Who Australasians trusted during COVID-19: lessons from the pandemic response

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ABSTRACT

AIM: Public trust in authoritative information sources is a key element of a successful public health response to a pandemic. This study investigated which sources of COVID-19 advice were most trusted by a primarily New Zealand-based cohort and considers implications for policy and practice regarding future pandemics.

METHOD: Data were from a COVID-19 vaccine intention survey presented to Australia- and New Zealand-based members of the longitudinal Dunedin Study (n=832) between ages 48 and 49, immediately before vaccines became available for the general population within New Zealand. We assessed participants' trust in specific sources of COVID-19 advice and investigated whether the pattern of responses differed by sex, socio-economic status (SES) or education.

RESULTS: Doctors and healthcare providers were the most trusted source of COVID-19 advice, over and above other institutional sources. This pattern was consistent across sex, SES and education. Institutional experts were trusted significantly more by those with higher SES compared to those with lower SES, and by those with formal qualifications compared to those without formal qualifications.

CONCLUSION: Our findings suggest that it is important to empower healthcare providers early in a pandemic to share advice with the public alongside other trusted sources, such as the government.

Global research shows that trust is important for public compliance with protective measures during a pandemic,[1–3] including the recent COVID-19 pandemic.[4,5] For example, international research indicates that greater trust in government was associated with better adherence to COVID-19 guidelines,[2,5] reduced COVID-19 death rates[4] and higher rates of vaccination.[5] Evidence suggests that trust in scientists is particularly important for compliance with public health measures and facilitates positive attitudes toward vaccination.[3] In the face of a novel health crisis, trusted information from others is crucial for guiding individuals' behaviour. However, trust in unreliable sources could be damaging to a pandemic response;[2] therefore, it is important to understand which sources are most trusted by the public. Researchers often distinguish between trust in institutions, known as institutional trust,[4] and trust in the general public, known as social trust.[6] In this study, we assessed trust in both institutional sources and social sources.

Research from the United States indicates that the relationship between trust and compliance with COVID-19 protective measures depends, at least in part, on individual factors.[2] Individual characteristics associated with historical experiences of discrimination or disadvantage could lead to institutional mistrust, including, for example, women, people with low levels of education, or people experiencing socio-economic deprivation.[7] Findings on the relationship between sex and trust are mixed,[8,9] but the majority of research suggests that those with a higher socio-economic status (SES)[10–12] or greater education[12–14] display higher levels of trust than those with a lower SES or lower education. Furthermore, greater mental health issues, adverse childhood experiences and particular personality traits, including greater negative emotionality, are related to lower levels of trust.[12]

Given the centrality of trust for a successful pandemic response,[1–6] it is important to understand which information sources are most trusted by individuals, and therefore which sources of information are best suited to provide the public with pandemic advice. International research shows that individuals trust pandemic-related information from institutional sources, such as scientists and governments, more than other

sources,[15] but more information is needed on which sources are most trusted in the New Zealand and Australian contexts. The purpose of this study was to investigate which sources of COVID-19 information are most trusted by individuals living in Australasia and to examine differences by sex, SES and education. Members of the Dunedin Multidisciplinary Health and Development Study ("The Dunedin Study") living in New Zealand and Australia were surveyed between April and July of 2021 on their levels of trust in different sources of COVID-19 advice. At the time of the survey, COVID-19 had been globally pervasive for over a year and participants were likely to have been exposed to COVID-19 information over that time. Data were collected immediately before the New Zealand public became eligible for vaccinations. Based on previous research demonstrating the importance of institutional trust for a successful pandemic response,[1–6] we expected participants to have high trust in perceived experts, such as healthcare providers, scientists, and the government. Based on past research suggesting that historically disadvantaged characteristics are associated with higher distrust,[8–11,13,14] we expected individuals with these characteristics to display less trust overall.

