



Tobacco smoking prevalence in Pacific Island countries and territories: a review

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Abstract

Aim To comprehensively review adult and youth smoking prevalence data in Pacific Island countries and territories (PICT).

Methods MEDLINE search for period 1986–2006 and search of World Health Organization and Centres for Disease Control and Prevention databases.

Results Smoking prevalence in PICT ranges from 22%–57% (males) and from 0.6%–51% (females). All PICT male populations (except Palau) report higher rates than in Australia and New Zealand.

Nauru, Tokelau, French Polynesia, New Caledonia, and Kiribati report high rates of female smoking. Youth rates of smoking range from 3%–68% (although unavailable for many PICT).

Palau, Northern Mariana Islands, Guam, Cook Islands, and American Samoa report very high levels of youth smoking in both males and females. Smoking prevalence appears to have decreased in the last 30 years in male populations with a variable picture in female populations.

Conclusions PICT continue to show high levels of smoking prevalence, with youth smoking rates particularly concerning. There is a need for more robust and systematic collection and publication of smoking prevalence data in PICT, especially youth data, but this should not delay urgently required action to reduce tobacco use in PICT. The Framework Convention on Tobacco Control provides a powerful tool, but its provisions should be implemented rapidly, particularly increased tobacco taxation.

The global burden of disease attributable to tobacco use continues to increase, particularly in low and middle income countries.¹ Unlike other low and middle income countries in Asia and Africa, most Pacific Island Countries and Territories (PICT) have long been in the epidemiological transition, with non-communicable disease comprising the majority of the disease burden.^{2,3}

Cardiovascular disease is the major cause of mortality in PICT, as in other low and middle income countries,^{4–6} and rates of cancer also appear to be increasing. Recent estimates of the population attributable fraction of cardiovascular disease in different PICT due to smoking range, in male populations, from 11% in Palau to 33% in Kiribati, and in female populations, from 0.4% in Federated States of Micronesia (FSM) to 32% in PNG.⁷ Tobacco use is arguably thus the most important modifiable risk factor for disease in PICT.

Despite this, there is a lack of robust information about trends in the prevalence of tobacco smoking in PICT. The availability and quality of data varies greatly. Whilst estimates for smoking prevalence in PICT are available in World Health Organization

(WHO) publications,⁸ these publications do not necessarily include the most up-to-date sources of information and some estimates date back to the 1980s. The only review of smoking rates in PICT evident in the peer-reviewed journal literature appeared in 1986 and this paper reported on only eight PICT.⁹

This paper aims to comprehensively review the literature to report on the current smoking prevalence in both adult and youth populations in the 22 PICT (shown in Table 1) served by the Secretariat of the Pacific Community (SPC) and included in the Western Pacific Region of the WHO. This paper also attempts to consider trends in tobacco use in PICT over the last 30 years and what these trends suggest for future health promotion efforts in the Pacific region to decrease the burden of disease related to smoking.

It should be noted that while this paper concentrates on smoking, chewing tobacco and other forms of tobacco use are important in some PICT, for example in Palau.¹⁰

Table 1. Pacific Island countries and territories*

American Samoa	Northern Mariana Islands
Cook Islands	Palau
Federated States of Micronesia (FSM)	Papua New Guinea
Fiji	Pitcairn Islands
French Polynesia	Samoa
Guam	Solomon Islands
Kiribati	Tokelau
Marshall Islands	Tonga
Nauru	Tuvalu
New Caledonia	Vanuatu
Niue	Wallis and Futuna

*As served by the Secretariat of the Pacific Community

Methods

The MEDLINE database was searched for the period January 1986 to December 2006, using the search terms ('tobacco' or 'smoking') and ('Pacific' or 'Oceania' or the names of the 22 PICT). The WHO's Infobase (http://www.who.int/ncd_surveillance/infobase/web/InfoBaseCommon/) and Tobacco-Free Initiative (<http://www.who.int/tobacco/en/index.html>) databases were also searched along with the Centres for Disease Control and Prevention (CDC)'s Youth Risk Behaviours Surveillance System (<http://www.cdc.gov/healthyyouth/yrbs/index.htm>) and Global Youth Tobacco Survey (<http://www.cdc.gov/Tobacco/global/GYTS.htm>).

