Title: The effect of antibody test result knowledge on transmission reducing behaviours

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Declarations

Author contributions

The study conceptualisation and design was developed by Sara Jenks. The questionnaire was developed by Alison Morrow and Hannah Dale. Data collection was performed by Becky Batchelor and Sara Jenks. Data analysis was performed by Alison Morrow. The first draft of the manuscript was written by Alison Morrow and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

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Conflicts of interest/competing interests

The authors have no relevant financial or non-financial interests to disclose.

Ethical approval

Ethical approval was obtained from the Health Research Authority [286538]. The procedures used in this study adhere to the tenets of the Declaration of Helsinki.

Consent

Informed consent was obtained from all individual participants included in the study.

Consent for publication

Consent to publish anonymised data related to the study was obtained from all participants.

Availability of data and materials

The datasets used and/or analysed during the study are available from the corresponding author on reasonable request.

Abstract

This study explored the effect knowledge of antibody status has on compliance with transmission reducing behaviours (TRBs). Participants (n=82) comprised of NHS Lothian staff and individuals enrolled in the BioResource study with community diagnosed and treated SARS-CoV-2 infections. They completed a baseline health beliefs questionnaire, provided blood samples for antibody testing and received result 2-4 weeks later. Around 2-4 weeks later, participants completed follow-up health belief questionnaires. The questionnaire was designed based on the constructs of the Health Belief Model, the most prominent framework for understanding why individuals may or may not act in the face of a threat. Fifty-six participants completed the follow-up health belief questionnaires. Knowledge of antibody status did not affect compliance with TRBs. Increased perceived benefits, cues to action and self-efficacy, and decreased perceived barriers, to comply with TRBs was significantly associated with higher compliance. No significant correlation was found between measures of susceptibility or severity and compliance with TRBs. Interventions to increase perceived benefits, cues to action and self-efficacy, and decrease barriers, to engaging in TRBs should be explored.

Keywords: SARS-CoV-2, compliance, transmission reducing behaviours, health belief model, antibody status

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Introduction

On 11th March 2020, due to the rapid increase of cases, the World Health Organisation officially declared the SARS-CoV-2 outbreak as a pandemic (WHO, 2020a). Until an effective vaccine for SARS-CoV-2 is universally accessible, testing for infection, contact tracing and social-isolation are the most effective public health strategies to keep the virus under control (WHO, 2020b). In addition, the spread of the virus can be limited by individuals, communities and populations adhering to transmission reducing behaviours, mostly social distancing, wearing personal protection, such as a face-covering, and hand-washing behaviours (Lakshmi Priyadarsini and Suresh, 2020). Although testing for antibodies could be a critical part of managing the disease, there are a number of factors to consider. The first is that there is an assumption that previous SARS-CoV-2 infection results in immunity to reinfection; however there is currently insufficient data to support this (Huang et al., 2020). Secondly, there is still debate around the extent and duration of immunity for those who have been identified as having antibodies (Altmann et al., 2020). Finally, there are risks involved relating to the sensitivity and specificity of the tests being used, which can produce false positive and false negative results (Long et al., 2020; West et al., 2020), and therefore affect the proportion of people being correctly identified as either having, or not having, antibodies.

Much of the concerns exist based on previous evidence suggesting that people alter their behaviour and perception of risk after receiving test results in a screening programme (Larsen et al., 2007; Marteau et al., 1996). Considering our modest knowledge of attitudes and behaviours related to SARS-CoV-2 risk perception and transmission, it is essential that we understand how antibody test results may or may not affect compliance with transmission

reducing behaviours and vaccination uptake. These factors must be considered when exploring the possibility of mass population testing and providing people with the knowledge of their antibody status, which could lead to negative behavioural consequences (Green et al., 2020). The Independent Scientific Pandemic Insights Group on Behaviours (SPI-B) has identified a summary of the possible negative behavioural consequences associated with antibody testing (SPI-B, 2020). They believe that those testing positive may have: a failure to recognise and respond to future SARS-CoV-2 symptoms; reduced adherence to transmission reducing behaviours; and engagement in risky behaviour through seeking increased exposure to the virus. Those testing negative may engage in unnecessary excessive avoidance of social situations or avoiding return to work for fear of re-infection. Given these uncertainties, we cannot yet reasonably rely on antibody tests results; neither do we want knowledge of antibody test results to influence people's transmission reducing behaviours, such as social distancing and wearing face-coverings. There is a risk that people may over-estimate the belief that because they have antibodies, they are at less risk of contracting the virus in the future or transmitting it to others.

