

# Trends in COVID-19 public health intervention adherence and vaccine hesitancy in South Africa: 2020–2021

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As the national vaccine roll-out ramps up, government ought to continue with accurate, continuous, and targeted communication surrounding the importance of public health interventions in the fight against the COVID-19 pandemic.

South Africa's stringent national lockdown Regulations served to contain the spread of COVID-19, but at a tremendous social and economic cost. The prioritisation of public health intervention adherence in combination with widespread vaccination coverage is critical in the effort to save lives without endangering livelihoods – but for these interventions to have an impact, sufficiently high levels of public acceptance and adherence are required.

We assessed changes in attitudes and adherence between May/June 2020 and April/May 2021 using longitudinal individual-level data from five rounds of the National Income Dynamics Study – Coronavirus Rapid Mobile Survey, a nationally representative survey conducted during the COVID-19 pandemic. We used these weighted data to estimate relevant population estimates over the period under review.

We observed a large increase in the prevalence of mask-wearing over time, from just half of all adults (53%) in May/June 2020 to the vast majority (83%) in April/May 2021. Hand hygiene decreased by approximately 20 percentage points over the same 12-month period (67% to 48%).

Staying home and physical distancing adherence remained relatively low. On aggregate, the proportion of adults who reported 'some' combination prevention behaviour (either mask-wearing or hand hygiene) increased over the year. In high-risk groups, the prevalence of mask-wearing among the hypertensive and obese adult sub-populations increased substantially, from approximately 55% in May/June 2020 to over 80% one year later. Similar trends were noted for those aged 60 years and older and those with other chronic conditions. Vaccine acceptance when first estimated in February/March 2021 was relatively high at 71%, and increased further by April/May 2021 to 76%.

As expected given the surge of COVID-19 cases, we observed a strong increase in mask-wearing adherence and intention to be vaccinated. Adherence to hand hygiene declined considerably over time, and staying at home and physical distancing remained low. Implications for policymakers are to continue with accurate, continuous, and targeted communication, health systems strengthening, and supporting multi-disciplinary research.

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## Introduction

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In March 2020, the first case of Coronavirus disease 2019 (COVID-19) was reported in South Africa, signalling the onset of a rapidly growing and deadly pandemic that threatened to collapse the health system. Early on, it became clear that one of the most effective ways to curb the spread of the virus was to implement a range of public health interventions that would require individuals to modify their behaviour. Many countries, including South Africa, implemented more stringent measures, such as partial or full lockdowns, stay-at-home orders, and/or travel restrictions to reduce mobility and hence physical interaction.

In the absence of a cure and widespread vaccination, public health interventions (PHIs) (previously known as non-pharmaceutical interventions (NPIs))<sup>1</sup> such as staying at home, physical distancing, wearing masks and hand hygiene (handwashing and/or using sanitiser), remain vital in the fight against COVID-19. These evidence-based measures allowed trade-offs between saving lives and livelihoods.<sup>2-7</sup>

Evidence also suggests that combining PHIs for infection control is more effective than using only one.<sup>8</sup> Thus, at least until vaccination coverage reaches a community immunity threshold, countries remain reliant on these measures to curb the spread of the pandemic and prevent health system overload.<sup>9</sup> Importantly, the high social and economic cost of the lockdown<sup>10-16</sup> has highlighted the significance of adherence to preventive behaviours as one of the pivotal measures for controlling COVID-19.

This paper provides a descriptive, quantitative summary of aggregate and between-group trends in PHI adherence behaviour (staying at home, avoiding mass gatherings, physical distancing, wearing masks and hand hygiene) and vaccination intention in South Africa from May/June 2020 to April/May 2021.

We analyse individual-level data from five rounds of the National Income Dynamics Study – Coronavirus Rapid Mobile Survey (NIDS-CRAM)<sup>17</sup> – a telephonic, longitudinal survey conducted from May/June 2020 to April/May 2021. The survey covers data on demographics, household welfare, employment, and COVID-19-related behaviour

and attitudes. The NIDS-CRAM sample was drawn using a stratified sampling design, and the sampling frame consists of individuals who were surveyed in the fifth round of the National Income Dynamics Study (NIDS) conducted in 2017 and were aged 18 years or older at the time of fieldwork preparation in April 2020. Given the design of the survey, the weighted NIDS-CRAM data is broadly representative of adults in South Africa who were surveyed in 2017 and followed up with in 2020 and 2021. Like the NIDS, the NIDS-CRAM was administered in the preferred official South African language of the respondent.

