THE LANCET
Digital Health

Supplementary appendix

This appendix formed part of the original submission and has been peer reviewed. We post it as supplied by the authors.

Supplement to: Rader B, White LF, Burns MR, et al. Mask-wearing and control of SARS-CoV-2 transmission in the USA: a cross-sectional study. *Lancet Digit Health* 2021; published online Jan 19. https://doi.org/10.1016/S2589-7500(20)30293-4.

Supplementary Materials

Figure S1. Mask Wearing, Social Contacts and the Predicted Probability of *Rt* below 1

Projected values from a logistic regression model measuring the association of community transmission control (R_t <1) with mask-wearing and social contacts in US states adjusting for population density, percent races other than white and a time trend (Model 1). The number of self-reported contacts at "social gatherings" from Facebooks' COVID-19 symptom survey was aggregated over each week and state utilizing a weighted sampling scheme.

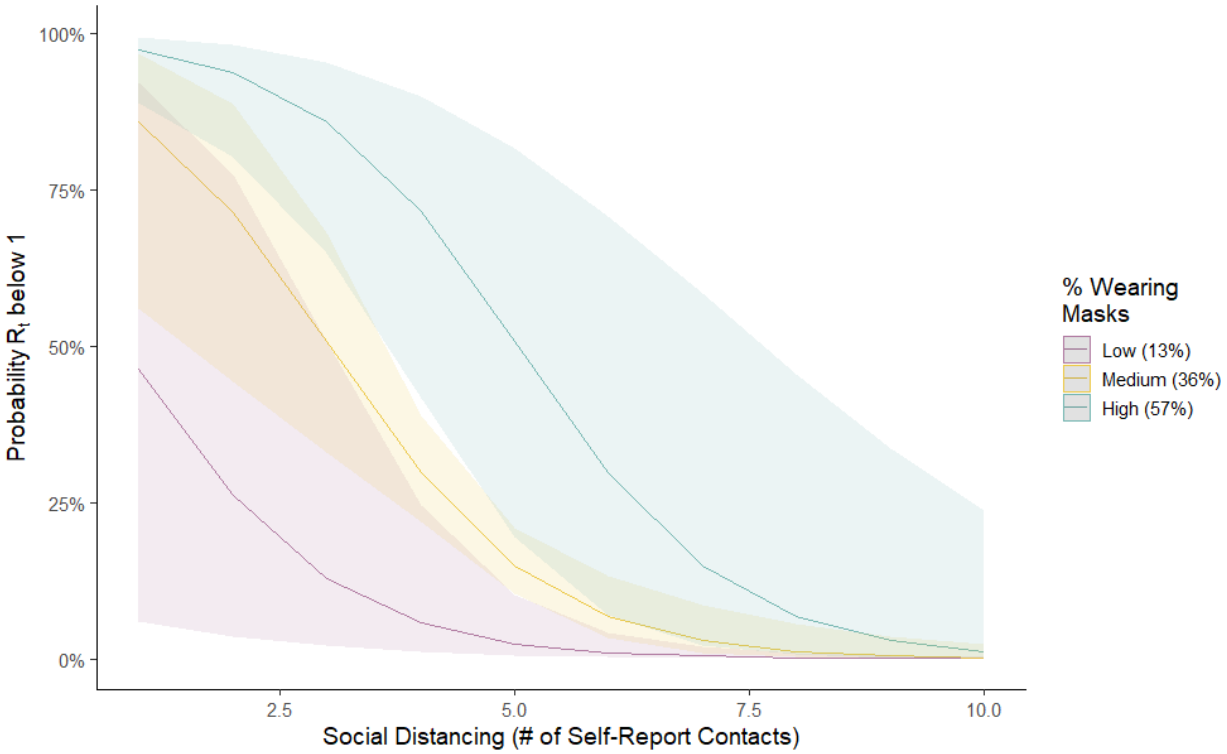


Figure S2. Association of mask wearing with R_t at different dichotomization cutoffs

Results from a logistic regression model measuring the association of community transmission control ($R_t < x$) with mask-wearing adjusting for social distancing, population density, percent races other than white and a time trend. Model was repeated as cutoff for R_t dichotomization (x) was varied. The odds ratio (point) and 95% confidence interval (-) for mask wearing that resulted from each iteration is shown.