Compliance with transmission reducing behaviours by individuals and communities is required to keep the virus under control. There are a range of health behaviour models that could have relevance, such as the COM-B model of behaviour change (Michie et al., 2014) and the Protection Motivation Theory (Rogers, 1975). However, the Health Belief Model (Becker, 1974) in particular has relevance to risk behaviours relating to a threat such as SARS-CoV-2. It proposes that the key factors that influence people's health behaviours are an individual's perceived threat to sickness or ill-health, their belief of their susceptibility to disease, the potential benefits of taking some kind of preventative action, the perceived barriers to

preventative action, and finally the confidence in their ability to succeed (Rosenstock et al., 1988). The Health Belief Model has previously been used to study a variety of behaviours that require some kind of modification to individual behaviour to mitigate a health threat, such as; using sunscreen (Detweiler et al., 1999), breast self-examination (Umeh and Rogan-Gibson, 2001) and engagement in health screening programmes (Champion and Springston, 1999; Lagerlund et al., 2000). It is one of the most prominent models used to understand why people may or may not act when faced with a threat, either personally or as a community, and is thus the most appropriate framework for this study. Despite recent news of a vaccination and the start of a vaccination programme, uptake of transmission reducing behaviours is something we must continue for some time. The vaccine may not be 100% effective, nor can we be sure that those who are vaccinated will be unable to transmit the virus (Mallapaty, 2021). People will be advised to get vaccinated even if they have previously contracted SARS-COV-2. Those who have previously tested positive for SARS-CoV-2 infection and antibodies may assume that they have “natural immunity”, however little is known about how long this may last or its effectiveness. Therefore, human behaviour is critical to manage SARS-COV-2, including the uptake of a vaccination.

This study was designed to test the hypothesis that, despite receiving information to the contrary, receiving a positive antibody test result increases the perception of low susceptibility and severity of future SARS-CoV-2 infection, as well as fewer benefits, cues to action and self efficacy, and more barriers to engaging in transmission reducing behaviours, and consequently reduced compliance with transmission reducing behaviours.

Methods

Study design and recruitment

This study, named the Covid-19 Antibody Test Evaluation (CATE) study, is a cohort study design which was conducted from October to December 2020. The study received ethical approval from the Health Research Authority [286538] in August 2020. Participants were recruited by generic email invitation to NHS Lothian staff and by recruitment from individuals already enrolled in the NHS Lothian BioResource research clinic, who were offered the opportunity to co-enrol in the CATE study at their research clinic appointment. The BioResource cohort had been attending clinic appointments in Lothian outpatients to provide blood samples at 4 weeks, 6 weeks, 8 weeks and 12 weeks post PCR confirmed SARS-CoV-2 diagnosis. The majority of the cohort consisted of individuals who had mild community diagnosed and treated SARS-CoV-2 infections. Participants were required to have had a PCR confirmed COVID-19 diagnosis at least 28 days prior to enable time for antibody production to have occurred. Frail or shielding individuals were excluded from the study to avoid this group being put at any risk due to the requirement of attending hospital visits.

Procedure

Participants were invited to attend a single research clinic appointment where they completed a demographic and symptom questionnaire, a baseline health beliefs questionnaire and provided capillary and venous blood samples for antibody testing. A subgroup of participants was given the opportunity to trial a home antibody test. Laboratory testing was carried out using the Abbott SARS-CoV-2 nucleocapsid IgG assay. Participants

were provided with details of their laboratory antibody test result 2 to 4 weeks after their research clinic appointment by letter. Participants were told they were either “positive” or “negative”. All participants, regardless of whether antibody status was positive or negative, were encouraged to continue to follow government guidelines on social distancing, using face-coverings and any new guidelines that may come in to force. Follow up questionnaires were administered between 2 to 4 weeks after participants received their letter informing them of their antibody result, spanning from mid-November to mid-December 2020. Participants were contacted by email and were requested to complete the health beliefs questionnaire via an online survey platform (JISC).

