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## Changes in the sexual health behaviours of New Zealand secondary school students, 2001–2012: findings from a national survey series

### Journal Item

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Title: Changes in the sexual health behaviours of New Zealand secondary school students, 2001-2012: Findings from a nationally representative cross sectional survey series.

New Zealand has high rates of unintended adolescent pregnancies relative to other Organisation for Economic Co-operation and Development (OECD) countries<sup>1,2</sup> and has disproportionately higher rates of sexually transmitted infections (STIs) such as chlamydia among 15-24 year olds compared to other age groups.<sup>3</sup> The personal and public health implications of unintended pregnancy and STIs in adolescence have been well documented.<sup>4-7</sup> However, relatively little research has investigated the sexual and reproductive health status of New Zealand youth, or explored ethnic variations in this area.<sup>8</sup>

Despite the public concern about adolescent sexual activity, rates of teen pregnancy and abortion are declining in New Zealand.<sup>9</sup> Most New Zealand teenagers in secondary schools are not sexually active<sup>10</sup>, and 70% of births to teenagers in New Zealand are to those aged either 18 or 19 years old.<sup>11</sup> While there appears to be improvements in reproductive health, there are disparities in rates of STIs and in rates of access to sexual health services among some populations.<sup>12-14</sup>

Tracking trends in sexual health behaviours among adolescents is essential for any evidence-based public health intervention to monitor progress, ascertain weaknesses in the delivery of sexual and reproductive health care, and to identify populations vulnerable to unplanned pregnancies and STIs. In this study we present data from the Youth2000 survey series, these are nationally representative health and wellbeing surveys of secondary school students in New Zealand.

## **Methods**

The Youth2000 survey series is a series of anonymous cross-sectional, self-administered surveys undertaken in 2001, 2007 and 2012 with secondary school students aged 12-19 (Years 9-13) in New Zealand. The surveys used a two-stage sample cluster design to recruit representative samples of New Zealand secondary school students. Approximately a third of eligible secondary schools in the country were invited to participate in each wave of the survey, with the aim of recruiting 10,000 students in each wave. School response rates were

85.7% in 2001, 83.5% in 2007 and 72.8% in 2012. Student response rates were 74% in 2001, 74% in 2007 and 68% in 2012 accounting for approximately 3-4% of the total New Zealand secondary school roll in each survey wave.

The 2012 survey instrument was based on the 2001 and 2007 surveys (available at [www.youthresearch.auckland.ac.nz](http://www.youthresearch.auckland.ac.nz)) and utilised a complex branching design delivered via M-CASI technology.<sup>15, 16</sup> Internet tablets were used to provide respondents with privacy and confidentiality to minimise the risks of a social desirability bias. There were nine main question categories: ethnicity; home; school; health and emotional health; nutrition, exercise and activities; sexual health; substance use and gambling; injuries and violence; and, neighbourhood and spirituality. The questionnaire was available in English and Te Reo Māori (Māori, the indigenous language of New Zealand). School level socio-economic information (school decile) was collected.<sup>17</sup> Ethical approval was obtained from the University of Auckland Human Participants Ethics Committee for each survey wave. Further details about the survey methodologies can be found elsewhere.<sup>18-20</sup>

### *Measures*

*Demographic information* was based on self-report for age, sex ('male' and 'female' only) and ethnicity. For the purposes of these analyses age was dichotomised into either 12-15 years or 16-19 years, with this cut-off selected because students in New Zealand can leave school at 16 years of age. Ethnicity was based on the New Zealand census standard 2001/2006 ethnicity question: '*Which ethnic group do you belong?*' Students were able to choose more than one response from the list of 23 options used in the statistical standard for ethnicity.<sup>21</sup> We have utilised the New Zealand ethnic prioritisation method (Lang 2002). Prioritised ethnicity is based on the hierarchy; Māori > Pacific > Asian > Other > New Zealand European (NZE). School decile indicates the extent to which the school draws its students from low socioeconomic communities. Decile 1 schools are the 10 percent of schools with the highest proportion of students from low socio-economic communities, whereas decile 10 schools are the 10 percent of schools with the lowest proportion of these students.<sup>17</sup> It is based on geographical meshblocks from the New Zealand census for: household incomes; occupation; household crowding; educational qualifications; and, governmental income support.

*Sexual health measures* ‘Ever had sex’ was measured based on two questions. In 2001 and 2007 we utilised the question “*About how old were you when you had your first experience of sex? (by this we mean sexual intercourse or going all the way)*”. Responses: all ages (excluding ‘never’) were coded as having ‘ever had sex’. In 2012 we changed the question to “*Have you ever had sex? (by this we mean sexual intercourse). Do not include sexual abuse*”. Responses: ‘Yes’ were coded as ‘ever having sex’. ‘Currently sexually active’ was measured from the question “*In the last 3 months, how many sexual partners have you had sex with? Do not include sexual abuse, or sex that you did not want.*” Responses: 1 or more partners in the past 3 months were coded as ‘sexually active’. Students who were classified as sexually active were asked further questions, including:

- ‘Always use condoms’ was measured from the question “*How often do you (or your partner) use condoms as protection against sexually transmitted disease or infections?*” Response: ‘Always’ was coded as ‘always using condoms’.
- ‘Condoms at last sex’ was measured using “*The last time you had sex, did you use condoms as protection against sexually transmitted disease or infection?*” Response: ‘Yes’ was coded as ‘condoms at last sex’.
- ‘Always use contraception’ was measured using the question “*How often do you or your partner use contraception (by this we mean protection against pregnancy).*” Response: ‘Always’ was coded as ‘always use contraception’.
- ‘Contraception at last sex’ was measured using the question “*The last time you had sex did you use any form of contraception?*” Response: ‘Yes’ was coded as ‘contraception at last sex’.
- ‘Ever been or got someone pregnant’ was measured using “*have you ever been pregnant or got someone pregnant (including miscarriage, abortion or termination)?*” Response: ‘Yes’ was coded as ‘ever been pregnant’.
- ‘Ever had an STI’ was measured using “*Have you ever had a sexually transmitted disease or infection?*” Response ‘Yes’ was coded as ‘ever having an STI’.

