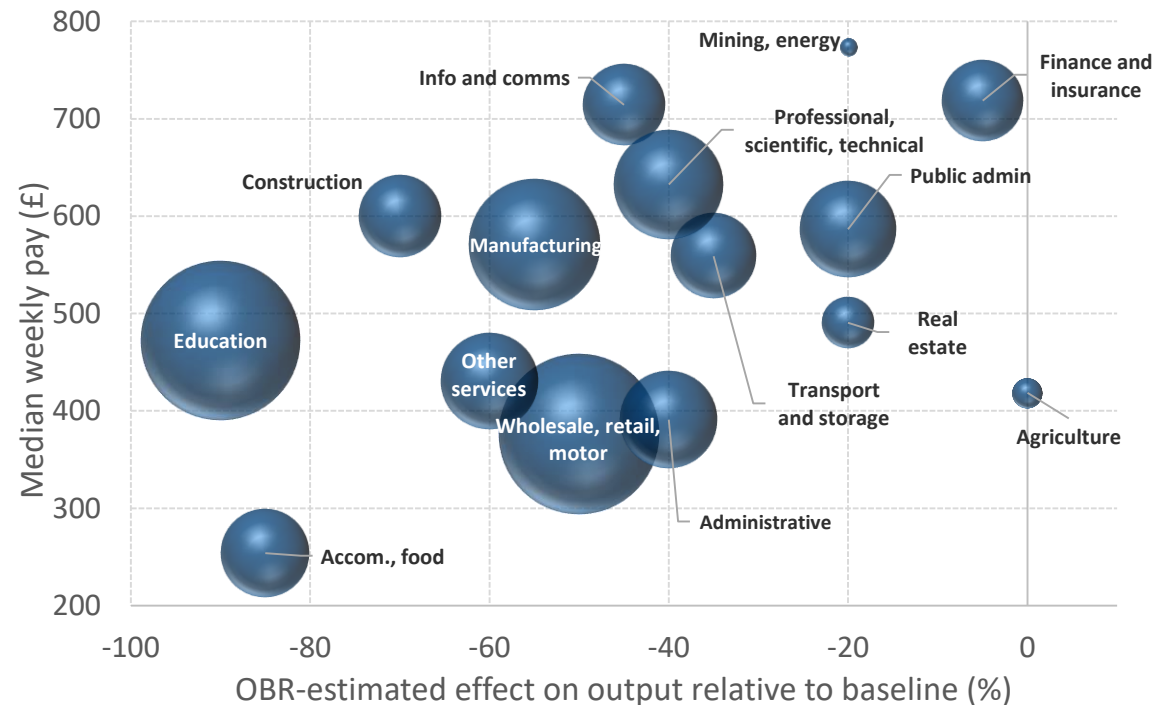
Health and education costs

Wider consequences of the lockdown include:

- **Students' learning** will be affected, with three months' less teaching estimated by one <u>study</u> to reduce test scores by 6% of a standard deviation.

- **Educational disparities** will grow, with some parents at an advantage over others in the time, knowledge, resources and non-cognitive skills they can devote to home schooling. Disadvantaged pupils have fewer learning opportunities outside school.

- **Lockdown also has health impacts.** The former head of the WHO Cancer programme warned six months of lockdown could mean 60,000 excess cancer deaths from reduced services. Non-Covid-19 respiratory visits to GPs fell by 75% from the 16 March introduction of distancing.

- <u>A&E visits</u> have fallen significantly, with a 29% drop year on year for March. Daily hospital visits for suspected heart attacks halved from 300 to 150.

Contagion, density and deprivation

5-day rolling case growth rates by deprivation, English local authorities

Most deprived — 2nd quartile — 3rd quartile — Least deprived
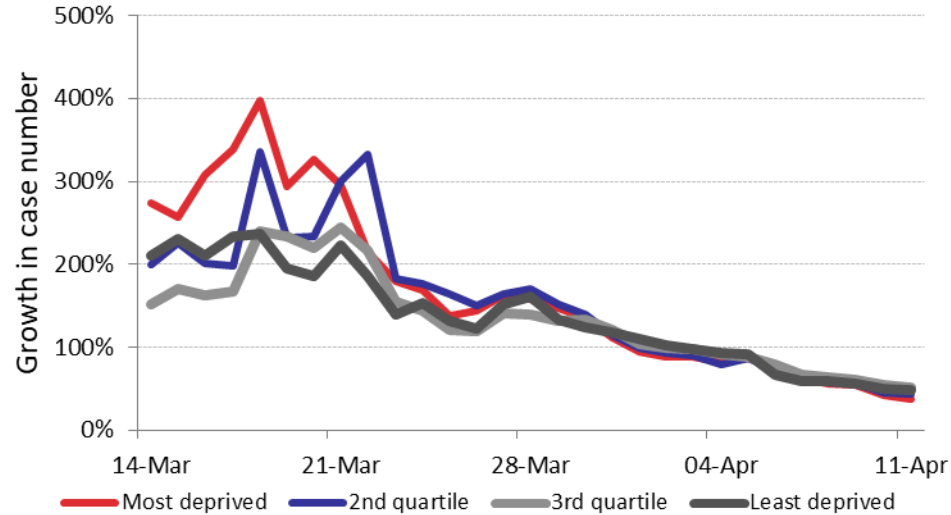
- There is no obvious difference between the rate of spread in more and less deprived local authorities in England.

