CHARIS: COVID-19 HEALTH & ADHERENCE RESEARCH IN SCOTLAND

3rd June – 15th July

Table of Contents

Executive Summary

CHARIS is a 5-month study of a representative sample of the Scottish population that uses behavioural science to measure and explain: a) adherence to behaviours designed reduce the transmission of coronavirus and b) general and mental health.

This report details the first 6 weeks of data collected by CHARIS; beginning on the 3rd of June and ending on the 15th July. During this period Scotland moved from lockdown through phases one and two and into phase three of the Scottish Government's 4-phase route map out of lockdown.

CHARIS is applying the three theories of behaviour to understand differences in levels of adherence to three transmission reducing behaviours across different sociodemographic groups.

3 Types of Behaviour:
- Physical distancing
- Wearing a face covering
- Hand washing

3 Theories of Behaviour:
- Protection Motivation Theory: beliefs about the risk and threat of coronavirus
- Common Sense Model of Self-Regulation: beliefs about the **illness covid-19**
- Social Cognitive Theory: beliefs about each of the 3 types of behaviour

CHARIS also measures general and mental health.

Levels of Adherence
- Adherence to physical distancing and hand washing was very high throughout the 6-weeks
- Adherence to wearing face coverings was lower initially but increased significantly when made mandatory by the government
- Adherence levels differed across sociodemographic groups

Who Reports Lower Adherence
- Younger people reported lower levels of adherence to all three behaviours
- Males reported lower levels of adherence to hand washing

Role of Beliefs in Adherence
- Beliefs about behaviour predicted all three behaviours.
  - People with higher self-efficacy (confidence that one can perform a behaviour) and stronger intention to carry out the behaviour were more adherent.
- Belief that the risk of covid-19 was severe and the belief that thee illness could recur, as well as other beliefs about covid-19 were associated with greater adherence to all three behaviours.

Health
- Poorer mental health was associated with several sociodemographic factors (including age, gender, housing tenure, employment status, covid-19 status, shielding status) and may have declined over the course of the 6 weeks
- Mental health was not associated with adherence to the transmission reducing behaviours

Implications
- Population adherence might be increased by interventions that:
  - enhance population beliefs that they can carry out the behaviours and that this is something they want and intend to do
  - target young people to increase their perceived seriousness of covid-19
  - target males to increase their self-efficacy and intention to wash their hands as recommended

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1. Background

In March 2020 the Chief Scientist Office of the Scottish Government initiated a rapid funding call to support research to address the coronavirus pandemic; Covid-19 Health & Adherence Research In Scotland (CHARIS) was funded as part of that initiative. CHARIS is a longitudinal study of adherence to the behaviours designed to avoid infection and reduce transmission of the coronavirus and hence to reduce the incidence of covid-19[a]. The grant holders and core research team are listed in the Appendix.

1.2 Changing Behaviour to Reduce Transmission

To halt the transmission of the coronavirus that causes covid-19 the Government asked the people of Scotland to change radically the way they live their daily lives. From the 23rd of March 2020 the Scottish people were asked to work from home wherever possible, to only leave their homes for a few specific purposes, to keep at least 2m away from other people, to not have face-to-face contact with anyone other than the people they live with, to wash their hands frequently and thoroughly and to wear face masks when on public transport and in shops. On the 28th of May the First Minister announced Scotland would move from lockdown to phase 1 of the Government's four-phase route map out of lockdown. As lockdown restrictions are eased adherence to the rules on physical distancing, hand hygiene and the wearing of face coverings has become even more important because it has increased the onus on individuals to regulate their behaviours to avoid infection and suppress transmission of the coronavirus.

1.3 What is CHARIS[a]?

The primary aim of CHARIS is to examine and increase understanding of adherence to behaviours designed to halt the spread of covid-19, namely, physical distancing, hand hygiene and wearing a face covering. From the 3rd of June CHARIS surveyed, by telephone, a nationally representative sample of 500 adults every week for 6 weeks. CHARIS is investigating adherence to three types of behaviour designed to reduce the transmission of coronavirus, namely physical distancing, wearing a face covering and hand washing. A secondary aim is to survey mental and general health.

1.4 Role of Behavioural Science

CHARIS is being led by behavioural scientists from the University of Aberdeen and the University of the Highlands and Islands with the support of a consortium of over 40 researchers from universities across Scotland. CHARIS is using behavioural science to identify factors that influence adherence to the behaviours designed to reduce transmission of the coronavirus. Three theoretical models of behaviour are used to identify the beliefs associated with adherence, namely, beliefs about risk or getting covid-19, beliefs about the illness covid-19, and beliefs about the behaviours. This knowledge can be used to inform interventions to increase adherence. These models have been found to explain a wide range of behaviours, including health-related behaviours and interventions which change these beliefs have been effective in changing behaviours[1].

The theoretical models that are used in CHARIS are:

- Protection Motivation Theory (PMT)[2]: beliefs about the risk and threat of coronavirus
- Common Sense Model of Self-Regulation (CS-SRM)[3]: beliefs about the illness covid-19
- Social Cognitive Theory (SCT)[4]: beliefs about each of the transmission reducing behaviours

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[a] https://www.abdn.ac.uk/iahs/research/health-psychology/charis.php

CHARIS assesses:
- the rates of adherence to each of the behaviours designed to reduce transmission and how these change over time in a nationally representative sample of adults in Scotland
- whether adherence rates differ between groups of the population
- beliefs that may explain the differences in adherence between groups

In addition, the pandemic has impacted on the mental and general health of the public. Thus, CHARIS also investigated mental and general health over the transition from lockdown through to phase 3 of the route map.

CHARIS was also designed to assess:
- the mental and general health of the public and how these change over time
- whether mental and general health differ between groups
- the relationship between mental health and adherence

2. Survey Details

2.1 Study Design:
Weekly cross-sectional, telephone surveys of a representative sample of the population of Scotland.

2.2 Survey Start and End Date for this report:
3rd June to 15th July

2.3 Scottish Government Route Map Phases[b] and Key Dates:
May 28th: Lockdown move to Phase 1
June 18th: Phase 1 move to Phase 2
June 22nd: Face coverings become mandatory on public transport
July 9th: Phase 2 move to Phase 3
July 10th: Face coverings become mandatory in shops

2.4 Participants and Recruitment:
~500 adults participated each week; total sample over 6 weeks = 3500. Adult men and women aged 16 or older, able to speak English, and currently living in Scotland were eligible to participate. The survey was administered by a commercial polling company (Ipsos MORI Scotland), who conducted telephone interviews using Computer Aided Telephone Interviewing (CATI), which involves random digit dialling to both landlines and targeted mobiles. Quotas were applied to ensure a representative sample of Scotland adults was achieved. Quotas were based on gender, age, working status, and geographical locations (distribution over the Scottish Parliament regions).

2.4 Measures:
2.4.1 Adherence:
Adherence to the following behaviours was assessed as follows:

Physical distancing
  i.   going out only for permitted reasons (i.e. for basic necessities, daily exercise, basic animal welfare, medical need, travelling for work purposes)
  ii.   staying 2 metres (6 feet) away from other people

Face covering
  i.   wearing a face covering when in a shop
  ii.   wearing a face covering when travelling on public transport

Hand washing
  i.   washing hands as soon as you get home
  ii.   washing hands using soap and water
  iii. washing hands for at least 20 seconds
  iv.   washing hands before eating and drinking.

Participants indicated the extent to which they had adhered to each behaviour over the previous week using a 5-point response scale (always, most times, sometimes, rarely, never). A higher score indicates greater adherence.

2.4.2 Beliefs:
CHARIS measured three different types of beliefs relevant to the transmission of coronavirus from the three theories; beliefs about the risk and threat of coronavirus (PMT); beliefs about the illness

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[b] https://www.gov.scot/coronavirus-covid-19/

covid-19 (CS-SRM) and beliefs about the behaviours (SCT). These belief types have been colour coded as indicated throughout the report. Within each belief type are nested more specific beliefs and these specific beliefs are described where appropriate, for example, beliefs about the illness covid-19 contain specific beliefs about: the cause of covid, its symptoms, the consequences of covid-10 for the individual, whether it can be treated or cures, and how long the illness will last. Further details of the belief measures are provided in the Appendix.

2.4.3 Mental and General Health:
Mental health was measured with the Patient Health Questionnaire-4 (PHQ-4)[5]. The PHQ-4 is a 4-item inventory designed as a screening tool to allow for very brief and accurate measurement of depression and anxiety. The total score ranges from 0 to 12 with categories of psychological distress being none 0-2, mild 3-5, moderate 6-8 and severe 9-12. The anxiety and depression subscales have a maximum score of 6; each subscale, a score of 3 or greater is considered positive for screening purposes. We report on the proportion of people who met the criteria of risk of anxiety and depression and overall score across the two sub-scales, which is an indicator of psychological distress. General Health was assessed by a single item based on the Scottish Government's harmonised core set of measures for cross sectional surveys[c], 'In general, how would you rate your overall health?' There were five response options: very good, good, fair, bad, very bad. We report on the proportion of people who had 'poor' general health. Poor general health was indicated by response of 'bad' or 'very bad' to the general health question.

2.4.4 Demographic Characteristics:
The demographic characteristics measured and included in this report were: age, gender, ethnicity, employment status, geographical region, number in household, number of children in household, housing tenure, whether they *believed* they had had covid-19 (regardless of whether or not they had had a confirmatory test) and whether they had been designated to be shielded.

2.5 Survey development
A draft version of the survey was developed by the core research group (DD, GH, MJ and CDD), based on previous research, and validated and tested measures where possible, and then shared with the CHARIS-consortium (a wider group of behavioural and health scientists drawn from Universities and Research Institutes across Scotland), and two patient and public involvement groups (the Scottish Health Council (SHC) Public Engagement Group and the NHS Research Scotland Primary Care Patient and Public Involvement group (NRSPC-PPI)). The draft survey was modified based on the feedback received to ensure question wording was clear and easily understood. Further, Ipsos Mori- piloted the survey and wording for measures was modified based on feedback.

2.6 Statistical Analysis
Analyses were carried out using SPSS and R by one of the core research group (CDD). Univariate and multivariate analyses were undertaken. Only the results of the multivariate analyses are reported here (both univariate and multivariate analyses are included in the Appendix). The significance level was set at a value of p≤0.01 throughout.

The number of participants is not the same for all outcomes. This is because some outcomes were not applicable for all participants (people for example did not always leave their house in the

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[c] The Scottish Government's harmonised core set of measures is available at:
https://www2.gov.scot/Resource/0051/00514576.pdf

previous week so items pertaining to behaviour when outside the home were not applicable). Analyses only include people for whom the behaviour was applicable.

