



A vaccine plan for Scotland



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Executive Summary:

COVID-19 has had devastating effects on individual lives, our social fabric and our economy. Scotland's governments have not dealt with it well. Despite huge expenditures, we have had among the worst death rates in Europe, the biggest economic hits. People have endured much. However now we have an opportunity: after astonishing scientific achievements, vaccines are becoming ready, with Pfizer's already approved and the UK government having secured large quantities very quickly. Initial roll out is expected to begin from Tuesday 8th December. The Scottish government must now take its responsibility for the huge task of vaccinating Scotland, and to do so, it must learn the lessons of the crisis so far.

Vaccine Success: The Opportunity

Extraordinary worldwide scientific efforts have produced numerous vaccine candidates. The UK government has indeed been world leading in funding, and securing vaccines. As a result, the UK will have approved and have access to large portfolio of vaccines before almost any other country. This outcome has been the result of un-stinting cooperation, including across the devolved nations.

As a result, it is possible the Scottish NHS could begin to vaccinate people very soon, and have access to enough vaccine to inoculate between 1-3 million people early next year in (waves 1 and 2 of the roll out), starting with the most vulnerable. We are likely to have enough vaccine to cover the whole population by the middle of next year. Vaccination is not a magic wand - other measures will be needed too, but is a huge step forward.

Vaccination Delivery: The Responsibility

Vaccinating almost all of Scotland's population is an unprecedented challenge. It needs a coherent strategy, a delivery system of unprecedented scale and complexity, clear triage and effective communication and community engagement programmes. For reasons that will be clear, this needs to be done in cooperation with the rest of the UK, but it is primarily a challenge for the Scottish government. It is their turn to step up to the plate, and they must learn the lessons not taken from the crisis so far, as well as more recent vaccination programmes. The Scottish public cannot afford the cost of failure.

The UK's vaccination strategy has been a joint one, with vaccine approval by a single regulator (MHRA), and guided by the Joint Committee on Vaccination and Immunisation. A shared approach to triage - identifying those who need to be vaccinated first based on risk of morbidity and mortality, and in subsequent tranches as more vaccine becomes available – has been mapped out.

The operational challenge is huge, at least 4 times bigger than any previous vaccination programme. At a minimum, each adult will need two doses of the same vaccine, within a set period. The Pfizer vaccine has to be transported and stored at very low (-70C) temperatures. The Scottish government will need multiple channels to tell individuals how and when to be vaccinated, ensure large numbers of trained vaccinators and support staff, and provide adequate support, resources and an equitable cost of delivery across different vaccination clinics.

Effective communication is essential, for people to be able to trust the vaccine, access it effectively, and understand the way it is being handed out is fair. The communication strategy must be consistent with the overall strategy, with consistent messages must be sent across the whole UK to avoid confusion that may undermine take up.

Lessons Not Learnt

It is not surprising mistakes have been made throughout this crisis; it was unprecedented in speed and scale. They include: failing to safeguard the most vulnerable, including care home residents – which still seems to be a problem in Scotland; no swift and convenient mass testing, to identify asymptomatic cases – only starting now; and poor relations and coordination between governments – which remain a problem. Four main lessons can be drawn from this.

Lesson One: Cooperation and Coordination Must Improve

Both UK and Scottish governments have put their own priorities above the common good throughout this pandemic. The UK government tends to forget about devolution, repeatedly innovating for England, without thinking instinctively about the other UK nations. The Scottish government's constant refrain of more powers and money, driven by a political strategy of showing Scotland can stand on its own, drives unnecessary operational separation. As a result, Scotland lagged the rest of the UK on testing, and is only now catching up, with the UK government providing two thirds of the capacity, including the latest innovation. We cannot afford to do this for vaccination – developing the same complex processes twice over. Sharing of resources and operational support is necessary for quick and efficient roll out.

Lesson Two: the Scottish Public Receives Messages from all Corners of the UK

The Scottish government's approach to COVID has been more or less the same as the UK's, with more or less the same results. But relatively minor differences of approach cause confusion, lessen compliance and increase risk. For example, more than half of Scottish adults didn't know the correct rules over the summer, creating issues over what guidance to follow. Different UK and Scottish government messages about vaccination are potentially very dangerous - 21% of Scots already say they may not take the vaccine: mixed messages could increase that number to even more dangerous levels. We can already see signs of differences in terms of triage (i.e. Scotland's adding unpaid carers to JCVI guidelines) and on resource differences impacting the cost of delivery across health settings.

Lesson Three: Strategy and Effective Operational Delivery must be Integrated

The absence of a coherent strategy on how to deploy testing in Scotland has meant that even though we now have the highest capacity in the UK, it has been ineffective. Even now, only 70 – 80% of care home staff are tested every week. Mismatches between supply and demand locally (there are still only 22 walk or drive centres in all Scotland) and convoluted logistics lead to delays in results, making track and trace ineffective, spotting under 30% of modelled infections. Similar insights can be gained from the 2020 flu vaccination, the first in which responsibility went to health boards. This took the pressure off GPs, but was patchy, in some places chaotic, with piecemeal, highly inefficient organisation and booking systems in some areas.

We cannot afford the same problems with the COVID vaccination. The Scottish government needs a coherent, well communicated, operational strategy, and properly resourced delivery mechanisms. The broad strategic approach sketched out by the UK-wide Joint Committee on Vaccinations and Immunisations is helpful, especially for the early tranches, but need to be made more precise, especially for later stages, and also determining priority areas / occupational / societal groups for vaccination, within the 'wave 3' mass population roll out. Health boards will need very substantial support from the Scottish government to avoid the same problems in vaccinating over four times as many people than ever before, with two doses each with a narrowly defined period of time between. This support needs to be equitable across health settings, ensuring the same cost for delivery. It seems highly that the pool of 2000 vaccinators currently being recruited from a relatively small pool of existing staff will have to be supplemented, particularly with support and administrative staff.

Lesson Four: People who have Suffered the Most will need Special Help

COVID has had a very uneven effect. Lower income households have had higher infection rates and are more likely to die. People in these circumstances make hard choices which may risk their health, driven by economic circumstances. Ethnic minority communities have also been more badly affected, for reasons not yet fully understood. The vaccine strategy must deal with this, but as of yet, no specific proposals have yet been made, e.g. to address hard to reach households, or reduce the financial burden from travel or loss of wages.

One Month to Plan, or a Year to Repent

Vaccinating Scotland is an unparalleled challenge. So far the Scottish government looks behind the curve against strategic and operational requirements known about in general terms for months. Coordination mistakes – ‘devolve and forget’ from Whitehall combined with a separate communications agenda for Scotland - could lead to further confusion and poor delivery, which will lead to the impacts of the crisis – deaths, misery, and economic depression – continuing for longer than is necessary. These issues could be replicated if the Scottish government devolve responsibility to health boards without sufficient support.

However, there is a critical month left to put the right strategy, resources and operations in place, to maximize the speed and efficiency this vaccine is dispensed at. There needs to be greater commitment to vaccinating a larger proportion of the population as quickly as delivery allows, with adequate resources to do so. Similarly the government needs to provide details of its full roll out plan across vaccination waves.

RECOMMENDATIONS

At a minimum, we would suggest the following critical initiatives must be deployed:

- 1. Deeper coordination between the UK and Scottish governments as the vaccine is rolled out**
 - Assessing, triaging, and defining different populations within the third tranche of vaccine rollout
 - Monitoring take-up and any pharmacovigilance issues across the UK
- 2. A dedicated Vaccines Minister and specific team to facilitate the Vaccine Roll Out**
- 3. Developing a common plan for communicating the benefits of the vaccine to the public at large, before mass roll out**
- 4. Specific task forces to be established in Scotland to maximise vaccine uptake in traditionally harder to reach communities that have been most negatively impacted by the virus**
 - Clear strategy, reach out and involvement with local community leaders to discuss challenges and ensure uptake of vaccine within their communities
 - Taking steps to remove any financial disincentives to vaccination
 - Offering travel expenses for all those who need them to get vaccinated
- 5. Greater resources to be given to Scottish Health Boards to operationalise the roll-out**
 - Establishing vaccination centres
 - Recruiting, re-deploy and train staff to deliver the vaccine
 - Financial support to ensure an equitable cost to deliver across different health settings and via different clinicians
 - Starting to communicate with those first in line for the vaccine

- Give clarity to those in remote areas given clarity over the level of UK military support available

6. Investment in and set up of effective booking and data management arrangements

Towards a Global Solution for the Pandemic:

The prospect of widespread vaccination is the first unequivocal good news since the beginning of the coronavirus pandemic. Vaccinating Scotland against the virus remains an enormous operational and communications challenge that the Scottish government must meet, in cooperation with the rest of the UK. At least until vaccination is complete, other measures to contain the virus will still be needed, and high levels of vaccination uptake across the country are essential if we are all to return to 'the new normal'.

However we are not safe until we are all safe. This applies not just in Scotland and the UK, but across the world. It is paramount that we as a nation do not forget that the COVID-19 pandemic is a global challenge, and vaccine roll out will require a globally coordinated and supported response. Scotland, along with the rest of the UK, has an important role to play in supporting equitable access to the vaccine for all nations, regardless of wealth, and ensuring the COVID crisis doesn't deepen inequality any further.

We encourage our governments to think about those less developed countries who do not have the UK's deep pockets, and will need help to vaccinate their populations. It is already highly commendable that AstraZeneca have committed to providing the vaccination at cost to low and middle income countries (LMICs) indefinitely, and we encourage the UK and Scottish governments to assist countries to access vaccines on these terms, and provide resources where necessary.

Introduction

The COVID-19 pandemic has wreaked huge damage across Scotland in the last 9 months, with c.5380 deaths¹ and at least 92k confirmed infections to date (Nov 2020), posing the greatest threat to Scotland in the 21st century. The country has put up a hard fight against the virus, with heroic efforts made by our remarkable front line workers and unparalleled restrictions on the Scottish public. People have endured much.

