

Alcohol use in the Pacific region: Results from the STEPwise approach to surveillance, Global School-Based Student Health Survey and Youth Risk Behavior Surveillance System

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Abstract

Introduction and Aims. Alcohol use is a leading risk factor for disease and injury in Pacific Island countries and territories (PICT). This paper examines drinking patterns across 20 PICTs. **Design and Methods.** We synthesised published data from the STEPwise approach to surveillance or similar surveys for adults 25–64 years, and from the Global School-Based Student Health surveys and Youth Risk Behavior Surveillance System (YRBSS) for youth. We examined current and heavy drinking, and for adults also frequency of consumption. Using YRBSS, we studied trends in youth alcohol use in US-affiliated PICTs between 2001 and 2013. **Results.** Alcohol consumption in adults and youth varied considerably across PICTs. In eight PICT populations, over 60% of male adults were current drinkers. Male adults consumed alcohol more frequently and engaged in heavy drinking more than female adults. Similar gender differences occurred in current and heavy drinking among youth. Across 10 PICTs, current drinking prevalence in males 13–15 years ranged from 10% to over 40%. Declines in alcohol use among grade 9–12 students were observed in YRBSS, although the magnitude differed by island and sex. **Discussion and Conclusions.** Alcohol consumption varies widely between PICTs. There are marked gender differences in use and abstention. There is scope in PICTs for implementation of best practice strategies to reduce alcohol-related harm. These need to be gender responsive and cognisant of concerning patterns of youth drinking. Strengthening surveillance of alcohol use and its consequences is vital to inform and monitor the impact of national and regional policies. [Kessaram T, McKenzie J, Girin N, Roth A, Vivili P, Williams G, Hoy D. Alcohol use in the Pacific region: Results from the STEPwise approach to surveillance, Global School-Based Student Health Survey and Youth Risk Behavior Surveillance System. *Drug Alcohol Rev* 2016;35:412–423]

Key words: alcohol consumption, drinking behaviour, epidemiology, Pacific Islands, prevalence.

Introduction

Since 1947, the islands of the Pacific have collaborated for development and public health as members of the Secretariat of the Pacific Community [1]. Although diverse in culture, population size and level of development, the 22 Pacific Island countries and territories (PICT) (referred to collectively here as ‘the Pacific region’) often face similar health and social challenges.

Alcohol consumption in the Pacific has been shaped by the region’s colonial history. Both trade in and prohibition of alcohol were used by various vested interests as a means of exerting influence over indigenous populations [2]. Harmful alcohol use and its consequences continue to be public health challenges in the region and mounting concerns.

Representatives of PICTs have previously called attention to increasing alcohol consumption, especially

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by youth, harmful patterns of use and the resulting impact on the health, social and economic welfare of individuals, families and communities [3]. A growing body of evidence from the region supports these concerns. Alcohol is a leading risk factor for disease and injury in the Pacific [4]. It is of particular importance as a risk factor in the context of the declared crisis of non-communicable diseases (NCD) [5]. In addition, a recent review of road traffic injury research observed that many studies implicated alcohol as a risk factor [6]. The involvement of alcohol in attempted suicide has also been recognised [7]. Furthermore, alcohol use has been identified as a significant contributing factor to violence against women in PICTs [8–11]. Young people in the Pacific also recognise the impact that alcohol has on them through violence and crime and its effect on the security of the home environment [12].

While the consequences of harmful use in the Pacific are apparent from the developing body of evidence, there remains a need for a comprehensive assessment of the patterns of alcohol consumption in the region. This paper collates the most recent available and comparable data from PICTs on alcohol use by adults and youth. Importantly, this regional perspective will inform and guide collaboration between PICTs on alcohol harm minimisation initiatives in the region. The results presented here will also provide a baseline against which the region can monitor progress towards achieving the global NCD target of at least a 10% relative reduction in harmful alcohol use by 2025 [13].

Methods

The World Health Organization (WHO) STEPwise approach to surveillance (STEPS) [14] and the Global School-Based Student Health Survey (GSHS) [15] have been implemented in several PICTs. We selected these two surveys for their wide coverage of the region and standard methodologies. In addition, we used the Youth Risk Behavior Surveillance System (YRBSS) [16] to examine trends between 2001 and 2013 in alcohol use among school students in five US-affiliated Pacific Islands (USAPI) [American Samoa, Guam, the Commonwealth of the Northern Mariana Islands (CNMI), the Republic of the Marshall Islands (RMI), and Palau]. The 22 PICTs and the surveys used in this analysis are listed in Table 1.

STEPS usually employs multi-stage cluster sampling, although Niue and Tokelau designed STEPS to include all members of the target adult population. Information on alcohol use in adults is collected in STEPS through core and expanded questions for STEP 1, an interviewer-administered questionnaire.

Population, non-response and sample weights are applied in the analysis as required [14].

For adults (25–64 years), we extracted data from published reports of STEPS or methodologically similar surveys from 15 PICTs [17–32]. We included the survey conducted in Wallis and Futuna which was based on STEPS methodology, and the Baromètre Santé in New Caledonia which, like STEPS, utilised a multi-stage sampling design and in-person interviewing.