The analyses of each outcome, i.e. each behaviour and general and mental health, are presented as follows:
1. Change over **time**: a graph of each outcome over time, e.g. the rate of adherence to physical distancing over the 6 weeks of the survey.
2. **Demographics**: multivariate linear regression analyses to identify the demographic characteristics that predict each outcome. These analyses identify who is adhering, who has better or worse general and mental health; adherence data for each identified group are presented graphically.
3. **Beliefs**: multivariate linear regression analyses to identify the beliefs that predict each outcome. These analyses identify the beliefs associated with adherence, general and mental health.
4. **Combining demographics and beliefs**: the demographic factors identified as significant predictors of outcome (step 2) are regressed onto the beliefs identified as significant predictors of outcomes (step 3). These analyses may explain the reasons why some groups are more (or less) adherent than others. For example, if step 2 shows that older people are more adherent to physical distancing, and if step 3 shows that the belief that covid-19 is a very severe illness is associated with greater adherence to physical distancing, then in step 4 we conduct analyses to find out if older people compared to younger people hold this belief. If this is the case, then this belief may explain why older people are more adherent to keeping 2m distant.

Full details of all univariate and multivariate analyses are included in the Appendix.

Interpretation of the analyses for this report were discussed by the core research group.

2.7 Basic Demographic Characteristics of Participants

Quota sampling was used to ensure that each weekly sample was representative of the adult population of Scotland. In summary, 40% of the participants were female and 60% male; 97% were white; 45% were working full-time; 79% owned their own home; 19% had children living at home, 21% lived alone and 45% lived with one other person. Participants were recruited from across mainland Scotland and the Western and Northern islands. The age distribution of the sample is shown in Table 1

Table 1: Age distribution

Age (yrs)	**16-24**	**25-34**	**35-44**	**45-54**	**55-64**	**65+**
% Participants	9.2	13.0	12.1	18.2	20.4	27.1

A physical or mental health condition or illness lasting or expected to last 12 months or more was reported by 30.4% of respondents. This condition reduced their ability to carry out day-to-day activities for 17.1% of the population (7.3% limited a lot, 9.8% limited a little), 13.2% were not limited by their condition. The majority of respondents reported that they had never had covid-19 (83.9%). Approximately 13% reported that they either currently had or had previously had covid-19, of which only 5.8% reported having had their infection confirmed by a test.

3 Adherence

We report on the rates of adherence to the three types of transmission reducing behaviours. Each type of transmission reducing behaviour is composed of a number of discrete behaviours and we report adherence to each discrete behaviour over the 6 weeks.

1. PHYSICAL DISTANCING BEHAVIOURS:
    i. going out only for permitted reasons (i.e. for basic necessities, daily exercise, basic animal welfare, medical need, travelling for work purposes)
    ii. staying 2 metres (6 feet) away from other people

2. FACE COVERING BEHAVIOURS:
    i. wearing a face covering when in a shop
    ii. wearing a face covering when travelling on public transport

3. HAND WASHING BEHAVIOURS:
    i.   washing hands as soon as you get home
    ii. washing hands using soap and water
    iii. washing hands for at least 20 seconds
    iv. washing hands before eating and drinking

For each behaviour we report on:

- Level of adherence over the 6 weeks
- Differences in adherence levels between groups
- Associations between beliefs and adherence

3.1 Physical Distancing

3.1.1 Adherence over time (3rd June to 15th July)

Adherence to both physical distancing behaviours was high throughout the period from the 3rd June to the 15th July. The maximum possible adherence score is 5, i.e. participants state they always adhere to that behaviour. Figure 1 shows participants were adherent *always* (5) or *most times* (4) to both physical distancing behaviours every week from the 3rd June to the 15th July.

Figure 1: Adherence To Physical Distancing Behaviours During Phases 1-3 Of The Route Map Out Of Lockdown
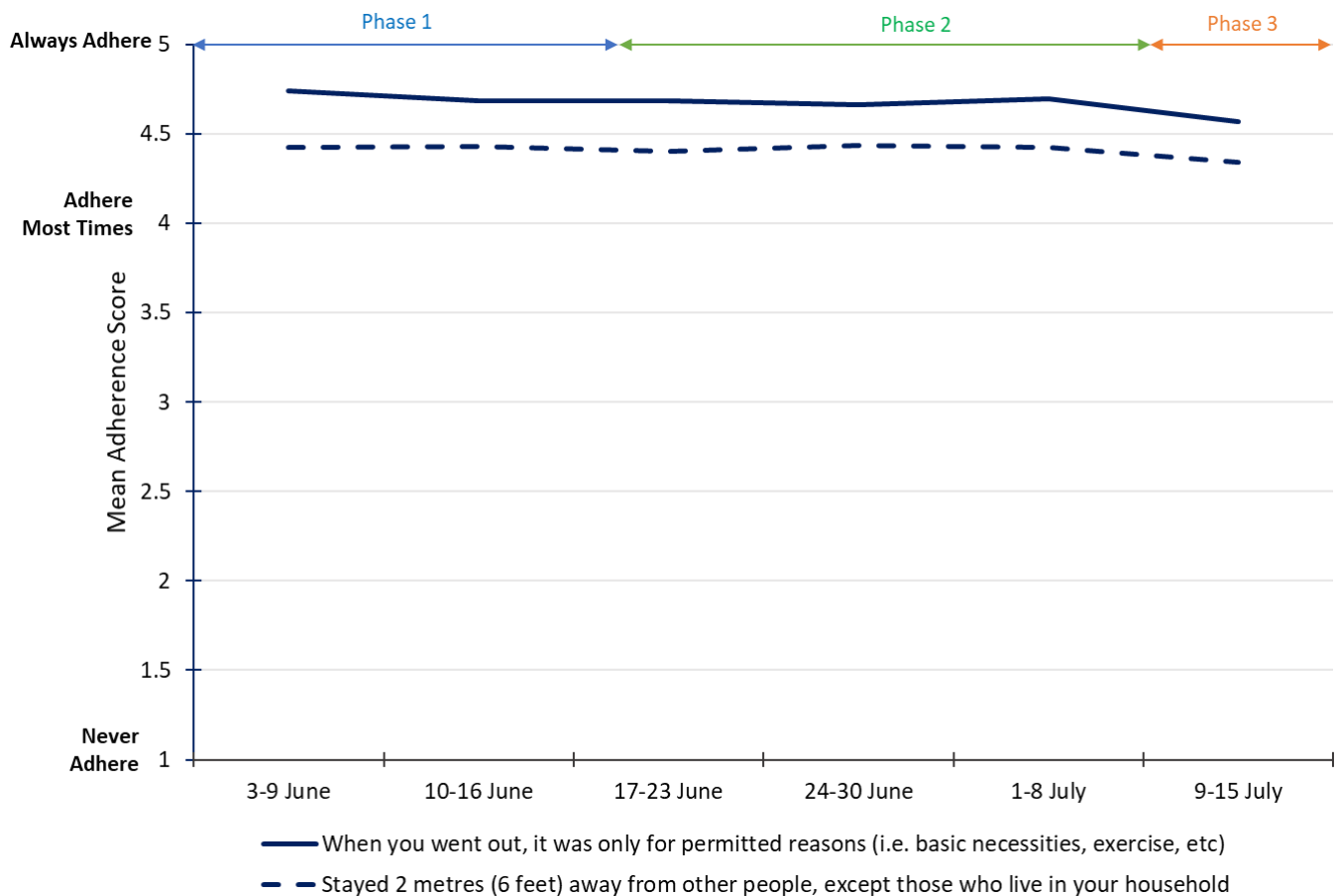
The relevance of physical distancing behaviour of 'only going out for permitted reasons' was left out of government guidance to the general public as Scotland began to move out of lockdown. Consequently, we chose to focus on the behaviour of 'keeping 2m away from other people, except those who live in the same household' in this report. The following analyses, therefore, pertain to this single behaviour.

3.1.2 Who is staying 2m distant from other people?

Adherence to staying 2m distant from other people was high for all sociodemographic groups across each phase of the release from lockdown between 3rd June – 15 July.

In multivariate analyses, allowing for other sociodemographic factors, two sociodemographic factors were associated with adherence to staying 2m distant from others:

- **Age: younger** people have **lower** adherence

- **COVID status:** people who report **having had[d]** covid-19 have **lower** adherence

Figure 2 shows the rates of adherence (as percentages) for the different groups that make up each sociodemographic factor. For example, approximately 40% of respondents aged 16-24 years 'always' adheres to staying 2m distant compared to approximately 70% of respondents aged 65 years of age and over.

Figure 2: Adherence To Staying 2m Distant For Different Age And Covid Status Groups: Descriptive Data
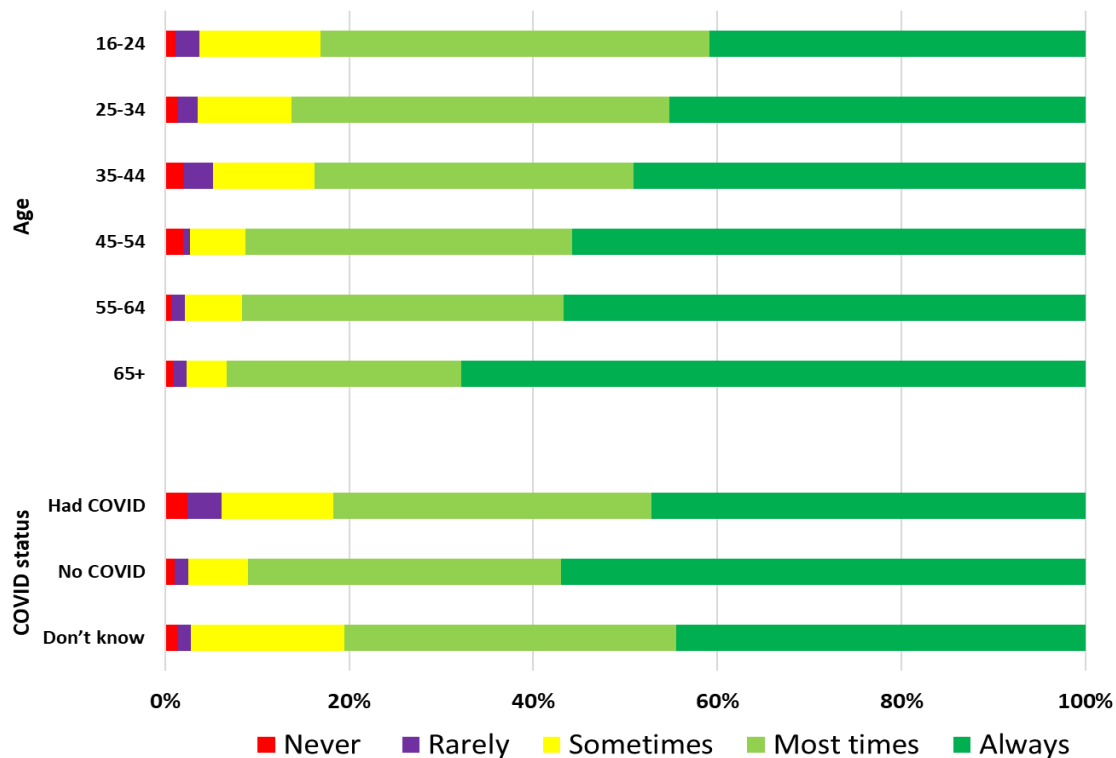
3.1.3 Beliefs associated with adherence to staying 2 metres distant from others
The following five beliefs were significantly **positively associated** with adherence to staying 2m distant from others in multivariate analyses:

