A Plan for Vaccine Acceleration

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Introduction

A new strain of Covid-19 has now been proven to have a higher transmissibility. [1] It is almost certainly the reason behind a surge of cases across the United Kingdom. This makes the need rapidly to accelerate the rollout of vaccines to as many people as possible even more urgent. Indeed, we must do all we can to suppress transmission through vaccination in order to reduce the likelihood of further mutations that could be even more transmissible or, worse still, more deadly. There is no precedent for the effort ahead and it requires a massive mobilisation of resources, beginning with a comprehensive government plan of action.

Almost 1 million people in the United Kingdom have received their first-dose vaccination against Covid-19. This is a Herculean effort from the NHS, which must be applauded. But in the situation we face, it is unfortunately not sufficient.

This is hard to hear given the unprecedented achievements in the development and deployment of the vaccine to date – but it is necessary. We must scrutinise every individual element of the vaccination supply and logistical chain, making every possible gain. This objective sat behind our recent call to increase the supply of vaccines by shifting towards a "first dose to many" strategy that would increase the time between doses but ensure more people are covered by the substantial immunity provided by this initial vaccine. Where a second dose is proven to increase immunity further (as with the three main approved Covid-19 vaccines), they must be supplied and provided to each person as soon as is practicable.

The government has taken up this recommendation. In this paper, we make further recommendations which, if implemented, would dramatically accelerate the vaccination programme. These recommendations cover four key areas of a vaccine rollout plan:

Supply	Maximising the quantity of vaccines and the speed at which they're available.

Setting	Using the largest number of venues in the right areas to reach as many people as possible.

Staffing	Recruiting and training the largest number of people possible to safely administer vaccines.

Systemisation	Preparing data-capture and data-sharing systems to garner insight and ensure the safe invitation, recall and recording of vaccines.

In many respects, Britain is leading the way in the global vaccination effort. Yet, given the unprecedented nature of a nationwide vaccine rollout, it is important that we draw on lessons from elsewhere and, as such, we have included specific examples of international best practice from different countries and cities.

Key recommendations:

In order to deliver the expedited and expanded vaccination programme we believe is vital, there are a number of key decisions the government must make now:

Supply

- By the end of January, aim for 3 million vaccinations per week, as fresh supplies of the vaccines are received.

- Manage public expectations by clearly and transparently setting out what vaccine doses will be available by when. This should be done by publishing, within the next week, a table similar to the one we have included in the "supply" section of this paper.

- Government and suppliers should move to a posture of being able to "press go" on future vaccines. This means stress testing their supply lines and delivery mechanisms and having as many vaccines stored and ready to roll out the minute they are approved.

Settings

- Introduce "vaccination stations" across the UK using polling stations as a blueprint.

- Ensure GP surgeries receive all support necessary to ensure as many as possible form part of the vaccination process.

- Expand vaccines distribution to all pharmacies regardless of their size by removing weekly "1,000 dose" threshold.

- Utilise currently unoccupied viable office space as settings from which to administer the vaccine.

Staff

- Put in place plans to recruit a minimum of 30,000 additional vaccinators.

- Establish one common e-learning platform for all volunteers. This would then be topped up with in-person training at hub sites.

- Agree effective oversight of the training and staffing of the vaccination sites. This should include the right mixture of NHS staff, volunteers and St John Ambulance.

- Clearly and transparently set out how many additional staff are still needed where gaps are identified.

Systemisation

- Identify and deploy one system to capture and store all possible data on Covid-19, particularly the vaccination process.

- Issue clear guidance for all those involved in treating, testing and vaccinating against Covid-19 to ensure the right information is captured and stored.

- Make publicly available emerging trends and patterns on Covid-19 to help underpin government action.

- Identify and deploy one platform for a Covid Pass. This should give each individual the capability to show online or offline their current Covid status on testing and whether this individual has been vaccinated.

- Offer a Covid Pass on a voluntary basis, with those able to display negative Covid testing status or that they have been vaccinated exempt from restrictions.

- Make anonymised data available to researchers, scientists and health-care professionals around the world to assist in the fight against Covid-19.

How Many Vaccines and by When?

Vaccines are our only way out of the pandemic. The ultimate objective must be to vaccinate the entire adult population as quickly as possible in order to reduce deaths and hospitalisations and to inhibit transmission of the virus.

