

# **Covid Passes: Evidence and Models for Future Use**

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# Executive Summary



In the context of a pandemic, Covid Passes can be a proportionate tool that governments can use to mitigate significant public-health risks.

Evidence shows that Covid Passes\*, whether digital or analogue, have helped to achieve two broad policy objectives: vaccine incentivisation and risk management.

They do not increase vaccination uptake under all conditions, but where they do, they lead to significant economic benefits and reduced hospitalisations.

Regardless of their impact on vaccination rates, they are still valuable as a tool to manage Covid risks.

As the pandemic evolves, policymakers can learn from the implementation of Covid Passes throughout 2021 in deciding on their future role.

**\* As a generic tool; see later slides for specific application.**



# The impact of Covid Passes

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# Evidence suggests Covid Passes improved vaccine uptake in selected countries



In many, though not all, countries, increased vaccination has been shown as a significant benefit of Covid Passes.

Increased vaccination has several knock-on benefits. It means vaccinated people are less likely to end up in hospital, which in turn helps to stabilise the economy.

In separate studies, researchers from the University of Oxford and Bruegel created models to compare actual vaccination rates with vaccination rates without Covid Passes.

Both analyses demonstrate that Covid Passes had a meaningful impact on vaccine uptake in selected countries where they were used extensively domestically. This in turn had a positive effect on hospitalisations and GDP.

## UNIVERSITY OF OXFORD COUNTERFACTUAL ANALYSIS OF COVID PASSES

COUNTRY	ADDITIONAL VACCINATIONS AS A RESULT OF THE COVID PASS
France*	+ 772,562
Italy*	+ 1,303,604
Israel	+ 2,120,849
Denmark	+ 243,202

\*The pass had an impact on vaccine uptake leading up to, as well as after, formal introduction in France and Italy.

[Source: University of Oxford](#)

# The impact of Covid Passes on vaccine uptake varied depending on the circumstances



Some countries did not [experience a rise in vaccine uptake](#) (for example, England and Scotland). Evidence indicates that the impact of Covid Passes on vaccine uptake depends on:

1. **Vaccine uptake prior to intervention:** countries with low levels of uptakes benefitted the most.
2. **Extent of application in domestic settings:** the countries that experienced an increase in vaccination required passes in a range of mid-risk venues: restaurants, cinemas, gyms, etc.
3. **Vaccine supply:** a limited vaccine supply in early 2021 in Denmark partially explains the country's lower uptake when the pass was first introduced.
4. **Policy objective:** Denmark initially used Covid Passes to encourage regular testing, not to incentivise vaccines, leading to a slower initial increase in vaccine uptake.

COUNTERFACTUAL ANALYSIS OF VACCINE UPTAKE VERSUS ACTUAL UPTAKE, BRUEGEL

COUNTRY	COUNTERFACTUAL VACCINE UPTAKE WITHOUT COVID PASSES %	ACTUAL VACCINE UPTAKE WITH COVID PASSES %	DIFFERENCE
France	65.2	78	12.8
Germany	67.3	73.5	6.2
Italy	70.4	80.1	9.7

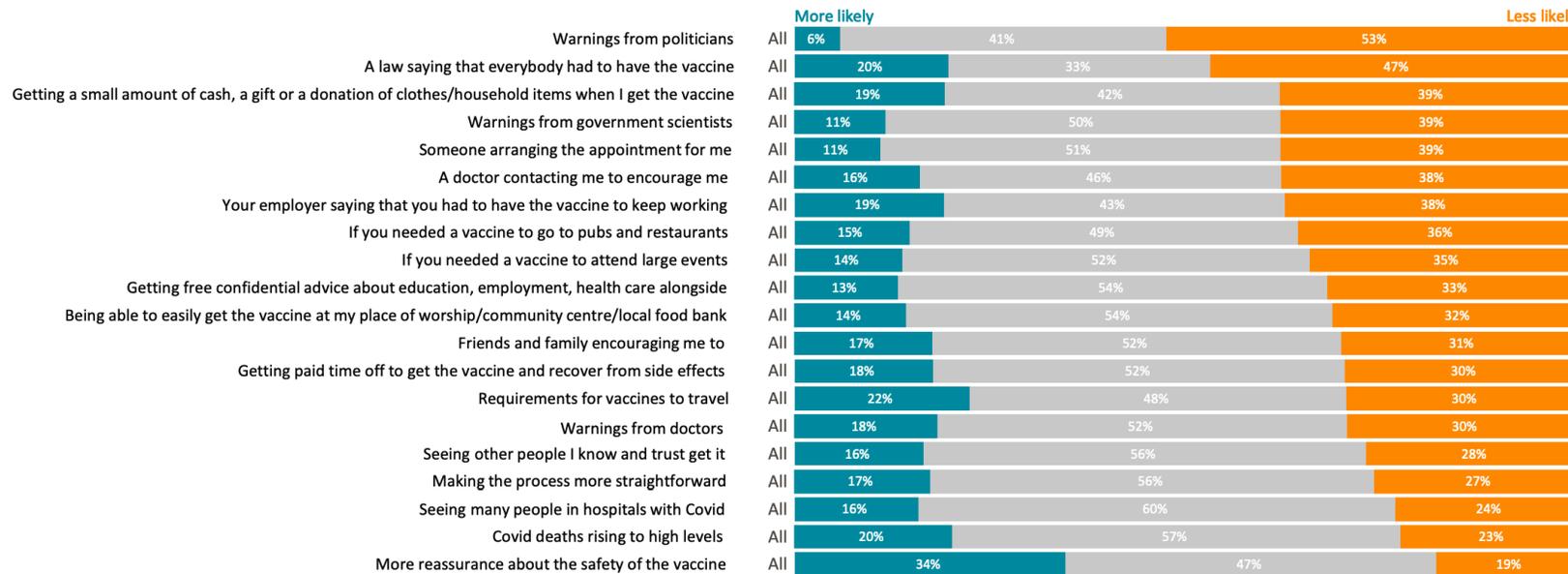
[Source: Bruegel](#)

