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CANCER AMONG PEOPLE LIVING IN RURAL AND REMOTE INDIGENOUS COMMUNITIES IN QUEENSLAND; AN UPDATE 1997-2002

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Summary

Indigenous Queenslanders in rural and remote areas continue to experience a higher mortality from cancer than non-Indigenous Queenslanders. The higher mortality from smoking related cancers and cervical cancer continues. The rate of liver cancer was also statistically significantly higher and this highlights the importance of the Hepatitis B vaccination program. Both cervical cancer and smoking related cancers are largely preventable. We need to continue our efforts to reduce the prevalence of smoking among Indigenous people and increase participation in the cervical cancer screening program.

Background

This circular is designed to provide an update of cancer among Indigenous people in Queensland for the period 1997-2002. Like a previous circular (No 54), which covered the period 1982-1996, this current circular is based on data from discrete rural and remote communities in Queensland. About 25,100 or 16.8 % of all Indigenous people in Queensland live in these communities (ABS 2002/HIB 2005).

The Queensland Cancer Registry (QCR) obtains data on the Indigenous status of people diagnosed with cancer in Queensland and like Western Australia is considered to have good coverage, but with some under-identification (AIHW, 2004). Besides the Northern Territory, other jurisdictions are considered to have less complete coverage than Western Australia or Queensland.

Despite this reasonably good coverage, we elected to limit our analysis to the discrete rural and remote Indigenous communities to ensure the current analysis was as valid as possible, and to allow comparison with the previous analysis.

What is known about Indigenous Cancer

Cancer is the third leading cause of death in Indigenous people after diseases of the circulatory system and injuries and poisonings (AIHW, 2004a). While cancer causes a larger percentage of deaths in the non-Indigenous population than the Indigenous (29% versus 16% in 2001 (ABS, 2002a)), it is erroneous to conclude that cancer is less significant among Indigenous Australians. The reason for the lower percentage of deaths among Indigenous people is that standardized mortality rates are higher for other common causes of death especially cardiovascular disease, which is the number one cause of death and has a standardized mortality rate (SMR) of three times that of non-Indigenous Australians (ABS,2003).

Mortality rates for cancer among Indigenous people are 25%-50% higher than for non-Indigenous people (Condon, 2003; Coory 2001) and more than 100% higher for Indigenous people younger than 65 years in the Northern Territory (Condon, 2004a).

Also, the overall pattern of Indigenous cancer among Indigenous people differs from that among non-Indigenous Australians. Cervical cancer had a 5-fold difference in incidence and 13-fold excess in mortality in Queensland rural and remote Indigenous communities for the years 1982-1996. Lung cancer also had a 2-3 fold higher mortality compared to non-Indigenous Queenslanders and higher mortality rates were also found in the larynx, pharynx and oesophagus in males and in the stomach in females.

In the Northern Territory, higher mortality rates were found among Indigenous people for cancer of the lung, cervix, oesophagus, uterus, pancreas, liver, mouth, throat and thyroid (Condon, 2004a).