Method

Participants

Participants were members of The Dunedin Study, a longitudinal investigation of health and behaviour in a representative birth cohort born between 1 April 1972 and 31 March 1973 in Dunedin, New Zealand. This cohort has previously been described in extensive detail.[16] Data have been collected at birth and each participant came to the research unit for private interviews and examinations at ages 3, 5, 7, 9, 11, 13, 15, 18, 21, 26, 32, 38 and most recently at age 45, when 94% of Study members still alive in 2019 participated. In April–July 2021, we invited the 942 living Study members residing in New Zealand and Australia to report their vaccine intentions in a rapid survey, obtaining an 88% response rate (*n*=832). The Dunedin Study was approved by the Health and Disability Ethics Committee, Manatū Hauora – Ministry of Health, New Zealand. Study members gave informed consent before participating.

Trust in sources of COVID-19 advice

To understand which sources could be best suited to provide the public with pandemic advice, Study members living in New Zealand and Australia were invited to complete a survey of their COVID-19 vaccine intentions between April and July of 2021, at ages 48–49.[12] Of the 942 Study members contacted, 832 (88%) agreed to take part. As part of this survey, participants were asked to indicate (yes/maybe/no) whether they trusted COVID-19 advice from each of 14 different sources (see Appendices). Given that some participants were based in Australia, we did not include New Zealand-based public servants and politicians (at the time, Director-General of Health Ashley Bloomfield, Prime Minister Jacinda Ardern and Minister for COVID-19 Chris Hipkins) in our analysis, as participants based overseas were instructed to respond differently to these sources (see Appendices).

Variables

Education level

Education level was measured as the highest level of educational attainment completed by Dunedin Study members at the time of the age-45 assessment. In our analysis, we compared those with formal qualifications (at least a high school qualification) to those with no formal qualifications (no high school qualifications by age 45).

Socio-economic status

Socio-economic status was measured at age 45 using standard New Zealand occupation-based indices,[17,18] which use a six-interval classification system (e.g., a doctor scores 1 and a labourer scores 6). Scores of 1 or 2 were allocated to high SES group; those scoring 3 or 4 were allocated to the medium SES group and those scoring 5 or 6 were allocated to the low SES group.
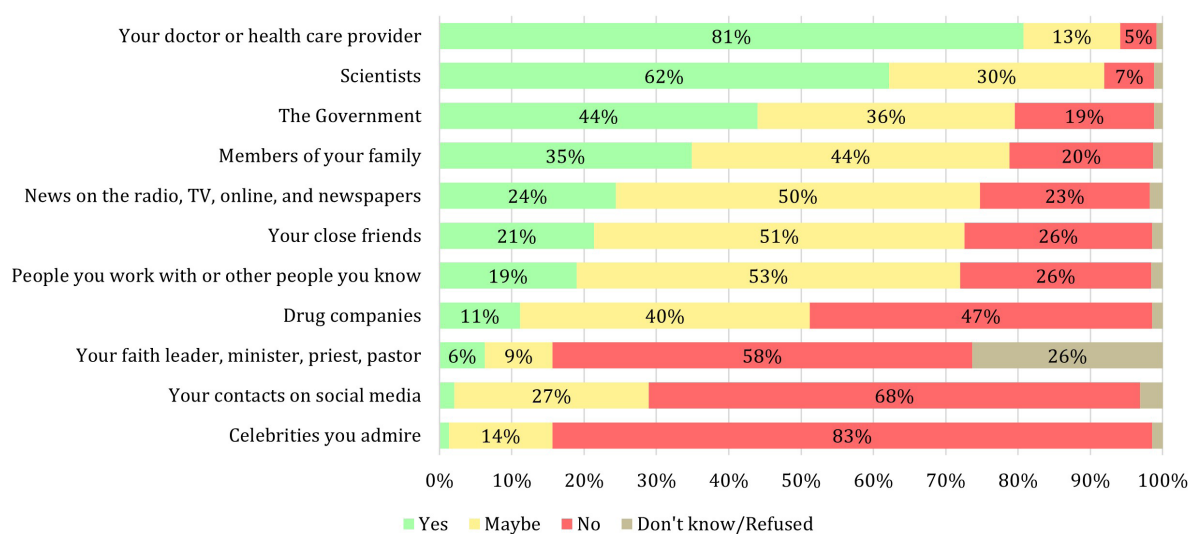
Sex

