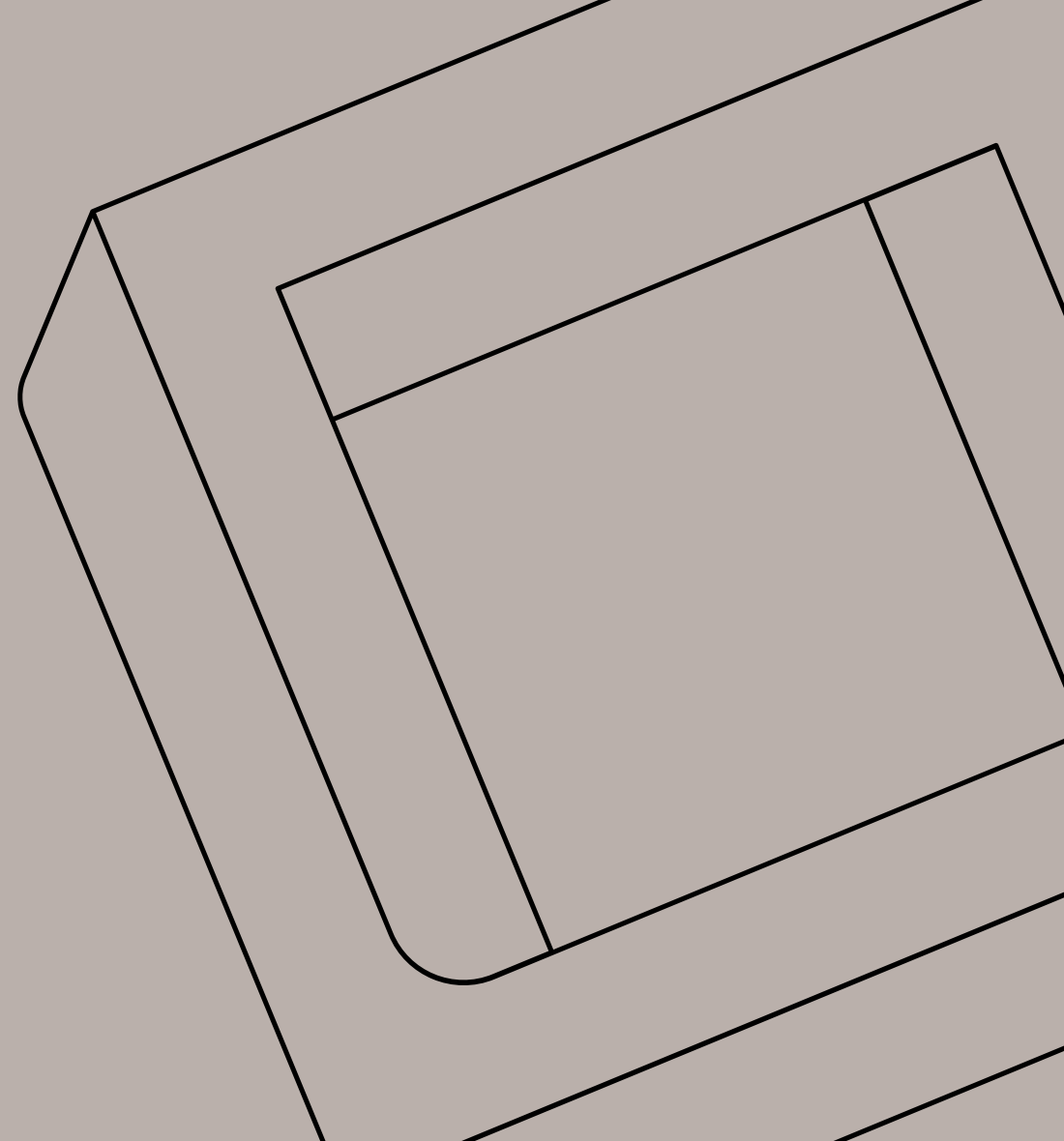# Measuring public health behaviours and intentions

Wave two

verian

Report content

1. Executive summary

2. Introduction

3. Recent health behaviours

4. Intended health behaviours

5. Risk reduction factors

6. Perceptions of measles

7. What inhibits and what could encourage measles vaccination?

8. Appendix

1:
Executive summary

How are public health behaviours changing over time?

- Actual compliance and intention to comply with public health behaviours appears to be eroding:

  - There has been an increase in the proportion of people with cold or flu symptoms not wearing a mask when seeing their primary healthcare provider – up from 31% in November 2023 to 52% in June.

  - There has been a statistically significant increase in the proportion of students* interacting when unwell – up from 52% to 74%.

  - Intention to comply with recommended public health advice has declined from 64% in November 2023, to 59%. Most of this shift is a move from being extremely likely to being somewhat likely – the proportion 'not likely' is largely unchanged.

- More generally, when unwell over the last three months, more than 50% of New Zealanders did not follow each of the public health guidelines asked about in the survey. For instances:

  - 54% interacted with colleagues/customers when unwell.

  - 52% didn't wear a mask to see their primary healthcare provider when they had cold/flu symptoms.

  - 62% didn't wear a mask in crowded indoor spaces when they had cold/flu symptoms.

  - 74% didn't wear a mask on public transport when they had cold/flu symptoms.

*As the sample is New Zealanders aged 18 and over, most of these students will be tertiary students.

What do New Zealanders know about measles?

- New Zealanders can be classified into four groups based on their perceptions of measles:

    - Very concerned (40% of people) – this group think measles is easy to catch and is severe, but the vaccine is effective with a low incidence of side effects.

    - Moderately concerned (46%) – this group are not as concerned about the severity and the ease of catching measles as the Very concerned, but like the Very concerned they do a lot of faith in the efficacy of the vaccine.

    - Unconcerned (6%) – this group do not think measles is severe and don't think it spreads easily. They have some concerns about the efficacy of the vaccine and the potential for side-effects. Around a third of this group haven't or are not intending to get their children vaccinated or are undecided.

    - Uncertain (9%) – this group lack knowledge about measles and just over a quarter say they haven't, will not, or aren't sure whether they will get their children vaccinated.

What inhibits and encourages measles vaccination?

- A relatively small number of people in the sample said their children weren't vaccinated or that they weren't intending to vaccinate their children. The most common reason these people gave for not vaccinating their children is that vaccines do more harm than good – i.e., the benefits don't outweigh the risks.

- All of the informational influencers (facts about measles that could influence the decision to vaccinate or not vaccinate) tested in the survey had a positive impact on intention to vaccinate. The most powerful influencer (including amongst the uncertain and unconcerned) was one that allowed people to imagine their child with the symptoms – i.e., "knowing that measles can lead to brain swelling, chest infections, or death".

- Amongst those people who don't believe vaccinations are useful to prevent illness, knowing that there are no mild cases was also a more effective informational influencer than almost all of the other influencers.

[cont.] What inhibits and encourages measles vaccination?

- A Bayesian Belief Network analysis revealed that if people understand how contagious measles are ("Knowing that one person can infect up to 90% of people close to them if they aren't immune") then this boosts the power of the other facilitators.

What reduces the risk of getting a cold, flu, or COVID-19?

- New Zealanders think that washing their hands frequently and getting vaccinated are the most useful ways of reducing their risk of catching a cold, flu, or COVID-19. Eating healthily, wearing a face mask, and ventilating their home are seen as the next most effective.

- There is variation in how effective people think each of these measures are – with people ranging from extremely useful to somewhat useful.

- Most New Zealanders are ventilating their home by opening their doors and/or windows a few times a week.

2:
Introduction

Background

COVID-19 has had a considerable impact on the New Zealand health system and COVID continues to remain a threat, especially to the most vulnerable in society. COVID also revealed that public interventions are only useful if the population is willing and able to adhere to them.

With the ongoing threat of COVID (including new variants) as well as possible new pandemics in the future, the Ministry of Health needs to be in a position to provide the best possible advice, recommendations, and decisions at critical junctures. To support this, the aim of this research is to:
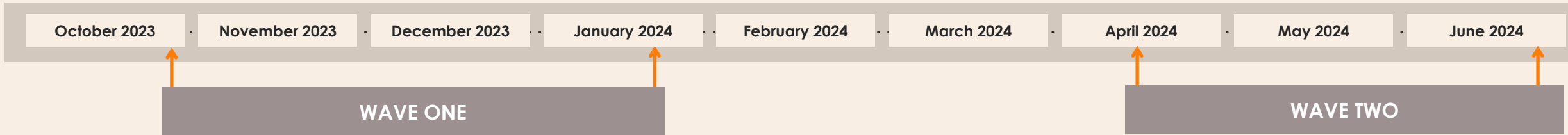
1. Monitor actual and likely adherence to public health measures.

2. Understand the drivers and behaviours to public health behaviour to determine how best to influence public health behaviour in the future.

These objectives require a staged research approach, which is outlined on the next page.
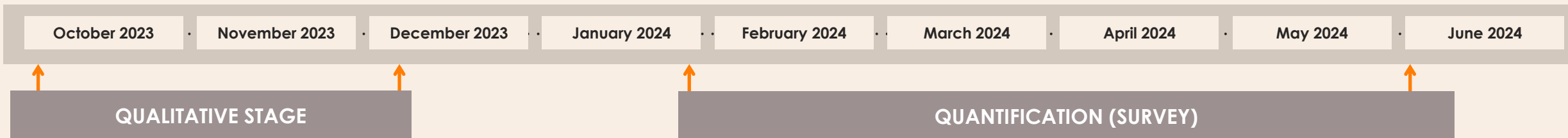
The research programme

Part 1:

Tracking survey to monitor public health behaviours and intentions.

| October 2023 | November 2023 | December 2023 | January 2024 | February 2024 | March 2024 | April 2024 | May 2024 | June 2024 |

WAVE ONE

WAVE TWO

Part 2:

Qualitative and quantitative approach to understand drivers and barriers to public health behaviour and intention – as well as how to influence them.

| October 2023 | November 2023 | December 2023 | January 2024 | February 2024 | March 2024 | April 2024 | May 2024 | June 2024 |

QUALITATIVE STAGE

QUANTIFICATION (SURVEY)

**This document reports the findings from Part 1, Wave 2.**

Focus of this report

This report focuses on several issues:

1. Understanding how public health behaviour and responsiveness to public health advice is changing.

2. Understanding people's knowledge of measles and the factors that inhibit or encourage them to vaccinate their children.

3. Perceptions about what factors reduce the risk of catching a cold, flu, or COVID-19.
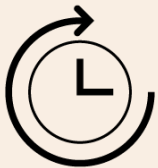
Methodology
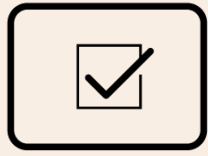
1,642 surveys conducted online using online research panels. Sample structured to be demographically representative of the population by age, gender, and region. Māori and Pacific peoples over-sampled relative to population to ensure sufficient sample sizes for analysis – 349 of the 1,642 surveys were with Māori and 197 were with Pacific peoples (33 people identified as both Māori and Pacific).

200 surveys conducted by telephone – 105 with Māori and 107 with Pacific peoples (12 people identified as both Māori and Pacific).

Surveying conducted 20 May to 9 June, 2024.

Methodology – additional notes

Weighting

The results have been weighted so that the characteristics of the survey sample match the New Zealand population by these characteristics: age and gender at the total population level; region; education level; age by gender for Māori; age by gender for Pacific peoples; and age by gender for Asian peoples.

The individual weights assigned ranged from .04 to 2.77.

Disability status

Disability status was determined using the Washington Group Short Set questions and self-identification. Having a disability was defined as having at least a lot of difficulty with: seeing (even if wearing glasses), or hearing (even if using a hearing aid), or walking or climbing steps, or remembering or concentrating, or washing all over or dressing, or communicating using your usual language, or self-identifying as a disabled person or tangata whaikaha Māori.

Rounding

Please note that the percentages may not always add to 100% for one of two reasons: (1) some questions allowed people to choose more than one response, or (2) rounding. Rounding is also the reason that some nett percentages may be slightly higher or lower than the sum of the categories that make up the nett.

Demographic analysis

A series of logistic regressions (forward stepwise) were used to understand demographic differences in the responses to key questions (i.e., to determine which demographic variables best explain differences across the total population). Demographic groups were entered into the regression either as binary variables (e.g., each ethnic group) or as categorical variables (e.g., employment status). For the categorical variables the following reference categories were used: men 35-49, rest of North Island (i.e., the North Island excluding Auckland and Wellington), in paid work, Bachelor's Degree, 3+ doses of a COVID vaccine, large town/city, and received a measles vaccine as a child. These categories were selected because they were closest to the population average on the most variables. The full list of demographic variables used in the logistic regressions can be found in the sample profile tables in the Appendix. No interaction effects were included in the regressions because of sample size constraints.

Methodology – additional notes [cont.]

Bayesian Belief Network

A Bayesian Belief Network was used to understand the interdependencies between different facilitators for measles vaccinations. An explanation of how to interpret the structural map produced by the Bayesian Belief Network analysis precedes the presentation of the map and an explanation of how the analysis is conducted is contained in the Appendix.

3:
Recent health behaviours
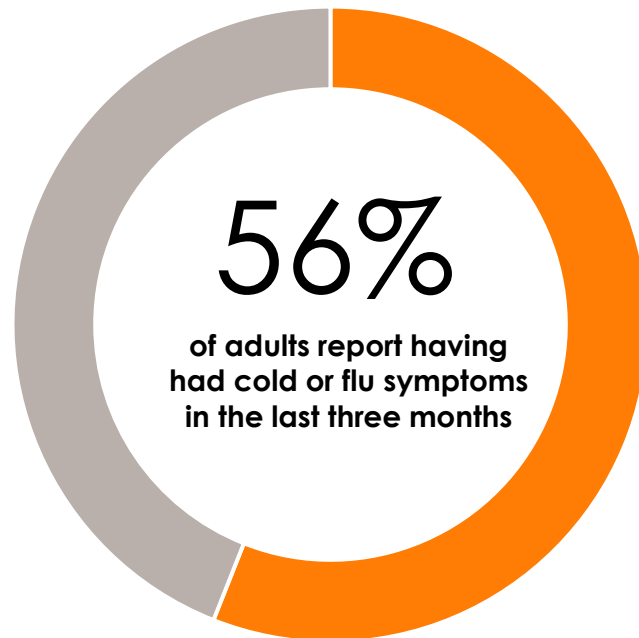
Incidence of behaviour in the last three
months

Just over half of all New Zealanders 18+ have had cold or flu symptoms in the last three months. This is similar to the incidence observed in November 2023.

