COVID-19 vaccine rollout management and communication in Europe: one year on

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ABSTRACT
Vaccines represent one of the most important methods to reduce the risk of hospitalisation and mortality as a result of COVID-19. To ensure the spread and risk of the Delta variant of COVID-19 is minimised, as many people as possible nationally must be fully vaccinated. Ensuring success in reaching high rates of vaccination relies on both effective risk management and risk communication strategies. This paper evaluates vaccine rollout management and communication strategies in five European nations: France, Germany, Sweden, Switzerland and England within the UK, updating findings from a previous paper on the same topic from January 2021. This paper evaluates these five nations’ management and communication strategies regarding the vaccine rollout timeline and prioritisation. Further, we discuss the effectiveness and importance of vaccine or immunity passports, highlighting the importance of ensuring that the needs of minoritised groups are considered in promoting the vaccine rollout, and ensuring fairness when prioritising certain groups over others to have earlier access to any vaccine. In conclusion, recommendations for policy makers and public health communicators are put forward.

1. Introduction
The rollout and uptake of vaccines against COVID-19 is widely seen as one of the most effective methods of minimising the impact and spread of a virus that has already killed over 360,000 people across France, Germany, Sweden, Switzerland and the United Kingdom (UK) alone (Ritchie et al. 2020). COVID-19 vaccines, including those created by Oxford-AstraZeneca and Pfizer-BioNTech are found to be between 69% and 90% effective against the development of a high viral load of COVID-19 14 days after the second dose is administered (Pouwels et al. 2021). As such, administering as many vaccines as possible has been a high-priority goal of all nations, including those in Europe, over the course of 2021. However, the growth of vaccine hesitancy and denial, widespread misinformation on social media and the COVID-19 infodemic have stymied efforts to establish the high rate of vaccination needed to reduce reliance on Non-Pharmaceutical Interventions (NPIs) to stop community spread of COVID-19 (van der Linden, Roozenbeek, and Compton 2020; Zarocostas 2020; Bartsch et al. 2020; Sherman et al. 2021).

This paper updates expectations and realities associated with the vaccine rollout risk communication and management strategies documented by Warren and Lofstedt (2021a) in
five European countries, namely: France, Germany, Sweden, Switzerland, and England within the UK. Here, we assess developments and progression of the vaccine rollout in these five nations since January 2021, focusing on two key areas: communication and management of the timeline and vaccine rollout speed, and rollout prioritisation. Further, we aim to extricate key themes from international examples that can act as potential lessons for other nations in how to achieve a more successful vaccine rollout. By assessing these nations’ vaccine rollouts, we aim to reflect on the uptake and impact of recommended measures outlined in our original paper and provide potential next steps for how governments can continue to improve the rates of vaccination uptake or overcome issues associated with the vaccine rollout.

2. Vaccine rollout timeline: communication and management

2.1. France

In France, the government originally employed a careful and measured communications strategy in the face of historic widespread vaccine hesitancy (Warren and Lofstedt 2021a). An October survey by Ipsos (2020) found that only 54% of the French population were likely to get the vaccine, the lowest of all nations surveyed in this international global study. As such, effective communication aiming to overcome issues of complacency and promote solidarity with the positive impact of herd immunity was seen as key (Schwarzinger et al. 2021).

In reality, the vaccine rollout started slowly in France. As seen in Figure 1, only 12% of the population had received a first dose of the vaccine by the end of March. However, between early May and mid-August the rate of first vaccinations increased dramatically, from around 23% to almost 69% of the population receiving a first dose. By mid-August, France had one of the highest rates of first vaccinations in Europe per 100 people at 69%, of which 53% had received two doses of the vaccine (Mathieu et al. 2021). French vaccine hesitancy has also diminished, with public willingness to take any vaccine but Oxford-AstraZeneca increasing from
42% in December 2020 to 70% in April 2021 (Odoxa 2021). Despite this, 16% of the public still did not intend to get vaccinated as of July 2021 (Cardot 2021).

Early on, the vaccine rollout effort was plagued by failures in procurement of the vaccine run by the European Commission, the decision to limit the use of Oxford-AstraZeneca vaccines, and by failures in communication. The decision to jointly procure vaccines across the European Union (EU) backfired as vaccine orders came in later than nations such as the US, UK and Israel due to a slow decision-making process (Gleißner et al. 2021). As such, French access to the vaccine was limited through the spring of 2021.

Further, the health authority flip-flopped on restrictions of the use of the Oxford-AstraZeneca vaccine due to an increased risk of thrombosis, first blocking it from being given to people over 55 years (Wise 2021), then only giving to those over 55 from March onwards (Haute Autorité de Santé 2021). President Emmanuel Macron further added to the confusion by stating in January that he believed the Oxford-AstraZeneca vaccine to be ‘quasi-ineffective’ for those aged over 65 (France24 2021). This has led to early confusion and suspicion about the vaccine. As a result, a March 2021 poll found that 61% of French respondents thought the Oxford-AstraZeneca vaccine was unsafe (YouGov 2021).