Unpublished reports were found within the WHO and CDC databases and also sought by communication with tobacco control personnel in the region. The aim was to find all estimates of smoking prevalence in PICT that used random sampling techniques such as to provide nationally representative estimates that could be used to compare between PICT (for adults, smoking was defined as daily use, and for youth, smoking was defined as current use).

The most recent such estimate was used to assess smoking prevalence for each PICT in adult and youth populations, with estimates prior to 1990 not considered for inclusion as a current estimate. Time trends in tobacco use in the Pacific were considered by comparing current national estimates in Cook Islands, Niue, Fiji, Kiribati, Nauru, New Caledonia, and Samoa with those reported in the

aforementioned 1986 paper⁹ which derived estimates from surveys conducted between 1975 and 1981. Prevalence estimates were also obtained from Australia and New Zealand for comparison.

Results

The MEDLINE search yielded 10 relevant papers.^{9,11–19} Searches of the WHO and CDC databases and bibliographies identified a further 15 relevant documents and resources.^{8,20–33} The surveys identified used differing methodologies and were undertaken over a range of years. As such, there are limitations to their comparability between different PICT and between different timepoints within the same state. However, the surveys utilised all aimed to produce nationally representative estimates.

Adult smoking prevalence

Post-1990 estimates for smoking prevalence were identified for American Samoa (survey year 2004),³³ Cook Islands (2004),³³ FSM (but limited to Kosrae, 1994),¹⁴ Fiji (2002),³³ French Polynesia (1995),⁸ Guam (2003),¹⁷ Kiribati (1999),⁸ Nauru (2004),³³ New Caledonia (1992),⁸ Niue (2002),²⁹ Palau (1998),²² Papua New Guinea (1990),⁸ Samoa (2004),³³ Tokelau (2005),³³ Tonga (1998),¹⁵ Vanuatu (1998),²¹ and Wallis and Futuna (1996).⁸ These estimates are summarised in Figure 1 along with comparisons from Australia (2001)³⁴ and New Zealand (2006).³⁵ Suitable estimates were not found for Marshall Islands, Northern Mariana Islands, Pitcairn Island, Solomon Islands, and Tuvalu.

