Experience of racism and associations with unmet need and healthcare satisfaction: the 2011/12 adult New Zealand Health Survey

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It is now well established that racism negatively impacts on health and wellbeing and contributes to racial/ethnic inequities.1,2 Racism is an organised system of power whereby racial/ethnic groups are categorised and ranked according to ideologies of superiority and inferiority within particular historical contexts.1 Racism can operate at societal, institutional and individual levels to create inequities across multiple social domains including health.1,4,5 The complex nature of racism as a structural phenomenon means that there are multiple pathways by which racism can have an impact on health, including directly through violence, trauma and chronic stress, and indirectly through differential access to social determinants of health and differential exposure to individual level health risk factors.4,6 Racism can also affect health through differences in access to, and quality of, healthcare by race/ethnicity.1,5,6

Experience of racism has been linked to various mental and physical health outcomes in many studies to date, as summarised in a recent systematic review,2 and is largely thought to affect health as a chronic stressor.1,2,6 The negative impact of racism on people’s experiences and use of healthcare has also been examined, albeit to a lesser extent.1,6 Racial discrimination experienced in both broader society and specifically in healthcare services can influence perceptions of healthcare by patients, as well as how people engage with and access services.10 Racism in wider society has the potential to influence trust in established institutions generally, including healthcare institutions.11 It may also affect the way patients perceive the quality of the care they receive, how satisfied they are with their healthcare, their likelihood of following healthcare recommendations and their future health service engagement.12,13 Subtle patient behaviour stemming from negative experiences of healthcare may also influence provider behaviour.14 More directly, experience of racial discrimination in healthcare may reflect differential treatment or poorer quality interactions, as supported by evidence that health provider racial/ethnic bias and negative stereotypes within healthcare may affect the quality and outcomes of healthcare interactions.15 The negative impact of racial discrimination on physical and mental health and the increased need for healthcare may also influence patterns of health service use.15,16

There is clear international and New Zealand-based evidence of inequitable healthcare by race/ethnicity.5,7,17,18 In New Zealand, most people (93%) have access to a usual medical centre,19 with primary care subsidised by the government – although individual

Abstract

Objective: Racism may affect health through differential access to, and quality of, healthcare. This study examined associations between experience of racism and unmet need and satisfaction with healthcare.

Methods: Cross-sectional analysis of the 2011/12 adult New Zealand Health Survey (n=12,596) was undertaken. Logistic regression was used to examine associations between experience of racism (by a health professional and other experiences of racism (ever)) and unmet need for a general practitioner and satisfaction with a usual medical centre in the past year.

Results: Experience of racism by a health professional and other forms of racism were higher among Māori, Pacific and Asian groups compared to European/Other. Both racism measures were associated with higher unmet need (health professional racism adjusted OR 3.52, 95%CI 2.42-5.11; other racism OR 2.21, 95%CI 1.78-2.75) and lower satisfaction with a usual medical centre (health professional racism adjusted OR 0.25, 95%CI 0.15-0.34; other racism OR 0.60, 95%CI 0.45-0.79).

Conclusions: Racism may act as a barrier to, and influence the quality of, healthcare.

Implications for public health: Addressing racism as a public health issue and major driver of inequities in healthcare and health outcomes is required within the health sector and wider society.

Key words: New Zealand, racial discrimination, healthcare, unmet need, satisfaction
visits usually attract a co-payment for those aged 13 years and over. However, there are still ethnic inequities in access to care and satisfaction with care, particularly for Māori (indigenous peoples) and Pacific peoples, who make up 15% and 7% of the population, respectively. There is also evidence that Māori, Pacific and Asian people experience higher rates of racism, which has been linked to negative patient experiences and (for Māori), lower breast and cervical cancer screening.

This study aims to build on the relatively limited literature examining the link between experience of racism at the person-level and negative healthcare measures using data from the 2011/12 adult New Zealand Health Survey. Specifically, this study seeks to examine the association between experience of racism (by a health professional, and other experiences of racism) with unmet need for primary care and satisfaction with a usual medical centre.