Despite the later success in the uptake of first vaccine doses in France, this cannot be attributed specifically to successful government communication efforts. If anything, commentators describe no real planned communications campaign by the French government, and a modus operandi where communications are but an addition to policy rather than being an integral part of the vaccine rollout strategy (Haudegand 2021). The most effective policy change to promote vaccine uptake other than opening up vaccine appointments to new priority groups has been the introduction and extension of the Pass Sanitaire, or Health Pass. The Pass Sanitaire is given to people who are fully vaccinated or have had a recent negative COVID-19 test. On 12 July, President Macron announced the requirement from the beginning of August to show a Pass Sanitaire to access cafés, restaurants, shopping centres, long distance public transport and medical establishments (Brunet 2021). Effectively, this expansion of the Pass Sanitaire serves to create negative consequences of not getting vaccinated, in effect creating a form of mandate in the aim of shifting individual risk-benefit calculations on getting vaccinated.

In the short-term, this policy has led to a record vaccination rate: according to Prime Minister Jean Castex, over 790,000 people were vaccinated in 24 hours on 13 July (Castex 2021). Indeed, the overall uptake of first doses has increased by around 15% in the last month following a lull in vaccinations (see Figure 1). However, this more coercive approach of restricting unvaccinated people’s freedoms by introducing ‘vaccine passports’ or COVID-19 immunity passes has practical and ethical considerations that must also be accounted for (Brown et al. 2020). These include promoting easy access to vaccination and testing and considering multiple methods of vaccine uptake incentivisation as different demographic groups will be incentivised or disincentivised in different ways (Wilf-Miron, Myers, and Saban 2021). If not considered, these kinds of policies can act as trust-destroying to certain groups. As Verger and Dubé (2020) assert, making vaccines mandatory or using coercive mechanisms to promote uptake can increase reactance and angry responses. Despite a majority of the public supporting the introduction of the Pass Sanitaire in a July poll, some 24% of respondents were opposed (Ipsos 2021). France has experienced this reactance first-hand, with six consecutive weekends of protests against the Pass Sanitaire including one that attracted over 175,000 protesters from across the country on 21 August (Le Monde and AFP 2021).

Overall, despite overcoming a poor start, risks remain to the vaccine rollout in France that must be reinforced with ethical and practical considerations to any implementation of the Pass Sanitaire. A broader range of measures to overcome issues related to promoting perceived vaccine safety and politicisation-based vaccine hesitancy, which is widespread among the broad population who are disengaged from the political process or associate with Far-Right or Far-Left political parties, is required (Ward et al. 2020).
2.2. Germany

In Germany, Health Minister Jens Spahn had been optimistic about the rate of the vaccine rollout from the outset (Warren and Lofstedt 2021a). Unlike France, Germany’s rate of vaccine hesitancy was lower pre-vaccine rollout, recorded at 30% in October 2020 (Ipsos 2020). Despite experiencing similar procurement issues to France, Germany is on track to meet its target of fully vaccinating the whole population before the end of 2021. That said, only around 10% of the population had received a first dose by late March. However, in the second half of 2021 the rate of vaccination has picked up dramatically before a slight tail off into August, with 62.9% of the population receiving a first dose of the vaccine and 57% receiving both doses (Mathieu et al. 2021). Of the nations evaluated here, Germany is only behind the UK and France in terms of proportion of the population receiving a first dose of the vaccine as of mid-August (see Figure 1). Health Minister Spahn more recently predicted that a vaccine will be offered to every person in the country by the end of the summer, however, the rollout has not been as fast as announced (ZDF 2021). An August study from ARD-DeutschlandTrend found that 83% of respondents either had already or were planning to get their first dose of the vaccine, while 12% stated that they were probably or definitely not going to get vaccinated (ARD Das Erste 2021).

Alongside the same procurement issues France suffered, Germany also had problems rolling out the vaccine due to bureaucratic issues. Although the original procurement was organised at the national- and EU-level, the domestic vaccine rollout was decentralised and controlled by the Bundesländer, or States, as seen with other German COVID-19 NPIs, resulting in slow progress until April (Warren, Lofstedt, and Wardman 2021; Oltermann, Giuffrida, and Willsher 2021). In mid-March, an agreement was reached to allow GPs and family doctors to administer the vaccine, and Merkel adopted a new motto in the resulting press conference of ‘vaccinate, vaccinate, vaccinate’ (AFP and DPA 2021). Because of their very even geographical distribution throughout Germany, the move to allow GPs and family doctors to vaccinate has been lauded as reinvigorating the ailing vaccination effort, as seen in the vaccination rates since early April (Oltermann, Giuffrida, and Willsher 2021). Alongside this, fundamentally high levels of trust in GPs and family doctors across Europe mean that healthcare providers are a highly recommended entity to rely on to administer and promote acceptance of vaccines and other health interventions to hesitant groups (Warren and Lofstedt 2021a; Bouder et al. 2015; Paterson et al. 2016).