# Covid Passes may have exhausted their utility as a vaccine incentive among those who are yet to be persuaded



How would, if at all, each of the following change the likelihood of you getting a vaccine?

*Asked only of the unvaccinated*



- In a UK context, polling conducted by TBI and JL Partners found that only 10% of the unvaccinated would be more likely to get the vaccine if passes were used.
- 44% of the unvaccinated stated they would be less likely to get the vaccine.
- Among the vaccinated, 43% said the introduction of passes made them more likely to get the vaccine.
- This suggests that Covid Passes may have been the right call earlier in the pandemic but might be a less effective incentive for those who are yet to be vaccinated.

[Source: JL Partners and TBI](#)

# Covid Passes should be understood as both a risk-management tool and a vaccine incentive



## EARLY EVIDENCE OF VACCINE EFFECTIVENESS AGAINST OMICRON

	Dose 2			Dose 3		
	0-3 months	4-6 months	6+ months	0-3 months	4-6 months	6+ months
Infection	Insufficient data					
Symptomatic disease	25-70%	5-30%	0-10%	50-75%	40-50%	Insufficient data
Hospitalisation	65-85%	55-65%	30-35%	80-95%	75-85%	Insufficient data
Mortality	Insufficient data	Insufficient data	40-70%	85-99%	Insufficient data	Insufficient data

[Source: UK Health Security Agency](#)

Covid Passes can improve outcomes in two ways:

- 1. Direct impact:** reducing the likelihood of an infectious person entering an event or venue
- 2. Indirect impact:** increasing vaccine uptake and therefore reducing the risk of individuals being infectious

Where Covid Passes do not increase vaccine uptake, they can still be beneficial for governments as a tool to manage transmission risk.

How Covid Passes are used depends on the types of risk governments are trying to manage.

Although current vaccines do not appear to eliminate transmission and protection wanes over time, vaccines do reduce the risk of hospitalisations and reduce transmission.

# There is limited but significant evidence that requiring proof of vaccination *or* testing can be effective at large events



From May through August 2021, the UK government conducted research using the NHS Covid Pass at high-risk, high-volume events, such as concerts and football matches (the Events Research Programme).

Uptake of the NHS app ranged between 70-98% per event.

The research took place in low-transmission environments, but the evidence generally suggests that a Covid Pass helped to manage transmission at events of this kind.

## CASE STUDY: WIMBLEDON CHAMPIONSHIPS

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- At the Wimbledon Championships, spectators needed to show proof of vaccination via the NHS app or a negative lateral-flow test.
- Attendance each day ranged between 55,000 and 60,000.
- Infections from the event never exceeded 0.17% (the maximum was 102 people among attendees on 9 July 2021).
- At some events, infections were as low as 13 people out of 57,000 attendees.

[Source: Events Research Programme Reporting Dashboard](#)

# By increasing vaccine uptake, Covid Passes reduce hospitalisations



Bruegel estimated that the increased vaccine uptake in France, Germany and Italy had a meaningful impact on hospitalisation rates. Similar assumptions could be made for any country that saw an uptick in vaccination as a result of a Covid Pass.