**Methods**

This study undertook secondary analysis of data from the adult 2011/12 New Zealand Health Survey (NZHS). At the time of analysis, the 2011/12 survey was the most recent NZHS instance to include questions on experience of racism (which are not included every year). The NZHS is an annual national survey run by the NZ Ministry of Health that collects information on self-reported health status, health conditions, health service use and experience, and health risk and protective factors, as well as a range of demographic variables. Data were provided by Statistics New Zealand as confidentialised unit record files (CURFs) following standard application and approval processes. The University of Otago Human Ethics Committee (D14/308) approved the study.

**Survey design**

From July 2011, the New Zealand Health Survey has been run continuously, with content updated each year. The 2011/12 New Zealand Health Survey used a complex sampling design based on multi-staged, stratified, probability-proportional-to-size (PPS) sampling. Meshblocks (small areas of approximately 90 people) were the primary sampling units, with households and individuals (from the usually resident New Zealand population aged 15+ years) randomly selected within selected meshblocks. Methods to increase sampling of Māori, Pacific and Asian participants were also undertaken. Data were collected between July 2011 and June 2012 in face-to-face computer assisted interviews. The survey achieved a 79% response rate (CURF n=12,596). Survey weights provided with the completed data enable calculation of nationally representative estimates. Further information on the study design, data collection processes and questionnaire are published elsewhere.

**Key variables**

**Outcome variables**

Choice of healthcare variables was informed by existing evidence of links between experience of racism and healthcare measures, evidence of ethnic health inequities in healthcare, data availability and data quality. We chose one health service utilisation variable (unmet need to see a general practitioner [GP]) and one patient experience variable (overall satisfaction with usual medical centre). These both focus on primary healthcare in New Zealand and represent the two types of healthcare measures identified in a recent review of racism and health service utilisation.

All participants were asked about unmet need for a GP. The question was: “In the last 12 months, has there been any time when you needed to see a GP about your own health, but didn’t get to see any doctor at all?”

Response options were ‘yes’, ‘no’, ‘don’t know’ and ‘refused’. Responses were analysed as ‘yes’ or ‘no’, with missing, don’t know and refused responses excluded from analysis (n=19).

Most participants had a usual medical centre (93%). People with a usual medical centre were asked: “How satisfied are you with the care you got at your usual medical centre in the last 12 months?” Response options were grouped into two categories for analysis – ‘very satisfied/satisfied’ vs. ‘neither satisfied or dissatisfied’/‘dissatisfied’/‘very dissatisfied’.

Participants who had not visited their usual medical centre in the past 12 months were coded as not applicable and excluded from analysis, (of those with a usual medical centre, n=1,235 had no recent visit and n=34 had missing data on recent visit status).

All respondents in this analysis group had responses on the satisfaction question.

**Experience of racism**

Five items examining participants’ experience of racism were included in the survey: experience of an ethnically-motivated verbal or physical attack, and unfair treatment because of ethnicity by a health professional, in work and in gaining housing. For analysis, these racism items were categorised into a three-level variable: any experience of racism by a health professional ever; any other experience of racism ever; and no reported experience of racism ever. A total of n=165 individuals had no recorded values for these questions (don’t know, refused, or missing).

**Ethnicity**

The NZHS uses the standard ethnicity question from the New Zealand population census. This asks people to self-identify the ethnic group or groups they belong to. Participants were grouped into four categories for analysis: Māori, Pacific, Asian, and European/Other. Because of prior grouping on the confidentialised unit record file (CURF) dataset we were unable to disaggregate the European/Other category; however, early surveys (2002/03, 2006/07 NZHS) showed this group is largely made up of participants who identify as European (99%). For descriptive analyses, total Māori, Pacific, and Asian groupings were used where people with multiple ethnicities could be counted in more than one group. These groupings were compared with a mutually exclusive European/Other category. In multivariable analyses, mutually exclusive ethnic categories were categorised whereby ethnicity was prioritised in the following order: Māori, Pacific, Asian, European/Other. Both total and prioritised methods are used in New Zealand.

**Covariates**

Other covariates included in regression models were age (15–24, 25–34, 35–44, 45–64, 65–74, 75+ years) and gender (male, female). Socioeconomic position was measured at an individual level using education qualification (no secondary qualification, secondary qualification or higher) and at an area-based level using the New Zealand Index of Deprivation (NZDep 2006). NZDep is an area-based measure of material deprivation applied to small areas where participants reside. Scores are analysed in quintiles from 1 (least deprived) to 5 (most deprived).