Despite this success, the German government vaccination communications strategy has otherwise been critiqued for using a poor choice of imagery, not offering real incentives to get vaccinated, and for exhibiting inconsistent policy and communication. Recent communications promoting vaccination have used images of clinical settings and images of vaccines in arms, which may have the reverse impact by triggering fear or other negative emotions among unvaccinated individuals due to the presence of needles (Scholz 2021). Fear of needles is strongly linked to reduced willingness to get vaccinated and heightened vaccine hesitancy so communicating in this way should be avoided (McLenon and Rogers 2019; Guidry et al. 2021). A recent communications campaign titled ‘Ärmel Hoch’ or ‘Sleeves up’ aims to diverge from past strategies and highlight famous celebrities who have been vaccinated with the aim of returning to normal life (Bundesministerium für Gesundheit 2021a).

Unlike France, incentives to get vaccinated have as yet been comparatively trivial, inconsistent and not particularly widespread despite public support for incentivisation. Conflicting responses to questions regarding government plans to vaccinate children and the impact of mask wearing have also eroded vaccine-hesitant groups’ trust in government entities (Scholz 2021). A recent study has found positive relationships between willingness to get vaccinated and trust in state institutions, science and media (Illner 2021). This highlights that reasoned transparency in communication alongside consistency and clarity are key elements to avoid long-term vaccine
hesitancy and widespread vaccine refusal (Warren and Lofstedt 2021a; 2021b; Balog-Way and McComas 2020; Petersen et al. 2021).

2.3. Sweden

At the end of November 2020, Swedish state epidemiologist Anders Tegnell noted that he thought the vaccination rollout would most likely take all of 2021, as that is what the companies manufacturing the various vaccines had told the Swedish Public Health Agency (PHA) (Dagens Nyheter 2020). Tegnell’s rather pessimistic view was swept aside when Richard Bergström, Sweden’s lead vaccination coordinator, stated that he thought it was possible that everyone over the age of 18 would be completely vaccinated by the Midsummer holiday on 26 June, sticking to this position until late January (Söderlund and Berntsson 2021).

In the New Year, however, Pfizer-BioNTech and Moderna announced that they had problems scaling up their factories, leading to fewer vaccines being available than previously announced. The impact was that by 10 February fewer than 430,000 had received their first vaccine dose, less than half the goal set by the PHA of 1.2 million individuals from phase 1 to have been vaccinated by end of January (Larsson 2021). This was further complicated by AstraZeneca announcing on 11 March that it would only be able to deliver half the promised doses to Sweden in the spring (SVT Nyheter 2021). Rather than 6.6 million doses, Sweden would instead receive 3.3 million. This led to several regional vaccine coordinators noting that the Midsummer goal was now unrealistic (Jacobsson 2021).

Like Germany and Switzerland, the responsibility of handling the vaccine roll out has been placed on Sweden’s 21 regions. They each appoint their own vaccine coordinator and they are ones who decided who should get vaccinated based on the recommendations coming from the PHA. By March this decision to decentralise the vaccine rollout process had become somewhat problematic. In many regions, local politicians, local vaccine coordinators or other senior doctors noted that they felt that the goals set by Bergström were unrealistic and needed to be re-examined as there were simply not enough vaccines available. Richard Bergström had noted on the 26 March that 5 million Swedes will be fully vaccinated by 25 June, which a spokesperson representing the Regions said was completely unrealistic (Olofsson 2021). Or as Gilbert Tribo, the Liberal head of public health Skåne, noted:

‘We don’t feel listened to, and that is not just my opinion. It has happened a number of times that we find out late on Friday afternoon that deliveries of the vaccine will be halved by Monday. That causes extreme uncertainty and extreme frustration.’ (Carlsson 2021).

On 1 April, at a press conference led by Minister for Health Lena Hallegren, the end goal of the Swedish rollout strategy was changed. The goal was altered from the aim that everyone who wants to will be fully vaccinated by 30 June, to the goal of all adults who want the vaccine would receive one dose by the 15 August and that everyone over the age of 65 would have received one dose by 16 May (Emanuelsson and Stjerberg 2021). This goal was further changed a few more times, including on the 24 June, when the PHA announced that everyone who wants to get a first dose will be able to do so by 19 September (Folkhälsomyndigheten 2021c).

The PHA also changed the timeframe between first and second doses of the Pfizer-BioNTech and Moderna vaccines. In March, when the PHA was very concerned about people not getting their first vaccine, and as such the timings between doses were initially increased to 6 weeks and then 7 weeks in May (Sinclair 2021). Yet at the end of July, when most of Swedes had left the city centres for holidays and demand for the vaccine had reduced, the interval between the two doses was decreased from 7 weeks to 4 weeks (Gestblom 2021).

By 3 September, 82.3% of all adults in Sweden had received a first dose while 71.5% had received a second dose (Mathieu et al. 2021). Among teenagers born between 2003 and 2005, 56.4% had received their first dose of the vaccine while 7.1% had received both doses.
(Folkhälsomyndigheten 2021e). That said, there are still large regional differences in public vaccine uptake. Rosengård, Malmö, for example, has the lowest uptake of the COVID-19 vaccine in Sweden with only 43.7% of the local population having taken their first dose by 1 September (Laurell 2021). As seen in the UK, foreign-born individuals are less likely to have received the vaccine (Folkhälsomyndigheten 2021b). As such, the local Muslim community in Malmö wanted to offer vaccines in their mosque at Friday prayers to overcome lower minority ethic vaccine uptake, however, received no response from the Skåne region's government (Laurell 2021). Likewise in the Stockholm region, in the wealthy area of Taby and Vaxholm, 75% of the inhabitants have been fully vaccinated, whereas in the poorer areas with a greater proportion of immigrants such as Rinkeby-Kista only 44% have been fully vaccinated (Dagens Nyheter 2021). To address this issue, local health officials are now using COVID-19 vaccination buses and pop-up tents to ensure that a greater percentage of foreign-born individuals get vaccinated (Fredling 2021).