### *Analyses*

Results are presented as weighted percentages with 95% confidence intervals. Logistic regression was used to explore variations between 2001 and 2012, and results are expressed as odds ratios, adjusted for age, ethnicity, school decile, and sex. All analyses have also been adjusted to account for the unequal probability of selection and the clustered survey design.

Overall changes between 2001 and 2012 are given and these changes over time are the focus of this paper, therefore the 2007 wave is not included in these analyses. Differences were interpreted conservatively (i.e. a p-value of  $\leq 0.01$  was taken to indicate statistical significance) given the sample size and number of comparisons.

## **Results**

In 2012, 91 schools participated, which was approximately 25% of all eligible schools in New Zealand, while in 2001 it was closer to 30% of all schools. There were similar proportions of private schools across survey waves, and an increase in the proportion of co-educational schools, small schools and lower decile (i.e. poorer) schools in 2012 compared to 2001. Demographic features of students show a higher proportion of older students and fewer European students in 2012 compared to 2001. These findings reflect the declining proportion of students categorised as New Zealand European (based on prioritised ethnicity) and a pattern of students staying in school longer.

### **(INSERT TABLE 1)**

*Ever had sex:* There has been a significant decline in the number of students reporting ‘ever had sex’ between 2001 and 2012. Although there was a slight increase in ‘ever had sex’ between 2001 and 2007 the trend for this outcome is for a significant decline between 2001 and 2012 (-6.9%,  $p < .001$ ) (see Table 2). In 2012, compared with 2001, younger students in particular, are delaying having sex. When comparing Māori to European students, the odds of ‘ever had sex’ are significantly higher (OR 2.6) among Māori students (averaged over the 3 waves), however by ethnicity, the most notable changes over time between 2001 and 2012 were among Māori students who showed large declines in initiating sexual activity, also indicating convergence with NZ European students (from 47.6% to 35.5%) (Table 2).

### **(INSERT TABLE 2)**

*Currently sexually active:* There was an increase overall between 2001 and 2007 in students who reported being ‘currently sexually active’, but a significant decline overall when the results were compared between 2001 and 2012 (-2.3%,  $p < .001$ ) (Table 2.). Older students and students from lower decile schools more frequently reported being currently sexually active between 2001 and 2012 (Tables 3). The odds of Māori students (OR 2.3) being

currently sexually active compared to European students was significantly higher when averaged over the 3 waves (Table 3), however Māori showed large declines in being sexually active between 2001 and 2012 also indicating convergence with NZ European students (Table 2).

*Always use condoms:* Overall, lower proportions of sexually active students reported ‘always using condoms’ in 2012 compared to 2001 (-3.3%,  $p=.006$ ). Over that period, males more frequently reported always using condoms than females, however students from lower decile schools and those in the older age group less frequently reported consistent condom use (Table 3). Māori (OR 0.7) and Pacific (OR 0.5) students reported lower odds of always using a condom compared to European students between 2001 and 2012 (Table 3).

*Condoms at last sex:* Using a condom the last time a student had sex has also declined from 2001 to 2012 (-7.0%,  $p=.002$ ). In particular, older students were less likely to use condoms the last time they had sex in 2012 compared to 2001 (Table 2). Māori (OR 0.8) and Pacific (OR 0.6) students reported lower odds of using a condom the last time they had sex compared to European students over that period (Table 3).

*Always use contraception:* Consistent contraception use (among sexually active students) has not changed significantly from 2001 to 2012 overall (-1.4%,  $p=.514$ ). Over that time period, younger sexually active students and students from lower decile schools less frequently reported ‘always use contraception’ (Table 3). Māori (OR 0.6), Pacific (OR 0.4), Asian (OR 0.5) and Other ethnic groups (OR 0.8) students were less likely to report consistent contraception use compared to European students (Table 3). European students use of contraception remained largely unchanged over the time period. There was a pattern of Māori and Asian students reporting declines in always using contraception between 2001 and 2012 (Table 2).

*Contraception at last sex:* Using contraception the last time a student had sex also declined over time (-5.8%,  $p<.001$ ). Māori and Pacific students showed large declines in using contraception at last sex since 2001 (Tables 2). Māori (OR 0.5), Pacific (OR 0.4), Asian (OR 0.4) and Other ethnic groups (OR 0.8) students reported lower odds of using contraception the last time they had sex compared to NZ European students averaged over the three time points (Table 3).

*Ever been or got someone pregnant:* Overall, from 2001-2012 there was no difference in reporting ever been pregnant (-0.8%,  $p=.03$ ) for the overall student population (Table 2). Māori (OR 3.6), Pacific (OR 2.0) and Other ethnic groups (OR 1.5) students more frequently reported higher odds of a pregnancy compared to European students (Table 3). However, it should be noted that numbers of students reporting pregnancy were very small.

*Ever had a STI:* There was a small (-0.3%) but significant drop in self-reported STI from 2001 to 2012 ( $p<.001$ ). Māori (OR 2.6) and Pacific (OR 2.0) students more frequently reported higher odds of having a STI compared to European students, with Asian students reporting lower odds (OR 0.5) than European students (Table 3). It should be acknowledged that the numbers of students reporting STIs were very small.

**(INSERT TABLE 3)**

## Discussion

Between 2001 and 2012 there were significant reductions in the proportions of New Zealand secondary school students who reported that they have ‘ever had sex’ or were ‘currently sexually active’. However, among sexually active students, condom and contraceptive use had not improved or had worsened over the 11 year period. There were no marked changes in the proportions of students who report ever having been pregnant or reported having a STI. Marked ethnic disparities continue with Māori, Pacific, Asian and Other ethnic groups less frequently reporting consistent contraception use.

