Dear Kamran,

Thank you for your feedback on our paper. We have now submitted an updated paper that we hope addresses these comments.

Best wishes

Azeem

Comments from Referee

1. The delay of the second dose. I'm puzzled by the remarks that "there were some benefits for individuals in delaying the second vaccine dose" - surely the point of the delay was not to benefit individuals but to get first doses into as many people as possible as the first dose conveys more than 50% of the protection? I'd a welcome on a statement on whether the authors think this was a risky departure from the evidence which by good fortune had no problematic consequences or a great example of British creativity in a sticky situation.

We thank the referee for picking this up. We have revised this to state that “there were potential population benefits in delaying the second vaccine dose". The delay in the second dose is one of the areas where the UK did diverge from the international consensus on vaccination, and it is essential that there is a rigorous review of the processes and evidence that led to this decision, as well as its impact on health outcomes in any future inquiry. The sudden change in vaccination policy was very disruptive with many vaccine sites complaining about the amount of time that staff had to spend cancelling appointments for patients who were due to have a second dose in the next 3 weeks. There were also many complaints from patients who had their appointments for second doses cancelled; with many patients not understanding the reason for the change in policy, often blaming vaccine clinics or GPs who had no role in making this decision. All the evidence that the JCVI used to make their decision was available before the UK’s Covid-19 vaccination programme started and one question for the inquiry is why the JCVI did not consider a delayed second dose in their initial advice to government. This would have avoided the disruption caused by the sudden change in policy. Another question for the inquiry is what plans were in place to evaluate the decision to delay the second dose, given that this policy was strongly discouraged by Pfizer-BioNTech and was not widely adopted by other countries.

2. Using GPs for vaccine delivery. Are GPs really the most efficient and cost-effective way to deliver vaccination at scale? GP practices have a range of competencies and one of their strengths is the range of services they can provide. Surely having more specialised staff and high throughput facilities is the best way to provide high levels of vaccination quickly and cheaply? And in any case do GPs really have the capacity for delivering vaccines in addition to the full range of business as usual once service utilisation is back to normal levels?

A range of sites were used to deliver Covid-19 vaccinations. A National Audit Office report published in 2022 confirmed that the majority of vaccines were delivered by primary care sites and that these sites had a lower cost per vaccination than other sites such as those managed by NHS Trusts. GP-led sites also vaccinated more complex groups such as the housebound, as well as targeting people who were vaccine hesitant. Many GPs did work together at primary care network or GP Federation level to deliver Covid-19 vaccinations. In the long-term, careful planning is needed on how to deliver Covid-19 (and other) vaccines. A separate NHS vaccine service risks fragmenting the delivery of preventive care, creating additional costs, and leading to unfunded work for primary care teams

(who inevitably have to field a large number of queries from patients even if the vaccinations are given elsewhere).

3. More publicity / transparency for JCVI. Given the emotive nature of vaccines surely there are risks and downsides to greater transparency, from chilling frank exchange of views to increasing the costs on and perhaps risks to the experts who participate. Are there international good practice exemplars of how to make decisions about vaccination in an open and transparent way? How does one balance the need for transparency with the attract and fully utilise the best available talent?

There are international examples of good practice about decision making in vaccine policy – such as from the USA. Many people found the JCVI's approach very opaque; albeit that they were trying to make vaccine policy at the same time as the evidence was still emerging (e.g. on the need for booster doses), which made developing vaccine policy in the UK very challenging.

Comments from Editorial Committee

1. We're reminding all author groups that the overall focus of The BMJ's covid-19 inquiry collection is to consider what we can learn from how scientific advice was incorporated into pandemic policy in the UK. We want to know what you would tell a public inquiry. What further questions do you believe that a public inquiry must address? We're also asking all author groups to revise their paper so that it explicitly sets out to do this.

To address this, we have added some further discussion of where the UK Covid-19 vaccination policy diverged from the international consensus. We have also added a box with some key questions for an inquiry. Many of these questions can't be answered in our own article as they would require a full paper in their own right but we hope that the questions we have listed can guide where further review is needed.