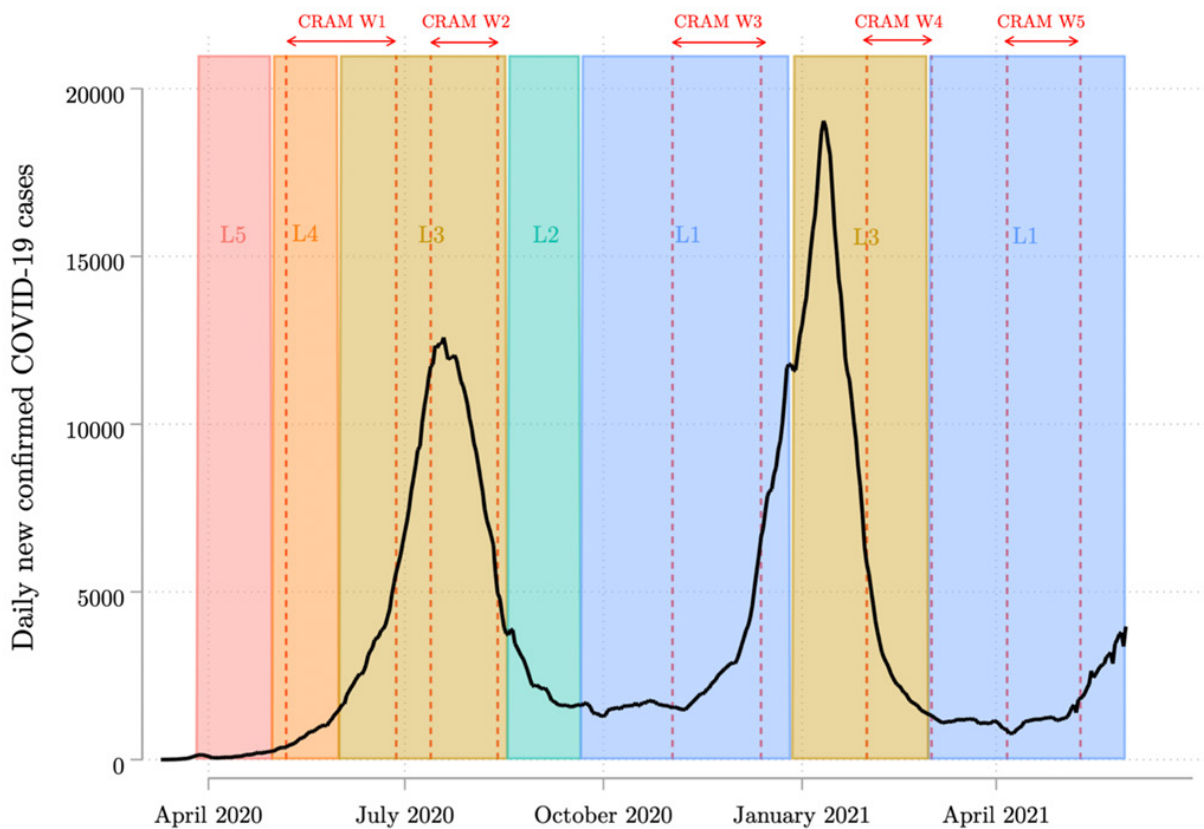
In total, over 17 500 individuals were asked to participate in the first round of the survey, of whom over 7 000 (40%) successfully completed the questionnaire. In the second round, approximately 5 700 individuals were successfully surveyed. Due to sample attrition (19%) between rounds 1 and 2, the sample was replenished with a top-up sample of about 1 100 individuals in the third round. This was done by adding a sub-sample of individuals from the NIDS round 5 sample who had not been selected for the first round of the NIDS-CRAM. After accounting for attrition (including negative attrition), this resulted in a sample of approximately 6 100 adults in the third round, 5 600 in the fourth round, and 5 800 in the fifth round. The use of sampling weights in our analysis accounts for non-random non-response and attrition in every survey round.

## The NIDS-CRAM in the context of the pandemic and lockdown in South Africa

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PHI adherence was assessed against the background of a rapidly changing environment. The relationship between the NIDS-CRAM survey rounds, COVID-19 case numbers and the various lockdown levels are depicted in Figure 1. In the beginning (during lockdown Alert Levels 5 and 4), severe restrictions on movement were imposed. However, subsequent easing of the Regulations during lockdown Alert Levels 3, 2 and 1 allowed for a return to public life that gave more freedom of movement but also posed more risk.

Figure 1: Daily new confirmed COVID-19 cases, national lockdown levels, and NIDS-CRAM rounds<sup>a</sup>



Daily new confirmed COVID-19 cases presented as weekly rolling average.

W = NIDS-CRAM survey wave (to avoid confusion, referred to as 'round' in the text); L = lockdown Alert Level.

Table 1: Summary of NIDS-CRAM survey rounds and lockdown Alert Levels

NIDS-CRAM round	Period	Lockdown Alert Levels during NIDS-CRAM round
1	7 May – 27 June 2020	<ul style="list-style-type: none"> <li>Levels 4 and 3</li> <li>Restrictions were relatively tight but began easing.</li> </ul>
2	13 July – 13 August 2021	<ul style="list-style-type: none"> <li>Level 3, starting at the peak of the first COVID-19 wave and continuing the decline in new infections</li> <li>Easing of restrictions despite a steep COVID-19 case number trajectory in June and July 2020</li> </ul>
3	2 November – 13 December 2020	<ul style="list-style-type: none"> <li>Level 1</li> <li>The fewest restrictions since the start of the pandemic in South Africa</li> <li>The beginning of the round coincided with the period that followed a lull in the pandemic.</li> <li>Towards the end of round 3, COVID-19 infections started to increase again, and the country approached the start of its second and more severe wave.</li> </ul>

<sup>a</sup> <https://ourworldindata.org/>

NIDS-CRAM round	Period	Lockdown Alert Levels during NIDS-CRAM round
4	2 February – 10 March 2021	<ul style="list-style-type: none"> <li>Adjusted Level 3</li> <li>Followed the second wave of COVID-19 infections</li> <li>On 17 February 2021, South Africa commenced Phase One of its vaccine roll-out programme, which was restricted to healthcare workers.</li> <li>Due to a possible link between the Johnson &amp; Johnson vaccine and blood clots, the vaccine roll-out programme was suspended on 13 April 2021, but resumed on 28 April 2021.</li> </ul>
5	6 April – 11 May 2021	<ul style="list-style-type: none"> <li>Adjusted Level 1</li> <li>Towards the end of the survey in May 2021, COVID-19 infections started increasing again, leading to South Africa's third COVID-19 wave.</li> <li>The country remained under lockdown Alert Level 1 until 30 May 2021. During this time, Phase One of the vaccine roll-out programme continued and by mid-May, approximately half a million healthcare workers were vaccinated. Phase Two of the vaccine roll-out programme – which extended the eligibility criteria to those 60 years and older – commenced on 17 May 2021, but the public sentiment was that the roll-out was moving far too slowly.</li> </ul>

## Measurement

This paper is based on questions included in the health module of the NIDS-CRAM questionnaire. This module poses several questions relating to health-seeking behaviour, self-assessed health, health insurance, and COVID-19-related preventive behaviour and knowledge. Importantly, as the policy and practice landscape in South Africa changed, the NIDS-CRAM questionnaire was adapted to account for these shifts. As such, data for some outcomes of interest are not available for all rounds of the survey.

### Measurement of self-reported preventive behaviour adherence (NIDS-CRAM rounds 1–5)

Our analysis focuses primarily on changes in self-reported preventive behaviour adherence against contracting COVID-19. Measures of preventive behaviours were derived from an open-ended question, which have proven useful in measuring opinion and salience.<sup>18</sup> The open-ended nature of this question also provided an opportunity to measure the salience (what is 'top of mind' for the responder) of PHI behaviours over time. Specifically, in each survey round, respondents were asked: *'Have you changed your behaviour since learning about the Coronavirus?'*. Those who responded affirmatively were then asked: *'In what ways have you changed your behaviour?'*. Enumerators were instructed to not read out possible responses and to simply select all responses given by the respondent that applied. These responses included: washing hands more; using hand-sanitiser; avoiding close contact with others; wearing a face mask; staying home more, and physical distancing. Respondents could provide as many responses as they liked.

