

Factors predicting forgone healthcare among Asian adolescents in New Zealand: unmasking variations in aggregate data

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ABSTRACT

AIM: To examine the relationship between social support, safety, healthcare experience and forgone healthcare for Asian secondary school students in New Zealand by unmasking variations in aggregate Asian data.

METHODS: The study population included 1,911 Asians (1,272 East Asians and 604 South Asians) from the Youth19 survey. The reference group included 3,053 Pākehā.

RESULTS: We found disparities in family socioeconomic status (SES), social support, safety in school and neighbourhood, healthcare experience and forgone healthcare between East Asians and South Asians compared to Pākehā. One in five Asians (20%) reported forgone healthcare. Compared to their Pākehā peers (18%), Asian students (AOR=1.18, CI=1.04–1.33) and East Asian students (AOR=1.24, CI=1.06–1.45) were more likely to experience forgone healthcare, but South Asian students were not (AOR=1.05, CI=0.86–1.28). Important unique predictors of forgone healthcare for both East and South Asian students were: being discriminated against by health professionals due to ethnicity, not having a family member to talk about their worries with, and unfair treatment by teachers. Other unique predictors varied: lower community and family SES, not getting enough quality time with family, and being bullied at school were significant predictors for East Asian students; low perceived neighbourhood safety was a predictor for South Asian students.

CONCLUSIONS: A complicated picture underlies the seemingly positive findings for the overall Asian group. We highlight the importance of disaggregating Asian youth data into East Asian and South Asian, to identify disparities in risk/protective factors and better inform targeted interventions.

Asians are projected to become the second largest major ethnic grouping in New Zealand by 2030.^{1,2} The Asian population is a highly diverse group with differences in culture, language, religion, migration and socioeconomic experiences.^{3,4} Young Asians differ in their levels of socialisation, ethno-cultural identities, migration histories and connectedness to mainstream society.^{5,6} Already almost 20% of the New Zealand population aged 15–29 years identifies with an Asian ethnicity.^{7,8}

As in other western countries,⁹ young Asians in New Zealand report favourable health outcomes in comparison to other major ethnic groups. Consequently, there has been minimal attention to national policies relating to Asian youth health.^{10,11} However, a more complicated picture underlies these seemingly positive findings. The “healthy migrant” effect is a well-recognised phenomenon captured in health statistics. Nevertheless, this positive effect on health dissipates as length of resi-

dence increases and in adapting to a new environment.^{5,12} Asian youth experience pressure to uphold the “model minority” myth and the perception that Asian youth are successful and resilient to external stressors. They also face challenges in meeting expectations and norms of both their family and mainstream society, as they negotiate both worlds. Further, Asian youths’ mental health needs are often hidden by stereotypes that prevent access to mental health support.¹³

Lastly, when Asians are included in health studies and surveys, their data are often reported for the aggregated group.^{14–16} Important differences in health status between Asian ethnic groups are masked when health data are presented in an aggregated form.^{16–19} For example, compared to Chinese, Indians have high levels of diabetes and cardiovascular disease,^{10,11} which may not be evident when health outcomes are aggregated to a singular, collective Asian group.

In New Zealand, the first nationally representative youth health survey (Youth2001) identified important differences in access to healthcare among Chinese and Indian students.¹⁵ And the Youth2007 survey showed Asian students (as an aggregate group) were more likely than Pākehā (ie, students of European or Caucasian origin) to experience ethnic discrimination by health professionals, which was associated with adverse health outcomes.²⁰

By disadvantaging Māori, Pasifika and Asian youth, New Zealand’s current healthcare system is leading to significant health inequities.²¹ The factors that influence adolescents to forgo healthcare are complex.²² Contextual-level influences amongst migrant populations has been emphasised previously.²³ Forgone healthcare is higher for adolescents from minority groups whose families experience poverty and who are from neighbourhoods with high levels of socioeconomic deprivation.^{9,22,24} Support from family or friends and neighbourhood or community is also known to influence adolescents’ access to health services.^{25,26} There are, however, few reports on the influence of support from family and community on forgone healthcare among young Asians in New Zealand.

This study has two main aims: (a) to examine whether reporting Asian data at an aggregate level will produce different findings than at the aggregate East Asian and South Asian levels, or at a specific Asian ethnicity level, and (b) to determine the relationship between social support, safety, healthcare experience and forgone healthcare for East Asian and South Asian students.

Methods

Study design and sampling strategy

This study uses data from the Youth19 survey administered to secondary school students in Auckland, Northland and Waikato, which accounts for approximately 46% of New Zealand’s high school population. The survey methodology has been reported previously.²⁷ In brief, a two-stage sample cluster design was used. First, we randomly selected 50% of high schools with >50 students in years 9 to 13. Forty-five of 80 mainstream high schools participated. Next, 30% of students were randomly selected from the school roll. Of the 12,359 students who were randomly selected and invited to participate, 7,374 (60%) took part in the survey, accounting for approximately 6% of students from the eligible schools. After the data were cleaned, 7,311 mainstream secondary school students had participated. Twenty-six percent (n=1,911) identified with an Asian ethnic group.

