COVID-19 certification may increase vaccine uptake in countries with below average vaccination coverage: modelling study

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COVID-19 certification led to increased vaccination uptake 20 days before and 40 days after introduction in countries with lower-than-

average vaccination coverage, according to a modelling study published in *The Lancet Public Health* journal.

COVID-19 certification, or 'vaccine passports', require people to have proof of complete vaccination, negative test, or COVID-19 recovery certificate, to access public venues and events (e.g. restaurants, concerts, hairdressers). As well as helping to prevent the spread of COVID-19 in public venues, it has been suggested that COVID-19 certification might encourage more unvaccinated people get vaccinated, particularly those who perceive their own risk of hospitalisation or death from COVID-19 as low, known as vaccine complacent groups.

Many countries have introduced or are considering introduction of COVID-19 certification, but whether this public health intervention increases vaccine uptake is so far unclear. Some survey-based evidence has suggested that participants reported they would be less likely to get vaccinated if COVID-19 certification was introduced, whereas some media and national health offices have reported increases in uptake following the introduction of COVID-19 certification.

Lead author of the study Professor Melinda Mills, Director, Leverhulme Centre for Demographic Science, University of Oxford, says, "As mass vaccination programmes continue to play a central role in protecting public health in this pandemic, increasing vaccine uptake is crucial both to protect the individuals immunised and break chains of infection in the community. Our study is an important first empirical assessment of whether COVID-19 certification can form part of this strategy. Overall, we observed a significant uptick in anticipation of restrictions coming into place around 20 days before introduction, which lasted up to 40 days after, but the context of existing vaccination uptake, vaccine hesitancy, levels of trust in authorities, and pandemic trajectory was crucial to the impact."

The study linked data COVID-19 certification introduced from April to September 2021 to vaccination uptake in six countries where certification was legally mandated (Denmark, Israel, Italy, France, Germany, Switzerland). Modelling was used to estimate what vaccine uptake would have been without COVID-19 certification in each of the six countries, based on vaccination uptake trends from 19 otherwise similar control countries without COVID-19 certification. In the main analysis, authors estimated the number of additional doses per population attributable to the policy. As a secondary analysis, the authors examined the impact of the policy on reported infections. They also examined differences in effects on vaccine uptake by age group and the influence of implementing COVID-19 certification in specific types of public venues (e.g., nightclubs and large events only).

In countries where vaccine coverage was previously low, introduction of COVID-19 certification was associated with a significant increase in the number of additional vaccine doses per million people—ranging from 127,823 in France, 243,151 in Israel, 64,952 in Switzerland and 66,382 in Italy. (See table in notes to editors for breakdown before and after introduction)

In contrast, in Denmark and Germany, where there were higher average vaccination rates before certification was introduced, there was no significant increase in vaccination. Moreover, Denmark introduced certification when overall vaccine supply was still limited (April 2021) despite demand being high. In Denmark, the policy's main aim was to increase testing before attending public venues, rather than encourage vaccination uptake, highlighting the multiple potential aims or consequences of COVID-19 certification policies beyond vaccine uptake.

Compared to the control countries, daily COVID-19 case numbers decreased after implementation in France, Germany, Italy, Switzerland,

but increased in Israel and Denmark. Many countries implemented certification as a response to rising cases, making it difficult to assess the effect of certification on reported infections. The authors say this highlights the importance of taking account of the phase of infection trajectory when the intervention is introduced.

After the introduction of COVID-19 certification, increases in vaccination were highest in people under 30 years old compared to older groups. The authors explored whether prioritisation of vaccine rollout among older age groups and eligibility in younger age groups around the time of certification may have influenced the results, but found that the effect could not be fully explained by age-based eligibility criteria.

In Switzerland, when COVID-19 certification was used to restrict access to nightclubs and large events only, increases in vaccination uptake was only observed in people aged under 20 years old. When restrictions were expanded to include all hospitality and leisure settings, uptake also increased among those 20-49-year-olds. The authors say this suggests that the policy may be useful in encouraging uptake in particular groups, but more research investigating other factors, including socioeconomic status and ethnicity, is needed to fully understand who certificates could effectively target.

Co-author on the study, Dr. Tobias Rüttenauer, University of Oxford, says "We know that certain groups have lower vaccine uptake than others and it may be that COVID-19 certification is a useful way to encourage vaccine complacent groups, like young people and men, to get vaccinated. However, COVID-19 certification alone is not a silver bullet for improving vaccine uptake and must be used alongside other policies. Vaccine hesitancy due to lack of trust in authorities, which is common among some minority ethnic and lower socioeconomic groups, may be addressed more successfully through other interventions, such as targeted vaccine drives and community dialogue to generate more

understanding about COVID-19 vaccines."

The authors note some limitations of their study. There was no data available to examine vaccine uptake by sociodemographic, gender and ethnic groups. They also emphasise that COVID-19 certification policies across the six countries were different for various reasons, including the phases of introduction, aims, eligibility criteria, level of enforcement, and pandemic context (case numbers and deaths). They also acknowledge that the causes of vaccine hesitancy are diverse across different countries, influenced by the historical experience of different social groups, which may limit the generalisability of their findings.

Finally, they point to several issues associated with certificates that policymakers should consider. This includes the risk of exacerbating inequalities among communities that have lower uptake, generating inequality in access to public spaces where COVID-19 vaccine roll-out is staggered by age, entrenching digital divides if passes are electronic, and data privacy concerns.

More information: Melinda C Mills et al, The effect of mandatory COVID-19 certificates on vaccine uptake: synthetic-control modelling of six countries, *The Lancet Public Health* (2021). DOI: 10.1016/S2468-2667(21)00273-5

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