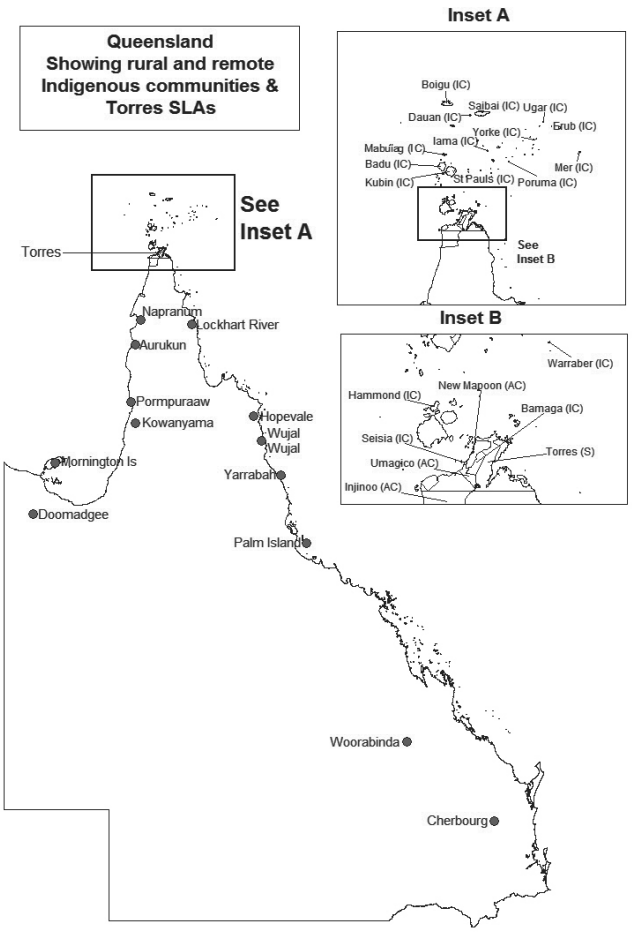
An analysis of trends in the Northern Territory showed that the rate of smoking related cancers among Indigenous people had doubled between 1977and 2000. In contrast, the cervical cancer mortality rate had decreased by 50% (Condon et al, 2004b), but the decrease was not statistically significant.

A study from the Northern Territory found cancer survival for Indigenous people worse for many common cancers (Condon et al, 2005). Indigenous people diagnosed with cancer were found more likely to be diagnosed with advanced disease for cancers of the colon and rectum, breast, cervix and non- Hodgkin's lymphoma. In addition, stage adjusted survival rates were worse for all the above cancer sites.

Lower survival was also shown for Indigenous people in South Australia. More presented with advanced disease and even after matching for stage, survival was found to be lower than for non-Indigenous people (SACR, 1997). However survival for specific sites was not reported.

In summary Condon et al 2003 notes that despite the difficulties with Indigenous identification and data, there is now high quality information showing a "*consistent pattern of large differences between Indigenous and non-Indigenous Australians in incidence at several specific sites, cancer mortality at most sites, and cancer survival*"

Figure 1:



All cancers combined

For the period 1997 to 2002 the overall incidence of cancer among people in the discrete rural and remote communities (Figure 1) was statistically significantly lower than the rest of Queensland. The standardised incidence ratio (SIR) for females was 79 and for males 70 (Table1). The previous study 1982-1996 also found a significantly lower incidence in males, but a similar incidence in females for Indigenous versus non-Indigenous cancer rates. The overall incidence rate may be lower for a number of reasons. While some cancers would have a true lower incidence such as melanoma there are a number of cancers such as breast, prostate and colorectal cancer that are more common with advancing age and competing causes of death such as cardiovascular disease and diabetes may mean that these cancers may not be diagnosed at the time of death. This is particularly relevant to Indigenous cancer where life expectancy is around 20 years less than non-Indigenous life expectancy. Lower rates of screening and early investigation also make it more likely that the cancers are not diagnosed at the time of death. Age and sex standardization does not take this completely into account.

As with the previous analysis, mortality rates were higher for both Indigenous males and Indigenous females (Table 2). One reason for the higher mortality rates is that Indigenous people are more likely to be diagnosed with cancers with a poor survival i.e. lung, liver, oesophageal and laryngeal/pharyngeal cancers and less likely to be diagnosed with of cancers with good survival e.g. melanoma. However, other possible reasons include more advanced disease at diagnosis, difficulty accessing or utilizing high quality treatment and co-morbidities (eg. co-existing cardiovascular disease, chronic bronchitis and emphysema, chronic renal failure, diabetes).

