

Smoking prevalence and trends in the Pacific

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Abstract

Tobacco smoking is associated with premature mortality and considerable morbidity from non-communicable diseases (NCD). In recent years the prevalence of smoking has decreased in some industrialized countries but is still increasing in many developing nations. Details of smoking habits in adults have been collected in various Pacific populations between the years 1975 and 1994, allowing comparison of smoking prevalence between populations and over time. The prevalence of smoking was low in the predominantly 7th Day Adventist communities of coastal Papua New Guinea and in Indian women in urban Fiji, but in most other populations, it was high in men (50-90%) and although lower, still considerable in women (20-30%). In Papua New Guinea Highlanders and Nauruans there was a high frequency of heavy smoking (>20 cigarettes per day). Rural-urban comparisons showed that smoking was generally more common in rural areas. In the populations where two or more surveys have been performed (Nauru, Western Samoa and Papua New Guinea Highlands) some decline in smoking prevalence has been identified, although overall prevalence is still high in these populations, and rates increased in urban Western Samoan women. These results show that cigarette smoking varies in Pacific populations. Although there is some indication of a slight decline in prevalence in some populations, this study highlights the need to introduce or strengthen anti-smoking programs.

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Introduction

Tobacco smoking is common in most parts of the world, including both developed and developing countries. It is well documented that smoking is associated with premature death and increased morbidity; it is responsible for as much as 90% of all lung cancers and 25% of ischaemic heart disease in men less than 65 years old¹. In recent years the prevalence of smoking has decreased in developed countries, but it is still on the increase in much of the developing world, where the already burdened health systems must deal with the effects of these smoking trends. Given the time it takes for the health consequences of smoking to become apparent, these effects are likely to worsen in the future. It is therefore important to have access to data on smoking prevalence in developing populations both to plan effective smoking prevention programs and for monitoring smoking trends.

Data collected between 1975 and 1981 in a number of Pacific countries demonstrated that the prevalence of smoking varies considerably between populations, and in general was low in women². Since 1981 follow-up data have been collected in some of these original populations, as well as from other countries of the Pacific region not previously

studied. We report here some updated cigarette smoking prevalence estimates for a cross-section of Pacific communities, and document trends in prevalence within the populations where this information is available.

Subjects and methods

Data for this study were collected during diabetes and non-communicable disease surveys conducted between 1975 and 1994 on whole community samples of adults (\geq 20 years old) in Micronesians from Nauru and Kiribati; Polynesians from Western Samoa, Cook Islands, Niue, Tuvalu, New Caledonia, Loyalty Islands and Wallis Island; Melanesians from Fiji, Papua New Guinea (PNG), New Caledonia and Loyalty Islands; and Asian Indians from Fiji.

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Table 1. Number of subjects in each study by age-groups

Populations	Age groups (years)											
	20 - 24		25 - 34		35 - 44		45 - 54		55+		Total	
	M	F	M	F	M	F	M	F	M	F	M	F
Nauru 1994	-	-	274	315	194	210	81	70	65	76	614	671
Papua New Guinea												
<i>Koku (Urban Coast) 1991</i>	-	-	137	173	154	91	60	53	51	31	402	348
<i>Wanigela (Rural Coast) 1991</i>	-	-	35	138	27	77	31	61	71	101	164	377
<i>Kalo (Rural Coast) 1991</i>	-	-	21	30	17	29	26	23	28	24	92	106
<i>Highlands 1991</i>	-	-	52	72	37	31	30	39	61	66	180	208
<i>Kerker Island 1986</i>	52	84	80	84	52	63	58	55	58	52	300	338
<i>Tolai 1985</i>	38	70	80	84	35	46	45	38	54	52	252	290
Western Samoa (1991)												
<i>Urban (Apia)</i>	-	-	71	108	77	86	64	120	118	146	330	460
<i>Rural</i>	-	-	110	159	118	136	100	104	144	134	472	533
Fiji (1980)												
<i>Melanesian: Urban</i>	54	77	119	126	78	112	77	84	71	65	399	464
<i>Melanesian: Rural</i>	38	36	67	71	48	45	40	41	46	44	239	237
<i>Indian: Urban</i>	68	82	118	152	77	90	56	80	65	59	384	463
<i>Indian: Rural</i>	32	40	68	71	49	52	35	47	29	29	213	239
Kiribati 1981												
<i>Urban</i>	173	219	318	330	223	210	145	139	60	83	919	981
<i>Rural</i>	79	114	97	124	98	114	93	98	107	114	474	564
Rarotonga (Cooks) 1980	72	75	129	150	109	155	112	111	121	93	543	584
Niue 1980	104	80	122	123	108	146	95	101	119	151	548	601
New Caledonia												
<i>Polynesians 1980</i>	4	23	50	96	100	102	90	72	13	22	257	315
<i>Melanesians 1980</i>	10	17	33	40	52	40	27	22	15	15	137	134
Wallis Island (Polynesians) 1980	38	57	80	81	56	61	41	52	59	54	274	305
Loyalty Islands (Mels + Pois) 1979	54	84	95	123	82	92	72	101	89	144	392	544
Funafuti (Tuvalu) 1978	52	60	58	65	47	57	60	50	37	44	254	276