Additionally, in some survey rounds a few direct questions on mask-wearing behaviour were included. Respondents were asked if they wore a face-mask when out in public, and the frequency thereof. We refrained from including these variables in our analysis here, given the very low degree of variation in responses.

### Measurement of combination prevention behaviour (NIDS-CRAM rounds 1–5)

Following Maughan-Brown et al.<sup>19</sup>, in our analysis 'salience' refers to the first item that respondents reported when answering the open-ended question. We also follow these authors in measuring combination prevention behaviour, which refers to a collection of behaviours that, when applied together, has the potential to reduce the risk of viral transmission and hence the growth of infections. Here, combination prevention behaviour is identified if a respondent reported both hand hygiene (either hand-washing and/or using hand-sanitiser) and mask-wearing in a given survey round, whereas 'some' combination prevention behaviour is identified if either hand hygiene or mask-wearing is reported, and 'none' if neither is reported.

### Alternative measures of mask-wearing (NIDS-CRAM rounds 3–5)

It is possible that self-reported measures of preventive behaviours, particularly mask-wearing, may reflect social-desirability bias, especially for behaviours that are legally or socially mandated. However, because of the open-ended nature of the question we describe above, the likelihood of social-desirability bias influencing our estimates is

reduced. Despite this, it remains unclear as to the degree to which our self-reported mask-wearing measure may be overestimated. Alternative estimates of mask-wearing using the following question were derived: 'In [reference month], how many people in your neighbourhood wore masks when they were in public, on the streets of your neighbourhood?'

#### Perceptions regarding contracting COVID-19 (NIDS-CRAM rounds 2–5)

From round 2 of the survey, the question 'Do you think you are likely to get the Coronavirus?' was included. Those who responded 'No' were then asked: 'Why do you think you are unlikely to get the Coronavirus?'. This item allows us to examine the dominant reasons surrounding the perceived risk of contracting COVID-19.

#### Measuring vaccination intention (NIDS-CRAM rounds 4–5)

Trends in vaccination intention and its relationship to PHI adherence behaviours were assessed.<sup>21</sup> The analysis of vaccination intention was based on the extent to which respondents agreed or disagreed with the statement: 'If a vaccine for COVID-19 were available, I would get it'. The respondent could choose from five options: 'Strongly agree'; 'Somewhat agree'; 'Somewhat disagree'; 'Strongly disagree'; 'Don't know'. 'Vaccination intention' was defined as both those who 'strongly' or 'somewhat' agreed with the statement. In contrast, 'vaccine hesitancy' was defined as those who 'strongly' or 'somewhat' disagreed, as well as those who said that they did not know.

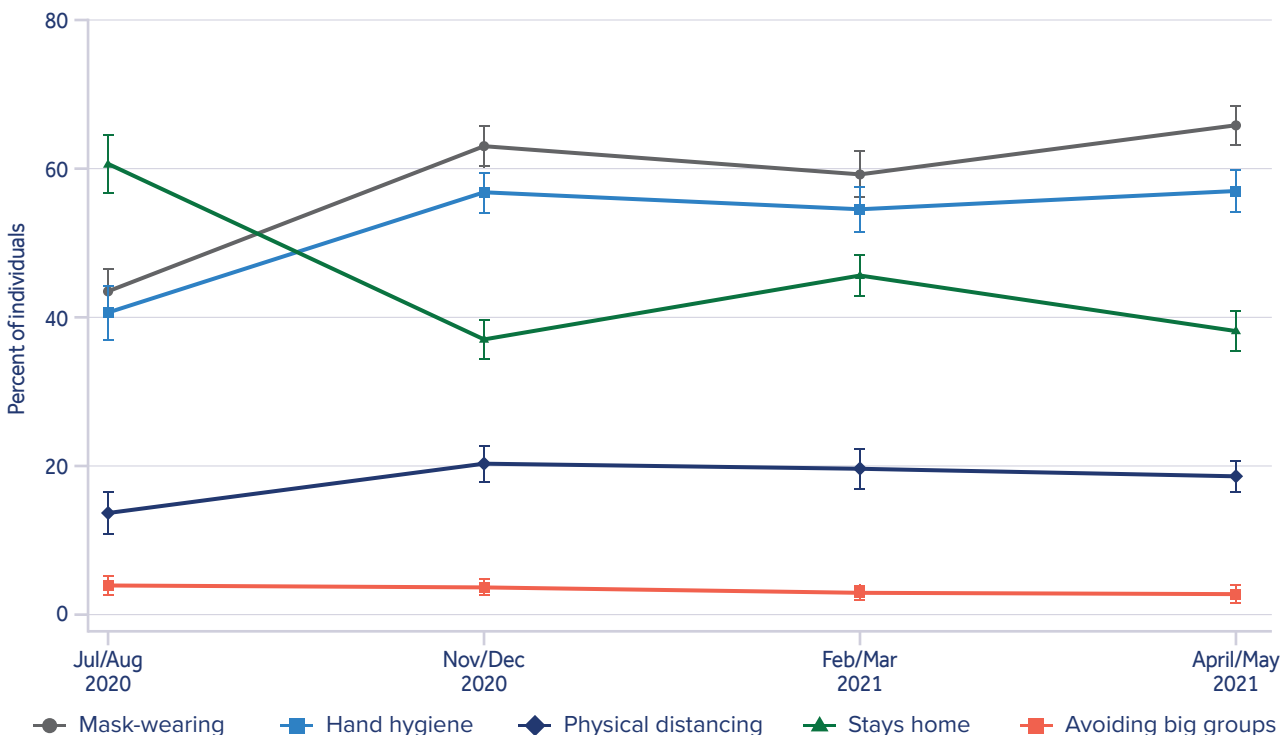
## Results

### Beliefs about contracting COVID-19

In May/June 2020, 66.57% of adults believed that they were unlikely to get COVID-19 – the highest proportion in our study period. Following the peak of the second pandemic wave (July/August 2020), this proportion decreased to 49.55% – a statistically significant change and the lowest proportion in our study period ( $p < 0.001$ ). This proportion remained relatively constant throughout the rest of the period during 2020 and 2021.