However the performance of Scotland in response to COVID did not have to be so poor. Scotland, in line with the rest of the UK, has suffered key policy failings that have undermined and weakened its capacity to deal successfully with the virus. More money has been spent to achieve a worse death rate (c.94 per 100,000²) and a more diminished economy than our peers. There has been a complete failure to protect the most vulnerable people in our care homes (hospital discharge without testing contributing to c.2000 care home deaths.)³ Mass testing is still not a reality, alongside failures to test the most vulnerable and front line workforce (goal for +50k weekly tests for care home residents and staff not met in any week in August).⁴ Failure to get a grip on the vaccine spread through an effective test, trace and isolate programme has led to the imposition of nationwide lockdowns, with unemployment reaching 4.5% and rising.⁵

Yet there is hope on the horizon; as we stand in early December 2020, with Pfizer's vaccine having been approved,⁶ and others likely to follow suit in the coming weeks, there is every likelihood of an effective vaccine being rolled out, offering a clear beginning of a route out of this crisis. Indeed, the Pfizer vaccine roll out is set to start on the 8th December. It is not implausible that Scotland as a result of the UK vaccine supply strategy may have sufficient doses to vaccinate the entire population by mid spring – early summer 2021, allowing us to turn the corner on the crisis, and refocus on clinical and economic inequality. The Scottish government must now take a responsibility for vaccinating Scotland, learning the lessons of the crisis so far. Only then can the immense logistical, operational and communication challenges involved with deploying the vaccine be overcome.

The purpose of this paper is therefore to address how the Scottish government can learn from these failings and effectively launch a mass roll out of the COVID vaccine to the 4.4 million Scots that will require it. In answering this, there are 4 central questions:

- *What is the current status of the UK's current portfolio of secured doses, pending approval, and what does this imply for Scotland?*
- *What does best practice look like in terms of successfully launching a 'whole of population' inoculation programme for Scotland?*
- *What are the lessons that Scotland should learn from this year's new flu inoculation programme, and from other major COVID programmes such as test and trace?*
- *What should Scotland therefore be doing now to best prepare for the vaccine?*

It is our intention to provide constructive suggestions to the Scottish government that will help to facilitate a streamlined and efficient vaccination roll out across the country, correctly prioritising the clinically vulnerable, whilst existing health inequalities are not exacerbated and that our NHS remains adequately resourced and fully operational across all settings.

¹ As of 22 November 2020, as reported at <https://www.gov.scot/publications/coronavirus-COVID-19-daily-data-for-scotland/>, accessed 26 November 2020

² Based on anyone with COVID-19 listed on a death certificate

³ <https://www.bmj.com/content/371/bmj.m4225> accessed 30 November 2020

⁴ Scottish Health Board Data

⁵ LFS: ILO unemployment rate: Scotland: All, accessed <https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/unemployment/timeseries/ycnn/lms>, accessed 27 November 2020

⁶ <https://www.bbc.co.uk/news/health-55145696>, accessed 2 December 2020.

1. Impact

The COVID-19 pandemic remains the greatest threat to Scotland in the 21st century; Scotland - in common with the rest of the UK - has fought hard, but has suffered key failings

Scotland has suffered horrendously under the COVID-19 pandemic, in common with the rest of the UK. Total deaths have reached c.5135 with c.94k confirmed infections, and 12k hospital admissions, since the pandemic started (as of November 28th 2020).⁷ Current infection rates highlight that the pandemic is not going away any-time soon - recent ONS estimates indicate infections are rising across the nation, with 1 in every 115 people in Scotland currently having the virus.⁸ The pandemic has reached every section of society, with an acute impact on care homes, representing c.41% of deaths⁹ and the older people (over 75s = 75% deaths).¹⁰ Particular regions have too been impacted more than others; for example the wider Glasgow area, including North and South Lanarkshire, represents c.33% of total deaths.¹¹

The total impact on Scotland has broadly been in line with the rest of the UK, though some variations exist (see *Table 1*). In particular, it is estimated from antibody tests that Scotland had seen by October a higher prevalence of the disease than other UK nations (at 7.1% vs 6.9% for England and 4.1% for Wales);¹² in part a result of an inadequate test, trace and isolate programme, and failure to test key workers, which has failed to stem the spread of the virus. At present, the death rate today is slightly worse than England - in the week leading to 13 November, the weekly death rate stood at 5/100,000 vs 4/100,000 for England.¹³ This may in part be impacted by greater propensity in Scotland to other diseases that are increasing the danger from COVID - '*Scotland's population is sicker on average.*'¹⁴

Table 1: Key COVID-19 statistics by UK nation

Note: Deaths used as anyone with COVID-19 listed on death certificate

Nation	Total Tests per 100,000	Total Positive Infections per 100,000	Estimated Infection Rate (Oct 2020, antibody based)	Hospital Admissions Rate (per 100,000)	Death Rate (per 100,000)	Current Infection Rate Estimate	Current Weekly Death Rate (per 100,000)
Scotland	49,949	1720	7.1%	211	94.0	1 in 115	5
England	61,785	2453	6.9%	319	101.5	1 in 85	4
Wales	46,118	2491	4.1%	659	102.4	1 in 185	6

⁷ From UK government figures by region, note slight discrepancy to reported Scottish government figures (c. 5380 as of November 22 2020. <https://coronavirus.data.gov.uk/details/healthcare?areaType=nation&areaName=Scotland>, accessed 28th November 2020

⁸ True impact potentially under-estimated by the ONS Modelling, given based on sample n of 15k. Modelling found <https://www.gov.scot/publications/coronavirus-COVID-19-ons-infection-survey-results---26-november-2020/>, accessed 26 November 2020

⁹ From data set 'Weekly Deaths by Week of Occurrence, Council Area and Location'; as of 22nd November 2020 as reported by Scottish government - <https://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/vital-events/general-publications/weekly-and-monthly-data-on-births-and-deaths/deaths-involving-coronavirus-COVID-19-in-scotland/related-statistics>, accessed 26 November 2020

¹⁰ From data set 'Weekly Deaths by location of death, age group, sex and cause'; as of 22nd November, as reported by the Scottish government - <https://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/vital-events/general-publications/weekly-and-monthly-data-on-births-and-deaths/deaths-involving-coronavirus-COVID-19-in-scotland/related-statistics>, accessed 26 November 2020

¹¹ From data set 'Weekly Deaths by location of death, age group, sex and cause'; as of 22nd November, as reported by the Scottish government - <https://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/vital-events/general-publications/weekly-and-monthly-data-on-births-and-deaths/deaths-involving-coronavirus-COVID-19-in-scotland/related-statistics>, accessed 26 November 2020

¹² COVID prevalence and current infection rate estimates from ONS, <https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/conditionsanddiseases/articles/coronavirusCOVID19roundup/2020-03-26>, accessed 26 November 2020

¹³ <https://www.ft.com/content/cadc1f6c-14f7-40a9-a68a-f1409fd25997>, accessed 27 November 2020

¹⁴ <https://www.ft.com/content/cadc1f6c-14f7-40a9-a68a-f1409fd25997>, accessed 27 November 2020

Northern Ireland	49,061	2737	2.1%	216	63.4	1 in 145	5
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Source: UK Government¹⁵, ONS¹⁶, ONS Population¹⁷, Financial Times¹⁸

International Comparisons

Regardless, Scotland, along with the rest of the UK, has been poor in comparison to international benchmarks, across all health related outcomes and testing rates.¹⁹ With an average death rate of 99.9 per 100,000 people across the UK, the UK has one of the highest death rates in the world, based on deaths following a positive COVID test - with only Italy and Spain higher than the UK average.²⁰ Germany, South Korea and Japan have seen a considerably lower death rate than the UK due to their success of their test, track and isolate programmes, similarly with New Zealand and Australia, who have followed strict quarantine rules (see table 2).

Table 2: UK Nations²² vs Rest of World²³, Key COVID-19 indicators

*Note: UK nation deaths are deaths with COVID-19 included anywhere on death certificate; other countries dependent on what is nationally reported so figures may actually be higher.

	Country	Total Positive Cases	Total Confirmed Deaths	Death Rate per 100,000
UK	Scotland	93,943	5,135	94.0
	England	1,380,869	57,147	101.5
	Wales	78,536	3,230	102.4
	Northern Ireland	51,824	1,201	63.4
	UK Average	1,605,172	66,713	99.9
Europe	France	2,260,789	52,212	80.0
	Germany	1,052,494	16,181	19.3
	Italy	1,564,532	54,363	89.9
	Spain	1,628,208	44,668	95.5

¹⁵ As of 28 November 2020, as reported at <https://coronavirus.data.gov.uk/details/healthcare?areaType=nation&areaName=Scotland>, accessed 26 November 2020

¹⁶ COVID prevalence and current infection rate estimates from ONS, <https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/conditionsanddiseases/articles/coronavirusCOVID19roundup/2020-03-26>, accessed 26 November 2020

¹⁷ Latest population estimate from mid-year 2019 used, <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates>, accessed 26 November 2020

¹⁸ Current death rate, week ending November 6, as accessed <https://www.ft.com/content/cadc1f6c-14f7-40a9-a68a-f1409fd25997>, accessed 30 November 2020

¹⁹ Mark Woolhouse, Professor of Infectious Disease Epidemiology, Edinburgh University, as quoted in the Financial Times, <https://www.ft.com/content/cadc1f6c-14f7-40a9-a68a-f1409fd25997>, accessed 26 November 2020

²⁰ As of 28 November 2020, deaths accessed <https://coronavirus.data.gov.uk/details/healthcare?areaType=nation&areaName=Scotland>, accessed 26 November 2020; death rate calculated from mid 2019 population data accessed <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates>, accessed 26 November 2020