Table 1: Cancer incidence among residents of discrete rural and remote communities 1997-2002

	Reported number of incident cases	Expected number of incident cases	SIR [a]	95% confidence interval [c]
Males	138	198	70	59-83
Females	130	164	79	66-94

Table 2: Cancer mortality among residents of discrete rural and remote communities 1997-2002

	Reported number of deaths	Expected number of deaths	SMR [b]	95% confidence interval [c]
Males	89	70.5	126	101-155
Females	81	45.9	177	140-220

(a) SIR: standardised incidence ratio, age standardised to the rest of the Queensland population. SIRs less than 100 indicate that the age-adjusted rate in the discrete rural and remote Indigenous communities is less than that for all of Queensland. Conversely, if the SIR is greater than 100, then the age- adjusted rate in the discrete rural and remote Indigenous communities is greater than that for all of Queensland.
(b) SMR: standardised mortality ratio, age standardised to the total Queensland population. SMRs less than 100 indicate that the age-adjusted rate in the discrete rural and remote Indigenous communities is less than that for all of Queensland. Conversely, if the SMR is greater than 100, then the age adjusted rate in the discrete rural and remote communities is greater than that for all of Queensland.
(c) If the 95% confidence interval does not include 100, then the age-adjusted rate in the discrete rural and remote Indigenous communities is statistically significantly different from the Queensland rate.

Specific Cancers (Table 3a&3b)

We found that the pattern of cancer incidence and mortality (Table 3a and 3b) for Indigenous people who live in the discrete rural and remote Indigenous communities in Queensland was similar to the previous period (1982-1996). That is, age- adjusted rates of smoking related cancers such as cancers of the lung, oral cavity, pharynx and larynx were significantly higher and that cervical cancer incidence and mortality also remained high. Oesophageal cancer continued to have a higher incidence in males.

Some differences to the previous period include the finding of high rates of liver cancer for both Indigenous men and women, and rates for oral, pharyngeal and laryngeal cancer were statistically significantly higher

Table 3a: Cancer Incidence and Mortality for selected cancers among Indigenous males in discrete rural and remote communities 1997-2002

Site	Reported number of incident cases	Expected number of incident cases	SIR	95% confidence interval	Reported number of deaths	Expected number of deaths	SMR	95% confidence interval
Lung	**32**	**20.2**	**159**	**109-224**	**30**	**16.8**	**179**	**121-256**
Prostate	***11***	***33.3***	***33***	***16-59***	3	8	37	8-110
Oral cavity, pharynx, Larynx	**16**	**7.9**	**202**	**115-327**	**12**	**2.6**	**462**	**239-807**
Oesophagus	**8**	**2.6**	**305**	**132-602**	6	2.5	238	87-518
Unknown primary	8	5.7	140	60-275	8	4.2	190	82-374
Liver	**7**	**1.8**	**398**	**160-821**	**5**	**1.5**	**332**	**108-775**
Colorectal	***5***	***24.7***	***20***	***7-47***	***2***	***8.7***	***23***	***3-83***
Stomach	5	4.3	117	38-274	3	2.3	129	27-378
Unknown Primary	8	5.7	140	60-275	8	4.2	190	82-374
Other	***4.5***	***96.7***	***47***	***34-62***	20	23.8	84	51-130

Table 3b: Cancer Incidence and Mortality for selected cancers among Indigenous females in discrete rural and remote communities 1997-2002

Site	Reported number of incident cases	Expected number of incident cases	SIR	95% confidence interval	Reported number of deaths	Expected number of deaths	SMR	95% confidence interval
Breast	***19***	***47***	***40***	***24-63***	4	8.7	46	13-118
Lung	*14*	*8.7*	*161*	*88-270*	**16**	**6.7**	**239**	**136-388**
Cervix	**11**	**4.9**	**222**	**111-398**	**11**	**1.1**	**1027**	**513-1838**
Unknown primary	**12**	**4.1**	**292**	**151-511**	**10**	**3.2**	**314**	**150-577**
Colorectal	***7***	***17.5***	***40***	***16-82***	2	5.9	34	4-122
Oral cavity, pharynx, Larynx	**9**	**2.4**	**380**	**174-721**	**7**	**.7**	**960**	**386-1978**
Liver	**6**	**.7**	**875**	**321-1904**	**6**	**.6**	**934**	**343-2032**
Stomach	3	2	152	31-444	2	1.1	185	22-669
Oesophagus	0	.9	0	0-393	0	.7	0	0-524
Unknown Primary	**12**	**4.1**	**292**	**151-511**	**10**	**3.2**	**314**	**150-577**
Other	***49***	***75.8***	***65***	***48-85***	23	17	134	85-202