Analytical strategy

Table 1 shows the variables included and the basis for grouping of the survey respondents.

Prevalence data, odds ratios and their confidence intervals have been adjusted for clustering and the unequal probability of each student being invited to participate in the survey.

We used generalised linear models (GLMs) to examine the associations between ethnicity and socioeconomic status (SES), social support, safety, healthcare experience and forgone healthcare. Age and sex were included as covariates. In the GLMs for forgone healthcare, several of the interaction terms between ethnicity (East Asian, South Asian) and the demographic, family SES and school support predictors were significant ($p < 0.05$), indicating that the rela-

Table 1: Independent, dependent and grouping variables.

Independent variables	
Ethnicity	Students reported their ethnicity at level 4 of the Statistics New Zealand classification ²⁸ (question: which ethnic group do you belong to?) and were able to choose as many ethnicities as applied to them. All options for level 4 reporting were provided.
Family socio-economic status (SES)	Assessed by the questions: Do your parents, or the people who act as your parents, ever worry about not having enough money to buy food? (often or all the time) AND For some families, it is hard to find a house that they can afford, or that has enough space for everyone to have their own bed. In the last 12 months, have you had to sleep in any of the following because it was hard for your family to afford or get a home, or there was not enough space? (do not include holidays or sleepovers for fun). ²⁹
Community level SES	School decile: Based on New Zealand census data of five SES indicators (household income, proportion of parents on income support benefits, household crowding, parental educational qualifications, and occupational skill level of employed parents). Students from lower decile schools are generally from households that are more socioeconomically disadvantaged. Neighbourhood decile: Based on New Zealand Deprivation Index, with decile 1 representing areas of least deprivation and decile 10 the most deprived. For data analyses, students were grouped into one of three neighbourhood decile bands indicating lower deprivation (deciles 1–3), medium deprivation (deciles 4–7) and higher deprivation (deciles 8–10) levels.
Family and friend support	Perceived support from family was assessed by the questions: There is someone in my family/whānau who I can talk with about things that are worrying me (agree or strongly agree); I feel like I get enough quality time with my family/whānau (agree or strongly agree). Perceived support from friends was assessed by the question: I have at least one friend who I can talk with about things that are worrying me (agree or strongly agree).
Community level support and safety	Perceived school support and safety was assessed by the questions: Do you feel like you are part of your school? (yes); How often do the teachers/tutors treat students fairly? (most or all the time); In the last 12 months how often have you been bullied in school/course? (about once a week or more). Perceived community support and safety was assessed by the questions: There is an adult outside of my family/whānau who I can talk with about things that are worrying me (agree or strongly agree); Do you feel safe in your neighbourhood? (all the time). Experience of discrimination based on ethnicity by health service provider was assessed by the question: Have you ever been treated unfairly (e.g. treated differently, kept waiting) by a health professional (e.g. doctor, nurse, dentist etc.) because of your ethnicity or ethnic group? (yes, within the past 12 months or yes, more than 12 months ago).
Dependent variable	
Forgone health-care	Assessed by question: In the last 12 months, has there been any time when you wanted or needed to see a doctor or nurse (or other health care worker) about your health, but you weren't able to?

Table 1: Independent, dependent and grouping variables (continued).

Grouping variable ¹	
Asian students	Identified based on Statistics New Zealand's definition. ²⁸
East Asian	Based on the World Bank definitions of East Asia, ethnicities with origins from Brunei, Cambodia, China, Hong Kong, Indonesia, Japan, North Korea, South Korea, Laos, Macao, Malaysia, Mongolia, Myanmar, Philippines, Singapore, Taiwan, Thailand, and Vietnam were included. ³⁰
South Asian	Based on the World Bank definitions of East Asia, ethnicities with origins from Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka were included. ³⁰
Chinese	Identified based on Statistics New Zealand's definition. ²⁸
Indian	Identified based on Statistics New Zealand's definition. ²⁸
Pākehā	Pākehā students were identified using Statistics New Zealand's ethnic prioritisation method where each respondent is allocated to a single ethnic group based on a pre-determined hierarchy. ²⁸ This ensured that students identifying with both an Asian and Pākehā ethnicity were excluded from the Pākehā reference group. Pākehā ethnic grouping includes students identifying as New Zealand Pākehā or any other Pākehā ethnicity.

¹For Asian ethnic groups, Statistics New Zealand's total response reporting was used where any participant who reported more than one ethnic group is included in all the groups they reported.

tionships varied by ethnicity. We therefore conducted separate predictive models for East Asians and South Asians to examine the effect of support and safety indicators on forgone healthcare. All models controlled for sex and age. As a high correlation between predictors can affect both the estimation and precision of regression coefficients, variables that were potentially problematic due to multicollinearity were excluded from the GLMs. We used likelihood ratio chi-square tests to examine whether the addition of family SES, support from friends, family support indicators, school support and safety indicators, neighbourhood safety and support indicators and experience of discrimination in the health service significantly increased the power of the model to predict forgone healthcare.

