The effect of social distancing on the reproduction number in the UK from a social contact survey
Report 2

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Aim

Estimate the reproduction number of COVID-19 under social distance measures in the UK.

Methods

We launched a second panel of the CoMix behavioural survey of UK adults (18+), with a study sample recruited to be broadly representative of the UK population. The survey was launched on Thursday 2nd April, 20y20 and asks about compliance with various social distance measures and contact patterns. The survey will be conducted every two weeks with the same sample of participants. Participants recorded face-to-face contacts that they made on the previous day, specifying physical or non-physical contact as well as the age of those contacted and the setting in which these contacts occurred (e.g. at home, work, while undertaking leisure activities, etc). The contact survey is based on the POLYMOD contact survey, which is used as a baseline for social mixing in the UK under normal conditions[1].

We used data on social contacts collected on the first five days of the first wave of a second panel of the CoMix survey. This contains information on the first 949 respondents who recorded 2382 contacts. As children (<18 years) were not included in the survey, we imputed contacts for lower age groups (child-child and child-adult contacts) using the POLYMOD UK data, setting school-contacts to 0 and adjusting contact in other settings (e.g. home) as observed for adults. We followed the same approach as in our previous report (Report 1) to impute the contact patterns of children. Further details are available here[2].

Results

The current average number of contacts per person was 2.6 (IQR 1, 3) which is similar to last week's panel (2.9; IQR 1, 4) , and still considerably lower than POLYMOD (10.8; 6, 14). The respective social contact matrices of direct contacts (including physical and non-physical contacts) are presented in Figure 1A. Assuming the initial value of R_0 to have been 2.6 in the UK, we estimated the current R_0 to be 0.56 (95% uncertainty interval 0.34 - 0.80). Based on physical contacts only, we estimated R_0 to be 0.36 (0.22 - 0.52). Data-collection across different population-strata is still ongoing, and these results should not be interpreted as final.

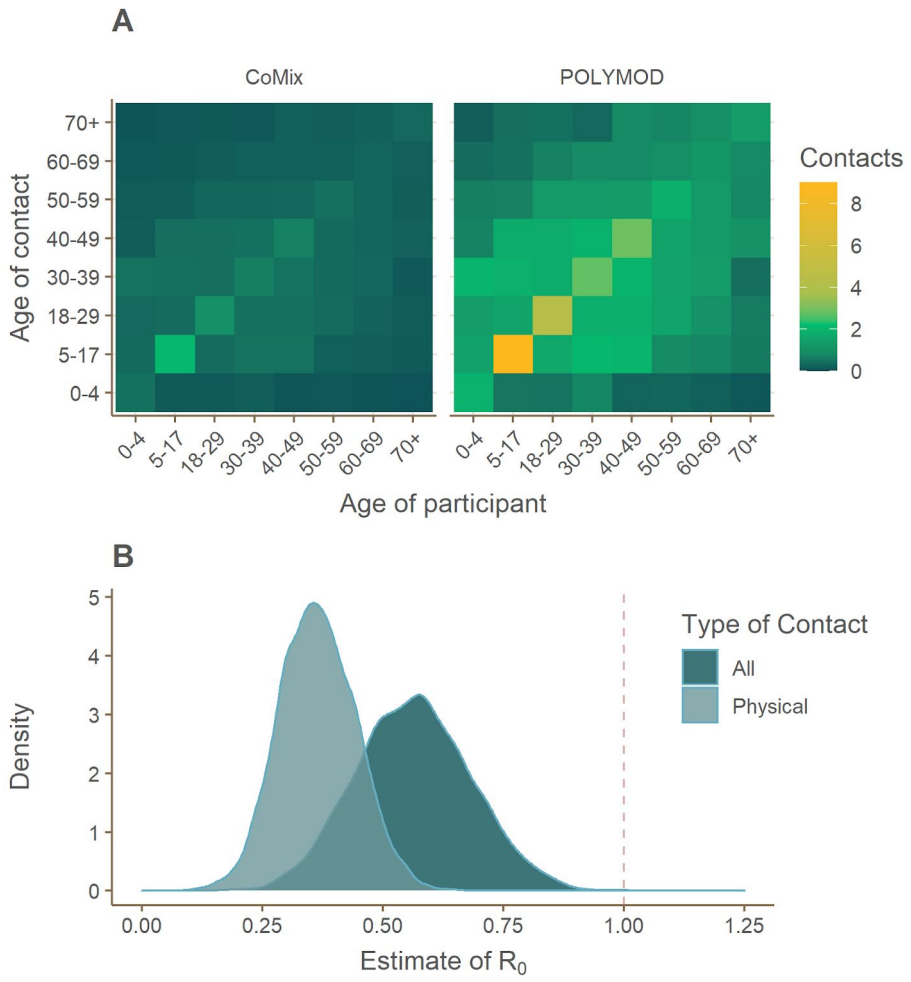

Figure 1. A) Average number of age-specific contacts per person per day; B) Estimate of R_0 by all contacts and physical contacts

Discussion

The model underpinning the reproduction number calculation is compartmental in nature. In particular, household structure is not represented explicitly in the model. It is likely that following

the imposition of strict social distance measures, transmission has continued within households with infected individuals. That is, transmission may not have declined as rapidly or as much in the community as these results would imply.

References

1. Mossong, J. *et al.* Social contacts and mixing patterns relevant to the spread of infectious diseases. *PLoS Med.* **5**, e74 (2008).

2. https://cmmid.github.io/topics/covid19/current-patterns-transmission/reports/LSHTM-CMMID-20200401-CoMix-social-contacts.pdf