Over time, Swedes have become increasingly positive about taking a COVID-19 vaccine. In November 2020 a Novus survey showed that 26% of the population would not get vaccinated against COVID-19 (Stiernstedt, Jakobsson, and Kaun 2020). In June 2021 the PHA did a survey and found that 69% said they would definitely take the vaccine while 18% noted that they probably would. Only 6% said they would not take the vaccine while 7% remained undecided (Folkhälsomyndigheten 2021d).

2.4. Switzerland

Switzerland’s original communication on the vaccine rollout timeline was much more measured than France and Germany, announcing that there was some uncertainty in the speed of the rollout in December 2020 (RTS 2020a, 2020b). In January, statements from the Federal Office of Public Health (FOPH) had been more optimistic, with the nation outlining their aim to vaccinate the entire willing population by the summer (Davis Plüss, Turuban, and Hunt 2021). However, only 49% of Swiss respondents were willing to get vaccinated in October 2020 (Sotomo 2020). In addition, Switzerland has relied on its own medical regulatory authority Swissmedic to approve vaccines over the EU-based European Medicines Agency. This means that the Swiss vaccine rollout is working on a different timeline and approval process to France, Germany and Sweden: Swissmedic approved the Pfizer-BioNTech vaccine on 19 December, the Moderna vaccine on 12 January and the Janssen vaccine on 22 March. However, Swissmedic rejected the Oxford-AstraZeneca vaccine for approval despite the Swiss authorities having ordered 5.3 million doses (RTS 2021).

Like all countries discussed thus far, the Swiss vaccine rollout also started slowly, with 10% of the population receiving a first dose by the end of March (see Figure 1). Since early April this has increased dramatically, rising from 11% receiving their first dose of the vaccine to 49% in late June. Since late June, however, the rate of first vaccination uptake has slowed somewhat: only 6% of the population received their first dose of the vaccine between late June and mid-August. As of late August, 55.4% of the Swiss population had received their first dose, and 50% received both doses of the vaccine (Mathieu et al. 2021). A recent RTS report found that, overall, only 60% may get fully vaccinated. This is far below the desired target of 80% set by Health Minister Alain Berset and also presented wide regional disparities in uptake (Renfer 2021). A survey from July also found that 25% of respondents had no intention of getting vaccinated, while a further 12% stated that they would rather wait to get vaccinated at this time (Sotomo 2021). Counterintuitively, public trust in the government has increased since failings from the winter months have been resolved (see Warren, Lofstedt, and Wardman 2021). Of the five nations evaluated in this article, Switzerland has the lowest rate of vaccine uptake.
Switzerland’s vaccine communications strategy has used some recommended elements from risk communicators: a solidarity-based strategy was launched by the FOPH in May 2021 to promote vaccine uptake (FOPH 2021). This approach is recommended when aiming to promote altruistic public actions as seen in the case of getting a vaccine as vaccines offer protections to both the individual and others throughout the population (Bierhoff and Küpper 1999; Warren and Lofstedt 2021b; Porat et al. 2020; Rieger 2020). However, this solidarity campaign has not seemed to be as successful as it was expected to be (Logean 2021). Despite this new solidarity campaign, an information campaign has instead formed an overriding backbone of the FOPH’s vaccination communication efforts (Wong Sak Hoi 2021). As outlined consistently over the last 20 years of risk communication research, top-down information-based efforts based on the paradigm of the knowledge-deficit model to improve public decision-making is insufficient at best, and flawed at worst (Burgess, Harrison, and Filius 1998; Owens 2000; Simis et al. 2016).

Further, despite Switzerland launching a COVID-19 vaccine certificate in June 2021, the certificate has, until recently, been optional and not enforced by many businesses, much to the disappointment of Health Minister Berset (SWI swissinfo.ch 2021). This weak application of NPIs follows a similar approach to enforcement of COVID-19 rules seen during the winter lockdown (Warren, Lofstedt, and Wardman 2021). The Swiss Federal Council announced a widening of the COVID-19 certificate’s use and requirement from 13 September, with its use now mandatory in restaurants, leisure and cultural buildings until January 2022 (Schäfer and Forster 2021). This decision was made in the aim of reducing rapidly increasing rates of hospitalisation as a result of COVID-19, rather than to exclusively increase vaccine uptake.