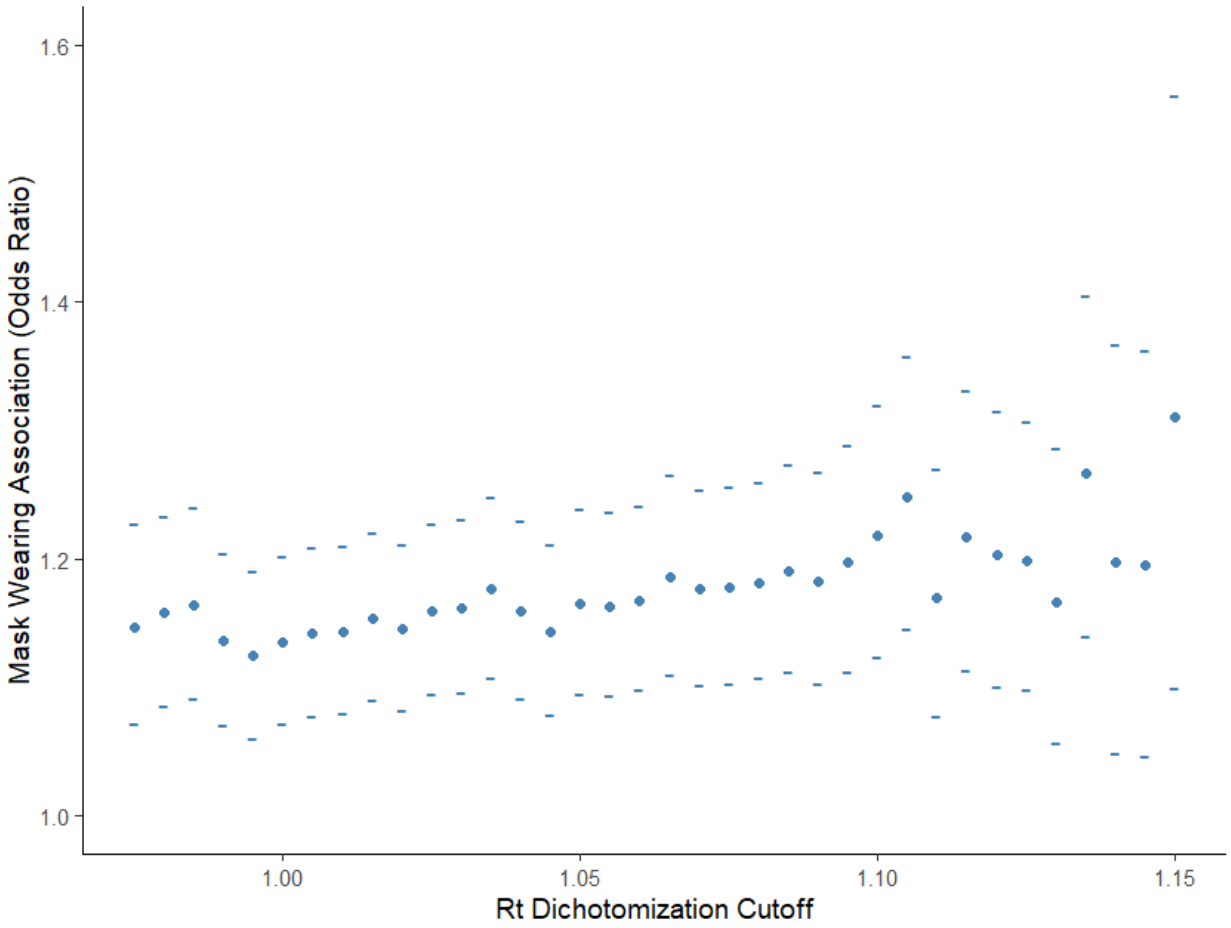
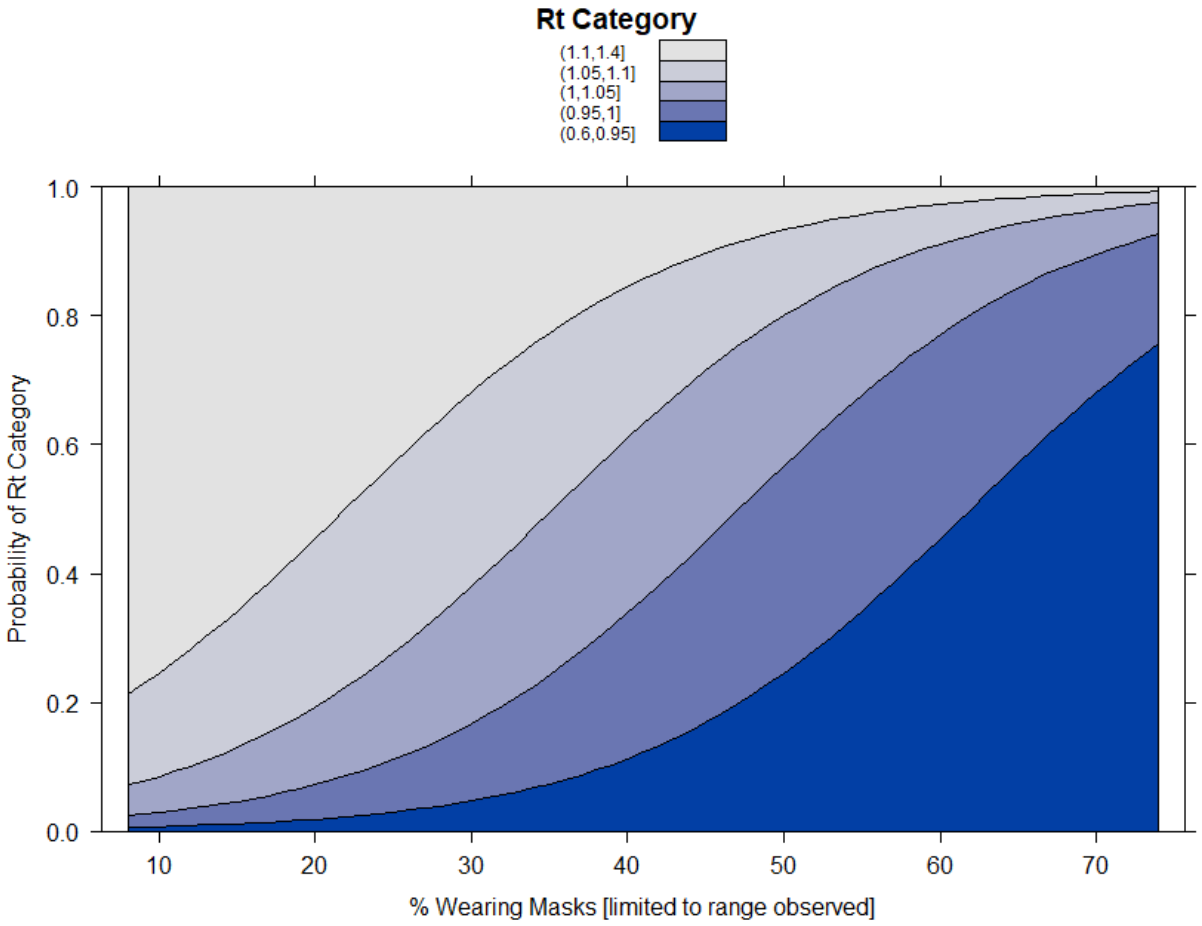