²¹ Johns Hopkins University, National Public Health Agencies and UN Population Data, as reported by BBC - <https://www.bbc.co.uk/news/world-51235105>, accessed 28 November 2020

²² As of 28 November 2020, deaths accessed <https://coronavirus.data.gov.uk/details/healthcare?areaType=nation&areaName=Scotland>, accessed 26 November 2020; death rate calculated from mid 2019 population data accessed <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates>, accessed 26 November 2020

²³ As of 28 November 2020, Johns Hopkins University, National Public Health Agencies and UN Population Data, as reported by World in Data, <https://ourworldindata.org/covid-deaths?country=GBR~IRL~DNK~AUS~NZL~USA~FRA~DEU~ITA~ESP~BRA~JPN~KOR>, accessed 3 December 2020

	Denmark	78,874	823	14.2
	Ireland	71,942	2,050	41.5
Americas	USA	13,244,687	266,047	80.4
	Brazil	6,290,272	172,561	81.2
Asia	Japan	145,457	2,042	1.6
	South Korea	33,824	523	1.0
Oceania	Australia	27,892	907	3.6
	New Zealand	2,050	25	0.5

Source: Johns Hopkins University, National Public Health Agencies and UN Population Data, as reported by World in Data, Scottish Government

Clinical & Testing Failings

There are clear clinical failings surrounding testing, failure to isolate, protection of the most vulnerable and a lack of clear public health guidance that have led to worse outcomes for the Scottish population vs international peers:

- **Testing** - The speed and efficacy of the track and trace programme, and rate at which it was rolled out across the UK during the first wave of the pandemic has inevitably led to excess deaths. In Scotland, testing data indicates only catching 30% of modelled infections. Even today, 2/3 of Scotland's testing capacity is reliant on UK wide infrastructure, and is indicating fewer cases (c.180 cases per million vs 325 cases per million in England²⁴) but a higher death rate.
- **Failure to Isolate** – There has been a significant failure to monitor and incentivise self isolation, both in Scotland and the whole of the UK. Recent statistics suggest that only 11% of the public are completing the full 14 day isolation when contacted by NHS track and trace.²⁵ Other countries that have used imposed hotel based quarantines have had considerable more success in preventing the transmission of the virus through such stricter measures (i.e. Australia, Hong Kong, New Zealand).
- **Protecting the most vulnerable** - with care homes representing over 40% of Scottish deaths, it is clear that the government has failed to effectively protect the most clinically vulnerable; the care home death rate is one of the highest in Europe.²⁶ Given their risk of health-related infection, the fact testing for COVID-19 was not an immediate requirement before discharge back into a care home, has meant hundreds of elderly patients died before their time. There has been serious failures to test the most vulnerable within care homes and their workforce (i.e. goal for +50k weekly tests for care home residents and staff not met in August).²⁷
- **Lack of Clear Public Health Guidance** - whilst the Scottish public have generally indicated in IPSOS polling that they trust in the Scottish government and their handling of the pandemic far better than in the UK government²⁸, disjoint between the two systems has led to confusion and non-compliance. For example polling indicated in May that over half of the Scottish public thought they should consider going to their workplaces if they could not work from home, despite the Scottish government not endorsing the UK government's message for employees to return to work in such cases.²⁹

²⁴ <https://www.ft.com/content/cadc1f6c-14f7-40a9-a68a-f1409fd25997>, accessed 26 November 2020

²⁵ <https://www.glasgowtimes.co.uk/news/18806458.rates-self-isolation-low-coronavirus-pandemic-goes/> accessed 3 December 2020

²⁶ <https://news.stv.tv/politics/scottish-government-betrayed-care-homes-during-COVID-19?top>, accessed 26 November 2020

²⁷ Scottish Health Board Data

²⁸ <https://www.ipsos.com/ipsos-mori/en-uk/scottish-views-boris-johnsons-handling-pandemic-hit-new-low>, accessed 26 November 2020

²⁹ The Policy Institute Polling, n=191 Scottish residents aged 16-75, interviewed 20-22 May 2020

Economic Impact and Rising Inequality across Scotland

The detrimental impact of COVID-19 on Scotland extends beyond health - there has been a profound economic downturn as a result of the crisis. The Scottish people are struggling to deal with the economic fall-out of the virus - with unemployment reaching 4.5% across Scotland, c.1% higher than 2019.³⁰ The pandemic has disproportionately affected lower income workers, such as those employed in the services sector, unable to work from home, and affected severely by lockdowns.

A series of interventions by the UK government to support those businesses (via the Job Retention Scheme and Small Business Loans Scheme) has been hugely important in saving some jobs. For example, latest data shows 242,600 furloughed workers in August, with figures higher in the preceding months.³¹ Yet these measures are not enough to stop the likely thousands of redundancies into spring 2021; unemployment rates will rise further, and any talk of a return to the 'new normal' may not be reached until 2024, according to some analysts.³² The likely reality for Scotland? Rising personal debt, homelessness and poverty, affecting the most vulnerable and socio-economically disadvantaged far beyond 2024, as future prospects are diminished.³³

³⁰ LFS: ILO unemployment rate: Scotland: All, accessed <https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/unemployment/timeseries/ycnn/lms>, accessed 27 November 2020

³¹ <https://www.gov.uk/government/publications/coronavirus-job-retention-scheme-statistics-october-2020/coronavirus-job-retention-scheme-statistics-october-2020#employments-furloughed-over-time-by-country-and-region>, accessed 27 November 2020

³² <https://fraserofallander.org/fai-publications/fraser-of-allander-economic-commentary-uncertain-outlook-at-key-crossroads-in-the-recovery/>, accessed 27 November 2020

³³ <https://www.gov.scot/binaries/content/documents/govscot/publications/research-and-analysis/2020/09/the-impacts-of-COVID-19-on-equality-in-scotland/documents/full-report/full-report/govscot%3Adocument/COVID%2Band%2Binequalities%2BFinal%2BReport%2BFor%2BPublication%2B-%2BPDF.pdf>, accessed 27 November 2020

2. Context

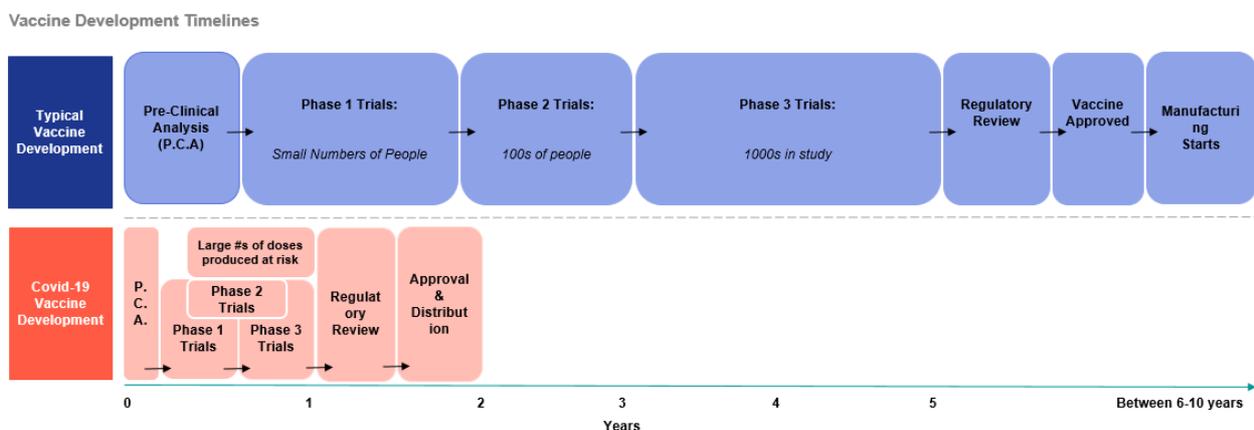
The UK Vaccine Procurement Programme has been a phenomenally successful example of cooperation between the UK nations to secure early vaccine access; an effective vaccine can allow us to turn the tide rapidly.

Context: Today's Global Progression Towards a Coronavirus

The COVID-19 pandemic has generated unprecedented levels of investment globally for research, development and manufacturing into the characteristics of this virus and vaccine development. In a world where the typical development of a vaccine from pre-clinical discovery to approval and manufacturing takes up to 10 years, it is anticipated that mass global distribution for a COVID vaccine will take <2 years. This extraordinary worldwide effort has produced over 200 vaccines in some form of development, with c.54 in clinical human trials and 12 in phase 3 testing (involving large scale efficacy monitoring), all utilising different technology.³⁴ The timelines for development have been remarkable, with the Pfizer vaccine already gaining approval this week for use in the UK³⁵, Oxford / AstraZeneca having submitted to the MHRA for approval in the UK,³⁶ and Moderna in the US and EU.³⁷

UK research efforts within the Oxford / AstraZeneca vaccine programme have to be applauded separately for both the speed at which the vaccine has been developed, and its commitment to providing a low cost solution for to the virus. The Oxford / AstraZeneca jab is cheaper (around £3) compared to c.£15 for the Pfizer and £25 for the Moderna vaccine.³⁸ It is highly commendable that AstraZeneca have committed to providing the vaccination at cost to poorer countries indefinitely, helping to bridge the economic inequality that the pandemic has proliferated across the world.

Chart 1 - Coronavirus Vaccine Development vs Traditional Vaccines, Indicative only



The UK's Existing Portfolio of COVID-19 Vaccinations

It is a true triumph of collective endeavour thus far that the UK government has made in terms of world leading funding, discovery and securement of vaccine doses for the British population. The UK has secured early access

³⁴ <https://www.nytimes.com/interactive/2020/science/coronavirus-vaccine-tracker.html> accessed 18 November 2020

³⁵ <https://www.bbc.co.uk/news/health-55145696>, accessed 2 December 2020.