- Covid-19 does not appear to spread more quickly in dense urban areas.

- Qian et al find transmission in China mainly occurred within the home or on public transport.

5-day rolling case growth rates by population density, English local authorities

Dense — Sparse
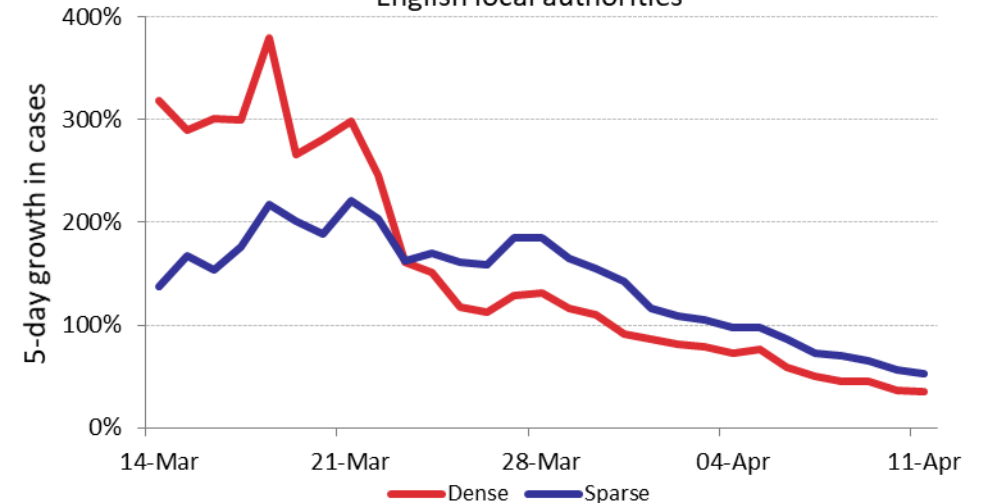
Source: Authors' calculations, PHE, ONS
Notes: Densely populated UTLAs are defined as those with more than 28 people per hectare, the average for English UTLAs

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Limited normalisation

Due to the high cost of lockdown, governments are considering easing suppression measures to allow more activity, once outbreaks are under control. They have several options.

Schools

- Children are far less likely to contract or suffer with coronavirus. 2.4% of cases are under 19, with 2.5% of those showing severe symptoms.

- Meanwhile scientific advice indicates school closures – combined with social distancing – is effective at limiting household-to-household transmission

- Research by UCL suggests school closures reduce deaths by 2-4%, based on evidence from 16 comparable outbreaks. However the scale of this benefit needs to be offset against the educational, health and economic impacts of closures.

- Given the low risk to children directly and the economic importance of schools, reopening them – particularly for younger children – is seen in many countries as a viable first step in easing suppression measures.

Challenges	• Preventing spread among teachers, school workers and parents • Maintaining social distancing or containment with children • Overcoming concerns of reluctant parents

NB: Schools are included as separate to age and sectoral segmentation due to their crossover with both, but also setting apart from other aspects of the economy

Age segmentation

- <u>IFS research</u> has shown that around one-third of workers in shutdown sectors are under 25; women are disproportionately in these sectors.

- <u>ONS data</u> show deaths are overwhelmingly among older people. Mortality for under 40s is one in 100,000. By comparison heart attack mortality is 0.67 for 15-34 year olds. Covid-19 mortality rises to 25.5 for 40-65s; for over 65s it's 491. Men are overrepresented at every age.