Bruegel's modelling also suggests that the Covid Pass reduced ICU-bed occupancy rates in France by approximately 24 patients per million at the end of 2021.

The Covid Pass may therefore have been instrumental in avoiding a lockdown by preventing high pressure on ICUs that triggered previous restrictions.

## BRUEGEL COUNTERFACTUAL ANALYSIS OF HOSPITALISATION AND DEATH WITHOUT COVID PASSES

COUNTRY	HOSPITALISATIONS WITHOUT COVID PASSES	% INCREASE WITHOUT COVID PASSES	DEATHS WITHOUT COVID PASSES
France	+ 32,065	+ 31.3%	+ 3,979
Germany	+ 5,229	+ 5.0%	+ 1,133
Italy	+ 8,735	+ 15.5%	+ 1,331

[Source: Bruegel](#)

# Covid Passes have clear economic benefits



Covid Passes have demonstrated economic benefits in two ways:

- 1. Enabling direct economic participation:** newly vaccinated people can safely resume in-person activities.
- 2. Avoiding restrictions:** businesses can operate at a higher or full capacity, while reduced hospitalisation rates make damaging lockdowns less likely.

**Where hospitalisations can be reduced, whether through increased vaccine uptake or risk management, the economic benefits are substantial.**

## BRUEGEL COUNTERFACTUAL ANALYSIS OF GDP LOSSES WITHOUT COVID PASSES

COUNTRY	WEEKLY GDP REDUCTION WITHOUT COVID PASSES	GROWTH ENABLED BY COVID PASSES
France	- 0.6%	€ 6 BILLION
Germany	- 0.3%	€ 1.4 BILLION
Italy	- 0.5%	€ 2.1 BILLION

# Covid Passes can be switched on and off based on the epidemiological needs of society



Covid Passes have been turned on, off, up or down depending on what governments perceived the Covid-19 risk to be.

In Israel, the [Green Pass Policy](#) has been used to varying extents since February 2021. The same was true of [France](#), [Italy](#), [Germany](#), [Scotland](#) and [England](#).

The digital format of the tool has also allowed it to be updated or withdrawn easily.

When Germany introduced five different Covid Pass statuses following the rise of Omicron, the Covid status of an individual was displayed clearly on the start page of the “Certificates” area of its app.

## CASE STUDY: ISRAEL



- The Green Pass Policy was used as a tool to respond to changes in multiple variables: vaccination rates, morbidity and mortality rates, new waves, or the emergence of pockets of unvaccinated people.
- Between February and August 2021, the Green Pass Policy was updated seven times. This demonstrates its flexibility as a digital tool, but also the importance of clarity in regulations to ensure enforcement.
- Digital Covid Passes had three uses in how they supported the broader framework of Covid-19 regulation:
  1. A tool to manage risk in society
  2. To complement other policies, such as mass testing or vaccination
  3. International vaccination certificate

# The rollout of Covid Passes faced technical and political difficulties



## Counterfeiting

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The French authorities have opened [400 investigations](#) for fake passes. It was also [reported](#) that German police had 6,000 active cases of suspected fake vaccination passes at the end of 2021. Even so, this represents approximately only 0.007% of the population so is not widespread.

## Buy-In from Business

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In the first months after passes were introduced, nightclubs and late-night settings in Scotland reported implementation challenges and [turnover losses](#). Half of all Scottish small businesses were [opposed to the extension](#) of the vaccine-passport scheme.

In Singapore, businesses have reported passes are a drain on resources as [several people need to be stationed](#) at both entrance and exit.

Checking of Covid Passes at trial events in [England was imperfect](#), due to varying degrees of confidence, training and time allowed for checks, which, at times, risked the efficacy of the pass.

## Vocal Opposition

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Anti-vaccine passport protests have taken place [across Europe](#), with concurrent demonstrations in Athens, Helsinki, London, Paris and Stockholm in January 2022.

French authorities [reported](#) that more than 105,000 people took part in protests across the country against the introduction of Le Pass Vaccinal.

It also generated controversy in Italy among a vocal minority, with 10,000 people gathering in [Rome in October 2021](#).



# What the evidence means

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# On balance, Covid Passes are a useful tool to manage different kinds of risk, but they're not completely infallible

Covid Passes can produce economic benefits and significantly improve vaccination uptake, which can in turn reduce hospitalisations.

**But...**

Covid Passes do not guarantee increased uptake as it depends on timing and the environment in which they are deployed.

Covid Passes can be an effective risk-management tool, for both transmission and hospitalisation when the pass incorporates a variety of different risk certifications.