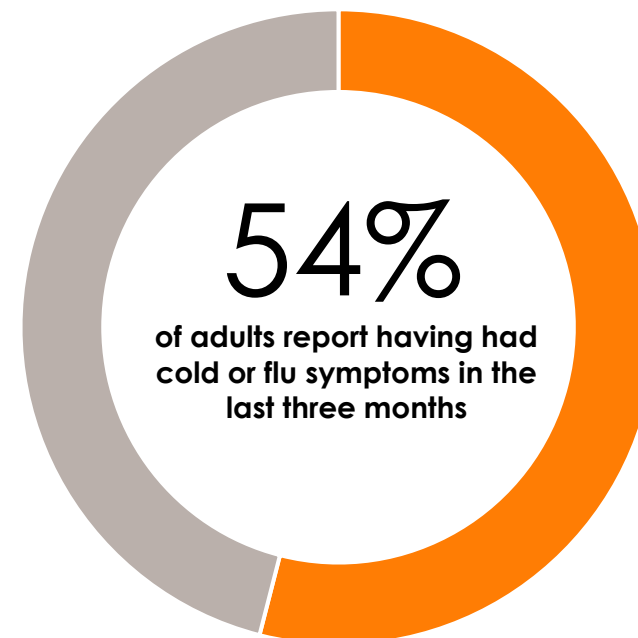**Incidence of cold or flu symptoms in the population**

November 2023

56%
of adults report having had cold or flu symptoms in the last three months

June 2024

54%
of adults report having had cold or flu symptoms in the last three months

As was the case in November 2023, those with children in their home are the most likely to have had cold or flu symptoms in the last three months.

Demographic explainers of the incidence of cold or flu symptoms*

Had cold or flu symptoms
average
54%

25%   35%   45%   55%   65%   75%

Retired
27%

Men 50 to 64
45%

Have
dependent
children
70%

Women 50 to 64
45%

*A logistic (forward stepwise) regression was done to determine which demographic variables help explain the incidence of having had or not having cold or flu symptoms in the last three months. The regression showed that demographic variables explain 16.5% of the variance in the incidence of cold or flu symptoms (Nagelkerke R-squared). The demographic variables shown in the chart above are those that significantly contribute to the explanation (at the <0.01 level).
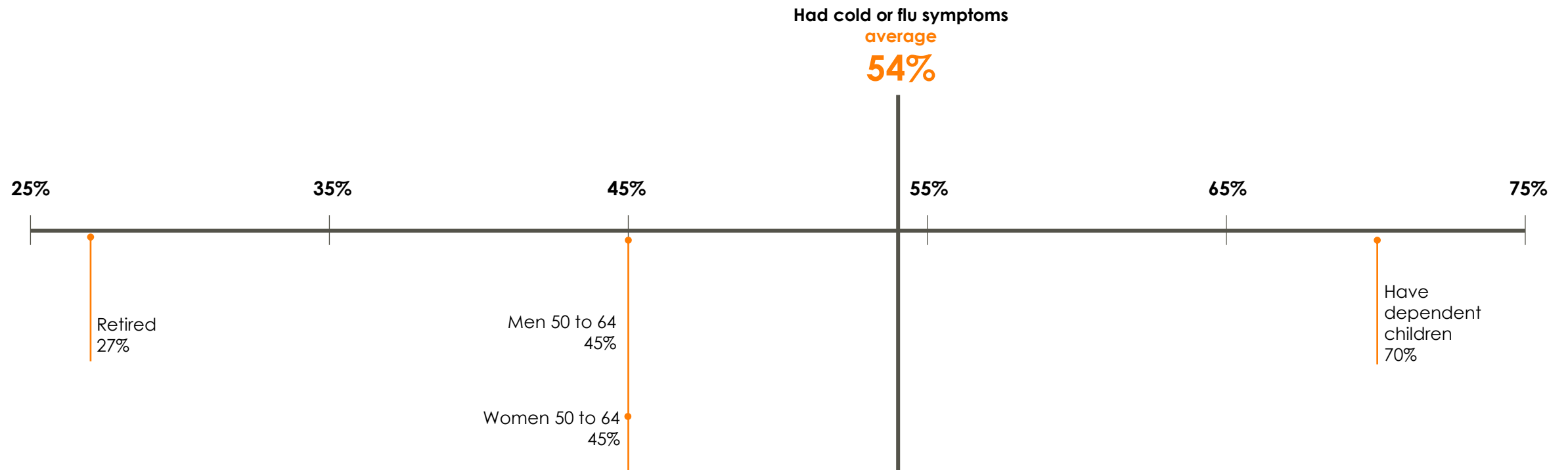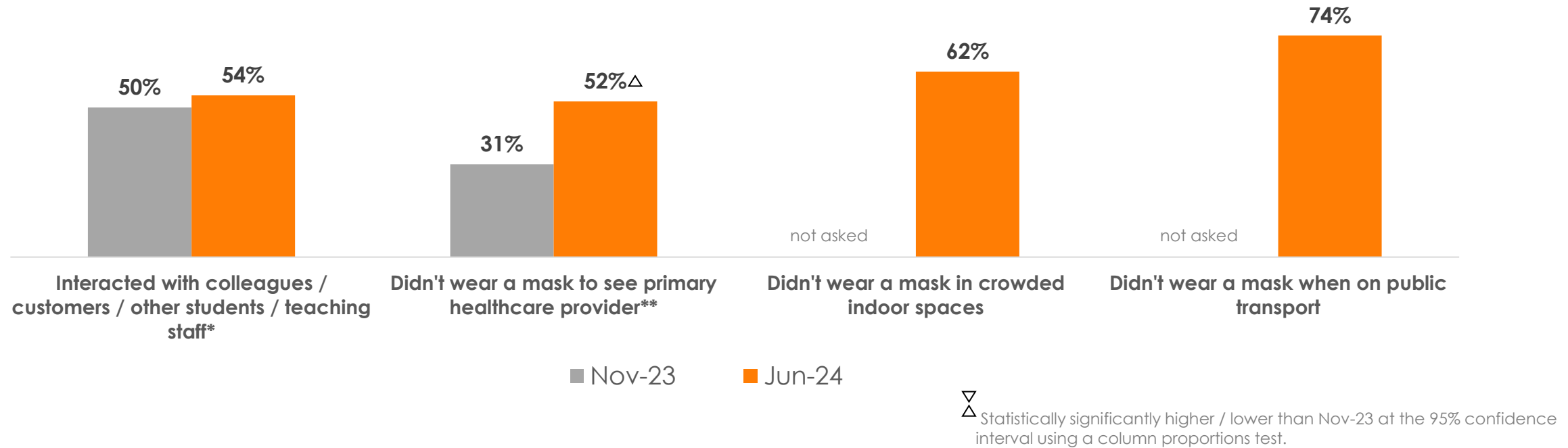
Source: Q1. Have you had cold or flu type symptoms (for example a sore throat, a cough and/or a blocked nose) in the last three months?

See appendix for sample sizes of each demographic group.

Amongst those who've been unwell, more than half did not follow each of the individual public health behaviours asked about in the survey. Additionally, while there has been no statistically significant change in interacting with others when unwell, there was been an increase in the percentage of people not wearing a mask to see their primary healthcare provider.

Behaviour when unwell

■ Nov-23   ■ Jun-24

▽
△ Statistically significantly higher / lower than Nov-23 at the 95% confidence interval using a column proportions test.

While there has been no statistically significant change in interacting with others when unwell at a total population level – there has been an increase amongst those studying full-time or part-time*.

Incidence of interacting with colleagues / customers / other students / teaching staff while having cold/flu symptoms – demographic groups that have had a statistically significant increase in interacting

50% 54% 52% 74%△

Total

Studying (full-time or part-time)

■ Nov-23 ■ Jun-24
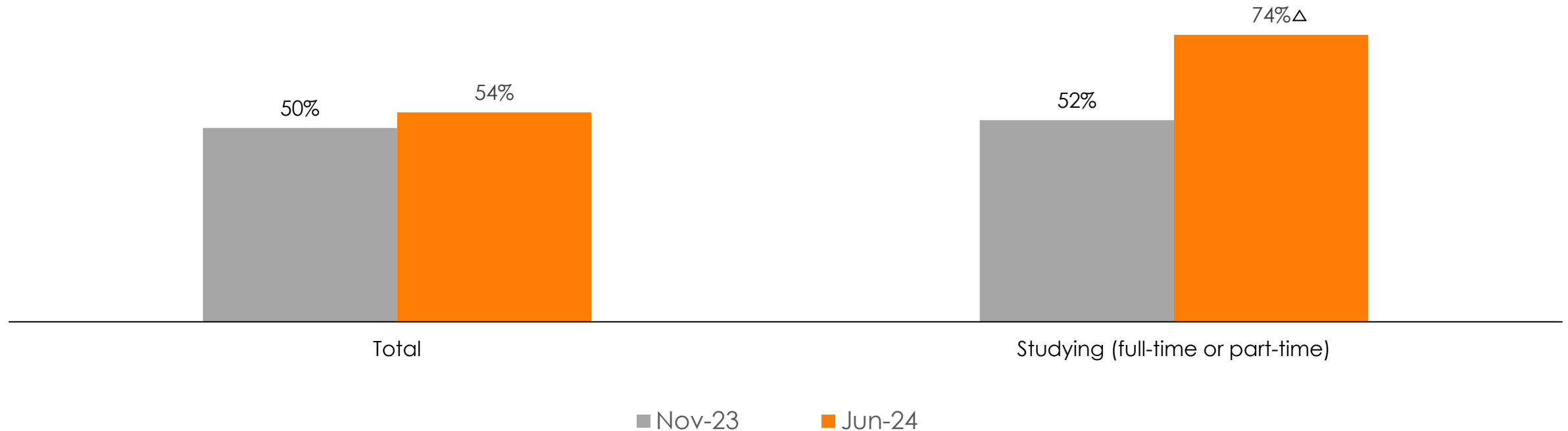
▽
△ Demographic groups statistically significantly more likely to interact when having cold/flu symptoms than they were in November 2023.

*Note: those studying are most likely tertiary students as the sample is people aged 18 and over.

Source: Q2a/b. When you had the cold or flu symptoms did you do any of the following?

Base: All respondents who've had cold/flu symptoms in the last three months and have a physical work/study place where they interact with people, Nov-23 n=644, Jun-24 n=748; those studying, Nov-23 n=57, Jun-24 n=59.

Looking just at current interaction behaviour (i.e., June 2024) – those studying** are the most likely to interact when unwell.

Demographic explainers of interacting with colleagues / customers / other students / teaching staff when unwell*

Interacted when unwell
average
54%

0%   20%   40%   60%   80%   100%

Not vaccinated
against measles
45%

Studying** full-
time or part-time
74%

In contrast to interacting when unwell, there have been statistically significant increases in not wearing a mask when visiting primary healthcare providers across many demographic groups.

Note that only those demographic groups with a statistically significant increase are shown in the chart.

Incidence of not wearing a mask at a primary healthcare provider while having cold/flu symptoms – demographic groups that have had a statistically significant increase in not wearing a mask

Group	Nov-23	Jun-24
Total	31%	52%
Women 18-34	30%	54%
Women 50-64	20%	55%
Men 18-34	20%	52%
Men 35-49	39%	63%
European	36%	59%
Māori	29%	50%
Pacific peoples	20%	41%
Asian peoples	16%	44%
Auckland	16%	46%
Other North Island	39%	59%
Canterbury	19%	52%
Small / med town	38%	55%
Large town / city	27%	52%
HH size 1-2	35%	51%
HH size 3+	28%	54%
No dependent children	30%	49%
Have dependent children	32%	58%
Working	34%	55%
Studying	18%	42%
Unemployed	24%	54%
No qualification / high school	16%	49%
Trade or Polytech	34%	59%
Bachelor's degree	35%	50%
Postgraduate degree	29%	53%
Disability	18%	49%
No disability	35%	53%
Vaccinated (1-2 doses)	37%	57%
Vaccinated (3+ doses)	27%	46%

■ Nov-23   ■ Jun-24

Looking at current mask wearing behaviour (i.e., June 2024) when unwell (across multiple situations) – those unvaccinated against COVID-19 are the most likely not to wear a mask when unwell.

