Supplementary File 1: additional information on methods

Full details of measures

Smoking status

Smoking status was assessed with the question: "Do you smoke?" with the response options: (a) non-smoker, (b) ex-smoker, (c) current light smoker (9 or less a day), (d) current moderate smoker (10-19 a day), (e) current heavy smoker (20+ a day). For our primary analyses, participants answering (c), (d), or (e) were combined as 'current smokers'.

Sociodemographic information

Highest level of education was used as a measure of socioeconomic position. This was analysed as a dichotomous variable defined according to whether or not the participant had gained any qualifications after the age of 16: post-16 qualifications (completed post-16 vocational course, A-levels (*subject specific qualifications typically taken at age 18*) or equivalent [at school until age 18], undergraduate degree or professional qualification, postgraduate degree) vs. no post-16 qualifications (no qualifications, completed GCSE/CSE/O-levels (*subject specific qualifications typically taken at age 16*) or equivalent [at school until age 16]). Full-time schooling is compulsory in the UK up until 16. Key worker status was assessed with the question: "Are you currently fulfilling any of the government's identified 'key worker' roles?" Participants were coded 1 if they responded 'health, social care or relevant related support work', 'teacher or childcare worker still travelling in to work', 'transport worker still travelling in to work', 'food chain worker (e.g. production, sale, delivery)', 'key public services worker (e.g. justice staff, religious staff, public service journalist or mortuary worker)', 'local or national government worker delivering essential public services', 'utility worker (e.g. energy, sewerage, postal service)', 'public safety or national security worker', or 'worker involved in medicines or protective equipment production or distribution'. Those who responded 'none of these' were coded 0. This variable was included as a covariate in analyses of confirmed and suspected COVID-19 and worry about COVID-19.

Health conditions

The presence of smoking-associated health conditions was assessed with the question: "Do you have any of the following medical conditions?" Those who selected 'high blood pressure', 'diabetes', 'heart disease', 'lung disease (e.g. asthma or COPD)', or 'cancer' were coded 1 and those who

selected none of these were coded 0. This variable was used as a covariate across the analyses, because people with chronic conditions may be more likely to experience severe symptoms (1–3). This method of measuring health conditions is commonly used in population surveys (e.g. English Longitudinal Study of Ageing) and previous studies have shown high agreement between self-reported health diagnoses and medical record validation in population-based samples (4).

The presence of anxiety disorders was assessed with the same question, with those who selected 'clinically-diagnosed anxiety' coded 1 and those who did not select this response coded 0. This variable was used as a covariate in analyses that include suspected COVID-19 and worry about COVID-19.

Adherence to COVID-19 protective behaviours

At the time data were collected, the government was recommending that people stay at home except for very limited purposes: (i) shopping for basic necessities (e.g. food, medicine) as infrequently as possible; (ii) one form of outdoor exercise a day (e.g. a run, walk or cycle), alone or with members of their household; (iii) any medical need (including to donate blood, avoid illness or injury, escape risk of harm, or to provide care or to help a vulnerable person); or (iv) travelling for work purposes, but only where they could not work from home (5).

Recent changes in smoking

For analysis of smoking less than usual, smokers who responded less than usual were coded 1 and those who responded about the same or more than usual were coded 0. For analysis of smoking more than usual, smokers who responded more than usual were coded 1 and those who responded about the same or less than usual were coded 0. Those who responded 'I don't smoke' (i.e. never smokers and ex-smokers) were excluded from analysis of changes in smoking.

Full details of statistical models tested

Smoking status and confirmed and suspected COVID-19

We used logistic regression to examine associations between smoking status (never smoker [referent], ex-smoker, current smoker) and (i) confirmed COVID-19 and (ii) confirmed and suspected COVID-19. We constructed three models for the association with confirmed COVID-19: 1) unadjusted; 2) with adjustment for sociodemographics (age, sex, ethnicity, and education), key

worker status, and survey date; and 3) with additional adjustment for comorbid health conditions. We constructed an additional fourth model for the association with confirmed and suspected COVID-19 which included further adjustment for anxiety disorders.

Smoking status and worry about COVID-19

We used logistic regression to examine associations between smoking status (never smoker [referent], ex-smoker, current smoker) and (i) worry about catching COVID-19, (ii) significant stress about catching COVID-19, (iii) worry about becoming seriously ill from COVID-19 and (iv) significant stress about becoming seriously ill from COVID-19. We constructed three models for each association: 1) unadjusted; 2) adjusted for sociodemographics, key worker status, and survey date; and 3) with additional adjustment for comorbid health conditions and anxiety disorders.

Smoking status and adherence to COVID-19 protective behaviours

We used logistic regression to examine associations between smoking status (never smoker [referent], ex-smoker, current smoker) and (i) general adherence to recommendations from authorities to prevent spread of COVID-19 and (ii) living life as normal. We constructed three models: 1) unadjusted; 2) with adjustment for sociodemographics, key worker status, and survey date; and 3) with additional adjustment for comorbid health conditions.

Recent changes in smoking

Among current smokers, we used logistic regression to examine associations of heaviness of smoking (light [<10 cigarettes per day] vs. heavy [≥10 cigarettes per day]), sociodemographics, comorbid health conditions, confirmed and suspected COVID-19, significant stress about becoming seriously ill from COVID-19, and survey date with (i) smoking less than usual and (ii) smoking more than usual. We analysed unadjusted associations (bivariate models) and independent associations (multivariable model) between each variable and outcome.

Moderation of associations by socioeconomic position

In order to explore whether associations between smoking status and confirmed and suspected COVID-19, worry about COVID-19, and adherence to COVID-19 protective behaviours were moderated by socioeconomic position, we repeated the fully adjusted models with the addition of an interaction term between smoking status and post-16 qualifications. We excluded key worker status from these models as we believed it would not be meaningfully independent of socioeconomic position and may obscure moderation effects. In order to explore whether

associations of age, sex, ethnicity, comorbid health conditions, significant stress about becoming seriously ill from COVID-19, and survey date with changes in smoking were moderated by socioeconomic position, we repeated the multivariable model adding the interaction between education and each of these variables in turn. Where any interaction was significant, analyses were repeated stratifying by level of education to gain further insight.

References

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