**But...**

Covid Passes will not totally eliminate transmission. There is no single non-pharmaceutical intervention that is 100% effective at eliminating transmission.

Covid Passes are likely to be more effective at directly reducing the risk of transmission within specific settings when they include alternative certifications, like testing.

**But...**

This can be less practical on a mass scale due to the testing infrastructure required.

The reduction in hospitalisations that Covid Passes drive, whether through vaccine uptake or infection control, produces meaningful economic benefits.

**But...**

The effective implementation and enforcement of Covid Passes requires investments in developing and testing infrastructure, and supporting take-up and implementation.

# Covid Pass use over the last year provides instructive lessons for policymakers on regulation and cost



Covid Passes have consistently attracted support from a majority of the public.	<b>But...</b>	Public hostility from a vocal minority is almost guaranteed.	<b>As seen in...</b>	Germany, Italy, France, Israel, England
Digital Covid Passes can be a useful tool when regulations change to deal with new Covid threats.	<b>But...</b>	Without clear communication for business and society, the implementation can be undermined by rapid changes in regulations.	<b>As seen in...</b>	Singapore, Germany, Italy, France
Any implementation problems businesses face with Covid Passes are typically resolved as the process of using certification matures.	<b>But...</b>	Teething problems at venues and events, in hiring and training new staff to accommodate Covid Passes, should be expected.	<b>As seen in...</b>	Scotland, England, Singapore
The main alternative to Covid Passes is lockdown, which carries high economic and social costs.	<b>But...</b>	Certification regulations may impose costs on businesses that need to hire additional staff.	<b>As seen in...</b>	Singapore
Counterfeiting is not widespread enough to undermine the effectiveness of Covid Passes.	<b>But...</b>	Further technical measures should still be taken to combat it where possible.	<b>As seen in...</b>	Germany, France, England

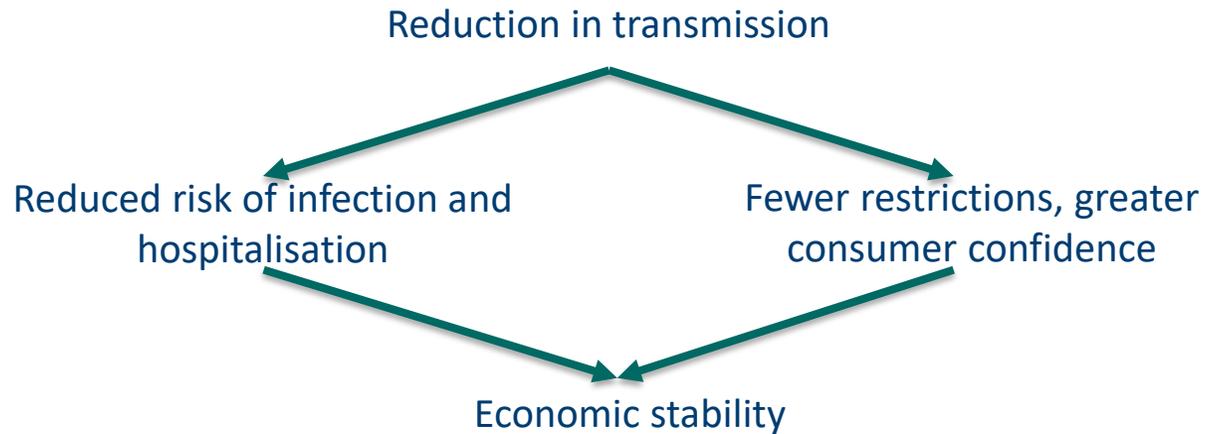
# Broadly, Covid Passes produce benefits for society in two ways



Covid Passes can be used in both ways simultaneously, but even where they do not increase vaccination rates, they can still be used as a risk-management tool.