Sex was measured as the biological sex recorded at birth.
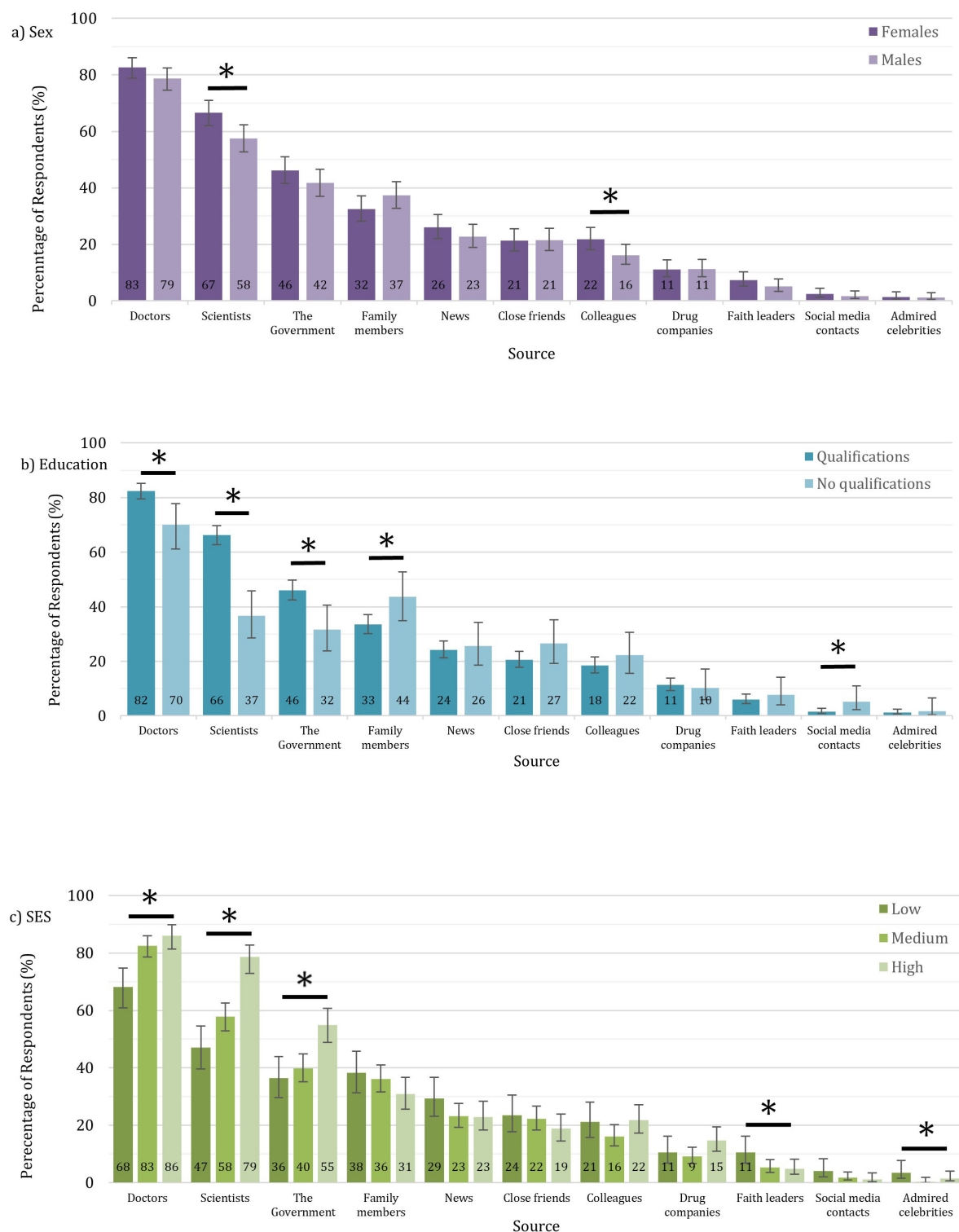
Data analysis

Stata SE v17 was used for all statistical analyses and a significance threshold of *p*<.05 was chosen. First, we calculated the percentage of respondents that trusted each source of COVID-19 advice (indicated "yes"). We then used two sample proportion tests (*z*-tests) to test for statistically significant differences in trust between the sources. We compared the level of trust in COVID-19 advice from doctors/healthcare providers and the government

Table 1: Participant characteristics (*n*=831).