From these STEPS and STEPS-like surveys, we selected the percentage of the adult population who consumed alcohol within the past 12 months (current drinkers). As a measure of heavy drinking, we selected the percentage of current drinkers who reported consuming six or more standard drinks on average on a drinking day. This was the highest category of number of drinks consumed presented in the reports. We also examined frequency of alcohol consumption among current drinkers.

For each sex, we applied 10-year age-specific estimates (20-year age-specific estimates for French Polynesia), to the WHO world population to produce age-standardised rates for those aged 25–64 years [33]. Prior to this, we developed two standard populations of the Pacific, compared these with the WHO world population, and found there was minimal difference for the 25–64 year age range. Thus the WHO population was adopted for this work. Standard errors and confidence intervals (CI) for the age-standardised estimates of prevalence were calculated using the methods described by Breslow and Day [34].

For youth, GSHS often employs two-stage sampling of schools and classes (the Cook Islands, Nauru and Niue designed GSHS to survey all members of the target youth population). GSHS assesses several risk and protective factors in students through an anonymous self-administered questionnaire. Data are weighted in analysis as required [35]. We used data from fact sheets published by WHO for 10 PICTs [36–45] to examine: (i) current (past 30 days) alcohol use; and (ii) lifetime occurrence of being drunk, among those aged 13–15 years.

YRBSS uses a similar sampling methodology and tool to GSHS and includes students in grades 9–12 [46]. In all USAPIs apart from Guam, during the period 2001–2013 YRBSS was conducted as a census of this student population (S. Kinchen; Centers for Disease Control and Prevention, 2014, personal communication). Survey data are weighted as required [46]. We extracted YRBSS data predominately from Youth Online, the Centers for Disease Control and Prevention database of results [16], which also provided a function to test statistical significance for results from Guam.

Table 1. Surveys used in this analysis, by year and Pacific Island country and territory, including the World Health Organization STEPSwise approach to surveillance (STEPS) or similar, the Global School-Based Student Health Survey (GSHS) and the Youth Risk Behavior Surveillance System (YRBSS)

	STEPS ^a	GSHS ^b	YRBSS ^c
American Samoa (USAPI)	2004		2007 2011
Commonwealth of the Northern Mariana Islands (CNMI) (USAPI)			2003 2005 2007
Cook Islands	2003–2004	2011	
Federated States of Micronesia (USAPI)	2002 (Pohnpei) 2006 (Chuuk)		
Fiji	2002	2010	
French Polynesia	2010		
Guam (USAPI)			2001 2007 2011 2013
Kiribati	2004–2006	2011	
Republic of the Marshall Islands (RMI) (USAPI)	2002		2003 2007 2009
New Caledonia	2010		
Nauru	2004	2011	
Niue	2011	2010	
Palau (USAPI)			2001 2003 2005 2007 2009 2011
Papua New Guinea			
Pitcairn Islands			
Samoa		2011	
Solomon Islands	2005–2006	2011	
Tokelau	2005		
Tonga	2004	2010	
Tuvalu		2013	
Vanuatu	2011	2011	
Wallis and Futuna	2009		

^aThe survey for Wallis and Futuna was based on STEPS methodology. The survey for New Caledonia (Baromètre Santé) utilised a methodology comparable to STEPS. Full reports for STEPS surveys in Papua New Guinea (2007–2008) and Samoa (2002) were not publically available for use in this analysis. STEPS indicators used in this analysis include (i) prevalence of current (past 12 month) drinkers; (ii) consumption of six or more standard drinks ‘on average’ on a day in which alcohol was consumed; and (iii) frequency of alcohol consumption among current drinkers, for adults aged 25–64 years. ^bGSHS indicators used in this analysis include (i) current (past 30 day) use of alcohol; and (ii) lifetime occurrence of being drunk, among students aged 13–15 years. ^cYRBSS indicators used in this analysis include (i) current (past 30 days) alcohol use and (ii) heavy drinking (having five or more drinks of alcohol in a row within a couple of hours on at least 1 day during the 30 days before the survey), among students in grades 9–12. USAPI, United States Affiliated Pacific Island.

YRBSS data for CNMI (2007) and RMI (2009) were also identified in additional reports [47,48]. As surveys have been conducted at least twice in the USAPIs, we examined trends in: (i) current (past 30 days) alcohol use; and (ii) heavy drinking (consuming five or more drinks of alcohol in a row within a couple of hours on at least 1 day in the 30 days prior to the survey).

Ethics approval was not sought for this study as the data used were collated (not unit record), unidentifiable and available within the public domain.

Results

The surveys selected provided information for adults and/or youth from 20 PICTs in total (Table 1). Equivalent data were unavailable for Papua New Guinea and the Pitcairn Islands.

Current drinking, volume and frequency of consumption among adults (25–64 years, STEPS)

There was a higher prevalence of current (past 12 month) drinkers among male compared with female adults (Table 2). In eight PICT populations presented, over 60% of male adults drank alcohol, while in nine PICT populations, less than a third of female adults were current consumers. Prevalence of past 12 month alcohol consumption was highest for both sexes in Tokelau, where over 90% of adults were current drinkers.