Table 2. Age-specific prevalence (%) of cigarette smoking in Pacific populations.

Populations	Age groups (years)											
	20-24		25-34		35-44		45-54		55+		Total	
	M	F	M	F	M	F	M	F	M	F	M	F
Nauru (1994)	-	-	50.2	66.6	52.6	67.9	47.4	55.2	40.0	36.1	49.5	62.5
Papua New Guinea												
<i>Koki (Urban Coast) 1991</i>	-	-	5.9	0.6	3.1	0.0	0.0	1.9	5.9	0.0	3.9	0.6
<i>Wanigela (Rural Coast) 1991</i>	-	-	2.9	0.0	0.0	0.0	0.0	0.0	1.4	0.0	1.2	0.0
<i>Kalo (Rural Coast) 1991</i>	-	-	47.6	10.0	88.2	17.2	56.0	17.4	50.0	25.0	58.2	17.0
<i>Highlands 1991</i>	-	-	48.1	23.6	72.2	50.0	66.7	68.4	55.7	30.8	58.7	38.1
<i>Karkar Island 1986</i>	73.1	27.4	80.0	58.3	86.5	87.3	87.9	92.7	89.7	90.4	83.3	66.6
<i>Tolai 1985</i>	47.4	1.4	55.0	1.2	48.6	8.7	48.9	21.1	42.6	19.2	49.2	8.3
Western Samoa (1991)												
<i>Urban (Apia)</i>	-	-	53.5	23.4	55.9	24.7	48.4	22.7	44.9	9.7	50.0	19.1
<i>Rural</i>	-	-	59.6	13.2	62.1	20.9	59.6	21.2	57.7	20.3	59.7	18.5
Fiji (1980)												
<i>Melanesian Urban</i>	59.3	39.0	68.1	31.7	69.2	28.6	67.5	34.5	63.4	33.8	66.2	33.0
<i>Melanesian Rural</i>	86.8	22.2	92.5	38.6	87.2	64.4	80.0	70.7	91.3	63.6	88.2	51.3
<i>Indian Urban</i>	42.6	1.2	43.2	0.0	48.1	5.6	37.5	8.8	37.5	8.5	42.3	3.9
<i>Indian Rural</i>	53.1	0.0	57.4	2.8	69.4	26.9	68.6	42.6	72.4	48.3	63.4	20.9
Kiribati (1981)												
<i>Urban</i>	61.8	39.3	63.5	37.6	49.8	31.0	37.2	23.7	31.7	20.5	53.6	33.1
	[85.0]	[58.0]	[83.3]	[68.5]	[84.3]	[73.3]	[86.9]	[66.2]	[78.3]	[59.0]	[84.1]	[66.1]
<i>Rural</i>	2.5	0.9	1.0	3.2	2.0	0.0	7.5	3.1	1.9	0.0	3.0	1.4
	[94.9]	[63.2]	[89.7]	[75.0]	[90.8]	[78.1]	[83.9]	[71.4]	[83.2]	[81.6]	[88.2]	[73.9]
Rarotonga (Cook Is.) (1980)	35.3	24.3	43.0	27.1	41.3	17.6	42.5	19.6	36.8	7.6	40.1	19.6
Niue (1980)	43.3	15.0	60.7	17.1	58.3	24.8	68.4	14.9	60.7	11.3	58.2	16.8
New Caledonia												
<i>Polynesians**</i>	100	60.9	83.0	17.7	81.3	23.8	77.1	30.6	81.8	36.4	80.5	27.1
<i>Melanesians**</i>	20	17.6	60.0	22.5	66.0	30.0	62.5	63.6	66.7	86.7	60.3	38.1
Wallis Island (Polynesians)**	78.4	8.9	89.9	13.8	92.7	26.2	95.1	45.1	94.9	60.8	90.8	28.8
Loyalty Islands (Mels + Pels)	28.3	3.6	21.7	11.5	43.9	16.7	42.3	16.8	50.0	15.5	37.6	13.2
Funafuti (Tuvatu)	84.2	38.7	76.8	62.0	90.9	45.0	86.7	64.3	71.0	37.8	82.0	50.2