The study was approved by the University of Auckland Human Participants Ethics Committee (Reference Number 023450).

Results

Participant characteristics

Table 2 provides a demographic breakdown. Students who identified with multiple ethnicities were included in each ethnic group analysis: eleven students (0.6% of Asians) identified as both East Asian and South Asian, and six (0.3%) identified as both Chinese and Indian. Forty-six students (2.4%) identified as Asian but did not specify whether they were East Asian or South Asian. More East Asian (16.7%) and Chinese (15.6%) students were international students compared to students who were South Asian (5.6%), Indian (6.0%) and Pākehā (1.5%).

Socioeconomic status

Although the proportion of East Asian and Chinese students attending high-deprivation (low decile) schools was not markedly different to that of Pākehā students, the corresponding proportions for South Asian and Indian students were higher. The proportion of students from each Asian subgroup living in highly deprived neighbourhoods was higher than that of Pākehā students.

Asian, East Asian, South Asian and Indian students, but not Chinese students, were more likely than Pākehā students to have low family SES (Table 3).

Perceived support and safety

Asian, East Asian and Chinese students, but not South Asian or Indian students, were less likely than Pākehā students to perceive that they spent enough quality time with family (Table 3). Asian, South Asian, East Asian and Chinese students were less likely to report having someone in their family they could talk about their worries with. Although there was no difference between Pākehā and the aggregated Asian group for parents wanting to know where they are and who they are with, there were significant differences between Pākehā and each of the Asian subgroups studied. Contrasting findings were also found for the friend support indicator. Compared to Pākehā students, Indian students were less likely, and East Asian students were more likely, to report having at least one friend they can talk about their worries with.

School support indicators were largely positive, with all Asian ethnic groups more likely to report feeling part of the school compared to Pākehā students. However, again there were important differences between Asian groups. Asian, East Asian and Chinese students were less likely than Pākehā to report being bullied in school compared. South Asian and Indian students were more likely than Pākehā to report that teachers care about them.

Compared to Pākehā, all Asian ethnic groups felt less safe in their own neighbourhood, and Asian, East Asian and Chinese students were less likely to report they had an adult outside the family they could talk about their worries with. All Asian groups were more likely to report being treated unfairly by a health provider due to their ethnicity.

Forgone healthcare

Asian and East Asian students were more likely than Pākehā students to report forgone healthcare. This difference was not observed for South Asian, Indian and Chinese students when considered separately.

Relationships between SES, social support and healthcare experience, and forgone healthcare

The unique effect of several indicators varied between East and South Asian students (Table 4).

Table 2: Participant demographic characteristics.

	All (n=7,311)		Asian (n=1,911)		East Asian (n=1,272)		South Asian (n=604)		Chinese (n=734)		Indian (n=494)		Pākehā (n=3,053)	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Sex														
Female	3,990	54.6	1,026	53.7	703	55.3	307	50.8	389	53.0	251	50.8	1670	54.7
Male	3,321	45.4	885	46.3	569	44.7	297	49.2	345	47.0	243	49.2	1383	45.3
Age (years)														
<13	1,323	18.1	263	13.8	158	12.4	99	16.4	98	13.4	79	16.0	578	18.9
14	1,635	22.4	388	20.3	240	18.9	142	23.5	134	18.3	116	23.5	689	22.6
15	1,620	22.2	430	22.5	284	22.3	136	22.5	160	21.8	107	21.7	654	21.4
16	1,403	19.2	393	20.6	280	22.0	107	17.7	160	21.8	89	18.0	605	19.8
>17	1,330	18.2	437	22.9	310	24.4	120	19.9	182	24.8	103	20.9	527	17.3
School decile¹														
Low	1,179	16.2	229	12.1	101	8.1	128	21.4	47	6.5	116	23.8	107	3.5
Medium	3,210	44.2	766	40.6	469	37.4	280	46.8	226	31.5	234	47.9	1,429	46.9
High	2,880	39.6	891	47.2	683	54.5	190	31.8	445	62.0	138	28.3	1,508	49.5
Neighbourhood deprivation²														
Low	2,098	31.3	454	25.8	337	28.8	104	18.6	211	31.9	91	20.0	1,294	46.0
Medium	2,772	41.4	872	49.6	585	50.0	273	48.9	316	47.7	214	46.9	1,185	42.1
High	1,829	27.3	433	24.6	248	21.2	181	32.4	135	20.4	151	33.1	334	11.9

¹ NZ Deprivation Index 2018: Low deprivation (1–3), Medium deprivation (4–7), High deprivation (8–10).² School decile: Low decile (1–3) indicating higher deprivation, Medium decile (4–7), High decile (8–10) indicating lower deprivation.

