

A Roadmap for Exit

Saving lives and livelihoods –
lessons from around the world

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MAY 2020



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Executive Summary

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Uncertainty, risk and the need for a “roadmap”

Deciding how and when to begin easing lockdown needs to be informed by three considerations: the **costs and benefits of lockdown**, transmission and **vulnerability**.

Under any approach we are very likely to face future outbreaks of uncertain scale. And **uncertainty** about the operating environment is almost as damaging for people and businesses as lockdown itself.

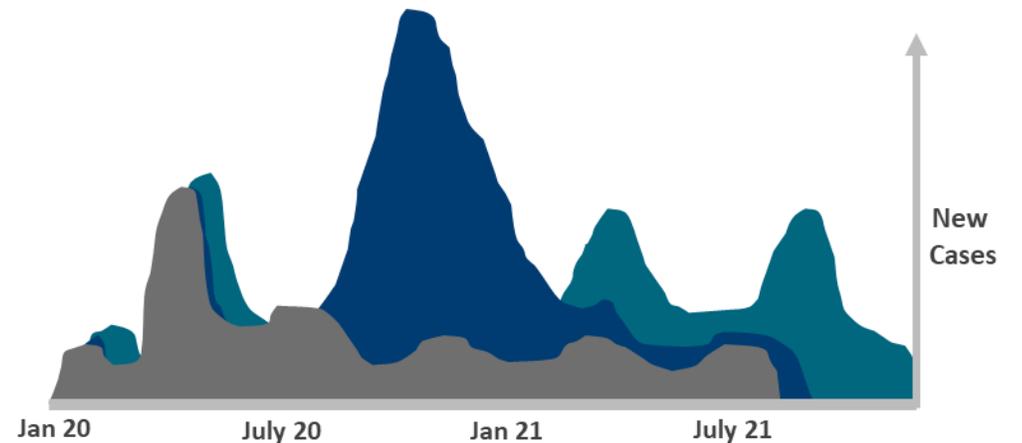
A well-structured roadmap helps people and businesses manage uncertainty and strengthens compliance with measures designed to save both lives and livelihoods.

1. Costs & benefits of lockdown

2. Risks of transmission

3. Vulnerability

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Components of an effective roadmap for exit

An sustainable exit strategy needs to be accompanied by a clearly communicated **roadmap for exit**.

Effective roadmaps offer clarity on:

- **What** are the levels of exit?
- **When** will different levels be triggered?
- **How** will Covid-19 be contained at each level?

The best roadmaps offer multi-stage plans with detail on implications for different types of businesses, clear metrics and thresholds for moving between levels, and advanced testing and tracing capacity.

Roadmap to Exit	
 What? <i>Levels</i>	What are the phases of exit? What are their implications for different businesses and individuals?
 When? <i>Triggers</i>	When will we move between levels? What are the metrics and thresholds that govern these decisions?
 How? <i>Measures</i>	How do we avoid a second spike after easing? What are the measures that will contain the virus at each level?
 Govt <i>Org & Comms</i>	Are new structures needed to manage exit? How will government enlist the help of business and people?

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	Multi-level plan, determined by transmission risks, vulnerability and relative costs of lockdown for different businesses and individuals	Multi-level plan without clear rationale	Single level lockdown or no clear definition of levels
	Defined metrics and thresholds for moving between levels	Distinct categories or tests to be met, but without clarity on thresholds	No clear articulation of how decisions to ease will be made
	Testing, tracing and isolation capacity, and potentially other containment and shielding measures sufficiently effective to contain new outbreaks	Expanded containment measures but largely untested at scale	Easing lockdown without substantially improved containment or shielding measures
	National strategy with central coordination, clear accountability and regular, transparent engagement	Public statements and documents allowing for some level of preparation for future phases	Little or no government discussion of future plans, or consultation

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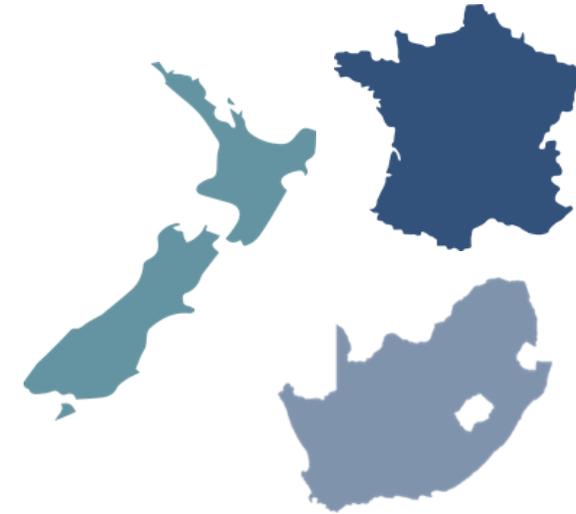


Lessons from around the world

Several countries have now outlined, and some have implemented, plans to ease lockdown measures. Various institutes have also suggested approaches. These vary in scope and sophistication.

The UK's plan should:

- Set out the **levels** of easing it will use and what they will mean for people and business.
- Build on the 5 tests with **triggers**, hard metrics and thresholds to move between levels.
- Set out how expanded containment **measures** can reduce the risk at each level.
- Have tailored **communications** to enlist the support of individuals and businesses.