	<65	65-69	70-74	75-79	80-84	95-89	90+
% of Covid-19 deaths	13%	7%	11%	16%	21%	18%	16%
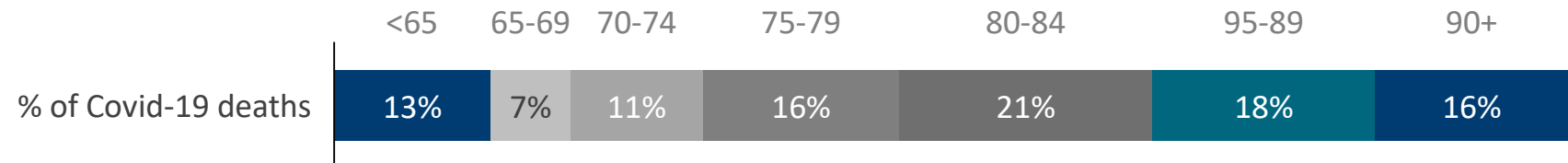
- This suggests that young people could be allowed to return to work first with lower personal risk. Note this is distinct from <u>shielding</u>.

- <u>Warwick University</u> researchers have proposed releasing from lockdown 4.2 million workers aged 20-30 who do not live with their parents.

Challenges	• Maintaining lockdown among other lower-risk age groups • Lack of labour demand with most of the economy shut down • Intergenerational equity

Sector segmentation

- ONS data show the impact on sectors from lockdown is very uneven:
    - 10% of businesses in education, health or IT are laying off workers.
    - This rises to 52% in hospitality, 39% in administration, construction and the arts, and 33% in transportation and storage.
- This is related both to differentiated ability to work from home, but also to the forced closure of many consumer-facing businesses.
- Reopening lower-risk sectors of the economy could help alleviate economic pain while keeping R lower than if the entire economy opens.
- There are several ways this could be achieved, for example:
    - Gradually expanding lower-risk sectors like manufacturing.
    - Allowing businesses that can maintain social distancing to open. For example restaurants with fewer tables, or cinemas half full.

| Challenges | • Cross-sector supply chains limit benefit of partial opening |
| | • Enforcing and monitoring social distancing within workplaces is hard |

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Geographic segmentation

- There were initially more cases in cities, especially London, but there appears to be no link between urban density and the rate of spread.

- Nevertheless severity of outbreaks varies markedly across the country, which could allow low-risk areas to ease restrictions first.

- Several countries have used geographic flexibility in lockdown as rates of infection vary – notably the US, Japan and South Korea.

New Covid-19 cases per million of population
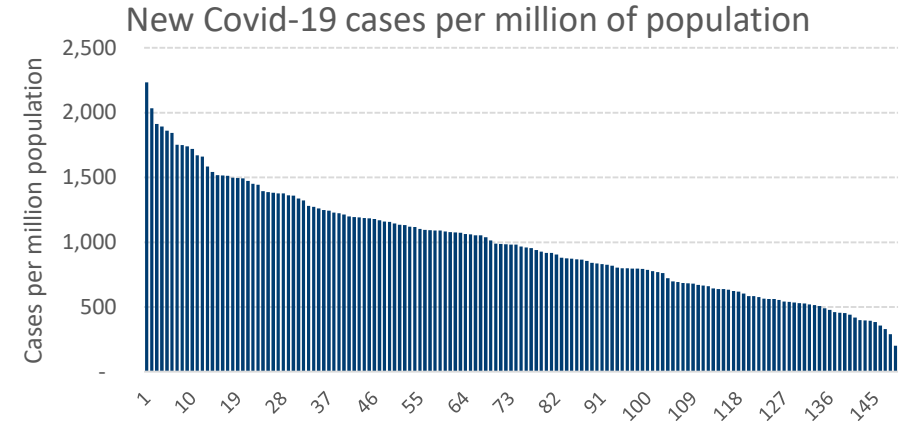
Note: New cases 1-15 April
Source: ONS, PHE, authors' calculations

Worst-affected local authorities	Least-affected local authorities
Sunderland	Peterborough
Gateshead	Wiltshire
Knowsley	Somerset
Middlesbrough	Isle of Wight
St. Helens	Rutland

Challenges	
	• Limiting movement between regions; enforcement in those locked down
	• Inconsistent political boundaries, e.g. health, police and local authorities
	• Exacerbating real and perceived regional inequalities

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Risks of normalisation

However, lifting restrictions without other measures risks accelerating the spread of the virus

Countries have little scope to lift restrictions

- Current estimates from Imperial College have the reproduction number (R) for the UK at around 0.7.

- Their estimate of the impact of different suppression measures suggests that just allowing schools to return could raise R close to one.

- Adding other relaxation measures could cause the spread of the virus to accelerate again.

- Significant relaxation therefore needs to be offset by other measures if cases are not to spike.