Table 3: Prevalence of family socioeconomic status, social support, safety, and healthcare experience indicators for Asian secondary school students.

		n	% [95% CI]	AOR ^a [95% CI]	p-value
Family socioeconomic status					
Low family SES [#]	Pākehā	357	12.3 [10.3–14.4]	ref	
	Asian	336	19.3 [16.5–22.1]	1.75 [1.44–2.12]	<.001
	East Asian	204	17.4 [14.5–20.2]	1.56 [1.24–1.96]	<.001
	South Asian	127	23.2 [19.7–26.8]	2.16 [1.78–2.62]	<.001
	Chinese	96	13.7 [9.6–17.8]	1.18 [0.86–1.64]	.312
	Indian	105	23.7 [19.6–27.7]	2.22 [1.79–2.77]	<.001
Family and friends support					
Gets enough quality time with family	Pākehā	2,224	73.7 [72.0–75.3]	ref	
	Asian	1293	68.3 [66.5–70.0]	0.78 [0.69–0.88]	<.001
	East Asian	831	65.2 [62.5–67.8]	0.69 [0.60–0.79]	<.001
	South Asian	441	75.6 [71.9–79.3]	1.08 [0.87–1.35]	.485
	Chinese	464	63.1 [59.9–66.3]	0.63 [0.55–0.71]	<.001
	Indian	362	75.6 [72.1–79.1]	1.08 [0.87–1.35]	.471
Family wants to know who student is with and where student is (usually or always)	Pākehā	2,841	92.9 [91.5–94.4]	ref	
	Asian	1,734	91.2 [89.5–92.9]	0.81 [0.64–1.04]	.104
	East Asian	1,133	89.2 [86.9–91.6]	0.65 [0.49–0.86]	.005
	South Asian	569	95.0 [93.4–96.6]	1.51 [1.05–2.16]	.031
	Chinese	641	87.6 [84.4–90.8]	0.56 [0.39–0.80]	.003
	Indian	465	95.0 [93.4–96.6]	1.52 [1.04–2.21]	.036
Has someone in family can talk about worries with	Pākehā	2,382	78.1 [76.1–80.2]	ref	
	Asian	1,348	72.0 [69.7–74.2]	0.72 [0.60–0.86]	<.001
	East Asian	896	71.4 [68.4–74.3]	0.70 [0.58–0.85]	<.001
	South Asian	432	73.5 [70.3–76.8]	0.77 [0.61–0.97]	.032
	Chinese	534	72.6 [69.1–76.2]	0.74 [0.61–0.91]	.007
	Indian	357	74.2 [70.8–77.5]	0.79 [0.62–1.01]	.073
Has at least one friend can talk about worries with	Pākehā	2,602	85.5 [84.3–86.8]	ref	
	Asian	1,612	84.7 [83.5–85.9]	0.92 [0.81–1.05]	.232
	East Asian	1,063	83.4 [81.9–85.0]	0.82 [0.71–0.96]	.016
	South Asian	525	88.0 [85.5–90.5]	1.26 [0.98–1.62]	.083
	Chinese	617	83.5 [80.4–86.6]	0.83 [0.64–1.07]	.163
	Indian	434	89.2 [86.9–91.6]	1.41 [1.07–1.87]	.021

Table 3: Prevalence of family socioeconomic status, social support, safety, and healthcare experience indicators for Asian secondary school students (continued).

		n	% [95% CI]	AOR^ [95% CI]	p-value
School support and safety					
Teachers/tutors care about student	Pākehā	2,387	79.5 [77.0–81.9]	ref	
	Asian	1,568	84.0 [81.4–86.6]	1.32 [1.11–1.57]	.003
	East Asian	1,036	83.5 [80.2–86.7]	1.23 [0.99–1.53]	.074
	South Asian	508	85.7 [81.8–89.5]	1.58 [1.14–2.20]	.010
	Chinese	600	83.1 [79.4–86.8]	1.19 [0.90–1.58]	.224
	Indian	416	86.4 [82.2–90.5]	1.68 [1.17–2.40]	.008
Feels like they are part of school	Pākehā	2,537	85.1 [82.6–87.5]	ref	
	Asian	1,680	89.9 [87.1–92.7]	1.58 [1.24–2.01]	< .001
	East Asian	1,125	90.2 [87.4–93.1]	1.62 [1.27–2.06]	< .001
	South Asian	528	89.4 [85.7–93.0]	1.55 [1.03–2.32]	.042
	Chinese	636	88.4 [85.6–91.2]	1.32 [1.02–1.71]	.039
	Indian	429	89.7 [85.5–93.8]	1.60 [1.04–2.45]	.039
Teachers/tutors treat students fairly (most or all of the time)	Pākehā	2,224	73.5 [71.2–75.9]	ref	
	Asian	1,342	70.1 [67.1–73.2]	0.82 [0.71–0.96]	.018
	East Asian	875	68.5 [64.3–72.7]	0.74 [0.61–0.91]	.006
	South Asian	442	73.5 [70.2–76.8]	1.01 [0.83–1.22]	.937
	Chinese	500	67.4 [59.6–75.1]	0.70 [0.49–1.00]	.057
	Indian	357	72.8 [68.5–77.1]	0.97 [0.78–1.21]	.781
Bullied at school weekly or more often in the past 12 months	Pākehā	200	6.3 [5.1–7.5]	ref	
	Asian	64	3.9 [2.7–5.0]	0.63 [0.44–0.90]	.014
	East Asian	34	3.2 [2.1–4.3]	0.53 [0.35–0.79]	.004
	South Asian	28	5.1 [3.5–6.8]	0.80 [0.55–1.17]	.265
	Chinese	18	2.6 [1.0–4.2]	0.42 [0.23–0.78]	.009
	Indian	22	5.1 [3.4–6.9]	0.81 [0.54–1.21]	.310
Other community support and safety					
Has an adult outside of family can talk about worries with	Pākehā	1,411	49.3 [46.2–52.3]	ref	
	Asian	738	43.3 [40.4–46.1]	0.79 [0.66–0.94]	.012
	East Asian	463	40.1 [36.8–43.4]	0.69 [0.57–0.84]	< .001
	South Asian	267	51.1 [44.3–57.8]	1.08 [0.80–1.46]	.611
	Chinese	263	38.7 [33.9–43.5]	0.66 [0.52–0.84]	.002
	Indian	218	51.2 [44.3–58.1]	1.09 [0.80–1.49]	.602
Feel safe in own neighbourhood (always)	Pākehā	1,853	61.3 [58.2–64.4]	ref	
	Asian	1,015	54.4 [51.0–57.7]	0.74 [0.64–0.86]	< .001
	East Asian	670	54.0 [49.3–58.7]	0.73 [0.63–0.86]	< .001
	South Asian	329	55.2 [50.8–59.6]	0.76 [0.60–0.96]	.027
	Chinese	402	55.2 [47.9–62.5]	0.77 [0.60–0.98]	.038
	Indian	267	55.1 [50.0–60.3]	0.76 [0.58–0.98]	.040