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	UK 4 May	New Zealand	South Africa	Israel	Germany	Austria	France	Spain	Harvard	CEP (LSE)	Romer
Levels	Red	Green	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Red	Yellow
Triggers	Yellow	Yellow	Yellow	Yellow	Yellow	Red	Yellow	Yellow	Yellow	Green	Yellow
Measures	Yellow	Yellow	Green	Yellow	Green	Red	Yellow	Yellow	Green	Red	Green
Govt	Red	Green	Green	Green	Green	Yellow	Yellow	Yellow	Green	Red	Yellow

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Context

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Costs & benefits of lockdown

Deciding how and when to begin lifting suppression should be informed by the **costs and benefits of lockdown**, modes of **transmission** and **vulnerability** to the disease. On the first of these, the lockdown has saved lives but is also imposing growing health, economic and social costs.



- Other diseases are going untreated, cancer referrals have dropped by 62% on pre-pandemic levels, and A&E visits fell by 25% in the week after lockdown. Heart attack-related visits have halved.
- More than one in five people say their mental health is worse due to Covid-19.



- According to the OBR, GDP could fall by 35% in the second quarter. Construction activity is down by 70%, and hospitality down 85%. April's Manufacturing PMI fell to a record-low of 32.6.
- Economic pain is unevenly spread. One-third of the lowest earning employees are in largely or entirely shut down sectors, compared to around 5% of the highest.



- Lost education hits the disadvantaged hardest, as there are few development opportunities beyond school.
- Domestic violence indicators are deeply concerning and loneliness is on the rise.



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Risks of transmission

Understanding how Covid-19 spreads is essential to planning how society can safely return to normality. The evidence on transmission is limited, but there are some early indicators:

- Qian et al find that in China 80% of cases were linked to home outbreaks and 34% to public transport, with some outbreaks linked to more than one setting. Critically, they found only a single outdoor outbreak, accounting for two cases.
- High infection rates within communal establishments like migrant worker dormitories in Singapore and care homes in the UK appear to be consistent with this.
- A recent evidence review suggests children may not play a significant role in transmission, contributing to decisions in Switzerland to allow under-10s to mix with over-60s.





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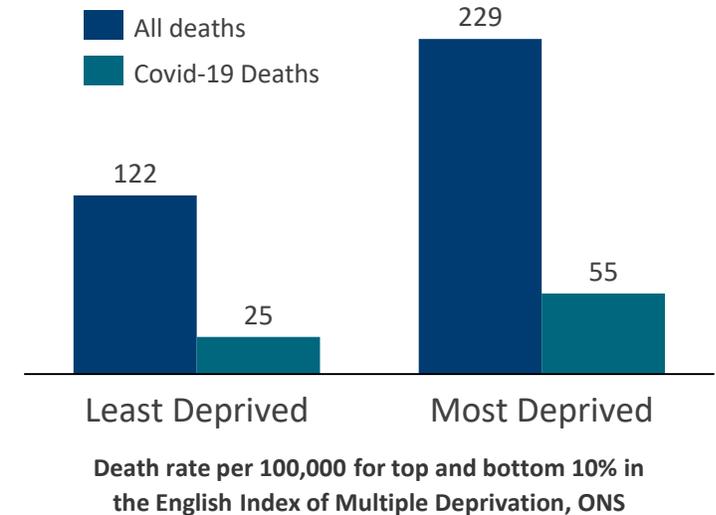
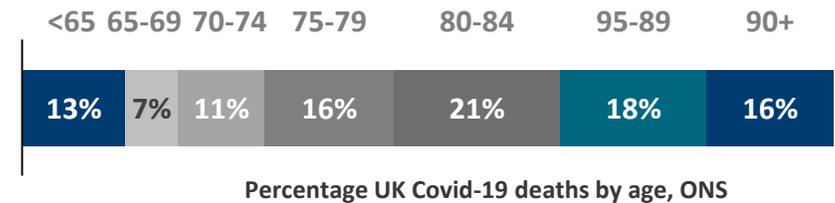
Vulnerability

Different groups face starkly different risks if they contract Covid-19. In designing a way to ease the lockdown, each group's individual risks should be considered, in a way that offers them the most protection possible. For example:

Age: Imperial estimates infection fatality rate for under-60s of 0.15% and a Harvard paper just 0.05%. Mortality rises by age decile.

Sex: Men appear to be more at risk than women, and are overrepresented in every age group. For 75-84 year olds in the UK, men die at almost twice the rate with 4,063 deaths compared to 2,434 women.

Deprivation: ONS analysis suggests that death rates are more than twice as high in the most deprived areas compared to the least.