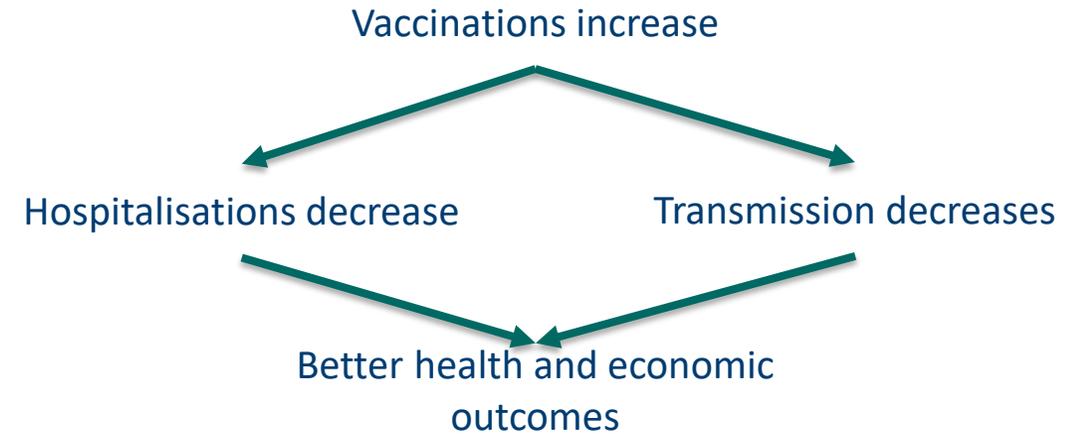
## As a Risk-Management Tool

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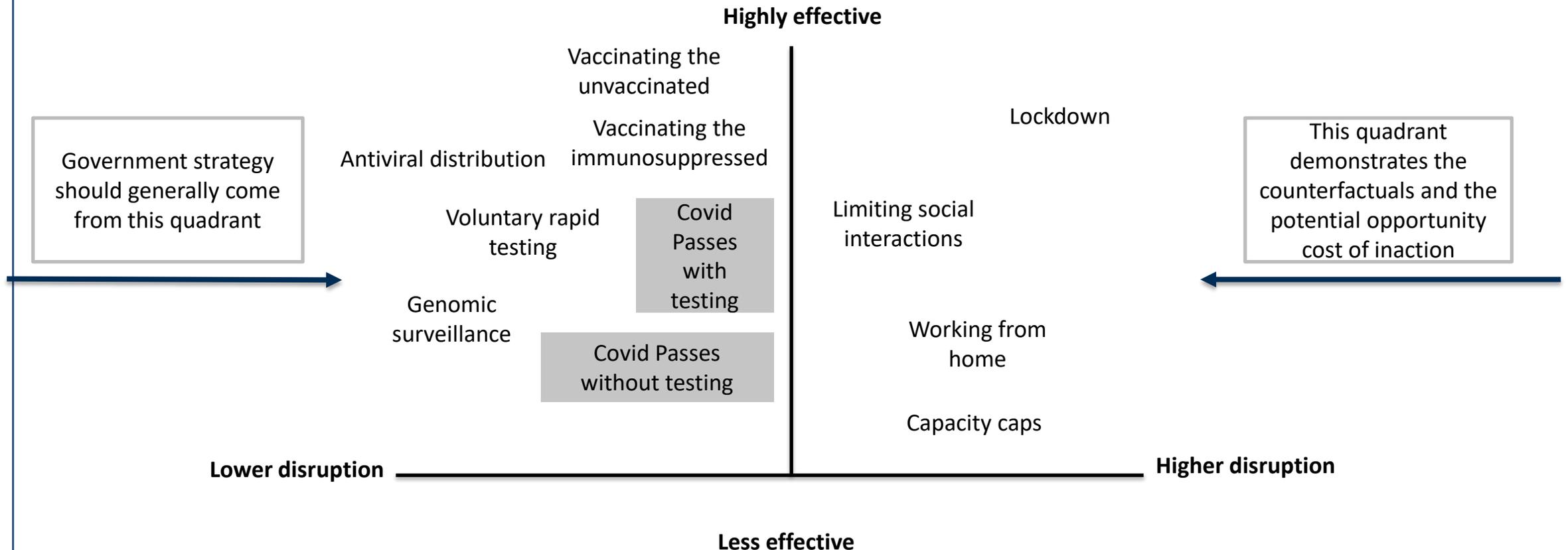
## As a Vaccine Incentive

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# Covid passes can be part of a “light-touch toolbox” to avoid severe interventions in the event of a new threat





**In the context of a pandemic, Covid Passes can be a proportionate tool that governments can use to mitigate significant public health risks**

**Covid Passes can be switched on, off, up and down depending on the epidemiological needs of society**

**With multiple options for risk certification, Covid Passes can provide a reliable indicator of an individual's risk levels**

**Covid Passes can be used to achieve multiple policy objectives**

Why?

Covid Passes have been used to manage varying degrees of restriction in many countries

Digital Covid Passes can support regulatory changes quickly and easily

Vaccines reduce the rates of hospitalisation, mortality and symptomatic disease

A negative PCR or lateral-flow test is a robust way of confirming low risk of infection, especially in high-risk settings

Where Covid Passes increase vaccine uptake or reduce transmission, they reduce hospitalisations and boost the economy

Covid Passes formalise rapid testing and can be used to enforce mandatory testing

So what?