* Number in brackets is prevalence of smoking cigarettes and/or twists of tobacco

** Prevalence of all smoking (cigarettes, pipe and tobacco).

Table 3. Level of cigarette smoking among current smokers only, in Pacific communities.

Population	Cigarettes smoked per day					
	n	% Men		n	% Women	
		<20	>20		<20	>20
Nauru 1994	298	60.7	39.3	410	65.9	34.1
Papua New Guinea 1991						
<i>Koki</i>	16	50.0	50.0	2	100	0
<i>Kalo</i>	53	73.6	26.4	18	83.3	16.7
<i>Highlands</i>	105	26.7	73.3	78	32.1	67.9
Western Samoa 1991						
<i>Urban (Apia)</i>	165	80.0	20.0	87	87.4	12.6
<i>Rural</i>	278	78.4	21.6	98	84.7	15.3
Fiji 1980						
<i>Melanesian: Urban</i>	264	87.1	12.9	153	99.3	0.7
<i>Melanesian: Rural</i>	210	92.4	7.6	121	95.0	5.0
<i>Indian: Urban</i>	162	88.3	11.7	18	100	0
Kiribati 1981						
<i>Urban</i>	493	78.3	21.7	325	91.1	8.9
<i>Rural</i>	14	92.9	7.1	8	87.5	12.5
Rarotonga 1980 (Cook Is.)	207	90.8	9.2	111	99.1	0.9
Niue 1980	318	83.0	17.0	101	92.1	7.9
Funafuti (Tuvalu) 1978	156	88.5	11.5	107	95.3	4.7

Note. The numbers of cigarettes smoked were not recorded for the other populations.

Details of sampling procedures, response and survey methodology can be found elsewhere but relevant information will be outlined here³⁻¹².

All surveys were conducted by a team from Melbourne in collaboration with local health authorities, and in some cases with support from the World Health Organisation and/or the South Pacific Commission. At each survey standard 75g oral glucose tolerance tests were performed and non-insulin-dependent diabetes mellitus (NIDDM) was diagnosed according to WHO criteria¹⁸. Questionnaire information was collected by trained interviewers in local languages for details of smoking and other lifestyle behaviours, medical history, and socio-economic indicators including education level. Smoking details included whether subjects were never smokers, ex-smokers or current smokers, and for the latter the level of daily smoking (≤ 20 per day or > 20 per day) was recorded. In most populations details of cigarette smoking only were recorded. However, in

Kiribati where smoking tobacco twists was very prevalent, any tobacco smoking was recorded as well as cigarette smoking alone, and both are reported here. Furthermore, due to the data collection procedure in the Wallis Island and New Caledonia survey prevalence of all types of tobacco smoking (i.e. cigarettes, pipes and tobacco) is presented for these groups¹⁶.

There were some differences in the recording of education level between surveys, but in most populations education could be divided into five groups based on the number of years education: years 0-3, 4-6, 7-9, 10-12 and post-year 12. In some communities formal education after year 12 was not available. In Papua New Guinea, a category for a mission education with no formal schooling was included, and levels of formal education were then broken down into groups for 1-6, 7-9 and 10 or more years. No education details were collected in the surveys of Tuvalu or the Loyalty Islands.

The numbers of subjects in each study according to sex and age-group are listed in Table 1. For cross-population comparisons, data from the most recent studies only are presented for Nauru (1994), Western Samoa (1991) and Papua New Guinea (1991, 1986 and 1985), while for the other populations only one survey has been performed. In studies performed since 1987 only subjects > 25 years old were included.