In Nauru, the Cook Islands, American Samoa and Tokelau, where more than half of the adult male population were current drinkers, over 54% of this subpopulation reported having six or more standard drinks on average on a day in which alcohol was

Table 2. Age-standardised prevalence [with 95% confidence intervals (CI)] of current drinkers,^a and heavy drinking^b [49] among current drinkers, for those 25–64 years, by sex and Pacific Island country and territory

	Current drinking % (95% CI)		Heavy drinking ^b % (95% CI)	
	Males	Females	Males	Females
American Samoa	71.6 (66.3–77.0)	37.9 (31.4–44.4)	54.6 (47.0–62.2)	35.3 (27.2–43.4)
Cook Islands	72.5 (67.7–77.2)	47.8 (42.8–52.8)	87.6 (84.8–90.4)	66.0 (61.0–71.0)
Federated States of Micronesia: Chuuk	33.1 (29.0–37.3)	1.2 (0.7–1.7)	82.4 (77.1–87.7)	36.7 (26.5–46.9)
Federated States of Micronesia: Pohnpei	44.3 (40.3–48.4)	9.2 (7.1–11.3)	46.0 (38.8–53.3)	16.4 (8.6–24.2)
Fiji	36.9 (32.9–40.9)	4.3 (2.5–6.0)		
French Polynesia	72.9	54.6		
Kiribati	45.1 (40.5–49.6)	6.0 (4.1–8.0)	81.3 (75.6–87.0)	48.0 (32.7–63.2)
Republic of the Marshall Islands	28.4 (23.9–32.9)	3.1 (1.7–4.4)	65.0 (55.2–74.8)	55.3 (38.5–72.2)
Nauru	60.6 (57.1–64.1)	28.7 (25.6–31.8)	89.2 (85.8–92.5)	80.1 (73.2–87.1)
New Caledonia	88.6 (86.5–90.8)	74.2 (71.8–76.7)		
Niue	79.8	65.2		
Solomon Islands	47.6 (44.0–51.3)	13.3 (11.1–15.4)	77.4 (72.5–82.3)	37.3 (28.6–45.9)
Tokelau	96.0	90.1	73.2	37.8
Tonga	13.1 (7.7–18.6)	4.2 (2.0–6.5)	78.5 (62.8–94.1)	57.1 (38.2–76.0)
Vanuatu	31.7	7.2		
Wallis and Futuna	76.2 (69.7–82.7)	35.3 (29.3–41.2)		

^aCurrent drinkers were defined as those consuming alcohol within the past 12 months. STEPwise approach to surveillance (STEPS) reports from French Polynesia, Niue and Vanuatu defined current drinkers as those having consumed alcohol within the past 30 days. The prevalence of past 12 month drinking (excluding those who were current drinkers) was also recorded. We derived estimates for French Polynesia and Vanuatu from the addition of these two indicators. Confidence intervals have therefore not been calculated. For Niue, which undertook a census of adults, age and sex-specific sample and case numbers were provided in the report, enabling the prevalence of past 12 month drinking (inclusive of past 30 day drinking) to be calculated and presented here.

^bHeavy drinking was defined as consuming six or more standard drinks 'on average' on a day when alcohol was consumed. Comparable data for heavy drinking were not available from STEPS and similar survey reports for Fiji, French Polynesia, New Caledonia, Niue, Vanuatu and Wallis and Futuna. Small numbers of current drinkers, especially among women, in some Pacific Island countries and territories resulted in high estimates of uncertainty for the prevalence of heavy drinking among current drinkers. Results must be interpreted with caution. Source: Kessaram T, McKenzie J, Girin N *et al.* Noncommunicable diseases and risk factors in adult populations of several Pacific Islands: results from the World Health Organization (WHO) STEPwise approach to surveillance. *Aust N Z J Public Health*. 2015; doi: 10.1111/1753-6405.12398. Confidence intervals were not applicable to Tokelau results as the survey was designed to include all members of the target population. In the Tokelau report, the recorded sample size for women for the indicator of current drinkers (134) was smaller than the total number of women participating in the survey (313). Source: STEPS and similar surveys conducted between 2002 and 2011.

consumed (Table 2) [49]. In females, over a third of current drinkers in Tokelau and two-thirds in the Cook Islands consumed six or more standard drinks on a drinking day. In Nauru, 80.1% (95% CI 73.2–87.1) of current female drinkers consumed alcohol similarly [49]. In Vanuatu, this indicator was reported for past 30 day drinkers, among which 24.4% (95% CI 17.2–31.6)

of males and 12.5% (95% CI 4.5–20.5) of females consumed this volume of alcohol.

Generally, a higher percentage of adult male current drinkers engaged in weekly drinking compared with females (Table 3). In 7 of 10 PICT populations presented, approximately a third or more of male current drinkers reported drinking on a weekly basis. In

Table 3. Age-standardised prevalence [with 95% confidence intervals (CI)] of frequency of alcohol consumption among current (past 12 month) drinkers aged 25–64 years, by sex and Pacific Island country and territory