Table 3: Prevalence of family socioeconomic status, social support, safety, and healthcare experience indicators for Asian secondary school students (continued).

		n	% [95% CI]	AOR [^] [95% CI]	p-value
Healthcare experience					
Forgone health-care in last 12 months	Pākehā	521	17.6 [16.4–18.8]	ref	
	Asian	370	20.3 [18.1–22.4]	1.18 [1.04–1.33]	.014
	East Asian	256	21.4 [18.3–24.5]	1.24 [1.06–1.45]	.011
	South Asian	106	18.0 [15.0–20.9]	1.05 [0.86–1.28]	.640
	Chinese	124	18.1 [15.3–20.9]	1.01 [0.85–1.19]	.944
	Indian	85	17.7 [14.6–20.9]	1.03 [0.82–1.29]	.788
Treated unfairly by health provider due to ethnicity - Yes (cf No) [^]	Pākehā	79	3.0 [2.3–3.7]	ref	
	Asian	82	5.9 [4.5–7.3]	2.08 [1.52–2.84]	< .001
	East Asian	52	5.6 [4.0–7.2]	2.03 [1.40–2.94]	< .001
	South Asian	28	6.2 [4.3–8.2]	2.06 [1.50–2.84]	< .001
	Chinese	29	5.3 [3.2–7.4]	1.94 [1.15–3.28]	.018
	Indian	22	5.9 [3.8–7.9]	1.92 [1.33–2.79]	.001
Treated unfairly by health provider due to ethnicity - Yes or unsure / don't know (cf No) [^]	Pākehā	302	10.6 [9.2–12.0]	ref	
	Asian	343	20.1 [16.8–23.3]	2.17 [1.76–2.69]	< .001
	East Asian	221	20.0 [15.9–24.0]	2.19 [1.68–2.85]	< .001
	South Asian	111	19.2 [14.8–23.5]	1.98 [1.49–2.64]	< .001
	Chinese	125	19.3 [14.5–24.2]	2.12 [1.52–2.95]	< .001
	Indian	89	18.7 [14.3–23.1]	1.93 [1.42–2.63]	< .001

The numbers presented (n and N) are based on the raw data of the number of survey participants. Percentages and AORs have been adjusted to account for the unequal probability of each individual being invited to participate in the survey.

[^]Adjusted odds ratio, controlling for age and sex; [^]Parents often worry about money for food OR student slept elsewhere than own bed because can't afford house or not enough space; [^]Yes compared to no (unsure / don't know responses excluded); [^]Unsure / don't know compared to no (yes responses excluded)

Table 4: Associations between independent variables (socioeconomic status, social support, safety and healthcare experience indicators) and forgone healthcare (dependent variable).