A count of any doctor-diagnosed chronic condition (0, 1, 2, 3–4, 5+) was included as an indicator of health status. In other work, health status has been included in models.
of the relationship between racism and healthcare as a confounding variable.\textsuperscript{29,30} In relation to racism experienced in health, health status can lead to increased risk of racism by a health provider because of increased visits (i.e. increased risk of exposure)\textsuperscript{31} but could also be conceptualised as a mediator.\textsuperscript{15,16} As our analysis was cross-sectional with limited information on temporality of variables, we were limited in considering how health status may be operating in a causal framework. Therefore, it is included in models sequentially in order to see how it impacts the experience of racism and healthcare association (see below).

Data analysis

All analyses were undertaken in SAS 9.4 (SAS Institute, Cary, NC) using the SURVEYFREQ and SURVEYLOGISTIC procedures to account for the complex survey design (clustering from the area-based sampling, stratification and sampling weights). Unweighted frequencies and weighted prevalences (with 95% CI) are presented for descriptive statistics.

We examined the relationship between experience of racism and healthcare measures using logistic regression. To examine the contribution of covariates to these associations, models were sequentially adjusted in the following order: experience of racism measures as a three-level variable (M0: unadjusted model); age, gender, ethnicity (M1); chronic conditions (M2); education, NZDep (M3); Socioeconomic position was not included as a simple confounder in the initial model (M1) as it is related to experience of racism and may be viewed as a marker of institutional racism.\textsuperscript{31} Analyses were restricted to data with valid responses. Don’t know, missing and refused responses were excluded. Furthermore, the satisfaction with usual medical centre analyses were restricted to people with a usual medical centre and a visit in the past 12 months. Numbers of participants in each analysis may differ. These are provided in the results.

To quantify any differential impact by type of racism experienced, we calculated odds ratios (in text and appendices) contrasting the odds of each outcome for those who experienced racism by a health professional compared to those who experienced other forms of racism (estimates and confidence intervals calculated by contrasts within the original model: see Supplementary Tables 1 and 2).

Interaction terms for racism and ethnicity were included in models to test for differences in the magnitude of association (the odds ratio between racism and health service outcomes) by ethnicity.

Results

Table 1 shows the prevalence of reported experience of racism (by a health professional and other forms), unmet need for a GP in the last 12 months and satisfaction with usual medical centre in the last 12 months, stratified by ethnic grouping. Both measures of experience of racism were higher among Asian, Māori and Pacific ethnic groups and lowest in the European/Other ethnic category. Inequities can also be seen in the healthcare measures with Māori and Pacific peoples reporting the highest unmet need for care and lowest satisfaction, compared with people in the European/Other group.

In univariate analysis of the relationship between healthcare measures and experience of racism (Table 2), people reporting experience of racism were less likely to be satisfied with their medical centre and more likely to report unmet need for care than those who did not report experience of racism. Approximately 93% of people who did not report any experience of racism reported being satisfied with their usual medical centre, compared with 71% of people who reported experience of racism by a health professional. Only 7% of people who did not report racism had unmet need, compared with 26% of people who reported experience of racism by a health professional. People reporting other experiences of racism were also less likely to be satisfied with their medical centre and more likely to report unmet need than those reporting no racism, although this was less pronounced than for racism by a health professional.

In the multivariable logistic regression analyses, reporting of racism (both by a health professional and other racism) was significantly associated with higher unmet need for GP care in past 12 months. People reporting experience of racism were 26% more likely to report unmet need for care than those who did not report experience of racism.

Table 1: Prevalence of racism, unmet need and satisfaction with medical centre, by ethnicity, 2011/12 New Zealand Health Survey.