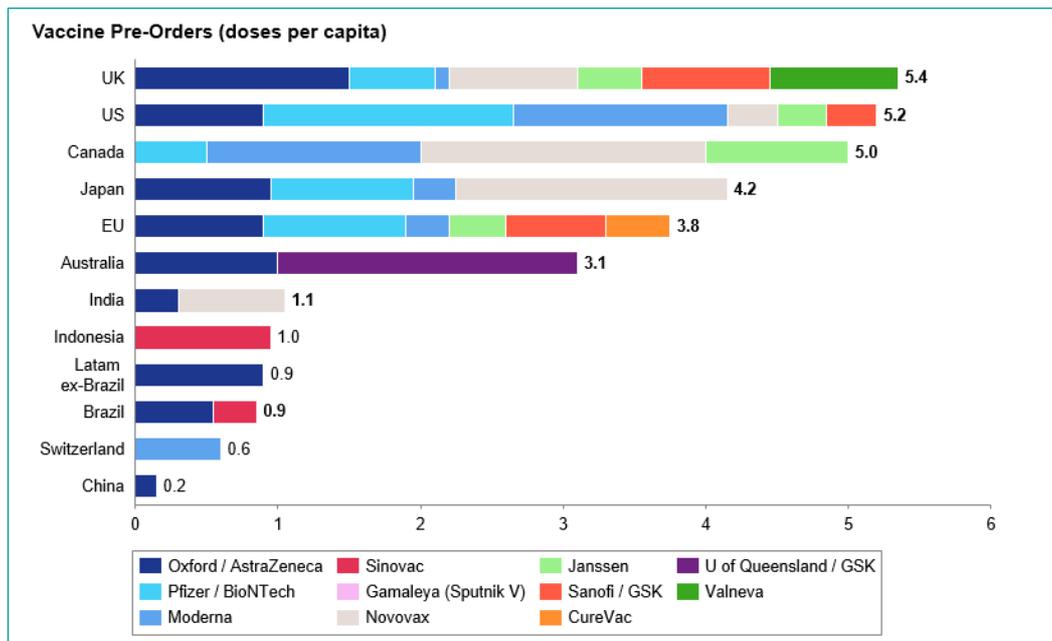
³⁶ <https://www.bloomberg.com/news/articles/2020-11-27/u-k-takes-steps-to-get-AstraZeneca-vaccine-approved-before-eu>, accessed 30 November 2020

³⁷ <https://www.bbc.co.uk/news/health-55129336>, accessed 1 December 2020

³⁸ <https://www.bbc.co.uk/news/health-55129336>, accessed 1 December 2020

to 7 different types of vaccine, with 357 million doses,³⁹ procurement occurring at a UK wide level. This portfolio is the largest and most diversified in the world, with c.5 doses per capita secured,⁴⁰ presenting us with the best opportunity to turn the corner on this crisis. Additionally, the UK has secured 1 million doses of AstraZeneca's antibody treatment, to neutralise the virus, which is used as a short term prophylactic for those who cannot receive the vaccines (i.e. cancer and immune-suppressed patients).

Chart 2: Vaccine Pre-Orders by Country (Doses per Capita)⁴¹



Central to the success of the UK's procurement strategy has been its investment in a diverse range of vaccine types. Vaccines are at different stages of development, with efficacies unknown, so the UK has, to the best of its ability, 'hedged its bets' on a multitude of options. Given the fact that it is not uncommon for vaccines to fail, this has been important to ensure distribution of the first type as quickly as approval allows. (Note - the probability of success for all drugs is c.13.8% from inception, rising to 59% for those that make it to phase 3 trials;⁴²) The government's upfront investment and bilateral agreements will enable the fast tracking of production, so if and when approval occurs, distribution and roll out can begin imminently, ahead of the curve in terms of other nations procurement ability.

In total, 5 of the 7 vaccines of which the UK has secured doses (listed below) are either finishing, or currently undertaking phase 3 trials, representing 2/3 of the UK's secured portfolio. Provided approval is granted, c. 30 million doses may be available from Pfizer and Oxford / AstraZeneca by the end of 2020, with a further 250-300 million, dependent on success through-out 2021. The UK government has already secured the MHRA approval of the Pfizer vaccine, and asked the MHRA approval board to review the Oxford AstraZeneca vaccine for emergency approval. Availability and roll out times will be heavily dependent on manufacturing and transportation capabilities, particularly given the UK's secured doses are predominantly dependent on international manufacturing.

³⁹ <https://www.gov.uk/government/news/uk-government-secures-additional-2-million-doses-of-moderna-COVID-19-vaccine>, accessed 30 November 2020

⁴⁰ <https://www.ft.com/content/e5012891-58da-4a4f-8a05-182adf3ba0e2>, accessed 20 November 2020

⁴¹ <https://www.ft.com/content/e5012891-58da-4a4f-8a05-182adf3ba0e2>, accessed 30 November 2020

⁴² <https://www.acsh.org/news/2020/06/11/clinical-trial-success-rates-phase-and-therapeutic-area-14845>, accessed 30 November 2020

Table 3: UK Secured Vaccine Portfolio:⁴³

Vaccine	Vaccine Characteristics					Logistics		Securement
	Vaccine Type	Current Stage	Efficacy (Symptoms)	Spread Reduction	Dose Re-gime	Production	Storage	UK Doses (no. of people)
Pfizer / BioNTech	mRNA vaccine	Emergency Approval in UK granted	95%	Unknown - need larger sample	2 doses, 21 days apart	Belgium, Germany, USA	-70C; cannot be removed >4 times	40m doses (20m people)
Moderna	mRNA vaccine	Phase 3 / Move Towards Approval	94.5%	Unknown - need larger sample	2 doses, 28 days apart	USA, Switzerland	-20C, can survive in fridge for 30 days	7m doses (3.5m people)
Oxford / Astra-Zeneca	Adenoviral vector vaccine	Phase 3 / Approval	Combined: 70.4% Half first dose: 70.4% Full dose: 62%	Claim positive reduction of spread but need more data	2 doses, likely half dose for initial	UK, India, Netherlands	No additional storage requirements	100m doses (50m people)
Novovax	Protein adjuvant vaccine	Phase 3	Awaiting Data	Awaiting Data	2 doses, 21 days apart	UK	2-8C	60m doses (30m people)
Janssen (J&J)	Adenoviral vector vaccine	Phase 3 of both 1 & 2 dose regimes	Awaiting Data	Awaiting Data	1 or 2 doses, 56 days apart	India	-20C for 2 years; 3 months 2-8C	30m doses (15-30m people)
GSK / Sanofi	Protein adjuvant vaccine	Phase 1/2	Awaiting Data	Awaiting Data	1 or 2 doses	USA	n/a	60m doses (30m people)
Valneva	Inactivated whole virus vaccine	Pre-Clinical Trials	Awaiting Data	Awaiting Data	2 doses	UK	No additional storage requirements	60m doses (30m people)

Next Steps to Roll Out Across UK: Approval and Monitoring

⁴³ <https://www.gponline.com/COVID-19-vaccines-lined-roll-out-nhs/article/1700217>, accessed 25 November 2020

With Pfizer's approval,⁴⁴ Oxford / AstraZeneca's submission for approval,⁴⁵ and Moderna following soon, it is only a matter of days before the first vaccines can be rolled out to high priority groups, with Pfizer beginning on 8th December. Gaining regulatory approval from the UK's Medicines and Healthcare Products Regulatory Agency (MHRA) is required before any mass roll out can occur - a process already being expedited in this public health emergency.⁴⁶ The MHRA reviews based on robust standards of quality, safety and effectiveness, and consistent manufacture.⁴⁷ The Joint Committee on Vaccination and Immunisation (JCVI) advises UK governments on rollout and Scotland must follow the JCVI's advice although it is not statutorily binding.⁴⁸

It is paramount that ongoing review of the vaccine evidence continues by the MHRA, and that the Scottish government continues to liaise and report findings to the WHO. In the excitement and optimism that the real potential of a vaccine before 2021 has brought, the Scottish government needs to be mindful, and have early plans in place concerning:

- 1) **Extent of Full efficacy** - *current phase 2 efficacy ratings are based on low samples of coronavirus cases; for example the Pfizer vaccine efficacy of 95% is based upon 163 coronavirus cases, whilst Moderna's 94.5% is based on 95 coronavirus cases. Additionally, given dosage mistakes in phase 3 trials for the Oxford AstraZeneca vaccine, interim trial data showed 3 efficacy levels ranging from 62-90%; further confidence and mass trials are required to test full efficacy.*⁴⁹
- 2) **Transmission Reduction** - *there is a current lack of concrete evidence around transmission reduction; phase 3 trials have shown that the vaccines don't prevent you from carrying the disease, but the extent to which transmission is reduced is debatable, requiring larger population results to ascertain,⁵⁰ and management of public expectations and behaviour until then.⁵¹ Oxford University reported that 'early indication shows that their vaccine could reduce virus transmission from an observed reduction in asymptomatic cases' but again requires a higher 'n' of cases (interim = 131 coronavirus cases) to ascertain fully.⁵²*
- 3) **Population Addressability** - *as more vaccines enter the market, the question of vaccine appropriateness for certain demographics and clinical conditions will fall to the JCVI to ascertain, alongside ongoing prioritisation. The JCVI is well versed in this - each year different influenza strains enter circulation, prevalent in different regions, with the JCVI making recommendations for vaccine type based on clinical characteristics.⁵³*

Implications for Scotland:

⁴⁴ <https://www.bbc.co.uk/news/health-55145696>, accessed 2 December 2020.