Characteristic	*n*	%
Sex		
Female	422	51%
Male	409	49%
Education level		
Formal qualifications	714	86%
No formal qualifications	117	14%
SES		
Low	166	20%
Medium	399	48%
High	266	32%

Figure 1: Percentage of respondents that trusted different sources of COVID-19 advice.

Note: data labels below 4% are not shown.

Figure 2a, b, c: The percentage of respondents that trust each source by sex, education and SES.

a) Sex

b) Education

c) SES

Note: data labels below 9% are not shown.

*Significant differences (*p*<.05) between subgroups are marked by an asterisk.

to trust in other sources (restricted to the sources trusted by more than 20% of respondents). We then used Chi-squared tests to assess whether the proportion of respondents that trusted each source differed significantly across sex, education or socio-economic status. Finally, we conducted sensitivity analyses for those living in New Zealand only, to assess whether findings differed between these individuals and those based in both New Zealand and Australia (see Appendices).

Results

Participant characteristics are displayed in Table 1, excluding one individual with no education level information. All were aged 48 or 49.

Overall trust in each source

Figure 1 shows the percentage of participants who said "yes," they trusted that source for COVID-19 advice. The most trusted sources of COVID-19 advice were doctors/healthcare providers (81%), followed by scientists (63%), the government (44%) and family members (35%). The least trusted sources of COVID-19 advice were admired celebrities (1%), social media contacts (2%) and faith leaders (6%).

Statistical comparisons between trusted sources

Compared with doctors/healthcare providers, a significantly lower percentage of participants trusted scientists (19%, $p<.001$), the government (37%, $p<.001$), family members (46%, $p<.001$), news organisations (56%, $p<.001$) and close friends (59%, $p<.001$). Compared with the government, a significantly higher percentage of participants trusted scientists (18%, $p<.001$), whereas a significantly lower percentage of participants trusted their family members (9%, $p<.001$), news organisations (20%, $p<.001$) or their close friends (23%, $p<.001$).

Demographic differences

Overall, females and males had similar levels of trust in each source, although females trusted scientists ($p=.007$) and colleagues ($p=.036$) significantly more than males (Figure 2a). Those with formal qualifications and those without formal qualifications had similar levels of trust for most sources (Figure 2b). However, those with formal qualifications trusted doctors/healthcare providers ($p=.002$), scientists ($p<.001$) and the government ($p=.004$) significantly more than those without formal qualifications, and family members ($p=.033$)

and social media contacts ($p=.011$) significantly less. For most sources, no significant differences in levels of trust across different SES categories were observed (Figure 2c). However, respondents with higher SES trusted doctors/healthcare providers ($p<.001$), scientists ($p<.001$) and the government ($p<.001$) significantly more than those with lower SES, and those with lower SES trusted faith leaders ($p=.032$) and admired celebrities ($p=.007$) significantly more than those with higher SES. Notably, doctors/healthcare providers were the most trusted source of COVID-19 advice regardless of any demographic differences.

Discussion

Overall trust

In this survey of a large population-based cohort of middle-aged adults living in New Zealand and Australia conducted between April and July 2021, the majority of respondents trusted perceived experts (doctors/healthcare providers and scientists) for COVID-19 information. The next most trusted sources of information were the government and family members. These findings support the idea that perceived expertise and, to a lesser extent, personal connection, are important predictors of trust. Indeed, sources with greater personal connection, such as family and friends, were more trusted than sources with less personal connection, such as drug companies. Research suggests that expertise, particularly perceived expertise,[7] is important for facilitating trust in advice,[19] especially in times of uncertainty.[20] Doctors/healthcare providers, who have both perceived expertise and (oftentimes) personal connection, were the most trusted source of COVID-19 advice. Furthermore, several characteristics associated with personal connection, including empathy, honesty and reciprocal trust have been shown to be important qualities within information sources to facilitate the development of trust.[7,19,20]