NB. Bold- indicates significant increased incidence or mortality; bold and italics significantly decreased incidence or mortality.

(a)SIR: standardised incidence ratio, age standardised to the rest of the Queensland population. SIRs less than 100 indicate that the age-adjusted rate in the discrete rural and remote Indigenous communities is less than that for all of Queensland. Conversely, if the SIR is greater than 100, then the age-adjusted rate in the discrete rural and remote Indigenous communities is greater than that for all of Queensland.
(b) SMR: standardised mortality ratio, age standardised to the total Queensland population. SMRs less than 100 indicate that the age-adjusted rate in the discrete rural and remote Indigenous communities is less than that for all of Queensland. Conversely, if the SMR is greater than 100, then the age adjusted rate in the discrete rural and remote communities is greater than that for all of Queensland.
(c) If the 95% confidence interval does not include 100, then the age-adjusted rate in the discrete rural and remote Indigenous communities is statistically significantly different from the Queensland rate.

among women. Stomach cancer which was previously statistically significant higher among Indigenous women was not significantly higher in the current study.

Prostate and colorectal cancer had a significantly lower incidence and mortality was also lower. It is important however to interpret these results with caution. Firstly, incidence rates may be affected by lower levels of screening or investigation. Secondly, both of these cancers are more common with advancing age and therefore other causes of death such as cardiovascular, diabetes or chronic renal disease may lead to death before the cancers are diagnosed or cause death. This is particularly relevant to Indigenous cancer statistics because Indigenous life expectancy is around 20 years less than non-Indigenous life expectancy (AIHW, 2004). Although the data is age and sex standardized the true incidence and prevalence of these cancers is likely to be underestimated.

Breast cancer was the most commonly diagnosed cancer among Indigenous women. Although age-adjusted incidence rates were lower than those for the rest of Queensland, this may reflect lower rates of screening, rather than the lower risk of breast cancer for Indigenous women. Mortality data (1997-2001) for Queensland, Western Australia, South Australia and the Northern Territory combined shows no significant difference in breast cancer mortality between Indigenous and non-Indigenous women (AIHW&AGDHA, 2003).

Risk Factors

Much of the excessive morbidity and mortality from cancer in Indigenous people is amenable to preventative measures. In particular, it is related to the relatively high prevalence of smoking and to the relatively low rates of participation in the cervical screening program. Alcohol is also a risk factor for oral cancer/pharyngeal and laryngeal cancer and acts synergistically with smoking (Schottenfeld, 1996). Higher rates of primary liver cancer in the Indigenous population are associated with the higher prevalence of chronic hepatitis B infection (Wan and Matthews, 1994).

There are two histological types of cancer of the oesophagus; squamous cell carcinoma and adenocarcinoma. Smoking and alcohol are risk factors for squamous call carcinoma of the oesophagus (Schottenfeld, 1996). The risk factors for adenocarcinoma are less clear. The current evidence suggests that gastro-oesophageal reflux is an important risk factor. The susceptibility to reflux may be influenced by obesity, which is more common among Indigenous people (Wong and Fitzgerald, 2005; ABS, 2003).