To assess trends in smoking prevalence, data from the 1975/76, 1982, 1987 and 1994 surveys in Nauru, the 1978 and 1991 surveys in Western Samoa and the 1983/85 and 1991 surveys in Papua New Guinea are presented^{3,5,8,9,11-13}. For within population comparisons prevalence estimates have been standardized for age by the direct method using the age bands (> 25 years only) presented in Table 1⁹. Standard populations used were: the total 1991 survey population for Papua New Guinea; the 1986 national census population for Western Samoa; and the 1992 national census population for Nauru.

In Papua New Guinea, Eastern Highlands populations were surveyed on two separate occasions - first in 1983 (rural villages of Gamusi and Gimisave) and then in 1985 (peri-urban village of Masilakaiufa)^{11,12}. These three areas were re-studied in the 1991 survey, and have been combined for some of the present analyses. The 1991 survey also included two rural coastal villages, Wanigela and Kalo,

Table 4. Prevalence of smoking according to level of education

Population	Education Level (years)									
	% Men					% Women				
	0-3	4-6	7-9	10-12	>12	0-3	4-6	7-9	10-12	>12
Nauru 1994	61.1 (18)*	48.9 (45)	67.1 (85)	49.4 (345)	35.9 (103)	68.2 (22)	44.7 (38)	67.6 (77)	64.7 (380)	58.6 (133)
Western Samoa 1991										
Urban (Apia)	55.5 (9)	53.3 (122)	56.8 (58)	47.3 (91)	36.7 (49)	0.0 (13)	18.5 (189)	20.5 (83)	21.9 (128)	17.1 (41)
Rural	82.6 (23)	60.6 (170)	63.5 (137)	52.8 (106)	44.8 (29)	17.9 (28)	22.2 (176)	15.9 (149)	16.8 (149)	20.0 (30)
Fiji 1980										
Mel. Urban	60.0 (25)	75.5 (98)	67.9 (159)	57.4 (115)	-	40.0 (45)	33.1 (133)	31.3 (179)	32.7 (107)	-
Mel. Rural	85.2 (25)	90.5 (98)	86.1 (159)	92.9 (28)	-	57.1 (35)	59.3 (86)	47.5 (101)	14.3 (14)	-
Indian:Urban	44.7 (47)	42.1 (38)	42.2 (109)	41.8 (189)	-	10.7 (122)	3.7 (54)	0.8 (133)	1.3 (151)	-
Indian:Rural	70.2 (57)	66.1 (59)	62.9 (70)	44.4 (27)	-	34.1 (123)	12.3 (57)	2.3 (44)	0.0 (15)	-
Kiribati 1981										
Urban	42.3 (222)	50.7 (268)	61.6 (328)	60.4 (101)	-	27.3 (333)	27.1 (310)	41.7 (288)	60.0 (50)	-
Rural	1.4 (214)	1.1 (177)	9.2 (76)	28.6 (7)	-	0.0 (287)	1.1 (190)	7.0 (86)	0.0 (1)	-
Rarotonga 1980	30.4 (23)	46.2 (65)	38.2 (165)	30.1 (136)	-	5.4 (37)	21.8 (55)	13.6 (199)	18.5 (130)	-
Niue 1980	64.2 (53)	64.1 (117)	58.2 (67)	46.8 (188)	66.7 (3)	10.8 (74)	17.0 (112)	14.3 (77)	21.0 (176)	-
Wallis Island 1980	90.1 (92)	95.0 (60)	95.0 (60)	84.2 (57)	-	43.4 (113)	24.5 (49)	23.2 (69)	13.1 (61)	0.0 (1)
Papua New Guinea	**	1.6	7.9	10+	-	**	1.6	7.9	10+	-
Highlands (1991)	60.0 (120)	62.5 (40)	42.8 (14)	40.0 (5)	-	40.7 (162)	34.4 (32)	0.0 (4)	14.3 (7)	-
Karkar Island (1986)	87.6 (178)	80.7 (88)	62.5 (16)	72.2 (18)	-	83.6 (213)	39.3 (107)	42.9 (7)	18.2 (11)	-
Tolai (1985)	46.8 (47)	61.0 (123)	43.8 (48)	17.6 (34)	-	15.7 (83)	6.2 (145)	8.3 (36)	0.0 (26)	-

* Number of subjects at each level of education. ** Mission education without formal schooling

and an urban settlement of Wanigela people living in Port Moresby (Koki settlement)¹³. The Tolai people (surveyed in 1985) were from both rural and peri-urban coastal villages in East New Britain Province¹². As the prevalence of smoking was similar in the two villages, they have been combined for presentation here.