2. We admire your upbeat tone, but vaccination policy was highly controversial and frequently criticised. Your piece should reflect this contentious debate. What was the role of politicians and what impact did it have on vaccination policy?

We have added some text on the role of politicians. This was largely in areas such as vaccine procurement. Politicians generally accepted the recommendations of the JCVI (e.g. on prioritisation for vaccination, dosing schedules and the need for booster vaccinations), so it is important to examine the role and remit of the JVI in a future inquiry.

3. Did vaccination policy follow the science?

The speed and scale of the COVID-19 pandemic necessitated that science and policy were developed almost simultaneously. The COVID-19 vaccine development and delivery policy fulfilled its goal of uncoupling infection with SARS-CoV-2 from severe COVID-19 disease, protecting health and preventing health services from being overwhelmed, particularly during the winter of 2021-22 when the UK faced a record number of Covid-19 infections.

4. How robust were the structures to deliver vaccination at unprecedented levels?

The NHS did step up well to deliver vaccinations and the speed of vaccine delivery in the UK compares well to that in most other countries. There was though often little time for planning (such as when the government announced an acceleration in the booster programme in December 2021).

5. What was the role of politicians and what impact did it have on vaccination policy?

There was a strategy from the outset that safe and effective vaccines were the lynchpin of the UK response. This drove a focussed strategy. Although ultimately successful, politicians, policy makers and those responsible for delivery did appear to lack independent scientific advice on the utility of the different vaccines in development and how best to invest their resources, leading to some lost opportunities and wastage. A short-term strategy may not deliver a robust 5-year plan for managing this pandemic. If we are to maintain gains accrued through the early success of the vaccine campaign, this longer-term plan is urgently needed.

6. Overall, the focus of the piece should be on UK vaccination policy and how it related to the evidence and practice elsewhere. One of the issues that needs to come out more clearly is that the vaccine work led by Kate Bigham was deemed a success, attracted criticism for the amount of vaccine doses it secured, but lost momentum after she left.

The remit of the vaccine task force during the initial pandemic was to secure vaccine COVID-19 supplies immediately they became available and to support rapid development of a safe and effective vaccine through the existing research and development platform in the UK. This it achieved (albeit at some expense) with considerable and laudable support from the National Institute for Health Research. The transition to continuing pandemic control and investing in on-going vaccine development has been weak by comparison. This indicates room for improvement in communication between the organisations tackling the pandemic and managing public health.

7. In addition, JCVI seemed to be a shambles. NHS stepped up, but even that lost momentum. We think a thorough description of events would be useful.

The remit of the JCVI is to provide scientific advice not to manage the delivery of vaccine programmes. In tackling the COVID-19 pandemic, the existing bodies managing vaccination strategy in the UK, including the JVCI, had to deal with unprecedented demand, a rapidly changing landscape and the necessary politicisation of vaccination strategy. Goal orientated success was evident with high primary COVID-19 vaccination coverage leading to 41,912,849 people having received 2 doses of vaccine between 8th December 2020 to 15th May 2022. On-going pandemic management has not enjoyed quite the same success, with some poorly attended booster clinics diverting resources from the NHS. This illustrates the need for a longer term COVID-19 vaccine management strategy.

8. We'd like more the debate in relation to vaccination of children. We wonder if the JCVI's hesitation, here and in other instances. itself led to vaccine hesitancy?

Severe COVID-19 is rarer in children than in adults and COVID-19 vaccines were developed to protect vulnerable adults from severe disease and death. Data on the use of COVID-19 vaccines in children and adolescents are emerging but are limited in scope and quality. For example, although pooled vaccine efficacy against COVID-19 was similar to adults in one meta-analysis; 92.7% (95% CI:82.2–97.0%), efficacy against SARS-CoV-2 infection was more uncertain with a wide confidence interval 91.6% (95% CI:37.8–99.5%). Emerging data on risks of myocarditis and pericarditis with mRNA vaccines means the risk benefit equation particularly amongst adolescent boys is close and this has extended the booster schedule to 12 weeks. At the same time widespread infection with the Omicron variant in children and adolescents has seeded immunity in the community. Constructing a clear policy in this landscape remains challenging.