Reducing Indigenous Cancer mortality

This update shows that much of the excessive burden for Indigenous people from cancer arises from smoking related cancers (lung/pharynx/larynx), cervical cancer and liver cancer. Oesophageal cancer was also higher in males; squamous cell carcinoma of the oesophagus has both alcohol and cigarette smoking as synergistic risk factors (Schottenfield, 1997), while adenocarcinoma of the oesophagus is associated with gastro-oesophageal reflux and obesity (Lagergren, 2005). Consequently, the higher incidence of these cancers is largely preventable by reducing Indigenous tobacco consumption, increasing participation in the cervical screening program, maintaining high rates of Hepatitis B vaccination and reducing alcohol consumption and obesity.

Smoking related cancers

In addition to cancer, cigarette smoking is also a major risk factor for cardiovascular disease with an age-adjusted standardized rate of 2.8 times higher than non-Indigenous Australians (ABS, 2002a). Smoking is the main cause of preventable mortality among Indigenous Australians (Cunningham and Condon, 1996). Based on what little data are available, it seems that the prevalence of smoking among Indigenous people is at least double that of non-Indigenous Australians; 51% vs. 24% (ABS, 2003).

Despite the high prevalence of smoking and its effect on the morbidity and mortality of Indigenous Australians there is a paucity of data on which interventions are most effective in reducing smoking among Indigenous people. While there is substantial evidence including systematic reviews of effective interventions among non-Indigenous groups the validity of these interventions among Indigenous people cannot be assumed (Ivers, 2003).

Some effective interventions among non-Indigenous groups include nicotine replacement therapy (Silagy et al, 2005); brief advice delivered by health professional (Lancaster and Stead, 2005) and group programs (Stead et al, 2002). Although inferences can be made about these interventions in Indigenous people there is an acknowledged need for more research in this area (Ivers, 2003).

Currently there are two interventions being trialled and evaluated in Queensland. Queensland Health's program, SmokeCheck is an Indigenous tobacco brief intervention program. The program aims to train about three hundred health professionals on a brief intervention program suitable for Indigenous clients. This program is being evaluated progressively and is expected to be completed in 2006.

The NHMRC is currently trialling and evaluating a suite of interventions among Indigenous communities in Northern Queensland. This includes SmokeCheck, a schools project, a workplace smoking policy project, a groups project and an events sponsorship project.

The National Tobacco Control Project undertaken by the National Aboriginal Community Controlled Health Organization (NACCHO) from 2000-2002 identified some of the key issues in program delivery (NACCHO, 2002). These included the need for:

- coordination of program delivery
- maximising community control of projects
- more funding for Indigenous tobacco control
- tobacco control to become a national Aboriginal and Torres Strait Islander Health priority
- tobacco programs to be holistic and consider the social determinants of health

Screening for early detection of lung and oral cavity/pharyngeal cancer

There is currently no evidence to support the screening of high-risk asymptomatic people for lung cancer by sputum cytology or chest x-ray (Kasper et al Ed, 2005).

A systematic review also found no evidence to support or refute the use of a visual examination as a method of screening for oral /pharyngeal cancer (Kujan O et al, 2003). The review however did note the need for further studies on the effectiveness of opportunistic screening in high risk groups.

Cervical Cancer

In the period 1993-2002 cervical cancer incidence in Queensland decreased by 41.5% and in the period 1982-2002 cervical cancer mortality decreased by 44.9% (Hall et al, 2005). Cervical cancer is now a relatively rare cancer being the 13th most common cancer in incidence and mortality in Qld 2002 (Health Information Branch and Queensland Cancer Registry 2005). However for Indigenous women in rural and remote areas, cervical cancer is the second most common cause of cancer deaths.

Cervical cancer is regarded as one of the most preventable of cancers. In countries that have population based cervical cancer screening programs, cervical cancer incidence and mortality has declined dramatically. Participation in screening is known to be the best protection against this disease.

Biennial participation rates of Indigenous women in rural and remote communities were 41% in the period 1999-2001 which was 30% lower than the rest of Queensland. Participation rates however varied between 19.9% and 63.5% (Coory et al, 2002). The study was not designed to identify the reasons for the differences, but noted in the communities with participation rates over 50%, cervical screening was seen as part of primary health care, there was a commitment to training health workers and maintenance of local information systems were important. More importantly, it showed that low participation in cervical screening wasn't an intractable problem.