	Less than once per month % (95% CI)		1–3 days per month % (95% CI)		1–4 days per week % (95% CI)		5 or more days per week % (95% CI)	
	Males	Females	Males	Females	Males	Females	Males	Females
Cook Islands	16.5 (13.8–19.1)	31.5 (28.1–35.0)	20.9 (17.5–24.2)	30.3 (24.0–36.7)	50.6 (46.3–54.9)	33.7 (28.1–39.3)	12.1 (9.7–14.5)	4.4 (2.6–6.3)
FSM: Chuuk	13.1 (7.8–18.3)	14.7 (0.0–30.0)	33.6 (25.4–41.7)	33.0 (24.8–41.1)	31.9 (24.5–39.3)	7.3 (0.0–18.7)	21.5 (15.6–27.3)	28.2 (21.4–35.0)
FSM: Pohnpei	14.7 (9.1–20.3)	27.0 (17.2–36.8)	40.6 (34.3–46.8)	36.2 (25.0–47.3)	28.7 (23.3–34.1)	24.3 (16.4–32.2)	16.1 (11.2–21.1)	12.5 (4.6–20.5)
French Polynesia	31.4 (27.8–35.0)	49.9 (46.0–53.8)	30.9 (27.4–34.4)	29.8 (26.1–33.5)	26.7 (23.5–30.0)	15.9 (13.2–18.7)	10.9	4.3
Kiribati	27.2 (21.2–33.2)	47.2 (33.0–61.3)	36.6 (31.2–42.0)	25.7 (15.3–36.2)	28.3 (22.8–33.8)	24.3 (12.3–36.2)	7.9 (4.7–11.2)	2.8 (0.7–4.9)
Nauru	41.2 (36.6–45.8)	66.1 (59.9–72.2)	26.3 (22.2–30.5)	19.1 (14.2–24.1)	28.0 (23.8–32.1)	10.9 (7.2–14.7)	4.5 (2.4–6.5)	3.8 (1.8–5.9)
Niue	25.5	44.2	26.1	28.3	43.1	21.2	5.3	6.3
Solomon Islands	53.3 (47.0–59.6)	69.6 (58.4–80.8)	29.0 (23.6–34.4)	20.6 (10.4–30.7)	12.3 (8.3–16.3)	8.6 (4.1–13.1)	5.4 (2.7–8.1)	1.2 (0–2.8)
Tonga	45.9 (26.6–65.2)	29.8 (16.7–42.9)	43.3 (19.8–66.7)	53.3 (40.2–66.4)	10.9 (0.0–22.4)	0.0 (0.0–0.0)	0.0 (0.0–0.0)	0.0 (0.0–0.0)
Vanuatu	64.9 (59.9–70.0)	67.7 (58.1–77.3)	27.9 (23.6–32.3)	22.1 (14.5–29.8)	2.9 (1.6–4.3)	6.2 (2.7–9.8)	4.2	4.0

The prevalence presented for drinking on 5 or more days per week was estimated for French Polynesia, Niue and Vanuatu from the addition of daily consumption and consumption on 5–6 days a week. For Pohnpei, the prevalence presented here is for drinking on 5–6 days per week; daily consumption was not reported. For Pacific Island countries and territories with small proportions of current drinkers, there were high uncertainty estimates for these results; results must therefore be interpreted cautiously. For female drinkers in Tonga and Chuuk, due to there being 0 values in the age standardisation process, proportions do not sum to 100% of current drinkers. Comparable data were not available from the STEPwise approach to surveillance and similar surveys conducted in American Samoa, Fiji, New Caledonia, Tokelau and Wallis and Futuna. Source: STEPS surveys conducted between 2002 and 2011.

contrast, a similar prevalence of reported weekly drinking among females occurred in only three PICTs. In all PICTs, approximately half or more of females drank on a monthly or less frequent basis.

Current alcohol use and the experience of being drunk among youth (13–15 years, GSHS)

In 8 of 10 PICTs, over 21% of males aged 13–15 years consumed at least one drink of alcohol within the previous 30 days (Table 4). Prevalence of current drinking was highest in Kiribati and Samoa, where over 43% of male students consumed alcohol. Alcohol consumption among females ranged from 5.1% in Tuvalu to 28.7% in the Cook Islands. Generally, a higher percentage of males than females had recently consumed alcohol. In Tonga, however, the point prevalence of current drinking was higher in females, and in the Cook Islands prevalence was similar between the sexes.

In 7 of 10 PICTs, approximately 20% or more of all male students had been drunk at least once in their

lifetime (Table 4). Prevalence was highest in Samoa in which almost half of male students reported this experience. Over 20% of female students in Samoa and the Cook Islands had been drunk at least once. The magnitude of difference by sex in this risk behaviour varied between PICTs.

Current alcohol use and heavy drinking among youth in USAPIs (grades 9–12, YRBSS)

Overall, current (past 30 day) alcohol use declined in male students in the five USAPIs within the period 2001–2013 (Figure 1). The magnitude of decline, however, varied considerably for each PICT. Notably, in Palau, prevalence fluctuated with an increase in use between 2007 and 2011. Trends in female current alcohol use also varied between USAPIs. Alcohol use declined in American Samoa, CNMI and RMI between survey years. In Palau, alcohol use in females fluctuated, with prevalence in 2011 similar to that recorded in 2001. Current drinking by males and females in Guam

Table 4. Prevalence of current drinking^a and being drunk one or more times in their lifetime^b [with 95% confidence intervals (CI)] among students aged 13–15 years, by sex and Pacific Island country and territory