Our finding that secondary school students are delaying the initiation of sexual behaviour, compared to their peers a decade earlier, has also been reported in Canada and the United States.<sup>22-24</sup> It is unclear exactly why adolescents are delaying sexual activity, although it is hypothesized the presence of various protective factors like family connection, good school performance, improved mental health, and high parental expectations are associated with delays in initiating sexual behaviour.<sup>25, 26</sup> These results are also consistent with previous findings from the Youth2000 findings that New Zealand secondary school students overall are proportionately engaging in fewer risky behaviours (e.g. reduced alcohol and drug use, reduced risky driving, reduced suicide attempts) compared to their peers in 2001.<sup>27</sup> Another contributor could be the availability of quality sexual and reproductive education and information, and the rise in opportunities to access information about sexual health from non-traditional sources, such as the Internet<sup>28</sup>. Not all sexuality education is effective, but recent systematic reviews of implemented programmes found that comprehensive sexuality education was associated with delays in initiating sexual intercourse, less frequent intercourse, fewer sexual partners, and an increase in the use of contraception and condoms.<sup>29, 30</sup> The influence of sexuality education in New Zealand school students is largely unevaluated, but evidence suggests that it does not currently meet the needs of all students<sup>31</sup> and is highly variable in quality and content between schools, despite government Ministries having developed recommendations for best practice.<sup>32, 33</sup>

The overall decline in self-reported pregnancy found in our study is consistent with declines in rates of termination of pregnancy and of births to teenager mothers in New Zealand<sup>34</sup> and with findings from the United States,<sup>35, 36</sup> Canada,<sup>37, 38</sup> Australia,<sup>39</sup> the Netherlands and Switzerland.<sup>40, 41</sup> In the United States, there has been an almost 40% drop in teenage birth rates over the past 20 years, with approximately 12% of this decline linked to policy



changes, such as expanded family planning services being provided through Medicaid.<sup>42</sup> In contrast, there has been little change in the adolescent pregnancy rate over the last decade in the United Kingdom with almost 50% of conceptions terminated in legal abortions among adolescents aged less than 18 years old.<sup>43</sup> Adolescents in the Netherlands and Switzerland had the lowest birth and abortion rate in the world, with easy access to contraception thought to play a major role in reducing the rates of pregnancy among Swiss adolescents.<sup>40, 41</sup>

In our study, there has been no change or improvement in the consistent use of contraception among sexually active students between 2001 and 2012 across the overall sample (59.6% in 2001, 60.3% in 2007, 58.2% in 2012  $p=.451$ ). The apparent contradictory findings of fewer (or the same proportion of) students using condoms and contraception, no change in self-reported pregnancy rates, and a rapidly declining teen pregnancy rate might be explained by fewer sexually active students in New Zealand secondary schools and/or shifts to more effective contraceptive use among those using them. The use of long-acting reversible contraceptive methods or LARC (e.g. implants, injectables and the intra-uterine methods) has contributed to the decline in teenage pregnancy in the United States.<sup>44-46</sup> These are safe and highly effective methods that reduce the issues of non-use and inconsistent use of contraceptives, which are frequently reported by adolescents as a major contributor to unintended pregnancy.<sup>47</sup> Although a range of studies have reported on the safety and efficacy of LARC among a broad range of females,<sup>48-50</sup> these methods still remain underutilised, particularly among adolescents.<sup>51, 52</sup> In 2010, the New Zealand Government subsidised LARC to increase access for all women. A New Zealand cohort study found that LARC insertion was well tolerated among adolescents who (similar to adults) were satisfied with the method and continued to use it.<sup>53</sup>

The sharp decline in Māori sexual debut relative to other ethnic groups over more than a decade is an important finding. This finding is consistent with the notion of converging fertility rates and narrowing of inequity in sexual behaviour for Māori compared to non-Māori which has been reported elsewhere.<sup>54</sup> While Māori youth remain significantly more likely to be sexually active compared to young people from other ethnic groups, this rapid decline suggests that delaying sexual activity is becoming more normative for Māori youth attending secondary school. Along with improved access to contraception<sup>54</sup> these findings may be signalling a shift in cultural norm for Māori youth. It is unclear what has hastened this change in behaviour compared to other ethnic groups. International literature suggests that

drivers behind the declines in teen pregnancies are related to access to good information, structural factors including economic inequality, access to education, economic downturns, childbearing norms, media perceptions about teen pregnancy, easier access to sexual healthcare and healthcare policies.<sup>55</sup> For Māori, early reproduction has been pathologised and conflated with social disadvantage and adverse risk factors.<sup>56, 57</sup> This has resulted in significant stigma for Māori youth, even though there is evidence that risks associated with early parenting disappear when accounting for socio-economic factors and support systems.<sup>58</sup> Le Grice<sup>57</sup> described Māori as “managing the contradictions of a colonised reality” p. 138 with regard to their fertility. Young Māori may delay having children as a way of resisting and negotiating racist discourses and the imposition of Western views. Le Grice also suggests that public health can resist this colonising practice of ‘knowing better than Māori youth’ by engaging in culturally meaningful and better quality sexual, reproductive and maternity care. Further research is required to explore these shifts in sexual behaviours and how the sexual and reproductive needs of Māori youth can be addressed adequately and in a culturally positive and appropriate manner.