# When to use Covid Passes going forward

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# Covid Passes can be tailored to specific objectives



To use Covid Passes effectively, governments should be clear on the policy objectives that they want to achieve with the pass.

Passes offer a range of different models and applications and so can be tailored to different aims.

Here we propose some indicative models based on evidence from different countries for these policy objectives.

These models are not prescriptive but highlight the key factors policymakers should consider when implementing a pass.

**1. To increase vaccine uptake**

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**2. To manage transmission risk**

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**3. To manage hospitalisation risk but not infection risk**

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**4. To protect the most vulnerable**

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**5. As a tool of pandemic preparedness**

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# Covid Pass implementations can vary across a range of models and policy applications

## Broad epidemiological benefit of different Covid Pass models

Covid Pass model	Epidemiological benefit
Vaccine only	Unlikely to be hospitalised if infected (Research on infection and transmission risk unavailable for Omicron)
Testing only	Unlikely to be infected and therefore unlikely to transmit the virus
Recent infection	Unlikely to be or become infected by the virus for a limited time after infection
Both vaccine and testing	Unlikely to be infected and therefore unlikely to transmit the virus; unlikely to be hospitalised if infected



# There are numerous different features of a Covid Pass that can be changed according to the need of restrictions

## Different policy aspects of a Covid Pass and sample options (non-exhaustive)

Types of enforcement	How to enforce in venues	Venue application	Certification type	Testing Infrastructure	Testing Accessibility	Time limit on testing pass
Mandatory in a wide range of public settings nationally	Check all attendees	High risk	Vaccine	Verified at a testing centre (PCR or LFT)	Free	24 hours
Mandatory in specified high-risk settings nationally	Spot-checks	Mid risk	Testing	Self-reported (LFT)	At cost	48 hours
Mandatory in specified high-risk settings at a regional level		Low risk	Recent infection			72 hours
Voluntary			Testing and vaccine			



# The “vaccine take-up” model is the most common and has been used across several countries

## Purpose

- To incentivise vaccine take-up, which in turn reduces hospitalisation and helps maintain economic stability.

## Advantages

- Including a testing certification as an alternative to vaccination avoids excluding the unvaccinated from social activities.

## Limitations

- Impact on vaccine uptake can vary depending on timing, availability of vaccines and other factors.
- Polling suggests Covid Passes may have now exhausted at least some of their utility as a vaccine incentive.

## Examples

- Variations of this model were applied in countries where the Covid Pass successfully acted as a vaccine incentive: France, Italy, Germany, Denmark, Israel.

Policy Feature	Application
Enforcement	Mandatory
How to enforce in venues	Universal
Venue	High risk, mid risk, low risk
Certification	Vaccine OR testing
Testing	Verified at a testing centre
Testing accessibility	Free
Time limit	48 hours



# Minimising the risk of transmission would require a broader testing infrastructure



## Purpose

- To reduce the overall risk of transmission, thus minimising risks of infection and hospitalisation simultaneously. This is different to **minimising the risk of hospitalisation but not infection.**

## Advantages

- By reducing the number of cases in circulation, passes reduce the number of people in hospital. This would be the most effective model to enforce mass asymptomatic testing in the case of a new transmissible variant emerging or a surging wave of infections.

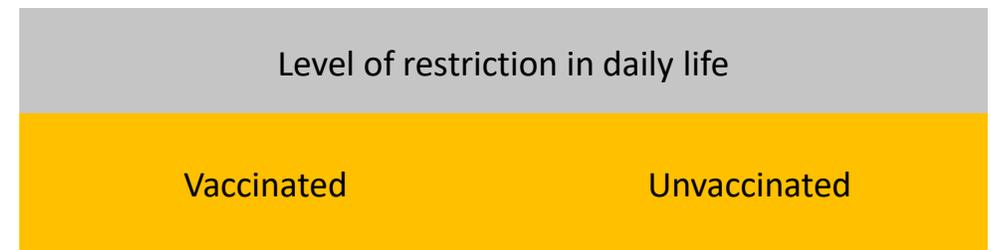
## Limitations

- While testing itself is robust, the longer the certification remains valid for, the less reliable the pass would be.
- The model requires extensive testing infrastructure.

## Examples

- This model has been used in Germany's 2G+ zones.

Policy Feature	Application
Enforcement	Mandatory
How to enforce in venues	Universal
Venue	High risk, mid risk
Certification	Vaccine OR recent infection, AND testing
Testing	Self-reported
Testing accessibility	Free
Time limit	48 hours





# Minimising hospitalisations but not infection risk leads to the heaviest restrictions on the unvaccinated

## Purpose

- To **minimise hospitalisation risk but not infection risk**, so that in the event a person is infected they are unlikely to be hospitalised.