Measures

Demographic information, including age, gender, healthcare worker and key-worker status, ethnicity and smoking status were collected during the initial clinic appointment. Participants were also asked to complete a health beliefs questionnaire (supplementary file 1). The questionnaire was designed based on the constructs of the Health Belief Model (Rosenstock et al., 1988). The HBM (Rosenstock et al., 1988) is one of the most prominent frameworks for understanding why individuals may or may not act in the face of a threat, in this case SARS-CoV-2 re-infection and consequently infecting others. The questionnaire consists of seven sections measuring perceived susceptibility (8 questions) and severity (4 questions) of SARS-CoV-2 infection, and the benefits (4 questions), barriers (11 questions), cues to action (8 questions), self-efficacy (4 questions) and compliance (2 questions) with transmission reducing behaviours, wearing a face-covering and socially distancing. Cues to action refer to any stimulus that triggers a behaviour, and can be internal (e.g. headache, sore chest, upset

stomach) or external (e.g. leaflet, notice board, advice from family etc.). The individual constructs were measured using a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Participants were also asked to rate their compliance with transmission reducing behaviours (“I always follow social distancing measures” and “I always wear a face-covering when in situations where it is recommended”), using a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The questionnaire was administered to participant’s pre and post knowledge of their antibody test result.

Statistical analysis

Mean substitution was used for missing items within a sub domain to complete the data set. This technique was used on 4 occasions, each time one item was missing per sub domain. When exploring the mean sub domain scores before and after substitution, this varied by less than 0.4 points (no change for 2 sub domains). Variables were then transformed to z-scores and outliers were identified as those who deviated by three standard deviations above or below the mean. The outliers identified were deemed to be a natural part of the population and therefore not removed from the statistical analysis. As such, nonparametric tests were used in the analysis of the data as they are robust to outliers, and the inclusion of them does not violate assumptions or distort results.

Descriptive statistics were conducted for the measures of demographics and rates of compliance with transmission reducing behaviours pre and post antibody status knowledge. Change scores were calculated for each HBM domain within the questionnaire by subtracting the HBM domain score at baseline from the HBM domain score at follow up.

The change score shows how participants perceived severity and susceptibility of contracting SARS-COV-19, and their perceived benefits, barriers, cues to action and self-efficacy of engaging in transmission reducing behaviours, changed following knowledge of their antibody status. A Wilcoxon signed-rank test was run to explore whether compliance in transmission reducing behaviours changed following receiving knowledge of antibody status. Mann-Whitney U tests were run to explore whether antibody status affects or changes participant's perceived risk of SARS-CoV-2 and perceived barriers, cues to action, self-efficacy of engaging in transmission reducing behaviours, as well as actual compliance with transmission reducing behaviours. Spearman's rank-order correlations were run to determine the relationship between participant's antibody status and their risk perception, as well the relationship between participant's compliance with TRBs and their perceived severity and susceptibility of SARS-CoV-2 infection, and their perceived benefits, barriers, cues to action and self-efficacy of engaging in TRBs.

Results

Participants

Eighty-two participants attended the initial research clinic appointment, completed the demographic and symptom questionnaire, the baseline health beliefs questionnaire and provided capillary and venous blood samples for antibody testing. Fifty-six of those participants completed the follow-up health beliefs questionnaire following receipt of their antibody test result. The results of the fifty-six participants will be explored. Participant characteristics did not differ greatly from the overall cohort and can be found in Table 1.

Table 1: Participant characteristics

Characteristic	n = 82	n = 56
Gender (% female)	77	78.6
Age (mean)	44	45.32
Ethnicity (% white)	98.7	100
Smoking status (% non-smoker)	75.6	75
Healthcare worker status (% HCW)	85.4	85.7
Antibody test result (% negative)	N/A	53.6

Compliance with transmission reducing behaviours

Rates of compliance with transmission reducing behaviours varied between behaviours and time points. Participant's compliance with social distancing increased post antibody status result and compliance with wearing a face-covering remained stable between the two time-points (Table 2).

Table 2: Compliance with transmission reducing behaviours before and after antibody test result (N = 56)

	Pre (% agree and strongly agree)	Post (% agree and strongly agree)
TRB		
Social distancing	78.6	85.7
Face-covering	98.2	98.2

Does antibody test result knowledge affect compliance with transmission reducing behaviours?

