THE UNIVERSITY OF SYDNEY

COPYRIGHT AND USE OF THIS THESIS

This thesis must be used in accordance with the provisions of the Copyright Act 1968.

Reproduction of material protected by copyright may be an infringement of copyright and copyright owners may be entitled to take legal action against persons who infringe their copyright.

Section 51 (2) of the Copyright Act permits an authorized officer of a university library or archives to provide a copy (by communication or otherwise) of an unpublished thesis kept in the library or archives, to a person who satisfies the authorized officer that he or she requires the reproduction for the purposes of research or study.

The Copyright Act grants the creator of a work a number of moral rights, specifically the right of attribution, the right against false attribution and the right of integrity.

You may infringe the author's moral rights if you:

- fail to acknowledge the author of this thesis if you quote sections from the work
- attribute this thesis to another author
- subject this thesis to derogatory treatment which may prejudice the author's reputation

For further information contact the University's Copyright Service.

sydney.edu.au/copyright

DENTAL SERVICES FOR ABORIGINAL PEOPLE IN NEW SOUTH WALES

SANDRA MEIHUBERS, B.D.S. (Syd.)

A Thesis submitted in partial requirement for

DIPLOMA IN PUBLIC HEALTH DENTRISTRY

UNIVERSITY
OF SYDNEY
DENTAL LIBRARY

Department of Preventive Dentistry,

Faculty of Dentistry,

University of Sydney.

1981

TABLE OF CONTENTS

		Page No.
Chapter 1:	Introduction	1
Chapter 2:	Aboriginal Health in New South Wales	3
	2.1 Changing dietary patterns in a changing environment	
	2.2 Socioeconomic factors affecting health status of Aborigines in New South Wales	8
	2.2.1 Housing	
	2.2.2 Income and Employment	15
	2.2.3 Education	18
	2.2.4 Alcoholism	19
	2.3 Health status of Aboriginal children in New South Wales	
	2.3.1 Hospital Morbidity Rates	24
	2.3.2 Mortality rates	29
	2.3.3 Malnutrition and disease patterns	29
	2.3.4 Growth retardation	32
	2.3.5 Infant feeding practices	34
	2.4 Health status of Aboriginal adults in New South Wales	
	2.4.1 Hospital morbidity rates	36
	2.4.2 Mortality rates	41
	2.4.3 Illness patterns	43
Chapter 3:	Oral Health Status of Aborigines	47
	3.1 Changing prevalence of dental caries	
	3.2 Recent studies on caries prevalence amongst Aboriginal people in New South Wales	52
	3.3 Prevalence of periodontal disease	61
	3.4 Other factors relating to oral health	65
Chapter 4:	Dental Services Available in New South Wales	70
	4.1 Health Commission of New South Wales	
	4.1.1 School dental scheme	
	4.1.2 Hospitals and institutions	71
	4.1.3 Other services	72
	4.2 United Dental Hospital of Sydney	74
	4.2.1 Travelling dental clinics	
	4.2.1.1 Travelling dental clinics - rail	75
	4.2.1.2 Road mobile unit	
	4.3 Dental Health Education and Research Foundation	76
	4.4 Private practice	77
	4.5 Aboriginal Medical Service	78
	4.6 Other dental clinic services	81
Chapter 5:	Possible Approaches to Expansion of Dental Health Services to Aborigines	83
	5.1 Traditional view of health care in Aboriginal society	
	5.2 Why an Aboriginal dental service?	86
	5.3 Expansion of services	88
	5.3.1 Short-term goals	91
	5.3.2 Long-term goals	92
	5.3.3 Aboriginal dental health educators	93
	5.3.4 Dental training of Aboriginal health workers	96
	5.4 Discussion of provision of dental services	97
Chapter 6:	Conclusion	98

Bibliography.

Appendix.