Vaccines will prevent or reduce the transmission of Covid-19, as they have done with many diseases such as polio, measles and flu. Further studies are needed to determine the extent to which each vaccine can reduce the transmissibility of the virus. While large-scale, more definitive transmission studies are still underway, initial data from participants who received a first half dose and a second full booster dose in the Oxford University/AstraZeneca vaccine trial indicate fewer asymptomatic SARS-CoV-2 infections than in the control group, suggesting reduced transmission. [2]

This is how we end the cycle of lockdowns that are damaging both economically and in terms of public health. This objective can be broken into three stages:

Stage 1: Eliminate 99 per cent of deaths and hospitalisations by vaccinating 29.6 million with their first dose (based on data in Figure 1, below).

Stage 2: Reduce transmissions by vaccinating the remaining 23.8 million adults [3] with their first dose.

Stage 3: Increase immunity in vaccinated population by administering second doses where needed.

The government's current target is to vaccinate 1 million people a week. [4] Based on these projections, stage one would take 6.7 months to complete and stage two would take a further 5.5 months – and these figures are discounting the need to administer a second dose after three months.

The rollout of the UK's vaccine programme must be hastened.

Figure 1 – The number of vaccines required to reduce deaths

Headline results

The table below shows the estimated COVIDs deaths in each group, cumulative percentage of total COVID deaths, approximate population of each group and the vaccinations required to prevent one COVID death.

Vaccination Group		COVID deaths	Cumulative % of total COVID deaths	Additional Population	Vaccinations to prevent one death
1	residents in a care home for older adults	22,800	36%	0.5m	20
	their carers	<100	36%	0.5m*	
2	everyone aged 80 and over	18,900	66%	3.0m	160
	frontline health and social care workers	900	68%	2.5m	
3	everyone aged 75 and over	6,300	78%	2.2m	350
4	everyone aged 70 and over	5,600	86%	3.3m	600
	clinically extremely vulnerable	1,000	88%	1.4m	
5	everyone aged 65 and over	3,100	93%	3.3m	1,000
6	age 16-64 with underlying health conditions; at higher risk	600	94%		
7	everyone aged 60 and over	2,000	97%	3.8m	2,000
8	everyone aged 55 and over	900	98%	4.4m	4,000
9	everyone aged 50 and over	500	99%	4.7m	8,000
10	All the rest	600	100%	37m	47,000
		63,200		*Assume 1:1 ratio for carers	

Figure 2 – Covid-19 deaths by age group and pre-existing condition

Breakdown by pre existing condition

Age group	Pre existing condition			
	Yes	No	Unkown presence of pre-existing condition	Total
Total	43,555	1,911	0	45,466
0 - 19 yrs	21	6	0	27
20 - 39	255	42	0	297
40 - 59	2,817	329	0	3,146
60 - 79	16,544	799	0	17,343
80+	23,918	735	0	24,653
Unknown age	0	0	0	0

Source: https://www.england.nhs.uk/statistics/wp-content/uploads/sites/2/2020/12/COVID-19-total-announced-deaths-17-December-2020-weekly-file.xlsx [5]

We believe the government's target should and could increase significantly. No expense should be spared as the alternative – an endless cycle of lockdowns – is far more costly both to the taxpayer and to the country's health and well-being.

We propose a target of 3 million vaccinations a week by the end of January. This alone would mean that 99 per cent of deaths would be prevented by March. This would need a supply of 12 million vaccines a month and can be achieved by bringing additional settings online and 30,000 more trained staff to administer the vaccines.

Supply

With the recent approval of the Oxford University/AstraZeneca vaccine, the UK now has the potential to access a large number of vaccine doses, which in clinical trials were proven effective with an interval of 12 weeks between dose one and dose two.

It has been difficult to fully understand what doses are available and when, and we call upon the government to publish a clear, transparent list. This is essential to manage expectations and to inform thinking on the logistics and rollout of vaccines.

The table below pulls together piecemeal data to set out what the projection for the coming months looks like. Following the government's adoption of our "first dose to many" strategy (with second doses to follow when and where appropriate) we are confident that, by the end of January, the UK can reach our target of 3 million doses a week – subject to measures being implemented across settings, staffing and systemisation.

That said, it's imperative the government is clear on dose availability. Estimates of production capacity made a while ago will now be hitting manufacturing and engineering reality around the globe. Keeping the process working at optimal speed is crucial and having the delivery system match the supply is going to be the toughest balance to strike.
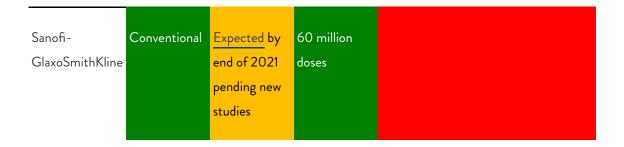
In the table below, we have set out the fullest picture available on the vaccine candidates that have been ordered by the UK government and when each vaccine is expected to become available. In the cases of Pfizer and Oxford University/AstraZeneca vaccines, which have already received approval by the Medicines and Healthcare products Regulatory Agency (MHRA), we have attempted to ascertain how many doses of each vaccine we will have in the first three months of 2021. This information is critical for creating and updating the vaccine rollout programme as well as managing public expectation on the speed of vaccine rollout.