In Western Samoa the two rural samples (from the areas of Poutasi on the main island of Upolu and Tuasivi on the island of Savai'i) were combined for comparison with the urban sample from Apia⁹. The New Caledonia Polynesians were first generation migrants who came from Wallis Island (rural) to Noumea (urban), and the New Caledonia

Melanesians resided in the areas of Noumea and Oundjo. The Loyalty Islands sample was from the island of Ouvea^{16,17}. As the prevalence of smoking was similar for Melanesians and part-Polynesians in Ouvea, they have been combined for presentation. The Cook Islands survey was performed in Rarotonga, and the main island of Funafuti was used for the Tuvalu survey^{6,15}.

Results

The numbers of subjects in the studies ranged from 92 men and 106 women in the 1991 PNG survey of Kalo village, to 919 men and 981 women in the urban Kiribati sample (Table 1).

Age-specific prevalence estimates of cigarette smoking for all studies are shown in Table 2. With the exception of Nauru, smoking was more common in men than women in almost all age groups and each population. There was no consistent trend in smoking prevalence across age groups. In PNG Tolai, New Caledonia Melanesian, Loyalty Islander and rural Fiji Melanesian women; and rural Fiji Indian, PNG Karkar Islander and Wallis Islander

men and women, there was a tendency for the prevalence to increase with age. However, in Nauru and urban Kiribati older subjects smoked less. Overall prevalence of cigarette smoking was high in rural Fiji Melanesian men and women (88.2% and 51.3% respectively), and in most other populations over 50% of men and 20-30% of women smoked. Prevalence of "all smoking" was also high in Wallis Islanders living on the island as well as in those who migrated to Noumea. Cigarette smoking was infrequent amongst the urban (Koki) and rural PNG Wanigela people (almost exclusively Seventh Day Adventist), as well as in PNG Tolai and urban Indian Fijian women. In rural Kiribati cigarette smoking was rare but smoking tobacco twists was frequent.

The PNG Highlanders and Nauruans had a high frequency of heavy smoking (> 20 cigarettes per day) whereas in the other populations relatively more smokers reported levels of <20 cigarettes per day (Table 3). More men than women reported heavy smoking in each population, except in rural Kiribati where there were very few cigarette smokers in total.

Table 5. Prevalence (%) of cigarette smoking in known diabetic subjects in selected populations.

Population	Men		Women	
	N	%	N	%
Nauru				
1982	99	61.6	104	52.9
1994	90	50.0	90	62.2
Papua New Guinea				
Koki 1991	41	4.9	42	2.4
Western Samoa				
Urban 1978	10	50.0	16	6.3
Urban 1991	24	50.0	39	15.4
Rural 1978	6	83.3	8	50.0
Rural 1991	14	42.9	23	13.0
Fiji 1980				
Melanesian	6	83.3	17	58.8
Indian	41	34.1	36	27.8
Kiribati 1981				
Urban (cigs only)	10	60.0	19	31.6
(all smoking)	10	90.0	19	63.2
Rarotonga	10	40.0	26	11.5
Niue	16	56.3	27	11.1
New Caledonia (Mels + Pols)	28	75.0	24	33.3

Table 4 shows the prevalence of smoking according to level of education attained. In men there was a tendency for the prevalence to decrease with increasing education level in several communities - Nauru, urban and rural Western Samoa, Fiji Indians, Niue and the PNG highlands. For men in the other communities there was no apparent association between smoking and education level. In women an inverse association with education level was found in Fiji Melanesians and Indians, PNG Tolai, Highlanders and Karkar Islanders, and Wallis Islanders. In Kiribati there was a tendency for the prevalence of cigarette smoking to increase with education level but when all smoking was considered (including tobacco twists, data not shown) the association was inverse.