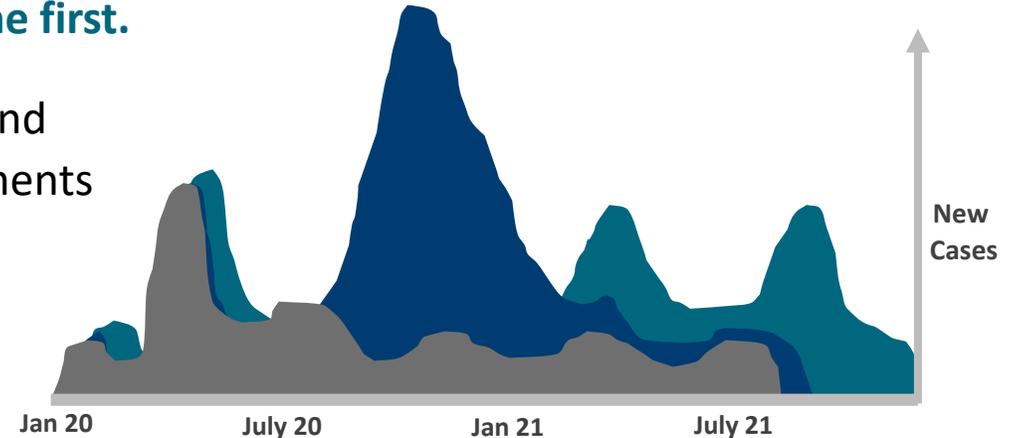


The uncertainty problem

It is highly likely that there will be future outbreaks, of uncertain scale. We could see **diminishing smaller peaks**, a **larger second spike** as happened with the 1918 Spanish flu, or further **waves of similar scale to the first**.

This compounds the uncertainty around when, how and for how long governments will allow some normality to return.

Pervasive uncertainty is almost as damaging as the lockdown itself:



- Businesses need to understand their likely operating environment over the months ahead in order to make plans and even just to keep going.
- People need to be able to look to the future and make plans for things like visiting friends and family, changing jobs, moving house or having children.

A well-specified and clearly communicated **roadmap for exit** is needed to help people and businesses manage the uncertainty and strengthen compliance with measures designed to save both lives and livelihoods.



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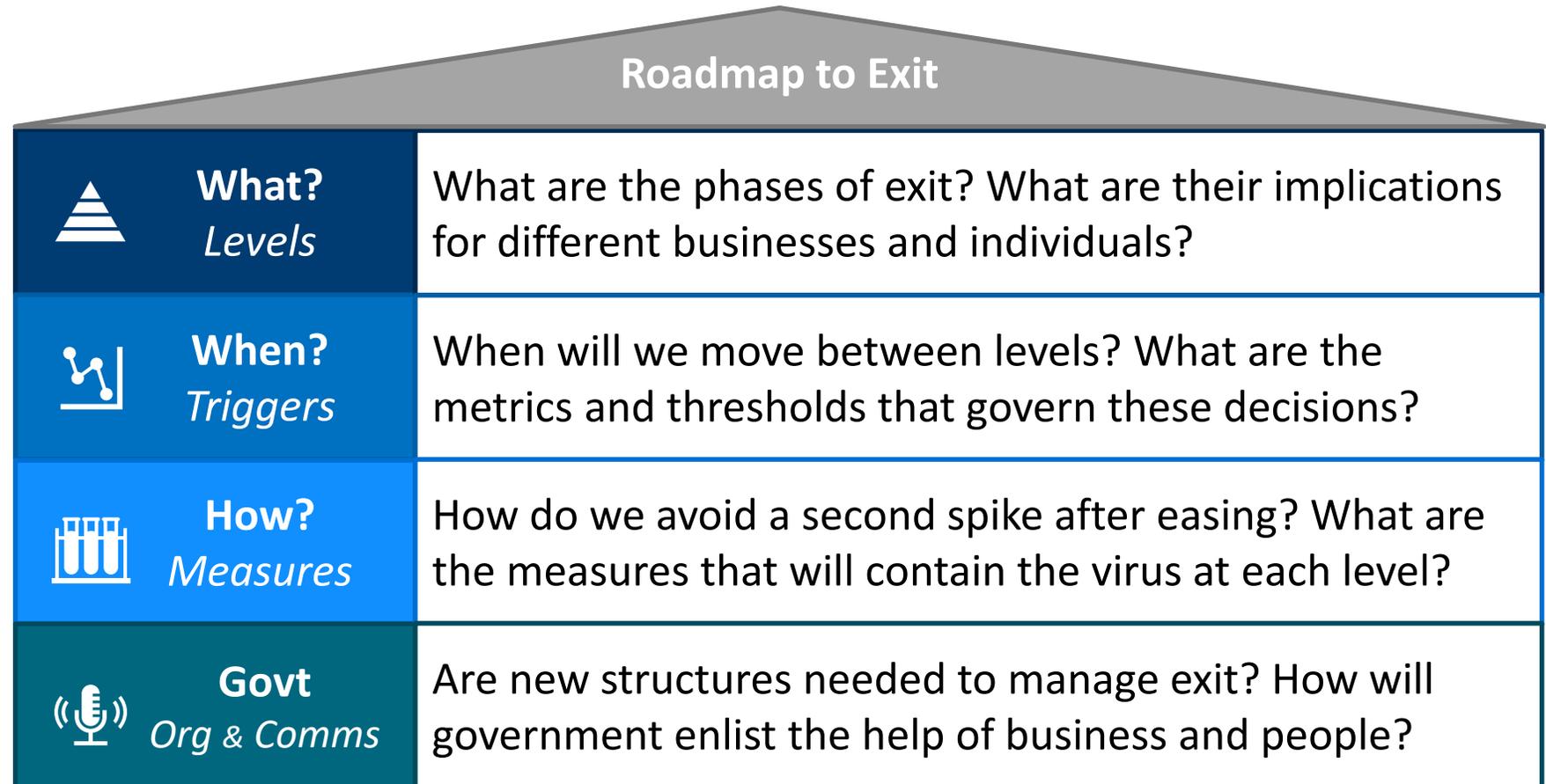


What does a good exit plan look like?