2.5. England within the United Kingdom

Originally, the UK government was very optimistic about the rate at which the vaccine would be rolled out in England but gave mixed messages in the winter of 2020 as to how soon restrictions would be lifted as a result of a successful vaccine rollout campaign (The Guardian 2020; BBC News 2020; Warren and Lofstedt 2021a). The UK has historically experienced substantial vaccine hesitancy and denial, with the 1998 MMR vaccine scandal only being overcome with serious public engagement in the mid-2010s (Larson et al. 2015). As such, only 37% of respondents to a November 2020 poll stated they would definitely take a COVID-19 vaccine (Ipsos MORI 2020). The UK was the first nation globally to approve the use of a vaccine against COVID-19 that had been tested in clinical trials (Ledford, Cyranoski, and van Noorden 2020). Contrary to all other nations examined, the UK’s vaccine rollout commenced very quickly. The proportion of the population who had received a first dose of the vaccine rose from 3% on 3 January to 41% on 21 March. Following this fast deployment, the rate of vaccination slowed somewhat between late March and late June, increasing to 65.5% receiving at least one dose of the vaccine (see Figure 1). Since then, the rate of vaccination has slowed considerably: between late June and mid-August the proportion of the total population that has received a first dose of the vaccine increased by around only 4% to 69.8% (Mathieu et al. 2021). Overall, 88.4% of the population aged 16 or over has received at least one dose of the vaccine, and 78.7% has received both doses by 1 September (Public Health England 2021). This represents the most successful vaccine rollout of the five nations examined here as a proportion of the population until 1 September.

In broad terms, the successful and fast start to the vaccine campaign for first doses came down to two main reasons: the comparatively greater availability of Oxford-AstraZeneca vaccines for older individuals in the UK, and the decision taken by the Joint Committee on Vaccination and Immunisation (JCVI) in December 2020 to prioritise first doses and lengthen the time between first and second doses of all vaccines to around 12 weeks rather than three employed by other nations (Department of Health and Social Care 2020; Tregoning et al. 2021). The rollout
has also been singularly administered by the National Health Service (NHS), which is one of the most widely trusted institutions in the UK and experiences comparatively high levels of public support (van der Schee et al. 2007). As such, using a trusted organisation in this way over more privatised means has been effective in promoting higher levels of uptake (Neville and Warrell 2021). The NHS’s successful track record on the rollout of the annual flu vaccine also put it in good stead to ensure consistent and effective delivery of vaccine doses across the country (Hui 2021). Furthermore, vaccine delivery across a wide range of locations and types of venues including GP and family doctor surgeries, cultural and sports venues catered to multiple different groups and has been very effective, in line with past expert recommendations (Anderson and Thornley 2014; Warren and Lofstedt 2021a).

Additionally, a communications strategy in England which showed images of key politicians and medical advisors receiving, and in the case of England’s deputy chief medical officer Jonathan Van-Tam administering, the vaccine has highlighted the importance of leading by example in general to promote NPIs an in specific on public vaccine uptake (BBC News 2021a; van Bavel et al. 2020). The consistent news of celebrities and public figures such as Elton John, Michael Caine and the Royal Family getting vaccinated have also been used to promote the vaccine to multiple groups, including vaccine sceptics (Campbell 2020; NHS England 2021). This approach has since been taken up as part of the German health authorities’ communications efforts (Bundesministerium für Gesundheit 2021a).

Despite the widespread success of the vaccine rollout, there is concern at the comparatively lower rate of vaccine uptake among younger age groups and the slowed rate of vaccination overall (Rigby 2021; Henley 2021). Among younger age groups this is not necessarily surprising: recent studies have found that these groups are more vaccine hesitant and less willing to get vaccinated than older age groups in the UK (Lazarus et al. 2020; Robertson et al. 2021). As such, recent communications campaigns have focused more specifically on the 18–29 age group, including one focused on highlighting that young people could miss out on nightlife and ‘good times’ unless they get vaccinated which includes pop-up vaccination centres at nightclubs (Mehta 2021). However, since 19 July all lockdown restrictions have been lifted in England and no incentive currently exists to promote vaccine uptake to younger age groups that involves restricting freedoms unless specified by businesses. There are new plans to introduce a vaccine or immunity passport for entry into nightclubs and other large indoor venues as a method of promoting vaccine uptake, although pubs and bars will not be included (Stewart 2021). Although the introduction of an immunity passport has been found to be effective in France, the lack of breadth of the planned UK version suggests that this will not be particularly effective and may be counterproductive (Grover, Stewart, and Quinn 2021). Recent inconsistent messaging on this issue between the government and Health Minister Sajid Javid is unlikely to promote confidence in the government’s approach and support for vaccine or immunity passes (see Jackson 2021).

Vaccine uptake among minority ethnic groups has been documented as lower than average, in line with expectations from studies conducted pre-rollout (Kadambari and Vanderslott 2021; Woolf et al. 2021). Alongside well-documented historical barriers to minoritised ethnic groups engaging with health systems globally (Schepers et al. 2006), barriers to COVID-19 uptake among minority ethnic groups in the UK include being historically marginalised through continuing systemic discrimination and racism in the healthcare sector, prior improper research on minority ethnic groups, safety fears due to perceived lack of testing and the spread of misinformation (Razai et al. 2021; Lintern 2021; Reverby 2011). The UK government must therefore engage specifically with these groups in England to build trust, engaging in two-way communication and providing tailor-made material suitable to these groups’ contexts and language needs (Kadambari and Vanderslott 2021).