⁴⁵ <https://www.bloomberg.com/news/articles/2020-11-27/u-k-takes-steps-to-get-AstraZeneca-vaccine-approved-before-eu>, accessed 30 November 2020

⁴⁶ Authorisation via Regulation 174, source: <https://www.gov.uk/government/consultations/distributing-vaccines-and-treatments-for-COVID-19-and-flu/consultation-document-changes-to-human-medicine-regulations-to-support-the-rollout-of-COVID-19-vaccines> accessed 20 November, 2020

⁴⁷ <https://www.gov.uk/government/news/government-welcomes-the-mhra-review-into-pfizer-and-biontech-vaccine>, accessed 23 November 2020

⁴⁸ Page 5, Joint Committee on Vaccination and Immunisation Code of Practice, June 2013, as accessed https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/224864/JCVI_Code_of_Practice_revision_2013_-_final.pdf, accessed 30 November 2020

⁴⁹ <https://www.bbc.co.uk/news/uk-55096434>, accessed 30 November 2020

⁵⁰ Tal Zaks, Moderna Chief Executive, as reported in Axios; quoted in <https://www.independent.co.uk/news/world/americas/coronavirus-vaccines-moderna-transmission-rates-b1761236.html>; accessed 24 November 2020

⁵¹ Malik Peiris, Gabriel M Leung, 'What can we expect from first-generation COVID-19 vaccines?', The Lancet, published 21 September, 2020, accessed 24 November 2020

⁵² <https://www.ox.ac.uk/news/2020-11-23-oxford-university-breakthrough-global-COVID-19-vaccine-0>, accessed 30 November 2020

⁵³ Note - for influenza 2020, children aged 2-17 offered a live vaccine as a nasal spray, adults aged 18-64 offered an injectable vaccine that is inactivated, with several types available, and adults 65+ offered an injectable vaccine with an adjuvant to issue stronger immune response. Source: <https://www.gov.uk/government/publications/flu-vaccination-who-should-have-it-this-winter-and-why/the-flu-vaccination-winter-2020-to-2021-who-should-have-it-and-why>, accessed 24 November 2020

The Scottish NHS should have sufficient doses to vaccinate 4.4 million people; allocation determined based on an adult population share⁵⁴ of the UK and vulnerable 16-17 year olds. UK efforts to secure these doses mean that there should be sufficient supply to meet the Scottish government's target of 1 million people by the end of January – above what we have modelled to be included in the first wave (c.600k people), pending delivery. With the arrival of 800k doses of the Pfizer vaccine to the UK in the week commencing 7th December,⁵⁵ Scotland should receive c.65.5k doses, enough for just under c.33k people,⁵⁶ given 50% have to be kept back for the second dose. Further deliveries for the vaccine across December are yet to be confirmed. It is not implausible, and planning should have certainly started, to be able to vaccinate the majority of the population by late spring / summer 2021, albeit all dependent on approval and pharmaceutical supply of the vaccines. The baton is thus passed to the Scottish Government and NHS to coordinate all the stakeholders and roll out an efficient vaccination programme. Vaccination is not a magic wand - other measures will be needed too, but it is a huge step forward.

Scottish Government Plans to Instigate Roll Out:

Roll out in Scotland will inevitably require immense logistical, operational and communication challenges that the Scottish government has to address. At a minimum, each adult will require two doses of the same vaccine a set number of days apart, with many doses being required to be transported to the most vulnerable people, with immense difficulties in terms of storage for one vaccine. This responsibility falls to the Scottish government, who has laid out a national policy and delivery framework, with details given in a statement to Scottish Parliament on 19th November⁵⁷, and laid out further plans for the delivery of the first vaccines in a statement on 3rd December,⁵⁸ but is so far lacking in further detail, planning and forward thinking, particularly for vaccinations past the first Wave.

Scottish Government plans state that procurement of additional resources, staff and logistics will all be handled at a national level, but the day to day delivery and management will fall to the regional NHS Boards, in accordance with the recent 2020 influenza vaccination responsibility changes. The Boards' activities will include local triage based on national JCVI guidelines, vaccine scheduling and clinic location identification and management, with support from GPs and other clinicians. To reach ambitions to vaccinate 1 million people by the end of January, the Government is planning for the recruitment of 2000 staff,⁵⁹ albeit this is not clear if it is vaccinators alone, or the necessary support staff required; these individuals are expected to move over from the national flu vaccination programme, alongside from existing NHS registries.⁶⁰ For initial roll out in December, the Health Minister has stated there have already recruited the 156 whole time vaccinators required per day.⁶¹ There are hopes of completing the first wave by the Spring.⁶²

For the earliest wave of vaccinations with the Pfizer vaccine (from 8th December), the Scottish government have stated that the doses will be delivered to the 23 commercial size freezers in acute hospitals around Scotland holding the vaccine in ultra-low temperatures. They then plan to begin vaccinating the 'vaccinators' bringing them to where the vaccines are being stored, and other health front line staff. The government has secured clarification as to the stability of the vaccine, allowing it to be transported in an unfrozen state for 12 hours, undiluted for 5 hours, and packed down from their 997 dose packs – therefore allowing the vaccination of care homes to begin from the 14th December.⁶³ Yet with only a limited supply of doses, and uncertainty yet of further supply throughout December, the question remains over the prioritisation of vaccinations between care home residents for these very first doses.⁶⁴

⁵⁴ <https://www.heraldscotland.com/news/national-news/18877892.uk-nations-able-procure-vaccines-plaid-cymru-deputy-says/>, accessed 24 November 2020.

⁵⁵ <https://www.bbc.co.uk/news/uk-scotland-55156783>, accessed 3 December 2020

⁵⁶ <https://www.glasgowlive.co.uk/news/coronavirus-vaccine-plan-scotland-revealed-19391882>, accessed 3 December 2020

⁵⁷ <https://www.gov.scot/news/covid-19-vaccines-update/>, accessed 20 November 2020

⁵⁸ Ministerial Statement in Scottish Parliament: COVID-19 Vaccine Delivery, delivered on 3 December 2020

⁵⁹ <https://www.bbc.co.uk/news/uk-scotland-54984390>, accessed 30 November 2020

⁶⁰ Ministerial Statement in Scottish Parliament: COVID-19 Vaccine Delivery, delivered on 3 December 2020

⁶¹ Ministerial Statement in Scottish Parliament: COVID-19 Vaccine Delivery, delivered on 3 December 2020

⁶² <https://www.glasgowlive.co.uk/news/coronavirus-vaccine-plan-scotland-revealed-19391882>, accessed 3 December 2020

⁶³ Ministerial Statement in Scottish Parliament: COVID-19 Vaccine Delivery, delivered on 3 December 2020

⁶⁴ Ministerial Statement in Scottish Parliament: COVID-19 Vaccine Delivery, delivered on 3 December 2020

3. Best Practice in Vaccine Roll Out

Launching a ‘whole of population’ inoculation programme of two doses is extremely complex; to be successful Scotland needs to ensure it has an adequate plan to overcome logistical complexities and administer the vaccine, whilst ensuring equitable vaccine access and availability, and driving acceptability amongst the population

The vaccine will only be effective for all of us if as many people get vaccinated as quickly as possible. Rolling out a ‘whole of population’ inoculation programme represents a challenge of unprecedented scale and complexity, 4x bigger than the annual flu vaccination programme.⁶⁵ To get the most out of the vaccine as quickly as supply allows, Scotland needs to focus on its capacity to deliver and ensure equitable access and acceptability across the population. Cooperation with the UK will be required, but the delivery within Scotland is primarily a challenge for Scottish government. This challenge has already faced Scotland with testing - in theory the nation has one of the best testing capacities in the world, but yet it has been let down significantly by operational issues.

At a base level for success, Scottish government needs to address (1) supply chain, logistics and transportation operational requirements, (2) the effective administration of the vaccine by suitably trained professionals to the public, (3) the need to ensure equitable access and availability across Scotland and (4) the promotion of vaccine acceptance amongst the Scottish population.⁶⁶

Operational Requirements: Supply Chain, Logistics and Transportation

The Challenge:

The mass manufacture, transportation and delivery of COVID vaccines across Scotland is required on an unprecedented scale and urgency to meet this public health challenge. Fortunately, the UK Government’s advanced securing of vaccine doses means that any localised demand issues are likely to be short-lived. However, more worryingly is the fact that, given the UK’s own vaccine manufacturing capacity is limited (only 3/7 secured doses are UK produced), there are significant logistical issues in getting the vaccine to the UK, particularly given the potential for Brexit-induced delays. Then the issue arises of storing and transporting the millions of doses to where they will be administered. Several of these vaccines have characteristics that compound this complexity - through thermostability, storage, packaging and time restrictions. Scotland presents a further logistical challenge, given the diversity of the country’s geography – from the central belt to the Outer Hebrides.⁶⁷ Ensuring the right equipment and vaccines are in the right location, to then be distributed to different clinical settings for administration will be crucial – we understand this may already be an issue with the freezers for the imminent Pfizer roll out.

Example: Logistical Obstacle - Pfizer’s -70C storage

Pfizer’s mRNA vaccine is the most complex of the early vaccine candidates, and as such is the ‘base case’ that the Scottish government should plan for. The vaccine itself must be stored at -70C and is being produced in Belgium, requiring transportation to the UK. Flights will transport vaccines in special dry ice packs holding 5000 doses, where upon arrival, the country can choose to store the vaccine in freezer farms for 6 months. Otherwise the

⁶⁵https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/895233/Surveillance_Influenza_and_other_respiratory_viruses_in_the_UK_2019_to_2020_FINAL.pdf, accessed 20 November 2020

⁶⁶ The DELVE Initiative (2020), SARS-CoV-2 Vaccine Development & Implementation; Scenarios, Options, Key Decisions. DELVE Report No. 6. Published 01 October 2020. Available from <http://rs-delve.github.io/reports/2020/10/01/COVID19-vaccination-report.html>.