Demographic differences

Females and males had similar levels of trust in each source and a similar pattern of most to least trusted sources. However, females were more likely than males to trust scientists or colleagues to provide them with COVID-19 advice. Across most sources, the pattern of most to least trusted sources was similar by education level and SES. However, there were some differences for specific sources. We found that those with higher levels

of education had greater trust in institutions and experts than those with lower levels of education. In contrast, those with lower levels of education trusted friends and family more than those with higher levels of education. These findings are consistent with research suggesting that greater education is related to greater trust in others, particularly in institutional sources.[13,14] We also found that those with higher SES had greater trust in institutions and experts than those with lower SES. In contrast, those with lower SES trusted faith leaders and admired celebrities more than those with higher SES. These findings are consistent with research suggesting that higher SES is related to greater trust in others, particularly in institutional sources.[10,11] Our findings suggest that sex, education levels and SES should be important considerations when developing public health information programmes, particularly when deciding which sources of pandemic advice are best suited to share information. The comparative distrust of institutions displayed by individuals with lower SES and education levels could be explained by the historical disadvantages they have faced. Disadvantaged groups are often exposed to negative experiences with institutions, such as healthcare facilities and governmental organisations, which could reduce trust in these institutions.[7] Another explanation for the relationship between education and trust is that education provides relevant information and improves information-seeking abilities,[21] which could enable people to be better informed regarding things like vaccines and better able to comprehend new information, thus improving trust in institutions.[22] This theory could also explain why less educated individuals display more trust in friends and family than more educated individuals—they may feel as though they cannot trust information from formal institutions and may seek information elsewhere.[13]

Implications for policy and practice

New Zealand's COVID-19 response initially relied on the centralised roll-out of information and advice from the Government, particularly regarding vaccines, with a gradual evolution to include general practitioners and community leaders.[23] Community leaders in New Zealand have argued that this slow decentralisation disproportionately affected Māori and Pasifika populations, highlighting socio-economic inequities in New Zealand.[24] We found that doctors/healthcare providers were the most trusted source of COVID-19 advice among our respondents. Additionally, scientists were the second most trusted source of COVID-19 advice among our respondents. Therefore, our findings suggest that doctors/healthcare providers and scientists should be empowered by the government to communicate with the public directly.

We found that levels of trust differed significantly by sex, education and SES. This suggests that subgroup differences are important to consider when deciding which sources of advice are best suited to share relevant pandemic information with the public. We found that doctors/healthcare providers were the most broadly trusted source regardless of any subgroup differences. This suggests that doctors/healthcare providers are an important source of information for all communities, including more marginalised ones, and that marginalised communities could be targeted with pro-vaccine messaging through doctors/healthcare providers.[12] Indeed, vaccine uptake within New Zealand was relatively slow, particularly in Māori and Pasifika communities, and it has been speculated that this was a result of low trust in the government and other sources of pandemic advice.[24] Māori and Pasifika groups have experienced ongoing systematic marginalisation and discrimination by the health and legal systems within New Zealand, which may have led to lower trust, particularly in institutions.[25,26] Indeed, Māori have experienced higher infection rates, hospitalisation rates and death rates than Pākehā in previous pandemics.[27] Furthermore, our findings may have implications for other public health initiatives, including screening programmes, general infection-minimisation behaviours, and encouragement of healthy behaviours such as physical exercise and responsible alcohol consumption. Specifically, our findings could suggest that public health initiatives utilise the most trusted sources of advice to share relevant information to improve public compliance.

Strengths and limitations

This study provides insight into trust in different sources of advice from a key time in New Zealand's pandemic response, immediately before vaccines became available to the general public. Furthermore, The Dunedin Study is a longitudinal, population-based study that allows for the development of high trust and honest self-reporting, and the inclusion of individuals who would not typically respond to a vaccine

intention survey.[28] We also completed sensitivity analyses to test whether findings differed between the individuals based in New Zealand only, and those based in both New Zealand and Australia. We found few differences, allowing us to interpret the findings from a larger sample of Australia- and New Zealand-based individuals in the context of the New Zealand COVID-19 response.