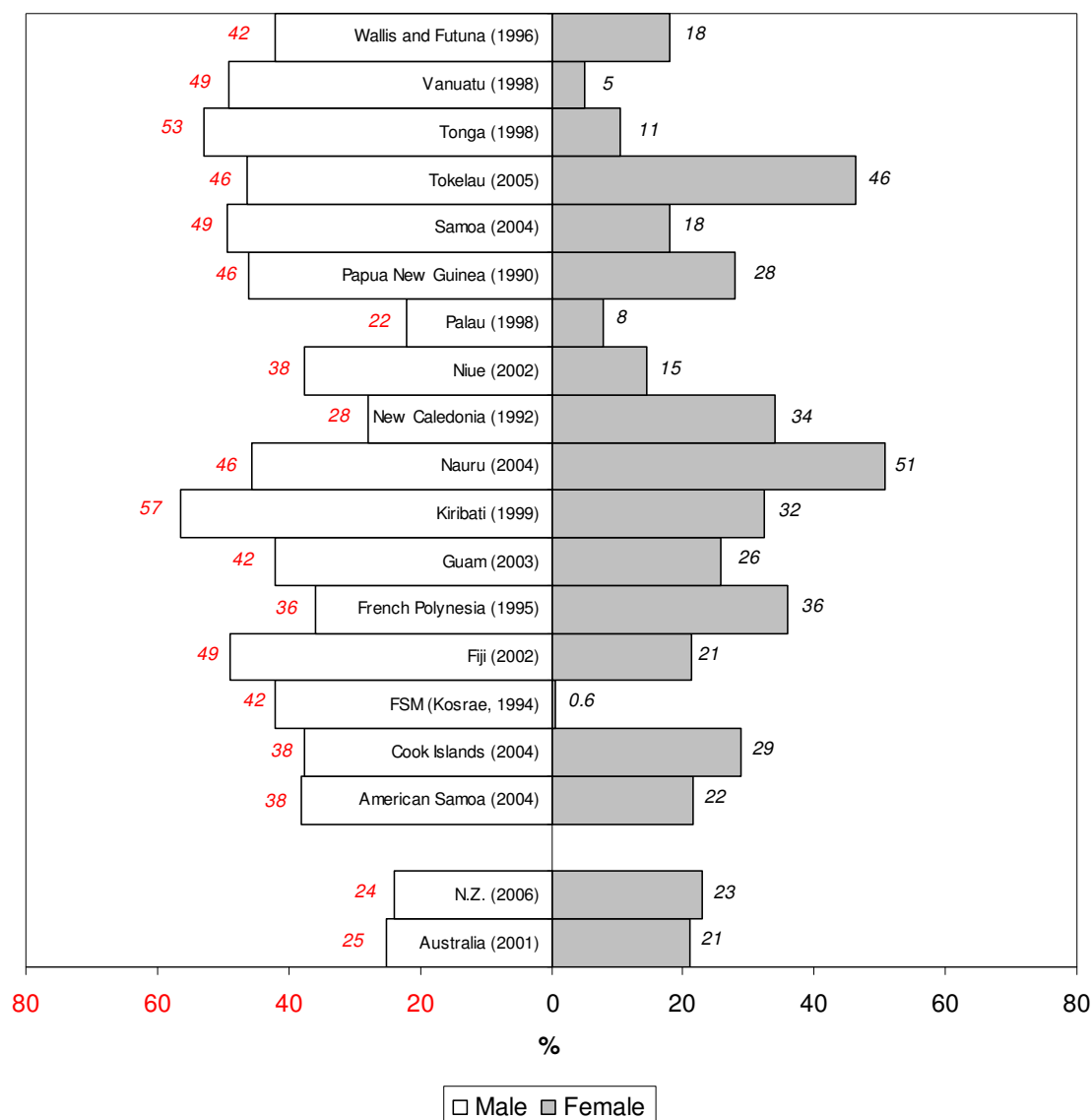
Survey definitions of adult varied. WHO STEPS data (discussed further below) was the source of estimates for American Samoa, Cook Islands, Fiji, Nauru, Samoa, and Tokelau. These surveys defined adult as 25–65 years old. The adult estimates for FSM were derived from 20–85 year olds; for French Polynesia, Niue, Papua New Guinea and Wallis and Futuna, from those 15 years and over; for Guam, 18 years and over; for Kiribati, 16 years and over; and for New Caledonia, Palau, Tonga and Vanuatu, from those aged 20 years and over. The estimates for smoking prevalence in Australia included those aged 18 years and over, and for New Zealand, those aged 15 years and over.

Adult smoking prevalence varied from 0.6% in FSM (Kosrae) women and 5% in Vanuatu women to 53% in Tongan men, 57% in Kiribati men, and 51% in Nauru women. Despite this great variation, in general, more men in PICT smoked than women with the exception of New Caledonia and Nauru, where more women smoked than men, and Tokelau and French Polynesia, where there was no gender difference.

Reported estimates of male smoking prevalence in PICT were all higher than recent estimates from Australia and New Zealand, with the exception of Palau. However, many PICT reported lower levels of male smoking prevalence than the age-standardised estimate of 41.3% reported in male Pacific peoples in New Zealand.³⁵

There was much greater variation in female smoking prevalence estimates in PICT than in male prevalence estimates. Many PICT had lower levels of reported smoking in women than in New Zealand and Australia, in particular, FSM (Kosrae), Vanuatu, Palau, and Tonga.