	Current drinkers ^a % (95% CI)		Drunk in lifetime ^b % (95% CI)	
	Males	Females	Males	Females
Cook Islands	29.4	28.7	25.1	22.3
Fiji	22.1 (18.6–26.0)	11.1 (8.4–14.6)	17.3 (14.4–20.7)	8.3 (6.0–11.4)
Kiribati	43.7 (37.4–50.2)	19.3 (15.0–24.5)	35.4 (28.7–42.8)	10.4 (7.4–14.4)
Nauru	27.1	17.6	24.5	15.9
Niue	35.5		39.5	
Solomon Islands	21.2 (14.7–29.4)	13.4 (9.0–19.5)	19.0 (12.4–28.2)	12.8 (9.2–17.6)
Samoa	43.4 (37.6–49.4)	25.4 (20.9–30.5)	47.7 (41.7–53.7)	25.2 (20.2–31.0)
Tonga	14.9 (11.8–18.6)	17.9 (14.6–21.7)	13.7 (10.6–17.5)	15.1 (12.0–19.0)
Tuvalu	22.2	5.1	22.5	2.9
Vanuatu	10.3 (6.1–16.8)	5.8 (3.6–9.2)	8.9 (5.9–13.3)	4.7 (2.8–7.7)

^aCurrent drinking was defined as consuming at least one drink containing alcohol on one or more of the past 30 days. ^bDrinking so much alcohol that they were really drunk, on one or more times during their life. Prevalence was not reported for females in Niue on account of small sample size (less than 20 students). CIs were not applicable to Cook Islands, Nauru, and Niue results as the surveys were designed to include all members of the target population. CIs were not reported for Tuvalu. Source: Global School-Based Student Health Surveys conducted between 2010 and 2013.

declined over the period presented, although the decrease from 2011 was not statistically significant among either sex.

There were overall declines in heavy drinking in males in the five USAPIs in the period examined (Figure 2). In RMI, however, the initial downward trend was reversed, resulting in a similar prevalence of heavy drinking in 2003 and 2009. Prevalence also fluctuated in Palau with an upward trend apparent between 2007 and 2011 among both sexes. Declines in this risk behaviour occurred in females in American Samoa, CNMI and RMI, to varying degrees. Prevalence of heavy drinking declined in Guam, especially among males, although the change in prevalence between 2011 and 2013 was not statistically significant for either sex.

Discussion

This paper examines patterns of alcohol use across twenty PICTs using three standardised surveys. Current alcohol consumption among adults and youth varies widely between islands. Generally, more males consume alcohol than females. Importantly, there are high levels of abstinence in youth and adults, particularly among females, in several PICTs. Of greatest concern is the evidence of hazardous patterns of alcohol consumption,

in male adults especially who drink more frequently and heavily than females. This gender difference is also observed within the prevalence of heavy drinking and being drunk by youth. Although current and heavy alcohol use by youth appear to be declining in most USAPIs, the rate of decline is not equal between the sexes, nor between islands. Further, observed increases in alcohol use over the period studied are concerning.

Strengths and limitations

This report fills a critical gap in knowledge on alcohol use in the Pacific region. The standard methodologies of STEPS, GSHS and YRBSS contribute to the reliability of the results and validity of comparisons.

Regarding the surveys selected, for adults we used only STEPS whereas the Behavior Risk Factor Surveillance System [50] can provide additional information for the USAPIs. Furthermore, STEPS data for our analysis were unavailable for Samoa or Papua New Guinea, though summary fact sheets of these surveys have been published. The absence of representative adult and youth data in this work for Papua New Guinea especially—the largest PICT with a population over 7 million—results in suboptimal coverage of the Pacific and a restricted regional perspective.