	AOR ^a [95%CI]
East Asian subgroup	
School decile - low (ref: high)	2.17 [1.07–4.38]
- med (ref: high)	1.11 [0.78–1.59]
Neighbourhood dep - high (ref: low)	0.75 [0.34–1.69]
- med (ref: low)	1.00 [0.67–1.50]
Low family SES	1.57 [1.07–2.30]
Has friend can talk about worries with	1.08 [0.60–1.94]
Gets enough quality time with family	0.60 [0.38–0.94]
Has someone in family can talk about worries with	0.41 [0.24–0.71]
Feel like are part of school	0.82 [0.50–1.35]
Teachers/tutors treat students fairly (most or all the time)	0.60 [0.43–0.85]
Bullied at school weekly or more often in the past 12 months	2.76 [1.25–6.11]
Feel safe in neighbourhood (always)	0.63 [0.40–1.01]
Has an adult outside of family can talk about worries with	1.14 [0.74–1.77]
Ever treated unfairly by healthcare provider due to ethnicity - yes (ref:no)	3.50 [1.76–6.96]
- don't know / unsure (ref: no)	1.52 [1.06–2.19]
South Asian subgroup	
School decile - low (ref: high)	1.29 [0.56–2.99]
- med (ref: high)	1.02 [0.56–1.86]
Neighbourhood dep - high (ref: low)	0.64 [0.31–1.32]
- med (ref: low)	0.66 [0.25–1.73]
Low family SES	1.60 [0.84–3.04]
Has friend can talk about worries with	0.83 [0.39–1.76]
Gets enough quality time with family	0.84 [0.52–1.35]
Has someone in family can talk about worries with	0.38 [0.16–0.87]
Feel like are part of school	0.61 [0.32–1.17]
Teachers/tutors treat students fairly (most or all the time)	0.59 [0.36–0.98]
Bullied at school weekly or more often in the past 12 months	1.53 [0.58–4.01]
Feel safe in neighbourhood (always)	0.43 [0.28–0.66]
Has an adult outside of family can talk about worries with	1.06 [0.61–1.84]
Ever treated unfairly by healthcare provider due to ethnicity - yes (ref:no)	6.99 [2.20–22.15]
- don't know / unsure (ref: no)	1.64 [0.81–3.31]

^aAdjusted for age and sex.

Bolded AORs are borderline or statistically significant at the $p < .05$ level and the CIs do not cross 1.

Nagelkerke $R^2 = 0.13$ for East Asian, $R^2 = 0.15$ for South Asian.

The data reported has been weighted to adjust for the unequal probability of each individual being invited to participate in the survey.

When all other indicators are constant, the odds of having forgone healthcare are higher for East Asian students who were socioeconomically disadvantaged, who felt less connected with their family, who had experienced bullying in school and who were unfairly treated by a teacher or a health professional (Table 4). The odds are higher for South Asian students who didn't have someone in the family to talk about their worries with, who didn't always feel safe in their neighbourhood and who were treated unfairly by a teacher or a health professional.

The complete analyses (see Supplementary Table) found that, except for the friend support model for East Asian students, the explanatory power of each of the family SES, school support and safety, community support and safety, and health service discrimination models were significantly greater than the nested model.

Discussion

In this population-based survey of New Zealand secondary school students, we found disparities in family SES, social support, safety, healthcare experience and forgone healthcare between East Asian, South Asian, Chinese and Indian students compared to Pākehā students. These disparities varied across the Asian ethnic groups. For example, South Asian, East Asian and Indian students were more likely than Pākehā to experience household poverty, a difference not evident for Chinese students. Furthermore, some differences did not appear when the aggregated Asian group was considered.

One in five Asian students, and East Asian especially, had forgone healthcare. Several indicators of SES and perceived support and safety were uniquely associated with forgone healthcare. Ethnic discrimination from health professionals, having someone in the family to talk about worries with, and teachers treating students fairly all had significant unique effects on forgone healthcare for both East Asian and South Asian students. However, other unique associations between social support and community SES indicators and forgone healthcare varied between East Asians and South Asians: lower school decile, lower family SES, less quality time with family and

being bullied at school were significantly associated with forgone healthcare for East Asian students, and low perceived neighbourhood safety was a significant predictor for South Asian students.

The Youth19 survey used rigorous sampling methods and the questions were self-administered and anonymous. There are, however, some limitations. The findings may not apply to adolescents who are not in school. Additionally, only schools in upper North Island were included. Although almost half of New Zealand's secondary school students live in this region, Asian students from other regions may face different challenges. The cross-sectional nature of the analyses limits inferences about the direction of causal associations; however, risk and protective factors identified in these models provide a useful basis for future causal analysis. The measurement of family SES of adolescents is known to be difficult, particularly when collecting data from young people themselves.

We did not explore interaction effects by gender or age because the study's primary focus was to first examine the impact of reporting data at the Asian aggregate level compared to the ethnic subgroup level, while controlling for gender and age. We also did not explore interaction effects by generation of migration. The healthy migrant effect is a well-recognised phenomenon, although this positive effect on health dissipates as length of residence in the host country increases. The next step is to explore variations between the Asian ethnic groups by gender, age and generation of migration. Lastly, barriers to accessing healthcare for international students living away from their families may be different to those for other students.

Despite these limitations, this study provides a contemporary profile on SES, perceived social support and safety, healthcare experience and forgone healthcare for a large sample of Asian young people and disaggregates data by ethnic subgroups.