However, our participants have been involved in a successful and enduring longitudinal study,[16] so may be more trusting of scientists than the wider population. Additionally, this study was conducted in middle-aged, predominantly New Zealand European individuals at a specific time during the COVID-19 pandemic, so may not generalise to other age groups, ethnicities or timeframes. For example, New Zealanders display higher trust compared with other OECD countries.[25,26] Furthermore, Māori and Pasifika individuals, who experienced significant health inequities related to COVID-19,[24] tend to display lower trust than the general New Zealand population, likely due to the ongoing impacts of colonisation.[25,26] Therefore, it is possible that our findings reflect higher levels of trust, particularly in institutions, than would be expected from a sample that included more Māori and Pasifika individuals. Finally, our findings reflect patterns of trust at a particular point in time: after the initial COVID-19 response when institutional trust in New Zealand peaked,[25,29] but before the spread of misinformation and disinformation in late 2021, which may have led to a shift away from vaccine hesitancy and towards vaccine resistance.[30] Although institutional trust within New Zealand fluctuated according to the particular socio-cultural context at the time,[25,29] our findings provide useful insight into the period when New Zealanders were making decisions on whether or not to get vaccinated against COVID-19.[12] Future research along similar lines is needed in different samples to improve understanding of the generalisability of findings. In particular, future research could specifically investigate patterns of trust in Māori, Pasifika and other marginalised populations.

Conclusion

Doctors and healthcare providers were consistently the most trusted source of COVID-19 advice, regardless of sex, education or socio-economic status. Given the importance of trust for a successful pandemic response,[1–5] particularly regarding public compliance with health measures and restrictions,[2,3,5] our findings indicate that healthcare providers should be empowered alongside government agencies and other trusted sources, such as scientists, to share information and advice during future pandemics to promote a successful response.

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Appendices

Appendix 1: Vaccine intention survey

3. Below is a list of sources where people go to get information about COVID-19. We'd like to know which ones you trust.

Do you trust COVID-19 advice from:

(a) Your doctor or healthcare provider	(0) No	(1) Maybe	(2) Yes
(b) Your faith leader, minister, priest, pastor	(0) No	(1) Maybe	(2) Yes
(c) Your close friends	(0) No	(1) Maybe	(2) Yes
(d) Members of your family	(0) No	(1) Maybe	(2) Yes
(e) People you work with or other people you know	(0) No	(1) Maybe	(2) Yes
(f) News on the radio, TV, online and newspapers	(0) No	(1) Maybe	(2) Yes
(g) Celebrities you admire	(0) No	(1) Maybe	(2) Yes
(h) Your contacts on social media	(0) No	(1) Maybe	(2) Yes
(i) Drug companies	(0) No	(1) Maybe	(2) Yes
(j) Scientists	(0) No	(1) Maybe	(2) Yes
(k) The government	(0) No	(1) Maybe	(2) Yes
(l) Dr Ashley Bloomfield Director-General of the New Zealand Ministry of Health (If overseas, the most prominent health leader)	(0) No	(1) Maybe	(2) Yes
(m) Prime Minister Jacinda Ardern (If overseas, the prime minister or president in the country where you live)	(0) No	(1) Maybe	(2) Yes
(n) Chris Hipkins, Minister for COVID-19 (If overseas, please leave blank)	(0) No	(1) Maybe	(2) Yes

Appendix 2: Sensitivity analyses: New Zealand-based Study members

This analysis included the 670 Dunedin Study members who participated in the COVID-19 survey and were living in New Zealand at the time of data collection. Participant characteristics are displayed in Appendix Table 1, excluding one individual with no SES information. All were aged 48 or 49. These participant characteristics were similar to those in the main analyses.

Overall trust in each source

Appendix Figure 1 shows the percentage of New Zealand-based participants who said "yes," they trusted that source for COVID-19 advice. Consistent with the results from the main analyses, the most trusted sources of COVID-19 advice were healthcare providers (82%), followed by scientists (62%), the government (46%) and family members (36%). The least trusted sources of COVID-19 advice were still admired celebrities (2%), followed by social media contacts (2%) and faith leaders (6%).