Figure 1. Adult smoking prevalence in the Pacific^{8,14,15,17,21,22,29,33-35}



In contrast, PICT such as Nauru, Tokelau, French Polynesia, New Caledonia, and Kiribati reported much higher levels of smoking for females than in New Zealand and Australian women. Most PICT reported lower prevalence of smoking in women than the age-standardised estimate of 33.8% in Pacific women in New Zealand.³⁵

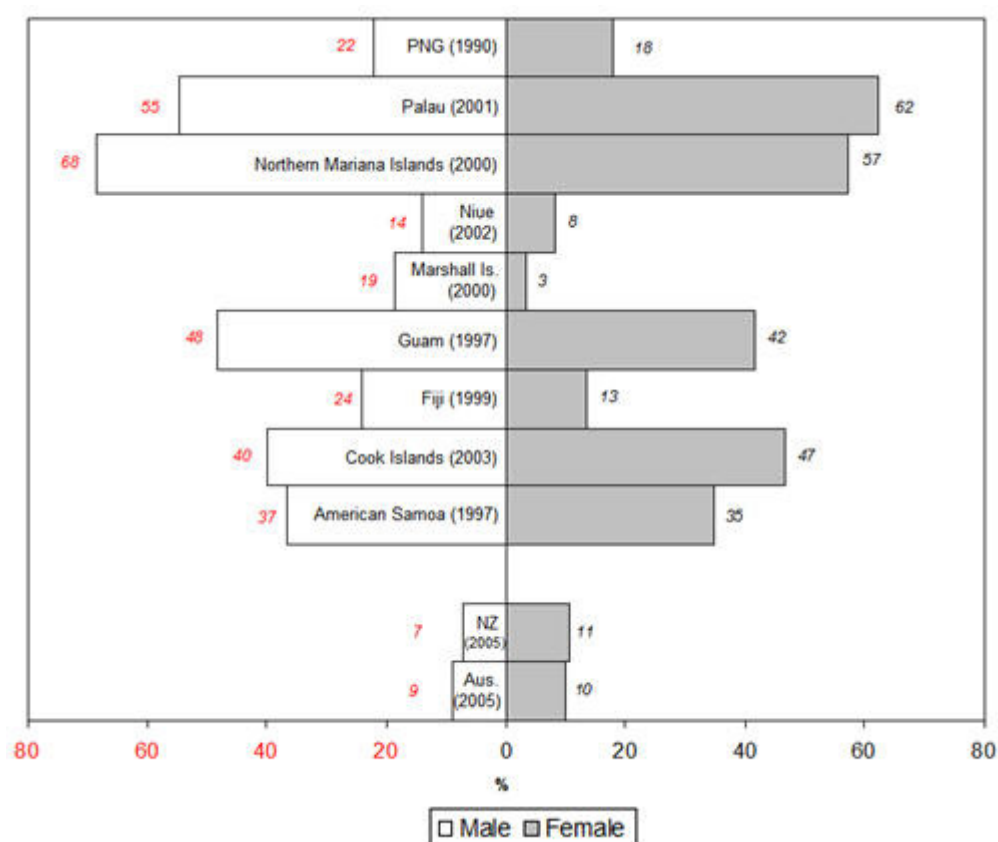
Age-stratified estimates were available for Fiji,²⁷ Niue, Palau, Samoa, Tonga (in a previous study²⁰ differing to the one used for the most recent country estimate), Nauru (again in a previous study³⁰), and Vanuatu.

In general, there were not major differences between age groups, except for lower levels of smoking in elderly age groups (>65 years) in Nauru, Niue, and Tonga.

Youth smoking prevalence

Recent estimates for youth smoking rates were available for fewer PICT than for adult smoking levels. Post-1990 estimates were available for only American Samoa (survey year 1997),³¹ Cook Islands (2003),²⁸ Fiji (1999),²³ Guam (1997),³² Marshall Islands (2000),¹⁸ Niue (2002),²⁹ Northern Mariana Islands (2000),²⁴ Palau (2001),²⁶ and Papua New Guinea (1990).⁸ These estimates are summarised in Figure 2 along with youth smoking rates in New Zealand (2005)³⁵ and Australia (2005).³⁶ Estimates were also available for FSM but these were not stratified by gender but rather undertaken separately for the islands of Kosrae (41.2% current smoking prevalence in 13–15 year old students) and Pohnpei (35.1% prevalence in 13-15 year old students).²⁵

Figure 2. Youth smoking prevalence in the Pacific^{8,18,23,24,26,28,29,31,32,35,36}



Most of the youth prevalence rates identified were derived from the Global Youth Tobacco Survey (developed by CDC and WHO) and focused on adolescents aged 13 to 15 years old or from the Youth Risk Behaviours Surveillance System (also CDC) for American territories which covered 13–17 year old students.