Access to healthcare remains a significant issue with 18.6% of New Zealand students reporting they had difficulty accessing the healthcare that they needed within the past 12 months, with those from socio-economically deprived communities (decile 1-3) having greater difficulty (15.5%).<sup>20</sup> Moreover, of those who reported difficulties, 2.4% (0.4% males, 3.9% females) reported challenges accessing help for pregnancy/pregnancy tests and 3.7% (1.7% males, 5.3% females) reported difficulty accessing contraception. Young people in New Zealand can access contraceptive services without the authority of their guardians, however only 36.8% of students reported that they had seen a healthcare provider in private (i.e. without their parents or other people in the room) and less than half (46.0%) were reassured of confidentiality (i.e. the doctor or health provider had told the student what they had talked about was confidential)<sup>20</sup>. Evidence suggests that health providers who do not see adolescents for at least part of a consultation alone, and do not discuss confidentiality, will not adequately meet the healthcare needs of young people, particularly those of a sensitive nature.<sup>59-61</sup> There is growing evidence that increasing access at venues that are convenient for young people like school-based health services<sup>59, 62, 63</sup> and youth ‘one-stop- shops’ can be an effective means for increasing healthcare access amongst adolescents.<sup>64</sup> Primary health care, including pharmacies, must be responsive and accessible.<sup>65, 66</sup>

Specific groups within the secondary school population have poorer sexual and reproductive health outcomes, this is particularly so for Māori and Pacific students, and students from low decile schools. Of note, there was a significant decline in using condoms among Pacific students (always using condoms -8.0% and using condoms the last time had sex -7.8%) and contraception use among Māori students (-2.9% for always using contraception and -9.2% using contraception at last sex) relative to students from other ethnic groups between 2001 and 2012. Students from socio-economically deprived communities (decile 1) were significantly less likely to consistently use contraception (OR 0.6) and condoms (OR 0.7) compared to students in wealthier communities (decile 10). Persistent disparities for these populations remain. Further research is required that explores barriers, strategies, interventions and health education messages that enhance condom and contraception access for these vulnerable populations.

In 2001, the Ministry of Health launched the New Zealand Sexual Health Strategy: Phase One which outlines the guiding principles and strategic direction of sexual and reproductive health for the country.<sup>12</sup> It was proposed that phase two would address vulnerable populations, in particular for Māori (acknowledging their special relationship with the Crown as part of Treaty of Waitangi obligations), for Pacific peoples, people with unplanned pregnancies, and those who have experienced sexual abuse and coercion. However, to date, no up-dated national strategy in relation to sexual health in New Zealand has been launched-Furthermore, over the past decade there appears to have been a general lack of development, resources and commitment to sexual and reproductive health. Urgent attention is required to reprioritise the sexual and reproductive health of youth, and to ensure that all young people have the education, resources and services they require to be sexually healthy and responsible citizens.

### *Limitations*

There are a number of limitations to this study. The information on 'ever had sex' should be interpreted with caution as the question has changed over time. In particular, the 2012 question actively excluded sexual abuse, and may account for some of the reduction in sex over time. Results from the National Survey of Australian Secondary Students and Sexual Health (2013) for ever had sex (i.e. experienced sexual intercourse) was 34%, which aligns with the earlier results from New Zealand for 2007 (36% ever had sex), but is a greater proportion than that from 2012 (24% ever had sex)<sup>67</sup>. However, the question on having sex

in the previous 3 months (i.e. currently sexually active) question has remained unchanged, and the results highlight a similar declining trend. The data on being pregnant must also be interpreted with caution given the small numbers reported, although it is consistent with the declining New Zealand teenage fertility rate of 27.7 per 1,000 (15-19 year olds) with 70% of those births occurring in those in their late teens, and most often not in secondary school <sup>11</sup>. Similarly, STI data must be interpreted with caution as there are small numbers reported. Moreover, many students may not know if they have an STI, or may not have been tested due to the asymptomatic nature of many STIs. We have not conducted analyses of the sexual minority (e.g. same/both-sex attracted) or transgender youth population in this paper, but we anticipate completing an analysis of the sexual health of these students in the future.

## **Conclusions**

Secondary school students in 2012 were more likely to delay sexual activity, but less likely to use condoms and contraception consistently compared to their peers in 2001. Declining contraceptive use over the 11 year period suggests current strategies to be inadequate, particularly for Māori and Pacific students, and those attending low decile schools. Appropriate and accessible sexual and reproductive services are urgently required.

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**Table 1: Characteristics of participating schools and students for the 2001, 2007 and 2012 surveys**

			2001		2007		2012	
			n	%	n	%	n	%
<b>Schools</b>	Response rate	Eligible	389	-	389	-	397	-
		Invited	133	-	115	-	125	-
		Participated	114	85.7	96	83.5	91	72.8
	Authority	Private: fully registered	7	6.1	8	8.3	8	8.8
		State: integrated	27	23.7	21	21.9	16	17.6
		State: not integrated	80	70.2	67	69.8	67	73.6
	Type of school	Co-educational	79	69.3	69	71.8	71	78.0
		Boys' school	14	12.3	15	15.6	6	6.6
		Girls' school	21	18.4	12	12.5	14	15.4
School size <sup>1</sup>	Large (≥350 students)	78	68.4	67	70.0	57	62.6	
	Small-medium (<350 students)	36	31.6	29	30.2	34	37.4	
Decile grouping	Low (decile 1-3)	26	22.9	15	16.3	26	28.6	
	Medium (decile 4-7)	49	43.1	52	56.5	36	39.6	
	High (decile 8-10)	39	34.2	25	27.2	29	31.9	
<b>Students</b>	Response rate	Invited	12934	-	12355	-	12503	-
		Participated	9,699 <sup>2</sup>	74.0	9107 <sup>2</sup>	74.0	8500 <sup>2</sup>	68.0
	Year	Year 9	2458	26.1	2176	24.3	2061	24.3
		Year 10	2233	23.8	2090	23.4	1936	22.8
		Year 11	2157	22.9	1933	21.6	1727	20.4
		Year 12	1580	16.8	1669	18.7	1534	18.1
		Year 13	978	10.4	1077	12.0	1227	14.5
	Gender	Male	4416	46.2	4911	54.0	3874	45.6
		Female	5153	53.8	4187	46.0	4623	54.4
	Age	≤ 13	1972	20.8	1860	20.4	1838	21.7
		14	2285	24.1	2101	23.1	1896	22.3
		15	2179	23.0	1973	21.7	1755	20.7
		16	1725	18.2	1743	19.2	1578	18.6
		≥ 17	1308	13.9	1423	15.6	1422	16.8
	Ethnicity <sup>3</sup>	NZ Euro	5219	55.4	4797	52.8	4024	47.4
		Māori	2340	24.8	1702	18.7	1701	20.1
Pacific		768	8.2	924	10.2	1201	14.1	
Asian		679	7.2	1126	12.4	1051	12.4	
Other		417	4.4	531	5.8	511	6.0	