Collectively, these findings show that using aggregated Asian ethnicity data in policy and planning is a problem. Studies on adult populations have also shown that reporting statistics for an aggregated Asian

ethnic group masks meaningful differences between Asian subgroups.^{17,31,32}

Previous studies have also shown that socioeconomically disadvantaged young people are more likely to report poorer wellbeing and health problems^{33–35} and forgone healthcare.⁹ Asian Americans are shown to have a similar relationship between SES and health status when measured as an aggregate group compared to Whites.³¹ However, this is different when specific Asian American ethnic groups are examined. Family poverty status has been found to be independently associated with low healthcare access, with significant heterogeneity found among Asian children.⁹ Similarly, a study of adolescents in the US found 54% of those who reported “hard times” also reported forgone healthcare.³⁶

In New Zealand, secondary school students who forgo healthcare are at increased risk of physical and mental health problems.²⁴ Rangatahi Māori (27%), Pasifika (25%), East Asian (21%) and South Asian (18%) youth experience high levels of forgone healthcare compared to Pākehā (16%).²¹ While Māori and Pasifika youth are not the focus of this paper, these findings should be seen within the broader context of New Zealand’s pattern of inequity and discrimination when compared to Pākehā/ New Zealand European students.

Experiences of discrimination and racism in healthcare cause poorer health outcomes, reduced access to healthcare and ethnic health inequities, both in New Zealand and

internationally.^{20,37,38} The manifestation of structural discrimination through the often implicit and unspoken biases of health practitioners results in health disparities for Asian New Zealanders.³⁹ The impact of racism on mental health among Asian communities in New Zealand was recently highlighted as a concern by the Suicide Mortality Review Committee.⁴⁰

Strengthening social support for young people in community settings and developing healthy supportive relationships between peers, and between teachers and students, will likely reduce forgone healthcare and improve health outcomes.⁴¹ The simultaneous delivery of interventions at the health service level (eg, enhanced cultural competency training for health providers) is also important. Co-designing interventions with young people from Asian subgroups would help mitigate risks associated with experiences of discrimination and racism.

Conclusions

SES, social support and safety, and healthcare use are affected by the ethnic composition of the Asian youth population. We highlight the importance of disaggregating youth data for the overall Asian group into East Asian and South Asian, or ideally at the specific Asian ethnicity level, to reveal disparities in risk and protective factors, gain a better understanding of the relationships between ethnicity and health and inform targeted interventions.

Supplementary material

Supplementary Table: Associations between socioeconomic status, social support, safety and healthcare experience indicators and forgone healthcare.

	AOR^ [95%CI]						
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
East Asian subgroup							
School decile - low (ref: high)	2.87 [1.82–4.52]	2.49 [1.45–4.27]	2.49 [1.43–4.32]	2.22 [1.22–4.04]	1.97 [1.11–3.52]	2.21 [1.05–4.65]	2.17 [1.07–4.38]
- med (ref: high)	1.39 [1.03–1.87]	1.39 [0.97–2.00]	1.39 [0.98–1.97]	1.36 [0.90–2.04]	1.25 [0.84–1.85]	1.12 [0.79–1.59]	1.11 [0.78–1.59]
Neighbourhood dep - high (ref: low)	0.93 [0.62–1.41]	0.86 [0.55–1.35]	0.85 [0.54–1.34]	0.88 [0.53–1.46]	0.96 [0.59–1.55]	0.68 [0.31–1.51]	0.75 [0.34–1.69]
- med (ref: low)	1.37 [0.99–1.91]	1.27 [0.92–1.74]	1.26 [0.92–1.71]	1.17 [0.84–1.64]	1.20 [0.86–1.68]	1.01 [0.70–1.45]	1.00 [0.67–1.50]
Low family SES		2.58 [1.75–3.80]	2.56 [1.77–3.70]	2.43 [1.61–3.68]	2.20 [1.51–3.20]	1.64 [1.16–2.33]	1.57 [1.07–2.30]
Has friend can talk about worries with			0.80 [0.42–1.54]	1.03 [0.53–2.01]	1.15 [0.71–1.86]	1.02 [0.55–1.89]	1.08 [0.60–1.94]
Gets enough quality time with family				0.50 [0.34–0.75]	0.53 [0.34–0.81]	0.51 [0.35–0.75]	0.60 [0.38–0.94]
Has someone in family can talk about worries with				0.49 [0.32–0.77]	0.52 [0.35–0.79]	0.46 [0.29–0.73]	0.41 [0.24–0.71]
Feel like are part of school					0.71 [0.46–1.08]	0.82 [0.48–1.40]	0.82 [0.50–1.35]
Teachers/tutors treat students fairly (most or all the time)					0.51 [0.35–0.75]	0.56 [0.40–0.80]	0.60 [0.43–0.85]
Bullied at school weekly or more often in the past 12 months					2.88 [1.40–5.94]	3.06 [1.43–6.55]	2.76 [1.25–6.11]
Feel safe in neighbourhood (always)						0.60 [0.40–0.91]	0.63 [0.40–1.01]
Has an adult outside of family can talk about worries with						1.21 [0.79–1.85]	1.14 [0.74–1.77]
Ever treated unfairly by healthcare provider due to ethnicity -yes (ref: no)							3.50 [1.76–6.96]
-don't' know / unsure (ref: no)							1.52 [1.06–2.19]

Supplementary Table: Associations between socioeconomic status, social support, safety and healthcare experience indicators and forgone healthcare (continued).