Knowledge of antibody status did not affect compliance with transmission reducing behaviours (Table 3). There was no significant difference in compliance in wearing a face-covering between participants who tested positive (Mean Rank: 28.12) compared to those who tested negative (28.83) for antibodies, $U(56) = 388$, $z = -.199$, $p = .842$. Similarly, change in compliance in wearing a face-covering following knowledge of antibody status did not significantly differ between participants receiving a positive (28.96) or negative (28.10) antibody test result, $U(56) = 378$, $z = -0.25$, $p = .80$. There was no significant difference in compliance with social distancing behaviour between participants who tested positive (28.54) compared to those who tested negative (28.47) for antibodies, $U(56) = 389$, $z = -.018$, $p = .986$. Similarly, change in compliance with social-distancing following knowledge of antibody status did not significantly differ between participants receiving a positive (27.77) or negative (29.13) antibody test result, $U(56) = 371.5$, $z = -.341$, $p = .733$.

Table 3: Change in compliance with in transmission reducing behaviours following knowledge of antibody status

		N	Mean Rank	Sum of Ranks
Face Mask After - Face Mask Before	Negative Ranks	7	8.57	60.00
	Positive Ranks	8	7.50	60.00
	Ties	41		
	Total	56		
	Sig. (2 tailed)	1.000		
Social Distancing After - Social Distancing Before	Negative Ranks	14	13.00	182.00
	Positive Ranks	13	15.08	196.00
	Ties	29		
	Total	56		
	Sig. (2 tailed)	0.852		

Associations between compliance with TRBs and perceived severity and susceptibility of SARS-CoV-2 infection, and perceived benefits, barriers, cues to action and self-efficacy of engaging in TRBs

Increased perceived benefits, cues to action and self-efficacy, and decreased perceived barriers, to comply with transmission reducing behaviours was significantly associated with higher rates of compliance with both wearing a face-covering and social distancing (Table 4). Although significant, many of the correlations were small according to Cohen's (1992) criteria. Medium sized correlations were found between measures of self-efficacy and compliance with social-distancing and wearing a face-covering, and measures of barriers and compliance with social-distancing.

No significant correlation was found between measures of susceptibility and severity and compliance with wearing a face-covering and social distancing.

Table 4: Associations between compliance with TRBs and perceived severity and susceptibility of SARS-CoV-2 infection, and perceived benefits, barriers, cues to action and self-efficacy of engaging in TRBs following antibody status result

		Severity	Susceptibility	Benefits	Barriers	Cues	Self-efficacy
Face- covering	Correlation	0.161	0.217	0.458	-0.451	0.321	0.586
	Sig. (2 tailed)	0.237	0.108	<.001***	<.001***	.016*	< .001***
	N	56	56	56	56	56	56
Social distancing	Correlation	0.247	0.239	0.419	-0.506	0.303	0.72
	Sig. (2 tailed)	.066	.076	.001***	<.001***	.023*	< .001***
	N	56	56	56	56	56	56

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

Does knowledge of antibody status change participant's perceived benefits, barriers, cues to action and self-efficacy of engaging in TRBs?

There was a significant difference between the change in participant's perceived cues to engaging in transmission reducing behaviours following a positive (22.37) and negative (33.82) antibody test result, $U(56) = 230.5, z = -2.627, p < 0.01$. This indicates that participants perceived there to be more cues to comply with transmission reducing behaviours following a negative antibody test. No significant difference was found between the change in participant's perceived self-efficacy, barriers or benefits to comply with transmission reducing behaviours following a positive and negative antibody test result (Table 5).

Does knowledge of antibody status change participant's perceived severity and susceptibility of SARS-CoV-2 infection?

Participant's perception of their risk of contracting SARS-COV 2 was less affected by a positive (24.06) antibody test result than a negative (32.35) result, however this difference was not statistically significant, $U(56) = 274.5, z = -1.91, p = .056$. Perceived severity of contracting SARS-COV 2 was less affected by a positive (26.00) antibody test result than a negative (30.67) result, however this difference was not statistically significant, $U(56) = 325, z = -1.09, p = .276$ (Table 5).