Demographic explainers of not wearing a mask when unwell at primary healthcare provider, in a crowded indoor space, and/or when on public transport*
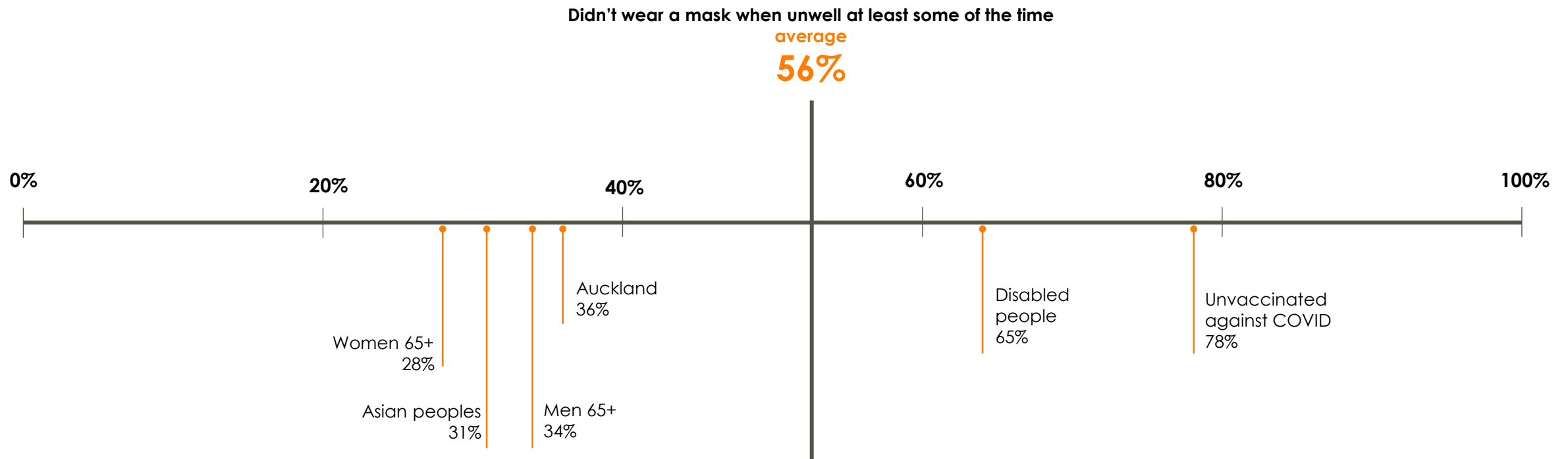
Didn't wear a mask when unwell at least some of the time

average
56%

0%   20%   40%   60%   80%   100%

Women 65+
28%

Asian peoples
31%

Men 65+
34%

Auckland
36%

Disabled people
65%

Unvaccinated against COVID
78%

*A logistic (forward stepwise) regression was done to determine which demographic variables help explain not wearing a mask when unwell. The regression showed that demographic variables explain 12.0% of the variance in mask wearing (Nagelkerke R-squared). The demographic variables shown in the chart above are those that significantly contribute to the explanation (at the <0.01 level).
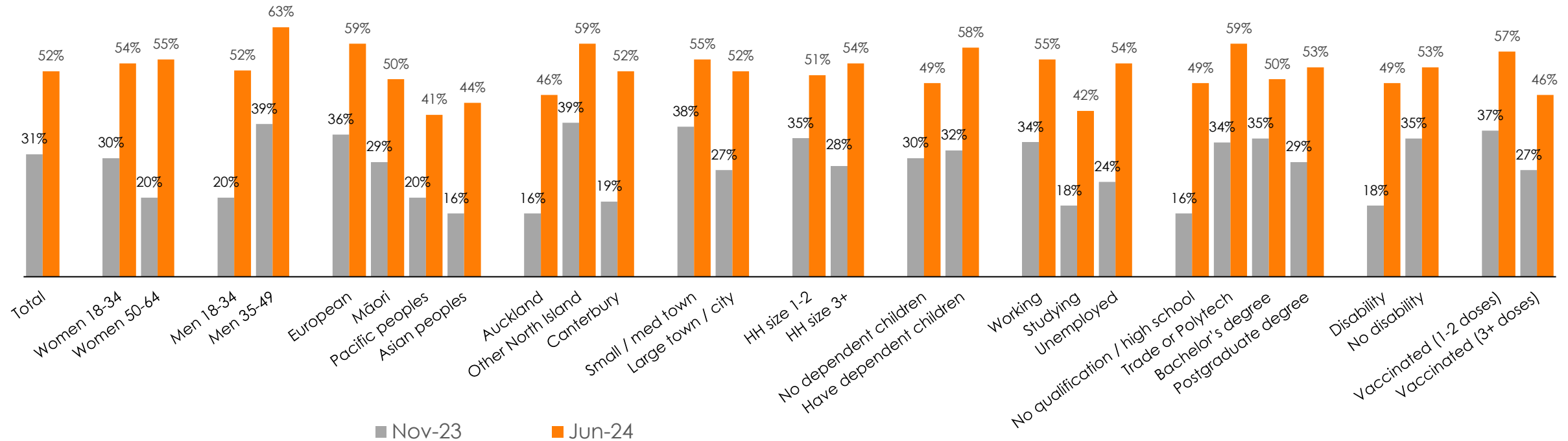
Source: Q3a. When you had the cold or flu symptoms in the last three months, did you wear a mask at least some of the time when you …

Base: All respondents who've been to see a primary healthcare provider or been in a crowded indoor space or on public transport while they've had cold/flu symptoms, n=748; unvaccinated n=32, Auckland n=357, Asian peoples n=223, women 65+ n=68, men 65+ n=53.

4:
Intended health behaviours

Likelihood of complying with public health advice

The proportion of people extremely or very likely to follow recommended public health advice has declined from 64% in November 2023 to 59%. The decline is largely due to a reduction in people saying they're extremely likely and increase in people saying they're somewhat likely.

Current likelihood to fully follow public health advice if it was recommended but not required by law

■ Extremely likely ■ Very likely ■ Somewhat likely ■ Not that likely ■ Not at all likely ■ Don't know

Nett extremely / very likely

	Extremely likely	Very likely	Somewhat likely	Not that likely	Not at all likely	Don't know	Nett
Jun-24	29% ▽	31%	27% △	8%	5%		59% ▽
Nov-23	36%	28%	21%	8%	6%	2%	64%
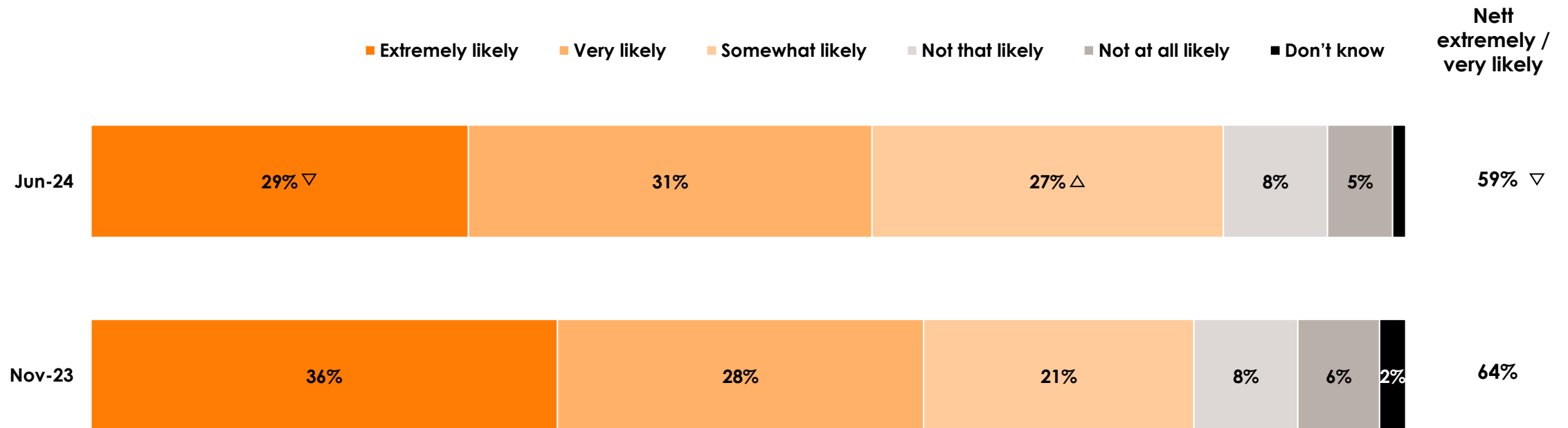
Note. The questions immediately preceding this question changed between wave one and wave two. In wave one the preceding questions asked the respondents to imagine that they had cold/flu symptoms and they were asked how long they would stay away from work/study etc. In wave two these questions were preceded by interacting with others and mask wearing while unwell questions. The change in context for this question may have influenced responses to it.

⬍ Statistically significantly higher / lower than Nov-23 at the 95% confidence interval using a column proportions test.

Source: Q13. How likely would you be to fully follow public health advice (e.g. to self-isolate when you have COVID), if it was recommended but was not required by law?

Base: All respondents Nov-23 n=1839, Jun-24 n=1842.

There have been statistically significant declines in the intention to comply with public health advice across several demographic groups. The groups with the largest declines since November 2023 are those not vaccinated against COVID-19 and women 35-49.

Note that only those demographic groups with a statistically significant increase are shown in the chart.

% extremely/very likely to comply with public health advice – demographic groups that have had a statistically significant decline in intention to comply

■ Nov-23　　■ Jun-24

Looking at current intention to comply with public health advice – retirees are the most likely to comply and those unvaccinated against COVID are the least likely.

Demographic explainers of the likelihood of complying with public health advice if it was recommended but not required by law*

**Extremely / very likely to comply with public health advice
if recommended but not required by law**

average

59%

| 30% | 40% | 50% | 60% | 70% | 80% | 90% |

Unvaccinated against COVID
29%

Men 18-34
42%

Women
35-49
46%

Had 1-2 doses of COVID vaccine
50%

Unemployed
63%

Asian peoples
66%

Household size
1-2
70%

Retired
83%

There is a strong link between intention to comply with public health advice and self-reported behaviour being consistent with current public health advice. The association is not perfect however, some people who say they are extremely likely to follow public health advice act in a way counter to this and some people who say they are not at all likely to follow public health advice do act in a way consistent with current advice.

% saying they behaved in a way consistent with public health advice

- 78% (Extremely likely) — Wore a mask when unwell at least some of the time at primary healthcare provider / in a crowded indoor space / on public transport
- 62% (Very likely)
- 64% (Very likely)
- 46% (Quite likely)
- 39% (Quite likely)
- 39% (Not that likely)
- 20% (Not that likely)
- 28% (Not at all likely)
- 15% (Not at all likely)
- 57% (Extremely likely) — Isolated from colleagues / customers / other students / teaching staff when unwell

Stated likelihood of fully following public health advice if it was recommended but not required by law

Extremely likely | Very likely | Quite likely | Not that likely | Not at all likely

5:
Risk reduction factors

Hand washing and vaccination are seen as the two most effective methods of reducing the risk of catching a cold, flu, or COVID-19.

Perceived effectiveness of methods to reduce the risk of catching a cold, flu, or COVID-19
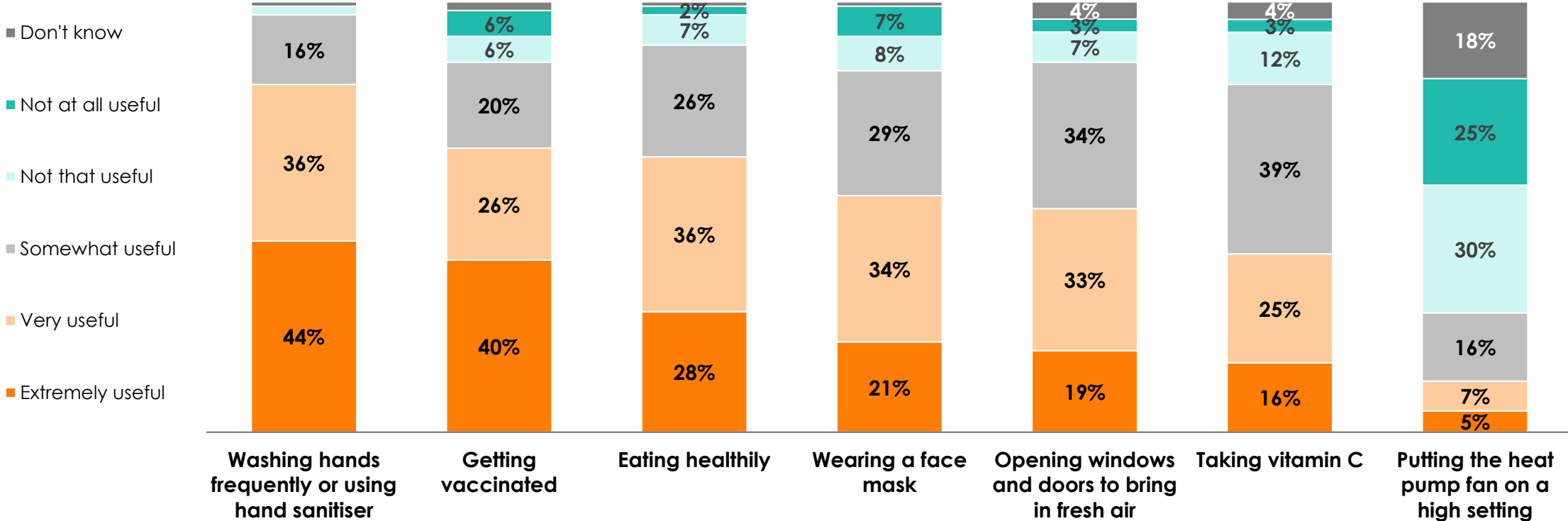
Legend:
- Don't know
- Not at all useful
- Not that useful
- Somewhat useful
- Very useful
- Extremely useful

	Washing hands frequently or using hand sanitiser	Getting vaccinated	Eating healthily	Wearing a face mask	Opening windows and doors to bring in fresh air	Taking vitamin C	Putting the heat pump fan on a high setting
Don't know	16%		2%		4%	4%	18%
Not at all useful		6%		7%	3%	3%	25%
Not that useful		6%	7%	8%	7%	12%	30%
Somewhat useful	36%	20%	26%	29%	34%	39%	16%
Very useful		26%	36%	34%	33%	25%	7%
Extremely useful	44%	40%	28%	21%	19%	16%	5%

Grouping New Zealanders by their perceptions of the effectiveness of each of the risk reduction measures* shows there are four groups of views:

- **Everything is effective, except for circulating air using a heat pump.**

- **Most measures are effective, but washing hands, vaccination, and eating healthily are the most effective.**

- **Everything is moderately effective (perhaps driven by a belief that people can get sick no matter what precautions are taken). Of the different measures this group see hand washing and vaccination as the most effective measures.**

- **Some measures are effective but not the main methods used during COVID – mask wearing and vaccination.**

The incidence of each of the views in the population is shown to the right.

Not the measures used during COVID
Are very against vaccination and wearing a mask, they do think most of the other measures are useful

Everything is moderately useful
Tend to rate most methods of risk reduction as moderately useful, and see vaccinations and hand washing as the most useful

Everything except heat pumps fans
Think most methods are extremely useful at reducing the risk of colds, flu, and COVID-19

Washing hands, vaccination, and eating healthily
View most methods as effective but favour three methods of reducing the risk over the other methods – washing hands, vaccination, and eating healthily.