<sup>1</sup> Students in Years 9-13

<sup>2</sup> Totals for each (not shown) are different to the overall total number of participating students due to different numbers of missing data for each.

<sup>3</sup> Ethnicity was assigned on the basis of prioritised ethnicity, using the NZ Census ethnicity prioritisation method <sup>21</sup>



**Table 2. Sexual health outcomes by sex, age group and ethnicity by survey wave (2001, 2007 and 2012)<sup>1, 2,3, \*</sup>**

		2001		2007		2012		Change between 2001 and 2012	p-value <sup>4</sup>
		n / N	% (95% CI)	n / N	% (95% CI)	n / N	% (95% CI)	% change (95% CI)	
<b>Ever had sex</b>	<b>Total</b>	2856 / 9067	31.3 (29.2-33.4)	2931 / 8064	36.3 (33.3-39.3)	2013 / 8264	24.4 (22.6-26.2)	-6.9 (-8.2,-5.6)	<.001
	Males	1346 / 4134	32.3 (29.7-35.0)	1610 / 4282	37.6 (34.2-41.1)	927 / 3737	24.9 (22.4-27.3)	-7.5 (-9.5,-5.5)	<.001
	Females	1510 / 4933	30.4 (28.2-32.7)	1321 / 3782	34.8 (31.4-38.3)	1084 / 4524	24.0 (21.9-26.0)	-6.5 (-8.2,-4.7)	
	≤15	1542 / 6140	25.0 (22.8-27.2)	1523 / 5224	29.1 (26.5-31.7)	816 / 5344	15.3 (13.5-17.0)	-9.7 (-11.2,-8.3)	<.001
	≥16	1305 / 2913	44.6 (41.9-47.3)	1408 / 2840	49.5 (44.7-54.3)	1193 / 2909	41.1 (38.1-44.0)	-3.6 (-6.1,-1.0)	
	Māori	1050 / 2202	47.6 (45.0-50.2)	827 / 1484	55.8 (52.3-59.3)	586 / 1641	35.5 (32.7-38.4)	-12.1 (-15.2,-8.9)	<.001
	Pacific	212 / 670	31.5 (27.1-36.0)	306 / 734	41.7 (37.6-45.9)	285 / 1130	25.3 (22.1-28.5)	-6.2 (-10.6,-1.9)	
	Asian	108 / 631	16.8 (13.3-20.3)	174 / 987	17.5 (13.0-22.2)	125 / 1017	12.3 (9.9-14.6)	-4.5 (-8.1,-1.0)	
NZ Euro	1346 / 5071	26.5 (25.0-27.9)	1464 / 4384	33.4 (31.3-35.6)	894 / 3970	22.6 (20.7-24.5)	-3.8 (-5.6,-2.1)		
Other	105 / 388	27.1 (21.7-32.5)	158 / 471	33.4 (28.8-38.1)	120 / 496	24.5 (19.7-29.3)	-2.6 (-8.5,3.2)		
<b>Currently sexually active<sup>1</sup></b>	<b>Total</b>	1909 / 8948	21.2 (19.6-22.7)	2017 / 7740	26.0 (23.8-28.2)	1550 / 8246	18.8 (17.3-20.4)	-2.3 (-3.5,-1.1)	<.001
	Males	846 / 4079	20.6 (18.7-22.5)	1056 / 4079	25.9 (23.4-28.4)	680 / 3725	18.3 (16.3-20.3)	-2.3 (-4.0,-0.5)	.500
	Females	1063 / 4869	21.6 (19.6-23.6)	961 / 3661	26.2 (23.3-28.9)	859 / 4519	19.3 (17.5-21.0)	-2.4 (-4.0,-0.7)	
	≤15	979 / 6047	16.1 (14.5-17.7)	992 / 5011	19.7 (18.0-21.5)	594 / 5332	11.2 (9.8-12.6)	-4.9 (-6.2,-3.7)	<.001
	≥16	922 / 2888	31.7 (29.4-34.0)	1025 / 2729	37.5 (33.7-41.3)	953 / 2904	32.9 (30.2-35.5)	1.2 (-1.2,3.6)	
	Māori	717 / 2136	33.5 (31.4-35.6)	587 / 1404	41.8 (38.6-45.0)	434 / 1633	26.5 (24.1-28.8)	-7.1 (-10.0,-4.1)	<.001
	Pacific	127 / 650	19.6 (15.8-23.3)	207 / 696	29.8 (26.1-33.5)	224 / 1128	19.9 (17.2-22.7)	0.4 (-3.5,4.2)	
	Asian	63 / 627	9.8 (7.2-12.4)	98 / 946	10.3 (7.2-13.4)	88 / 1013	8.7 (6.9-10.4)	-1.1 (-4.1,1.8)	
NZ Euro	909 / 5051	17.9 (16.7-19.1)	1024 / 4247	24.1 (22.4-25.8)	714 / 3966	18.1 (16.5-19.7)	0.2 (-1.4,1.8)		
Other	66 / 381	17.1 (13.0-21.1)	100 / 444	22.4 (18.4-26.3)	88 / 496	17.9 (14.1-21.7)	0.8 (-4.2,5.9)		
<b>Always use condoms<sup>1</sup></b>	<b>Total</b>	901 / 1851	48.8 (46.3-51.3)	903 / 1995	45.2 (42.6-47.9)	686 / 1509	45.5 (43.0-48.0)	-3.3 (-6.7,0.1)	.006
	Males	455 / 816	56.1 (52.7-59.5)	532 / 1042	51.0 (47.5-54.5)	339 / 651	52.1 (48.5-55.7)	-4.0 (-9.2,1.1)	<.001