LIST OF TABLES AND FIGURES

	Page No.
Table 1: Housing Needs of Aboriginal families in some New South Wales Towns	13
Table 2 : Effect of alcohol on adult life expectancy	20
Table 3 : Hospital admissions in New South Wales, 1977 Alcohol-related diseases	21
Table 4 : Public hospital separations of children, 1977 Age specific rates per 1,000 population	25
Table 5 : Aboriginal children aged less than 5 years separated from public hospitals in country regions, 1977	27
Table 6 : Separations of Aboriginal residents of country regions 1977: Diagnosis by Age + Sex - Age-Sex specific rates per 1,000 population	28
Table 7 : Public hospital separations of residents of country regions, 1977. Principal diagnosis - rate per 1,000 population	37
Table 8 : Public hospitals separations and bed-days per 1,000 population, 1977	39
Table 9 : Percentage distribution of deaths by Age 1978 and 1979	42
Table 10: Comparison of Aboriginal and Non-aboriginal age specific death rate for New South Wales	44
Table 11: Caries incidence in Aboriginal subjects examined on University of Adelaide field expeditions	48
Table 12: Mean caries experience and severity rating of carious lesions of Aboriginal and Caucasian children	54
Table 13: Proportionate distribution of the components of the DIMFT index for Aboriginal and Caucasian children	55
Table 14: Caries experience of 77 dentate Aboriginals by age; mean DIMFT per person	58
Table 15: Distribution of the components of the DIMFT index for 77 dentate Aborigines	58
Table 16: Spread of Aboriginal population throughout New South Wales, and year in which fluoridation was commenced	68
Table 17: Application of preventive measures to dental health	89
Figure 1:	40

CHAPTER ONE

INTRODUCTION

1.1 It is believed that Aboriginal people have been on this continent for almost 40,000 years. (FOX [51]) In their natural state, Aboriginal people had remarkably low caries experience (BARRETT [10]; CAMPBELL [19]).

Since the commencement of European settlement in Australia 200 years ago, there has been a great disruption of Aboriginal tribal life and customs. The new settlers made inroads into tribal territories, typically forcing the Aborigines from their sacred and hunting areas. Traditional Aboriginal life eased to exist in any significant degree over much of the south-eastern, middle-eastern and south-western areas of the continent. In the northern and central region, where contact with white man was at a minimum, a form of traditional life was preserved (WESTERN [110]).

Displaced from their tribal lands, and unable to adapt to rapid cultural and environmental changes, a large proportion of the remaining Aborigines in New South Wales conduct a lethargic existence. Many of these people are entirely dependent on social services, and are living in fringe communities around small towns in sparsely-populated, arid areas.

The traditional diet has been largely replaced by processed foods and this factor, associated with introduced infections diseases and poor living conditions, has led to a deterioration of health, accompanied by a deterioration of oral health.

In this thesis I will attempt to outline the factors which are related to this deterioration in health and oral health, for if one is going to consider the provision of dental services to Aboriginal people, one must have an understanding of the cause for their poor health status, which is so closely related to poor oral health status.

I will discuss the dental services that are provided at present - both general dental services, and those specifically for the Aboriginal community - and how these services could be expanded to provide a broader coverage of the Aboriginal community. I will also discuss why we need a specific Aboriginal dental service, and the importance of Aboriginal community controlled health services.

CHAPTER TWO

ABORIGINAL HEALTH IN NEW SOUTH WALES

2.1 CHANGING DIETARY PATTERNS IN A CHANGING ENVIRONMENT

As the Aboriginal people were forced away from their traditional tribal areas, and into reserves, settlements and missions controlled by white people, so they lost their traditional life style and diet - Campbell [20] recorded that the Aboriginal "eats as food anything that is safely edible."

His diet was made up of a large variety of plant foods - roots, tubers, leaves and stems of trees, cereals and fruits - supplemented by flesh food, the availability of which was governed by prevailing circumstances. Coastal dwellers had an abundant supply of seafood: fish and molluscs were also obtained form rivers and lakes.

Other flesh food was obtained from mammals (especially the kangaroo and wallaby), birds (in particular the large birds such as the emu and wild turkey) and reptiles.

Eggs were not a regular item in the diet, and were principally those of aquatic birds.

There was a scant supply of honey from the native bee and some also from the honey ant.

Insects were also eaten, including moths and witchetty grubs.

The sources of food supply were affected by geographic control, which was related to aridity of the area, and seasonal rainfall.

The water supply of Aborigines came from permanent and temporary sources. Permanent sources included natural springs and roots of water-bearing plants, such as the water-bearing mallee (*Eucalyptus oleosa*) and the needlebush (*Hakea leucoptera*).