Figures 1 and 2 depict the trends in prevalence for populations where there have been one or more follow-up surveys. In men in Nauru there was a gradual decline in the prevalence of smoking between 1975/76 and 1994,

although the overall level remained high. However, rates were constant in women. In Western Samoa there was also a decline in frequency in men between 1978 and 1991 which was more pronounced in the rural areas. In women there was also a decrease in prevalence in rural areas but a slight increase in the urban area. In both rural and peri-urban PNG highland communities there were declines in the prevalence of smoking between surveys in men and women. Prevalence remained higher in the rural communities

Table 5 shows the prevalence of smoking in subjects with previously diagnosed diabetes in selected populations. In general the prevalence reflected that of the general population for each community. However, in women of some communities there was a slightly lower prevalence of smoking in the known diabetic group (Western Samoa, Cook Islands and Niue). In Nauruan men there was a slight decrease in the proportion of known diabetic subjects smoking between 1982 and 1994 but in women there was an increase. In rural Western Samoa there was a decrease and in urban women an increase between surveys.

Discussion

The changes in disease patterns in developing populations of the Pacific region during the post-war period have been well documented^{20, 21}, with the significant emergence of NCDs and a decline in infectious diseases. Cigarette smoking is a major risk factor for NCD including cancer and cardiovascular diseases, and is practised to varying degrees in Pacific communities. Results from our studies show a wide range in the prevalence of cigarette smoking from 4% and 1% in men and women in the urban Adventist population of Koki, PNG (1991) to 88% and 51% in male and female Melanesians in rural Fiji in 1980. In each population where rural and urban subjects were surveyed, smoking was more common in the rural areas. It has been suggested that this is because of greater access to tobacco which is cultivated in many rural areas throughout the Pacific².

However, manufactured cigarettes are progressively replacing home-made forms even in rural areas, although we do not have documentation of relative proportions for the study populations. Nevertheless, the rural-urban trend in cigarette smoking contrasts with other non-communicable disease risk factors which are generally more prevalent in urban areas¹.

Except for the Adventist PNG communities and women in Niue, Rarotonga, Fiji (Indians) and Western Samoa, the prevalence of smoking in the populations studied were high compared to developed, Western populations. A WHO report listed the prevalence of smoking in Australia (1983) as 37% in men and 30% in women; in the USA (1987) as 30% in men and 32% in women; and in the United Kingdom (1984) as 36% in men and 32% in women¹.

Related to extensive anti-smoking campaigns, increased taxation and legislation controlling advertising and sponsorship by tobacco companies, cigarette smoking has decreased in recent years in many industrialized countries^{22,23}. As an example, in the state of Victoria, Australia, where such measures have been in operation for a number of years, prevalence of smoking for the 10-year period 1983-1993 has fallen from 37 to 26% in men and 32 to 25% in women²⁴. However, smoking is still increasing in frequency in much of the developing world¹. Much of this attributed to aggressive marketing by tobacco companies in their attempt to retain profits in the face of dwindling markets in the developed world²³. In the Pacific, data documenting trends in smoking are scarce, but results from our studies show a steady, albeit not very dramatic, decline in smoking amongst Nauruan men over a period of 18 years, although this was not the trend in women. Similarly, in Western Samoa there was a

decrease in smoking prevalence over a 13 year period in all groups (except urban women), and in the PNG Highland smoking decreased in both rural and peri-urban men and women over a 6 or 8 year period. Although these trends are encouraging, the frequency of smoking at the latest surveys remained high, and women in urban areas may be taking up smoking more often than men.

It has been shown in New Zealand studies that the frequency of smoking has an inverse relationship with socioeconomic status²⁵. An inverse association between smoking and education level was evident in some of the Pacific communities, while in others there was a positive association or none at all. This inconsistency probably reflects the interaction of effects including relative income and affordability, exposure to anti-smoking information, and cultural factors. For example, in Kiribati the data demonstrated that

more educated persons chose to smoke cigarettes rather than twists of tobacco.

To diminish the risk of macrovascular complications (e.g. stroke, coronary heart disease, peripheral vascular disease) it is imperative that people with diabetes should not smoke. However, in most of the Pacific populations studied, the prevalence of smoking in known diabetic subjects was similar to that in the general community. This suggests that health education, at least on this aspect of diabetes management, is failing. Given the demonstrated high mortality rates in diabetic Pacific islanders increased attention should be given to anti-smoking advice in this group²⁶⁻²⁸.

Smoking in women is less frequent in most Pacific communities. However, urban women should be specifically targeted for smoking prevention strategies as any trends for decreased smoking prevalence are not evident in this group.