Cervical cancer mortality has also been shown to differ by rurality. O'Brien et al, 2000 found that the risk of cervical mortality increased by 4.3 fold for metropolitan areas, 9.7 fold for rural areas and 18.3 fold for remote areas compared with non-Indigenous women. This study did not explore the reasons for the disparity but acknowledged the probability that this was due to poorer access to services for screening and early diagnosis of cervical cancer. This finding supports that proposition that access to high-quality screening programs is important in improving cervical cancer mortality.

Some of the barriers to cervical screening were explored in a qualitative study in Queensland (Kirk et al, 1998). These included:

- lack of knowledge about cervical cancer and cervical screening
- confusion between Pap smears and tests for sexually transmitted infections
- preference for a female service provider
- not having available an Indigenous woman to take the Pap smear when preferred
- concern about confidentiality
- fear of consequences of an abnormality being detected
- culturally unsafe or insensitive services

Queensland Health's Indigenous Women's Cervical Strategy 2000-2004 arose from concerns about the high mortality from cervical cancer in Indigenous women. The strategy was also largely based on barriers identified by Kirk et al, 1998. The key areas in this strategy included community education of Indigenous women, improved screening and follow up services (culturally effective and safe), workforce development including education and training of Indigenous personnel, improving cancer support services and recognising and supporting the role of men. Currently this strategy is under review and feedback will be utilized in forming the Indigenous cervical strategy for 2005-2009.

One of the programs in Cape York currently underway is The Healthy Women's Initiative which aims to improve health outcomes of Indigenous women through the implementation of sustainable, culturally effective and culturally safe models of screening .

The initiative involves training for Indigenous Health Workers and the establishment of dedicated Indigenous

Women's Health Worker positions. Other features of the initiative include that the service is community focused and supported by local women and links with other initiatives such as the Enhanced model of Primary Health Care. It is a joint initiative between Queensland Health and Apunipima Cape York Health Council.

Other programs aimed at improving access and qualities of cervical screening services in rural and remote areas of Queensland are the Rural and Remote Women's Health Program (outreach service for women's health involving female general practitioners going to rural and remote areas) and the Mobile Women's Health Service.

Other more recent programs for cervical screening include the use of the Thin Prep smears. This technology and test reduces the number of unsatisfactory smears and has been funded by Queensland Health since 2001 in accordance with the Queensland Health Policy and protocol for the use of Thin Prep. A study of the use of Thin Prep in an isolated community in far north Queensland that was predominantly Indigenous showed that the use of Thin Prep combined with conventional smears reduced unsatisfactory smears from 17.3% to 4.3% (Shield et al, 1999). This reduces the number of repeat smears and need for follow up by colposcopy for women with continuing reports of unsatisfactory smears which may create difficulties for women in remote areas.

Liver Cancer

Because survival rates are very poor for liver cancer, primary prevention is the most effective strategy for reducing mortality. The major risk factor for primary liver cancer in Indigenous people is chronic hepatitis B infection and consequent cirrhosis (Wan and Mathews 1994). Alcohol misuse is associated with a greater risk of disease progression (Fisher and Huffam, 2003).

Hepatitis B infection is usually acquired in early childhood in Indigenous communities and in 90% of cases becomes a chronic infection (Fisher and Huffam, 2003). In the year 2000 the prevalence of chronic hepatitis B in rural Indigenous people was 8% and for urban Indigenous 2%. This contrasts with 0.1% prevalence in first time blood donors (O'Sullivan et al 2004). Studies in the 1980s and early 1990s showed even higher levels where 46.9% of Indigenous schoolchildren in the Northern Territory had serological markers of HBV infection (Gardner et al 1992).