The Marshall Islands' estimate covered 11–17 year old students, the Niue estimate was derived from 15–17 year old adolescents, and the Papua New Guinea estimate included 10–15 year old young people. The comparison estimates for Australia included 12–17 year olds students and for New Zealand, 14–15 year old students.

Due to this variability, the youth estimates are less comparable between PICT than the adult estimates for smoking prevalence described above.

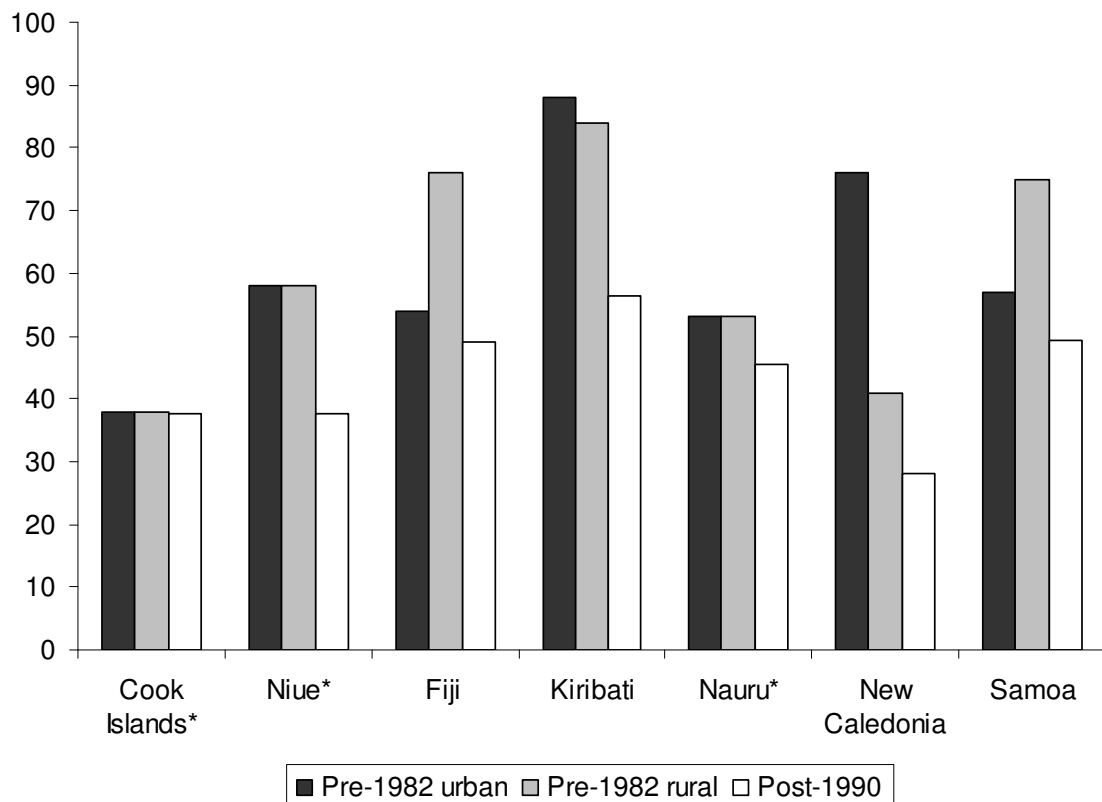
Palau, Northern Mariana Islands, Guam, Cook Islands, and American Samoa reported very high rates of youth smoking in both males and females, significantly higher than estimates for young people in New Zealand and Australia. These estimates were also higher than those reported for young Pacific people in New Zealand—10.2% for males and 14.5% for females.³⁵

All PICT with youth estimates showed similar rates for male and female young people with the exception of Marshall Islands and Fiji, which reported much higher rates in young males.