	Females	446 / 1035	42.9 (39.9-45.9)	371 / 953	38.9 (35.5-42.2)	347 / 857	40.5 (37.4-43.7)	-2.4 (-6.8,2.1)	
	≤15	482 / 943	51.2 (47.6-54.7)	476 / 974	48.9 (45.2-52.5)	282 / 567	49.8 (45.5-54.1)	-1.4 (-6.6,3.9)	<.001
	≥16	416 / 901	46.3 (42.5-50.2)	427 / 1021	41.8 (38.2-45.4)	401 / 939	42.7 (39.4-46.0)	-3.6 (-8.2,0.9)	
	Māori	322 / 696	46.4 (42.2-50.6)	209 / 580	36.1 (32.3-39.9)	183 / 419	43.8 (38.2-49.4)	-2.6 (-8.6,3.4)	
	Pacific	51 / 121	42.6 (33.5-51.6)	63 / 204	30.9 (25.8-36.0)	75 / 217	34.6 (30.6-38.6)	-8.0 (-18.8,2.9)	
	Asian	28 / 57	46.8 (32.5-61.0)	55 / 98	55.8 (46.3-65.3)	41 / 87	46.7 (35.1-58.3)	-0.1 (-16.7,16.6)	
	NZ Euro	464 / 892	52.2 (49.1-55.2)	512 / 1013	50.5 (47.3-53.6)	340 / 700	48.5 (44.7-52.3)	-3.6 (-8.6,1.3)	
	Other	32 / 60	54.8 (41.3-68.3)	63 / 99	63.8 (53.3-74.3)	46 / 84	55.6 (44.6-66.6)	0.8 (-15.7,17.3)	
	<b>Total</b>	1095 / 1825	60.0 (57.9-62.1)	1203 / 1993	60.3 (58.0-62.7)	806 / 1519	53.0 (50.7-55.4)	-7.0 (-10.3,-3.6)	.002
<b>Condoms at last sex<sup>1</sup></b>	Males	522 / 800	65.4 (62.3-68.5)	687 / 1040	66.1 (62.9-69.3)	388 / 657	59.1 (55.5-62.7)	-6.3 (-11.3,-1.3)	<.001
	Females	573 / 1025	55.7 (52.7-58.7)	516 / 953	54.0 (50.9-57.1)	418 / 861	48.5 (44.9-52.1)	-7.2 (-11.7,-2.7)	
	≤15	591 / 923	64.1 (61.2-66.9)	630 / 972	64.9 (61.6-68.2)	335 / 571	58.8 (55.2-62.4)	-5.3 (-10.4,-0.2)	<.001
	≥16	499 / 895	55.6 (52.2-59.1)	573 / 1021	56.0 (53.1-59.0)	469 / 945	49.5 (46.5-52.6)	-6.1 (-10.7,-1.6)	
	Māori	413 / 684	60.4 (57.1-63.6)	326 / 579	56.4 (52.4-60.5)	219 / 424	51.7 (47.4-56.1)	-8.6 (-14.6,-2.6)	<.001
	Pacific	66 / 117	57.4 (44.8-70.0)	92 / 204	45.1 (38.2-52.0)	108 / 218	49.6 (43.5-55.8)	-7.8 (-18.9,3.4)	
	Asian	32 / 54	57.6 (44.7-70.5)	60 / 98	61.0 (52.7-69.3)	47 / 87	54.0 (42.7-65.4)	-3.6 (-20.4,13.2)	
NZ Euro	539 / 885	60.9 (57.7-64.1)	652 / 1012	64.3 (61.2-67.5)	383 / 705	54.2 (50.3-58.0)	-6.7 (-11.6,-1.8)		
Other	36 / 60	60.5 (50.3-70.8)	72 / 99	73.0 (64.2-81.9)	48 / 83	58.0 (47.1-68.8)	-2.6 (-18.9,13.7)		
	<b>Total</b>	1103 / 1851	59.6 (56.5-62.7)	1126 / 1871	60.3 (57.5-63.1)	872 / 1499	58.2 (54.4-62.1)	-1.4 (-4.7,2.0)	.514
<b>Always use contraception<sup>1</sup></b>	Males	487 / 801	61.1 (57.6-64.6)	567 / 955	59.4 (55.8-63.1)	361 / 646	56.0 (51.4-60.5)	-5.1 (-10.2,0.0)	.652
	Females	616 / 1050	58.5 (54.4-62.5)	559 / 916	61.1 (57.1-65.2)	511 / 852	60.0 (55.2-64.9)	1.5 (-2.9,6.0)	
	≤15	512 / 949	53.8 (49.4-58.2)	486 / 899	54.2 (51.0-57.5)	258 / 564	50.6 (45.8-55.4)	-3.2 (-8.5,2.0)	<.001
	≥16	587 / 897	65.8 (61.7-69.8)	640 / 972	65.8 (61.8-69.8)	585 / 932	62.8 (58.4-67.2)	-2.9 (-7.3,1.5)	
	Māori	355 / 694	51.3 (46.0-56.6)	278 / 534	52.2 (48.1-56.2)	204 / 421	48.4 (42.6-54.2)	-2.9 (-9.0,3.1)	<.001
	Pacific	49 / 119	42.2 (34.5-50.0)	73 / 188	38.8 (32.5-45.1)	91 / 215	42.4 (34.8-50.0)	0.1 (-10.9,11.2)	
	Asian	33 / 60	54.1 (44.0-64.3)	52 / 92	57.0 (47.8-66.1)	42 / 82	51.5 (42.4-60.5)	-2.7 (-19.3,13.9)	
NZ Euro	621 / 890	69.8 (66.8-72.7)	657 / 962	68.3 (64.7-71.9)	487 / 695	70.1 (66.9-73.4)	0.4 (-4.2,4.9)		
Other	35 / 62	56.8 (46.0-67.6)	66 / 94	71.2 (60.8-81.5)	48 / 85	56.7 (46.5-67.0)	-0.1 (-16.3,16.1)		
	<b>Total</b>	1362 / 1845	73.8 (71.3-76.4)	1328 / 1957	68.0 (64.9-71.0)	1013 / 1492	68.0 (63.9-72.2)	-5.8 (-8.9,-2.7)	<.001