⁶⁷ <https://www.bbc.co.uk/news/uk-scotland-54984390>, accessed 25 November 2020

vaccine has only 10 days to reach the vaccine centre in the dry ice packs, and 5 days to be stored at fridge temperatures, before it becomes unusable.⁶⁸ Difficulties are likely to arise transporting and administering them within 12 hours of them being removed from freezers.⁶⁹ Adding to this a potential dry ice shortage from a global shortage of carbon dioxide early in the year, which may all impact capacity to deliver.⁷⁰

Solution: An Operational Masterplan with Distributed Hub and Spoke Network

An operational masterplan is going to be required to move and store the vaccine from airports to freezer/ storage sites to clinics, through a distributed hub and spoke network, with a rapid logistics system. Utilisation of local resources and military support via the UK Government will be necessary to enable the quick fulfilment of vaccine delivery across temporary regional locations. The Scottish Government needs to ensure that adequate funding, information sharing and procurement of resources are provided to be able to execute this operational plan, ensuring tie up with the UK government where necessary. This cannot be a repeat of the shambles that occurred with the PPE crisis earlier on in the pandemic where supply chains failed to get the NHS the resources it needed, when required. Alongside this, at a UK level the government needs to provide several assurances that there won't be any trade and transportation barriers for medical goods entering the UK, particularly as the UK transitions out of EU trade terms on December 31st.⁷¹

Effective Administration of the Vaccine by Health Care Professionals

The Challenge:

Administering the vaccine to c.4.4 million adult Scots within a short time frame presents several logistical and administrative challenges. Firstly, how to bring people and vaccine together - given the nature of Scotland's geography, a one size approach adopted by each Health Board will not work. The real challenge will be scaling up existing resources and effectively rolling out appropriate clinics to administer the vaccine whilst maintaining a safe environment to prevent infection, and equitable cost to deliver in different settings and via different clinicians. Secondly, the existing workforce for vaccine administration both in terms of clinical and non-clinical staff are already under pressure from current services - to maximise the daily capacity to deliver the vaccine, additional clinical and non-clinical individuals will be required. Vaccine administration should not have a detrimental impact on other health services due to lack of workforce, nor on the financial remuneration for staff. Finally, the nature of the vaccines, and requirement of multiple doses, with different set time intervals dependent on the vaccine itself compounds the administrative challenges.

Solution: Tailoring of Clinics to Population Requirement; adequate resources and workforce to administer vaccine

The Scottish government must provide the adequate support, both in terms of planning and resources, to Health Boards, to roll out the vaccine effectively. As part of the operational masterplan, Health Boards must adequately plan for their local areas, ensuring an enough mass vaccination sites (to cater for urban areas), mobile units (for more rural locations) and call out services (to serve care homes etc) to bring people to the vaccine or *vice versa*. Resources need to be scaled appropriately, via the recruitment of a clinical and non-clinical staffing pool to maximise the daily capacity to deliver the vaccine, with flexibility to move resources where required to address demand. Finally, there needs to be some form of multi-channel vaccine booking and notification platform to notify individuals of how and when to get vaccinated, and allow convenient access of those that are entitled. Automated monitoring of timing between doses will likely be needed to ensure that people complete the full vaccination programme.

⁶⁸ <https://www.bbc.co.uk/news/uk-scotland-54984390>, accessed 25 November 2020.

⁶⁹ First Minister Statement to Scottish Parliament re. Covid Vaccination Plan, 3 December 2020

⁷⁰ <https://www.bbc.co.uk/news/technology-54889084>, accessed 25 November 2020

⁷¹ <https://www.ft.com/content/197ad4a1-610b-4a00-bf76-1de2ab2d8105>, accessed 20 November 2020

Ensuring Access and Availability to the Most Vulnerable within Society

The Challenge:

The delivery of vaccinations across an entire population risks exacerbating health inequalities due to availability, capacity, access and adequate resources of the Health Boards to administer the vaccine effectively. Already we have seen how the virus has hit the most vulnerable in the society (seen with the higher care home death rate) and disproportionately impacted minorities (deaths in South Asian ethnic groups are 2x more likely than white deaths)⁷² and poorer socio-economic groups. Delivering the vaccination will require careful focus on these groups to ensure equal outcomes.

Ensuring equitable access within a population is a multi-layer dilemma, with issues concerning the correct triage of vaccine access, the potential exacerbation of existing health inequalities and need to ensure high uptake amongst different ethnicities, age groups and affluence levels. In Scotland, uptake of routine vaccinations is generally high, but reduces in areas of deprivation and amongst certain minority communities - for example, in 2016/7 teenage booster immunisations were lower for people living in the most deprived areas, at 79%, vs 92% in the most affluent.⁷³ Additionally, there is likely to be a significant displacement of other health services, impacting certain societal segments - again compounded by an already back-logged NHS elective procedure list.

Solution: Clear Triage and Community Collaboration

To ensure clinical inequalities are addressed and vulnerable populations are protected, there needs to be clear clinical and perhaps also geographical triage, making sure that those most in need get the vaccine first, and where it is most prevalent. This triage needs to be communicated effectively through every 'wave' to the public with a clear strategy within each. Other solutions to ensure equitable access include ensuring collaboration with local community leaders to drive awareness of the vaccine, and discuss best rollout. The vaccine needs to be smoothly supplied to the population, with 'round the clock' services and out of hours times to reduce any economic disincentive to vaccination. Finally, to address the impact on other health services, best practice needs to be shared across regional NHS boards, with resource allocation, and the monitoring / quantification of the impact the vaccine is having on other health services.

Promoting Vaccine Acceptability Amongst the Scottish Population

The Challenge:

The success of any vaccination programme requires getting to a level of community immunity that reduces or prevents the active transmission of the virus within the society. A key driver of this success is ensuring high acceptability and uptake of the vaccine. Recent polling however indicates that c.21% of British adults say they are likely to refuse the vaccine, with c.12% proportion still making up their mind.⁷⁴ A core, but relatively small, element of this is the rise in the anti-vaccination movement, and spread of disinformation about vaccines. The Lancet reports that anti-vaccine groups have proliferated since 2019 (7.8 million increase in membership),⁷⁵ and, with social media failing to remove 95% of 'anti-vax' misinformation,⁷⁶ they will play a serious role in reducing uptake of the vaccine. Thankfully, the UK anti-vax sentiment is limited to <5% of the population, but concerns around the

⁷² <https://www.gov.scot/binaries/content/documents/govscot/publications/research-and-analysis/2020/09/the-impacts-of-COVID-19-on-equality-in-scotland/documents/full-report/full-report/govscot%3Adocument/COVID%2Band%2Binequalities%2BFinal%2BReport%2BFor%2Bpublication%2B-%2BPDF.pdf>, accessed 1 December 2020

⁷³ <http://www.healthscotland.scot/health-topics/immunisation/overview-of-immunisation>, Accessed 25 November 2020

⁷⁴ Adam McDonnell, You Gov Polling: 'How many Britons are willing to take a coronavirus vaccine?'; n=1632, 11-12 November 2020

⁷⁵ Talkha Burki, The Online anti-vaccine movement in the age of COVID-19', The Lancet, published October 2020

⁷⁶ 'Failure to Act - How Tech Giants continue to defy calls to reign in vaccine misinformation', as published by the Centre for Countering Digital Hate, 2020, accessed here - https://252f2edd-1c8b-49f5-9bb2-cb57bb47e4ba.filesusr.com/ugd/f4d9b9_8d23c70f0a014b3c9e2cfc334d4472dc.pdf

safety of the vaccine, low trust in the vaccine and perceptions of low personal risk from COVID all need to be addressed.⁷⁷

There are also considerable socio-economic disincentives to vaccination that have the potential to impact vaccine acceptability, including the requirement of time off to receive the vaccine and cost to travel. Finally, it may be that some higher risk groups have barriers to vaccine uptake. There is evidence that black and ethnic minority communities have lower levels of access to childhood immunisation, for what may be due to language, cultural or other reasons. Uptake of coronavirus vaccines will need to be monitored to avoid any such imbalance.

Solution: A Mass Public Awareness Campaign Driving Awareness, and Support to Ensure Uptake

To drive acceptability of the vaccine, there needs to be an unprecedented public awareness and marketing campaign with clear and simply messaging stating the information, stringent trial requirements and benefits as well as addressing the challenge and limitations of the vaccine. Best practice likely looks like the Treasury's 'Explain, Engage and Educate' campaign.⁷⁸ The messaging needs to resonate across all ages, and directly address any disinformation head on. Additionally there needs to be active collaboration with local community leaders to ensure uptake of the vaccine and address concerns, and inclusion of financial support to incentivise the socio-economically disadvantaged to get vaccinated. Crucially, this must be consistent across the UK so that mixed or contradictory messages are avoided.

⁷⁷ Adam McDonnell, You Gov Polling: 'How many Britons are willing to take a coronavirus vaccine?'; n=1632, 11-12 November 2020

⁷⁸ The DELVE Initiative (2020), SARS-CoV-2 Vaccine Development & Implementation; Scenarios, Options, Key Decisions. DELVE Report No. 6. Published 01 October 2020. Available from <http://rs-delve.github.io/reports/2020/10/01/COVID19-vaccination-report.html>.

4. Challenge

As it takes on the baton to perform, the Scottish Government does not appear to have learnt the lessons of failures earlier in the year around cooperation and coordination, mixed messaging, strategy and effective operational delivery and serving vulnerable populations

It is not surprising mistakes have been made throughout this crisis - it was unprecedented in speed and scale. There are urgent lessons to be learnt as the Scottish government looks to rolling out the vaccine, with a model dependent on nationally supported, localised Health Board Delivery that will only 'boost' existing infrastructure used from this year's annual influenza vaccination programme. There is the real potential for Health Boards to be overwhelmed without greater national coordination and support.

The government need only look to the following failures throughout the pandemic to see where improvements can be made: the failure to triage and safeguard the most vulnerable groups in society (including care home residents that still seems to be a problem in Scotland), the failure to conduct swift and convenient mass testing, poor and complicated communications to the Scottish public surrounding rules and regulations, and the failure to effectively 'link up' and coordinate with the UK government (instead adopting a 'stand alone' Scottish response).