Table 5: Does knowledge of antibody status change participants perceived benefits, barriers, cues to action and self-efficacy of engaging in TRBs

	Severity	Susceptibility	Benefits	Barriers	Cues	Self-efficacy
	Change	Change	Change	Change	Change	Change
Mann-Whitney	325	274.5	370	371.5	230.5	388
U						
Wilcoxin W	676	625	721	836.5	581.5	853
Z	-1.09	-1.909	-0.333	-0.305	-2.627	-0.033
Sig. (2 tailed)	.276	.056	.74	.76	.009**	.973

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

Associations and difference between antibody status and perceived severity and susceptibility of SARS-CoV-2 infection

Participants who tested positive for antibodies perceived themselves to be significantly less at risk of contracting SARS-CoV-2 (20.40) than participants who tested negative (35.52), $U(56) = 179.5$, $z = -3.49$, $p < .001$. The perceived severity of contracting SARS-CoV-2 was found to be almost identical between those who tested positive (28.02) and those who tested negative (28.92), $U(56) = 377.5$, $z = -.209$, $p = .835$.

A Spearman's rank-order correlation was run to determine the relationship between participant's antibody status and their perceived susceptibility to SARS-COV-2. There was a positive correlation between antibody status and susceptibility to SARS-COV-2, which was statistically significant $r_s = .470$, $p < .001$, $N = 56$. This result indicated that participants who received a negative antibody test result perceived their susceptibility of contracting SARS-CoV-2 to be greater than those who tested positive for antibodies. No relationship between antibody status and perceived severity SARS-CoV-2 was identified, $r_s = .028$, $p = .837$, $N = 56$.

Discussion

This study examined the effect of antibody test result knowledge on compliance with transmission reducing behaviours (TRBs). The research used constructs of the Health Belief Model (Rosenstock et al., 1988) to identify the determinants of compliance with transmission reducing behaviours, specifically wearing a face-covering and social distancing, to prevent contracting and ultimately spreading SARS-COV-2. Knowledge of antibody status did not affect compliance with transmission reducing behaviours. Although there was a small increase in compliance with social distancing it was not significant, and compliance with wearing a face-covering remained stable pre and post antibody status knowledge. No difference was found between compliance with wearing a face-covering or social distancing between participants who tested positive compared to those who tested negative for antibodies. Similarly, change in compliance with transmission reducing behaviours following knowledge of antibody status did not differ between participants receiving a positive or negative result.

Participant's compliance with transmission reducing behaviours was exceptionally high before receiving their antibody status, with 98.2% agreeing or strongly agreeing with the statement "I always wear a face-covering when in situations where it is recommended" and 78.6% agreeing or strongly agreeing with the statement "I always follow social distancing measures". Existing research (Den Daas et al., 2021) examining adherence and changes in adherence over time to transmission reducing behaviours highlights that the general population are largely compliant; however participants are more compliant with wearing face-coverings than social distancing. This may be explained by the laws regulating mandatory face-coverings in public spaces. In Scotland, the general public were advised to wear face-

coverings on public transport and in public spaces in May, which then later became law in mid-June and July respectively. Additionally, although anonymous, participants within these studies may wish to avoid revealing that they were engaging in socially undesirable behaviours, like not complying with transmission reducing behaviours, thus showing an upward bias of estimates of compliance. The study population comprises predominantly of healthcare workers. Previous research has highlighted the significant and unique differences experienced by healthcare workers compared to the general population during a pandemic (Cawcutt et al., 2020). Increased fear of contracting the virus and thus infecting others is compounded by the fear of being unable to provide the level of care required to those who need it most. Similarly, increasing rates of infection of SARS-COV-2, tighter local restrictions and consequently increased pressures on the NHS during the time of the study may all affect actual or reported compliance. Thus, levels of conscientiousness and compliance within this sample may not be representative of the general population.

The findings highlighted that four out of six of the constructs of the HBM (Rosenstock et al., 1988), perceived benefits, barriers, cues to action and self-efficacy, were significantly associated with compliance with transmission reducing behaviours. The strongest associations were found between measures of self-efficacy and compliance to social-distancing and wearing a face-covering, and measures of barriers and compliance to social-distancing. Thus, participants who perceived there to be fewer barriers and more benefits, and increased self-efficacy and cues to action, were more likely to comply with both wearing a face-covering and social distancing. This aligns with previous research based on the theoretical constructs of the HBM (Rosenstock et al., 1988) which identified that cues to action and perceived benefits were predictors of wearing a face-covering during the outbreak

of SARS (Tang and Wong, 2004), and highlights that self-efficacy may also be an important factor. Participants who tested negative for antibodies perceived there to be more cues to comply with transmission reducing behaviours, however this did not translate into a change in compliance with TRBs. Given the impact of a negative antibody result on perceived cues to action, and previous research reporting this construct as a predictor of compliance, it may be that the study was not sufficiently powered to find this association. Receiving a negative antibody test may bring more conscious awareness to internal and external cues to compliance. Additionally, sharing knowledge of a negative antibody result with family and friends may increase caution, advice and recommendations and thus awareness of the importance of compliance, as well as result in more cues and social expectations to adhere to guidance.

