Annex - Feedback for Public Health Scotland on the report on "Discharges from NHSScotland Hospitals to Care Homes between 1 March and 31 May 2020"

Communicating uncertainty

Often in analyses and reports of this nature, the main challenge is how best to express the strength of evidence and how to communicate statistical uncertainty. Whilst we recognise the difficulties in expressing this clearly, we consider there are some sections of the report that could be confusing to readers.

The hazard ratios in tables 10 and 11 show that while there is a statistical relationship between hospital discharge and care home outbreak in the univariate analyses, this relationship ceases to be significant in the adjusted models. This is clearly explained in the report, but some of the discussion of the uncertainty around the estimates led to the report feeling a little inconsistent in its messaging. For example, on page 39, where the report outlines that the estimated risk of hospital discharge is not statistically significant, and then proceeds to detail a best estimate of risk figure. Greater clarity and consistency with explanations would assist the reader to understand the findings of the statistical modelling.

Specific feedback on analysis of associations between any hospital discharge and outbreak (table 10)

The adjusted hazard ratio when looking at discharge compared to no discharge is 1.21 with confidence intervals of 0.94-1.54. Although this is not statistically significant, the fact that the lower confidence interval is close to 1 means that this is marginal for this level of confidence. The section on interpreting table 10 states clearly and in bold that "hospital discharge was not statistically significantly associated with care home outbreaks (adjusted HR 1.21)".

The conclusion section for this table then goes on to acknowledge that *"the best estimate of the hazard ratio for hospital discharge is >1 and the confidence interval in the adjusted analysis is relatively wide. We therefore cannot statistically exclude the presence of a small risk from hospital discharge"*.

While it is good to see this discussion of uncertainty, this sentence feels quite technical and perhaps harder for a less experienced user to understand. It might also have been helpful to include this point in the section on interpreting table 10, alongside the statement of the non-significant finding, rather than in the conclusion. The way the information is presented in the report gives too much emphasis to the non-significant finding and not enough to the uncertainty. Presenting all of the information together (rather than under separate "interpreting table 10" and "conclusion" headers) would allow for a more balanced overall discussion of the statistical finding and the uncertainty around it.

Specific feedback on analysis of associations between different types of hospital discharge and outbreaks (table 11)

When looking at the different types of discharge, we see adjusted hazard ratios of 1.00 for tested negative, 1.27 for untested and 1.45 for tested positive. Although the confidence intervals again suggest these findings are not significant, the observed 'dose-response' pattern in the adjusted hazard ratios is consistent with a causal relationship between positivity and outbreak. Given the sensitivity of the care home setting during this pandemic, and the likely uses of the evidence from this analysis, some users may have benefited from additional discussion of this in the report.