OPTIONS APPRAISAL FOR COVID INTERVENTIONS IN SCOTLAND

November 2021 (DRAFT)

[Redacted], University of Edinburgh, 18/11/21

Policy summary

The medium-term outlook for COVID-19 in Scotland remains highly uncertain but a package of interventions, implemented as soon as possible, could both significantly reduce the pressure on the NHS over the coming winter and reduce the risk of more drastic interventions being required later.

Background

Model-based projections of impact of relaxing restrictions over summer were far too pessimistic [1].

However, the delta variant is far more transmissible so we have still experienced a significant wave [2], several weeks before most of Europe where delta arrived later.

Scotland has experienced large but transient waves in young adults and school-aged children, coupled with a steadier rise in older age groups (+ recent fall-off in cases in over 85s, consistent with an impact of boosters) [2].

The role of schools is unclear but likely to be making some contribution to transmission. No apparent impact of re-opening universities, nor of COP26 [2,3].

There is clear evidence of waning vaccine-induced protection [4], plus clear evidence of benefits of booster vaccination [5].

Levels of antibody positivity are very high, and herd immunity (natural + vaccination) is having a substantial impact on course of epidemic [6].

There is uncertainty about the impact of combination of vaccination and natural exposure on immunity profile of population, and how this will persist/decay over time.

The link between cases and hospitalisations/deaths still exists, but is more complex, indirect and tenuous than in earlier phases of the pandemic.

Causes for concern

Medium term projections for Scotland are uncertain; central estimates suggest little change in admissions and occupancy but allow the possibility of both an increase or a decrease in coming weeks [7]. Longer term projections (into 2022) are highly uncertain [1].

An increase in burden on the NHS is more likely if:

- Waning of vaccine-induced reduction in risk of hospitalisation and death and of infection and infectiousness
- Booster uptake is poor
- Changes in behaviour as society gradually returns to normal, coupled with seasonal effects (including Christmas holidays)
- Arrival of a new variant – highly likely at some stage but timing and threat level are impossible to predict

There is a recognised possibility of winter surge in other respiratory viruses [8], though this remains uncertain.

Impact of selected NPIs

Table 1. Comparison of expected impact of vaccine passports, negative LFTs and face coverings on public health burden of COVID-19.

	Vaccine passports	**Negative LFT**	**Face coverings**
Benefit to individual	Reduces exposure to degree depending on severity of restrictions, but to a limit set by level of exposure within own household	None	Reduces risk but to a limited extent [9]
Benefit to contacts	Some benefit but depends on proportion of infections in unvaccinated population. Relative risk is higher but absolute risk is likely to be lower given that the majority are vaccinated.	Substantial but less than 100% due to false negatives (estimated at less than 10%) [8]	Reduces risk but to a limited extent [9]
Reduction in community transmission	Not clear, could be quite modest	Substantial in many settings [10]	Significant, estimated at 29% in US [11]
Benefit to NHS	Potentially substantial depending on severity of restrictions. Depends on fraction of hospital cases who are unvaccinated (has been >50%). However, majority of unvaccinated people are in low risk groups.	Indirect but potentially substantial, especially if used widely for activities involving high-risk individuals	Indirect but potentially significant, especially if used widely for activities involving high-risk individuals
Vaccine uptake	"could increase uptake in certain groups" [12]. Presumably linked to severity of restrictions.	Possible decline if used as alternative to vaccination?	Unknown

Table 1 indicates that recommendations for use of NPIs depend on the desired public health goal.

- If the aim is to increase vaccine uptake then severe restrictions on unvaccinated individuals, i.e. non-passport holders, seem likely to have the greatest impact.
- If the aim is to directly reduce the burden on the NHS then vaccine passports, negative test and face coverings could all have an impact. All these will have greatest direct impact when used in settings where vulnerable groups (especially unvaccinated elderly and frail) are at risk of infection.
- If aim is to reduce community transmission (the R number) then vaccine passports could have some impact, though there is stronger evidence for negative test and face coverings.
- If the aim is to reduce the risk to contacts then negative test likely to have greatest impact.
- If the aim is to minimise the risk to the individual themselves then continue to promote full vaccination, including boosters.