Beliefs about Risk
Severity: *If I were ill with covid-19 it would be serious for me*

Beliefs about the illness covid-19
Duration: *My covid-19 symptoms would last a long time*

Worries and anxieties: *Having covid-19 would make me feel anxious*

Beliefs about behaviours
Self-efficacy: *I am confident that I can follow the government instructions, all or most of the time, of limiting contact with people*

Intention: *I intend to follow all the government instructions on limiting contact with people*

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[d] This was self-reported covid-19 status rather than status confirmed by a test

3.1.4 Understanding differences in adherence to keeping 2 metres distance

As shown above (section 3.1.2), age and covid-19 status were associated with different levels of adherence to keeping 2m distance; younger people and people who had had covid-19 reported lower levels of adherence. As shown above (section 3.1.3) five beliefs were also associated with different levels of adherence. Here we examine whether age and covid-19 status are related to those beliefs that are predictive of adherence.

3.1.4.1 Age x Beliefs

Age was associated with all five beliefs predictive of adherence to keeping 2m distant. The strength of each of the five beliefs increased with age. Compared with younger people, older people were more adherent to keeping 2m distance *and* more likely to strongly agree with the beliefs predictive of greater adherence, i.e. that covid-19 would be serious for them, that its symptoms will last a long time and that having covid-19 would make them anxious. Older people also had higher self-efficacy for physical distancing, i.e. were more confident that they can keep 2m distant from other people and have a stronger intention to do so. Both higher self-efficacy and intention were associated with higher adherence.

3.1.4.2 Covid-19 status x Beliefs

Covid-19 status was associated with four of the five beliefs predictive of adherence to keeping 2m distance; the belief about severity was not predictive. Compared with people who have had covid-19, people who have not had covid-19 held the four beliefs more strongly: that covid-19 symptoms would last a long time and that having it would make then anxious. They also had higher self-efficacy for physical distancing and had a stronger intention to limit their contact with other people.

3.2 Wearing a Face Covering

3.2.1 Adherence over time (3rd June to 15th July)

Between the 3rd June to the 15th July, adherence to wearing a face covering increased. At the beginning of June most people stated they wore a face covering 'rarely' or 'never'. During the week in which their use became mandatory on all forms of public transport (22nd June) a rapid increase was observed in adherence on public transport and a less pronounced increase in their use in shops (see Figure 3). In the first week of July there was a dip in adherence to use on public transport. On the 10th July it also became mandatory to wear a face covering in shops, following which adherence increased sharply for their use both on public transport and in shops.

Figure 3: Adherence to Wearing a Face Covering Behaviours During Phases 1-3 Of The Route Map Out Of Lockdown
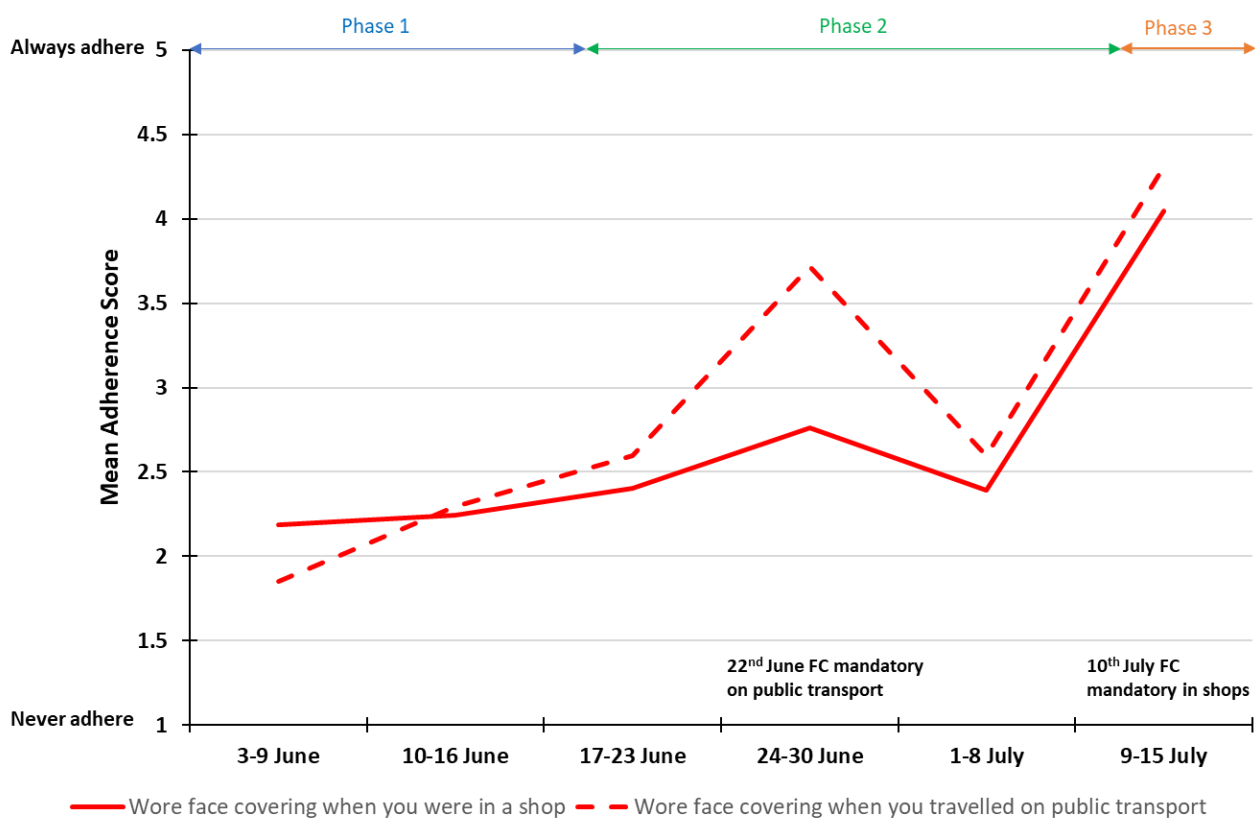
3.2.2 Who is adhering to wearing a face covering?

In multivariate analyses three sociodemographic factors were associated with adherence to wearing a face covering:

- **Age:** people between **25 and 34** had **lower** adherence
- **Work status: full-time** workers had **lower** adherence
- **Tenure:** people who **rent** their home had **higher** adherence

Figure 4 shows the rates of adherence (as percentages) for the different groups within each sociodemographic factor.

Figure 4: Adherence to wearing a face covering for different sociodemographic groups: Descriptive Data
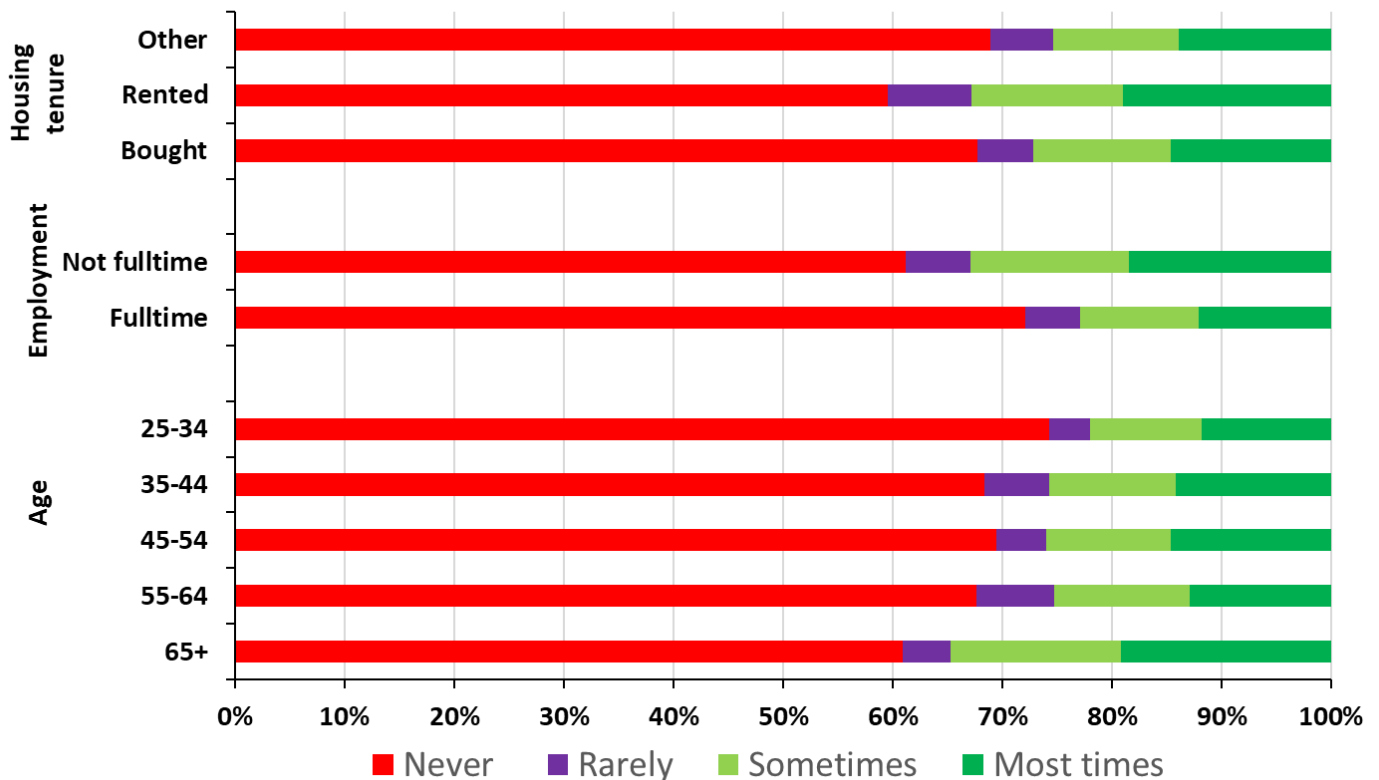
3.2.3 Beliefs associated with adherence to wearing a face covering

Six beliefs were associated with wearing a face covering. The following five beliefs were significantly **positively associated with adherence** to wearing a face covering in multivariate analyses:

Belief about Risk
- **Severity:** *If I were ill with covid-19 it would be serious for me*

Beliefs about the illness covid-19
- **Recurrence:** *I could get covid-19 again*
- **Causes of covid-19:** *I didn't wear a face covering when I went outside my home*

Beliefs about behaviours
- **Self-efficacy:** *I am confident that I can follow the government instructions, all or most of the time, of limiting contact with people*
- **Intention:** *I intend to follow all the government instructions on wearing face covering when out shopping or on public transport*

The following belief was significantly **negatively associated** with adherence to wearing a face covering in multivariate analyses:

Beliefs about behaviours
- **Normative beliefs:** *People in my area are following the government instructions of limiting contact with people, washing their hands thoroughly and frequently, and wearing a face covering when out shopping or on public transport most or all of the time*

3.2.4 Understanding differences in adherence to a wearing face covering

As shown above (section 3.2.2), age, work status and housing tenure were associated with different levels of adherence to wearing a face covering; younger people and people who work fulltime reported lower levels of adherence, whilst people who rent their home reported higher adherence. As shown above (section 3.2.3) six beliefs were also associated with different levels of adherence. Here we examine whether age, work status and housing tenure are related to those beliefs that are predictive of adherence.