A framework for assessing exit plans

An effective roadmap for exiting from lockdown consists of four elements





What does a good roadmap look like?

	Strong	Moderate	Weak
	Multi-level plan, determined by transmission risks, vulnerability and relative costs of lockdown for different businesses and individuals	Multi-level plan without clear rationale	Single level lockdown or no clear definition of levels
	Defined metrics and thresholds for moving between levels	Distinct categories or tests to be met, but without clarity on thresholds	No clear articulation of how decisions to ease will be made
	Testing, tracing and isolation capacity, and potentially other containment and shielding measures sufficiently effective to contain new outbreaks	Expanded containment measures but largely untested at scale	Easing lockdown without substantially improved containment or shielding measures
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What?
Levels



When?
Triggers



How?
Measures



Government
Organisation & Comms



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What? Setting the levels of easing



An effective roadmap consists of different levels of restrictions according to the severity of the threat. Levels will vary from the most restrictive, as in the current lockdown, to lighter restrictions that are closer to “normal”. Pre-announced levels set out detailed implications for different businesses and types of people, allowing the public to plan ahead.

France plans a gradual, time-based reopening but not in distinct phases.



South Africa will operate on five alert levels, ranging from a stronger lockdown than the UK (5) to normal activity (1).



Israel has no phased exit plan, but has made several announcements of a gradual exit from lockdown.



Spain has outlined four phases; each last two weeks.



New Zealand operates four alert levels that can vary geographically: (1) prepare, (2) reduce, (3) restrict, (4) lockdown.



Germany has no phased exit plan, but has made several announcements of a gradual exit from lockdown.



Austria has a three-phase reopening structured by business type, size and date.





What? Setting levels of easing

Levels should be risk based. This requires a full assessment of risks, not just in terms of the virus's development, but also the economic and health impacts of lockdown. The most sophisticated plans consider both the risk to health and livelihoods in their sequencing. In many countries, levels are variable at local geographic levels.

- 1 **Transmission and vulnerability:** Most plans lead with opening sectors that pose the smallest risk, either through transmission, such as limited numbers in small shops like Austria. Israel will operate restaurants at 30% capacity. Given low risk in young children, schools reopen will early in France, Germany and New Zealand.
- 2 **Economy:** Harvard's plan prioritises essential functions, and advises moving next to end economic misery. As in South Africa and New Zealand this includes sectors where employees cannot work from home, and whose livelihoods are most at risk – but only if employers can implement sufficient distancing or containment.

New Zealand and South Africa use **alert levels** (analogous to the UK's terror alert levels) structured by economic sector. They travel in both directions depending on transmission mode of the virus.

Nearly all countries allow for **geographic variation of levels**, where some states, regions or district are at different levels or tailor easing measures within a national-determined level.



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When? Hard metrics determine progress



Triggers determine how you move between levels. Many countries outlined tests that must be met, but few have specified the metrics or thresholds that trigger a shift in the level. Most European countries currently only use time-based milestones, which does little to manage future uncertainty. Options for trigger metrics include the following:

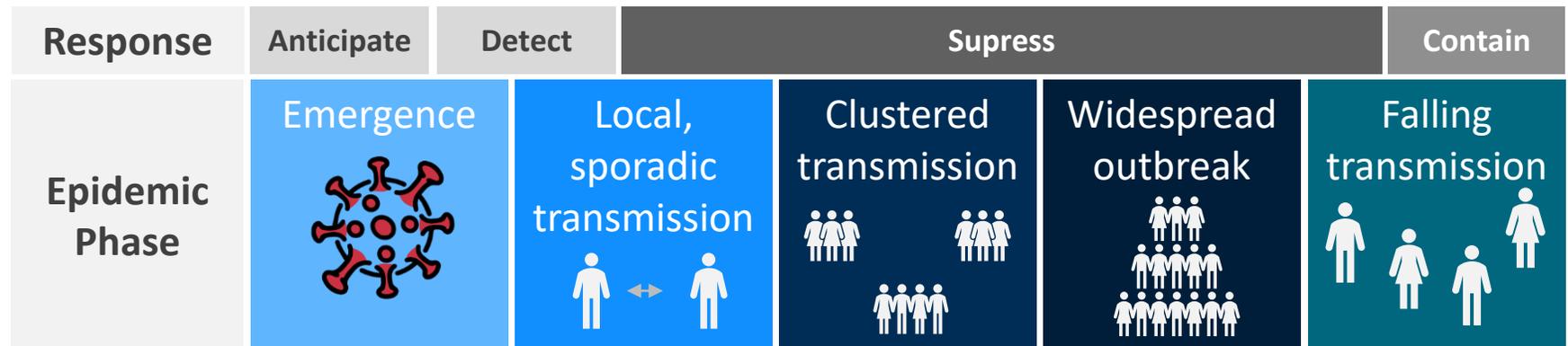
- 1 Health system capacity:** Measuring capacity through spare beds or equipment availability is important for response, but does not inform you in advance of how the virus spreads.
- 2 Health system demand:** Basic measures like ICU admissions, as proposed by Imperial College, or a falling case rate are in many countries' criteria. Sophisticated ones include R proxies like the Koch Institute's surveys or TBI's (forthcoming) early warning model.
- 3 Death rate:** New York's plan sets a hard metric of 14 days' continuous falls in the death rate to justify easing, though it's unclear what role absolute numbers play. Assessments of death rates vary; Belgium focuses on excess deaths not hospital and care-home numbers.
- 4 Mode of transmission:** New Zealand's plan provides clarity by explicitly tying levels to the predominant mode of transmission from widespread to household only, but it's unclear whether this means absolute numbers or is related to the reproduction rate.
- 5 Cost-benefit analysis:** The Centre for Economic Performance uses a "wellbeing framework" for analysing costs and benefits, suggesting June is optimal timing to lift restrictions.