Adherence to PHIs was a dominant reason for why adults felt that they were unlikely to contract COVID-19. As shown in Figure 2, mask-wearing and hand hygiene (hand-washing or hand-sanitiser) were increasingly reported as the dominant reasons for adults believing that they were unlikely to contract COVID-19, rising from 44% and 41% in July/August 2020 to 66% and 57% in April/May 2021, respectively ( $p < 0.001$  and  $p = 0.002$ , respectively). The prevalence of these two behaviours was statistically significantly higher than all others observed from the end of 2020 onwards ( $p < 0.001$  in all cases). This may reflect people's ongoing belief in the protection afforded by adherence to these PHIs. However, this finding contrasts with the trend in the proportion of adults reporting 'staying at home' as a reason – the dominant reason reported in July/August 2020 at 61% but just 38% in April/May 2021.

Figure 2: Reasons why adults believe they are unlikely to get COVID-19, July/August 2020 – April/May 2021

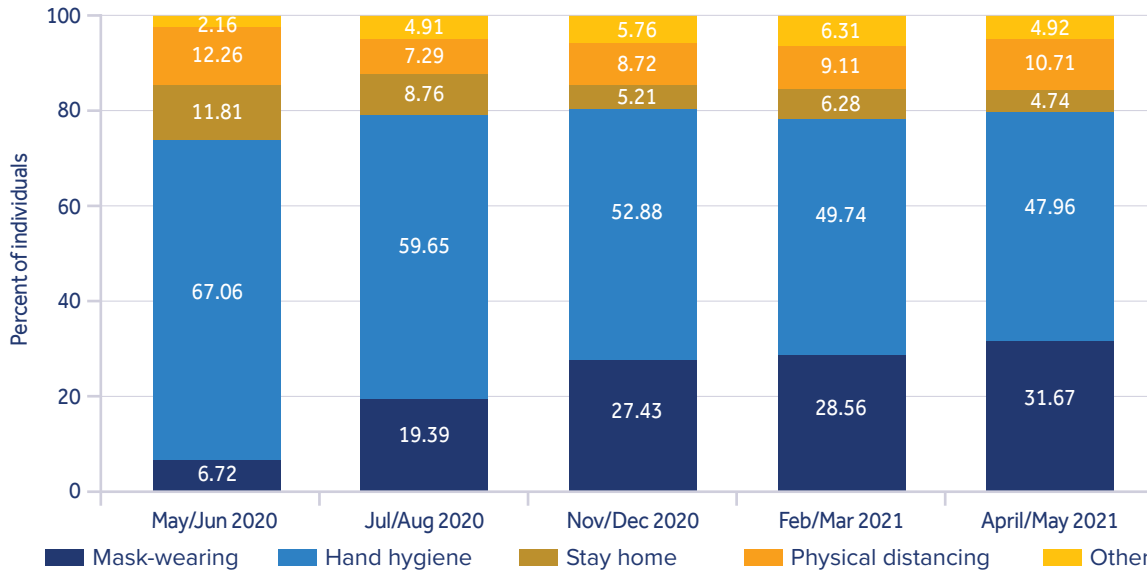


### PHI salience

A notably sustained increase in mask-wearing as a reported 'top-of-mind' PHI was observed, increasing by a factor of 5 from 6.7% in May/June 2020 to 32% of adults

in April/May 2021 (Figure 3) ( $p=0.000$ ). Despite this rise in the prevalence of mask-wearing salience, hand-hygiene salience remained consistently dominant.

Figure 3: Trends in PHI salience, May/June 2020 – April/May 2021

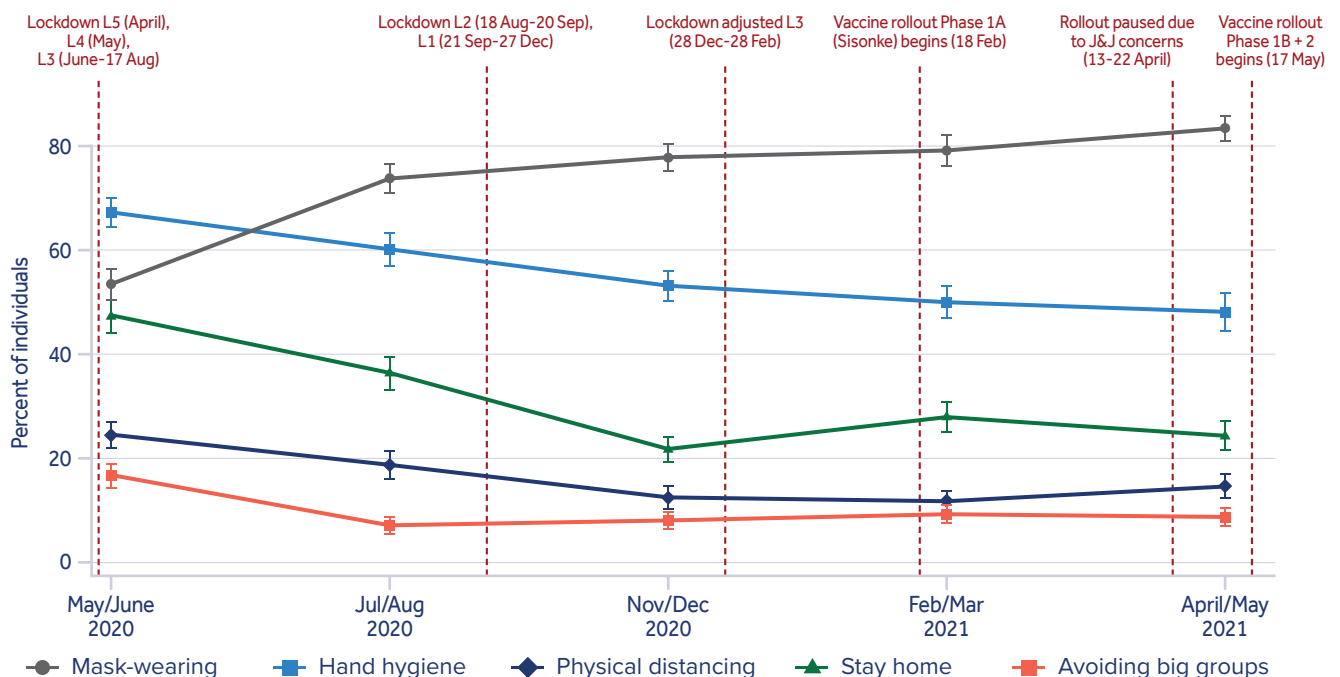


### PHI adherence behaviour

Analysis of aggregate changes in PHI adherence behaviour (Figure 4) reveals a statistically significant and sustained increase in reported mask-wearing over time, from 53% of adults in May/June 2020 to the vast majority (83%) in April/May 2021. Hand hygiene, conversely, decreased from 67% to 48% ( $p=0.004$ ). Variations in trends for other PHI

adherence behaviours are observed, but overall adherence to most of these behaviours remained low since the start of the pandemic. Most notably, the overall downward trend for staying at home is likely to be attributable to a variety of factors such as the easing of lockdown alert levels (which allow for greater social and economic interaction), holidays, and pandemic fatigue.