9%
22%
28%
41%
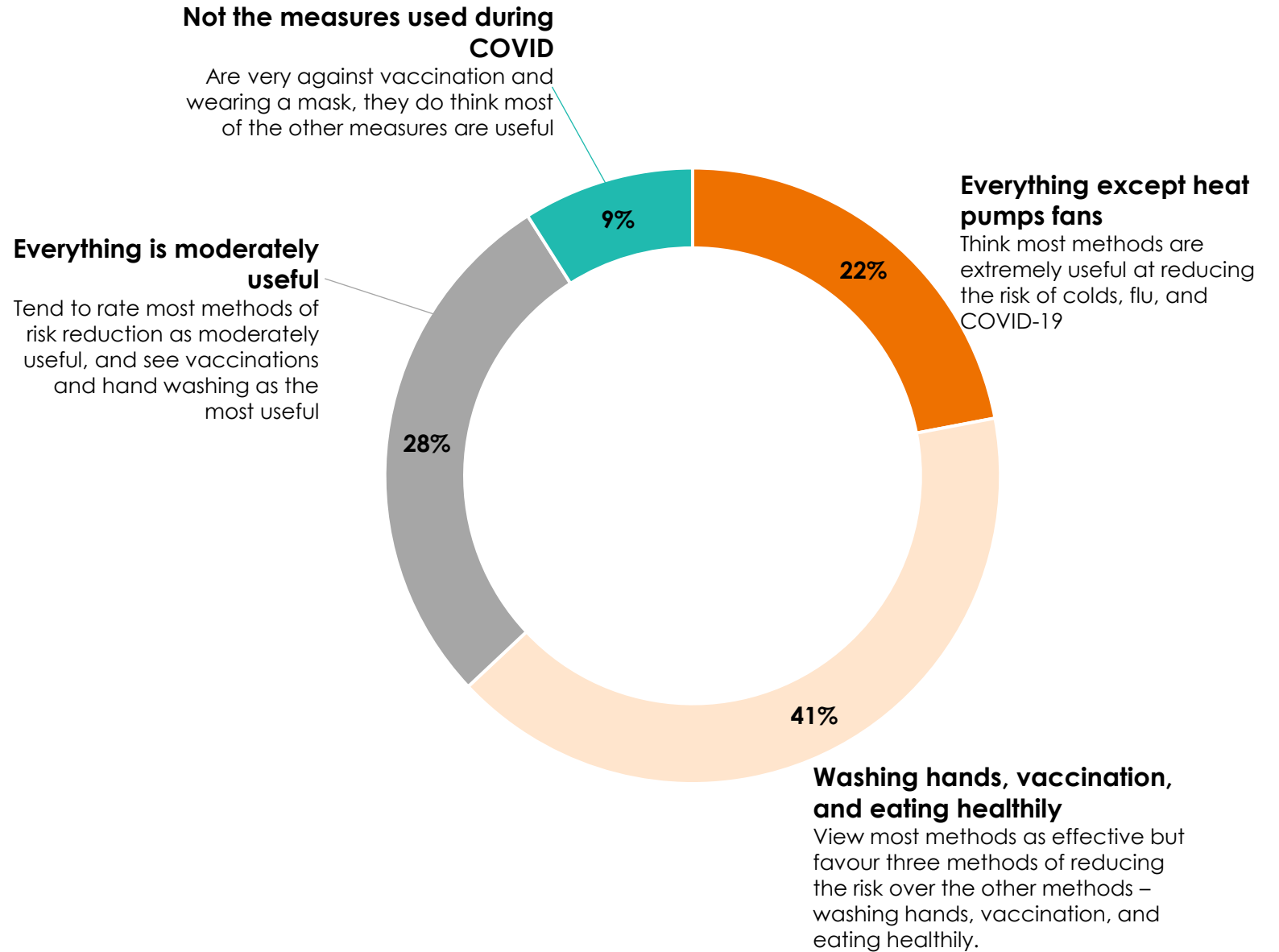
The chart below illustrates the perceptions of each group in more detail.

Perception of methods by group		Everything except heat pump (22% of New Zealanders)	Washing hands, vaccination, and eating (41% of New Zealanders)	Everything is moderately useful (28% of New Zealanders)	Not the COVID measures (9% of New Zealanders)
Washing hands	Extremely/very	100%	96%	51%	56%
	Not that/at all			5%	10%
Vaccination	Extremely/very	88%	81%	45%	4%
	Not that/at all	2%	3%	14%	76%
Eating healthily	Extremely/very	94%	82%	13%	61%
	Not that/at all	1%		26%	9%
Wearing a mask	Extremely/very	87%	64%	33%	1%
	Not that/at all	5%	7%	19%	65%
Opening windows	Extremely/very	87%	64%	9%	46%
	Not that/at all	1%	1%	32%	4%
Vitamin C	Extremely/very	78%	46%	8%	38%
	Not that/at all	4%	9%	36%	11%
Heat pump fan	Extremely/very	30%	12%	1%	
	Not that/at all	28%	53%	79%	52%

% who said 'somewhat' or 'don't know' is not shown.

Source: Q30. How useful do you think each of the following are at reducing your risk of catching things like colds, flu, or COVID-19?

Base: Everything except heat pump n=447, Washing hands, vaccination, and eating n=774, Everything is moderately useful n=488, Not the COVID measures n=133.

The 'Not the measures using during COVID' group are most likely to be those unvaccinated against COVID.

Demographic explainers of being in the 'Not the measures used during COVID' group*
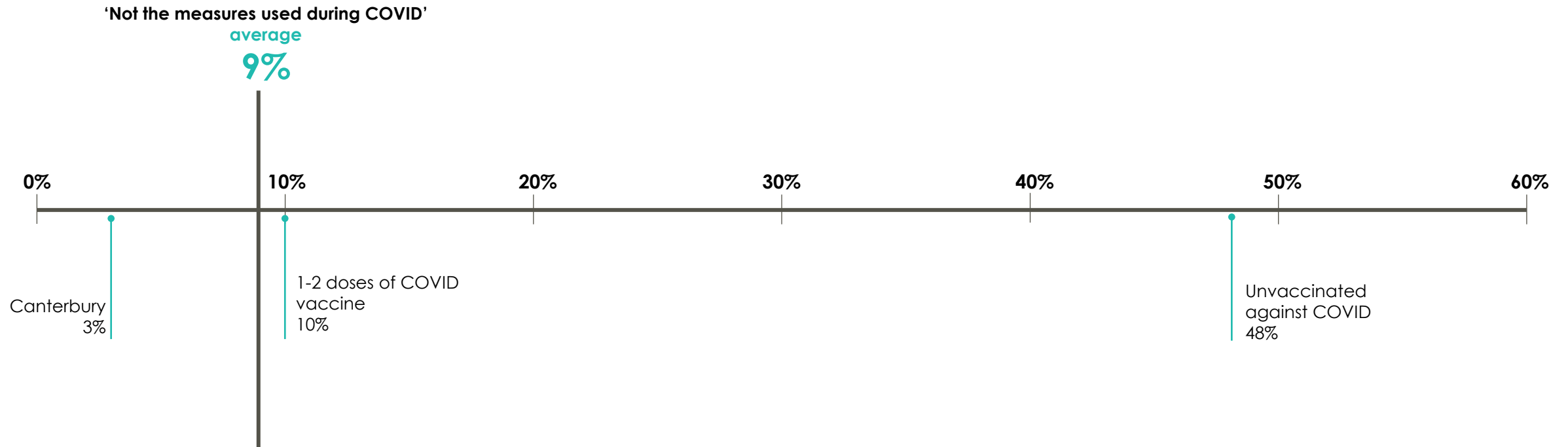
'Not the measures used during COVID'

average

9%

| 0% | 10% | 20% | 30% | 40% | 50% | 60% |

Canterbury
3%

1-2 doses of COVID
vaccine
10%

Unvaccinated
against COVID
48%

*A logistic (forward stepwise) regression was done to determine which demographic variables help explain assignment to the 'Not the measures used during COVID' group. The regression showed that demographic variables explain 25.2% of the variance in the assignment (Nagelkerke R-squared). The demographic variables shown in the chart above are those that significantly contribute to the explanation (at the <0.01 level).

See appendix for sample sizes of each demographic group.

The 'Everything is moderately useful' group tend to be European and not vaccinated against measles.

Demographic explainers of being in the 'Everything is moderately useful' group*
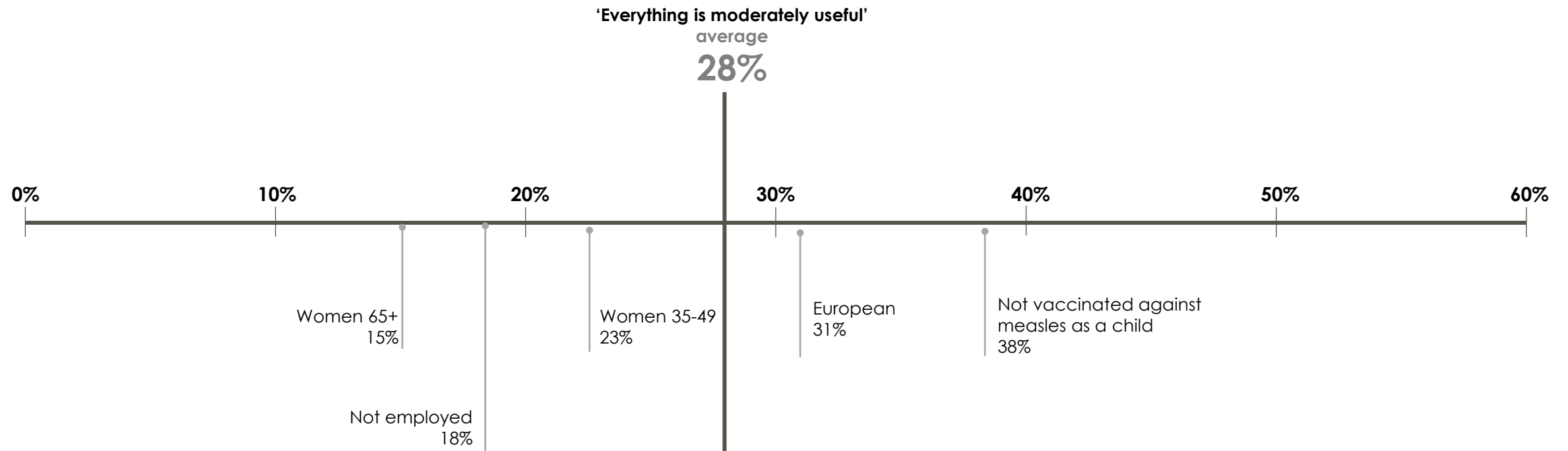
'Everything is moderately useful'
average
28%

| 0% | 10% | 20% | 30% | 40% | 50% | 60% |

Women 65+
15%

Women 35-49
23%

European
31%

Not vaccinated against
measles as a child
38%

Not employed
18%

*A logistic (forward stepwise) regression was done to determine which demographic variables help explain assignment to the 'Everything is moderately useful' group. The regression showed that demographic variables explain 10.1% of the variance in the assignment (Nagelkerke R-squared). The demographic variables shown in the chart above are those that significantly contribute to the explanation (at the <0.01 level).

See appendix for sample sizes of each demographic group.

Demographics explain very little of the assignment to the 'Washing hands, vaccination, and eating healthily' group – they are less likely than average to be unvaccinated or just have had one or two doses of the COVID vaccine.

Demographic explainers of being in the 'Washing hands, vaccination, and eating healthily' group*

'Washing hands, vaccination, and eating healthily'
average
41%

| 0% | 10% | 20% | 30% | 40% | 50% | 60% |

Unvaccinated against COVID
21%

1-2 doses of COVID vaccine
36%

*A logistic (forward stepwise) regression was done to determine which demographic variables help explain assignment to the 'Washing hands, vaccination, and eating healthily' group. The regression showed that demographic variables explain 2.5% of the variance in the assignment (Nagelkerke R-squared). The demographic variables shown in the chart above are those that significantly contribute to the explanation (at the <0.01 level).

See appendix for sample sizes of each demographic group.

The 'Everything except heat pump fans' are most likely to be women aged 65+.