How? Containment measures and timing



- The WHO guidance below on response measures is tied to the virus's spread. However countries are beginning exit strategies from very different places, with some easing lockdown while the outbreak is still widespread.
- One option is to end community transmission first. New Zealand and South Korea began lifting only when new daily cases were almost zero. Likewise Austria's daily case load was well below 100. These numbers make testing, tracing, isolation and other containment measures more manageable.
- Many European countries are trying something different. They are moving to a containment stage when transmission is still falling but absolute daily numbers remain significant. It's unclear which strategy the UK will take.





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How? Building containment infrastructure



Containment and shielding measures prevent easing from accelerating infections. We don't know how exit plans will affect R, but pre-planned measures could contain future peaks. Full pandemic resilience, as Harvard's plan advocates, is likely the best approach.

- 1 Tracing:** Effectiveness is tied to manageable case loads and capacity. The Bundeswehr works with Lander to build teams of five tracers per 20,000 people. Germany is tracing 80% of infections in 24 hours. South Korea supports expanded manual tracing with strict digital tracing.
- 2 Testing:** Sufficient testing capacity to suppress the virus is tied to demand. New Zealand reduced cases to zero before reopening and plans to test all potential cases and random samples. France has high test capacity (700k per week) but the outbreak remains widespread.
- 3 Masks:** South Africa, Austria, France, Spain and Israel are all enforcing masks in most if not all public spaces. Germany is relying on strong recommendations, but with variable implementation across Lander.
- 4 Shielding:** Most plans continue to isolate the elderly and vulnerable until later stages, although most are "strong recommendations" like NZ and South Africa, rather than mandatory.
- 5 Innovative tech:** Some are exploring new solutions to contain the virus, for example thermal testing is being put in shops in the UAE. TBI will be releasing a paper on how to develop the infrastructure to contain Covid-19 through use of new technological innovations.
- 6 Social distancing:** Continuing to enforce social distancing and isolation of the symptomatic.



How? Learning from East Asian measures



Strongly enforced containment measures allowed some East Asian countries to avoid lockdown altogether, with mobility only slightly lower than normal. Their experience of SARS and MERS has led to a much more advanced containment infrastructure.

- South Korea is the only state with over 10,000 cases to report zero new cases (18 Apr).
- Taiwan, despite close connection to China, had 438 cases in total and only six deaths.

- 1 Both countries **test** widely and began **tracing** in January. Their approach is more draconian however. Residents can be fined or worse for violating quarantine, while in South Korea carrying your phone for tracing purposes is legally mandated.
- 2
- 3 Taiwan rationed **masks** in January, while establishing 60 new production lines.
- 4 **Shielding** of non-symptomatic elderly is not enforced, but in South Korea some areas used by predominantly elderly people have been closed for their protection.
- 5 Taiwan was one of the first countries to use data **technology** to track cases. South Korea's approach is evolving with wearable tracking bracelets and a smart city health database.
- 6 Both continue to rely on some **distancing** measures including the banning of large events.



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Clear accountability & communications



Effective plans are underpinned by good governance and communication. In this case, that means clear accountability and strong communications that can secure the active cooperation of individuals and businesses. Governments that are leading the way have adapted their machinery to manage the pandemic and secure public consent.

- 1 Accountability:** In South Korea, every part of the plan has a specific, named person responsible for its execution. Harvard's plan calls for a Pandemic Testing Board to coordinate testing growth and rollout.
- Stakeholder Liaison.** In South Africa, ministers are appointed to oversee liaison with specific sectors of the economy and industry bodies. Germany, Switzerland and Norway have similar models of systematic outreach to representatives in each sector. Their responses to discrete government questions form the basis of recommendations which are fed back to industry for agreement on the path forward.
- Clear, centralised communications:** Taiwan established a National Health Command Centre (NHCC) as the command point for SARS communications. For Covid-19, the NHCC set up an epidemic command centre for rapid communications and intelligence sharing. South Africa have established the National Command Council to coordinate the response to the pandemic. Harvard calls for tailored "Risk Communications" at local, state and federal levels.



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Assessing exit plans around the world



How do different roadmaps measure up?

- To build an effective plan the UK should recognise the components of an effective plan.
- Many European countries have levels dictated only by time. However, many lack clarity about the triggers used to justify progression between levels and how containment measures will be resourced or delivered.
- South Africa and New Zealand are notable exceptions in having published plans, underpinned by clear trigger metrics, and having set out machinery of government reforms to deliver the necessary change.