<b>Contraception at last sex<sup>1</sup></b>	Males	592 / 796	74.5 (71.7-77.3)	660 / 1013	65.3 (61.8-68.8)	418 / 639	65.7 (61.8-69.6)	-8.8 (-13.6,-4.0)	.197
	Females	770 / 1049	73.3 (69.8-76.9)	668 / 944	70.9 (66.6-75.2)	595 / 852	69.9 (64.1-75.6)	-3.5 (-7.6,0.6)	
	≤15	656 / 940	70.1 (66.5-73.6)	587 / 943	62.4 (58.8-66.1)	339 / 564	60.4 (55.2-65.5)	-9.7 (-14.7,-4.7)	<.001
	≥16	701 / 899	77.8 (74.5-81.1)	741 / 1014	73.1 (69.2-77.0)	673 / 926	72.7 (68.3-77.2)	-5.1 (-9.1,-1.2)	
	Māori	455 / 686	66.7 (62.5-70.9)	341 / 561	60.9 (56.7-65.2)	237 / 461	57.5 (52.4-62.5)	-9.2 (-15.2,-3.3)	<.001
	Pacific	80 / 120	67.6 (57.8-77.5)	85 / 197	43.1 (35.7-50.5)	97 / 216	45.1 (37.3-52.8)	-22.6 (-33.3,11.9)	
	Asian	42 / 59	70.8 (61.1-80.5)	51 / 98	52.3 (42.5-62.1)	51 / 82	62.1 (52.3-71.8)	-8.7 (-24.3,7.0)	
NZ Euro	728 / 891	81.6 (79.1-84.0)	774 / 1001	77.5 (74.5-80.4)	569 / 693	82.1 (78.8-85.4)	0.5 (-3.3,4.3)		
Other	44 / 63	69.0 (57.9-80.2)	77 / 99	78.1 (68.8-87.5)	59 / 84	70.1 (60.1-80.0)	1.1 (-14.0,16.1)		
<b>Ever been or got someone pregnant<sup>2</sup></b>	<b>Total</b>	311 / 8840	3.5 (3.0-4.0)	280 / 7807	3.6 (3.0-4.1)	173 / 6423	2.7 (2.2-3.2)	-0.8 (-1.3,-0.2)	.030
	Males	125 / 4004	3.1 (2.4-3.7)	138 / 4098	3.4 (2.7-4.0)	66 / 6876	2.3 (1.7-2.9)	-0.8 (-1.5,0.0)	.026
	Females	186 / 4836	3.8 (3.2-4.5)	142 / 3709	3.8 (3.0-4.6)	106 / 3545	3.0 (2.3-3.7)	-0.8 (-1.6,-0.1)	
	≤15	190 / 6005	3.1 (2.6-3.7)	160 / 5060	3.1 (2.6-3.7)	88 / 4615	1.9 (1.4-2.4)	-1.2 (-1.8,-0.7)	<.001
	≥16	119 / 2821	4.1 (3.4-4.8)	120 / 2747	4.4 (3.4-5.3)	83 / 1799	4.6 (3.5-5.8)	0.5 (-0.7,1.7)	
	Māori	139 / 2109	6.5 (5.4-7.6)	114 / 1397	8.1 (6.9-9.3)	76 / 1131	6.7 (5.2-8.1)	0.1 (-1.6,1.9)	<.001
	Pacific	30 / 653	4.6 (2.8-6.4)	38 / 661	5.4 (3.7-7.1)	30 / 874	3.4 (2.3-4.5)	-1.1 (-3.2,0.9)	
Asian	15 / 622	2.4 (1.4-3.4)	12 / 969	1.2 (0.3-2.0)	6 / 898	0.7 (0.2-1.2)	-1.7 (-3.0,-0.4)		
NZ Euro	111 / 4979	2.2 (1.8-2.6)	100 / 4282	2.3 (1.8-2.8)	48 / 3124	1.5 (1.0-2.1)	-0.7 (-1.3,-0.1)		
Other	10 / 379	2.6 (1.0-4.3)	15 / 457	3.3 (1.9-4.7)	12 / 388	3.2 (1.5-5.0)	0.6 (-1.8,3.0)		
<b>Ever had an STI<sup>2</sup></b>	<b>Total</b>	117 / 8797	1.3 (1.1-1.6)	136 / 7804	1.7 (1.4-2.1)	86 / 8084	1.1 (0.8-1.3)	-0.3 (-0.6,0.1)	<.001
	Males	42 / 4019	1.1 (0.7-1.4)	54 / 4129	1.3 (0.9-1.7)	32 / 3640	0.9 (0.6-1.1)	-0.2 (-0.6,0.3)	<.001
	Females	75 / 4778	1.5 (1.2-1.9)	82 / 3675	2.3 (1.7-2.8)	54 / 4442	1.2 (0.8-1.6)	-0.3 (-0.8,0.1)	
	≤15	53 / 6005	0.9 (0.7-1.1)	52 / 5066	1.0 (0.7-1.3)	34 / 5248	0.6 (0.4-0.9)	-0.3 (-0.6,0.1)	<.0001
	≥16	64 / 2779	2.2 (1.7-2.8)	84 / 2738	3.0 (2.3-3.8)	52 / 2827	1.8 (1.2-2.4)	-0.4 (-1.1,0.4)	
	Māori	41 / 2107	1.9 (1.4-2.5)	43 / 1396	3.1 (2.2-4.0)	34 / 1579	2.1 (1.5-2.8)	0.2 (-.07-1.0)	<.001
	Pacific	13 / 647	2.0 (1.0-3.2)	15 / 699	2.2 (1.0-3.3)	18 / 1102	1.6 (0.8-2.5)	-0.5 (-1.8-0.9)	
Asian	3 / 612	0.6 (0.1-1.2)	6 / 966	0.6 (0.1-1.2)	4 / 1004	0.4 (0.1-0.7)	-0.2 (-0.9,0.5)		
NZ Euro	46 / 4955	0.9 (0.7-1.1)	66 / 4280	1.5 (1.1-2.0)	24 / 3909	0.6 (0.3-0.9)	-0.3 (-0.6,0.1)		