Figure 4: Trends in public health intervention (PHI) behaviour, May/June 2020 – April/May 2021

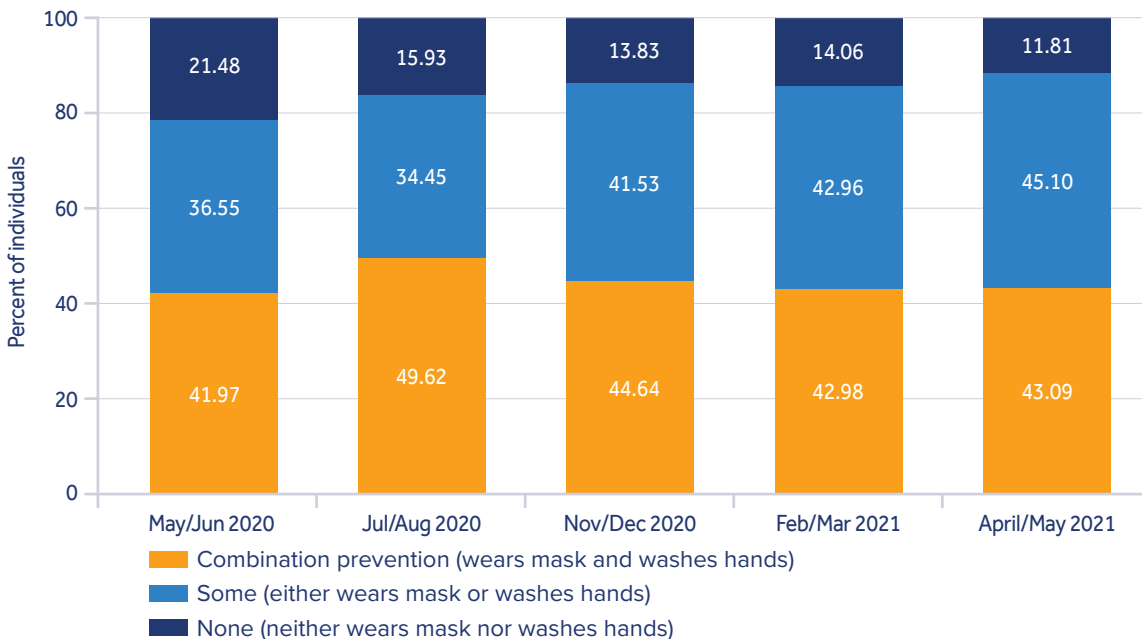


### Combination prevention behaviour

We now consider combination prevention behaviour in Figure 5 in terms of mask-wearing and hand hygiene (the two most reported PHI behaviours in the surveys). Except for rounds 1 (May/June 2020) and 2 (July/August 2020) where an increase of combination prevention behaviour is observed from 42% to 50% of adults ( $p=0.021$ ), the extent

of combination prevention behaviour remained largely unchanged on aggregate. However, on aggregate, the prevalence of ‘some’ prevention behaviour (either mask-wearing or hand hygiene) increased from 37% to 45% over the year ( $p=0.041$ ), whereas those who reported not washing their hands nor wearing a mask (‘none’) decreased from 21% to 12% ( $p=0.022$ ).

Figure 5: Trends in combination prevention behaviour, May/June 2020 – April/May 2021