Statistical comparisons between trusted sources

Consistent with the results from the main analyses, compared with healthcare providers, a significantly lower percentage of participants trusted scientists (21%, $p<.001$), the government (36%, $p<.001$), family members (47%, $p<.001$), news (57%, $p<.001$) and close friends (60%, $p<.001$). C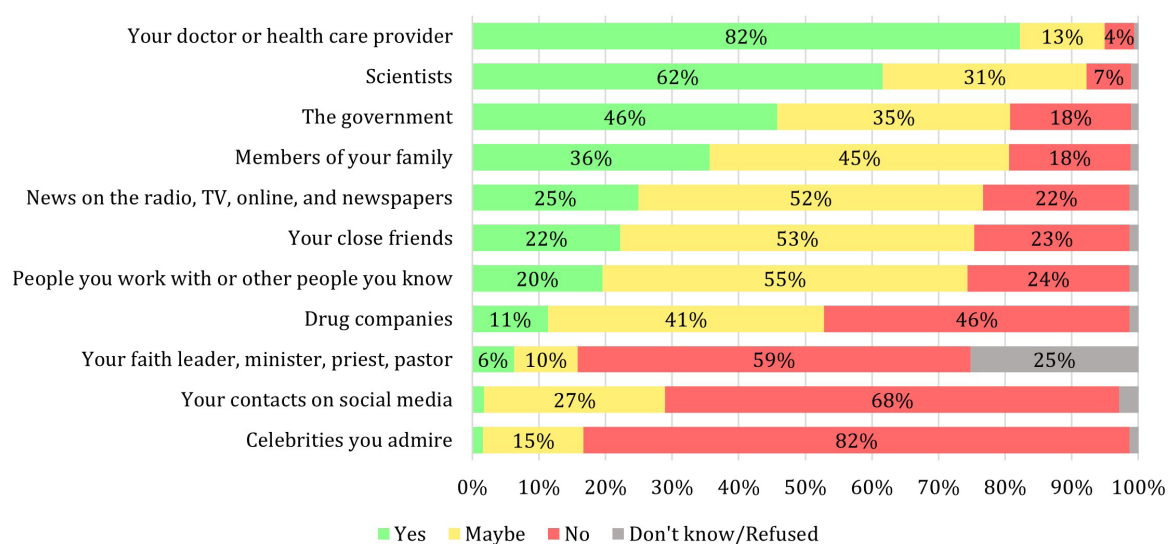ompared with the government, a significantly higher percentage of participants trusted scientists (16%, $p<.001$), whereas a significantly lower proportion of participants still trusted their family members (10%, $p<.001$), news organisations (21%, $p<.001$) or their close friends (24%, $p<.001$).

Demographic differences (sensitivity analyses)