Demographic explainers of being in the 'Everything except heat pump fans' group*
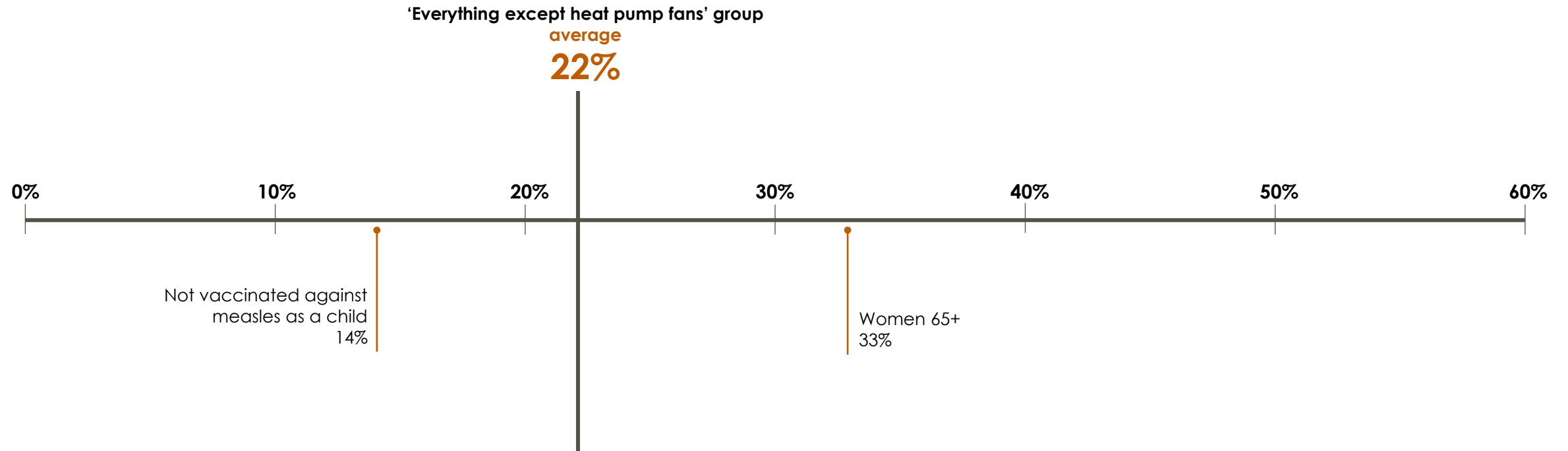
'Everything except heat pump fans' group
average
22%

0% 10% 20% 30% 40% 50% 60%
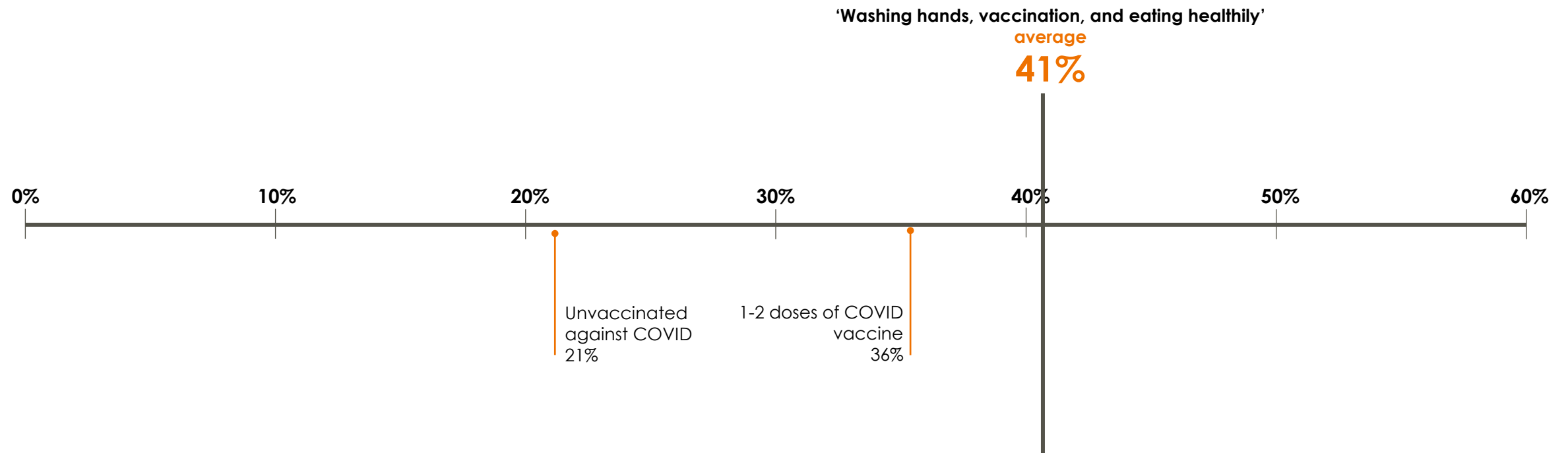
Not vaccinated against
measles as a child
14%

Women 65+
33%

*A logistic (forward stepwise) regression was done to determine which demographic variables help explain assignment to the 'Everything except heat pump fans' group. The regression showed that demographic variables explain 7.2% of the variance in the assignment (Nagelkerke R-squared). The demographic variables shown in the chart above are those that significantly contribute to the explanation (at the <0.01 level).

See appendix for sample sizes of each demographic group.

Opening doors and windows is the most common source of ventilation and almost all of those opening their doors and windows for ventilation are doing so multiple times each week.

Sources of ventilation

- Opening the doors or windows — 91%
- Home ventilation system — 25%
- Don't bring fresh air in — 1%
- Don't know — 1%
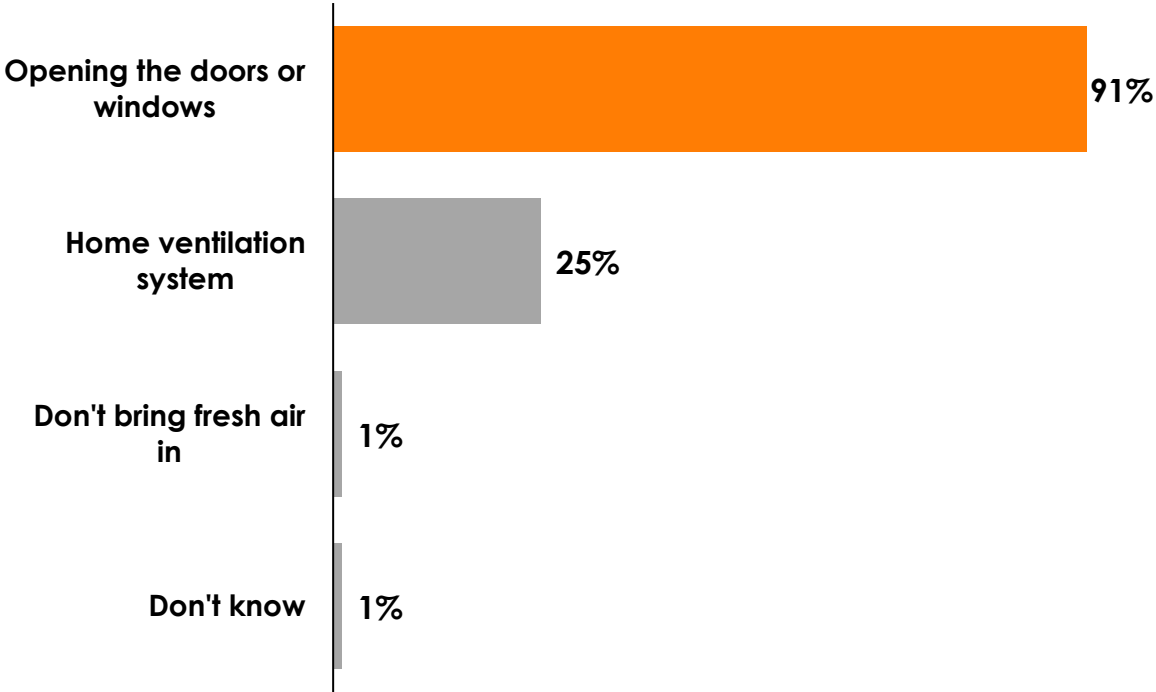
Frequency of opening doors and windows

- Every day — 75%
- A few times a week — 22%
- Once a week — 2%
- Once or twice a month — 1%

6:
Perceptions of measles

The is no consistent, common understanding of the ease of catching measles, its severity, the effectiveness of the measles vaccine, and the commonness of serious side-effects from the vaccine.

Perceptions of measles
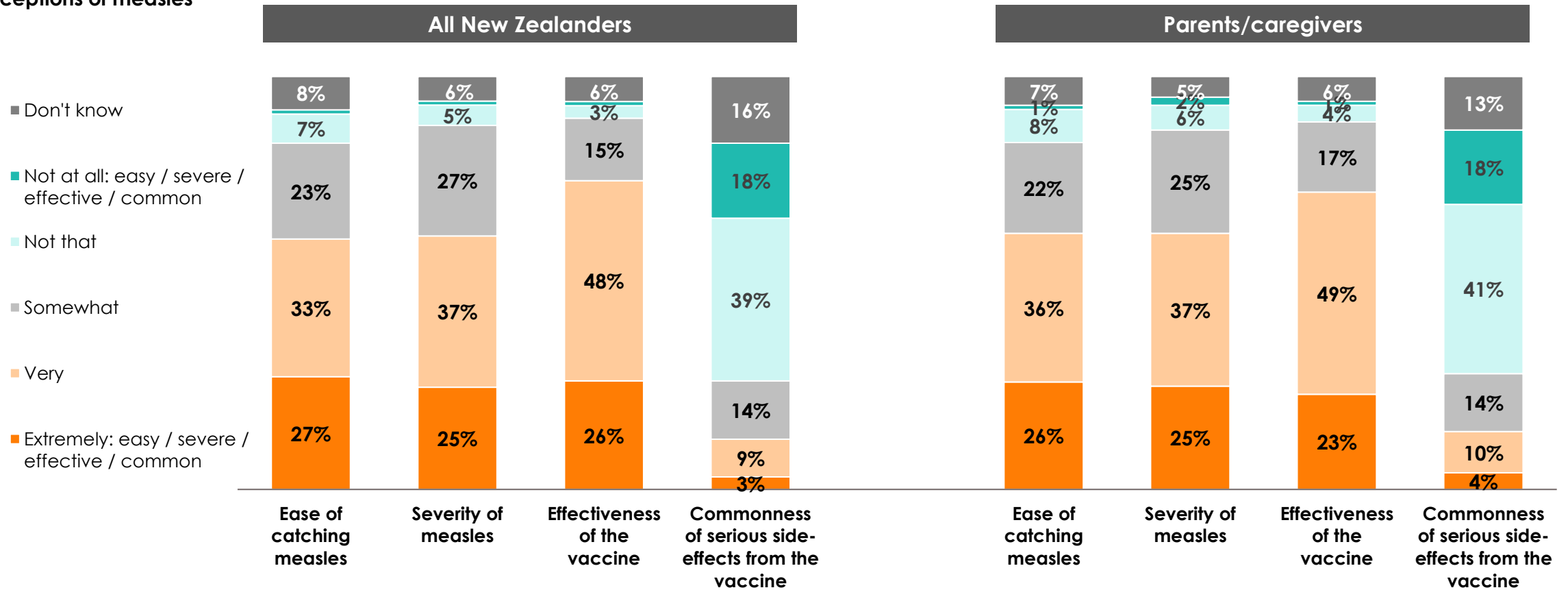
All New Zealanders

	Ease of catching measles	Severity of measles	Effectiveness of the vaccine	Commonness of serious side-effects from the vaccine
Don't know	8%	6%	6%	16%
Not at all: easy / severe / effective / common				18%
Not that	7%	5%	3%	39%
Somewhat	23%	27%	15%	14%
Very	33%	37%	48%	9%
Extremely: easy / severe / effective / common	27%	25%	26%	3%

Parents/caregivers

	Ease of catching measles	Severity of measles	Effectiveness of the vaccine	Commonness of serious side-effects from the vaccine
Don't know	7%	5%	6%	13%
Not at all: easy / severe / effective / common	1%	2%	1%	18%
Not that	8%	6%	4%	41%
Somewhat	22%	25%	17%	14%
Very	36%	37%	49%	10%
Extremely: easy / severe / effective / common	26%	25%	23%	4%

Legend:
- Don't know
- Not at all: easy / severe / effective / common
- Not that
- Somewhat
- Very
- Extremely: easy / severe / effective / common

Grouping New Zealanders by their perceptions of measles and the measles vaccine* reveals that New Zealanders tend to hold one of four views about measles:

- **Very concerned about measles – think measles is easy to catch, severe, the vaccine is effective with a low incidence of serious side-effects.**

- **Moderately concerned – Think measles is very or somewhat easy to catch, very or somewhat severe, the vaccine is effective with a low incidence of serious side-effects.**

- **Unconcerned – think measles is not easy to catch, not severe, and have mixed views on the effectiveness of the vaccine.**

- **Uncertain – lack knowledge about measles and its vaccine.**

The incidence of each of the views in the population and amongst parent/caregivers is shown to the right.
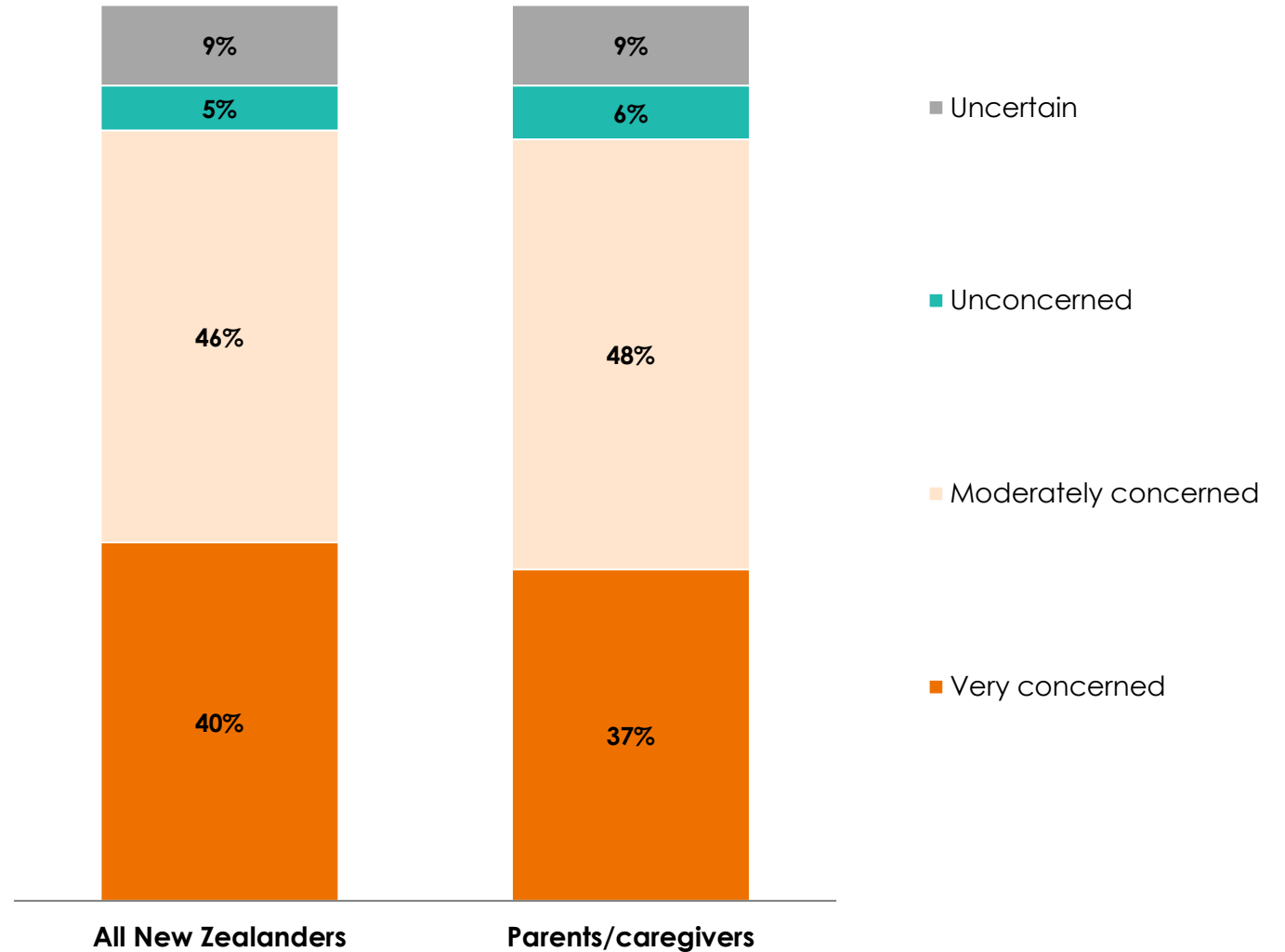
	All New Zealanders	Parents/caregivers
Uncertain	9%	9%
Unconcerned	5%	6%
Moderately concerned	46%	48%
Very concerned	40%	37%

The chart below illustrates the perceptions of each group, in the total population, in more detail.