Temporary sources of water were dependent on seasonal rainfall. Some of these were water-holes, rockholes (main catchment areas formed by naturally-occurring depressions on a rock surface or mass) and soaks (a rather shallow excavated depression into which the water supply oozes, and replenishes itself slowly after occasions of removal). The water from a soak was much less likely to be contaminated.

The only source of milk was human milk, and the length of time of breast-feeding was much longer than among Caucasion communities. The duration very commonly was 3 years or more (CAMPBELL [20]).

Much of the food obtained, especially plant food, was eaten in its fresh raw state.

Aborigines generally did not boil foods, due to a lack of any fabricated containers, and any cooking of foods was done in the ashes of a fire.

Cereals were winnowed, cleaned and ground between stone grinding mills. Water was added during the grinding process, and the resultant "mash" was sometimes eaten raw, but more often it was baked into a leaf, by being poured into a shallow oval depression made in the sand and ashes.

The carcasses of animals had scales, feathers or fur removed, generally by being thrown onto the flames of a freshly-built fire, which burnt off the scales of a reptile, hair of a mammal, and any feathers remaining on a bird after it had been plucked.

Then, depending on the size of the animal it was either simply thrown on the side of the fire and covered over by hot ashes and sand; or placed in a depression or shallow hole formed by scraping away the hot embers, ashes and sand.

By this method of cooking, only a small amount of the surface fat, skin and muscle tissue is lost or destroyed in the preliminary burning or roasting process, and practically all the tissue fluids are retained in the cooked carcasse.

Cooking time depended on the size of the animal, and quite often portions of the animal were still almost raw when the animal was eaten. Marrow was generally extracted from the bones, and sometimes even portions of the bones were consumed.

Scott [102] noted that "whenever meat was grilled, advice would be given not to knock off all the ashes and coals as these were good for the teeth."

Indeed, the native diet as a whole was good for the teeth, for it required vigorous masticatory effort to break down the tough, fibrous foods, and there was definitely a low prevalence of fermentable carbohydrate.

Due to the nature of food preparation, sand, grit and ashes were often consumed along with the food, and this caused marked attrition, thereby eliminating retentive pits and fissures. In some cases, the whole of the occlusal surface was worn down (CLELAND [29]).

The traditional diet was "high in energy, protein, sometimes oils, and minerals and vitamins, especially ascorbic acid." (COYNE and DARNTON-HILL [32]).

Elphinstone [50] remarked that Aboriginal men with no previous European contact were "slimly built, sinewy featherweights , and that the unsophisticated Aboriginal is an athlete by any standards."

However, the modern diet of the Aborigine is in sharp contrast to the traditional one (KALOKERINOS [66]; GRACEY [53]; SYKES [105]; COYNE and DARNTON-HILL [32]).

Since the advent of European colonisation 200 years ago, the fertile eastern and southern coastal belts were claimed by the new arrivals to this country. The land and its natural food resources became progressively unavailable to the original inhabitants.

The natural environment was disturbed by the introduction of foreign animals such as cattle, sheep and dogs; foreign foods planted as crops; and new species of pests and insects.

New diseases were also introduced, such as measles, smallpox and tuberculosis.

The Aboriginal people, deprived of their land, were forced to live on designated areas of land controlled by the European settlers. They depended, more and more, on European style food, supplemented where possible by native foods.

Food was given to them in the form of rations, either as subsistence staples handed out, or, as in the case of those living on missions, as one or more communal meals per day, plus rations. (CAMPBELL and BARRETT [24]). The meal tended to be a stew based on meat, with added vegetables if available.

A study of dietary and nutrient intakes done in a rural Aboriginal community (HITCHCOCK and GRACEY [60]) gave some indication of dietary problems which are likely to be widespread in Aboriginal communities. Inadequate intakes of calcium, riboflavin and Vitamin C were common. The sources of energy were often unsatisfactory and included highly refined cereals, sweets and aerated drinks.

The effect of the new environment and diet has been to cause a high incidence of malnutrition amongst Aboriginal children, and a high incidence of obesity and diabetes amongst the adults, problems which were unknown in the Aborigines' traditional way of life. (GRACEY [54]).