	UK 4 May	New Zealand	South Africa	Israel	Germany	Austria	France	Spain	Harvard	CEP (LSE)	Romer
Levels	Red	Green	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Red	Yellow
Triggers	Yellow	Yellow	Yellow	Yellow	Yellow	Red	Yellow	Yellow	Yellow	Green	Yellow
Measures	Yellow	Yellow	Green	Yellow	Green	Red	Yellow	Yellow	Green	Red	Green
Govt	Red	Green	Green	Green	Green	Yellow	Yellow	Yellow	Green	Red	Yellow

Of the academic plans published, Harvard's is most complete though CEP's framework is the only one to have a methodology for triggers



Bringing it all together

Our previous report outlined how to bring together a “contingent” exit plan that combines levels, triggers and measures in a single roadmap.

Containment and shielding measures are contained within each level

Triggers include defined metrics and thresholds

Levels set out how the future will look for different individuals and businesses

<i>NB: Thresholds and measures are illustrative</i>	Individuals	Hospitality, entertainment	Transport	Retail	Schools	Other business	Econ impact
Hard Lockdown <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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%



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Assessing the UK's approach so far



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Where the UK is building from



The **UK government has yet to formally set out any detail on the different levels of easing** and what that will mean for different sectors of the economy, geographies or demographics, but more is anticipated. There have been challenges with communicating the implications of the current lockdown for some geographies and sectors.



The UK has set **five tests for easing lockdown** – but these need to go further and offer a clearer, more effective guide to planning (see next slide).



The government has **successfully ramped up testing capacity** over April – but greater testing needs to be combined with an increase in tracing capability and capacity. The Health Secretary has suggested that a new tracing app – alongside an 18,000-strong army of tracers – will be ready late May, following trials this week in the Isle of Wight.



- COBRA has provided central decision-making authority, but otherwise **no additional structures** have been established to manage and coordinate the crisis.
- The government has **not established clear lines of accountability**, for example, with named ministers responsible for different elements of the pandemic response and there is currently **no infrastructure to support engagement with different sectors of the economy** and/or different geographies.
- **Communications have been inconsistent** and there has been a lack of transparency about the thinking behind exit, with plans drip-fed to the newspapers by different parts of government.



Developing the UK's five tests

The government's five tests should evolve to set clear metrics and thresholds to trigger a change in policy and clarify how and when policy will change if the virus does begin to accelerate again.

1 **The NHS can cope**

Many countries use health capacity as a metric. The UK already publishes NHS bed and equipment capacity, these can be tied to expected demand in each phase.

2 **Sustained and consistent fall in the death rate**

It is unclear how this test will be assessed or over what timeframe such falls would need to be seen to trigger the next phase.

3 **Rate of infection falls to manageable levels**

This is a sensible aspiration, but it is unclear what infection rate is "manageable", not least because it depends on the status of the containment capacity.

4 **Tests and PPE can meet demand**

The demand for containment will vary with the level of easing. Government should set out the tracing and testing capacity required for each exit stage.

5 **Adjustments do not risk a second peak**

This relates to the containment capacity. As lockdown eases, containment measures will need to be dialled up. Modelling R based on containment stringency will be vital.



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Appendix – selected other countries' plans



Austria

	<p>Austria plans a three-phase reopening, structured by business type and size.</p> <p>Level 1: Hardware stores, shops less than 400m², garden centres opened (14 April). One person per 20m²</p> <p>Level 2: Open all shops, shopping centres and hairdressers. Gatherings of up to 10 people are permitted. Maximum 30 people at a funeral (1 May). Schools begin opening from 4 May (mature students and final classes).</p> <p>Level 3: Gradual reopening of other businesses. Restaurants will reopen 15 May with four adults at one table and 1m distancing in force, advance bookings only. From 18 May, school-age pupils return to school in elementary and middle school, and then 3 June, all schoolchildren return. From 29 May, hotels and leisure facilities will be allowed to open. Art and cultural centres (e.g. libraries, museums) can open from 18 May, but federal museums will stay closed until the end of June.</p>
	
	<p> Triggers for opening shops are time-based. There is no evidence of these being tied to specific metrics, although Chancellor Kurz has acknowledged a increase in risk from the disease might warrant a return to earlier lockdown.</p>
	<p> Containment: It is compulsory to wear masks in most public spaces, and individuals must maintain a 1m distance from each other in public. The government reserves the right to pull an “emergency brake” if infections spike. Travel restrictions will remain in place until a vaccine is ready for use. Testing is not widespread but will soon cover elderly populations, but no evidence of shielding.</p>
	<p> </p> <ul style="list-style-type: none">• No additional structures• Some information available on the government website, but no publicly available framework or metrics; most information conveyed by statements by the chancellor.



France

 	<p>France plans gradual, time-based, reopening but not distinct phases.</p> <ul style="list-style-type: none">• 7 May – Assess dynamics of the epidemic.• 11 May – Visits and outings must be “surrounded by precaution.” Primary schools and nurseries will reopen with groups limited to 15 and 10 respectively. Public transit will reopen with reduced capacity. Gatherings of 10 are allowed with shops, parks and outdoor sport facilities opening.• 18 May – Reopen colleges.• Not before 2 June – Open high schools, museums, places of worship, party rooms, indoor sport venues, cinemas and theatres, beaches, restaurants and bars.• Not before September – Resumption of sporting events, demonstrations of more than 5,000 people.• Until further notice – No wedding celebrations.
 	<p>Authorities will use three indicators alongside phases, though their relationship with time is unclear</p> <ul style="list-style-type: none">• The number of people infected in the past seven days• Hospital and ICU occupancy• The ability to perform tests and detect chains of contamination
 	<p>Containment: Masks are compulsory on public transport, in schools (teachers and older students) and in workplaces. Significant ongoing travel restrictions. Carriers are required to isolate, and will be traced with a target of 700,000 tests per week.</p> <p>Shielding: Restrictions on the elderly lifted 11 May, replaced with a principle of “trust & responsibility”.</p>
 	<ul style="list-style-type: none">• https://www.gouvernement.fr/en/coronavirus-covid-19 - updates from the government