<table>
<thead>
<tr>
<th>Variable (and level)</th>
<th>Ethnicity*</th>
<th>% (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Asian</td>
<td>European/Other</td>
</tr>
<tr>
<td>Racism experience (n)</td>
<td>n=900</td>
<td>n=8,229</td>
</tr>
<tr>
<td>Racism ever (by a health professional)</td>
<td>3.4 (2.0–4.7)</td>
<td>0.8 (0.6–1.1)</td>
</tr>
<tr>
<td>Racism ever (other)</td>
<td>28.4 (24.3–32.5)</td>
<td>10.6 (9.5–11.7)</td>
</tr>
<tr>
<td>No racism reported</td>
<td>68.2 (64.3–72.2)</td>
<td>88.6 (87.5–89.6)</td>
</tr>
<tr>
<td>Unmet need* (n)</td>
<td>n=928</td>
<td>n=8,281</td>
</tr>
<tr>
<td>Yes unmet need</td>
<td>8.4 (5.8–11.0)</td>
<td>7.6 (6.8–8.4)</td>
</tr>
<tr>
<td>No unmet need</td>
<td>91.6 (89.0–94.0)</td>
<td>92.4 (91.6–93.2)</td>
</tr>
<tr>
<td>Satisfied with carec* (n)</td>
<td>n=678</td>
<td>n=7,052</td>
</tr>
<tr>
<td>Very satisfied/satisfied</td>
<td>91.5 (89.3–93.7)</td>
<td>92.7 (91.9–93.5)</td>
</tr>
<tr>
<td>Neutral or dissatisfied/very dissatisfied</td>
<td>8.5 (6.3–10.7)</td>
<td>7.3 (6.5–8.1)</td>
</tr>
</tbody>
</table>

Note: The number of valid responses (n) is provided for each variable by ethnicity
a: Total ethnicity is used for Māori, Pacific and Asian ethnic groupings, with a mutually exclusive European/Other comparison group
b: Satisfied with care at usual medical centre amongst those with a usual medical centre (GP, student health, after-hours or Accident and Medical centre) who had visited in the past 12 months
c: Satisfied with care at usual medical centre amongst those with a usual medical centre (GP, student health, after-hours or Accident and Medical centre) who had visited in the past 12 months

Table 2: Prevalence of unmet need by experience of racial discrimination.

<table>
<thead>
<tr>
<th>Experience of racial discrimination (ever)</th>
<th>Healthcare Outcome (and response level)</th>
<th>% (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>From health professional</td>
<td>Other racism</td>
</tr>
<tr>
<td>Unmet need* (n)</td>
<td>n=287</td>
<td>n=1,796</td>
</tr>
<tr>
<td>Yes unmet need</td>
<td>26.4 (20.6–32.1)</td>
<td>15.5 (13.4–17.6)</td>
</tr>
<tr>
<td>No unmet need</td>
<td>73.6 (67.9–79.4)</td>
<td>84.5 (82.4–86.6)</td>
</tr>
<tr>
<td>Satisfied with care* (n)</td>
<td>n=254</td>
<td>n=1,485</td>
</tr>
<tr>
<td>Very satisfied/satisfied</td>
<td>70.5 (62.2–78.9)</td>
<td>87.5 (85.0–90.1)</td>
</tr>
<tr>
<td>Neutral or dissatisfied/very dissatisfied</td>
<td>29.5 (21.1–37.8)</td>
<td>12.5 (9.9–15.0)</td>
</tr>
</tbody>
</table>

Note: The number of valid responses (n) is provided for each variable by racism experience
a: Unmet need for GP care in past 12 months
b: Satisfied with care at usual medical centre amongst those with a usual medical centre (GP, student health, after-hours or Accident and Medical centre) who had visited in the past 12 months

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need and lower satisfaction after adjusting for age, gender and ethnic grouping (Table 3, M1). The magnitude of association was stronger for experience of racism by a health professional (Unmet need OR 4.27, 95%CI 2.97-6.12; Satisfaction OR 0.20, 95%CI 0.14-0.30) than for experience of other forms of racism (Unmet need OR 2.46, 95%CI 2.00-3.02; Satisfaction OR 0.50, 95%CI 0.43-0.73).

The direct comparison of magnitude of association by type of racism confirmed this heightened impact for racism by a health professional (Health professional vs. other ORs [95%CI]: Unmet need 1.74 [1.23-2.45]; Satisfaction 0.36 [0.25-0.59]).

For both healthcare outcomes, further adjustment for chronic conditions and socioeconomic measures attenuated the association between both measures of racism. However, the associations between experience of racism (by health professionals and other) and higher unmet need and lower satisfaction remained significant and substantial in the fully adjusted models. In addition, the stronger association for experience of racism by a health professional compared to other experiences of racism remained in these adjusted models. Full models and comparisons between racism measures are appended (Supplementary Tables 1 and 2).