Time trends in smoking prevalence

Comparisons of recent national estimates in Cook Islands, Niue, Fiji, Kiribati, Nauru, New Caledonia, and Samoa with estimates from 1975–1981 reported by Tuomilehto et al⁹ are presented for adult male populations in Figure 3 and adult female populations in Figure 4. The older estimates included as adult those aged 20 years and over, except for the Nauru estimate which included those aged 15 years and over. Older estimates of youth smoking prevalence were not identified.

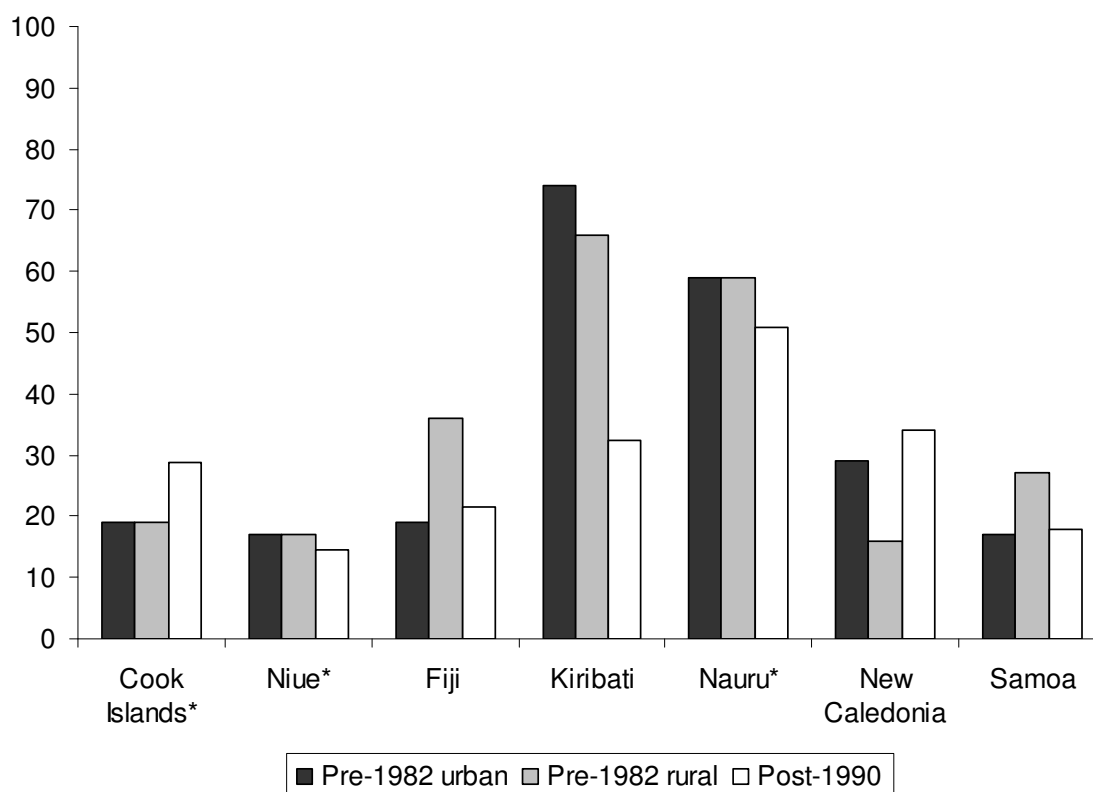
Figure 3. Adult male smoking prevalence (%) time trend^{8,9,29,33}



*For Cook Islands, Niue, and Nauru, a single pre-1982 estimate was identified and thus this figure is used for both urban and rural populations.

There are significant difficulties in comparing estimates in this way due to the differing methodologies employed in these surveys. However, smoking rates appeared to have decreased in most male populations. Time trends for female populations were variable with increasing rates noted in Cook Island and New Caledonian women.

Figure 4. Adult female smoking prevalence (%) time trend^{8,9,29,33}



*For Cook Islands, Niue, and Nauru, a single pre-1982 estimate was identified and thus this figure is used for both urban and rural populations.