2.2 SOCIOECONOMIC FACTORS AFFECTING HEALTH STATUS OF ABORIGINES IN NEW SOUTH WALES

2.2.1. Housing

"A large proportion of Aborigines live in housing conditions which are detrimental to their physical and social well-being and which are unacceptable by standards normally applied to the non-Aboriginal population." This view by Ruddock [95] encapsulates the problem of inadequate housing faced by many Aboriginal people in New South Wales.

A Health Commission survey in 1976 revealed that 2,000 families (approximately 50% of the New South Wales Aboriginal population) were living under the conditions described above (DOWLING and WARD [41]).

The main Aboriginal housing programme in New South Wales is that of the Housing Commission. Dowling and Ward claim that this programme is inadequate in extent, and that, in forming policies, the Housing Commission has not considered the life-style and expressed need of the Aboriginal community.

The Housing Commission runs a Housing for Aborigines programme (HFA) which builds houses in towns, and then rents them to Aborigines deemed "eligible", for a relatively low rent.

Some Aboriginal families live in "ghetto-type" housing settlements, where families are crowded together in identical sub-standard dwellings, in an area isolated from town. These conditions are most

prevalent on "Reserves", which are designated areas of land on the edge of a township, where Aborigines can live rent-free.

These "ghetto-type" settlements are found at West Brewarrina, Greenhills at Kempsey, Mehi Crescent in Moree, Box Ridge at Coraki, The Mission at Wilcannia, Three Ways Bridge and Namitjira Avenue in Dareton, to name just a few.

As well as problems of overcrowding, the Aboriginal people have to contend with unsafe or inadequate water supplies and waste disposal systems, sometimes a lack of electricity, and poor facilities for food storage.

In country areas of New South Wales (ie, excluding the areas of Sydney, Newcastle and Wollongong) there were at least 2000 families without running water to their dwellings. These people must carry water from some source, eg. a river, and store it in large drums which are often in the sun.

At Wilcannia, the majority of the Aboriginal population had no access to tank water, and relied on water from the river, which is untreated. They had poor facilities for boiling water, and there was a reluctance to use much water for washing.

At the Bourke Reserve there was no sewerage or electricity, with only one family being in possession of a Kerosene refrigerator. All the dwellings had earthen floors, with the result that in the wet weather the whole Reserve became little less than a swamp. (KAMIEN [7])

Human waste disposals are generally designed for a community density of 4-6 persons per dwelling. The average density of Aboriginal people per dwelling in New South Wales is 7-9 persons. Those people who live in areas with a pan collection system (collected once per week) use 2 or more pans per week. One or more pans are then left lying in the sun, often without lids, for several days.

Septic systems are often inadequate to cope with the load, and frequently become blocked, consequently overflowing, leaving faecal matter lying on the ground.

There are many physical, social and psychological problems associated with overcrowding, some of which are:-

- a constant presence of a pool of infecting agents responsible for respiratory, ear, eye, gastrointestinal and skin infections.

- noisy conditions due to a large number of people sharing the one dwelling. Privacy is difficult, and breast feeding is often inhibited in the situation where young mothers share a household with brothers and uncles.

- heavily contaminated water supplies are a key factor in the spread of infectious disease.

- a lack of electricity reduces the facility to store fresh, perishable foodstuffs, causing a greater dependence on tinned and packaged foods.

All the land that was designated Aboriginal Reserve is owned by the Aboriginal hands Trust of New South Wales, which was formed by the New South Wales Government in 1973. In 1976 the Trust owned and managed more than 400 houses, seven hundred shacks and other temporary dwellings.

At least 6,000 Aborigines were living in dwellings owned by the Trust, the majority of which are sub-standard, due to years of neglect.

As well as those people who live on Reserves, there are Aborigines who live in the towns, in houses other than those provided by the Housing Commission. Some people own their homes, or pay rent to live in houses which are run by housing co-operatives. These cooperatives are run by both blacks and whites.

The conditions of these homes are variable, with the best dwellings belonging to those who actually own them (KAMIEN [75]).