Hepatitis B vaccination given in early childhood or infancy is a highly effective method of prevention. Queensland Health commenced an Indigenous hepatitis B vaccination program in 1984 and a universal vaccination program in 2000. The estimate of Indigenous coverage at 12-15 months in Queensland was 95% in 2004 (ACIR, 2004). If these high coverage rates persist it is likely that the prevalence of chronic hepatitis B infection and subsequent liver cancer will decline over the next 20-30 years.

General practitioners and specialists often screen for hepatocellular carcinoma (HCC), the main type of liver cancer by regular measurement of serum alpha fetoprotein and liver ultrasound examination in people with chronic hepatitis B infection. Early diagnosis of HCC gives a greater opportunity for curative therapy. However, there is no widely published or accepted screening protocol and the current data available from trials is too preliminary to support or refute screening of people with chronic hepatitis B infection with alpha-fetoprotein and/or ultrasound to detect early hepatocellular cancer (Wun and Dickenson, 2003).

Breast Cancer

Screening rates for the 50-69 year age group (the target age for screening) among Indigenous women for 2000-2001 were 50% with a lower participation rate of 44% in rural and remote areas. The overall screening rate in Queensland was 58% (Qld Health, 2004). Breastscreen aims to screen 70% of women aged 50-69 years. A number of services currently exist to improve screening in Indigenous women such as mobile services to Indigenous communities and some Aboriginal Medical Services, and health promotion officers based in breast screen clinics whose role includes developing links with Indigenous services.

As breast cancer is the most commonly diagnosed cancer among Indigenous women this emphasises the need for ongoing effort by BreastScreen Queensland and Indigenous organisations to increase the participation rate of Indigenous women in regular breast screening. Regular breast screening is regarded as the most effective way of reducing mortality.

Issues of presentation, access and navigation through the Health System

Studies from the Northern Territory and South Australia found that Indigenous people with cancer are generally diagnosed later than non-Indigenous people and have poorer survival than non-Indigenous people diagnosed at the same clinical stage. Queensland and the other Australian states do not currently routinely collect data on the stage of cancer at the time of diagnosis.

However, poorer survival is suggested in the Queensland data. For example for cervical cancer mortality rates are 10.2 times higher than for non-Indigenous women but incidence rates are only 2.2 times higher. Apart from late presentation, which is more likely with low cancer screening participation rates, delayed and incomplete

treatment and the presence of other chronic diseases are other possible reasons for poorer survival.

Programs are needed not only to target prevention and screening but also early detection and treatment of cancer among Indigenous people. Some of the barriers to Indigenous people accessing services include geographical remoteness, cultural inappropriateness of services, poor doctor-patient communication and poverty (Kirk 1997; Gruen et al, 2002).

Utilizing our current understanding of the barriers of Indigenous people accessing health services, models of care need to be in place to improve access and utilization of health services for the early diagnosis and treatment of cancer.

Appendix

Methodology

Data was obtained from the Queensland Cancer Registry (QCR) for the six years 1997-2002. Indigenous communities were identified based on the address of usual residence reported to the QCR when the cancer was first diagnosed.

Because of the different age distribution of the Indigenous population, the cancer rates were indirectly age standardized to the total Queensland population. Although this analysis is a follow on from 1982-1996 numbers were too small to assess trends.

The population estimate for the rural and remote Indigenous communities and Torres population was obtained from the Australian Bureau of Statistics (ABS, 2002).

In the tables and text, a standardized incidence ratio (SIR) less than 100 indicates that the age-adjusted rate in the discrete rural and remote Indigenous communities is lower than that for the rest of Queensland. Conversely, a SIR greater than 100 indicates that the age-adjusted rate is higher than the rest of Queensland. Similar comments apply to standardised mortality ratios (SMRS). We calculated statistical significance by calculating 95 % confidence intervals. If the 95% confidence interval for a particular SIR or SMR does not include 100, then the age adjusted rate is statistically significantly different from the rest of Queensland.

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