Figure S3. Association of mask wearing with categorical R_t

Projected probabilities from an ordinal logistic regression model measuring the association of community transmission control (R_t) with mask-wearing adjusting for social distancing, population density, percent races other than white and a time trend. Observed mask wearing was between 8.1%-73.7%.



Supplementary Methods

Weighted Variable of Mask Wearing:

We assigned the below values to individuals according to the four-point Likert scale for reported mask wearing while at the grocery store or with family/friends. We then averaged across both conditions. For example, an individual who said they would be very likely to wear a mask with family and friends, but not so likely to wear one to the grocery store would receive a score of .625.

Very Likely: .95
Somewhat Likely: .6
Not So Likely: .3
Not Likely at All: .05

The seven models presented in table 2 and the additional modeling frameworks are described:

Model 1. Generalized linear model with a logit link function:

$$\ln\left(\frac{\left(Y_{ij} = R_t < cut \middle| x_{ij}\right)}{1 - p\left(Y_{ij} = R_t < cut \middle| x_{ij}\right)}\right) = \beta_0 + \beta_1 mask_{ij} + \beta_2 dist_{ij} + \beta_3 nonwhite_{ij} + \beta_4 density_i$$

With variables defined in the following fashion:

i = State, j = Week
R_t = Instantaneous reproductive number as measured by rt.live
cut = dichotomization threshold, set to the R_t critical value of 1
mask = Mask wearing defined percentage of respondents who replied "very likely" to mask while with family and friends and at the grocery store
dist = Social distancing defined as percentage change from baseline via google community mobility
nonwhite = Percentage of survey respondents who self-identify as a race other than white
density = Population density as measured by 1000 people per square kilometer

Model 2: Replication of model 1 with the *mask* and *nonwhite* terms being weighted according the SurveyMonkey weighting scheme.

Model 3: Replication of model 1 but defining R_t as the instantaneous reproductive number measured by epiforecasts.io

Model 4: Replication of model 1 but defining *mask* as the percentage of respondents who replied "very likely" to mask while with family and friends

Model 5: Replication of model 1 but defining *mask* as the percentage of respondents who replied "very likely" to mask at the grocery store

Model 6: Replication of model 1 with the addition of the following term:

$$+ \beta_5 peak\_rt_i$$

peak_rt defined as the peak observed R_t from March-May 2020 as measured by rt.live for each state (i)

Model 7: Replication of model 1 with the addition of the following term:

$$+ \beta_5 mask_{ij} * dist_{ij}$$

Figure S1: Replication of model 1 but defining *dist* as the number of self-reported contacts at "social gatherings" (censored outlier responses) utilizing Facebook's survey and weighted sampling scheme

Figure S2: Replication of model 1 but varying *cut* sequentially from .975 to 1.15 with .005 breaks

Figure S3 (ordinal logistic regression) : same covariates as are in model 1, but R_t defined as an ordinal variable:

Category 1: (0.6,0.95]
Category 2: (0.95,1]
Category 3: (1,1.05]
Category 5: (1.05,1.1]
Category 6: (1.1,1.4]

Mixed Model: same covariates as are in model 1, but a random intercept for state (i) included