## Advantages

- It does not require extensive testing infrastructure.
- If infection of the vaccinated is seen to carry lower risk, this pass could complement a reduced or absent period of isolation.

## Limitations

- This is most reliable when the unvaccinated are unlikely to be mixing with the vaccinated, who may be infected, thus requiring the heaviest restrictions on the unvaccinated.

## Examples

- This model has been used in Germany's 2G zones and Italy since December 2021 due to the rise of Omicron.

Policy Feature	Application
Enforcement	Mandatory
How to enforce in venues	Universal
Venue	High risk, mid risk
Certification	Vaccine or recent infection
Testing	None
Testing accessibility	None
Time limit	None





# Using a Covid Pass to protect the most vulnerable carries few restrictions for broader society

## Purpose

- To protect the most vulnerable. Life continues to go on for the population in most contexts, but particular settings such as care homes will still have mandatory safeguards.

## Advantages

- Managing testing infrastructure is straightforward as the environments it is needed for are specific.
- Would enable visiting in hospitals and care homes to return to, and stay, at a higher capacity.

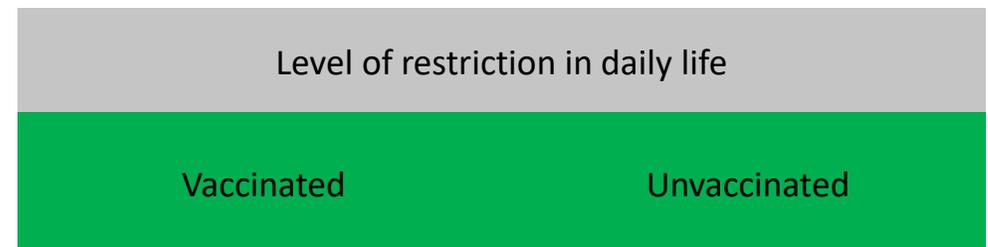
## Limitations

- Rapid testing is not 100% accurate.

## Examples

- Rapid testing has been used for high-risk settings, such as care homes, [across England](#). However, this has not been embedded in a Covid Pass.

Policy Feature	Application
Enforcement	Mandatory
How to enforce in venues	Universal
Venue	High risk
Certification	Testing
Testing	Self-reported
Testing accessibility	Free
Time limit	24 hours



# Keeping the Covid Pass in reserve should be seen as a key tool of pandemic preparedness



## Purpose

- To maintain the ability to deploy a Covid Pass should the need arise for it to be used again in domestic settings.

## Advantages

- Even when not used to manage restrictions, digital Covid Pass apps can be enhanced with useful tools, such as booking and reporting tests or public-health education tools.
- National Covid Pass apps are still useful for facilitating international travel, especially where interoperability standards are applied.

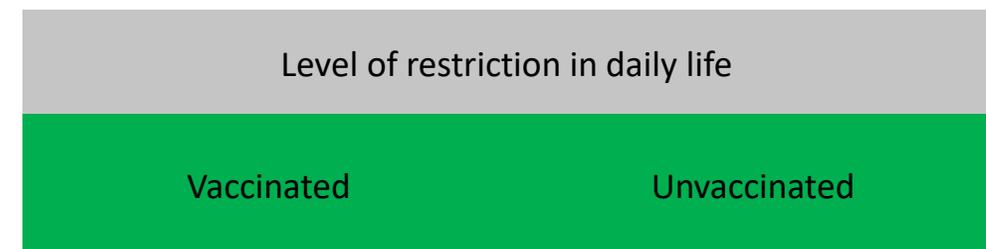
## Limitations

- It will require some, albeit relatively small, maintenance costs.

## Examples

- This model is in place in Israel.

Policy Feature	Application
Enforcement	None
How to enforce in venues	None
Venue	None
Certification	None
Testing	None
Testing accessibility	None
Time limit	None





# How to use Covid Passes well

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# There are five core recommendations for how Covid Passes can be used as we enter a new phase of the pandemic



- 1.** MINIMISE THE STRAIN ON BUSINESSES THROUGH MORE DIRECT, PRECISE COMMUNICATION
- 2.** ENSURE THE DESIGN OF COVID PASSES INCORPORATES LESSONS LEARNED FROM THE FIRST YEAR OF WIDESPREAD USE
- 3.** INTEGRATE THE DIGITAL COVID PASS APP WITH OTHER HEALTH TOOLS (AS WITH THE UK'S NHS APP) AND CONTINUE TO IMPROVE AND ADD NEW FEATURES
- 4.** CONSOLIDATE LESSONS FROM COVID PASS APPS TO INFORM A LONGER-TERM APPROACH TO DIGITAL HEALTH CARE
- 5.** PUBLISH FINDINGS, COSTINGS AND EXPERIENCES OF COVID PASSES TO ENABLE BETTER ANALYSIS

# 1. Minimise the strain on businesses through more direct, precise communication



By addressing common business concerns about Covid Passes, we can ensure they are a pro-business policy tool.