Interaction tests (racism x ethnicity) to examine differences in the strength of association between racism and healthcare measures for different ethnic groupings all yielded high p values (p < 0.02) suggesting no significant differences in the magnitude of these associations by ethnicity. Therefore, we did not conduct ethnically stratified analyses.

### Discussion

Reported experience of racism by a health professional and experience of other forms of racism were both substantially higher among Māori, Pacific and Asian groups compared to European/Other. Experience of both measures of racism were significantly associated with considerably higher reported unmet need for a GP and lower reported satisfaction with a usual medical centre over the past 12 months (across all ethnic groups). In addition, this association was significantly stronger for experience of racism by a health professional than for other experience of racism.

This study adds to the limited national and international evidence that reported experience of racism in the health sector and more broadly can both act as a barrier and healthcare outcomes have simultaneously looked at exposures of racism defined in healthcare and in other settings, with most of these studies were undertaken in the United States. Our study makes an important contribution to the international body of work by examining the links between experience of racism and negative healthcare measures in a different setting, and within a different healthcare system that is comparably more universal. Importantly, our research examines prevalence of racism for Māori, contributing to evidence of the potentially harmful effects of racism on healthcare for indigenous populations.

This study had several other key strengths. Few published studies examining negative healthcare outcomes have simultaneously assessed the prevalence of racism defined in healthcare and in other settings, with most of these suggesting that experience of racism in healthcare settings is more strongly associated with negative healthcare measures. Our current study specifically estimated and demonstrated this difference in the strength of association, with racism by a health professional more strongly associated with healthcare measures.

Another strength of this study is the ability to produce nationally representative findings for adults, including the ability to examine the prevalence of racism by major ethnic groupings to determine who is most likely to be affected by this potential barrier to quality healthcare.

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Table 3: Association between experience of racism (ever) and health care measures of unmet need for a GP in the last 12 months and satisfaction with usual medical centre in the last 12 months, logistic regression models, 2011/12 NZHS.

<table>
<thead>
<tr>
<th>Model (main exposure: experience of racism)</th>
<th>Unmet need* (n=12,332)</th>
<th>Satisfied with care from usual medical centre (n=10,320)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OR (95% CI)</td>
<td>OR (95% CI)</td>
</tr>
<tr>
<td>M0: unadjusted</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Racism by a health professional</td>
<td>4.87 (3.53–6.72)</td>
<td>0.18 (0.12–0.26)</td>
</tr>
<tr>
<td>Racism other</td>
<td>2.44 (1.99–2.98)</td>
<td>0.53 (0.40–0.70)</td>
</tr>
<tr>
<td>No racism</td>
<td>1 (Reference)</td>
<td>1 (Reference)</td>
</tr>
</tbody>
</table>

| M1: age, ethnicity, gender                |                         |                                                 |
| Racism by a health professional           | 4.27 (2.97–6.12)        | 0.20 (0.14–0.30)                                |
| Racism other                              | 2.46 (2.00–3.02)        | 0.56 (0.43–0.73)                                |
| No racism                                 | 1 (Reference)           | 1 (Reference)                                   |

| M2: M1, chronic conditions               |                         |                                                 |
| Racism by a health professional           | 3.68 (2.53–5.37)        | 0.22 (0.15–0.32)                                |
| Racism other                              | 2.24 (1.80–2.80)        | 0.58 (0.44–0.77)                                |
| No racism                                 | 1 (Reference)           | 1 (Reference)                                   |

| M3: M2, education, NZDep                  |                         |                                                 |
| Racism by a health professional           | 3.52 (2.42–5.11)        | 0.23 (0.15–0.34)                                |
| Racism other                              | 2.21 (1.78–2.75)        | 0.60 (0.45–0.79)                                |
| No racism                                 | 1 (Reference)           | 1 (Reference)                                   |

Notes:

* unmet need is for GP in the past 12 months
* satisfied (very satisfied/satisfied vs neither satisfied or dissatisfied/disatisfied/very dissatisfied) with care from usual medical centre in past 12 months
A number of limitations should be considered when interpreting our findings. Firstly, this study is cross-sectional, with limited ability to comment on causality. We note that experience of racism has been linked to perceived lower quality of care and adherence in longitudinal research40 and physician racial/ethnic bias has been shown to be related to objective measures of the quality of interaction with patients.