Similarly, the roll out of the recent 2020 Influenza Vaccination programme also led to significant administrative bottlenecks in effective triage and organisation, leading to disparate outcomes across Boards. Given it is this same roll out framework underpinning the coronavirus vaccine roll out, learning from these mistakes will be vital.

We believe that there are 4 main lessons that can be drawn from this:

Lesson 1: Co-operation and Coordination across Governments must Improve

Both UK and Scottish governments have at times put their own priorities above the common good. With the UK government, there has been a tendency to 'devolve and forget', repeatedly innovating for England, without thinking instinctively about the other UK nations. This is most evident recently in the £500 self isolation support grants. The Scottish government's constant refrain of more powers and money, driven by a political strategy of showing Scotland can stand on its own, drives unnecessary operational separation. It is for this reason that Scotland lagged behind the rest of the UK on testing for months due to a desire to maximise the use of NHS Scotland capacity, and has only caught up since greater cooperation between the Scottish government and the UK testing laboratory has begun, with around 2/3 of tests and the public booking platform now being provided by UK resources, allowing Scotland to have access to the latest innovations in lab-based testing.

We cannot afford to let this happen on vaccine roll out - the need is too important, and time will be wasted operationalising all of these complex processes twice, without information and resource sharing. Yet the UK government so far has been very silent about operational support; whilst procurement of resources is a devolved matter, the join up and sharing of information will facilitate more efficient roll out across all 4 nations. Likewise, the Scottish government's communications so far have emphasised that Scotland will, alone, develop delivery frameworks, workforce models, undertake procurement and logistics, and manage the data platform.

Lesson 2: The Public Receives Messages from All Corners of the UK - When the UK Speaks in Unison they are More Likely to be Heard

Clarity of government messaging in a pandemic is vital in order to promote adherence and acceptance to rules, and this will remain key for vaccination roll out. Over the course of the pandemic so far, the Scottish government

has repeatedly emphasised Scotland's different approach to public health, despite following a very similar pathway to the rest of the UK that has led to similar results. Relatively minor differences of approach cause confusion, lessen compliance and increase risk. Whilst polling indicates that the Scottish government's specific messaging has been regarded as clear by the population, 86% clarity, particularly vs UK governments 39%,⁷⁹ this disjoint has threatened to undermine it. Polling over the summer indicated that in some areas of difference (for example whether to consider going back to a workplace or how many households can meet up outside the home), over 50% of Scottish adults did not know the appropriate rules.⁸⁰

As we look to vaccine roll out, we can already see differences in terms of triage (i.e. Scotland's elevation of unpaid carers vs JCVI guidelines⁸¹) and on resource differences impacting the cost of delivery across health settings. There is potential here for confusion that may prevent the greater uptake of the vaccine - already a concern given 21% say they aren't likely to take the vaccine, due to specific concerns around safety and low risk.⁸² Differences in messaging is likely to be picked up on by these individuals, undermining attempts to address their concerns.

Lesson 3: Strategy and Effective Operational Delivery Must be Integrated

The absence of a coherent strategy in how to operationalise both testing and the flu vaccination programme has led to detrimental outcomes across Scotland. In testing, despite now the highest per capita capacity for testing across the UK, impact so far has been ineffective. A lack of strategy in *how* and *where* to deploy testing capacity in Scotland to achieve the greatest strategic benefit has led to a series of missed opportunities to drive uptake - for instance there are still only 22 walk or drive in centres across all of Scotland. A convoluted logistics system that has meant delays of up to 5 days between request and results, and localised supply issues have led to a system in which only 30% of total modelled infections are identified. This invalidates the 'track and trace' component, given c.70% of new cases are unable to be tracked.

Similar insights can be gained from the 2020 flu vaccination roll out, the first year that responsibility was transferred from GPs to Health Boards. This move pre-dated the pandemic in an attempt to relieve GP pressure, which, in a time of a pandemic, was objectively the right strategy, to keep the most vulnerable away from GP surgeries and reduce the threat of infection. However the roll out of the vaccine was patchy; in some places chaotic, with many regions over-whelmed by the surge in demand, and piecemeal, highly inefficient organisation and booking in some areas. For example, issues arose regarding appropriate scheduling and age prioritisation in Glasgow and Clyde from using old childhood vaccination software which failed to triage appropriately, whilst in other areas, there were significant delays in appointments being sent out and identifying the 'at risk' population via the Scottish Immunisation Recall System.

We cannot afford the same problems with the COVID vaccination. The Scottish government needs a coherent, well communicated, operational strategy, and properly resourced delivery mechanisms. Triage will need to be effectively planned by the Scottish government - the outline given by the Scottish government regarding 'Wave 1' prioritisation of front-line workers, older care home residents, care home staff / unpaid carers and the over 80s, and 'Wave 2' the over 65s and those under 65 with clinical risk, has been thought out in line with JCVI recommendations,⁸³ but must be refined as more scientific reviews are conducted, with the need to make the 'Wave 3' mass roll out needs to be made more precise. Currently, beyond the c.600k Scots in the first wave, and 1.9m Scots in the second wave, there is no real plan for how to prioritise and engage with the 1.9 million Scots in the third wave. Specific efforts should be made around communities and professions that may be more at risk, including key workers to effectively plan and prioritise resources towards the clinically most vulnerable.

⁷⁹ <https://www.ipsos.com/ipsos-mori/en-uk/four-five-scots-say-nicola-sturgeon-has-handled-coronavirus-outbreak-well>, accessed 25 November 2020

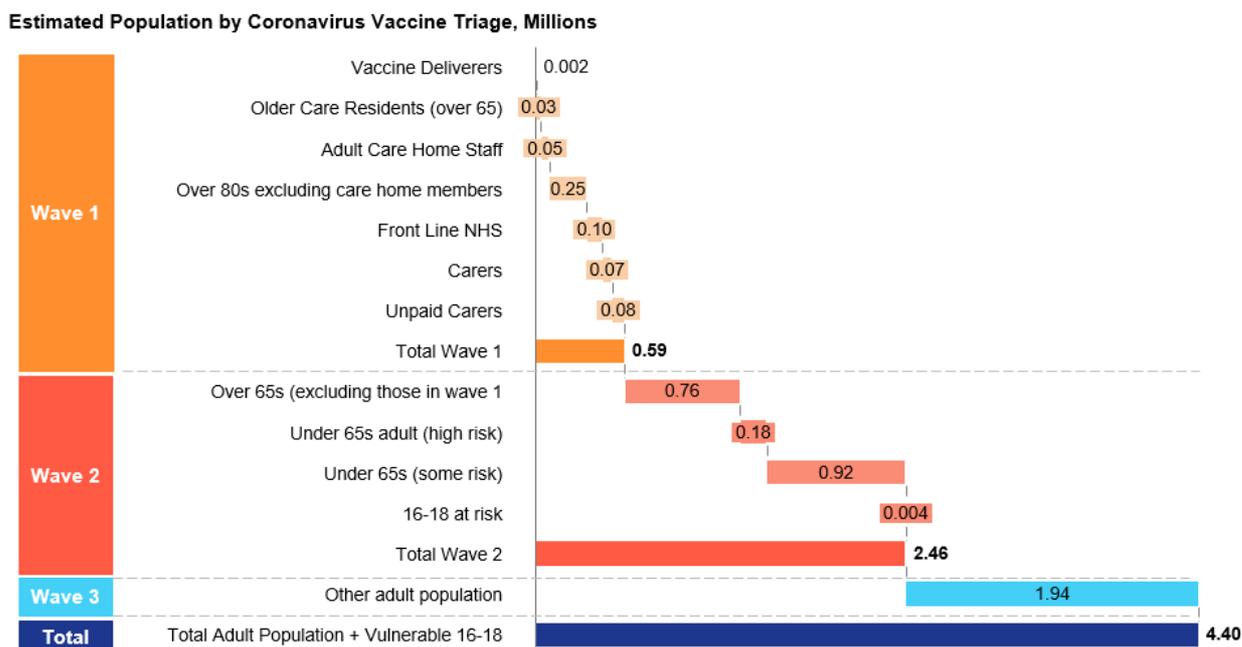
⁸⁰ The Policy Institute Polling, n=191 Scottish residents aged 16-75, interviewed 20-22 May 2020

⁸¹ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/940396/Priority_groups_for_coronavirus_COVID-19_vaccination_-_advice_from_the_JCVI__2_December_2020.pdf, accessed 2 December 2020

⁸² Adam McDonnell, You Gov Polling: 'How many Britons are willing to take a coronavirus vaccine?'; n=1632, 11-12 November 2020

⁸³ <https://news.gov.scot/speeches-and-briefings/COVID-vaccine-delivery-statement-health-secretary>, accessed 23 November 2020

Chart 3: Waterfall of Coronavirus Triage for Scottish Adult and Vulnerable 16-18 Year Old Population⁸⁴



Sources: National Records of Scotland⁸⁵, ISD Scotland⁸⁶, Scottish Government Social Work Report⁸⁷, STV⁸⁸, 2019/20 Care Home Consensus⁸⁹, The Lancet⁹⁰

Health Boards will require substantial support from the Scottish government to avoid the same problems that occurred with the flu vaccine, in a roll out 4x the size,⁹¹ requiring multiple doses. Faster and more efficient vaccination will inevitably save lives, making this process all the more critical. Additional resources, best practice sharing, guidance and technology will be required to ensure the 2020 flu vaccination was a dress rehearsal, not a precursor. Effective planning needs to ensure the join up of equipment, vaccines and vaccinators across a varied geography, in the right place, and the right time.