	Other	7 / 377	1.7 (0.6-2.8)	6 / 460	1.3 (0.3-2.3)	5 / 480	1.0 (0-2.1)	-0.6 (-2.2,0.9)	
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<sup>1</sup> Among sexually active students only

<sup>2</sup> Denominator was all students

<sup>3</sup> Adjusted for sex, age, ethnicity and school decile

<sup>4</sup> p value for difference between 2001 and 2012

\* Between 2001 and 2012 there were significant changes at the  $p < .001$  level for students from different deciles who had ever had sex, are currently sexual active, always use condoms, always use contraception and those who used contraception the last time they had sex. The proportion of students from different deciles also changed over this time period with regards to the number who had ever been or got someone pregnant ( $p=.004$ ). There were no significant changes in the proportion of students from various deciles who reported to have used a condom the last time they had sex between 2001 and 2012 ( $p=.292$ ).

**Table 3. Odds Ratios for sexual health outcomes averaged over time (2001,2007 & 2012)<sup>5</sup>**

	<b>Ever had sex</b> OR (95% CI)	<b>Currently sexually active</b> OR (95% CI)	<b>Always use condoms</b> OR (95% CI)	<b>Condoms at last sex</b> OR (95% CI)	<b>Always use contraception</b> OR (95% CI)	<b>Contraception at last sex</b> OR (95% CI)	<b>Ever been or got someone pregnant</b> OR (95% CI)	<b>Ever had an STI</b> OR (95% CI)
<b>Males vs Females<sup>1</sup></b>	1.1 (1.1 - 1.2)	1.0 (0.9 - 1.1)	1.7 (1.5 - 1.9)	1.6 (1.4 - 1.8)	1.0 (0.9 - 1.2)	0.9 (0.8 - 1.1)	0.8 (0.7 - 1.0)	0.6 (0.5 - 0.8)
<b>13 vs 17 year olds<sup>2</sup></b>	0.1 (0.1 - 0.1)	0.1 (0.1 - 0.1)	1.6 (1.3 - 2.1)	1.7 (1.3 - 2.2)	0.6 (0.5 - 0.8)	0.6 (0.4 - 0.7)	0.3 (0.2 - 0.4)	0.1 (0.1 - 0.2)
<b>Māori<sup>3</sup></b>	2.6 (2.4 - 2.8)	2.3 (2.1 - 2.5)	0.7 (0.6 - 0.8)	0.8 (0.7 - 0.9)	0.6 (0.5 - 0.7)	0.5 (0.4 - 0.6)	3.6 (3.0 - 4.2)	2.6 (2.0 - 3.3)
<b>Pacific<sup>3</sup></b>	1.2 (1.0 - 1.4)	1.1 (1.0 - 1.3)	0.5 (0.4 - 0.7)	0.6 (0.5 - 0.8)	0.4 (0.3 - 0.5)	0.4 (0.3 - 0.5)	2.0 (1.5 - 2.7)	2.0 (1.3 - 3.1)
<b>Asian<sup>3</sup></b>	0.4 (0.3 - 0.5)	0.4 (0.3 - 0.4)	1.0 (0.8 - 1.4)	0.9 (0.7 - 1.2)	0.5 (0.4 - 0.7)	0.4 (0.3 - 0.5)	0.6 (0.4 - 0.9)	0.5 (0.3 - 0.8)
<b>Other<sup>3</sup></b>	1.1 (0.9 - 1.3)	1.0 (0.8 - 1.1)	1.4 (1.0 - 1.8)	1.2 (0.8 - 1.5)	0.8 (0.6 - 1.1)	0.8 (0.6 - 1.1)	1.5 (1.1 - 2.1)	1.3 (0.8 - 2.2)
<b>School Decile 1 vs 10<sup>4</sup></b>	1.7 (1.4 - 2.2)	1.6 (1.2 - 2.0)	0.7 (0.5 - 0.9)	0.8 (0.5 - 1.0)	0.6 (0.4 - 0.8)	0.4 (0.3 - 0.5)	1.5 (0.9 - 2.4)	1.0 (0.5 - 2.0)

<sup>1</sup>Reference group males

<sup>2</sup>Reference group 13 year olds

<sup>3</sup>Reference group for ethnicity is NZ European

<sup>4</sup>Decile 1 schools refer to the 10% of schools with the highest proportion of students from low socio-economic communities, whereas decile 10 refers to the 10% of schools in the wealthiest of communities (see methods)

<sup>5</sup>Model includes wave, age, sex, ethnicity and school decile