While we cannot rule out the potential for reverse causality with this cross-sectional design, there is little support for reverse causality when considering these findings in the context of the wider literature on racism and health. This is the case for studies looking at healthcare experiences/quality outcomes9 as well as the wider literature on racism as a health determinant.4 A recent meta-analysis on experience of racism and health outcomes showed that in studies on experience of racism and mental health, cross-sectional study designs tended to demonstrate stronger associations with negative mental health measures than longitudinal study designs, although this did not apply to all types of mental health measures.7 There are insufficient studies to explore the consistency of such patterns for healthcare measures. However, if the same holds true it would lead to an overestimate of the strength of association with negative healthcare measures. This highlights the need for more prospective studies to examine the negative impact of experience of racism on healthcare.

There is also potential for residual or unmeasured confounding by variables not included in the analysis, as the study was limited to the data available in the NZHS. For example, we were unable to adjust for other measures of socioeconomic position (due to data quality issues in collected data) or measures of social desirability (as these were not included in the original NZHS data collection). In addition, we could not examine measures of trust in medical care or providers in our models, which is often examined as a mediator in the association between racial discrimination and satisfaction in healthcare.36–38

While all measures in the New Zealand Health Survey undergo cognitive testing, both of our measures of exposure and outcome are self-reported and subject to the biases inherent in these types of measures.82 While self-reported experience of racial discrimination is commonly used in studies of racism and health, there are a number of recognised limitations with it.7 Thus we would expect that the measures of racism used in this study are likely to underestimate participant experiences, particularly for Māori, Pacific and Asian ethnic groups, for a number of reasons. Firstly, our experiences of racism measures are restricted to certain types and settings, as well as being focused on experience of personally-mediated racism, and so are likely to underestimate broad-level experiences, vicarious exposures (e.g. witnessing other people’s experiences of racism) and exposure to institutionalised racism. In addition, the measures used do not cover multiple or cumulative experiences of racism or experiences of other forms of discrimination over time, which we know are differentially distributed by ethnicity.24–41 Finally, they are subject to other limitations of self-reporting experiences of racism for marginalised groups including difficulty recognising and naming racism, social desirability, and the impact of internalised racism on reporting.44

An underestimation of experience of racism would also lead to underestimates for associations with negative measures of healthcare. In this study it would underestimate the association with unmet need and overestimate the association with satisfaction. Similarly, the validity of self-reported outcome measures of healthcare such as reported satisfaction and unmet need could be strengthened in future research in New Zealand through the objective measurement of outcomes from actual healthcare encounters,41 and the use of recorded health data for measures of quality of healthcare such as appropriate and timely treatment and management of health problems.9 These studies would require substantially different study designs.

Implications for public health

The association between reported experience of racism and both higher reporting of unmet need and lower satisfaction with care has implications for population health and reducing ethnic health inequities. Access to high-quality primary care is an important determinant of health outcomes.46 Our study suggests that experience of racism may act as a barrier to healthcare and influence the quality of care received. The disproportionate experience of racism by Māori, Pacific and Asian peoples means that racism has the potential to contribute to ethnic inequities in healthcare and health outcomes. Of further concern is that racism by a health professional had the strongest impact on healthcare access and quality, although experience of this type of racial discrimination was less common than other forms. In the context of longstanding ethnic health inequities in New Zealand,46 addressing racism as a public health issue needs serious consideration and action as a major driver of these inequities and barrier to care.

Within the health sector, we all need to consider how experiences of racism influence people’s healthcare decisions, behaviours and experiences; how health professionals may be influenced by a patient’s race or ethnicity; and how healthcare systems can better create safe environments that mitigate and reduce racism. In New Zealand, medical practitioners must meet cultural competency requirements,42 and addressing the role of racism in health and healthcare needs to be an important component of this. However, addressing racism in healthcare alone will have limited impact, as the higher prevalence of experience of racism outside of health settings also has the capacity to impact on healthcare access and experience. Therefore, continued and strengthened efforts to eliminate racism in wider society are necessary.

Acknowledgements

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References


Supporting Information

Additional supporting information may be found in the online version of this article:

Supplementary Table 1: Association between experience of racism (ever) and unmet need for a GP in the last 12 months, full logistic regression models, 2011/12 NZHS.

Supplementary Table 2: Association between experience of racism (ever) and satisfaction with usual medical centre in the last 12 months, full logistic regression models, 2011/12 NZHS.