3.2.4.1 Age x Beliefs

Age was associated with four of the six beliefs predictive of adherence. The strength of each belief increased with age. For example, an older person would be more likely to strongly agree with the statement *I could get Covid-19 again*, than a younger person. Thus, older people were more adherent, *and* they were more likely to believe strongly that covid-19 would be serious for them and that it can reoccur; both these beliefs were associated with greater adherence to wearing a face covering. Older people also had a higher intention to wear a face covering when outside and intention was a strong predictor of adherence. Interestingly, normative beliefs, i.e. the belief that other people are adhering to government instructions, was negatively associated with adherence yet older people held this belief more strongly, which would act to reduce adherence.

3.2.4.2 Employment Status x Beliefs

Employment status was associated with three of the six beliefs predictive of adherence to wearing a face covering. People who do not work fulltime were more adherent to wearing a face covering, *and* they believe covid-19 would be serious for them, that it is caused by not wearing a face covering and they have a high intention to wear a face covering.

3.2.4.3 Housing Tenure x Beliefs

Housing tenure was associated with three of the six beliefs predictive of adherence to wearing a face covering. Homeowners were more adherent to wearing a face covering, *and* they believe covid-19 would be serious for them and that it is caused by not wearing a face covering. However, homeowners also believed more strongly, than people who rent their home, that other people in their area were adhering to government instructions. This normative belief was associated with lower adherence, and holding it strongly was associated with decrease adherence to wearing a face covering.

3.3 Hand Washing

3.3.1 Adherence over time (3rd June to 15th July)

Hand washing was assessed via adherence to four discrete behaviours:

Washing hands:

1. as soon as you got home,
2. with soap and water
3. for at least 20 seconds
4. before eating and drinking

Between the 3rd June to the 15th July, adherence to all four hand washing behaviours was high (see Figure 5). The large majority of people indicated that they adhered 'all' or 'most of the time'. Adherence to the use of soap and water and washing hands as soon as one returns home were especially high.

Figure 5: Adherence to Hand Washing Behaviours Over Time During Phases 1-3 Of The Route Map Out Of Lockdown
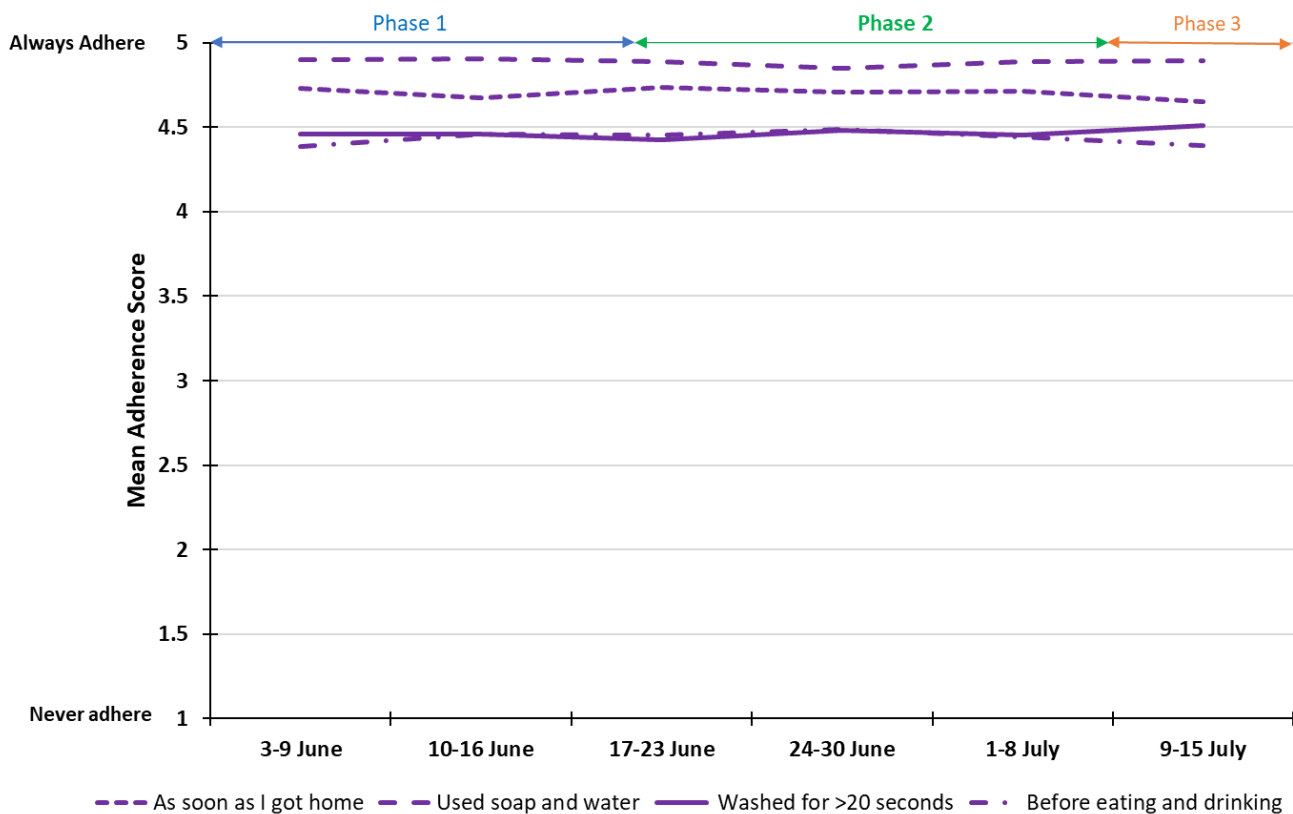
3.3.2 Who is adhering to thorough and frequent hand washing?

To examine differences in adherence to hand washing behaviours over the 6-week study period an average adherence score across the four hand washing behaviours was generated. This score represents a compound hand washing behaviour; *thorough and frequent hand washing*. Adherence to thorough and frequent hand washing was high for all sociodemographic groups.

In multivariate analyses three sociodemographic factors were associated with adherence to thorough and frequent hand washing:

- **Gender: males** have **lower** adherence
- **Age: younger** people have **lower** adherence
- **Child(ren) in household:** People living with child(ren) have **higher** adherence

Figure 5 shows the rates of adherence (as percentages) for the different groups within each sociodemographic factor.

Figure 5: Adherence to Thorough and Frequent Hand Washing by Different Sociodemographic Groups: Descriptive Data
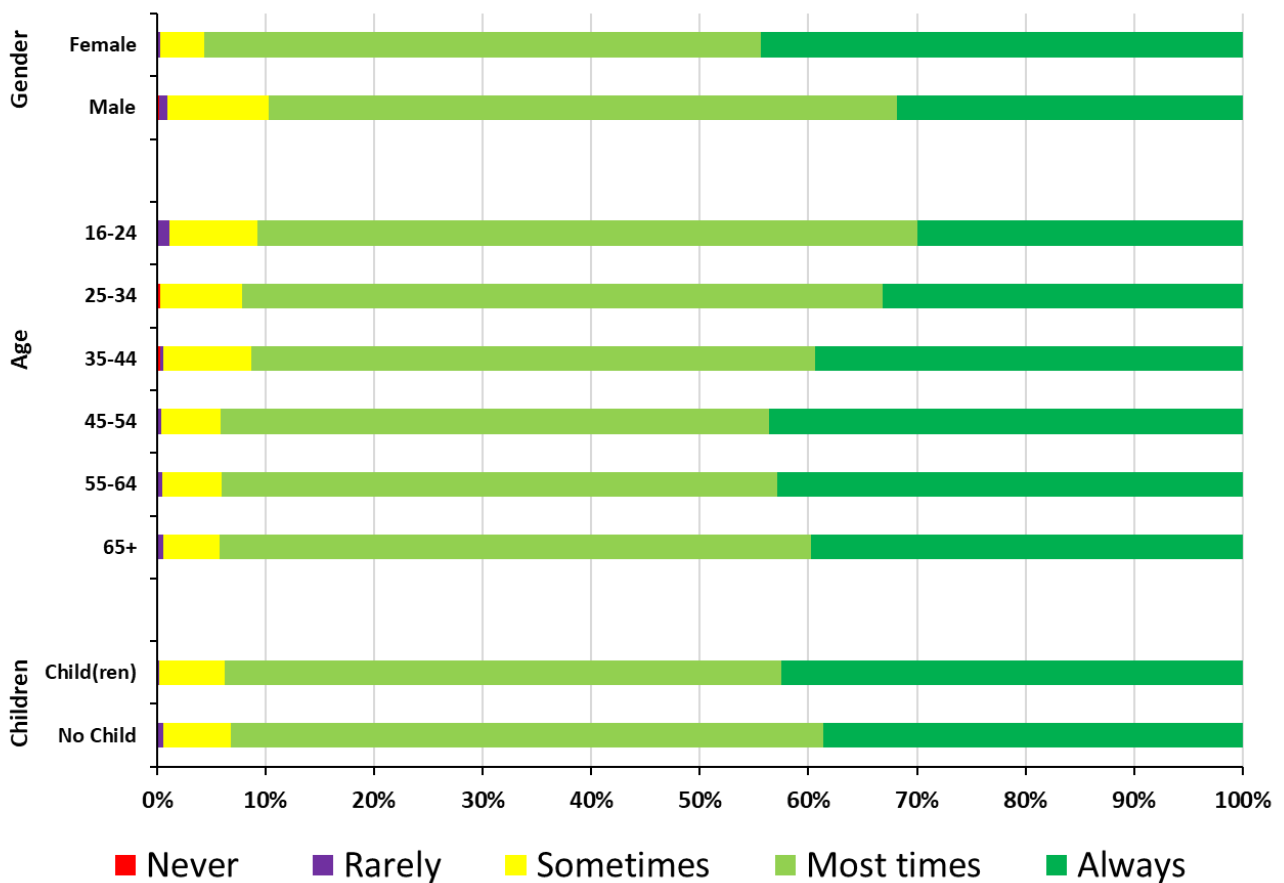
3.3.3 Beliefs associated with adherence to thorough and frequent hand washing