The green highlighted boxes below include publicly available information, while the amber boxes indicate estimates based on the best available data or conversations with experts, and the red boxes indicate no concrete figures were publicly available.

Figure 3 – Vaccine candidates ordered by the UK government and when they will be available

Company	Complexity of storage and distribution	When will it be available?	Total doses ordered by UK	Estimated to be available in January	Estimated to be available in February	Estimated to be available in March
Pfizer	Challenging. Must be stored at -70°C. Can be refrigerated for maximum of five days.	Approved 2 December 2020	40 million			
Oxford University/ AstraZeneca (AZD1222)	Conventional	Approved 30 December	100 million	15 million (estimated)	30 million (estimated)	40 million by March [6] (estimated)
Moderna	Conventional	Approval pending (Initial results 94.5% effectiveness)	7 million			Available in spring, earliest
Johnson & Johnson/	Conventional	Expected early 2021	30 million doses, with an option for an			

Janssen (Ad26.COV2.S) One-dose regimen			additional 22 million doses
Johnson & Johnson/ Janssen (Ad26.COV2.S) Two-dose regimen	Conventional	Phase III trials to conclude the recruitment of participants by March 2021	
Novavax (NVX-CoV2373)	Conventional	Phase III trial results expected Q1 of 2021	60 million doses
Valneva (VLA2001)	Conventional	Expected second half of 2021	60 million doses; two further options for additional doses – one for 40 million and the other, between 30 million and 90 million – by 2025

Sanofi-GlaxoSmithKline	Conventional	Expected by end of 2021 pending new studies	60 million doses	

It is vital all possible time is saved in making vaccines available and getting the process moving at full speed. To ensure this happens we call on the government and suppliers to move to a posture of being able to "press go" as soon as vaccines are approved. This means fully stress testing supply lines, delivery mechanisms and storage facilities. It also means producing and storing as many doses as possible so they can be rolled out, at scale, the minute they are approved. This is particularly relevant to the upcoming Johnson & Johnson vaccine but will also be relevant with others likely to come onstream this year.

Recommendations:

1. By the end of January, aim for 3 million vaccinations per week, as fresh supplies of the vaccines are received.

2. Manage public expectations by clearly and transparently setting out what vaccine doses will be available by when. This should be done by publishing, within the next week, a table similar to the one we have included above.

3. Government and suppliers should move to a posture of being able to "press go" on future vaccines. This means stress testing their supply lines, delivery mechanisms and having as many vaccines stored and ready to roll out the minute they are approved.

Setting

The current approach to vaccination settings has been driven by the NHS and focuses on the primary-care network with proposed vaccination super centres due to come online. GPs have done a remarkable job in stepping up this mammoth task.

According to NHS England, as of mid-December there were 414 GP-run vaccination sites in operation in England with approximately one site per primary care network, each of which is typically made up of five or six surgeries. This means about a third of GPs are now involved in administering vaccines. [7]

We expect further GP surgeries to come online in January. Many GPs have, however, opted out of the vaccination programme due to staffing concerns, heavy workloads, and the fact that they are already overstretched administering the flu jab to the expanded free flu jab group. [8]

The government and NHS should provide all possible support to GP surgeries to ensure as many as possible are able to administer vaccines. Whether this requires additional staffing or equipment, it is vital these settings are able to form the core of the vaccine programme.

We also need to bring many additional settings online – both big and small. This includes expanding vaccination to all pharmacies, regardless of their size. There are also staffing implications as the NHS plans to open GP surgeries from 8am to 8pm every day, each dispensing at least 1,000 jabs a week. It is possible that surgeries could open longer if they are staffed by trained volunteers outside of working hours. Any unutilised space should be opened up to the vaccine effort.

GP surgeries provide an ideal setting. They are local, known and trusted, but it's clear that given the constraints on GPs and if we're to reach the ambitious targets set out in this paper, we must also find additional settings. The large vaccination centres will go some way to doing this, but we also must learn from existing nationwide logistical efforts – including elections. The polling station approach and network presents an ideal solution to develop accessible "vaccination stations" in towns and surgeries. All of this should be done by carefully deploying the right vaccine, for the right setting.

Vaccinator Status Should Be Expanded to All Pharmacies

The UK's 11,539 local pharmacies have been recognised as part of the solution but there are concerns from industry leaders that they fall outside of the current plans. They are critical – 89.2 per cent of the population is estimated to have access to a community pharmacy within a 20-minute walk. Community pharmacists in England administered 1,431,538 flu vaccinations to patients under the national NHS Flu

Vaccination Service in 2018/19 and many are accustomed to participating in vaccine efforts – 78.2 per cent of community pharmacies participated the national NHS Flu Vaccination Service in 2018/19.