Approximate effectiveness of different suppression measures

Rt under different measures

Legend:
- + Self isolation
- + Lockdown
- + Public events
- + Social distancing
- + Schools
- Current R

Chart values: 0.1, 2.0, 0.6, 0.3, 0.2, 0.7
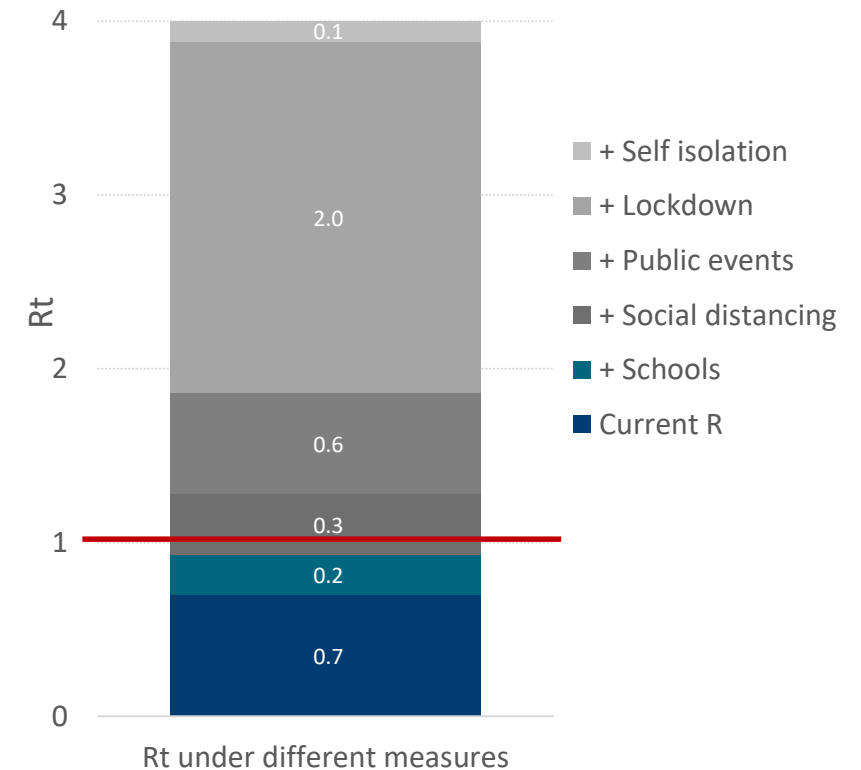
Notes: Indicative only. Authors' calculations based on Imperial College *Estimated impact of interventions*, scaled to UK estimates R0=4, Rt=0.7

The dilemma: an unavoidable trade-off?

Lifting suppression = higher R? = more deaths?
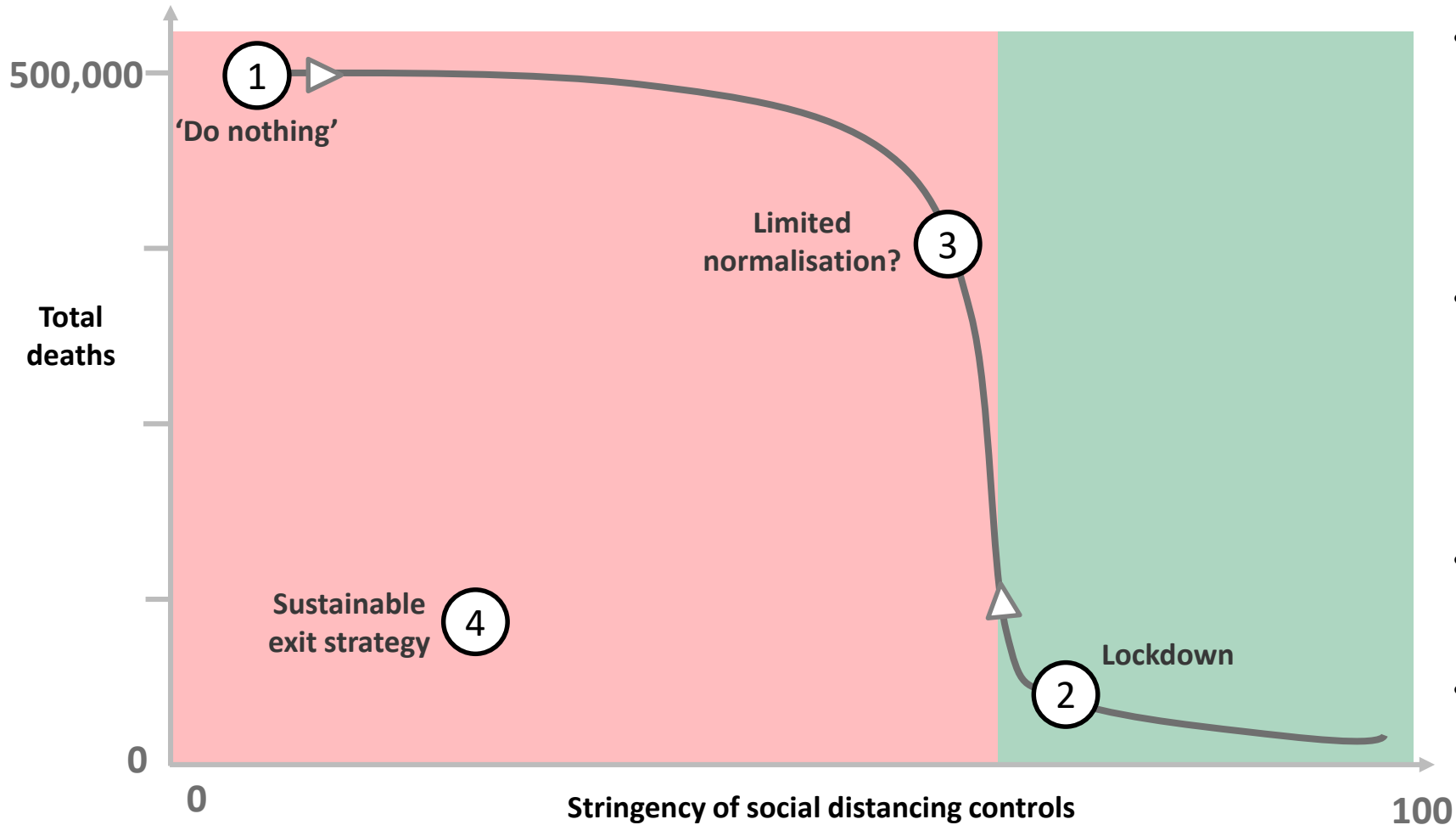
- Only stringent **lockdown measures (2)** have brought the spread of the virus under control, hopefully limiting deaths.
- But **lifting suppression measures (3)** alone could lead to the accelerating spread and large numbers of deaths.
- Estimates suggest there is very little room for manoeuvre.
- A **sustainable exit (4) strategy** means getting away from this trade-off.