The following five beliefs were significantly **positively associated** with adherence to thorough and frequent hand washing in multivariate analyses:

Beliefs about Risk
- **Severity:** *If I were ill with covid-19 it would be serious for me*

Beliefs about the illness covid-19
- **Recurrence:** *I could get covid-19 again*
- **Causes of covid-19:** *Other people didn't keep their distance when I was out*

Beliefs about behaviours
- **Self-efficacy:** *I am confident that I can follow the government instructions, all or most of the time, of limiting contact with people*
- **Intention:** *I intend to follow all the government instructions on wearing face covering when out shopping or on public transport*

3.3.4 Understanding differences in adherence to thorough and frequent hand washing

As shown above (section 3.3.2), gender, age, and having children in the household were associated with different levels of adherence to hand washing; males and younger people reported lower levels of adherence, whilst people in households with children reported higher adherence. As shown above (section 3.3.3) six beliefs were associated with different levels of adherence. Here we examine whether gender, age, and having children in the household are related to those beliefs that are predictive of adherence.

3.3.4.1 Gender x Beliefs

Gender was associated with three of the five beliefs associated with greater adherence to hand washing. Females were more adherent, *and* they believed more strongly than males that covid-19 can reoccur. Females also had higher self-efficacy towards hand washing, i.e. they were more confident than men that they could wash their hands thoroughly and frequently and expressed a stronger intention to wash their hands thoroughly and frequently.

3.3.4.2 Age x Beliefs

Age was associated with two of the five beliefs associated with greater adherence to hand washing. Older people were more adherent, *and* they believed more strongly that covid-19 would be serious for them and that covid-19 can reoccur.

3.3.4.3 Child(ren) in Household x Beliefs

The number of children in a household was only associated with one belief predictive of adherence to hand washing. People in households with no children were more adherent, *and* they believed more strongly that if they were ill with covid-19 it would be serious for them.

3.4 Summary and Implications

Table 2 summarizes the findings regarding who was most and least adherent and the beliefs associated with adherence. Over all three transmission-reducing behaviours, younger people were less adherent and people with higher self-efficacy and intention to carry out the behaviour were more adherent. Belief that the risk of covid-19 was severe and could recur, as well as other beliefs about covid-19 were associated with greater adherence.

Examining the beliefs held by the less adherent groups suggests that believing covid-19 to be serious and recurring as well as having the intention and self-efficacy for adhering were important.

These results suggest that messages or interventions to increase adherence should aim to enhance population beliefs that they can carry out the behaviours and that this is something they want and intend to do. Making the behaviours more attractive and easier to accomplish, as well as persuading people that they can carry out the behaviours may facilitate greater adherence.

It might also be important to specifically target younger people, especially regarding the seriousness of covid-19.

Table 2: Summary of Adherence findings (↓ indicates less adherence; ↑indicates more adherence)

<table>
<tr><td rowspan="2"></td><td colspan="3">Transmission Reducing Behaviours</td></tr>
<tr><td>Physical Distancing</td><td>Face Covering</td><td>Hand Washing</td></tr>
<tr><td>Who</td><td>younger ↓

covid positive ↓</td><td>younger ↓

work full-time ↓

rent home ↑</td><td>younger ↓

male ↓

child in household ↑</td></tr>
<tr><td>Risk</td><td>severity ↑</td><td>severity↑</td><td></td></tr>
<tr><td>Illness</td><td>duration ↑

anxious ↑</td><td>recurrence ↑

cause= face covering↑</td><td>recurrence ↑

cause= other people's behaviours ↑</td></tr>
<tr><td>Behaviour</td><td>self-efficacy ↑

intention ↑</td><td>self-efficacy ↑

intention ↑

normative↓</td><td>self-efficacy ↑

intention ↑</td></tr>
</table>

(Row group label: **Beliefs**)

4 Health

In this section we report on general and mental health status.

We present the proportion of participants who reported poor general health and the proportion meeting the criteria for being at risk of anxiety and depression over the course of the 6-week data collection period.

In addition, for mental health we describe who reports psychological distress (anxiety and depression combined), and the association between anxiety and depression and adherence.

4.1 General and Mental Health Over Time (3rd June -15th July)

The proportion of respondents reporting poor general health and the proportion at risk of anxiety and depression is shown in Figure 6. The proportion of the participants reporting poor general health averaged ~5% over the course of the 6 weeks. The proportion of participants at risk of anxiety and depression averaged ~13% over the 6 weeks. There is a suggestion in the data that both general and mental health worsen over time; formal analyses of change over time will be conducted when additional waves of data are available.

Figure 6: General Health, Anxiety and Depression Over Time
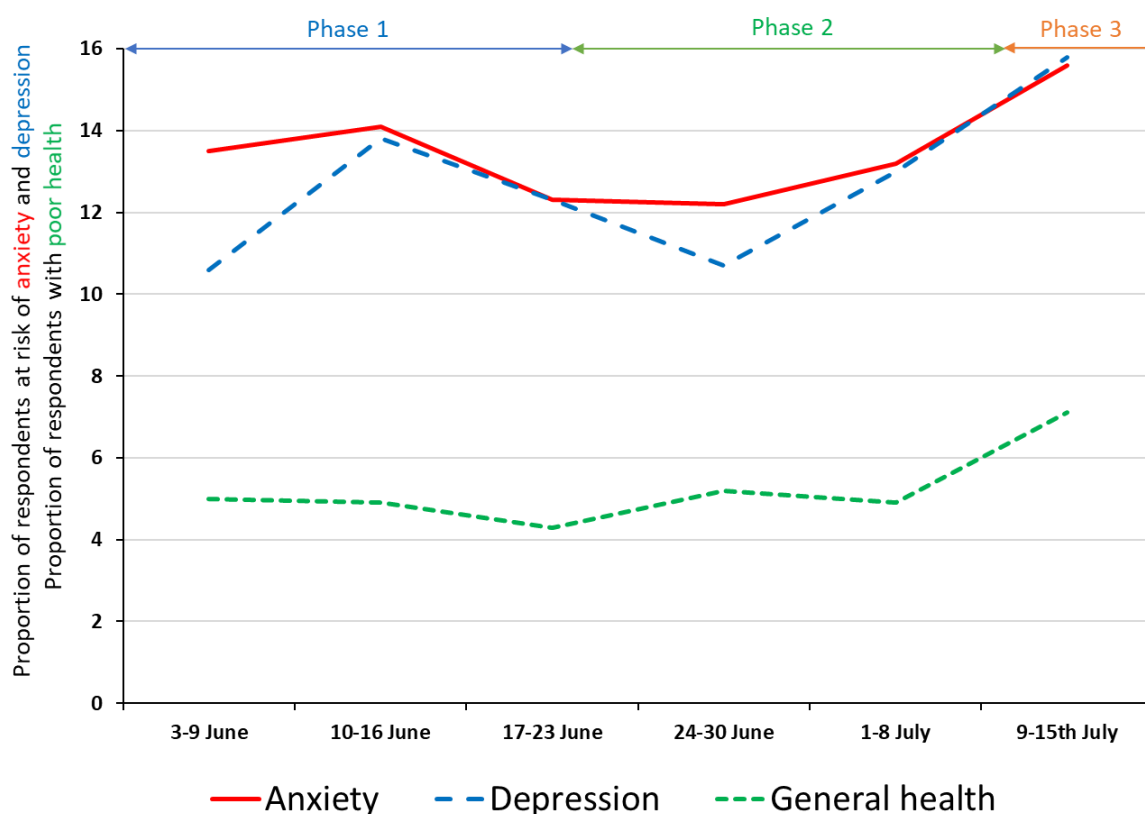
4.2 Mental Health

4.2.1 Who reports psychological distress?

Eight sociodemographic factors were associated with **higher** psychological distress. The following groups within each factor reported **higher** psychological distress:

1. **Housing Tenure:** people who rent their home
2. **Shielding:** people shielded by the government
3. **Age:** younger people
4. **Adults in household:** people living alone
5. **Scottish Parliament Region:** people living in Central Scotland (cp to Highland and Islands)
6. **Gender:** females
7. **Scottish Parliament Region:** people living in Glasgow (cp to Highland and Islands)
8. **Employment status:** not working fulltime
9. **COVID status:** people who believe they have or had had covid-19

The above list is ranked according to the difference in the proportion of participants reporting moderate or severe psychological distress between the groups within each factor. For example, within the factor 'housing tenure' are a group of people who rent their home and a group of people who own their home; 23.3% of people who rent their home reported moderate or severe distress compared to 8.1% of those who own their own home; a difference of 15.2%. This was the largest difference, the smallest difference (3.2%) was observed between the group who believed they had had covid-19 and those who believed they had not had covid-19.