Cost



- Precisely identify which venues will incur significant resourcing costs from checking Covid Passes (e.g. nightclubs already must have door staff by law so there is no additional wage cost).
- Financial support could be considered for organisations with low existing staffing if Covid Passes are introduced as a mandatory, universal requirement in mid-risk settings.

Processes



- Implement a grace period of enforcement to allow the processes for pass verification to mature.
- Depending on the setting and risk level, governments should consider allowing a certain percentage of spot checks for certain venues over universal enforcement.

Confusing regulations



- Use verifier apps more strategically. Build in functionality for venues to specify what kind of setting they are in the verifier app, so they can see the correct set of rules for their business.

## 2. Ensure the design of Covid Passes incorporates lessons learned from the first year of widespread use



### Infrastructure

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- ✓ Robust IT and data infrastructure that can cope with fluctuating usage should regulations change quickly
- ✓ Interoperability between databases, i.e., vaccination and testing records
- ✓ Privacy-preserving data infrastructure
- ✓ Robust security mechanisms

### Tools

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- ✓ Ability to book and report tests in the same app as the pass
- ✓ Up-to-date vaccine certification
- ✓ Public-health education information and/or notifications

### Clarity

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- ✓ Clear, accessible app design
- ✓ Privacy-preserving user interface for verification

### Reliability

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- ✓ Minimise counterfeiting through QR codes that are ineffective when photocopied
- ✓ Where codes may not be scanned, make them as reliable as possible if a verifier were to just look but not scan the QR code

### Accessibility

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- ✓ Easy to obtain if an individual does not have a smartphone
- ✓ Accessible without an internet connection

### Redress

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- ✓ If a Covid Pass is not automatically generating upon a negative test or vaccination, create clear routes of redress that enable individuals to obtain a temporary one

### 3. Make the app the centre of Covid tools for citizens: optimise the app with other tools and interventions



Public education



- Build alert functions into the Covid Pass app to inform users when regulations for their local area change or to provide information about variants of concern.
- Let users subscribe to notifications for changes in regulations that affect the types of venues that matter the most to them.

Booking and reporting tests



- Ordering, booking and reporting tests should be built into the same app as the pass itself.

Vaccine and antiviral distribution



- Personalise vaccination information and notifications. The app should notify individuals when they are eligible/due for another vaccine dose, and they should be able to book in the app.
- The distribution of antivirals (as [recommended here](#)) should be managed via a Covid Pass app and triggered by a positive test.

# 4. Consolidate lessons from Covid Pass apps to inform a longer-term approach to digital health care



Technology has played a significant role in health care during the pandemic for both governments and citizens, including through data dashboards, vaccine management and distribution, telemedicine, Bluetooth contact tracing and Covid Passes.

There is now a new user base of health-care app users. For example, the Covid Pass in England is stored within the NHS app itself, where patients can also book GP appointments. This app now has over [22 million users](#), nearly half the population.

Health-care innovation is a rapidly growing field. The potential for patients is extensive: consumer-friendly monitoring through wearable technologies, [precision nutrition](#), predicting and [identifying patient care gaps](#), care coordination and communication, and digital therapeutics.

## Recommendations

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1. Using the new user base of health-care apps, governments should prioritise investment for additional tools within national health-care apps.
2. Introduce new funding mechanisms for innovation in health care, such as challenges, [following the model adopted by Nesta](#).
3. Publish the maximum possible information regarding digital health services' performance to help build confidence.

# 5. Publish findings, costings and experiences of Covid Passes to enable better analysis



Where governments can publish their general findings and experiences of Covid Passes, they should, for two reasons:

1. It enables more analysis from independent researchers (as seen with aforementioned analysis from Bruegel and the University of Oxford).
2. It strengthens the quality of policy debate and analysis.

In turn, this can either improve the use of Covid Passes in the future, should they be needed, or the lessons can instead be applied to other innovations in the public sector – such as digital identity.

## Recommendations

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1. Publish costing information: initial upfront costs, maintenance costs, human resource costs.
2. Publish user data: how many unique users the Pass had, how many times it was used, how this matches up to how much respective verifier apps were used, whether there were particular patterns in usage depending on waves of infection.