	AOR^ [95%CI]						
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
South Asian subgroup							
School decile - low (ref: high)	1.84 [0.87–3.90]	1.53 [0.63–3.73]	1.63 [0.65–4.10]	1.67 [0.74–3.73]	1.59 [0.65–3.89]	1.23 [0.53–2.87]	1.29 [0.56–2.99]
- med (ref: high)	1.27 [0.64–2.52]	1.15 [0.51–2.62]	1.22 [0.54–2.74]	1.34 [0.62–2.89]	1.16 [0.53–2.51]	1.20 [0.60–2.38]	1.02 [0.56–1.86]
Neighbourhood dep - high (ref: low)	0.85 [0.38–1.86]	0.79 [0.36–1.76]	0.81 [0.37–1.80]	0.84 [0.38–1.87]	0.87 [0.37–2.05]	0.77 [0.37–1.61]	0.64 [0.31–1.32]
- med (ref: low)	1.22 [0.51–2.91]	1.06 [0.45–2.50]	1.08 [0.46–2.50]	1.03 [0.40–2.63]	0.99 [0.33–2.91]	0.87 [0.33–2.31]	0.66 [0.25–1.73]
Low family SES		2.34 [1.24–4.40]	2.24 [1.21–4.15]	1.93 [1.03–3.62]	1.99 [1.07–3.70]	1.62 [0.81–3.22]	1.60 [0.84–3.04]
Has friend can talk about worries with			0.47 [0.26–0.85]	0.60 [0.32–1.14]	0.66 [0.35–1.24]	0.74 [0.37–1.46]	0.83 [0.39–1.76]
Gets enough quality time with family				0.66 [0.41–1.06]	0.67 [0.39–1.14]	0.86 [0.50–1.48]	0.84 [0.52–1.35]
Has someone in family can talk about worries with				0.33 [0.18–0.59]	0.39 [0.20–0.79]	0.38 [0.19–0.75]	0.38 [0.16–0.87]

Supplementary Table: Associations between socioeconomic status, social support, safety and healthcare experience indicators and forgone healthcare (continued).

	AOR ^a [95%CI]						
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Feel like are part of school					0.73 [0.42–1.25]	0.62 [0.33–1.16]	0.61 [0.32–1.17]
Teachers/tutors treat students fairly (most or all the time)					0.56 [0.34–0.94]	0.61 [0.35–1.06]	0.59 [0.36–0.98]
Bullied at school weekly or more often in the past 12 months					1.63 [0.62–4.31]	1.63 [0.63–4.18]	1.53 [0.58–4.01]
Feel safe in neighbourhood (always)						0.40 [0.25–0.64]	0.43 [0.28–0.66]
Has an adult outside of family can talk about worries with						1.01 [0.58–1.74]	1.06 [0.61–1.84]
Ever treated unfairly by healthcare provider due to ethnicity -yes (ref:no)							6.99 [2.20–22.15]
-don't' know / unsure (ref: no)							1.64 [0.81–3.31]

^aAdjusted for age and sex

Bolded AORs are borderline or statistically significant at the $p < .05$ level and the CIs do not cross 1.

The data reported has been weighted to adjust for the unequal probability of each individual being invited to participate in the survey.

Comparing model fit (East Asian): Model 2 vs 1: $\chi^2(2) = 86.1, p < .001$; Model 3 vs 2: $\chi^2(1) = 0.8, p = .37$; Model 4 vs 3: $\chi^2(3) = 46.7, p < .001$; Model 5 vs 4: $\chi^2(4) = 48.0, p < .001$; Model 6 vs 5: $\chi^2(2) = 79.5, p < .001$; Model 7 vs 6: $\chi^2(2) = 27.8, p < .001$.

Nagelkerke R^2 (East Asian): Model 1 = 0.03, Model 2 = 0.05, Model 3 = 0.05, Model 4 = 0.09, Model 5 = 0.11, Model 6 = 0.12, Model 7 = 0.13.

Comparing model fit (South Asian): Model 2 vs 1: $\chi^2(2) = 19.5, p < .001$; Model 3 vs 2: $\chi^2(1) = 6.5, p = .01$; Model 4 vs 3: $\chi^2(3) = 30.1, p < .001$; Model 5 vs 4: $\chi^2(4) = 16.4, p = .002$; Model 6 vs 5: $\chi^2(2) = 36.9, p < .001$; Model 7 vs 6: $\chi^2(2) = 15.5, p < .001$.

Nagelkerke R^2 (South Asian): Model 1 = 0.02, Model 2 = 0.04, Model 3 = 0.05, Model 4 = 0.10, Model 5 = 0.11, Model 6 = 0.12, Model 7 = 0.15.

Competing interests:

Nil.

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