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Germany

 	<p>Germany plans a gradual approach that is partly time-dependent, partly dependent on estimates of R0:</p> <ul style="list-style-type: none">• 20 April – Social-distancing measures remain in place. Retailers with less than 800m² could reopen if they could assure physical distancing and avoid queues forming in front of stores.• 30 April – Playgrounds, cultural institutions (e.g. museums & zoos), religious assemblies could reopen.• 4 May – Hairdressers able to reopen if they can comply with strict protective measures. Students in their final year or with critical exams will be taught in priority groups.• Not before 31 August – All big events such as festivals, concerts, or big sporting events will not be allowed until September. A decision on other sports events is expected soon.• Until further notice: All other restrictions (e.g. on restaurants and bars) remain in place.
 	<p>Germany will use the following triggers to determine whether to proceed with easing or to reintroduce pre-20 April measures:</p> <ul style="list-style-type: none">• Numbers of new cases in federal states; and• Estimates of the infection rate.
 	<p>Containment: Strong recommendation to wear cloth masks in public. Contact tracing, with RKI and the army working with the states to establish tracing teams of five per 20,000 people, and the RKI establishing a 40-person unit to coordinate tracing with all municipal public health services.</p> <p>Shielding: Strong recommendation to continued shielding of vulnerable people.</p>
 	<ul style="list-style-type: none">• Strong central coordination from the chancellor, speaking weekly with the heads of the federal states, regular engagement with business, and clear public comms.



Israel

 	<p>Israel proposed a four phased exit plan on May 5, building on earlier loosening at the end of April:</p> <ul style="list-style-type: none">• Late April - restricted reopening of some small commercial and service shops, in open air centres; Industry, production and services can increase the proportion of workers on site from 15 to 30%• 3 May - school system opens for ages 6-8 but with small class sizes, distancing and staggered timings.• 10 May – Kindergartens open and gatherings of 50 people outdoors allowed.• 17 May – museums open, contact-less sport of up to 20 allowed.• 31 May – gatherings of up to 100 allowed outdoors, restaurants may open and higher grades might return to school.
 	<p>The Ministry of Health has announced two key metrics for determining easing of restrictions:</p> <ul style="list-style-type: none">• the daily increase in number of infected individuals does not exceed 300, and• the total number of critically ill does not exceed 300
 	<p>Govt. announces detailed criteria ('purple badge standard'), which businesses, industry and commerce must adhere to, to suppress and minimise infection while allowing economic activity:</p> <p>Containment: Masks outdoors are mandatory for anyone over 7. Tracing capacity highly advanced</p> <p>Suppressions: Short-term localised lockdowns in outbreak areas (e.g. currently some ultra-Orthodox communities. Return to full lockdown on specific holidays to prevent large gatherings e.g. Memorial Day and Independence Day and parts of Ramadan.</p>
 	<ul style="list-style-type: none">• Formed an interagency task force to manage the crisis, with the PM's Office, the National Security Council, the Ministry of Health, the Ministry of Finance and other agencies.• The Ministry of Health's website publishes the restrictions, easing measures, and guidelines.• The Internal Security Service can use counter terrorism surveillance tech to trace cases and contacts.



New Zealand

	<p>NZ operates four alert levels that vary geographically and can move in either direction:</p> <p>Level 4: Lockdown; all citizens must stay at home; business and schools are closed except for essential services.</p> <p>Level 3: Restrict; only business that can avoid physical interaction can open; schools are responsible for whether they can open. Most people must remain at home.</p> <p>Level 2: Reduce; schools are open, but distancing is advised in recreation. Most businesses are allowed to open providing they meet tracing requirements and implement new ways of working.</p> <p>Level 1: Prepare; work and schools are open and there are no restrictions on recreation or domestic life.</p>
	<p>There are not publicly available metrics for each phase, but instead they map onto stages of disease transmission outlined by the WHO</p> <ul style="list-style-type: none">• Covid-19 is contained in NZ but there is potentially isolated household transmission.• There is household transmission or isolated clusters.• Community transmission is possible, any new clusters can be controlled.• There is widespread community transmission.
	<p>Containment and distancing requirements are adapted by phase. Contact tracing, isolation and testing of all potential cases and random samples continue in all phases, as do “robust border measures”.</p> <p>Shielding of the vulnerable for example is recommended in phases 2, 3 and 4.</p>
	<ul style="list-style-type: none">• The plan is publicly available.• There are no obvious new governmental structures, but decision making is effective and efficient.