The government has attempted to engage with these groups, including a minority ethnic celebrity-led TV campaign urging those eligible to get vaccinated in February 2021 (Mohdin
and the aforementioned introduction of vaccine or immunity passports. However, the latter coercion strategy is not likely to be successful based on findings from a recent study by de Figueiredo, Larson, and Reicher (2021). As such, further tailor-made multidirectional engagement with minority ethnic groups is needed (Paul, Steptoe, and Fancourt 2021), including language-based tailoring, trust-building conversations with communities and increased ease of access to vaccination (Hoppe and Eckert 2011; Kadambari and Vanderslott 2021).

3. Vaccine prioritisation strategy: communication and management

3.1. France

In France, the original vaccine prioritisation strategy outlined in November 2020 highlighted five key groups, mainly based around age but also allowing certain key workers to receive the vaccination early (Haute Autorité de Santé 2020; see Warren and Lofstedt 2021a). In the eventual rollout, three main phases prioritised these groups in order: (1) from 27 December 2020 onwards, Phase 1 prioritised ‘the highest priority audiences’ including nursing home residents and staff over 50, caregivers and firefighters from 5 January 2021; (2) from 18 January Phase 2 focused on ‘high risk groups’, including over individuals over 75 years not in care homes, and in late February and March vaccination bookings were opened to 65-74 year olds and those over 50 with comorbidities; (3) from May, Phase 3 included those aged 18-49 with comorbidities, the general population aged 50-64 and essential workers (Direction de l’information légale et administrative (Premier ministre)) 2021). Restrictions on ability to book a vaccine were fully lifted on 31 May, two weeks earlier than expected, allowing all individuals over 18 to be vaccinated (le Figaro 2021). The French government has broadly followed the prioritisation strategy outlined in November 2020, and the approach to include health personnel alongside those with high-risk comorbidities and older individuals was broadly in line with public prioritisation beliefs in May 2021 (Cevipof 2021).

3.2. Germany

The German prioritisation strategy largely followed the recommendations set out by STIKO and the Robert Koch Institut (RKI) (2020) in early November. The prioritisation dates, however, were set by individual States. The priority groups were split into three: (1) Group 1, those with ‘the highest priority’ included individuals aged over 80, vaccinators, carers, and medical staff in high-risk areas; (2) from March Group 2, those with ‘high priority’ included those aged over 70, individuals with highly relevant health conditions, those working in public services, childcare workers and those working with the elderly were offered the vaccine; (3) from late April Group 3, those with ‘heightened priority’ including those aged over 60, those with relevant but not severe health conditions and their close contacts, key workers such as food retail workers, and those at higher risk of contracting COVID-19 were offered a first dose of the vaccine (Bundesministerium für Gesundheit 2021b, 2021c). Since 7 June, the vaccine prioritisation order has been lifted nationwide and all adults have since been eligible to receive a vaccine (Bundesregierung Deutschland 2021).

The approach taken by the government is somewhat in contrast to public opinion: while the government prioritised those at highest risk, a nationally representative study by Sprengholz et al. (2021) finds that the public would have preferred a strategy prioritising staff working in the medical field and carers for elderly individuals. Despite staying broadly in line with the prioritisation groups outlined by STIKO in December, the German prioritisation strategy has suffered due to the decentralised State-led rollout of the vaccine that has led to inconsistencies in prioritisation timings and indeed varying eligibility between States. For example, in late
January Bavaria began vaccinating trainee doctors in cities with many clinics while seniors were not able to book appointments (Mehr 2021). The opening up of availability to risk groups 2 and 3 has also been occurring at different times in different States (das Erste 2021), highlighting inconsistency and risking confusion and diminishing trust in the vaccine rollout as seen in Bavaria (Mehr 2021).

Alongside group prioritisation, certain States such as Berlin allowed individuals to choose which brand of vaccine they preferred to receive in Winter 2020–21 (Kinkartz 2021). This approach was deemed in error by State Health Minister Dilek Kalayci after a large amount of Oxford-AstraZeneca vaccine doses were left unadministered (Gallersdörfer 2021). This issue has continued in the rollout of second doses in Rheinland-Palatinate among other states, where individuals have been able to decide not to have the Oxford-AstraZeneca vaccine for their second dose (SWR 2021).

3.3. Sweden

In terms of vaccine prioritisation, the rollout in Sweden had 4 phases: (1) Phase 1 included residents in old people’s homes, people in need of home help, care and health staff associated with old people homes and home help, and close household contacts; (2) Phase 2 included those aged 65 or older, individuals in certain risk groups such as those on dialysis and people with new organ transplants, close household contacts of these people, and individuals working in the public health sector; (3) Phase 3 included 60-64 year olds, those aged 18-59 with certain medical risks such as diabetes or Downs syndrome and individuals who have difficulties in following the Agencies recommendations; (4) Phase 4 consisted of all those aged 18-59 (Folkhälsomyndigheten 2021a). The regions themselves can decide who should be first vaccinated in Phase 4. Phase 4 equates to around 4 million people (Johansson 2021).