Recent research (Harper et al., 2020; Vally, 2020) found that perceived risk of contracting SARS-CoV-2 predicted an increase in compliance with transmission reducing behaviours, such as hand-washing and social distancing. Similarly, Norman et al. (2020) found a small association between perceived susceptibility and greater compliance for three out of five recommended transmission reducing behaviours. Despite those testing negative for antibodies perceiving themselves to be at more risk of contracting SARS-COV-2, it did not significantly affect their compliance with transmission reducing behaviours. This may be explained by the fact that compliance with transmission reducing behaviours was already high, leaving little room for any significant improvement. Equally, no significant correlation was found between measures of susceptibility and severity and compliance with wearing a face-covering or social distancing. Interestingly this contradicts previous research which highlights that susceptibility, along with benefits and barriers are the most powerful

components of the HBM in influencing whether people engage in preventative behaviours (Harrison et al., 1992; Janz and Becker, 1984). One explanation may be that healthcare workers (the majority of participants) experience a diluting effect, as they have to accept a relatively high risk of exposure in their jobs, and therefore perceived susceptibility does not impact their behaviour. Additionally, this is a homogenous cohort in terms of susceptibility as by definition, all participants had and survived previous infection at least once, and are mostly relatively young, fit healthcare workers. It would be appropriate to include frail or vulnerable individuals in any follow up studies, as baseline susceptibility results may differ significantly.

This study has several limitations. Firstly, crude ratings were used to measure compliance with transmission reducing behaviours. This fails to explore the contextual factors associated with compliance, which may be affected by particular social or structural environments, such as being at home, work or in a public place (Tang and Wong, 2004). Secondly, the sample comprised mostly of healthcare workers. Due to their unique experience of the SARS-CoV-2 pandemic, they may perceive themselves to be more at risk or susceptible to infection. This may affect the samples rates of compliance with transmission reducing behaviours compared to the general population. Finally, the study's limited sample size and need for the use of non-parametric tests may affect statistical power. It is important to consider that this may lead to a type II error of failing to detect a difference that does exist. Similarly, there were too few cases to investigate any interaction between healthcare worker status and antibody status. Despite these limitations, the study's strengths include providing novel insights in to the potential determinants of compliance with transmission reducing behaviours.

Recommendations and implications for practice

In addition to further research as already discussed, there may be opportunities to apply the findings to the development of interventions to increase levels of compliance, particularly in healthcare populations. Specifically, interventions should aim to increase the perceived benefits to engaging in TRBs through evidence-based educational material and prompts/cues in the environment; the latter also seeking to increase cues to action. Interventions should also aim to increase people's self-efficacy to engage in TRBs, for example through prompting people to think about when they have succeeded in engaging in TRBs and what they did to help with this. Interventions may also need to decrease the perceived barriers, for example through using implementation intentions to support people to anticipate barriers and problem solve what they would do in these situations. Interventions emphasising people's potential susceptibility to SARS-CoV-2, despite receiving a positive antibody result, should also be explored to maintain or improve compliance.

Conclusions

Although antibody status does not appear to affect compliance with transmission reducing behaviours, further research must explore this with a larger, more diverse sample. It would be of particular interest and value to compare compliance of healthcare workers and the general population, as perceptions of risk, and thus levels of conscientiousness and compliance may differ between the two groups. Receiving a positive antibody result appears to decrease perceptions of susceptibility, which may lead to engagement in riskier behaviours and reduce compliance with transmission reducing behaviours. Further work should be done to understand and develop interventions to increase the perceived benefits, cues to action and self-efficacy, and decrease barriers, to engaging in transmission reducing behaviours, as

they are significantly associated with compliance. With this in mind, we must continue to be aware of the power of language when discussing and providing antibody status with both healthcare workers and the general population as the way in which antibody status is described may have implications on transmission reducing behaviours, transmission rates within communities and vaccination uptake.

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Supplementary file 1

Baseline Heath Belief Model Questionnaire

Participant study ID:

1. Have you received any antibody test results?

YES / NO

2. If YES, what was the approximate date and result of the antibody test result?

If NO, move straight to question 3.