Consistent with the results from the main analyses, females trusted scientists significantly more than males ($p=.01$), but the observed difference between female and male trust in colleagues no longer reached statistical significance ($p=.113$), as shown in Appendix Figure 2a. Those with formal qualifications trusted doctors/healthcare providers ($p=.009$), scientists ($p<.001$) and the government ($p=.003$) significantly more than those without formal qualifications, and family members ($p=.02$) and social media contacts ($p=.009$) significantly less (Appendix Figure 2b). Respondents with higher SES trusted doctors/healthcare providers ($p<.001$), scientists ($p<.001$) and the government ($p=.002$) significantly more than those with lower SES, and those with lower SES still trusted faith leaders ($p=.037$) and admired celebrities ($p=.007$) significantly more than those with higher SES (Appendix Figure 2c). As opposed to the main analyses with all respondents, those with higher SES trusted drug companies significantly more than those with lower SES ($p=.037$) and those with lower SES trusted social media contacts significantly more than those with higher SES ($p=.005$).
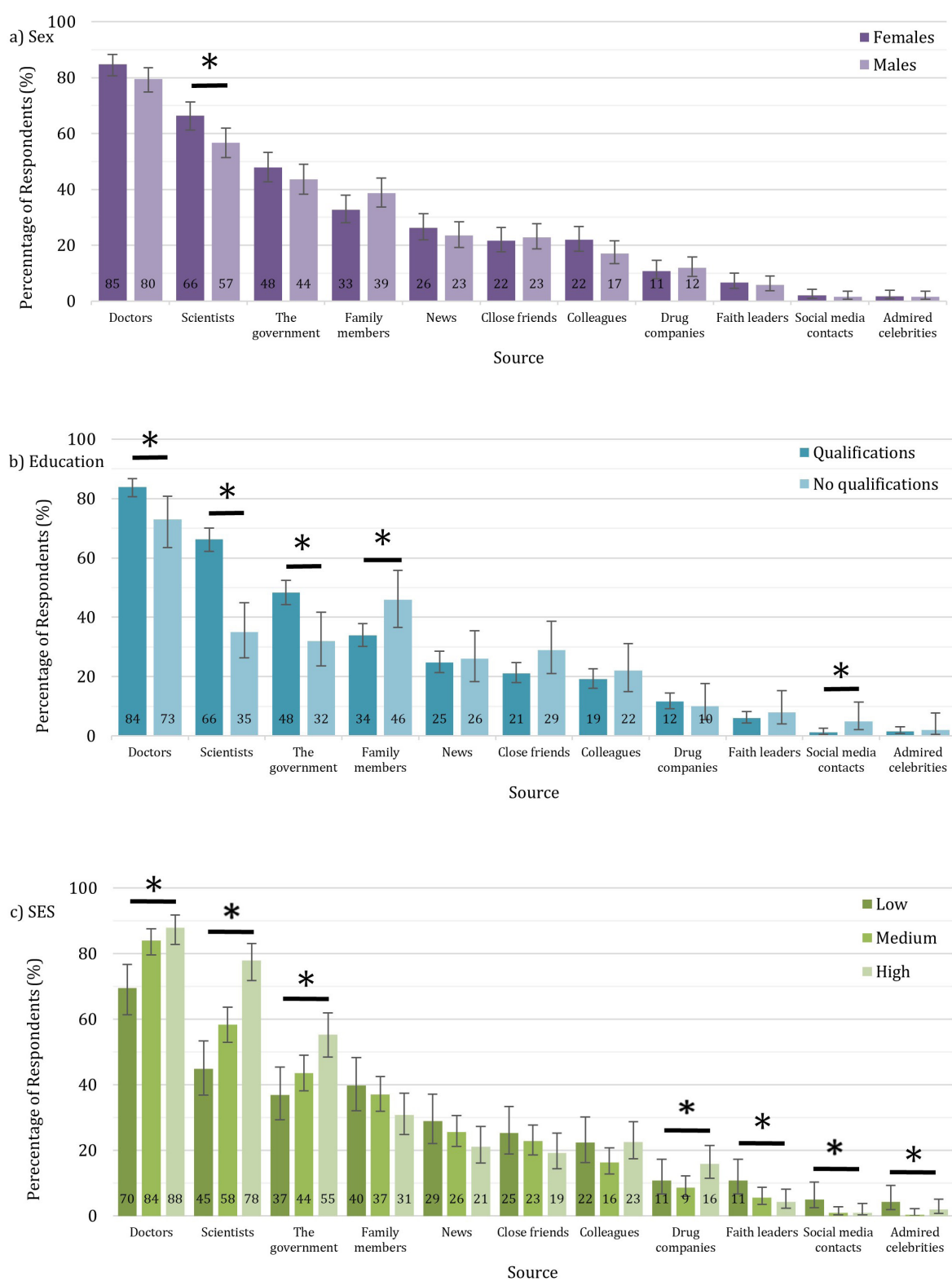
Appendix Table 1: Participant characteristics for New Zealand-based respondents (*n*=669).

Characteristic	*n*	%
Sex		
Female	342	51%
Male	327	49%
Education level		
Formal qualifications	569	85%
No formal qualifications	100	15%
SES		
Low	138	21%
Medium	323	48%
High	208	31%

Appendix Figure 1: The proportion of New Zealand-based respondents that trust different sources of COVID-19 advice.

Note: data labels below 4% are not shown.

Appendix Figure 2a, b, c: The proportion of New Zealand-based respondents that trust each source by sex, education and SES.

Note: data labels below 9% are not shown.
*Significant differences between subgroups of $p<.05$ are marked by an asterisk.