According to a survey done by the National Pharmacy Association, 73 per cent of people said that they would receive their Covid-19 flu jab from their pharmacy if this option were available to them. In addition, the data found that almost 70 per cent of respondents visited a pharmacy during the pandemic, indicating that participants felt comfortable at their pharmacy and were able to get there during the lockdown. [9]

All pharmacies, regardless of size, should be encouraged to be part of the vaccination effort and this can only be achieved by reducing their barrier to participation. As it stands, pharmacies must meet a number of different criterion, as set out here. This includes *"fridge space to store at (2-8ºC), around 1000 vaccine doses at one time or confirmed plans to have fridge capacity in place, and capacity to* **administer 1000 doses per week***, ensuring all doses are administered within appropriate shelf life"* which is likely to be an arduous commitment for small community pharmacies.

Lowering this threshold would increase the number able to provide vaccines. Even 50 per cent of community pharmacies at 100 vaccines a week would add 550,000 extra doses a week to capacity.

The pharmacy industry has urged the government to use its extensive network to accelerate the delivery of vaccines, especially the Oxford University/AstraZeneca vaccine. But so far, the industry has told the BBC that the government has not considered them in initial frontline plans, nor has it included pharmacies in its delivery target of 1 million jabs a week. [10] Pharmacies have experience participating in the NHS flu jab programme, are abundant throughout the UK, and are a valuable, yet currently untapped resource in the vaccine rollout programme.

Taking "The Polling Station" Approach to Set Up Vaccination Stations

The 650 constituencies across England, Wales, Scotland and Northern Ireland offer around 50,000 or so polling stations, according to the BBC in 2015. Polling stations are an established network of settings that are easily adaptable and should become vaccination stations.

Fridges and privacy screens would replace polling booths and electoral official tables. The locations of these settings are widely distributed, covering neighbourhoods, small towns and villages, and are readily accessible by the most vulnerable. Given they can be set up quickly for elections and handle a huge capacity of voters, it makes sense to mirror this approach for vaccination.

The government should immediately involve the Electoral Commission in the identification, verification and communication with different venues. They are accustomed to doing this at short notice in the run-

up to a general election and there is absolutely no reason why this logistical expertise can't be transferred across.

Potential vaccination stations in the "Polling Station Approach" include:

- Empty pubs
- Unused offices
- Village halls
- Football clubs
- Leisure facilities
- Religious centres
- Social clubs
- Farms in rural areas

As the vaccination programme widens to include not only the vulnerable, but the critical groups of people that are spreading the virus, these settings will then need to widen further. One example for how this should happen is conducting vaccinations on young people at schools and universities. This would draw on the vaccination workforce and storage facilities at those sites where available or mobile vaccination facilities where there isn't available storage. This will form a critical next phase of the vaccination as we move from protecting the vulnerable to stopping the spread.

Workplaces

Through collaboration with occupational-health providers we envisage workplace vaccination taking two forms.

- Putting in place a vaccination process for those organisations that are still working in person (particularly key workers). Occupational-health providers would support this and ensure data capture.
- Government should call on businesses that have moved to working remotely until the spring to make available potential space to house vaccination centres. While larger venues are important, we believe having the fullest possible list of available space will be vital in the coming months.

Large Vaccine Hubs

Military personnel have been ordered to transform ten sites into vaccine hubs, including: [11]

- Nightingale Hospital, London
- Epsom racecourse, Surrey

- Ashton Gate football stadium, Bristol

- Robertson House conference facility, Stevenage

- Derby Arena

Other facilities under consideration include:

- The Black Country Living Museum, Dudley

- Millennium Point, Birmingham

- Malvern's Three Counties' Showground, Worcestershire

- Villa Park, home of Aston Villa FC

- Leicester Racecourse

Recommendations:

1. Set up "vaccination stations" across the UK using polling stations as a blueprint.

2. Ensure GP surgeries receive all support necessary to ensure as many as possible form part of the vaccination process.

3. Expand vaccines distribution to all pharmacies regardless of their size by removing weekly "1,000 dose" threshold with an aim of bringing 5,500 community pharmacies online.

4. Utilise currently unoccupied office space as settings from which to administer the vaccine.

Staff

Alongside ensuring we have appropriate supplies of the vaccine and settings within which to administer it, the right size of workforce is vital. The whole process cannot work without the people to oversee, administer and run the vaccination programme.