In reality, the regions themselves prioritised different groups over others even before Phase 4. For example, in some cases nurses and doctors were prioritised before over 65-year-olds (Kudo 2021). In addition, even when Phase 4 was announced, most regions maintained age brackets early on. In other words, once those pertaining to Phase 3 of the vaccine prioritisation were vaccinated, the regions began Phase 4 with older age groups starting with those aged 55 and above, and then 50 and above, progressively working through age groups from oldest to youngest (see MSB 2021). By early July, however, when there was no shortage of vaccines, most regions such as Gotland opened the booking systems to everyone over the age of 18 (see Region Gotland 2021). Disparities have also developed on vaccination priorities between regional health authorities. By the end of March, it became clear the regions did not necessarily follow the recommendations set by the PHA. This is best witnessed by the fact that only 17% of the hospital staff had received their first dose of the vaccine in Dalarna compared to 64% in Kalmar (Kudo 2021). As Tegnell noted:

‘The regions are independent and take their own decisions. We can’t tell them what to do but we give them recommendations. It is as clear as it could be. Then if one is working in different ways in the various regions that happens all the time in Sweden.’ (Kudo 2021).

3.4. Switzerland

Like Germany, Switzerland’s vaccine rollout has been decided to a great extent on a Cantonal level (Davis Plüss, Turuban, and Hunt 2021). The Swiss Federal Commission for Vaccinations had originally decided in December that those with relevant comorbidities, those close to those with comorbidities, and workers in the health sector would be prioritised (24 Heures 2020). In actuality, Switzerland has operated a system of Target Groups, although the criteria could be changed by individual Cantons (see Bundesamt für Gesundheit, 2021b). These groups, in order
of priority, include: (1) Group 1, comprising of people at risk aged 16 or over; (2) Group 2, including health workers that come into contact with patients or carers of people at risk; (3) Group 3, composed of close contacts to vulnerable people; (4) Group 4, those aged over 16 in community facilities with those of varying age groups at higher risk of infection and transmission; (5) Group 5, all individuals aged between 16 and 64; (6) Group 6, including those aged 12 to 15 (Bundesamt für Gesundheit 2021a).

Switzerland opened up the vaccine to individuals in Group 5, all adults aged over 16, in May and to those aged 12 to 15 on 4 June (Bundesamt für Gesundheit (BAG) and Eidgenössische Kommission für Impffragen (EKIF) 2021). However, issues with the broadness of the original risk groups have meant large amounts of the population were eligible earlier on, despite reduced amounts of vaccine, creating difficulty and panic to book appointments that were hard to find and in short supply (Davis Plüss, Turuban, and Hunt 2021). As such, an approach that was more specific and was therefore more forgiving to the situation Switzerland was in, of a low level of vaccines in spring 2021, would have been more appropriate.

Similar to Germany, Switzerland also has regional and Cantonal disparities (Davis Plüss, Turuban, and Hunt 2021; Hoffmeyer 2021). In some Cantons such as Zurich, the vaccine appointments system has run on a ‘first come, first served’ basis over any kind of random allocation which has been deemed unfair, favouring those who use the internet and have more flexible work or school situations (SRF 2021). Although there is some more positive belief in the Federal Council among Swiss people in a recent poll, vaccination intentions remain starkly divided between age groups: 52.5% of 16 to 25-year-olds have either been vaccinated once or twice, or plan to get vaccinated, compared to 88% of over 75-year-olds (Kissling 2021).

3.5. England within the United Kingdom

A very structured 9-group plan to vaccinate the most vulnerable was outlined by the JCVI in September 2020 and has been adopted by the UK government in England (JCVI 2020). After successively opening up each of these groups as Phase 1 of the vaccine rollout, Phase 2 continued to move through lower age groups, split into Group 10 (all adults aged 40 to 49), Group 11 (individuals aged 30 to 39) and Group 12 (all those aged 18 to 29) (JCVI 2021). This highly age-based prioritisation strategy has come under criticism for not offering added priority to those deemed in high-risk or essential roles, such as teachers, bus drivers and police officers as seen in other nations such as France and Germany (BBC News 2021b). A recent study by Liu et al. (2021) found that a very incremental age-based strategy is not necessarily as effective as broader age group prioritisation, especially when the rollout is fast, contrary to the approach in England.

Overall, prioritisation strategies have broadly been in line with expert recommendations and original plans set in late 2020. This is important to ensure perceived consistency and fairness. However, certain nation-specific issues, including inconsistencies surrounding decentralised state rollouts in Germany and Switzerland and debates around the need for certain professions or characteristics to be prioritised in the UK highlight need for reasoned transparency and fairness in any vaccine rollout.

4. Vaccine rollout timeline and prioritisation: evaluation

In the early stages of the vaccine rollout, the timeline was dictated by the speed by which vaccine doses could be procured in all five countries. Several nations had been cautious in communications about the potential speed of their vaccine rollout in late 2020, which followed an approach recommended by experts (Warren and Lofstedt 2021a; Hrynick, Ripoll, and Schmidt-Sane 2020; Peiris and Leung 2020). However, this has broadly not had much of an
impact in mitigating reduced public support for government in the wake of perceived failures in spring 2021.