Illustrative only.

Minimising the trade-off

Two approaches can help us minimise the trade-off, by breaking the links between suppression, the spread of the virus and the number of deaths.
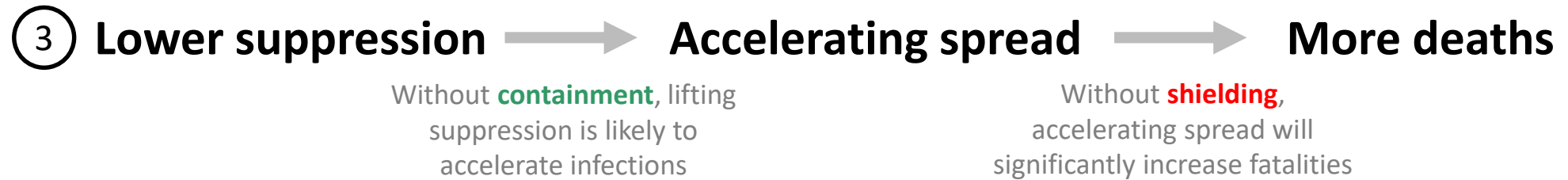
③ **Lower suppression** ➡️ **Accelerating spread** ➡️ **More deaths**

Without **containment**, lifting suppression is likely to accelerate infections

Without **shielding**, accelerating spread will significantly increase fatalities

Containment

Containment measures allow us to reduce suppression measures without the spread of the virus accelerating. Masks, testing, tracing all help achieve containment.

+

Shielding

Shielding the vulnerable allows us to reduce the death toll of the virus even if the spread of the virus does accelerate. Older people and people with relevant health conditions would be protected.

④ **Lower suppression** ✖️➡️ Accelerating spread ✖️➡️ More deaths

4

Containment

Measures that reduce the spread of the virus

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Mass testing

- Since the start of the pandemic, the World Health Organisation has emphasised the importance of testing in order to trace transmission.

- Random sampling in Iceland showed that the virus had a much wider spread in the community than had been assumed from original screening of high-risk people, indicating the importance of a broader testing regime.

- Antigen tests have accuracy limitations but can still be effective at scale (see forthcoming TBI work). No antibody tests are currently licenced in the UK.

- Opinions on the capacity required vary, for example Paul Romer calls for universal random testing of 7% of the population. However <u>Cleevely et al.</u> suggest that 21% daily testing would be needed, if done at random, but that targeted testing of critical groups is a more practical option.

- TBI has <u>previously argued</u> that mass testing is essential.

Challenges	• Antigen tests produce significant false negatives, face scaling challenges • Testing capacity is constrained by availability of reagents, as well as PPE • Significant workforce is required to administer tests

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App-augmented contact tracing

- Contact tracing closes down disease transmission by isolating people who have come into contact with a person who tests positive for Covid-19. The <u>coverage</u> of contacts and speed at which they isolate are key to effectiveness.