At present the NHS is planning to utilise a mixture of paid staff and volunteers, while also ensuring the process is a priority within the health service itself. We understand around 10,000 people have been recruited to help deliver the Oxford University/AstraZeneca vaccine.

We welcome this as a first step but feel the government must go further with staffing the vaccination strategy. This would mean drawing on all possible health professionals, health-care scientists, dental staff and others with appropriate first-aid training, who are able to undertake additional comprehensive training. [12]

How Many Additional Vaccinators Should We Recruit?

We believe the government should aim to recruit a minimum of an additional 30,000 vaccinators. This would enable the government to increase vaccinations to 3.15 million per week. We set this out in more detail below.

Where Should We Recruit Them From?

In order to deliver the expanded and accelerated vaccine programme, we believe the government should also draw on the following categories of people:

- Retired medical experts
- Health-care professionals (including all possible pharmacy staff)
- Making the fullest possible use of the NHS volunteers
- Medical students
- Qualified first-aiders

If further staffing is required, we suggest the government considers making use of workers who have been furloughed. With training they could provide important additional resource to the vaccination programme.

How Do We Train Them?

In order to train this expanded vaccine workforce, we suggest the following steps:

- Identify and contact all possible staff.
- The whole of January should be used to train the largest possible pool of people.
- Deploy a coordinated e-learning platform for all volunteers for virtual training.
- Utilise hub points for additional in-person training.
- Make full use of St John Ambulance to help coordinate the training and deployment of volunteers, where the NHS does not have capacity.

No one at these vaccination sites will be working in isolation – less trained staff could always work alongside the more trained, senior staff members.

What Does Each Additional Trained Vaccine Administer Provide?

Each additional trained vaccinator would boost capacity by approximately 21 vaccines per day [13] – meaning an additional 30,000 recruits with sufficient space (see "setting" section) would allow for 630,000 additional vaccines a day – or 3.15 million a week. [14]

Currently, all Pfizer vaccine recipients must be observed for 15 minutes due to three recipients having had allergic reactions. This observation time reduces the number of shots per hour. To maximise the time of vaccinators a reduced observation period of ten minutes rather than 15 minutes could be considered, especially given the commonality of the biotechnology behind the AstraZeneca vaccination. If the AstraZeneca vaccination does not cause similar, rare, allergic reactions, the observation period may not be necessary.

According to the Royal College of Nursing (RCN), the need for a 20-minute observation period is a common misconception. The majority of reactions will occur within two minutes of injection while some can occur hours later. The advice from the RCN is that there is no need to keep patients waiting unless this is specifically indicated in the summary of product characteristics for a particular vaccine. [15]

According to Pharmacy2U, which provides NHS services, the average time for a flu jab appointment is 20 minutes, including a ten-minute observation period. These jabs are administered at drive-through centres by expert pharmacists and fully trained St John Ambulance crew.

The target for any trained vaccinator should be to administer three jabs per hour. To reach this, all factors must be scrutinised and in large vaccination centres, each should be managed separately as part of a

walk-through process. Factors that can impact the speed of the vaccination process include variations caused by vaccinator rotation, Covid safety requirements such as checking temperatures and social distancing, resupply requirements, completing vaccination card/paperwork, and required observation time.

Recommendations:

To accelerate the vaccination programme the NHS needs to identify and deploy more staff as soon as possible. This should be treated as a war-time effort, acknowledging and celebrating those who do get involved. We offer the following recommendations:

1. **Additional workforce:** Aim to recruit a minimum of 30,000 additional vaccinators.

2. **Coordinated training:** Put in place one, common, e-learning platform for all volunteers. This would then be topped up with in person training at hub sites.

3. **Effective oversight:** Agree effective oversight of the training and staffing of the vaccination sites. This should include the right mixture of NHS staff, volunteers and St John Ambulance.

4. **Identify gaps:** Clearly and transparently set out how many additional staff are still needed where gaps are identified.

Systemisation

The Importance of Data

As we have set out previously, in this enormously complex and fast-moving situation, there is a critical role for data. The UK must dramatically upgrade the amount of data it is capturing, storing and sharing on Covid-19.

We will quickly be in a situation where different areas of the country are under different levels of restrictions; have varying levels of access to mass testing and have large groups of people both vaccinated and unvaccinated. This require a significant level of systematisation through data.

Data capture

We require, first of all, the fullest possible capturing of data at source. When people are vaccinated, this data must be captured in full and in detail.

In addition, it is critical all possible data is collected on testing. This must include the substantial number of people conducting private testing outside the NHS regime. This information is vital in understanding the spread of the virus, as well as being a key mechanism to free up those who do not have the virus.