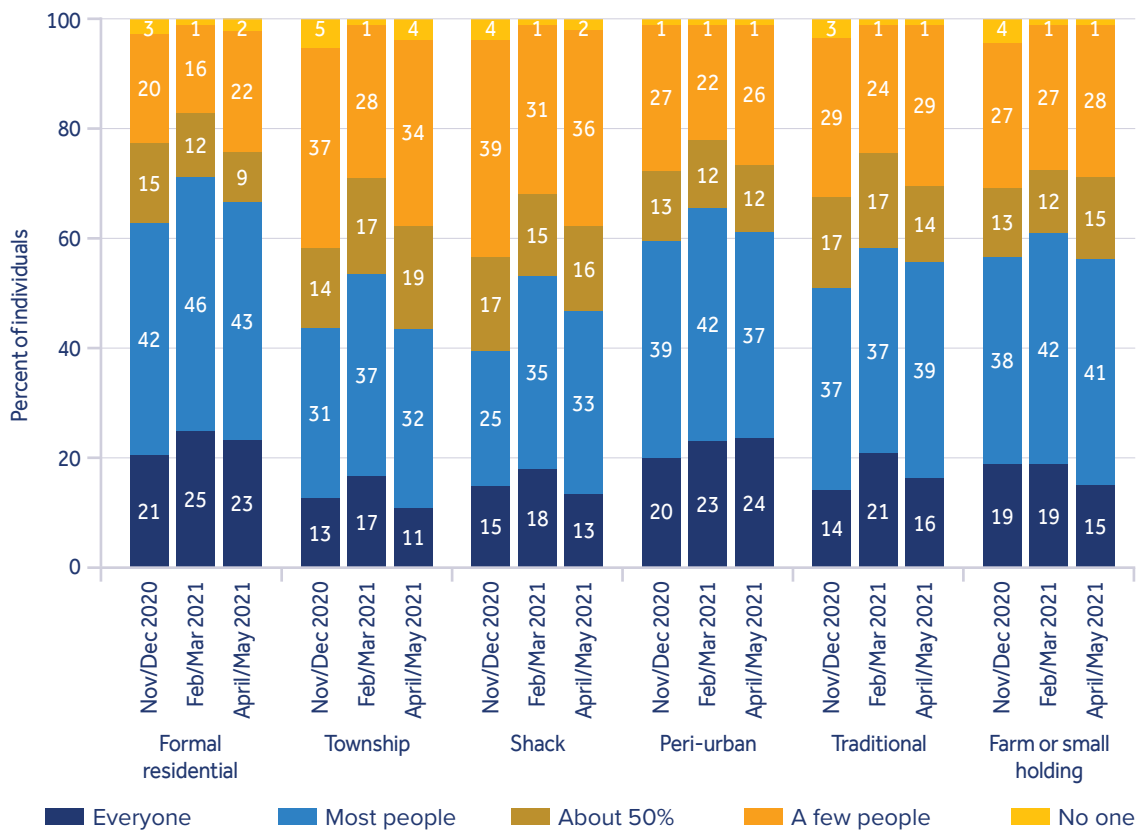


### Prevalence of mask-wearing by neighbourhood type

Within a given survey round (keeping in mind that data for this question were available only for rounds 3 to 5), the highest mask-wearing observation prevalence (i.e. the combination of ‘everyone’ and ‘most people’ in the neighbourhood wearing masks in public) was reported in formal residential and peri-urban areas (Figure 6), with

lower prevalence in townships and informal settlements. All areas saw an increase in mask-wearing prevalence (the combination of ‘everyone’ and ‘most people’) from the end of 2020 to February/March 2021, following the second COVID-19 wave. However, this upward trend reversed between February/March 2021 and April/May 2021 for all area types.

Figure 6: Neighbourhood-level prevalence of mask-wearing by neighbourhood type, November/December 2020 – April/May 2021<sup>b</sup>



### PHI adherence among high-risk groups

Notable variation in behaviour across and within several groups of adults who face a greater risk of COVID-19 mortality was observed (Table 2). Over time, the prevalence of mask-wearing among the hypertensive and obese adult sub-populations increased substantially from 55% in May/June 2020 to over 80% one year later ( $p < 0.001$ ), closely following aggregate prevalence. However, those reporting any chronic condition (including HIV, TB, and diabetes) and those older than 60 years exhibited a significant increase from May/June 2020 to November/December 2020, after which prevalence plateaued.

It was previously found that the prevalence of hand hygiene decreased on aggregate over time. This trend was also observed in several high-risk groups. However, hand-hygiene prevalence among older adults (60 years and above) exhibited a non-linear trend: increasing slightly during the last half of 2020 before decreasing during the remainder of the period. Considering physical distancing, prevalence among high-risk groups follows the average and does not statistically differ from it in any period ( $p > 0.200$  in all cases), with the notable exception of those with high blood pressure in April/May 2021, when 19.4% of hypertensive adults reported physical distancing – statistically higher than the average of 14.6% ( $p = 0.034$ ).

<sup>b</sup> Geographic area definitions follow Visagie and Turok.<sup>20</sup>



Table 2: Trends (% of individuals) in PHI adherence behaviour across high-risk groups, May/June 2020 – April/May 2021

Group	May/Jun 2020	Jul/Aug 2020	Nov/Dec 2020	Feb/Mar 2021	April/May 2021
<b>Mask-wearing</b>					
Hypertensive	55.3	74.0	77.8	79.1	82.4
Obese	56.5	74.9	76.7	78.2	84.5
Any chronic condition <sup>c</sup>	51.2	76.0	79.2	76.2	80.0
Age					
18–34	51.1	74.2	76.9	81.3	85.1
35–59	55.0	76.2	79.4	80.3	84.8
60+	54.6	65.7	75.7	72.3	76.0
All adults	53.3	73.8	77.8	79.1	83.3
<b>Hand-washing</b>					
Hypertensive	65.1	58.0	58.0	54.7	51.9
Obese	69.7	64.8	57.8	52.6	54.1
Any chronic condition <sup>b</sup>	66.1	63.9	58.6	54.4	54.2
Age					
18–34	67.0	59.8	48.9	45.3	43.6
35–59	68.6	63.2	55.6	54.2	53.5
60+	63.5	51.7	55.7	53.4	46.4
All adults	67.2	60.1	52.9	49.8	48.0
<b>Physical distancing</b>					
Hypertensive	21.6	17.1	11.9	14.1	19.4
Obese	24.7	18.4	10.0	12.7	14.3
Any chronic condition <sup>b</sup>	25.6	18.5	9.6	11.2	12.4
Age					
18–34	24.4	19.0	13.0	12.7	16.0
35–59	25.8	18.9	13.1	11.6	13.7
60+	22.0	17.2	9.1	12.6	17.3
All adults	24.7	18.7	12.5	11.7	14.6

### Vaccination intention

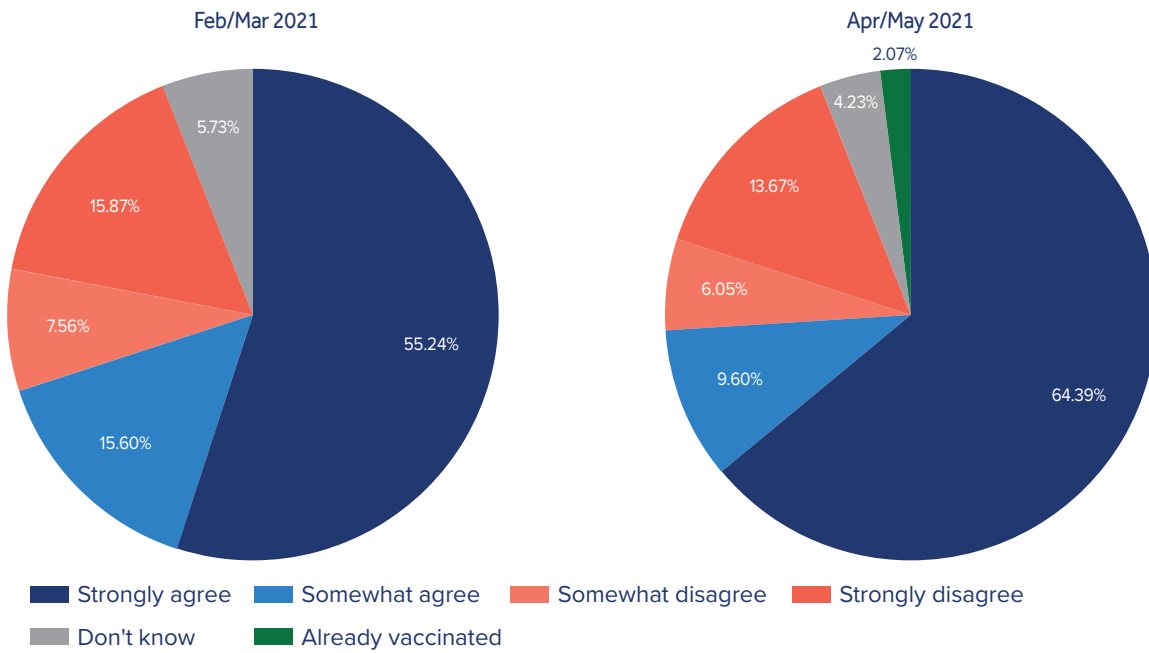
There is encouraging evidence about vaccination intention (respondents who ‘strongly agree’ or ‘somewhat agree’ to be vaccinated for COVID-19 if available) in South Africa.<sup>21</sup> It was relatively high (71%) when it was first estimated in February/March 2021 and increased further by April/May 2021 (76%) – a statistically significant difference ( $p=0.031$ ) (see Figure 7). Most adults felt ‘strongly’ about being vaccinated, conditional on a vaccine being available to them (55% in February/March 2021