Perceptions of measles by group – All New Zealanders

		Very concerned (40% of New Zealanders)	**Moderately concerned** (46% of New Zealanders)	**Unconcerned** (5% of New Zealanders)	**Uncertain** (9% of New Zealanders)
Ease of catching	Extremely/very	95%	44%	12%	11%
	Not that/at all	3%	8%	63%	7%
	Don't know	1%	4%	3%	70%
Severity	Extremely/very	88%	53%	3%	15%
	Not that/at all		2%	80%	5%
	Don't know	1%		6%	62%
Effectiveness of vaccine	Extremely/very	95%	72%	24%	23%
	Not that/at all	1%	2%	51%	2%
	Don't know	1%	2%	1%	58%
Commonness of vaccine side-effects	Extremely/very	15%	10%	28%	4%
	Not that/at all	67%	59%	44%	12%
	Don't know	10%	9%	8%	79%

% who said 'somewhat' is not shown.

The chart below illustrates the perceptions of each group, amongst parents/caregivers, in more detail.

Perceptions of measles by group – Parents/caregivers
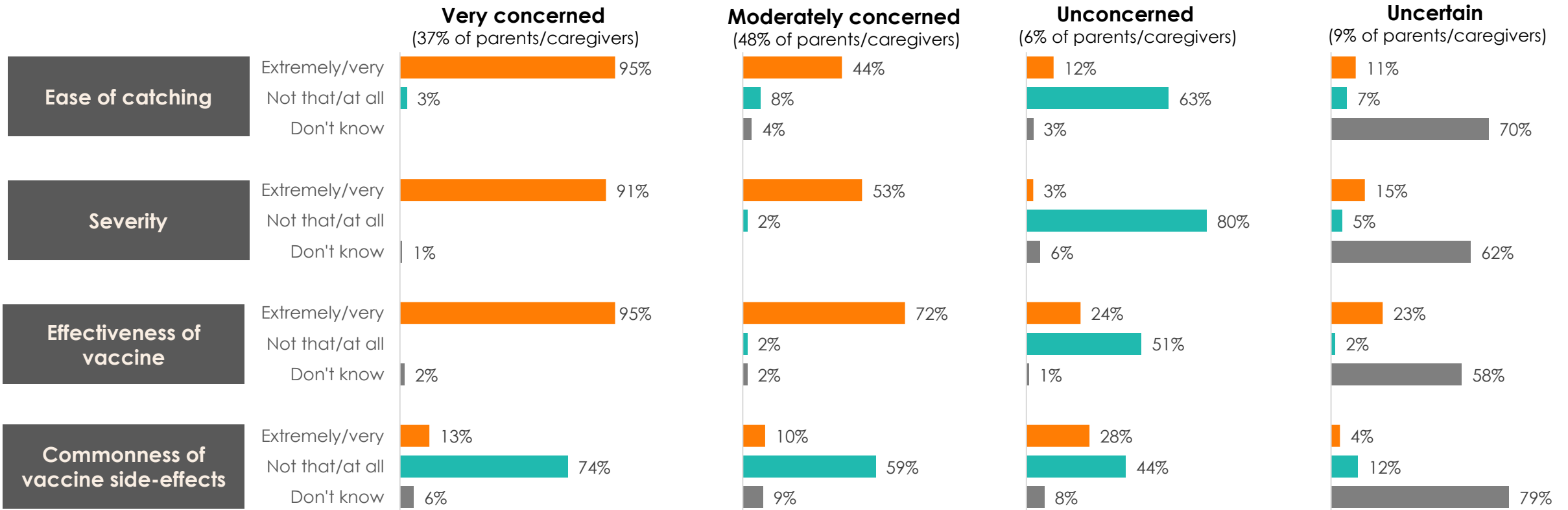
		Very concerned (37% of parents/caregivers)	**Moderately concerned** (48% of parents/caregivers)	**Unconcerned** (6% of parents/caregivers)	**Uncertain** (9% of parents/caregivers)
Ease of catching	Extremely/very	95%	44%	12%	11%
	Not that/at all	3%	8%	63%	7%
	Don't know	4%	4%	3%	70%
Severity	Extremely/very	91%	53%	3%	15%
	Not that/at all	1%	2%	80%	5%
	Don't know	1%	6%	6%	62%
Effectiveness of vaccine	Extremely/very	95%	72%	24%	23%
	Not that/at all	2%	2%	51%	2%
	Don't know	2%	2%	1%	58%
Commonness of vaccine side-effects	Extremely/very	13%	10%	28%	4%
	Not that/at all	74%	59%	44%	12%
	Don't know	6%	9%	8%	79%

% who said 'somewhat' is not shown.

The Unconcerned and the Uncertain are less likely to have vaccinated their children against measles than the Very concerned and the Moderately concerned.
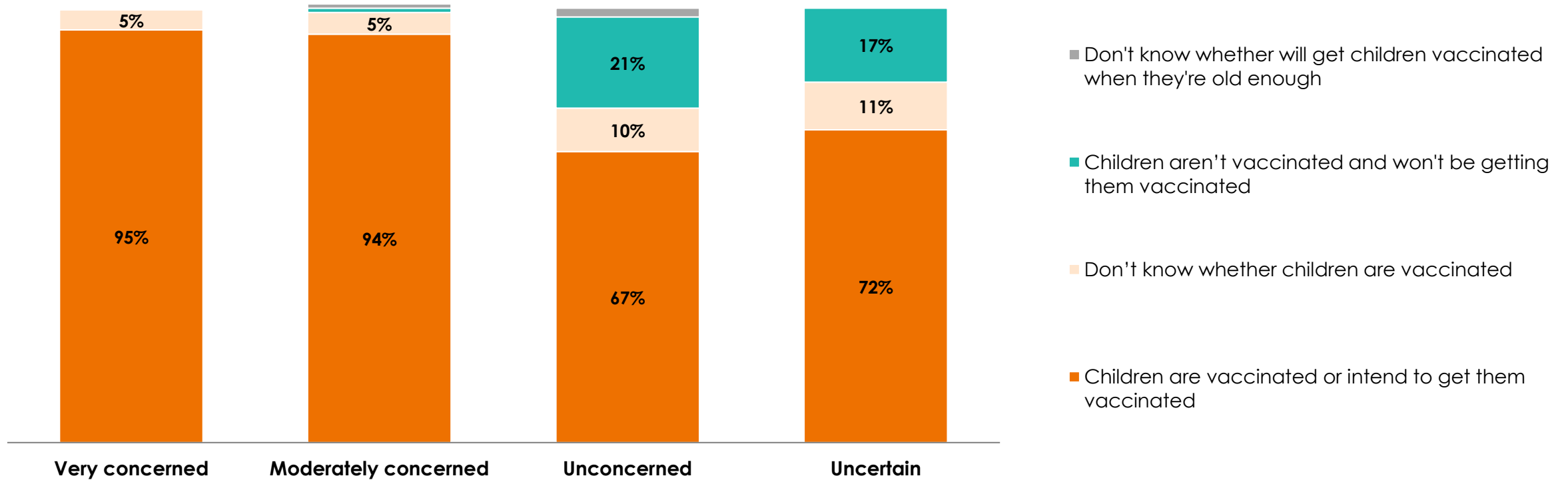
Very concerned
- 5%
- 95%

Moderately concerned
- 5%
- 94%

Unconcerned
- 21%
- 10%
- 67%

Uncertain
- 17%
- 11%
- 72%

Legend:
- Don't know whether will get children vaccinated when they're old enough
- Children aren't vaccinated and won't be getting them vaccinated
- Don't know whether children are vaccinated
- Children are vaccinated or intend to get them vaccinated

The Unconcerned are most likely to be those unvaccinated against COVID and also unvaccinated against measles.

Demographic explainers of being in the unconcerned group*
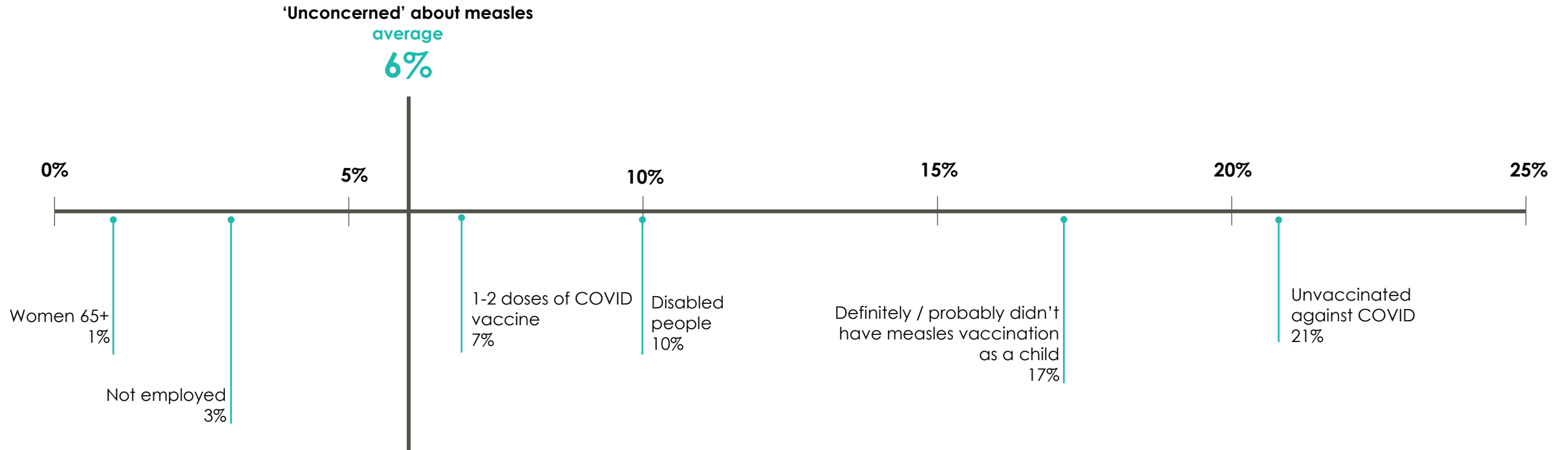
'Unconcerned' about measles
average
6%

0%   5%   10%   15%   20%   25%

1-2 doses of COVID vaccine
7%

Disabled people
10%

Definitely / probably didn't have measles vaccination as a child
17%

Unvaccinated against COVID
21%

Women 65+
1%

Not employed
3%

*A logistic (forward stepwise) regression was done to determine which demographic variables help explain assignment to the 'unconcerned' group. The regression showed that demographic variables explain 20.9% of the variance in the assignment (Nagelkerke R-squared). The demographic variables shown in the chart above are those that significantly contribute to the explanation (at the <0.01 level).

See appendix for sample sizes of each demographic group.

The Uncertain are most likely to be those who don't know their measles vaccination status.

Demographic explainers of being in the uncertain group*
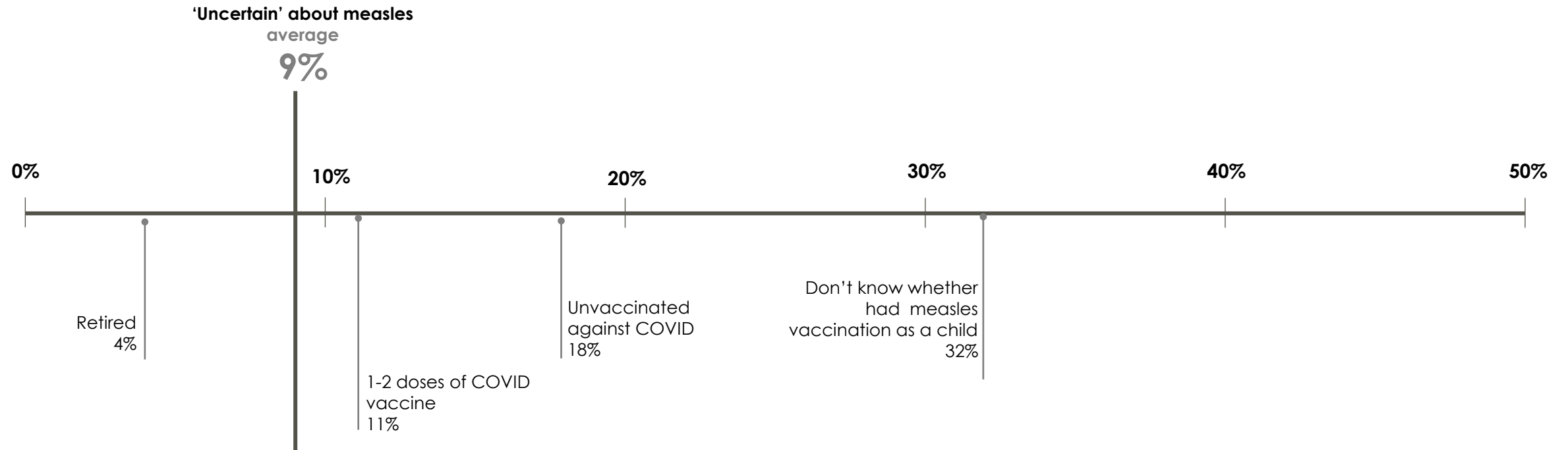
'Uncertain' about measles
average
9%

0%   10%   20%   30%   40%   50%

Retired
4%

1-2 doses of COVID
vaccine
11%

Unvaccinated
against COVID
18%

Don't know whether
had measles
vaccination as a child
32%

*A logistic (forward stepwise) regression was done to determine which demographic variables help explain assignment to the 'uncertain' group. The regression showed that demographic variables explain 17.5% of the variance in the assignment (Nagelkerke R-squared). The demographic variables shown in the chart above are those that significantly contribute to the explanation (at the <0.01 level).