Data storage

All of this information must be stored on a central system. It should inform government decisions on resources, prioritisation and better understanding the virus.

Data sharing

This data must then be shared across the health-care system. Where appropriate, for instance in terms of trends with the virus, this information should then be made public.

Most critical of all, an individual's Covid-19 information must be made available to them. This is particularly important for the creation of a Covid Pass.

The Role of Data: Phase IV Trials (aka, post-market surveillance)

Capturing the right data will enable the NHS and the government to have the fullest possible picture on key questions that remain about the virus. They include the below:

- Does vaccination reduce transmission of Covid-19?

- How often do we need to boost vaccinations?

- Can Covid-19 jab be co-administered when flu jab is given?

- Research on the effect of these vaccines on immunocompromised patients?

Oracle:

One example of this type of health management system is provided by Oracle. We set out below information on how their system works as we believe it is a good example of the type of platform that could be deployed more widely. Others of course will and should be considered and the best taken up.

In the US, the Centres for Disease Control and Prevention (CDC) is using Oracle's National Electronic Health Records Cloud plus Oracle's Public Health Management Applications Suite to manage the Covid-19 vaccination program throughout the United States. The Oracle Public Health Management Applications Suite includes applications for managing the entire vaccination process from ordering the vaccine, tracking shipments and managing inventory – to directly communicating with vaccinated patients via smartphones to collect safety data such as side effects and adverse events. Oracle's National Electronic Health Records (EHR) system enables US public-health officials to have access to up-to-the minute data as to how many people have been vaccinated anywhere in the US. This real-time nationwide view of Covid-19 health-care data was not possible with their existing fragmented provider-based EHR systems. The Oracle systems were first used in the US this summer to register and communicate with over 50,000 people part of the trials for Covid-19 vaccines and therapeutics. Working with the CDC and the US Department of Defense, Oracle then extended this capability nationwide. [16]

TBI and Oracle have partnered to bring this same cloud technology to Africa to manage public-health programmes. Initially, Ghana, Rwanda and Sierra Leone will use the new Oracle Health Management System to create electronic health records for their vaccination programmes for yellow fever, HPV, polio, measles and Covid-19, as soon as that vaccine is distributed to Africa. These participating countries will have access and support for the system, free of charge, for the next ten years. The Oracle Health Management System creates an electronic health record in a cloud database for every person as they are vaccinated. This highly secure system can be quickly configured to interoperate with each country's existing technology and meet their most stringent data sovereignty requirements.

The Role of Data: Covid Pass

There is a very immediate prospect of people being in various different positions in terms of their Covid status. Some will have been vaccinated, some tested and clear, some tested and be carrying the virus. The only way to navigate this is with a simple, transportable Covid Pass.

A Covid Pass, in the form of a digital health ID with a backup printed hard copy, is the answer to this challenge. A transportable, simple pass would show:

1. Next testing date

2. Current testing status (antigen)

3. Vaccine date and location

4. Vaccine status including expiry date

The status of the health ID would mean that those with an up-to-date negative Covid-19 test or a vaccination would not be subject to strict Covid-19 restrictions and would be able to access settings such as:

- The workplace

- Hospitality venues

- Sporting events

- Concerts

The ID would give a status based on three simple levels.

We suggest that a Covid Pass is rolled out and made available to citizens on an optional basis. As set out, given the pass would enable those with a negative test or who have been vaccinated to be exempt from restrictions we believe it will be a valuable way to ensure blanket lockdown measures can be avoided.

Health IDs Around the World

A number of countries around the world have been considering or trialling a health ID for Covid-19. Slovakia included one as part of its mass-testing programme. The Ada Lovelace Institute has also been keeping a consolidated list of developments around the world.

Estonia piloted an immunity passport system earlier this year. It was operated by local firms, including A&T Sport, Radisson Blu Sky Hotel Tallinn and PR Foods. It allowed staff to be tested and then be able to share and show their results via a QR code.

The system operates via mobile and web apps and manages information about a person's Covid-19 testing status, with the ambition to include vaccination information once available.

Estonia's pilot had six distinct phases:

1. Building awareness among companies and their staff

2. Agreeing scope of testing and logistics between the companies participating and the health-care

provider

3. Testing staff

4. Entering results into immunity passport application

5. Showing results to employers

6. Gathering feedback

Global Travel

Over 120 countries require a negative PCR test prior to arrival.

Efforts are underway globally to find a common health passport to allow travellers to move freely again. One example of this is the CommonPass initiative.

Built on the Common Trust Framework, the World Economic Forum and The Commons Project Foundation are launching CommonPass – a platform to allow individuals to document their Covid-19 status electronically and present it when they travel.