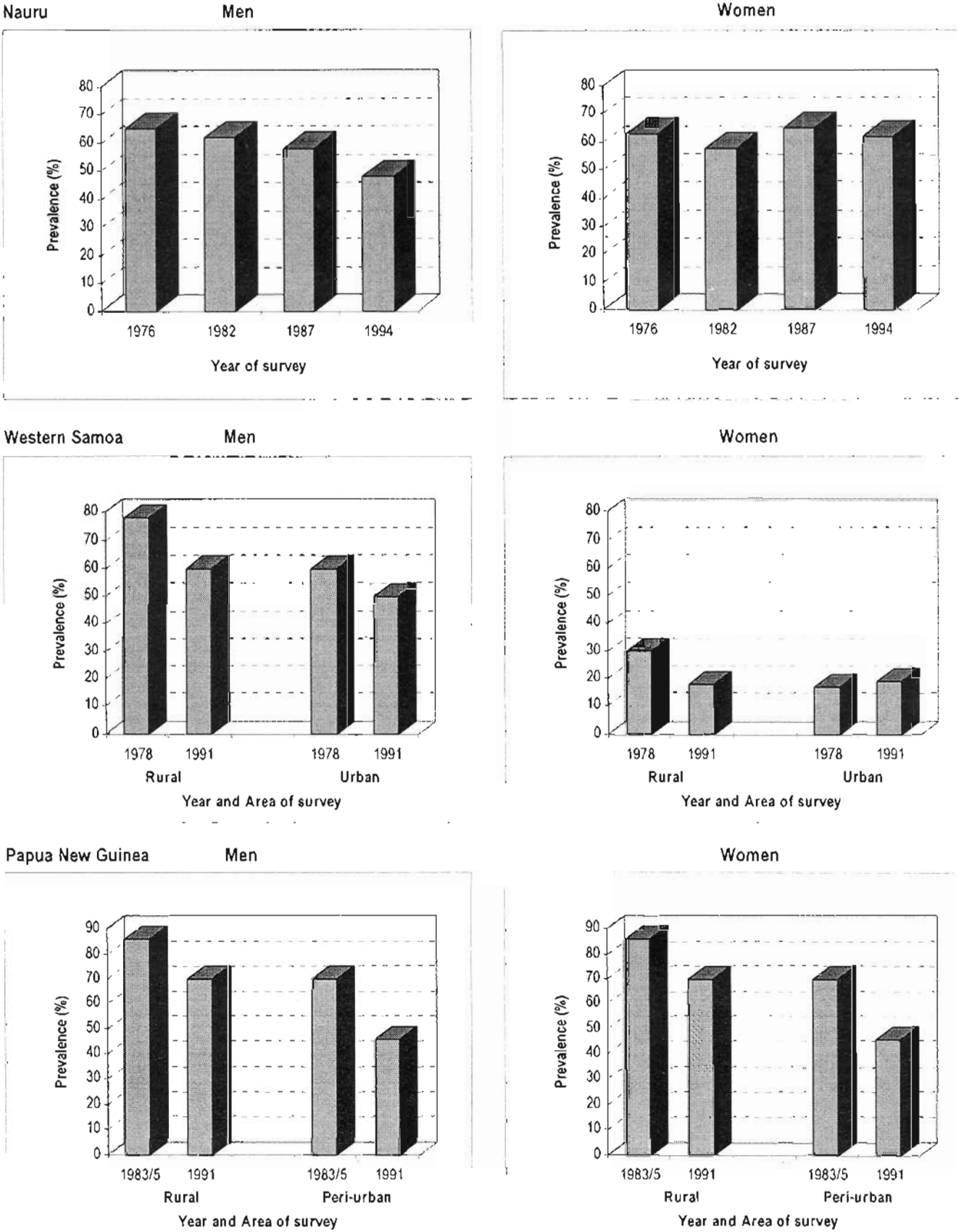
Along with health education campaigns, fiscal measures (increased taxation) and cigarette advertising bans appear to have had considerable success in decreasing the prevalence of smoking in many developed countries²²⁻²⁴. Implementation of such strategies in Pacific countries to date has been incomplete. The burgeoning problem of smoking-related disease highlights the urgent need to introduce or strengthen anti-smoking programs in the region.

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“An inverse association between smoking and education level was evident in some of the Pacific communities, while in others there was a positive association or none at all.”

Figure 1. Age-standardised prevalence (%) of smoking in Nauru, Western Samoa and Papua New Guinea, by year and area of survey



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