Figure 7: Psychological Distress in Different Sociodemographic Groups: Descriptive Data
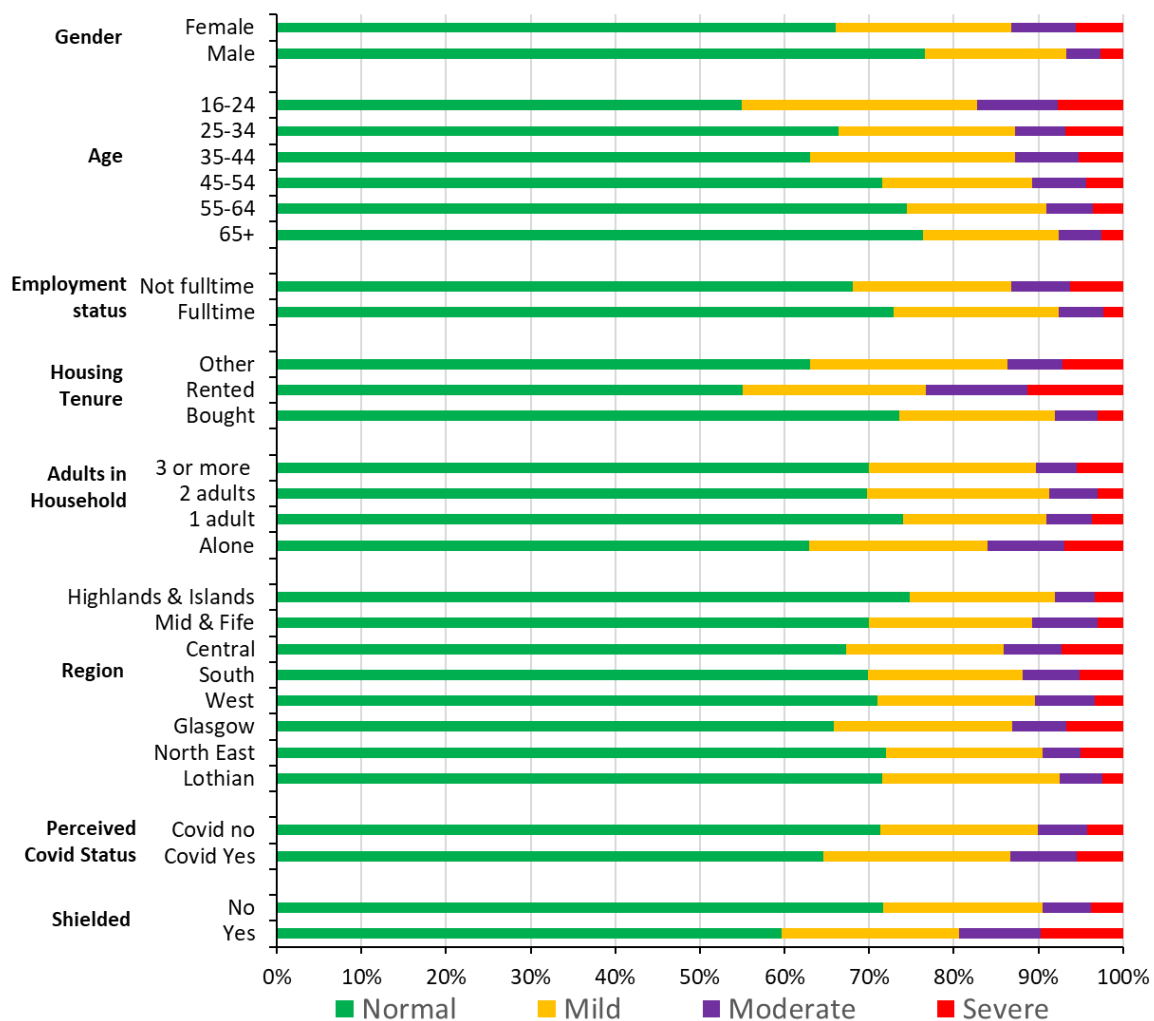
4.2.2 Relationship between health and adherence

4.2.2.1 General Health

Better general health was associated with lower adherence to wearing a face covering. General health was not associated with adherence to physical distancing or hand washing behaviours.

4.2.2.2 Mental Health

There was no association between anxiety or depression and adherence to any of the three transmission reducing behaviours.

Summary and Implications

Sociodemographic factors were associated with psychological distress. People who rent their home, those shielded by the Government, young people and those living alone were especially vulnerable to worse mental health. Consideration might be given as to how best to support the mental health of these group in particular, especially if and when restrictions are re-imposed in response to spikes in cases in local areas.

Overall Summary and Next Steps

The first 6-weeks of CHARIS have demonstrated a role for individual beliefs in relation to adherence to transmission reducing behaviours. We have shown that beliefs can contribute to understanding differences in adherence between different sociodemographic groups of the population in Scotland and to different behaviours. This understanding can be used to:

- inform evidence-based interventions/messaging by identifying:
    - groups who need support to help them adhere to each behaviour
    - beliefs to target to promote the desired behaviours in the general population and within particular groups
- identify knowledge gaps, for example:
    - CHARIS has demonstrated that males have lower confidence and weaker intentions towards hand washing behaviours, but CHARIS is not designed to identify the factors that affect their confidence and intention. Qualitative work with men would provide this required understanding.

Future Reports:

CHARIS was designed with some flexibility of content to enable us to respond to the progress of the pandemic, our ongoing analyses and evidence generated by others, for example, we have measured cognitive function so that we can examine the relationship between cognition and adherence in more depth.

We have, and will continue to measure beliefs in more detail so that we can identify environments that may pose a challenge to adherence and the beliefs associated with adherence, for example does being in a pub affect the beliefs that are predictive of adherence. Our aim is to use CHARIS to broaden our understanding of, and ability to explain adherence as our environment begins to pose greater challenges to adherence as we move through the route map out of lockdown.

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APPENDIX

A1 SURVEY: BELIEF MEASURES

A1.1 Beliefs about Illness

Identity	Cause	Cure/control	Consequences	Timeline	Emotional rep
The symptoms of COVID-19 are easy to recognise	1. Bad luck 2. A germ or virus 3. Too much contact with other people 4. Not washing your hands enough 5. Not wearing a face covering when you went outside your home 6. One of your family brought it into your home 7. Other people didn't keep their distance when you were out 8. *Poor response to the pandemic from the Scottish Government[5]* 9. *Poor response to the pandemic from the UK Government in London[6]*	1. There are actions you can take to influence how your body responds to having COVID-19 2. Your COVID-19 will be cured with treatment that doctors or nurses provide	Having COVID-19 has bad consequences for your life	1. Your COVID-19 symptoms will last a long time 2. You could get COVID-19 again	1. You spend time worrying about having COVID-19 2. Having COVID-19 makes you feel anxious

A1.2 Beliefs about Risk

Threat severity	Vulnerability	Response efficacy (behaviour X (or coping response X) will avert the threat)	Self-efficacy (SE towards being able to enact the threat reducing behaviour)	Protection Motivation/intention
If you were ill with COVID-19 it would be serious for you	1. Compared to other people similar to you in terms of age, gender, etc. do you think your chances of getting ill with COVID-19 are… 2. It is likely that you will get COVID-19	If you follow the government instructions of limiting contact with people, washing your hands thoroughly and frequently, and wearing a face covering when out shopping or on public transport it will stop you getting COVID-19	You are confident that you can avoid getting COVID-19 by following the government instructions of limiting contact with people, washing your hands thoroughly and frequently, and wearing a face covering when out shopping or on public transport	Do you intend to follow all the government instructions on each of the following? I. Limiting contact with people II. Washing your hands thoroughly and frequently III. Wearing a face covering when out shopping or on public transport

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[5] *Waves 1 and 2 only*

[6] *Waves 1 and 2 only*

A1.3 Beliefs about Behaviours

Self-efficacy	Behavioural norms	Intention
How confident or not are you that you can follow the government instructions, all or most of the time, on each of the following? I. Limiting contact with people II. Washing your hands thoroughly and frequently III. Wearing a face covering when out shopping or on public transport	How many people in your area do you think are following the government instructions of limiting contact with people, washing their hands thoroughly and frequently, and wearing a face covering when out shopping or on public transport most or all of the time?	Do you intend to follow all the government instructions on each of the following? I. Limiting contact with people II. Washing your hands thoroughly and frequently III. Wearing a face covering when out shopping or on public transport

A2 SIMPLE AND MULTIVARIATE LINEAR REGRESSION ANALYSIS AND EFFECT MODIFYING ANALYSIS

A2.1 Adherence

A2.1.1 2m Distance

A2.1.1.2 Demographics

Outcomes of the simple and multivariate linear regression analysis (Beta and standard errors), with adherence to keeping 2 metres distance as outcome and the demographic variables as predictors (multivariable: $F_{(24,2712)}=5.193$, $p < .001$, R-square = 0.044).

		Simple regressions				Multivariable regression	
		B	SE	R^2	F-change	B	SE
Gender (Ref = female)	Male	-.062*	.031	.001	3.901	-.049	.032
Age (Ref = 65+)	16-24	-.380***	.058	.027	14.994	-.355***	.069
	25-34	-.301***	.051			-.247***	.062
	35-44	-.311***	.053			-.232***	.066
	45-54	-.141**	.046			-.102	.056
	55-64	-.109*	.045			-.080	.048
Working status (Ref = not working FT)	Fulltime	-.174***	.031	.012	31.975	-.073*	.037
Adults in household (Ref=0)	1 adult	.010	.041	.001	0.501	.074	.042
	2 adults	-.022	.048			.086	.051
	3 or more	-.042	.053			.113	.058
Child(ren) in household (Ref = no)	Child(ren)	-.134**	.040	.004	11.526	-.020	.046
Region (Ref = Highlands and Islands)	Lothian	-.017	.065	.003	1.079	-.002	.064
	North East	.011	.066			.015	.065
	Glasgow	-.051	.069			-.032	.068
	West	-.091	.067			-.088	.067
	South	.051	.066			.048	.065
	Central	-.059	.066			-.025	.066
	Mid and Fife	-.035	.067			-.023	.066
Ethnicity (Ref = not white)	White	.111	.099	.000	1.272	.025	.099
Tenure (Ref = homeowner)	Renter	.030	.044	.003	4.026	.059	.046
	Other	-.160**	.060			-.019	.065
COVID status (Ref = no COVID)	COVID	-.242***	.045	.012	16.629	-.190***	.045
	Unknown	-.232**	.095			-.228*	.095
Shielded (Ref = no)	Shielded	.163**	.048	.004	11.733	.089	.049

* $p < .05$, ** $p < .01$, *** $p < .001$

Abbrevations: B = Unstandardised Beta, R^2 = R-square, Ref = Reference category, SE = Standard Error

A2.1.1.3 Beliefs About Illness

Outcomes of the simple and multivariate linear regression analysis (Beta and standard errors), with adherence to keeping 2 metres distance as outcome and beliefs about the illness as predictors (multivariable: $F_{(15,2014)}=6.784$, $p < .001$, R-square = 0.048).

		Simple linear regressions				Multivariable linear regression	
		B	SE	R^2	F-change	B	SE
Beliefs about the illness	The symptoms of COVID-19 would be easy to recognise	.061***	.017	.005	13.32	.035	.019
	Having COVID-19 would have bad consequences for your life	.107***	.016	.018	47.09	.028	.022
	Your COVID-19 symptoms would last a long time	.123***	.018	.019	46.38	.067**	.022
	You could get COVID-19 again	.093***	.020	.010	20.80	.050*	.021
	There are actions you could take to influence how your body responds to having COVID-19	.009	.018	.000	0.28	-.013	.019
	Your COVID-19 would be cured with treatment that doctors or nurses provide	.041**	.016	.003	6.82	-.003	.019
	You would spend time worrying about having COVID-19	.057***	.014	.006	15.70	-.030	.020
	Having COVID-19 would make you feel anxious	.133***	.017	.023	61.53	.076**	.026
Beliefs about the cause of the illness	Bad luck	.012	.014	.000	0.73	.000	.016
	A germ or virus	.044**	.017	.003	7.10	.028	.018
	Too much contact with other people	.057**	.018	.004	10.62	-.001	.022
	Not washing your hands enough	.058***	.015	.005	14.39	-.005	.020
	Not wearing a face covering when you went outside your home	.093***	.016	.013	34.40	.039	.020
	One of your family brought it into your home	.031*	.014	002	4.84	-.008	.017
	Other people didn't keep their distance when you were out	.128***	.018	.018	48.61	.064*	.025

* $p < .05$, ** $p < .01$, *** $p < .001$

Abbrevations: B = Unstandardised Beta, R^2 = R-square, Ref = Reference category, SE = Standard Error

A2.1.1.4 Beliefs About Risk & Behaviours

Outcomes of the simple and multivariate linear regression analysis (Beta and standard errors), with adherence to keeping 2 metres distance as outcome and beliefs about risk and behaviour as predictors (multivariable: $F_{(8,2119)}=60.803$, $p < .001$, R-square = 0.187).