Date:

Result:

Test 1 ____/____/____
 Test 2 ____/____/____
 Test 3 ____/____/____

Positive / Negative
 Positive / Negative
 Positive / Negative

3. Please read each item below and circle the number that best captures the extent to which you agree with each statement.

Please read each item below and circle the number that best captures the extent to which you agree with each statement.	5. Strongly agree				
	4. Agree				
	3. Neither				
	2. Disagree				
	1. Strongly disagree				

1. Susceptibility					
1. I am at risk of contracting COVID-19	1	2	3	4	5
2. I am at risk of catching COVID-19 when I use public transport	1	2	3	4	5
3. I am at risk of catching COVID-19 when at the shops	1	2	3	4	5
4. If I do not adhere to social distancing measures, I may be at risk of catching COVID-19	1	2	3	4	5

5. If I had COVID-19 symptoms, I would be at risk of infecting other people with COVID-19	1	2	3	4	5
6. If I had COVID-19 symptoms, I would be at risk of infecting people with COVID-19 when I use public transport	1	2	3	4	5
7. If I had COVID-19 symptoms, I would be at risk of infecting people with COVID-19 when at the shops	1	2	3	4	5
8. If I do not follow social distancing measures, I may be at risk of infecting others with COVID-19	1	2	3	4	5
2. Severity					
1. I will become very unwell if I catch COVID-19	1	2	3	4	5
2. I will have to be admitted to hospital if I catch COVID-19	1	2	3	4	5
3. My family and / or friends will become very unwell if they catch COVID-19	1	2	3	4	5
4. My friends and / or family will be admitted to hospital if they catch COVID-19	1	2	3	4	5
3. Benefits					
1. Wearing a face mask in public will protect me against COVID-19	1	2	3	4	5
2. Wearing a face mask in public will protect others against COVID-19	1	2	3	4	5
3. If I follow social distancing measures I will be keeping myself safe	1	2	3	4	5
4. If I follow social distancing measures I will be keeping other people safe	1	2	3	4	5
4. Barriers					
1. I don't have access to a face-mask	1	2	3	4	5
2. I don't know how to wear a face-mask accurately	1	2	3	4	5
3. I don't understand why I need to wear a face-mask	1	2	3	4	5
4. I don't think that wearing a face-mask would protect me from COVID-19	1	2	3	4	5
5. I don't think wearing a face-mask would protect others from COVID-19	1	2	3	4	5
6. I find it difficult to follow the social distancing measures	1	2	3	4	5
7. I don't know what the rules are around social distancing	1	2	3	4	5
8. I don't understand why I have to socially distance	1	2	3	4	5

9. I don't think socially distancing would protect me from COVID-19	1	2	3	4	5
10. I don't think socially distancing would protect others from COVID-19	1	2	3	4	5
11. There are more important things than COVID-19	1	2	3	4	5
5. Cues to action					
1. People will respect me more if I wear a face-mask in public	1	2	3	4	5
2. People will respect me more if I stick to the social distancing measures	1	2	3	4	5
3. People expect me to wear a face-mask in public	1	2	3	4	5
4. People expect me to stick to the social distancing measures	1	2	3	4	5
5. I feel worried if I do not wear a face-mask in public	1	2	3	4	5
6. I feel worried if I do not stick to the social distancing measures	1	2	3	4	5
7. My family and / or friends remind me to wear a face-mask	1	2	3	4	5
8. My family and / or friends remind me to follow social distancing measures	1	2	3	4	5
6. Self-efficacy					
1. Wearing a face-mask is easy for me	1	2	3	4	5
2. Adhering to social distancing measures is easy for me	1	2	3	4	5
3. I am confident in my ability to wear a face-mask	1	2	3	4	5
4. I am confident in my ability to follow social distancing measures	1	2	3	4	5
7. Compliance with TRBs					
5. I always wear a face-mask when in situations where it's recommended	1	2	3	4	5
6. I always follow social distancing measures	1	2	3	4	5

Follow-up Health Belief Questionnaire

Participant study ID:

1. Have you received the letter with your laboratory antibody test result following your recent clinic appointment?

YES / NO / NOT YET

2. What was the result of your laboratory antibody test?

POSITIVE / NEGATIVE / I HAVEN'T RECEIVED MY LETTER
YET

3. Was your laboratory antibody test result different from any results you received in the clinic appointment (for example, using a finger prick test kit)?