- Large-scale manual tracing operations appear to be an essential feature, with Singapore, for example, drawing on its armed forces to assist.

- Apps can augment manual tracing and potentially act as a 'passport' out of lockdown. BDI <u>estimates</u> that 60% app usage could end the epidemic.

- Singapore's TraceTogether logs anonymised records of nearby phones via Bluetooth, avoiding intrusive location tracking. NHSX's app will be similar.

- Apple and Google <u>announced</u> interoperable, privacy-protecting APIs, allowing CT apps to run in the background, enhancing tracing effectiveness. Though strict anonymity limits the ability of government to use data to suppress outbreaks.

Challenges	• Rapidly scaling up manual contact-tracing capacity • Reaching take up of 60% • Encouraging app use and dealing with privacy concerns

Masks

- Evidence from the SARS outbreak suggested mask wearing reduced infection rate, and some anecdotal evidence suggests it is effective against Covid-19 too.

- But other studies show low effectiveness against flu pandemics. The WHO only recommends masks for severe pandemics.

- Greatest effectiveness seems to be in public places such as public transport, shops and town centres. They are less effective in the home, and fail to prevent infections in large crowds.

- Feasibility depends on availability of masks – restricted at present, partly because of export bans in many producer countries.

  - Even simple homemade cloth masks provide some protection.

  - Other countries e.g. South Korea and Taiwan have been able to supply two masks a day for everyone through increasing production and rationing.

Challenges	• Ability to make or procure sufficient masks • Improper, inconsistent use – especially around food, while sleeping • Managing attitudinal change like an undue feeling of 'protectedness'

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Shielding

Measures that protect the vulnerable but do not affect the spread of the virus

Shielding

- Evidence from China suggests the case fatality rate for Covid-19 is 1.4%, while the fatality rate for all those who contract the virus (including asymptomatic) is around 0.7%.

- The infection fatality rate is estimated at almost 8% for the over-80s. However it is 0.6% for people in their 50s, and well below 0.1% for under 40s.

- This suggests that if people above working age are isolated, the fatality rate can be reduced even if containment fails.

Covid-19 case and infection fatality rates by age, China
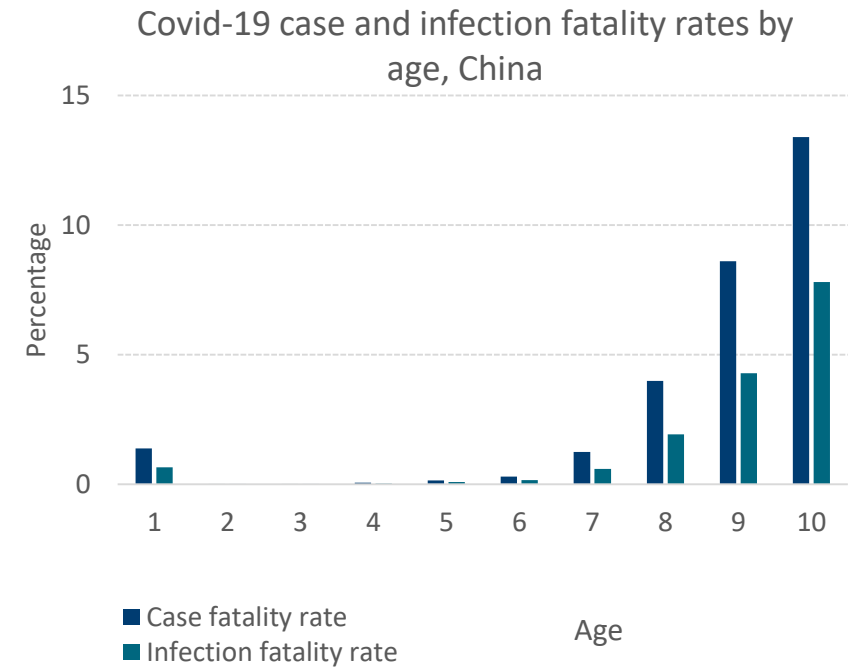
Challenges	• Maintaining lockdown will itself be harmful for older people • Defining vulnerability and therefore risk level is difficult • Managing behaviours, visits from non-vulnerable family or friends

Options summary

	Costs vs benefits?	How quickly can it be done?	Will it be seen as fair?	How practical is it?	Can it be enforced?
Opening schools	🟢	🟢	🟢	🟢	🟢
Geographic segmentation	🟡	🟢	🟡	🟡	🟡
Age segmentation	🟢	🟢	🔴	🟡	🟡
Sector segmentation	🟡	🟡	🟡	🟢	🟢
Shielding	🟢	🟢	🟡	🟢	🟡
Masks	🟢	🟢	🟢	🟢	🟡
Mass testing	🟢	🟡	🟢	🟡	🟢
App-augmented contact tracing	🟢	🟡	🟢	🟡	🟢

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Exit strategies around the world

The European Approach

Europe is starting to ease lockdown measures. While the rate of new infections remains high in many countries, most are now well down on peak infection rates in late March.