	Simple linear regressions				Multivariable linear regression	
	B	SE	R^2	F-change	B	SE
Compared to other people similar to you in terms of age, gender, etc. do you think your chances of getting ill with COVID-19 are	.056**	.018	.004	10.09	.012	.017
If you were ill with COVID-19 it would be serious for you	.156***	.019	.031	69.19	.083***	.019
It is likely that you will get COVID-19	.016	.023	.000	0.51	.033	.021
If you follow the government instructions it will stop you getting COVID-19	.122***	.020	.016	37.30	.032	.021
You are confident that you can avoid getting COVID-19 by following the government instructions	.141***	.023	.016	37.72	.005	.025
How many people in your area do you think are following the government instructions most or all of the time?	.095***	.018	.010	26.62	.044*	.019
How confident are you that you can limit contact with other people	.418***	.021	.131	411.51	.258***	.027
How much do you intent to limit contact with other people	.350***	.017	.130	409.47	.213***	.022

* $p < .05$, ** $p < .01$, *** $p < .001$

Abbrevations: B = Unstandardised Beta, R^2 = R-square, Ref = Reference category, SE = Standard Error

A2.1.1.4 Demographics and Beliefs

Simple linear regression of the demographics that are associated with adherence to keeping 2 metres distance on the beliefs that are associated with adherence

Predictor		Outcome	Simple linear regressions			
			B	SE	R^2	F-change
Age		Your COVID-19 symptoms would last a long time	.008***	.001	.024	61.08
		Having COVID-19 would make you feel anxious	.006***	.001	.013	35.86
		If you were ill with COVID-19 it would be serious for you	.017***	.001	.105	276.94
		How confident are you that you can limit contact with other people	.006***	.001	.026	76.65
		How much do you intent to limit contact with other people	.005***	.001	.012	34.82
COVID status (Ref = No COVID)	COVID	Your COVID-19 symptoms would last a long time	-.503***	.052	.036	93.71
	COVID	Having COVID-19 would make you feel anxious	-1.101***	.046	.167	568.20
	COVID	How confident are you that you can limit contact with other people	-.119***	.038	.004	5.88
	Unknown		.092	.079		
	COVID	How much do you intent to limit contact with other people	-.116**	.045	.003	4.31
	Unknown		.115	.094		

A2.1.2 Wearing Face Covering

A2.1.2.1 Demographics

Outcomes of the simple and multivariate linear regression analysis (Beta and standard errors), with adherence to wearing face covering outcome and the demographic variables as predictors (multivariable: $F_{(24,2394)}=4.546$, $p < .001$, R-square = 0.044).

		Simple regressions				Multivariable regression	
		B	SE	R^2	F-change	B	SE
Gender (Ref = female)	Male	-.158*	.074	.001	4.559	-.150*	.075
Age (Ref = 65+)	16-24	-.161	.138	.017	8.133	.032	.163
	25-34	-.658***	.122			-.438**	.146
	35-44	-.387**	.125			-.214	.156
	45-54	-.508***	.109			-.293*	.131
	55-64	-.394***	.106			-.285*	.114
Working status (Ref = not working fulltime)	Fulltime	-.466***	.073	.017	41.244	-.246**	.087
Adults in household (Ref = none)	1 adult	-.016	.096	.004	3.608	.183	.099
	2 adults	-.065	.113			.169	.121
	3 or more	-.362**	.125			-.135	.137
Child(ren) in households (Ref = no)	Child(ren)	-.204*	.094	.002	4.755	-.104	.108
Region (Ref = Highlands and Islands)	Lothian	.314*	.152	.009	3.032	.317*	.151
	North East	-.080	.155			-.079	.154
	Glasgow	.317	.162			.275	.161
	West	.155	.158			.135	.157
	South	-.136	.155			-.156	.154
	Central	.077	.156			.098	.155
	Mid and Fife	-.066	.158			-.055	.157
Ethnicity (Ref = not white)	White	-.394	.233	.001	2.854	-.410	.233
Tenure (Ref = homeowner)	Renter	.356**	.104	.005	6.047	.377***	.108
	Other	-.034	.142			-.031	.154
COVID status (Ref = no COVID)	COVID	-.195	.107	.002	1.930	-.116	.107
	Unknown	.138	.225			.128	.223
Shielded (Ref = no)	Shielded	.340**	.113	.004	9.119	.174	.116

* $p < .05$, ** $p < .01$, *** $p < .001$

Abbrevations: B = Unstandardised Beta, R^2 = R-square, Ref = Reference category, SE = Standard Error

A2.1.2.2 Beliefs About The Illness

Outcomes of the simple and multivariate linear regression analysis (Beta and standard errors), with adherence to wearing face covering as outcome and beliefs about the illness as predictors (multivariable: $F_{(15,1836)}=19.896$, $p < .001$, R-square = 0.141).

		Simple linear regressions				Multivariable linear regression	
		B	SE	R²	F-change	B	SE
Beliefs about the illness	The symptoms of COVID-19 would be easy to recognise	.118**	.040	.004	8.82	.060	.043
	Having COVID-19 would have bad consequences for your life	.267***	.037	.023	52.53	.097*	.048
	Your COVID-19 symptoms would last a long time	.191***	.043	.009	19.88	.019	.048
	You could get COVID-19 again	.286***	.048	.019	35.92	.164***	.047
	There are actions you could take to influence how your body responds to having COVID-19	.028	.041	.000	0.47	-.021	.043
	Your COVID-19 would be cured with treatment that doctors or nurses provide	.041	.037	.001	1.25	-.068	.041
	You would spend time worrying about having COVID-19	.247***	.033	.023	54.49	.098*	.043
	Having COVID-19 would make you feel anxious	.272***	.040	.019	45.64	-.008	.058
Beliefs about the cause of the illness	Bad luck	.002	.033	.000	0.01	-.038	.035
	A germ or virus	.064	.039	.001	2.67	-.008	.041
	Too much contact with other people	.165***	.042	.007	15.70	-.023	.049
	Not washing your hands enough	.093*	.036	.003	6.62	-.137**	.045
	Not wearing a face covering when you went outside your home	.615***	.036	.115	298.17	.578***	.045
	One of your family brought it into your home	.066*	.033	002	3.90	-.031	.038
	Other people didn't keep their distance when you were out	.360***	.043	.029	69.76	.111*	.055

* p < .05, ** p < .01, *** p < .001

Abbrevations: B = Unstandardised Beta, R² = R-square, Ref = Reference category, SE = Standard Error

A2.1.2.3 Beliefs About Risk And Behaviours

Outcomes of the simple and multivariate linear regression analysis (Beta and standard errors), with adherence to wearing face covering as outcome and beliefs about risk and behaviour as predictors (multivariable: $F_{(8,1851)}=136.431$, $p < .001$, R-square = 0.372).

	Simple linear regressions				Multivariable linear regression	
	B	SE	R^2	F-change	B	SE
Compared to other people similar to you in terms of age, gender, etc. do you think your chances of getting ill with COVID-19 are	.165***	.042	.008	15.50	.069	.036
If you were ill with COVID-19 it would be serious for you	.299***	.045	.023	44.73	.105**	.038
It is likely that you will get COVID-19	.088	.054	.001	2.65	-.034	.044
If you follow the government instructions it will stop you getting COVID-19	.269***	.047	.016	32.47	.017	.045
You are confident that you can avoid getting COVID-19 by following the government instructions	.335***	.054	.019	37.97	-.004	.052
How many people in your area do you think are following the government instructions most or all of the time?	.008	.043	.000	0.03	-.144***	.040
How confident are you that you can wear face covering	.998***	.035	.258	821.87	.449***	.048
How much do you intent to wear face covering	.754***	.022	.332	1188.29	.555***	.032

* $p < .05$, ** $p < .01$, *** $p < .001$

Abbrevations: B = Unstandardised Beta, R^2 = R-square, Ref = Reference category, SE = Standard Error

A2.1.2.4 Demographics And Beliefs

Simple linear regression of the demographics that are associated with adherence to wearing face covering on the beliefs that are associated with adherence

Predictor		Outcome	Simple linear regressions			
			B	SE	R²	F-change
Age		You could get COVID again	.003**	.001	.004	8.92
		Not washing your hands enough	.000	.001	.000	0.10
		Not wearing a face covering when you went outside your home	-.001	.001	.000	0.37
		If you were ill with COVID-19 it would be serious for you	.017***	.001	.105	276.94
		How many people in your area do you think are following the government instructions most or all of the time?	.004***	.001	.007	21.12
		How confident are you that you can wear face covering	.002	.001	.001	2.79
		How much do you intent to wear face covering	.007***	.001	.008	23.13
Working status (Ref = Not working fulltime)		You could get COVID again	-.023	.037	.000	0.40
		Not washing your hands enough	.011	.039	.000	0.08
		Not wearing a face covering when you went outside your home	-.133***	.037	.005	12.64
		If you were ill with COVID-19 it would be serious for you	-.326***	.037	.032	77.80
		How many people in your area do you think are following the government instructions most or all of the time?	-.068*	.032	.002	4.61
		How confident are you that you can wear face covering	-.085*	.034	.002	6.15
		How much do you intent to wear face covering	-.236***	.051	.007	21.45
Tenure (Ref = Home owner)	Renter	You could get COVID again	.083	.052	.005	6.03
	Other		-.206**	.071		
	Renter	Not washing your hands enough	-.003	.055	.000	0.64
	Other		-.085	.076		
	Renter	Not wearing a face covering when you went outside your home	.170**	.053	.005	6.49
	Other		.148*	.073		
	Renter	If you were ill with COVID-19 it would be serious for you	.143**	.053	.010	11.62
	Other		-.267*	.073		
	Renter	How many people in your area do you think are following the government instructions most or all of the time?	-.217***	.045	.009	12.52
	Other		-.123*	.062		
	Renter	How confident are you that you can wear face covering	.011	.049	.000	0.03
	Other		.005	.067		
	Renter	How much do you intent to wear face covering	-.007	.073	.000	0.03
	Other		-.023	.100		

A2.1.3 Hand Washing

A2.1.3.1 Demographics

Outcomes of the simple and multivariate linear regression analysis (Beta and standard errors), with adherence to thorough and frequent hand washing outcome and the demographic variables as predictors (multivariable: $F_{(24,2912)}=6.214$, $p < .001$, R-square = 0.049).