It seems likely that the 2000 additional vaccination staff currently being recruited from a small pool of existing staff must be supplemented, both through clinical support and on site operators and administrative staff, to ensure that non-clinical processes are efficient, and clinical staff can prioritise the ‘medical act of vaccination’. Simple modeling done by Our Scottish Future using only publicly available information (see note) suggests that, to meet targets of first wave vaccinations by the end of February, c.1400-1500 vaccinators and c. 4000 support staff will be required. Further workforce requirements are likely in the larger second and third waves.

⁸⁴ Includes in Wave 2 all those with at least 1 ‘higher risk’ condition, modelled via global age risk bands via [https://www.thelancet.com/journals/langlo/article/PIIS2214-109X\(20\)30264-3/fulltext](https://www.thelancet.com/journals/langlo/article/PIIS2214-109X(20)30264-3/fulltext), accessed 1 December 2020

⁸⁵ <https://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/population/population-estimates/mid-year-population-estimates>, accessed 1 December 2020

⁸⁶ <https://www.isdscotland.org/Health-Topics/Workforce/Publications/2019-06-04/2019-06-04-Workforce-Report.pdf> accessed 1 December 2020

⁸⁷ <https://www.gov.scot/binaries/content/documents/govscot/publications/corporate-report/2016/02/social-work-and-social-care-statistics-for-scotland-a-summary/documents/social-work-social-care-statistics-scotland-summary-pdf/govscot%3Adocument/Social%2BWork%2Band%2BSocial%2BCare%2BStatistics%2Bfor%2BScotland%2B-%2BA%2BSummary.pdf>, accessed 1 December 2020

⁸⁸ <https://news.stv.tv/politics/scottish-government-gives-19-2m-thank-you-to-unpaid-carers>, accessed 1 December 2020

⁸⁹ <https://www.isdscotland.org/Health-Topics/Health-and-Social-Community-Care/Care-Homes/Census/>, accessed 1 December 2020

⁹⁰ ⁹⁰ Includes in Wave 2 all those with at least 1 ‘higher risk’ condition, modelled via global age risk bands via [https://www.thelancet.com/journals/langlo/article/PIIS2214-109X\(20\)30264-3/fulltext](https://www.thelancet.com/journals/langlo/article/PIIS2214-109X(20)30264-3/fulltext), accessed 1 December 2020

⁹¹ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/895233/Surveillance_Influenza_and_other_respiratory_viruses_in_the_UK_2019_to_2020_FINAL.pdf, accessed 20 November 2020

Flexible yet strategic resourcing and planning are therefore pre-requisites for success for the Health Board coronavirus vaccination roll out. The Scottish government must take full responsibility for this national coordination, and offer their support to these Boards via adequate resourcing. They cannot become a scapegoat for any operational challenges that arise.

Note - Modelling Sources for Workforce Population Size:

- *For First Wave Population Size: National Records of Scotland⁹², ISD Scotland⁹³, Scottish Government Social Work Report⁹⁴, STV⁹⁵, 2019/20 Care Home Consensus⁹⁶, The Lancet⁹⁷;*
- *Estimations on Vaccination Staff Required: Boots⁹⁸, Expert Interviews guiding assumptions*

Lesson 4: Patient Choices, Financial Circumstances and Health Outcomes are Inextricably Linked

Through-out the pandemic, COVID has had a very uneven effect. Lower income households and areas, alongside those in lower paid employment have borne the brunt of higher infection rates, and higher deaths.⁹⁹ This has also affected minority groups severely, for reasons not yet fully understood.¹⁰⁰ Poorer people consistently have had to make choices informed by a harsh economic reality to take more risk with their health in order to be able to maintain a basic standard of living. Recent innovations, such as the quarantine payment for certain households, have improved, but not eliminated this inequality, and it is these groups that are going to be disproportionately affected by rising unemployment and business closures.

There are currently no stated plans actively either to use financial incentives, encourage specific low income / hard to reach households to get vaccinated, or to remove obstacles such as the financial burden of travel costs / child care / cutting into work time. We know that for this vaccine roll out to be a success, we need high uptake amongst these groups, and it is the Scottish government's role to address these barriers for uptake and provide a solution, creating a scheme that ensures vaccination access is equitable for all.

⁹² <https://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/population/population-estimates/mid-year-population-estimates>, accessed 1 December 2020

⁹³ <https://www.isdscotland.org/Health-Topics/Workforce/Publications/2019-06-04/2019-06-04-Workforce-Report.pdf> accessed 1 December 2020

⁹⁴ <https://www.gov.scot/binaries/content/documents/govscot/publications/corporate-report/2016/02/social-work-and-social-care-statistics-for-scotland-a-summary/documents/social-work-social-care-statistics-scotland-summary-pdf/social-work-social-care-statistics-scotland-summary-pdf/govscot%3Adocument/Social%2BWork%2Band%2BSocial%2BCare%2BStatistics%2Bfor%2BScotland%2B-%2BA%2BSummary.pdf>, accessed 1 December 2020

⁹⁵ <https://news.stv.tv/politics/scottish-government-gives-19-2m-thank-you-to-unpaid-carers>, accessed 1 December 2020

⁹⁶ <https://www.isdscotland.org/Health-Topics/Health-and-Social-Community-Care/Care-Homes/Census/>, accessed 1 December 2020

⁹⁷ ⁹⁷ Includes in Wave 2 all those with at least 1 'higher risk' condition, modelled via global age risk bands via [https://www.thelancet.com/journals/langlo/article/PIIS2214-109X\(20\)30264-3/fulltext](https://www.thelancet.com/journals/langlo/article/PIIS2214-109X(20)30264-3/fulltext), accessed 1 December 2020

⁹⁸ <https://www.boots.com/online/pharmacy-services/winter-flu-jab-services>, accessed 1 December 2020

⁹⁹ <https://www.ipsos.com/ipsos-mori/en-uk/latest-interim-findings-react-COVID-19-study-published> accessed 30 November 2020

¹⁰⁰ <https://www.ipsos.com/ipsos-mori/en-uk/latest-interim-findings-react-COVID-19-study-published> accessed 30 November 2020

5. One Month to Plan, or a Year to Repent:

Our Initiatives for the Scottish Government

We are at a critical juncture in the fight against the COVID pandemic, but on path towards a vaccine that can help to turn the tide. Vaccinating Scotland remains an unprecedented challenge. So far, the Scottish government looks to be behind the curve against strategic and operational requirements, known about for months. Coordination mistakes - 'devolve and forget' from Whitehall - combined with a separate communications agenda could lead to further confusion and poor delivery. Issues seen throughout the pandemic could be replicated if the Scottish government devolve responsibility to health boards without sufficient support.

However there is still a valuable month left to put the right strategy, resources and operations in place to maximise the speed at which the vaccine can be dispensed. This paper therefore argues that greater urgency is required to plan the vaccine rollout, and likely implications, than is being seen today. There needs to be greater commitment to vaccinating a larger proportion of the population as quickly as delivery allows, with adequate resources to do so. Similarly the government needs to provide details of its full roll out plan across waves.

At a minimum, we would suggest the following critical initiatives must be deployed:

1. **Deeper coordination between the UK and Scottish governments as the vaccine is rolled out**
 - Assessing, triaging, and defining different populations within the third tranche of vaccine rollout
 - Monitoring take-up and any pharmacovigilance issues across the UK

2. **A dedicated Vaccines Minister and specific team to facilitate the Vaccine Roll Out**

3. **Developing a common plan for communicating the benefits of the vaccine to the public at large, before mass roll out**

4. **Specific task forces to be established in Scotland to maximise vaccine uptake in traditionally harder to reach communities that have been most negatively impacted by the virus**
 - Clear strategy, reach out and involvement with local community leaders to discuss challenges and ensure uptake of vaccine within their communities
 - Taking steps to remove any financial disincentives to vaccination
 - Offering travel expenses for all those who need them to get vaccinated

5. **Greater resources to be given to Scottish Health Boards to operationalise the roll-out**
 - Establishing vaccination centres
 - Recruiting, re-deploy and train staff to deliver the vaccine

- Financial support to ensure an equitable cost to deliver across different health settings and via different clinicians
- Starting to communicate with those first in line for the vaccine
- Give clarity to those in remote areas given clarity over the level of UK military support available

6. Investment in and set up of effective booking and data management arrangements

6. Conclusion Towards a Global Solution for the Coronavirus Pandemic

The prospect of widespread vaccination is the first unequivocal good news since the beginning of the coronavirus pandemic. Vaccinating Scotland against the virus remains an enormous operational and communications challenge that the Scottish government must meet, in cooperation with the rest of the UK. At least until vaccination is complete, other measures to contain the virus will still be needed, and high levels of vaccination uptake across the country are essential if we are all to return to 'the new normal'.

However we are not safe until we are all safe. This applies not just in Scotland and the UK, but across the world. It is paramount that we as a nation do not forget that the COVID-19 pandemic is a global challenge, and vaccine roll out will require a globally coordinated and supported response. Scotland, along with the rest of the UK, has an important role to play in supporting equitable access to the vaccine for all nations, regardless of wealth, and ensuring the COVID crisis doesn't deepen inequality any further.

We encourage our governments to think about those less developed countries who do not have the UK's deep pockets, and will need help to vaccinate their populations. It is already highly commendable that AstraZeneca have committed to providing the vaccination at cost to low and middle income countries (LMICs) indefinitely, and we encourage the UK and Scottish governments to assist countries to access vaccines on these terms, and provide resources where necessary. Vaccine nationalism remains a core threat to this global equitable access, and, whilst the UK has already committed to the COVAX vaccine alliance, facilitating the pooled procurement and suitable distribution of COVID vaccines with financing for LMICs, our governments can go further. We encourage the government to publicly commit to contributing the surplus stock of vaccines back to an initiative such as COVAX, as is being discussed in Canada and the EU.¹⁰¹

Note on the Author:

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¹⁰¹ <https://thehill.com/homenews/news/527422-trudeau-says-canadians-will-likely-have-to-wait-until-2021-for-first-doses-of>, accessed 25 November 2020