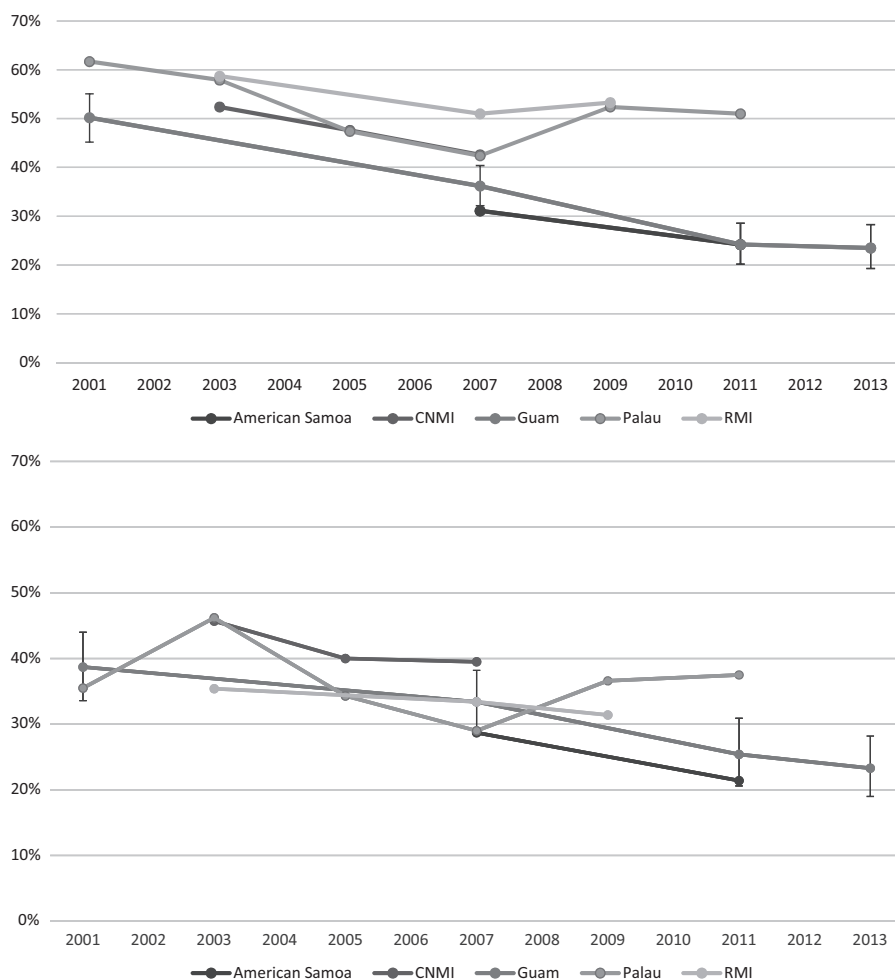


Figure 1. Prevalence (with 95% confidence intervals) of current drinkers* among males students (above) and female students (below) in grades 9–12, by Pacific Island country and territory. Source: Youth Risk Behavior Surveillance System (2001 to 2013).

*Current drinkers were defined as those who had at least one drink of alcohol on at least one day during the 30 days before the survey. 95% confidence intervals presented for Guam only as in American Samoa, the Commonwealth of the Northern Mariana Islands (CNMI), Palau and the Republic of the Marshall Islands (RMI), the surveys were designed to include all members of the target student population (S. Kinchen, Centers for Disease Control and Prevention, personal communication July 12 2014). Results for CNMI for 2007 were obtained from: Lippe J, Brener N, Kann L. et al. Youth risk behavior surveillance—Pacific Island United States Territories, 2007. *MMWR Surveillance Summaries*. 2008;57(12):28–56. Total sample size for 2007 in CNMI was 2292. Results for RMI for 2009 were obtained from RMI Epidemiological Working Group, *Substance Abuse Epidemiological Profile 2010, Republic of the Marshall Islands*. Total sample size for 2009 was 1847.

Cell sizes: Males: American Samoa: 1205 (2011); 1366 (2007). CNMI: 1014 (2005); 929 (2003). Guam: 642 (2013); 721 (2011); 725 (2007); 629 (2001). Palau: 162 (2011); 202 (2009); 299 (2007); 224 (2005); 190 (2003); 192 (2001). RMI: 523 (2007); 274 (2003). Females: American Samoa: 1366 (2011); 1592 (2007). CNMI: 1051 (2005); 952 (2003). Guam: 588 (2013); 663 (2011); 719 (2007); 683 (2001). Palau: 213 (2011); 247 (2009); 283 (2007); 288 (2005); 263 (2003); 233 (2001). RMI: 593 (2007); 339 (2003).

The selected surveys were conducted at various points within the last 15 years; present-day alcohol use may differ considerably. Examination of change in use over time is limited due to lack of repetition of STEPS and GSHS. Furthermore, our trend analysis from YRBSS is incomplete as more recent sex-specific results for some USAPIs were not available through Youth Online.

All survey tools rely on participants' self-reports; the results may be subject to social desirability or response

bias. In addition, the surveys may not always be nationally representative. Due to logistical challenges, some STEPS surveys excluded islands or some of the more remote areas from the sampling frame. GSHS and YRBSS do not include youth outside the formal education system.

By choosing indicators that represent current drinking, frequency and volume of alcohol consumption, we aimed to provide a comprehensive perspective of the extent of alcohol use and potentially harmful patterns