		Simple linear regressions				Multivariable linear regression	
		B	SE	R²	F-change	B	SE
Gender (Ref = female)	Male	-.172***	.017	.034	105.676	-.174***	.017
Age (Ref = 65+)	16-24	-.109**	.032	.008	4.844	-.132***	.037
	25-34	-.074**	.028			-.112***	.034
	35-44	-.029	.029			-.094**	.036
	45-54	.014	.025			-.030	.030
	55-64	.015	.024			.001	.026
Working status (Ref = not working fulltime)	Fulltime	-.038*	.017	.002	5.059	.009	.020
Adults in household (Ref = none)	1 adult	.017	.022	.001	0.504	.041	.023
	2 adults	.008	.026			.047	.028
	3 or more	-.012	.029			.039	.031
Child(ren) in household (Ref = no)	Child(ren)	.030	.021	.001	1.940	.064**	.025
Region (Ref = Highlands and Islands)	Lothian	-.028	.035	.002	0.707	-.023	.035
	North East	-.034	.036			-.035	.035
	Glasgow	-.022	.037			-.015	.037
	West	-.030	.036			-.033	.036
	South	.002	.036			-.005	.035
	Central	.015	.036			.032	.036
	Mid and Fife	-.037	.036			-.029	.036
Ethnicity (Ref = not white)	White	-.012	.054	.000	0.049	-.029	.054
Tenure (Ref = homeowner)	Renter	.031	.024	.001	1.651	.040	.025
	Other	-.037	.033			.034	.035
COVID status (Ref = no COVID)	COVID	-.045	.025	.001	1.837	-.033	.025
	Unknown	.024	.052			.021	.051
Shielded (Ref = no)	Shielded	.042	.026	.001	2.611	.034	.027

* $p < .05$, ** $p < .01$, *** $p < .001$ Abbreviations: B = Unstandardised Beta, R² = R-square, Ref = Reference category, SE = Standard Error

A2.1.3.2 Beliefs About The Illness

Outcomes of the simple and multivariate linear regression analysis (Beta and standard errors), with adherence to hand washing as outcome and beliefs about the illness as predictors (multivariable: $F_{(15,1836)}=19.896$, $p < .001$, R-square = 0.141).

		Simple linear regressions				Multivariable linear regression	
		B	SE	R^2	F-change	B	SE
Beliefs about theillness	The symptoms of COVID-19 would be easy to recognise	.023*	.009	.002	6.21	.004	.011
	Having COVID-19 would have bad consequences for your life	.059***	.008	.018	49.28	.016	.012
	Your COVID-19 symptoms would last a long time	.062***	.010	.016	40.27	.027*	.012
	You could get COVID-19 again	.085***	.011	.026	59.91	.064***	.012
	There are actions you could take to influence how your body responds to having COVID-19	.032***	.010	.004	10.92	.016	.011
	Your COVID-19 would be cured with treatment that doctors or nurses provide	.032***	.008	.006	14.74	.004	.011
	You would spend time worrying about having COVID-19	.036***	.008	.007	21.48	-.003	.011
	Having COVID-19 would make you feel anxious	.064***	.009	.017	48.30	.018	.015
Beliefs about the cause of the illness	Bad luck	-.006	.008	.000	0.58	-.010	.009
	A germ or virus	-.005	.009	.000	0.36	-.017	.010
	Too much contact with other people	.027**	.010	.003	8.03	-.009	.013
	Not washing your hands enough	.049***	.008	.012	35.38	.020	.011
	Not wearing a face covering when you went outside your home	.060***	.009	.017	48.20	.028*	.011
	One of your family brought it into your home	.012	.008	001	2.31	-.013	.010
	Other people didn't keep their distance when you were out	.074***	.010	.019	55.84	.036**	.014

* p < .05, ** p < .01, *** p < .001

Abbrevations: B = Unstandardised Beta, R^2 = R-square, Ref = Reference category, SE = Standard Error

A2.1.3.3 Beliefs About Risk And Behaviour

Outcomes of the simple and multivariate linear regression analysis (Beta and standard errors), with adherence to hand washing as outcome and beliefs about risk and behaviour as predictors (multivariable: $F_{(8,2210)}=163.809$, $p < .001$, R-square = 0.373).

	Simple linear regressions				Multivariable linear regression	
	B	SE	R^2	F-change	B	SE
Compared to other people similar to you in terms of age, gender, etc. do you think your chances of getting ill with COVID-19 are	.041***	.010	.008	18.70	.011	.008
If you were ill with COVID-19 it would be serious for you	.074***	.010	.022	52.15	.035***	.009
It is likely that you will get COVID-19	.021	.012	.001	2.78	.023*	.010
If you follow the government instructions it will stop you getting COVID-19	.060***	.011	.012	30.66	.019	.010
You are confident that you can avoid getting COVID-19 by following the government instructions	.093	.012	.022	55.96	.015	.012
How many people in your area do you think are following the government instructions most or all of the time?	.035***	.010	.004	11.99	.001	.009
How confident are you that you can wash your hands	.402***	.016	.169	602.85	.147***	.019
How much do you intent to wash your hands	.516***	.013	.343	1549.96	.436***	.017

* $p < .05$, ** $p < .01$, *** $p < .001$

Abbrevations: B = Unstandardised Beta, R^2 = R-square, Ref = Reference category, SE = Standard Error

A2.1.3.4 Demographics And Beliefs

Simple linear regression of the demographics that are associated with hand washing on the beliefs that are associated with adherence

Predictor	Outcome	Simple linear regressions			
		B	SE	R^2	F-change
Gender (Ref = female)	You could get COVID-19 again	-.125***	.037	.005	11.37
	Other people didn't keep their distance when you were out	-.032	.032	.000	1.00
	If you were ill with COVID-19 it would be serious for you	.069	.038	.001	3.29
	How confident are you that you can wash your hands	-.106***	.017	.013	37.58
	How much do you intent to wash your hands	-.173***	.019	.027	81.95
Age	You could get COVID-19 again	.003**	.001	.004	8.92
	Other people didn't keep their distance when you were out	.001	.001	.000	0.49
	If you were ill with COVID-19 it would be serious for you	.017***	.001	.105	276.94
	How confident are you that you can wash your hands	.000	.000	.000	0.03
	How much do you intent to wash your hands	.000	.001	.000	0.00
Child(ren) in household (Ref = no)	You could get COVID-19 again	.050	.047	.001	1.14
	Other people didn't keep their distance when you were out	.014	.041	.000	0.11
	If you were ill with COVID-19 it would be serious for you	-.241***	.048	.011	25.48
	How confident are you that you can wash your hands	-.009	.022	.000	0.17
	How much do you intent to wash your hands	.018	.024	.000	0.56

A2.2 Mental Health

A2.2.1 Depression and Anxiety

A2.2.1.1 Demographics

Outcomes of the simple and multivariate linear regression analysis (Beta and standard errors), with depression and anxiety as outcome and the demographic variables as predictors (multivariable: $F_{(24,2912)}=17.443$, $p < .001$, R-square = 0.127).

		Simple linear regressions				Multivariable linear regression	
		B	SE	R^2	F-change	B	SE
Gender (Ref = female)	Male	-.770***	.100	.020	59.312	-.634***	.098
Age (Ref = 65+)	16-24	1.370***	.187	.025	14.910	2.005***	.212
	25-34	.821***	.165			1.507***	.190
	35-44	.811***	.169			1.425***	.203
	45-54	.420**	.148			1.095***	.171
	55-64	.209	.143			.733***	.149
Working status (Ref = not working fulltime)	Fulltime	-.518***	.099	.009	27.311	-.786***	.114
Adults in household (Ref = none)	1 adult	-.800***	.130	.013	12.945	-.637***	.129
	2 adults	-.623***	.153			-.679***	.157
	3 or more	-.461**	.169			-.651***	.178
Child(ren) in household (Ref = no)	Child(ren)	.241	.127	.001	3.576	-.059	.141
Region (Ref = Highlands and Islands)	Lothian	.175	.207	.006	2.475	.271	.197
	North East	.251	.211			.336	.201
	Glasgow	.679**	.220			.604**	.210
	West	.242	.215			.332	.205
	South	.426*	.211			.467*	.201
	Central	.636**	.213			.561**	.202
	Mid and Fife	.290	.215			.322	.205
Ethnicity (Ref = not white)	White	-.172	.317	.000	0.293	.248	.304
Tenure (Ref = homeowner)	Renter	1.571***	.139	.043	67.348	1.084***	.141
	Other	.738***	.190			.165	.200
COVID status (Ref = no COVID)	COVID	.386**	.145	.003	4.933	.373**	.140
	Unknown	.563	.306			.625*	.291
Shielded by government (Ref = no)	Shielded	.987***	.153	.014	41.786	1.006***	.151

* $p < .05$, ** $p < .01$, *** $p < .001$

Abbrevations: B = Unstandardised Beta, R^2 = R-square, Ref = Reference category, SE = Standard Error

Outcomes of the simple and multivariate linear regression analysis (Beta and standard errors), with adherence to keeping 2 metres distance, wearing face covering, and hand washing as outcome and the mental and general health as predictors.

				Simple regressions		Multivariable regression	
		B	SE	R^2	F-change	B	SE
Adherence to keeping 2 metres distance						$F_{(3,2734)}$=2.37, p = .069, R^2=.003	
Anxiety		.001	.001	.000	0.64	.000	.000
Depression		.000	.000	.000	1.29	.001	.001
General health		-.041*	.017	.002	5.51	-.040*	.018
Adherence to wearing face covering						$F_{(3,2411)}$=4.95, p = .002, R^2=.006	
Anxiety		-.001	.002	.000	0.55	.000	.001
Depression		.001	.001	.000	0.34	-.002	.002
General health		-.152***	.041	.006	13.54	-.154***	.041
Adherence to hand washing						$F_{(3,2958)}$=1.34, p = .260, R^2=.001	
Anxiety		.000	.000	.000	1,06	.000	.000
Depression		.000	.000	.001	2.83	.000	.000
General health		.003	.009	.000	0.10	.003	.010

* p < .05, ** p < .01, *** p < .001
Abbrevations: B = Unstandardised Beta, R^2 = R-square, Ref = Reference category, SE = Standard Error

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