Figure 4 – How CommonPass works

Source: CommonPass [17]

Countries would implement their own border-entry and health-screening requirements, including whether and what type of lab tests or vaccinations are required. CommonPass then verifies that incoming travellers' health data satisfies the destination country's entry requirements and generates a green travel certificate that airlines and countries can rely on to allow someone to board a flight or enter a country.

These types of initiatives will only accelerate and widen as more of the world gets access to a Covid-19 vaccine.

Giving individuals their Covid-19 status information and enabling them to display it with a Covid Pass will therefore become increasingly important.

Recommendations:

To properly step up the country's capability on how to make the fullest possible use of data we recommend the following steps:

- **One system:** Identify and deploy one system to capture and store all possible data on Covid-19, particularly the vaccination process.

- **Full spectrum usage:** Issue clear guidance for all those involved in treating, testing and vaccinating against Covid-19 to ensure the right information is captured and stored.

- **Public platform:** Make available to the public emerging trends and patterns on Covid-19 to help underpin government action.

- **Covid Pass:** Identify and deploy one platform for a Covid Pass. This should give each individual the capability to show online or offline their current Covid-19 status on testing and whether the person has been vaccinated.

- **Optional rollout:** We suggest this pass is made available to people as a way to show their status and thus be exempt from Covid-19 restrictions.

- **Data sharing:** Make anonymised data available to researchers, scientists and health-care professionals around the world to assist in the fight against Covid-19.

Vaccination Strategies Around the World

Israel

Nine days into its vaccination programme, the country vaccinated half a million people, or 5.7 per cent of its population.

Adult Vaccine Eligible Population: 6.5 million [18], [19]

Supply: Israel ordered 8 million doses of the Pfizer vaccine, which can fully inoculate 4

million people. According to the Jerusalem Post, 3.2 million doses are already in the country and 600,000 more expected imminently. The remaining Pfizer doses are expected to arrive by the end of March. The Pfizer supply will be bolstered just in time by 6 million doses of the Moderna vaccine that is expected to arrive no earlier than April. If manufacturing and delivery continue to go smoothly, Israel could see a steady flow of doses into the country over the first quarter of 2021.

Staff: The army enlisted about 700 paramedics to help with the injections of the vaccine, in addition to staff at hospitals and local clinics.

Systemisation: Israel's health-care system is highly digitised. As soon as the vaccines were ready to be administered, text and voice messages were sent out to eligible cohorts advising them to make an appointment through healthcare providers. The system also has a strong recall ability, allowing individuals to provide an ID number to providers in order to schedule a missed appointment or follow-up, with missed appointments often arranged for the following day. Israel is also set to become the first country to issue "green passports" to residents who have received the full two-doses of a vaccine, essentially providing a passport out of lockdown.

New York City's Vaccine Command Centre

Supply: NYC's Vaccine Command Centre closely monitors how many vaccine doses have been reserved by the federal government for NYC, delivered and given to people in the city, in order to minimise waste and ensure the rollout of vaccines goes quickly. This information is publicly available on their website.

Systemisation: The Vaccine Command Centre uses data from the Citywide Immunisation Registry to track data and notify individuals of second dose appointments. It keeps immunisation records for all city residents – children and adults – and records are available upon request to public and private schools. All

flu and Covid-19 jabs must be added to the system within 24 hours. This provides real-time, up-to-date figures on who and how many people have been vaccinated.

Indonesia's Alternative Approach to Prioritisation

Indonesia's vaccination campaign will focus on inoculating those between 18 and 59 years of age, starting with those working on the front lines of the pandemic such as health workers, the police and the military.

According to Bloomberg, Indonesia will then target the people who are most mobile due to their jobs, as well as regions with the highest number of coronavirus cases. Its strategy focuses on using the vaccine as a tool to curb the spread of the virus and eventually reach herd immunity.

Los Angeles County – An Apple Wallet Health Passport

A partnership with health software firm Healthvana will allow individuals who receive the Covid-19 vaccine to keep proof of immunisation in their iPhone's digital wallet. Officials say it will first be used to remind people to get their second required dose of the vaccine, but it could eventually be used as proof of vaccination in the Covid-19 hotspot of Los Angeles. [20]

Conclusion and Recommendations

The government's recent decision to move to a posture of accelerated vaccinations is to be welcomed. We argued that a "first dose to many" strategy, with second doses to follow where appropriate, should be considered as a way to help handle the rising caseload across the UK and welcome the fact the government is moving forward on this. As this document sets out, however, a significant organisational challenge remains. It requires the government to make decisive steps on ensuring the right supply of the vaccine, organising for it to be administered in all possible settings, mobilising the necessary workforce and ensuring the process is underpinned by the right systemisation through data.