See appendix for sample sizes of each demographic group.

Only one demographic group helps explain the assignment of people to the Moderately concerned group – Asian peoples are more likely to be Moderately concerned than the total population average.

Demographic explainers of being in the moderately concerned group*

'Moderately concerned' about measles
average
46%

0%   10%   20%   30%   40%   50%   60%

Asian peoples
57%

*A logistic (forward stepwise) regression was done to determine which demographic variables help explain assignment to the 'moderately concerned' group. The regression showed that demographic variables explain 4.1% of the variance in the assignment (Nagelkerke R-squared). The demographic variables shown in the chart above are those that significantly contribute to the explanation (at the <0.01 level).

See appendix for sample sizes of each demographic group.

The Very concerned about measles are most likely to be women aged 65+ or have European ethnicity.

Demographic explainers of being in the very concerned group*
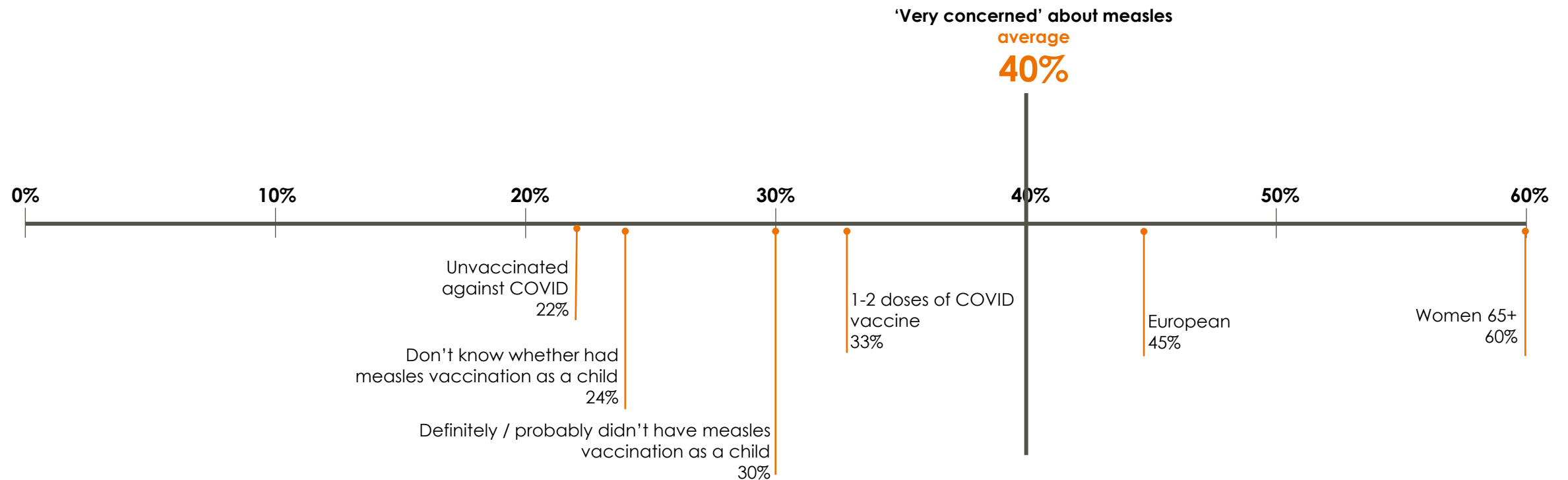
'Very concerned' about measles
average
40%

0%   10%   20%   30%   40%   50%   60%

Unvaccinated
against COVID
22%

Don't know whether had
measles vaccination as a child
24%

Definitely / probably didn't have measles
vaccination as a child
30%

1-2 doses of COVID
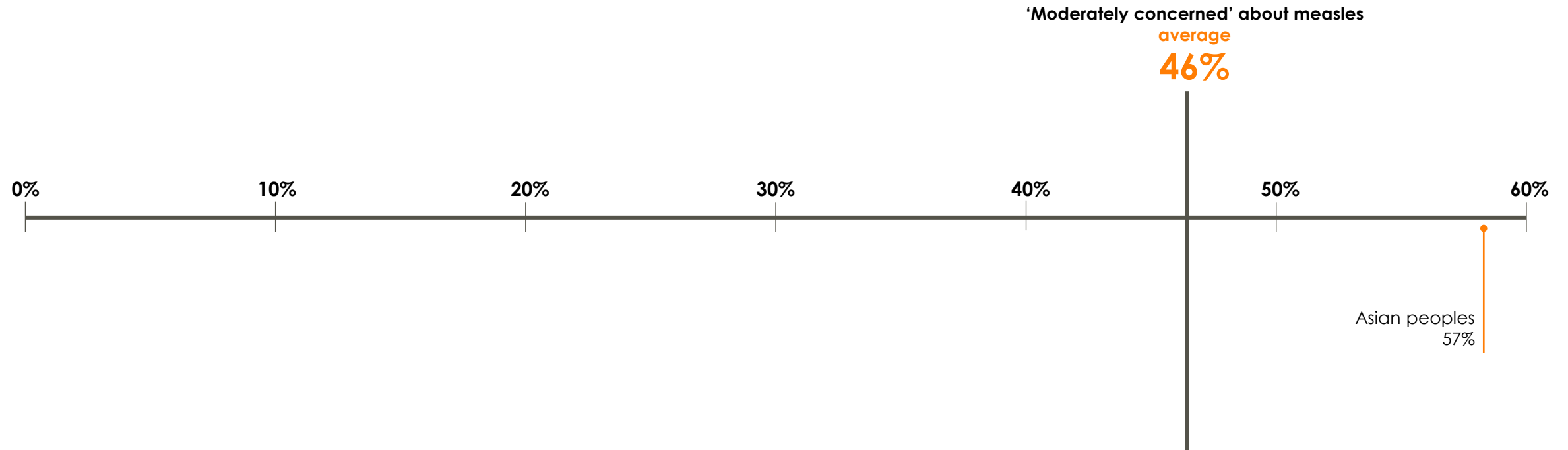vaccine
33%

European
45%

Women 65+
60%

*A logistic (forward stepwise) regression was done to determine which demographic variables help explain assignment to the 'very concerned' group. The regression showed that demographic variables explain 11.3% of the variance in the assignment (Nagelkerke R-squared). The demographic variables shown in the chart above are those that significantly contribute to the explanation (at the <0.01 level).

See appendix for sample sizes of each demographic group.

7:
What inhibits and what could encourage measles vaccination?

Most of the parents/caregivers in the sample said that their children have had the measles vaccination or that they intend them to get it when they're old enough.

Don't know whether children are vaccinated or not

Children aren't vaccinated and don't intend to get them vaccinated

5%

4%

91%

Children are vaccinated against measles or intend to get them vaccinated when they're old enough*
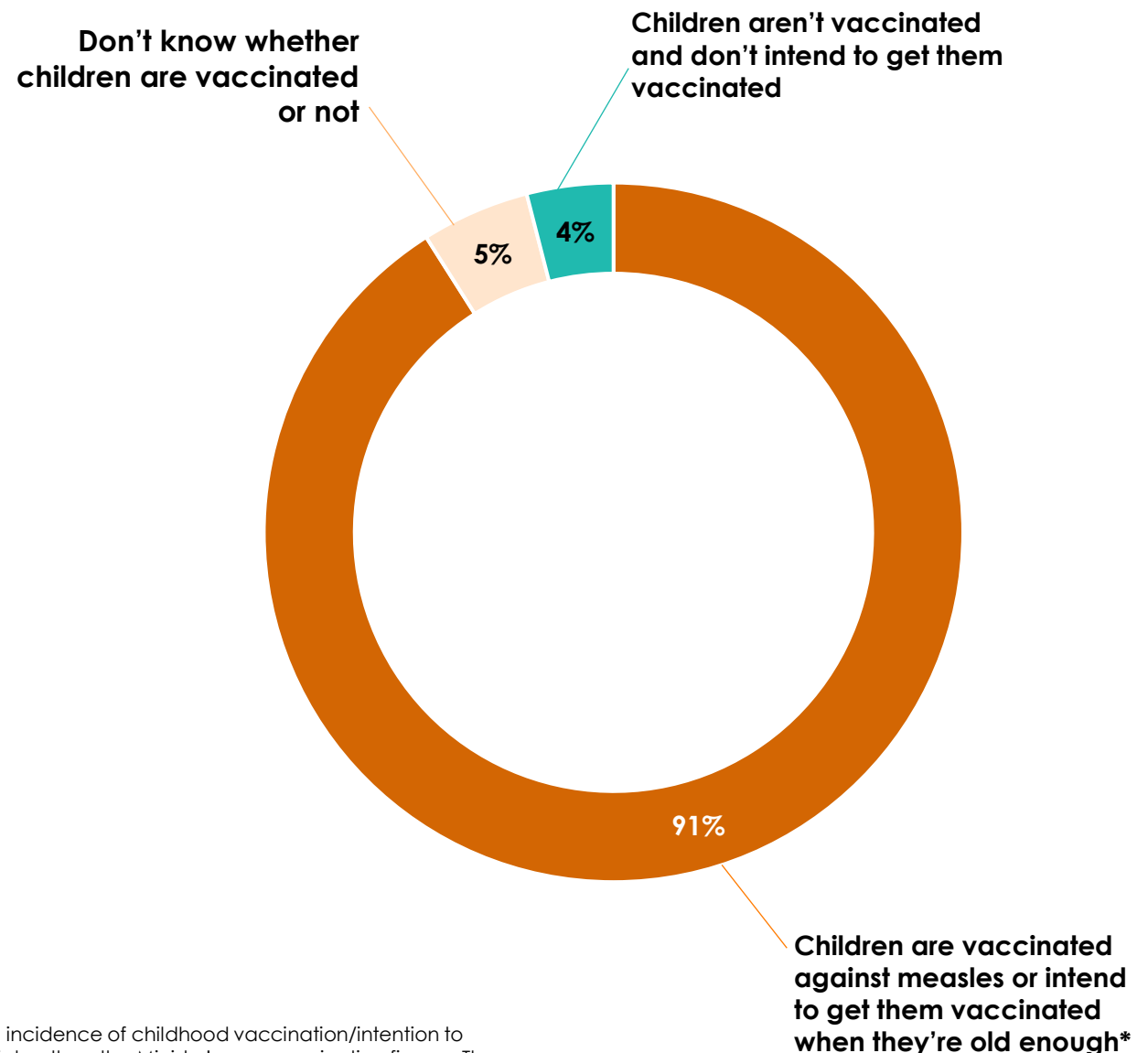
*Note that the incidence of childhood vaccination/intention to vaccinate is higher than the Ministry's own vaccination figures. There are several possible explanations for this, one of which is that the results have been influenced by social desirability response bias (i.e., people want to be seen as good parents/caregivers and so over-state their 'good' behaviour).

Amongst the small number of parents/caregivers (15 people) who said their children aren't vaccinated and they don't intend to get them vaccinated in the future, the most commonly mentioned reason for not vaccinating is the belief that vaccines do more harm than good (see verbatim comments to the right). Most of the other reasons given were less specific (see verbatim comments on the next slide).

"Don't believe vaccination is sufficiently effective to outweigh the risks involved."

"I feel vaccines are not necessary and cause more harm than good."

"I have a long list of reasons for this but I will try to keep it brief. My eldest had a massive decline after some of his vaccines, the most profound being the MMR (though this was given in Australia who use Thimerosal in the vaccines still, NZ doesn't). From there my second son only received some of the childhood vaccines, delayed, and did not receive anything past the 6 month mark. My youngest son has lots of issues (fully vaccinated until 1.5 years old). My second son has none at all. A lot of my friends children its been a 50/50 hit and miss with health issues and disabilities – except those that are not vaccinated they're all completely healthy.

If we were able to separate different vaccines, and they weren't all grouped together, then I'd be more likely to vaccinate from certain things. Also doctors don't seem to care even in the slightest about anyone's health issues nor the suffering they're going through - even if its leading to death or potential death for the patient - but yeah they seem to really care a lot about if someone is vaccinated. Major red flag. None of the nurses undertaking the inoculations seems capable of answering simple questions around vaccines (ingredients and what they're for, risks, side effects, statistics, etc). One nurse nearly gave my 6 week old a 6 month old jab and this was only prevented due to my observancy. A friend's baby was mistakenly injected with saline solution instead of his vaccine, and the staff realised a week later leading to him needing to go back for another jab.

I saw the physical and mental changes vaccines had on my eldest son, and friends children - primarily the MMR vaccine."

"Not sure of safety and effectiveness."

Most of the other reasons mentioned for not vaccinating their children were non-specific, aside from mentions of non-vaccinated parents/caregivers saying they'd had no problems and there being a backlog of appointments.

"As a child growing in Tahiti, we had some vaccinations but not for anything and everything. We never had problem with measles in Tahiti. Safe care, natural immunity have played a big part in my family which works really well. We look after our children closely into their health. Modern medicine has its place in our world so does the natural medicine I have grown up with and my kids."