YES IT WAS DIFFERENT / NO IT WAS THE SAME / I HAVEN'T
RECEIVED MY RESULT YET

4. How would you describe your feelings about your laboratory test result?
(Please tick as many boxes as you need).

- Happy
- Relieved
- Excited
- Worried
- Stressed
- Unhappy
- Disappointed
- No feelings either way
- Prefer not to answer

5. Do you think knowledge of your antibody status will change your social distancing behaviour?

1. Extremely likely
2. Moderately likely
3. Slightly likely
4. Neither likely nor unlikely
5. Slightly unlikely
6. Moderately unlikely
7. Extremely unlikely

6. Is there any information that you would like to have received in the antibody results letter?

7. Please read each item below and circle the number that best captures the extent to which you agree with each statement.

Please read each item below and circle the number that best captures the extent to which you agree with each statement.	5. Strongly agree				
	4. Agree				
	3. Neither				
	2. Disagree				
	1. Strongly disagree				

1. Susceptibility					
1. I am at risk of contracting COVID-19	1	2	3	4	5
2. I am at risk of catching COVID-19 when I use public transport	1	2	3	4	5
3. I am at risk of catching COVID-19 when at the shops	1	2	3	4	5
4. If I do not adhere to social distancing measures, I may be at risk of catching COVID-19	1	2	3	4	5
5. If I had COVID-19 symptoms, I would be at risk of infecting other people with COVID-19	1	2	3	4	5
6. If I had COVID-19 symptoms, I would be at risk of infecting people with COVID-19 when I use public transport	1	2	3	4	5
7. If I had COVID-19 symptoms, I would be at risk of infecting people with COVID-19 when at the shops	1	2	3	4	5
8. If I do not follow social distancing measures, I may be at risk of infecting others with COVID-19	1	2	3	4	5
2. Severity					
1. I will become very unwell if I catch COVID-19	1	2	3	4	5
2. I will have to be admitted to hospital if I catch COVID-19	1	2	3	4	5
3. My family and / or friends will become very unwell if they catch COVID-19	1	2	3	4	5
4. My friends and / or family will be admitted to hospital if they catch COVID-19	1	2	3	4	5

3. Benefits					
1. Wearing a face mask in public will protect me against COVID-19	1	2	3	4	5
2. Wearing a face mask in public will protect others against COVID-19	1	2	3	4	5
3. If I follow social distancing measures I will be keeping myself safe	1	2	3	4	5
4. If I follow social distancing measures I will be keeping other people safe	1	2	3	4	5
4. Barriers					
1. I don't have access to a face-mask	1	2	3	4	5
2. I don't know how to wear a face-mask accurately	1	2	3	4	5
3. I don't understand why I need to wear a face-mask	1	2	3	4	5
4. I don't think that wearing a face-mask would protect me from COVID-19	1	2	3	4	5
5. I don't think wearing a face-mask would protect others from COVID-19	1	2	3	4	5
6. I find it difficult to follow the social distancing measures	1	2	3	4	5
7. I don't know what the rules are around social distancing	1	2	3	4	5
8. I don't understand why I have to socially distance	1	2	3	4	5
9. I don't think socially distancing would protect me from COVID-19	1	2	3	4	5
10. I don't think socially distancing would protect others from COVID-19	1	2	3	4	5
11. There are more important things than COVID-19	1	2	3	4	5
5. Cues to action					
1. People will respect me more if I wear a face-mask in public	1	2	3	4	5
2. People will respect me more if I stick to the social distancing measures	1	2	3	4	5
3. People expect me to wear a face-mask in public	1	2	3	4	5
4. People expect me to stick to the social distancing measures	1	2	3	4	5
5. I feel worried if I do not wear a face-mask in public	1	2	3	4	5
6. I feel worried if I do not stick to the social distancing measures	1	2	3	4	5

7. My family and / or friends remind me to wear a face-mask	1	2	3	4	5
8. My family and / or friends remind me to follow social distancing measures	1	2	3	4	5
6. Self-efficacy					
1. Wearing a face-mask is easy for me	1	2	3	4	5
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4. I am confident in my ability to follow social distancing measures	1	2	3	4	5
7. Compliance with TRBs					
1. I always wear a face-mask when in situations where it's recommended	1	2	3	4	5
2. I always follow social distancing measures	1	2	3	4	5