○ **Suppression.** Measures are being put into reverse. Lifting by sector and geography incrementally.

● **Containment.** Testing capacity is limited, while tracing plans appear to be at an early stage in most countries. There is an emphasis on use of masks and avoiding public transport.

○ **Shielding.** Shielding of vulnerable groups is mostly through soft, communication measures rather than formal policies.

Most countries are poised to re-enter lockdown if R rises. Austria, Spain and Denmark have explicitly recognised this.

May 11 will be the beginning of a new step. It will be progressive, the rules may be adapted in function of the results. The objective is the health of people

Emmanuel Macron

If our health system recovers, we will move forward with [other] measures. De-escalation will be progressive and very cautious from two weeks

Pedro Sanchez

This is like walking the tightrope. If we stand still along the way we could fall and if we go too fast it can go wrong. We must take one cautious step at a time

Mette Frederiksen

Brussels is supporting/urging national governments to coordinate exits from lockdown. The EC advises:

• Criteria for releasing restrictions are the decreased spread of Covid-19 (significantly and sustained) and sufficient hospital capacity for any increase in cases.

• Notify and provide advanced warning of plans to relax border controls or confinement or reopen shops.

● Governments should expand testing, gather harmonised data and coordinate contact-tracing apps.

○ Exit should be gradual, with a one-month gap between different steps.

○ Lifting of measures should start locally and extend geographically.

○ Internal EU borders will relax first, followed by coordinated external border.

○ Confinement should remain for vulnerable groups.

○ Services could reopen with restricted opening hours.

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European timelines for easing suppression

First infection peak   **Containment**

Austria

26 Mar
1.3k cases

+ 19 days

14 Apr
Small non-essential shops reopen

+ 17 days

1 May All shops reopen, only one person per 20m^2

+ 15 days

Mid May Other shops, hotels and restaurants

Facemasks are mandatory; size of social gatherings still limited

Denmark

7 Apr
390 cases

+ 7 days

15 Apr Day care and schools reopen

Gatherings of more than ten still banned

Germany

27 Mar
6.9k cases

2 Apr
50k tests per day

+ 23 days

20 Apr
Shops of 800m^2 reopen

+ 14 days

4 May Schools reopen for students near exams

Mid May
Federal states may vary measures

Masks are recommended but voluntary, mandatory only in some cities; apps in development

France

3 Apr
23k cases

+ 38 days

11 May Schools, some businesses to open; masks and tests available

Post-lockdown masks will be available to all, testing capacity raised; app in development but delayed

Spain

26 Mar
8k cases

+ 19 days

14 Apr Manufacturing, construction, some shops reopen

+ 26 days

10 May
Lockdown ends

Facemasks given out on public transport, cycling/walking encouraged

Italy

21 Mar
6.6k cases

+ 24 days

14 Apr
Forestry/timber production restart; some shops reopen; Veneto relaxes social distancing; Lombardy in full lockdown

+ 19 days

3 May
Lockdown ends

Europe

Note: Cases denote highest number of daily new infections, not controlled by population https://www.worldometers.info/coronavirus/#countries

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East Asia has a stronger emphasis on containment

East Asia

Singapore
No lockdown: test, treat, track

20 Mar Stronger social distancing

+21 days

10 Apr Sectoral lockdown

16 Apr 728 cases

South Korea
+14 days

15 Feb Mass testing, tracing, quarantine

3 Mar 851 cases

+18 days

21 Mar Social distancing expanded

Hong Kong
Masks culturally embedded

25 Mar Quarantines & tracing arrivals

29 Mar 82 cases

April 1-3 Sectoral restrictions

April 20 Secondaries reopen

Japan
+18 days

Feb 12 limited testing but contact tracing

1 Mar Schools close

+22 days

23 Mar Moderate social distancing

+15 days

7 Apr State of emergency allows sectoral & geographic lockdown

11 April 743 cases

Masks culturally embedded

● There is strong reliance on manual and tech-based tracing and testing. Mask use culturally embedded. In South Korea location tracking measures are highly intrusive, though less so in Singapore.

● Most never entered full lockdown. However school closures and sectoral restrictions are common.