Discussion

PICT continue to show very high levels of tobacco smoking, with the exception of a few female PICT populations. Whilst there is some evidence that adult male smoking rates in PICT have decreased in the last 30 years, smoking rates remain high and there are concerning levels of smoking in youth populations.

Overall, rates of smoking in PICT are higher than those seen in neighbouring high income countries such as Australia and New Zealand, although similar to prevalence for Pacific peoples in New Zealand.

These findings are concerning given the high burden of cardiovascular disease in PICT and increasing rates of cancer. In the context of struggling health systems,

action to combat tobacco use is thus a major priority to improve the health of populations in PICT.

There is a lack of comprehensiveness and rigour to some of the surveys included above from which estimates are derived. As such, some estimates may not be representative for all parts of the nations they derive from. In some PICT, it is very difficult to carry out genuinely national surveys given the multiple islands that these states contain. Furthermore, there are vast differences between populations within many PICT and thus these national figures may mask similar difference in tobacco use. However, this criticism potentially applies to national figures for all countries.

A more pressing concern is the age of some of the estimates, and the hitherto lack of regular monitoring of smoking prevalence using consistent methodology. As such, it is difficult to be sure of the time trends in smoking in PICT and the apparent decrease seen in adult male smoking prevalence should not be cause for complacency given the high rates of youth smoking and the latency of much smoking-related harm.

Many of these concerns about the availability and quality of smoking prevalence data in PICT will be addressed by the implementation and publication of WHO's STEPS survey for non-communicable disease risk factors, which includes tobacco use.³⁷

STEPS surveys have already been carried out in many PICT. STEPS data for tobacco use in adults is available for Fiji, American Samoa, Samoa, Tokelau, Nauru, and Cook Islands, and these estimates are used above. However, currently Fiji is the only PICT to have published a final report based on the STEPS survey results.

Data has also been collected in Marshall Islands, FSM, Vanuatu, Tonga, Solomon Islands, and Kiribati³³ though it is unclear when results will be available. As such, the availability and comparability of smoking prevalence data in PICT should improve greatly in the medium term. It is thus imperative that all PICT publish and disseminate results of STEPS surveys and continue to undertake smoking surveys using STEPS methodology at regular intervals to enable robust monitoring of smoking rates to inform tobacco control efforts.

Despite the reservations about the estimates reviewed in this paper, all of the reported surveys employed randomised sampling aimed at producing a representative estimate and/or have been recognised by WHO as providing a national estimate. Whilst there should be some caution exercised in interpreting differences between PICT, due to the differing methodologies used, the estimates provide the best indication available of tobacco smoking prevalence in these states.

Most importantly, given the large magnitude of smoking prevalence in many PICT, concerns about methodology should not obscure recognition of the scope of the continuing threat that tobacco poses to public health in these countries and territories and of the need for further action.

All PICT eligible to do so have become parties to the Framework Convention on Tobacco Control (FCTC)³⁸ and have pledged to make progress on legislation and policy consistent with the FCTC at the meetings of Pacific Health Ministers in Tonga in 2003 and Samoa in 2005.^{39,40} This is encouraging but PICT need to make urgent progress on action to reduce tobacco use in their populations.

In particular, tobacco taxation remains an underutilised tool with rates of tax often much lower than in countries such as Australia and New Zealand. Indeed, tobacco taxation has been partially responsible for the decline in tobacco use in many high income countries such as New Zealand⁴¹ and it has been suggested that tobacco

taxation is even more effective in low and middle income countries, judging from Papua New Guinea data.⁴²

The findings reviewed here thus suggest that PICT should proceed with measures such as taxation and other tobacco control legislation and policy, as detailed in the FCTC, at the same time as they carry out improved monitoring of tobacco smoking rates in their states.

The importance of implementing STEPS monitoring of tobacco use will lie not in establishing the problem of tobacco use but rather in evaluating the effectiveness of tobacco control measures. Without such immediate action, the burden of disease from cardiovascular disease and cancer in PICT is likely to continue to increase at great cost to the peoples of the Pacific.

Competing interests: None.

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