Alternatives

Increase vaccine uptake by re-invigorated and appropriately targeted public health messaging plus improved access to vaccination and boosters, especially for high risk groups.

Reduce community transmission by vaccinating under 12s (though impact may not be great).

Reduce community transmission by improving performance of Test & Protect:

- Case finding is improved by use of LFTs in the home and, potentially, by expanding list of recognised systems (which would increase testing rates)
- Better support for self-isolation to improve compliance
- Measures to reduce risk of spread by contacts of cases, ranging from more rigorous testing regimes to re-introduction of self-isolation

Reduce community transmission by re-introducing social distancing measures, including:

- Closing universities (though no evidence that universities are playing a major role in transmission at present)
- Closing schools:
    - Delta variant has had a big impact; more transmissible in all age groups but effect most visible in school-aged children because vaccination has reduced transmission in older groups (largely by reducing risk of infection)
    - Role of schools in community transmission still unclear and contentious [13], but no consistent impact across UK of schools opening/closing since August [2]
    - Recent evidence of some increase in risk to teachers relative to other professions (not seen prior to delta) [14]
    - No indications of increased risk of severe infection in children from delta [15] and absolute risk remains very low
- Work-from-home (but limited evidence on its effectiveness [16])
- Community-wide social distancing, i.e. lockdown, but note accumulating evidence that lockdown had much more limited impact on community transmission than originally supposed [17]

Time-scale: If the aim is to have an immediate impact then vaccine-based interventions are slower to work than using NPIs to directly reduce exposure/transmission.

Conclusions

Sensible to apply the principle that earlier intervention can be less drastic intervention.

Direct impact of vaccine passports (by preventing vulnerable people becoming infected) may be small but improves with severity of restrictions (and compliance).

Direct impact of negative test policy could be greater (depending on uptake).

Existing approaches to increasing vaccine uptake, protecting the vulnerable and reducing transmission could be strengthened.

Combination of measures likely to be most effective.

References

1. S1384_Warwick_Autumn_and_Winter_scenarios.pdf (publishing.service.gov.uk)
2. Coronavirus (COVID-19) state of the epidemic 12 November 2021 - gov.scot (www.gov.scot)
3. First report on COP26 and COVID-19 - News - Public Health Scotland
4. Chris Robertson report to C19AG meeting 14/10/21
5. Boosters give over 90% protection against symptomatic COVID-19 in adults over 50 - GOV.UK (www.gov.uk)
6. Coronavirus (COVID-19) latest insights - Office for National Statistics (ons.gov.uk)
7. Paper 2a
8. ams-preparing-for-winter.pdf (publishing.service.gov.uk)
9. S1395_EMG-NERVTAG_Update_on_transmission_and_environmental_and_behavioural_mitigation_strategies__including_in_the_context_of_delta__13_October_2021.pdf (publishing.service.gov.uk)
10. Presentation to C19AG Testing Subgroup 16/11/21
11. Effectiveness of public health measures in reducing the incidence of covid-19, SARS-CoV-2 transmission, and covid-19 mortality: systematic review and meta-analysis | The BMJ
12. SPI-B: Behavioural considerations for maintaining or reintroducing behavioural interventions and introducing new measures in Autumn 2021 (publishing.service.gov.uk)
13. Understanding the effectiveness of government interventions against the resurgence of COVID-19 in Europe | Nature Communications
14. Coronavirus (COVID-19) latest insights - Office for National Statistics (ons.gov.uk)
15. Illness characteristics of COVID-19 in children infected with the SARS-CoV-2 Delta variant | medRxiv
16. S0770_NPIs_table__pivot_.pdf (publishing.service.gov.uk)
17. Ranking the effectiveness of worldwide COVID-19 government interventions | Nature Human Behaviour and Inferring the effectiveness of government interventions against COVID-19 (science.org)