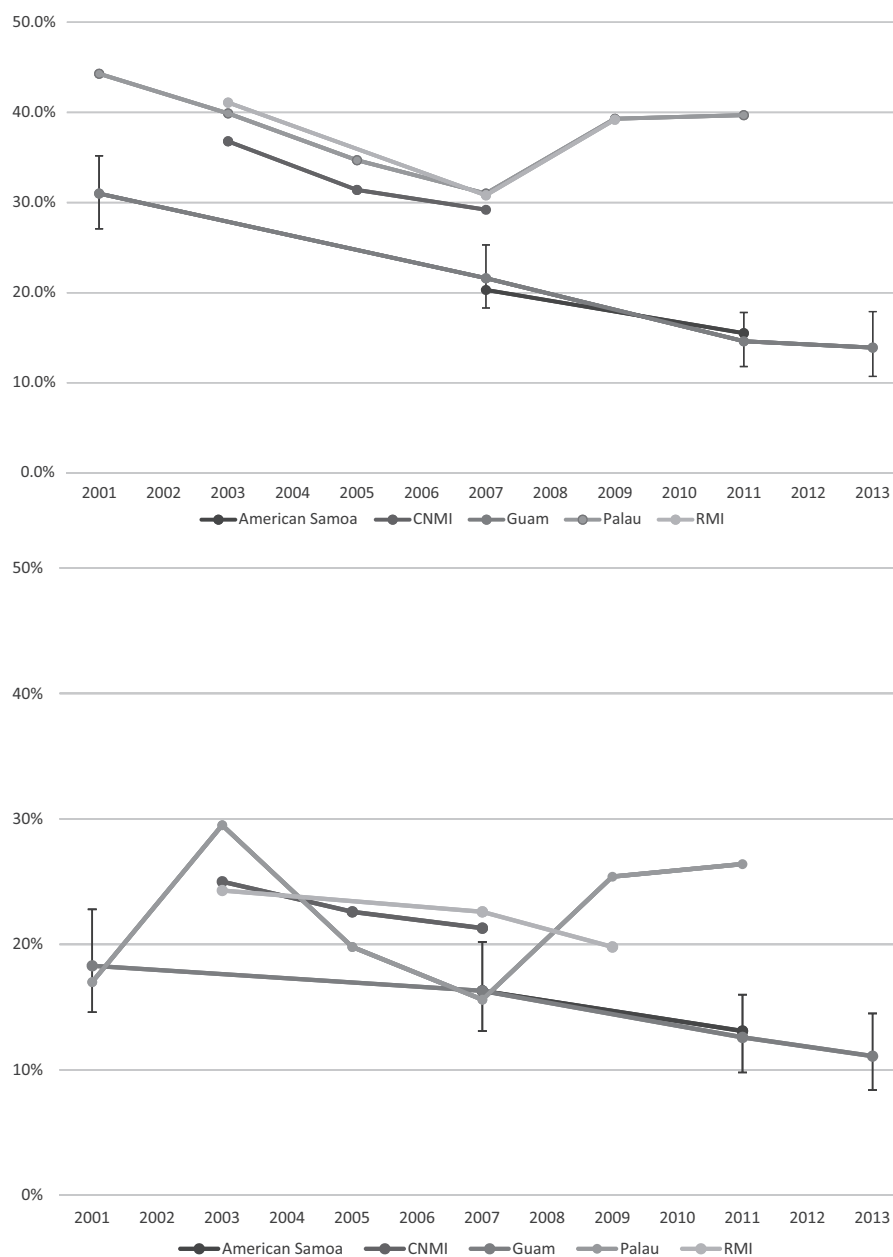


Figure 2. Prevalence (with 95% confidence intervals) of heavy drinking* among male students (above) and female students (below) in grades 9–12 by Pacific Island country and territory. Source: Youth Risk Behaviour Surveillance System (2001 to 2013).

*Heavy drinking was defined as having five or more drinks of alcohol in a row within a couple of hours on at least 1 day during the 30 days before the survey. 95% confidence intervals presented for Guam only as they surveys in American Samoa, the Commonwealth of the Northern Mariana Islands (CNMI), Palau and the Republic of the Marshall Islands (RMI) were designed to include all members of the target student population (S. Kinchen, Centers for Disease Control and Prevention, personal communication July 12 2014). Results for CNMI for 2007 were obtained from: Lippe J, Brener N, Kann L. et al. Youth risk behavior surveillance—Pacific Island United States Territories, 2007. *MMWR Surveillance Summaries*. 2008;57(12):28–56. Total sample size for 2007 in CNMI was 2292. Results for RMI for 2009 were obtained from RMI Epidemiological Working Group. *Substance Abuse Epidemiological Profile 2010, Republic of the Marshall Islands*. Total sample size for 2009 was 1847.

Cell sizes: Males: American Samoa: 1429 (2011); 1598 (2007). CNMI: 1088 (2005); 1017 (2003). Guam: 722 (2013); 804 (2011); 831 (2007); 655 (2001). Palau: 204 (2011); 229 (2009); 328 (2007); 248 (2005); 207 (2003); 219 (2001). RMI: 667 (2007); 360 (2003). Females: American Samoa: 1523 (2011); 1772 (2007). CNMI: 1112 (2005); 1008 (2003). Guam: 666 (2013); 742 (2011); 793 (2007); 698 (2001). Palau: 234 (2011); 284 (2009); 347 (2007); 307 (2005); 279 (2003); 245 (2001). RMI: 693 (2007); 424 (2003).

of use in the Pacific. Estimates of heavy drinking and frequency must be interpreted cautiously as small numbers of current drinkers, especially among women, resulted in high levels of uncertainty. Although not identical to the WHO definition of heavy episodic drinking (consumption of ≥ 60 g of pure alcohol—six or more standard drinks—on at least one single occasion at least monthly) [51], the indicator we selected for adults was the one most consistently available across PICTs, and provides an alternative approximation of heavy drinking. Other available indicators from STEPS, such as recent binge drinking, would complement this analysis.

Finally, original unit data from STEPS were not available. As a result, there was a loss of information when data were analysed and presented in reports using a different indicator definition. Further, we were unable to investigate differences in alcohol use patterns by ethnicity, socioeconomic status or rural/urban locality for adults or youth in all PICTs.

Comparison with Pacific and international studies

The findings presented here support the existing evidence base, particularly that pertaining to youth. A recent review of studies on alcohol use in Fiji noted serious concerns regarding the high prevalence of binge drinking among young people [52]. A 2008 survey of secondary school students in Apia, Samoa, observed a statistically significant higher percentage of past 30 day alcohol use in boys (19.6%) compared with girls (11.3%) [53]. The Health Behaviour and Lifestyle of Pacific Youth study (2000–2001) identified that the self-reported prevalence of being drunk tended to increase with age in boys in Tonga, Vanuatu and Pohnpei, Federated States of Micronesia. Among 15-year-olds, the proportion of boys and girls who reported being drunk on two or more occasions was highest in Pohnpei (51% and 18%, respectively) [54]. A review of alcohol consumption using 2006–2008 data from Second Generation Surveillance Surveys and YRBSS also noted a high prevalence of heavy drinking among 15- to 24-year-olds in several PICTs [55].