Recommendations:

Supply

- **Bring onstream more doses:** By the end of January, aim for 3 million vaccinations per week, as fresh supplies of the vaccines are received.

- **Manage public expectations:** Clearly and transparently set out what vaccine doses will be available by when. This should be done by publishing, within the next week, a table similar to the one we have included in the "supply" section of this paper.

- **Adopt a "press go" posture:** Government and suppliers should move to a posture of being able to "press go" on future vaccines. This means stress testing their supply lines and delivery mechanisms and having as many vaccines stored and ready to roll out the minute they are approved.

Settings

- **Vaccination stations:** Introduce "vaccination stations" across the UK using polling stations as a blueprint.

- **All possible GP surgeries:** Ensure GP surgeries receive all support necessary to allow as many as possible form part of the vaccination process.

- **Every pharmacy:** Expand vaccines distribution to all pharmacies regardless of their size by removing weekly "1,000 dose" threshold.

- **Office space:** Utilise currently unoccupied office space as settings from which to administer the vaccine.

Staff

To accelerate the vaccination programme, the NHS needs to identify and deploy more staff as soon as possible. To do so, we suggest the following steps are taken:

1. **Additional workforce:** Aim to recruit a minimum of 30,000 additional vaccinators.

2. **Coordinated training:** put in place one common e-learning platform for all volunteers. This would then be topped up with in-person training at hub sites.

3. **Effective oversight:** Agree effective oversight of the training and staffing of the vaccination sites. This should include the right mixture of NHS staff, volunteers and St John Ambulance.

4. **Staffing gap:** Clearly and transparently set out how many additional staff are still needed where gaps are identified.

Systemisation

To properly step up the country's capability on how to make the fullest possible use of data, we recommend the following steps:

- **One system:** Identify and deploy one system to capture and store all possible data on Covid-19, particularly the vaccination process.

- **Full spectrum usage:** Issue clear guidance for all those involved in treating, testing and vaccinating against Covid to ensure the right information is captured and stored.

- **Public platform:** Make available to the public emerging trends and patterns on Covid-19 to help underpin government action.

- **Covid Pass:** Identify and deploy one platform for a Covid Pass. This should give each individual the capability to show online or offline their current Covid-19 status on testing and whether the person has been vaccinated.

- **Data sharing:** Make anonymised data available to researchers, scientists and health-care professionals around the world to assist in the fight against Covid-19.

Footnotes

1. ^ https://www.imperial.ac.uk/news/211793/new-covid19-variant-growing-rapidly-england/

2. ^ https://www.thelancet.com/journals/lanmic/article/PIIS2666-5247(20)30226-3/fulltext

3. ^ Based on 53.4 million adults in UK population, see United Kingdom Population 2020 (Demographics, Maps, Graphs) (worldpopulationreview.com)

4. ^ https://www.telegraph.co.uk/global-health/science-and-disease/coronavirus-news-covid-vaccine-oxford-astrazeneca-lockdown-tier/

5. ^ https://www.england.nhs.uk/statistics/wp-content/uploads/sites/2/2020/12/COVID-19-total-announced-deaths-17-December-2020-weekly-file.xlsx

6. ^ Based on conversations with experts.

7. ^ https://www.theguardian.com/world/2020/dec/22/nhs-leaders-raise-concerns-pace-covid-vaccine-rollout

8. ^ https://www.theguardian.com/society/2020/dec/11/gp-practices-england-opt-out-covid-vaccine-rollout

9. ^ [9] https://www.chemistanddruggist.co.uk/news/covid-19-73-people-would-get-their-vaccination-pharmacy

10. ^ https://www.bbc.co.uk/news/business-55485012

11. ^ https://www.telegraph.co.uk/news/2020/12/30/pfizer-vaccine-priority-list-who-first-covid-when/

12. ^ https://www.england.nhs.uk/coronavirus/join-the-nhs-covid-19-vaccine-team/#i-am-a-retired-clinician-interested-in-a-paid-role

13. ^ Assumes three an hour, seven-hour day.

14. ^ Assumed five-day week.

15. ^ https://www.rcn.org.uk/clinical-topics/public-health/immunisation/practical-and-clinical-guidance-for-vaccine-administration

16. ^ https://www.oracle.com/news/announcement/oracle-cloud-manages-covid-19-vaccination-program-121520.html

17. ^ https://commonpass.org/

18. ^ 72.12% (per cent of population aged 15+) of 9.05 million (population of Israel in 2019, according to Statista) = 6,526,860. Vaccine eligible population is 16+ so approximately 6.5 million

19. ^ https://www.statista.com/statistics/526596/age-structure-in-israel/

20. ^ https://www.bbc.co.uk/news/technology-55487302

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