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South Africa

	<p>Level 5: Full lockdown. Until end of April.</p> <p>Level 4: (from 1 May) Some activity can be allowed to resume subject to extreme precautions required to limit community transmission and outbreaks. Borders closed. Masks for passengers, and limits on passenger numbers on transport. Only essential movement for work. No gatherings permitted.</p> <p>Level 3: Involves the easing of some restrictions, including on work and social activities.</p> <p>Level 2: Involves the further easing of restrictions, but the maintenance of physical distancing and restrictions on some leisure and social activities.</p> <p>Level 1: Means that most normal activity can resume, with precautions followed at all times.</p>
	<p>Levels are reviewed regularly by the National Command Council and set at provincial level according to:</p> <ul style="list-style-type: none">• Local rate of infection• Local health system capacity
	<p>Containment: Testing and tracing. Cloth masks worn at all times outside the house, social distancing, hand-washing.</p> <p>Shielding: Over-60s and those with underlying conditions encouraged to remain at home.</p>
	<p>Plan announced by the National Command Council</p> <ul style="list-style-type: none">• Detailed guidance issued to businesses on their responsibilities• Ministers assigned to communicate sector-by-sector detail of restrictions• Consultation with industry bodies before new regulations are decided



Spain

	<p>The plan allows for different speeds across the country. There are four phases, each two weeks.</p> <p>Phase 0 - Adults may exercise, prof. athletes can train alone, some business open for pre-bookings.</p> <p>Phase 1 – Bars’ outside space open but only 30% of space, same for religious buildings, but cannot enter other people’s homes or travel between provinces. Socially distant shopping.</p> <p>Phase 2 - Schools open for exams and children under 6 if parents must go back to work; events up to 400 people (providing they are distant), pre-book seats in cinemas etc open using 30% of space. Religious venues increase to 50%. Mobility only allowed within provinces.</p> <p>Phase 3 - Travel across provinces, stop WFH, easing of restrictions on hospitality.</p>
	<p>Phases are progressed by date. Phase 0 begins 3 May; phase 1, 11 May; phase 2, 25 May; and phase 3, June 8 to 22. There are criteria that must be met to move phases but the acceptable level of these criteria is not public:</p> <ul style="list-style-type: none">• capacity of the health-care system (hospitals and ICUs)• the epidemiological situation• the implementation of collective protection measures and monitoring of the use of public
	<p>Containment: Face masks are mandatory on public transport, and partly supplied by the state. Little information on the growth in testing, and tracing capacity required.</p> <p>Shielding: Most people must work from home until phase three.</p>
	<ul style="list-style-type: none">• The federal Minister of Health decides which provinces are allowed to progress phases.• https://www.mscbs.gob.es/profesionales/saludPublica/ccayes/alertasActual/nCov-China/ciudadania.htm – government website for information.



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Appendix – selected academic plans



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Centre for Economic Policy (LSE)

	N/A
	<ul style="list-style-type: none">• Provides a single metric – the number of Wellbeing-Years (WELLBYs) – to determine when to end the lockdown, which balances the impact of the decision upon incomes, unemployment, mental health, public confidence and many other factors, as well as upon the number of deaths from Covid-19.• This new metric makes it possible to compare the impact of each factor in a way that is relevant to all public policy decisions.• Suggests the optimal time to lift the lockdown will be in June.
	N/A
	N/A



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Harvard Safra Centre for Ethics

 	<p>Phase 1: Stabilise essential sectors, including using non-essential workers to expand potential workforce.</p> <p>Phase 2: Expand the essential workforce, relaxing some measures and using a broader definition of “essential” to include the medium and long-term such as construction and R&D.</p> <p>Phase 3: End economic misery by further increasing sectors, and relaxing regulations to allow for modified business practices.</p> <p>Phase 4: Fully mobilise a pandemic resilient recovery, returning those able to work from home to the office and opening schools.</p>
 	<ul style="list-style-type: none">• Phases are dictated by testing capacity (1) Each trigger is accompanied by a percentage of the workforce covered in each level. 40% at phase one, and additional 15, 10 and 20% at phases 2-4. Until the sectors in each phase can test, trace and protect their workforce, they are unable to open.• Testing is also used to prove a declining case rate (2).• The final trigger is sufficient hospital capacity (3).
 	<p>Containment measures are the fundamentals of the plan. Without pandemic resilience through testing, tracing, isolation and public health protections a sector cannot open and stay open. Sufficient containment prevents a return to early phases. Shielding: Vulnerable are protected until phase three.</p>
 	<ul style="list-style-type: none">• Pandemic testing board with powers to secure testing supply and deploy infrastructure• Guidance and readiness frameworks for rollout across all government tiers, including a daily fusion cell call to coordinate public-information updates• Non-governmental control of tracing apps and data• Expanded US public health service corps



Paul Romer



Goal: Test everyone in the US once every two weeks and isolate all those who test positive.

Level 1: Start testing the essential workers who are already on the job. Begin with health-care and other frontline workers; as capacity expands move to include other roles e.g. grocery clerks.

Level 2: Extend the tests to those who we want to urgently return to work, teachers for example, allowing reactivation of parts of the economy such as schools, restaurants, retail businesses, manufacturers, and other urgently needed services.

Level 3: Offer tests to everyone.



The triggers for opening up the economy are driven by testing capacity. As testing capacity increases and processes are refined, these categories can expand; once everyone has tests, the rest of the workforce can safely resume activity.



Containment: Contact tracing can play a supportive role, and antibody tests can be useful for disease surveillance, but there is no alternative to containment policies, achieved through test and isolate.



A strong commitment is needed from Congress to provide states with the resources they need to ramp up a comprehensive testing plan that will enable responsibly reopening the economy.