"There isn't enough evidence or research regarding vaccinations for me to feel completely comfortable."

"Against vaccinations."

"Did not believe it was necessary to put poison in to create antibodies."

"Didn't agree to vaccinate."

"Don't want them having vaccinations."

"Don't want to."

"I don't do immunisation, any needles."

"My own choice."

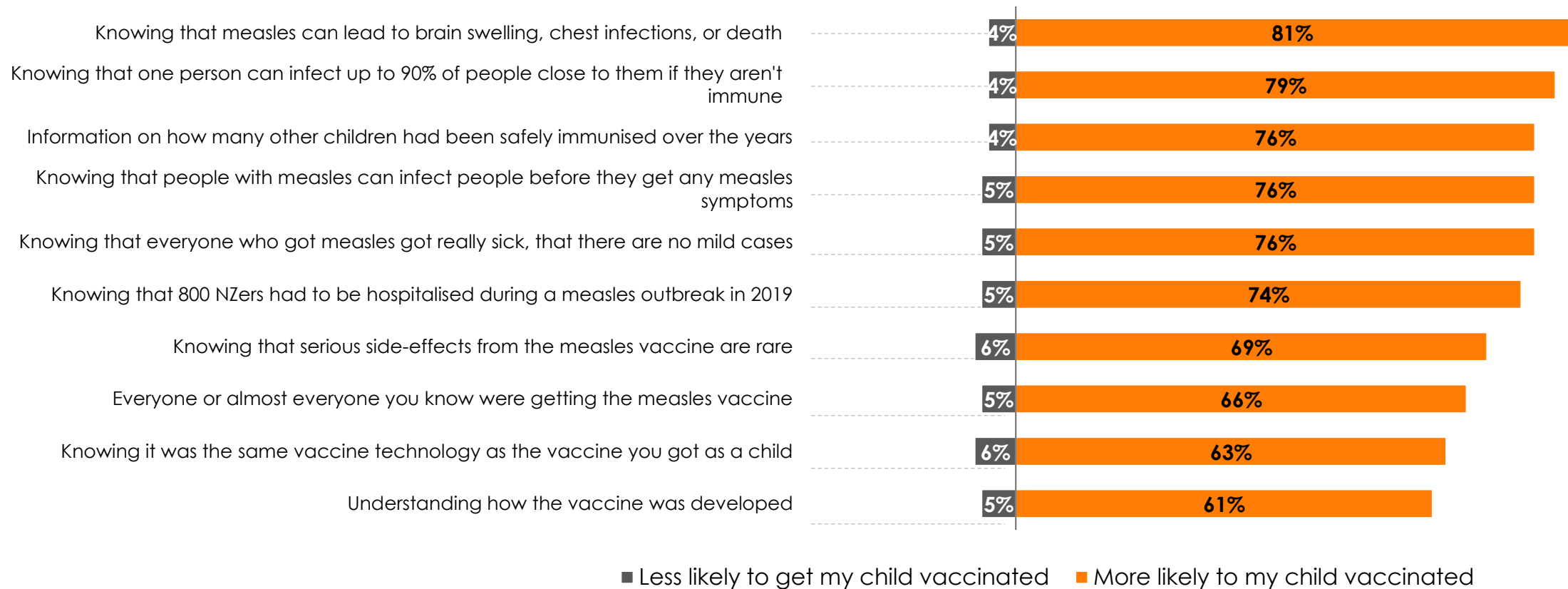*"There is a backlog of appointments."*

Most of the informational influencers included in the survey have a positive effect on the intention to get a child the measles vaccination – however the two motivators that describe the symptoms and infection directly in terms of the impact on their child and those around them have a slightly greater positive effect on intention.

Informational influences on the decision to vaccinate children against measles

	Less likely to get my child vaccinated	More likely to my child vaccinated
Knowing that measles can lead to brain swelling, chest infections, or death	4%	81%
Knowing that one person can infect up to 90% of people close to them if they aren't immune	4%	79%
Information on how many other children had been safely immunised over the years	4%	76%
Knowing that people with measles can infect people before they get any measles symptoms	5%	76%
Knowing that everyone who got measles got really sick, that there are no mild cases	5%	76%
Knowing that 800 NZers had to be hospitalised during a measles outbreak in 2019	5%	74%
Knowing that serious side-effects from the measles vaccine are rare	6%	69%
Everyone or almost everyone you know were getting the measles vaccine	5%	66%
Knowing it was the same vaccine technology as the vaccine you got as a child	6%	63%
Understanding how the vaccine was developed	5%	61%

■ Less likely to get my child vaccinated   ■ More likely to my child vaccinated

Source: Q29. Now imagine that you have a child in your care who is at the age where you need to decide whether to get them vaccinated against measles. Would you be more or less likely to get your child vaccinated if …

Base: All respondents n=1,842.

Amongst those who don't generally value vaccinations, the informational influencers most likely to encourage vaccination are a description of the symptoms that allows someone to imagine their child with those symptoms and also knowing that there are no mild cases.

Informational influences on the decision to vaccinate children against measles - % more likely to get my child vaccinated

	All people	Believe vaccinations are extremely or very useful to prevent illness	Believe vaccinations are somewhat useful to prevent illness	Don't believe vaccinations are useful to prevent illness
Knowing that measles can lead to brain swelling, chest infections, or death	81%	88%	77%	58%
Knowing that one person can infect up to 90% of people close to them if they aren't immune	79%	87%	74%	48%
Information on how many other children had been safely immunised over the years	76%	83%	71%	49%
Knowing that people with measles can infect people before they get any measles symptoms	76%	85%	70%	46%
Knowing that everyone who got measles got really sick, that there are no mild cases	76%	83%	71%	56%
Knowing that 800 NZers had to be hospitalised during a measles outbreak in 2019	74%	83%	67%	42%
Knowing that serious side-effects from the measles vaccine are rare	69%	78%	62%	40%
Everyone or almost everyone you know were getting the measles vaccine	66%	74%	61%	37%
Knowing it was the same vaccine technology as the vaccine you got as a child	63%	69%	58%	43%
Understanding how the vaccine was developed	61%	67%	57%	39%

■ 67%+ are more likely   ■ 50-66% are more likely   ■ Less than 50% are more likely

The description of the symptoms that allows someone to imagine their child with those symptoms is also the strongest influencer amongst each of the perceptions of measles groups (identified in the previous section).

Informational influences on the decision to vaccinate children against measles - % more likely to get my child vaccinated

	All people	Very concerned (40% of NZers)	Moderately concerned (46% of NZers)	Unconcerned (6% of NZers)	Uncertain (9% of NZers)
Knowing that measles can lead to brain swelling, chest infections, or death	81%	88%	83%	47%	58%
Knowing that one person can infect up to 90% of people close to them if they aren't immune	79%	88%	81%	34%	46%
Information on how many other children had been safely immunised over the years	76%	85%	77%	45%	48%
Knowing that people with measles can infect people before they get any measles symptoms	76%	85%	78%	38%	44%
Knowing that everyone who got measles got really sick, that there are no mild cases	76%	86%	78%	43%	46%
Knowing that 800 NZers had to be hospitalised during a measles outbreak in 2019	74%	85%	74%	35%	45%
Knowing that serious side-effects from the measles vaccine are rare	69%	79%	70%	39%	42%
Everyone or almost everyone you know were getting the measles vaccine	66%	75%	66%	38%	40%
Knowing it was the same vaccine technology as the vaccine you got as a child	63%	69%	64%	38%	47%
Understanding how the vaccine was developed	61%	69%	62%	39%	34%

■ 67%+ are more likely   ■ 50-66% are more likely   ■ Less than 50% are more likely

The informational influencers are similar across each of the key demographic groups.

Informational influences on the decision to vaccinate children against measles - % more likely to get my child vaccinated

	All people	Māori	Pacific peoples	Asian peoples	European	Disabled people	Non-disabled people
Knowing that measles can lead to brain swelling, chest infections, or death	81%	83%	77%	80%	82%	77%	82%
Knowing that one person can infect up to 90% of people close to them if they aren't immune	79%	79%	78%	77%	80%	73%	80%
Information on how many other children had been safely immunised over the years	76%	76%	78%	77%	76%	72%	77%
Knowing that people with measles can infect people before they get any measles symptoms	76%	77%	72%	76%	76%	74%	76%
Knowing that everyone who got measles got really sick, that there are no mild cases	76%	74%	72%	76%	78%	70%	78%
Knowing that 800 NZers had to be hospitalised during a measles outbreak in 2019	74%	74%	68%	72%	76%	72%	74%
Knowing that serious side-effects from the measles vaccine are rare	69%	70%	67%	73%	69%	67%	70%
Everyone or almost everyone you know were getting the measles vaccine	66%	63%	68%	74%	64%	63%	67%
Knowing it was the same vaccine technology as the vaccine you got as a child	63%	65%	71%	69%	60%	62%	63%
Understanding how the vaccine was developed	61%	60%	63%	73%	59%	61%	61%

■ 67%+ are more likely   ■ 50-66% are more likely   ■ Less than 50% are more likely

To understand how the facilitators might work together (i.e., amplify each other) to encourage measles vaccination, the facilitators were included in a Bayesian Belief Network.

The diagram to the right illustrates how to interpret the relationship between the facilitators shown on the following slides.

Direction of arrow

A likely to influence B: A —————● B

B likely to influence A: A ●————— B

Bidirectional relationship: A ●———● B

Thickness of arrow

Weak relationship: A ·············● B

Moderate relationship: A ————● B

Strong relationship: A ━━━━● B

Colour of arrow

Positive relationship: A ————● B

Negative relationship: A ————● B

The key take-out from the Bayesian Belief Network is that understanding the contagiousness of measles is the root facilitator – i.e., it is the facilitator that can enhance the effectiveness of the other facilitators.

Knowing that one person can infect up to 90% of people close to them if they aren't immune

Knowing that 800 NZers had to be hospitalised during a measles outbreak in 2019

Knowing that people with measles can infect people before they get any measles symptoms

Knowing that measles can lead to brain swelling, chest infections, or death

Knowing that everyone who got measles got really sick, that there are no mild cases

Information on how many other children had been safely immunised over the years

Knowing that serious side-effects from the measles vaccine are rare

Understanding how the vaccine was developed

Knowing it was the same vaccine technology as the vaccine you got as a child

Everyone or almost everyone you know were getting the measles vaccine

Note: Threshold value, 0.45

Base: All respondents with a child who provided an answer for each facilitator, n=587

8:
Appendix

Demographic profile of the sample.

	Unweighted sample size	Weighted sample size
Total	1842	1842
Women 18-34	363	267
Women 35-49	236	227
Women 50-64	221	228
Women 65+	195	213
Men 18-34	250	276
Men 35-49	204	224
Men 50-64	196	215
Men 65+	174	188
Another gender	3	3

	Unweighted sample size	Weighted sample size
Total	1842	1842
European	1014	1239
Māori	454	267
Pacific peoples	304	131
Asian peoples	395	321
Auckland	658	603
Wellington	208	199
Other North Island	566	603
Canterbury	198	238
Other South Island	212	199

	Unweighted sample size	Weighted sample size
Total	1842	1842
Household size 1-2	871	956
Household size 3+	971	886
No dependent children	1242	1286
Dependent children	600	556
Working	1199	1154
Studying	99	95
Not employed	202	202
Retired	324	369
Unsure / prefer not to say	18	23

Demographic profile of the sample, cont.

	Unweighted sample size	Weighted sample size
Total	1842	1842
No qualif. / high school	633	813
Trade or Polytech	350	477
Bachelor's degree	451	272
Postgraduate degree	351	207
Other	57	74
Definitely or probably vaccinated against measles as a child	1569	1554
Definitely or probably not vaccinated against measles as a child	161	165
Don't know whether vaccinated as a child	112	123

|	Unweighted sample size	Weighted sample size
Total	1855	1855
Rural area	136	158
Small or medium town	489	535
Large town or city	1184	1114
Not sure	33	34
Disabled people	304	300
Non-disabled people	1538	1542
Unvaccinated	76	87
Vaccinated	1729	1712
Vaccinated (1-2 doses)	632	640
Vaccinated (3+ doses)	1097	1072
Prefer not to say	37	43

# Technical details regarding Bayesian Belief Networks.

There are four key stages in generating the Bayesian Belief Network maps:

1) **Determination of relationships between map variables:** Connections between variables are determined based on tests of independence conducted within a learning algorithm

2) **Determination of indicative directionality of relationships:** Indication of causal direction is determined by the pattern of conditional dependence and independence between variables.

A simple example of this can be seen below.
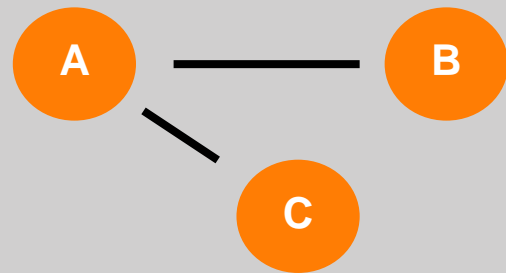
Three variables, two of which (B and C) are conditionally independent
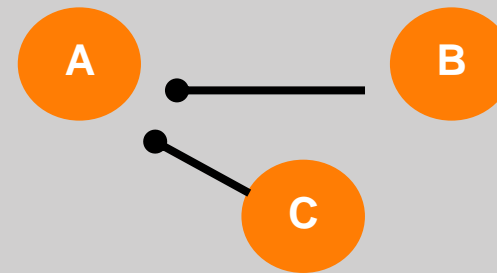
Given conditional independence of B and C, causal direction has to occur as on left

3) **Running tests across the dataset:** Multiple tests of independence between all independent/dependent variables are conducted.

4) **Determining the most stable solution:** Steps 1-3 are run for at least 200 bootstrap samples. The average of these maps is presented as the final map, resulting in a more robust and stable model. The threshold value presented with the model represents the number of bootstraps the relationships shown are present in.