WHO estimates that globally in 2010, 38.3% of adults aged 15 years and over were current drinkers; conversely, 61.7% of the population were past 12 month abstainers. In all WHO regions, a higher proportion of males drank alcohol and females engaged less in heavy episodic drinking [51]. Results of our present study indicate that the gender disparities in both abstinence and harmful alcohol use among Pacific adults reflect international patterns.

GSHS results from several countries of the Americas revealed that current alcohol use prevalence among 13- to 15-year-olds was around 40%, with minimal

difference between males and females [56]. A similar prevalence is observed by GSHS for males in American Samoa and Kiribati. The variation in current alcohol use prevalence among Pacific youth is more similar to that reported by GSHS for nine African countries, which ranged from 4.0% in males and 2.0% in females in Senegal, to 62.1% in males and 61.2% in females in the Seychelles [56].

The extent of similarity between the most recent YRBSS results for individual USAPIs and the equivalent national 2013 results for the USA varies markedly. Among those in grades 9–12 in the USA, 34.4% of males and 35.5% of females were current drinkers; 22% of males and 19.6% of females engaged in heavy drinking [16]. In some instances, prevalence of these indicators is considerably higher in the USAPIs, such as for current and heavy drinking among male students in Palau.

Implications for policy and future research

There is scope for implementation in PICTs of several evidenced-based policy options, as recommended in the Western Pacific's *Regional Strategy to Reduce Alcohol-Related Harm* and the *Global Strategy to Reduce Harmful Use of Alcohol* [57]. Considerable differences between PICTs have been noted, however, in the funding and capacity available for initiatives, and the extent to which alcohol harm prevention policies have been established [58]. The identified 'best buys' to prevent premature mortality and reduce the economic burden of NCDs arising from alcohol use may assist with prioritising action [59]. These low-cost, cost-effective policies, which are feasible to implement in low- and middle-income countries include:

- tax (and price) increases;
- restricted access to retailed alcohol; and
- bans on alcohol advertising [59].

To address harmful alcohol use in youth especially, alcohol marketing and advertising targeting and appealing to young people in PICTs could be banned and the age of purchase could be raised, for example to 21 years as in some USAPIs. As funding and capacity to enforce legislation is challenging, revenue from increased taxation, retailer licensing and infringement of legislation could be channelled into enforcement of alcohol laws.

Given the observed variability in drinking patterns across the region, our work also supports public health policies which are tailored to national contexts, and which may differ between islands. Examples of initiatives in the Pacific include restriction of the hours of sale of alcohol on Wednesdays (during school term), Saturdays, Sundays and public holidays in New Caledonia [60]. In

2012, Tonga utilised new legislation to stop and breathalyse drivers and impose fines and press charges on those who were driving while intoxicated [61]. As abstinence is an important mediating factor in the population level of harm attributable to alcohol [51], and high levels of abstinence are observed in several PICTs, strategies may aim to maintain environments supportive of abstinence in addition to minimising alcohol-related harm. There is an acute need to evaluate national initiatives, in order to prioritise future local strategies and inform those considered by other PICTs.

In addition to sharing experiences of policy in practice, collaboration between PICTs on regional determinants of alcohol consumption is essential. In particular, the liberalisation of markets through free trade agreements has the potential to lower alcohol prices, increase its availability, give rise to more aggressive marketing and advertising by the alcohol industry, stimulate demand and undermine harm reduction strategies [62]. The present exclusion of alcohol from tariff reduction requirements in the Pacific Island Countries Trade Agreement is therefore a powerful measure to protect public health. The Pacific Agreement on Closer Economic Relations Plus, participants of which include PICTs, Australia and New Zealand, may, however, undermine this precedent.

Although the body of evidence on alcohol use in the Pacific is expanding, there are significant areas in which knowledge can be enhanced. Robust data for those 15–24 years is limited, although a portion of this population is included in YRBSS. Data are also available for this group for some PICTs through STEPS surveys. This age bracket, however, is comprised of both adolescents and young adults; relevant differences in alcohol use by age may consequently be masked. Future quantitative and especially qualitative research is essential, to more clearly distinguish patterns by demographic, understand the similarities and differences in social, economic and cultural determinants of alcohol use by age, gender and PICT, and to explain observed trends. Analyses of differences in alcohol use by income or socioeconomic status are also urgently needed to measure and monitor inequalities.

In Pacific countries, beer and spirits comprise the majority of recorded alcohol consumption [51]. With regards to unrecorded consumption, average estimates for 2008–2010 indicate that in most Pacific Island countries levels (which range from 0.5 to 2.5 L of pure alcohol per capita) have not changed since 2003–2005 [51]. Further collection of data on unrecorded alcohol consumption would be valuable, especially to monitor and address concerns regarding the impact of regulatory policies on the production, exchange/sale and consumption of alcohol, such as home brew, in the informal sector.

Conclusion

Surveillance of alcohol consumption and alcohol policy implementation in the Pacific are essential components of the public health response. Regular repetition of standardised surveys and enhanced coverage of the Pacific's population will also assist in monitoring progress towards the global target.

In the Pacific, it is imperative to address the prevalence of alcohol use among youth and heavy episodic drinking across the population. Public health action must be equitable and conscious of the historical and contemporary social, cultural and economic influences on present-day patterns of consumption. Fundamentally, sustainable funding, cross-sector collaboration and unwavering political commitment by PICTs and development partners will be critical for success.

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