and 64% in April/May 2021). The vast majority (85%) of adults who strongly agreed in February/March 2021 also strongly agreed a few months later in April/May. Among the hesitant, just 43% of those who strongly disagreed maintained their beliefs over time.<sup>21</sup> Vaccine-related beliefs were not necessarily time-invariant. Notably, 40% of those who strongly *disagreed* with receiving a COVID-19 vaccine if available to them in February/March 2021 either somewhat or strongly *agreed* two months later.

c ‘Any chronic condition’ includes HIV, TB, and diabetes.

Figure 7: COVID-19 vaccination intention, February/March 2021 and April/May 2021

Weighted response to "If a vaccine for COVID-19 were available, I would get it."

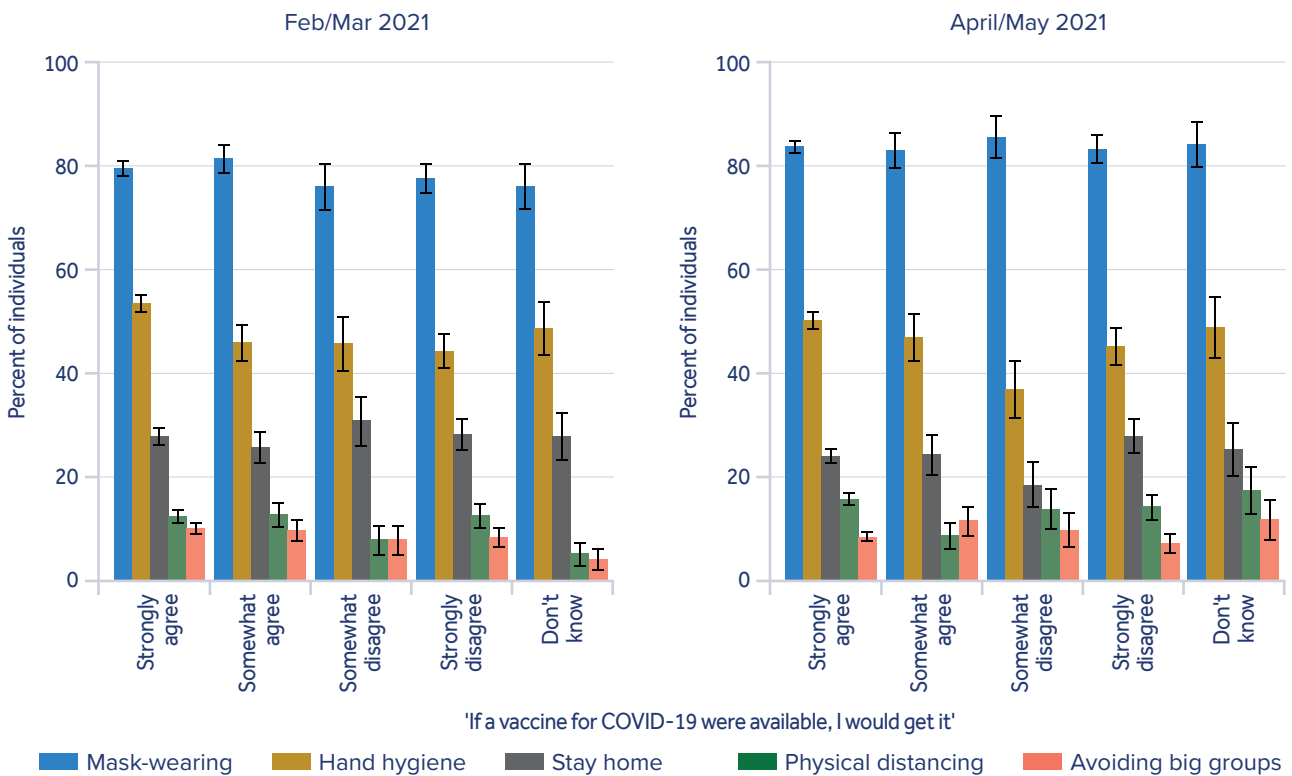


Source: Burger et al. 2021.<sup>21</sup>

We expected to find a relationship between PHI adherence and vaccine beliefs, but we observe no significant variation in PHI adherence across vaccine beliefs, regardless of

PHI (see Figure 8). This may be received as good news by policymakers, since it implies that they may need not rely on vaccine beliefs to encourage PHI adherence, or vice versa.

Figure 8: PHI adherence by COVID-19 vaccination intention, February/March 2021 and April/May 2021



## Summary of findings

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Our analysis showed that mask-wearing and hand hygiene remained consistently dominant as key PHI-related strategies among adults in South Africa. Almost half believed they were unlikely to contract COVID-19, with the vast majority citing mask-wearing and hand hygiene as primary reasons for their response. This finding suggests a high degree of agency and empowerment among respondents. Equally, our results show a lower reported prevalence of mask-wearing in township and informal settlements. More research should be conducted to explore the reasons behind this.