● Shielding of vulnerable groups is mostly through soft, communication measures rather than formal policies.

● Several countries have suffered from a renewed spike in infections, however these remain far below European numbers.

Note: Cases denote highest number of daily new infections, not controlled by population https://www.worldometers.info/coronavirus/#countries/

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Strategies so far

Legend: Yes (green), Partial (yellow), No (red), Tent. (dashed)

		Germany	Italy	France	Austria	Denmark	Spain	Japan	S. Korea	HK
Easing suppression	Schools	Partial	No	Partial	No	Partial	No	No	Partial	Partial (Tent.)
	Geographic segmentation	Partial (Tent.)	Partial	No	No	No	No	Yes	Yes	No
	Age segmentation	No	No	No	No	No	No	No	No	No
	Sector segmentation	Partial	Partial	Partial (Tent.)	Partial	Yes (Tent.)	Partial	Partial	Partial	Partial
Shielding	Shielding	Partial	Partial	Partial (Tent.)	Partial	Partial	Partial	No	No	No
Containment	Masks	Partial	Partial	Partial	Yes	No	Partial	Partial	Yes	Yes
	Mass testing	Yes	No	No	No	Partial (Tent.)	No	No	Yes	Partial
	App-based tracing	Partial (Tent.)	No	No	Partial (Tent.)	Partial (Tent.)	No	No	Partial	Partial

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Implications

- **European countries** are lifting measures more gradually than in East Asia, mainly reflecting their much more severe outbreaks as well as less sophisticated containment infrastructure. Leaders' references to "walking tightropes" imply a potential return to lockdown if R increases.

- **East Asian countries** have progressed much further with testing, tracing and mask production, largely due to past experience and different cultural practices. Containment measures are in development in Europe, but not likely to be fully ready by the time parts of the economy emerge.

- **Neither bloc has enforced plans to shield the vulnerable**, though in some countries there is messaging to this effect.

- Given the challenges of scaling up containment activity quickly, the UK may need to use shielding measures to limit the risks as it lifts lockdown.

- The UK is behind both regions on the curve. This means it may be able to learn from Europe to avoid re-entering hard lockdown, but must urgently address testing, tracing, PPE and shielding capacity.

What could a plan look like?

Principles for a plan

- Lockdown is damaging the economy, and people's health and wellbeing, partly because of uncertainty about what life could look like in the coming months.

- Government cannot provide certainty about when case numbers will drop or what future outbreaks may occur, so providing firm dates for lifting lockdown measures weeks in advance may be unwise.

- However it could substantially reduce uncertainty and strengthen adherence to the lockdown by taking three steps:

  - Put hard **metrics on its five tests** for lifting the lockdown.

  - **Establish different levels of suppression** measures that will be in force, conditional on the scale of an outbreak, potentially varying by region.

  - **Clarify what each level of suppression will mean** for people and different types of businesses.

- The following grid is **intended as an illustration** of how such a plan could be constructed. The detailed contents should not be taken as firm proposals.

A contingent exit plan

NB: Thresholds and measures are illustrative	Individuals	Hospitality, entertainment	Transport	Retail	Schools	Other business	Econ impact
Hard Lockdown if • Daily new cases > 500	Only leave home for exercise, medical need or essential supplies	Closed	Essential transport only	Closed	Closed	Only essential business to be done on-site	**Economy around 65% (OBR)**
Soft Lockdown if • Daily new cases < 500 • Testing capacity > 100k • Tracing capacity > 50% • Shielding	Work if workplace open and clear tracing-app reading, masks where possible otherwise only leave home as for Hard Lockdown. Over-65s as per Hard Lockdown	Partially open with strict capacity limits. Patrons encouraged to show clear contact tracing app reading	Private transport, public transport with masks, social distancing and clear app readings for passengers	Social distancing enforced, entry to shops limited, patrons to wear masks and have clear app reading	Open	Open with social distancing enforced, masks, clear app readings for staff	**Economy around 90%**
Soft Open if • Daily new cases < 100 • Testing + tracing as for Soft LD	Public gatherings < 100 allowed, travel to low-risk countries allowed	Open, patrons encouraged to show clear contact-tracing app reading	Private transport, public transport with masks and clear app readings for passengers	Social distancing enforced, masks	Open	Open with social distancing enforced, clear app readings for staff	**Economy around 95%**

Economic activity assumptions derived from OBR scenario. Soft lockdown: Accom & Food remains at OBR's lockdown activity level, Transport & Storage and Wholesale & Retail see 50% recovery towards normality, Health up 20% on normal, other sectors down 10% on normal. Soft Open: Accom & Food down 20% on normal, Health up 10%, other sectors down 5% on normal.

Policy Futures