In the later stages of the vaccine rollout, there has been a shift in the strategy of promoting vaccine uptake, from ensuring enough doses are available to persuading the largest number of individuals possible to decide to take the vaccine (DeRoo, Pudalov, and Fu 2020; French et al. 2020). This change towards communication and management techniques for incentivising and motivating individuals to get vaccinated has led to multiple methods across the five countries analysed, including more recently the idea of a vaccine or immunity passport in domestic settings. The nature, breadth, and enforceability of such a pass varies between the countries analysed, with France having the strictest and broadest requirements, Switzerland using until recently a broad yet unenforceable pass, and the UK planning an internal pass focused on large-scale events rather than limiting day-to-day activity. This form of incentive puts those refusing a vaccine at a disadvantage in order to motivate them to change their mind, and some authors claim this can be effective to increase uptake (Jecker 2021; Brown et al. 2021).

However, findings from multiple studies highlight disparities between populations in different nations’ willingness to accept the introduction of a vaccine or immunity passport and a minority stating strong opposition in the case of the UK (Kowalewski et al. 2021; Nehme et al. 2021; Lewandowsky et al. 2021; de Figueiredo, Larson, and Reicher 2021). There are also different national public expectations regarding their use and application between nations, such as a preference for paper-based documents in Germany or an expectation that certification would not be needed for social events in Switzerland (Kowalewski et al. 2021; Nehme et al. 2021). If a vaccine or immunity passport is inappropriately introduced or enforced in the national and local context, this could negatively impact on public trust especially among already mistrustful groups (Drury et al. 2021). Because there is a strong relationship between higher levels of public trust in authorities and vaccine acceptance (Lazarus et al. 2021), any trust-destroying incident could exacerbate vaccine hesitancy and denial (Lindholt et al. 2021). As such, care must be taken to ensure the appropriate use and applicability of any vaccine or immunity passport. Overall, incentivisation methods must be measured, including positive incentives alongside any potential penalties for non-vaccinated individuals (Saban et al. 2021).

Certain nations, such as the UK and Sweden, have attempted to address disparities in vaccine uptake between various demographic groups. These have tended to involve top-down messaging campaigns led by trusted community leaders (see Mohdin 2021). Although this technique may be effective, ensuring that more participatory methods of communication are key to promoting wider public engagement and eventual vaccine uptake (Hoppe and Eckert 2011; Kadambari and Vanderslott 2021; Paul, Steptoe, and Fancourt 2021). Alongside engagement to persuade groups to overcome vaccine hesitancy, communication must serve as part of a wider strategy to increase accessibility to vaccines especially among minoritised groups (Thomas, Osterholm, and Stauffer 2021). Examples of this include pop-up vaccination centres in Sweden and the UK (Mehta 2021; Fredling 2021). However, this strategy to ensure equitable uptake across demographic groups should further include promotion of accessibility including protected paid time off to get vaccinated or recover from potential side-effects and producing materials relevant to the language or demographic group in question across all European nations examined.

All nations studied in this article have generally given vaccination priority to high-risk groups, those at highest risk of contracting COVID-19, and to some extent those working in certain choice professions. These strategic decisions have largely been based on expert recommendations, which has avoided any egregious cases of perceived unfairness apart from in isolated cases (see Mehr 2021). Ensuring fair prioritisation, despite a decentralised system such as in Germany or Switzerland, is also key. Disparities in vaccine prioritisation between communities and regions risk the creation of perceived unfairness, therefore equitable national prioritisation
strategy with a consistent application across local and regional administrations is vital (Nuffield Council on Bioethics 2020). This approach is recommended, as fairness is one of the key drivers of public trust in government risk management strategies (Lofstedt 2005). Public trust in scientists and public health authorities has been found to be one of the strongest drivers of vaccine acceptance, and so maintaining it is vital for any successful vaccine rollout (Lindholt et al. 2021).

5. Recommendations

Based on the analysis above, we recommend the following actions to governments and health authorities with regards to future vaccine rollout management and communication strategies:

1. Ensure that a broad range of vaccination locations and trusted vaccinators are available to those willing to be vaccinated, from more habitual locations such as family doctors’ offices to sports stadia;
2. Cautious and realistic communication of the vaccine rollout timeline is important to avoid perceived failures;
3. Communicators should exercise reasoned transparency to the public on issues related to vaccine safety, the timeline of the rollout and prioritisation strategies;
4. Flexibility in promoting the vaccine to groups with lower vaccination rates and improved accessibility are key. This can involve using mobile vaccination units, pop-up centres, longer opening times and ensuring paid leave from work;
5. Among groups with lower vaccination rates such as minoritised groups, two-way deliberative engagement as a trust-building exercise can be a key part of promoting greater vaccine uptake;
6. Ensure communication efforts are accessible to all, not only in terms of content, messenger, and delivery process, but also accounting for language and social context;
7. Governments should consider a range of incentives and penalties to promote vaccination rates that are balanced and present consequences for vaccine refusal. However, vaccines should not be mandated amongst the general public;
8. Considered use and application of vaccine or immunity passports based on the national context is vital to avoid trust-destroying incidents;
9. Prioritisation of specific groups to be vaccinated ahead of others must follow expert recommendations and avoid local disparities to overcome risks of unfairness.

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