A significant and sustained increase in mask-wearing (from 53% in May/June 2020 to 83% by April/May 2021) was observed. Hand hygiene decreased over the same period (67% to 48%). Encouragingly, large increases in mask-wearing were noted among those who fell within high-risk categories. Of concern was the steady decrease in hand hygiene across all high-risk groups. Physical distancing remained low overall, as well as among those within the high-risk categories, and continued to decline over time. Similar changes were noted in other settings.<sup>22</sup> The only significant change was noted among hypertensive respondents who were more likely to practice physical distancing relative to the average.

Encouraging evidence for a relatively high amount of vaccination intention was observed, conditional on access.<sup>21</sup> Among adults, 76% reported an intention to be vaccinated in April/May 2021 – a statistically significant increase from February/March 2021 (71%). The smaller proportion who reported hesitancy cited side-effects as the primary reason.<sup>21</sup> The results show that vaccine-related beliefs are not 'rigid' but exist along a continuum. This suggests that investment in interventions that aim to persuade individuals to be vaccinated, even those who are particularly vaccine-hesitant, holds promise. This aligns with evidence from other surveys.<sup>23–25</sup>

## Discussion

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Knowledge of COVID-19 prevention behaviour change over time is vital for assessing the success of prior and current strategies, and for informing future adaptations. Given the slow pace of vaccination and suboptimal levels of vaccine demand in many parts of the world and South Africa, PHI adherence remains a key strategy for curbing the spread of COVID-19.

The need for widespread, consistent PHI adherence and high vaccination coverage is even more pressing given the rise of more dangerous variants which threaten to undermine vaccination efforts. The arrival of the highly transmissible Delta variant resulted in a massive and rapid upswing in cases, precipitating a third wave and necessitating the implementation of a fresh round of lockdown measures.

Experts predicted a fourth wave in South Africa before the end of 2021.<sup>26</sup> Indeed, at the time of writing, a new and highly transmissible variant – the Omicron variant – had been discovered in multiple parts of the world, including South Africa. The latter, coupled with increased probabilities of transmission through close contact among individuals within households, schools, workplaces and at gatherings, as well as a slow pace of vaccination, warrants ongoing and consistent adherence to the broad range of PHIs. Policymakers should consider prioritising the maintenance or adoption of several strategies and approaches. These are briefly discussed as follows.

### Ongoing consistent, targeted communication

Risk communication remains a central strategy to prevent further infections during a pandemic.<sup>27</sup> The results presented here demonstrate that overall PHI adherence was relatively high, and most respondents have consistently adopted mask-wearing as a prevention strategy. The findings also demonstrate an increase in adherence over time, both overall and among those in high-risk groups. This suggests that communication regarding wearing of masks may have successfully changed behaviour and should be amplified, particularly given the high prevalence of the Delta and new Omicron variants.<sup>26</sup> Notably, hand hygiene has declined over time, and of concern is that physical distancing levels have remained relatively low.

Earlier NIDS-CRAM reports have applied behavioural change theoretical lenses that have great utility for informing communication strategies. The behavioural literature shows that it is difficult to encourage people to continue adhering to PHIs when the threat of the pandemic subsides, media coverage is lower, and life starts to return to its pre-COVID rhythms.<sup>28,29</sup> The pandemic will become less visible and salient, and under such circumstances it will be harder to motivate the daily sacrifices inherent in PHIs as COVID-fatigue sets in. Many may be tempted to succumb to erroneous learning, reasoning that their risk may be low because they have not yet contracted the virus.

It has previously been shown that COVID-fatigue in South Africa is more likely among men, those residing in poorer households, and those living in peri-urban areas.<sup>19</sup> In terms of sources of information, most people received information via news networks (80%), but the most reliable information regarding symptoms was obtained from government sources of healthcare workers. News networks should be supported to communicate accurate information, and the current approach of health officials and researchers using television as a means of communication should continue.

Prior analysis has shown that vaccination hesitance was more likely among those living in urban residential housing, who spoke Afrikaans, were White or Coloured, and were social media users and youth.<sup>21</sup> Notably, a large share of adults indicated being more likely to consider vaccination should a well-known community leader receive the vaccine and demonstrate that they remain well thereafter. Clearly,

an opportunity exists to adopt a positive stance when communicating, which means focusing on the high levels of population vaccination intention; and providing information on how vaccines are manufactured and typical vaccine side-effects.<sup>21</sup> Communities should be mobilised, and key figures and organisations should be supported with accurate information and resources where possible to, in turn, support their communities. Such bottom-up approaches are important to engage the harder-to-reach communities and to ensure that trusted individuals lead through role-modelling.

Ongoing, targeted communication should be rooted in an understanding of behavioural change theories and concepts, as COVID-19 prevention is considered to be for the public good, meaning that the personal benefits of complying are fewer than social benefits as a whole.<sup>22</sup> Greater emphasis should be placed on informing the public about the importance of physical distancing and avoiding non-essential gatherings, particularly in private and household settings. It is vital to provide detailed guidance on how to behave within the household, at workplaces and in gatherings when meeting with non-household members to reduce person-to-person spread, as people tend to drop their guard in such instances. Ultimately, clear and consistent communication should be increased alongside messages of hope for the future.

Lastly, the pandemic has brought to the fore the importance of discipline-specific and interdisciplinary research that provides information on a broad range of biomedical, social, public health, health systems and economic factors of relevance. Constant monitoring of the pandemic should be coupled with ongoing surveillance of PHI adherence and the impacts of various State strategies that target behavioural change. In this light, longitudinal surveys provide important policy-relevant information.

## Conclusion

The COVID-19 pandemic has disrupted normal life across the globe and has forced changes in behaviour. Governments have had to respond rapidly by instituting a range of PHIs and other measures to contain and mitigate the spread of the virus and in so doing, reduce morbidity and mortality. In South Africa, PHI adherence will continue to be the mainstay of prevention until such time that vaccine coverage rates can assure population-wide protection. Current mask-wearing adherence is relatively high, as is vaccination intention. However, staying home and physical distancing compliance is low, and this could possibly be caused by increased population mobility in response to eased lockdown restrictions. This requires further research and attention, as mask-wearing alone is insufficient to limit SARS-CoV-2 spread. South Africa has done well to communicate the importance of and enforce the wearing of face coverings, physical distancing, and hand hygiene. However, effective communication of the salience

of these behaviours as important preventative measures must be sustained to overcome compliance fatigue while the government continues its vaccine roll-out.

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