In Sydney, the condition of overcrowding also exists, with many people living in situations where there are 3 or more persons per room available to the household. There is often a problem of poor lighting and storage facilities. (LICKISS [82])

Housing projects for Aboriginal people are generally planned without prior consultation with the Aboriginal community. Many Aborigines are discouraged from applying for Housing Commission homes because of the numerous forms that must be completed, the absence of any Aboriginal involvement in decisions such as suitability of families for housing, and the absence of any concession to cultural

differences between Aboriginal and white families.

Many people who move from the Reserves into a Housing Commission house in town experience problems for which they have had no education, such as failure to meet rent payments because of inexperience at budgetting, or low and often irregular incomes. Many families run up a large electricity bill, again due to inexperience, and are then not able to pay the accounts. Some are unable to maintain Housing Commission standards because of inability to cope with intrafamily stresses.

Some families feel then that they cannot cope in the new house, and move back to their previous housing conditions on the Reserve.

Table 1 shows the housing needs among Aboriginal families in a number of New South Wales towns. (DOWLING and WARD [41]). Included in the table are the average numbers of houses that have been built or purchased under the HFA or Housing Commission programmes since the Housing Commission of New South Wales took responsibility for Aboriginal housing in 1969.

The authors then deduced the average number of years a family would have to wait for a house, upon application in 1976.

The table shows there is a large discrepancy between geographical distribution of housing needs, and proposed supply.

This is having the effect of encouraging people to move to a major centre (eg. Sydney, Albury, Newcastle, Wollongong) to obtain

TABLE 1

HOUSING NEEDS OF ABORIGINAL FAMILIES IN SOME NEW SOUTH WALES TOWNS.

Community	Housing	No. of Houses Built Since June 1969 or under Construction	Average No. Built per Year Since June 1969	No. of Years to House a Family Applying Today
Wagga Wagga	1	22	3	0.3
Albury	3	19	3	1.0
Tamworth	5	24	3	2.0
Orange	4	16	2	2.0
Wollongong	13	48	7	2.0
Coffs Harbour	19	18	3	3.0
Lismore	4	9	1	4.0
Dubbo	25	39	6	4.0
Sydney/Mt. Druitt	210	279	39	5.0
Newcastle	23	32	5	5.0
Taree	10	12	2	5.0
Nowra	28	37	5	6.0
Kempsey	21	23	3	7.0
Armidale	30	31	4	7.0
Wellington	7	10	1	7.0
Collarenebri	9	10	1	9.0
Inverell	13	8	1	13.0
Narranderra	14	9	1	14.0
Griffith	16	8	1	16.0
Mungindi	10	4	0.6	17.0
Moree	75	28	4	18.0
Menindee	14	4	0.6	24.0
Wilcannia	63	13	2	32.0
Wee Waa	14	3	0.4	35.0
Condobolin	16	3	0.4	40.0
Brewarrina	43	7	1	43.0
Tingha	20	3	0.4	50.0

TABLE 1 (cont'd)

HOUSING NEEDS OF ABORIGINAL FAMILIES IN SOME NEW SOUTH WALES TOWNS

Community	Housing	No. of Houses Built Since June 1969 or under Construction	Average No. Built Per Year Since June 1969	No. of Years to House a Family Applying Today
Murrin Bridge (Lake Cargelligo)	30	4	0.6	50.0
Bourke	52	10	1	52.0
Dareton	33	3	0.4	58.0
Enngonia	16	0	0	?
Bogabilla	30	0	0	?
Goodooga	44	0	0	?

From Dowling and Ward [41].

a house, thus disrupting the community to which they have strong ties.

Many families refuse to sacrifice the security of their community for the uncertainty of urban existence, and continue to live in unhealthy environmental conditions.

2.2.2 Income and Employment

It has not been possible to obtain figures relating to the income of Aboriginal people, but it is well known that many people are dependent on social security benefits (AUSTRALIAN COUNCIL OF CHURCHES, [3]).

In March 1981, there were 4,558 Aborigines in New South Wales who were registered as unemployed with the Commonwealth employment Service (CES). The unemployment rate for the total population of New South Wales is 4.9%, but there are no statistics available to indicate the level of unemployment in the Aboriginal community.

It is believed that the number of unemployed Aborigines is actually higher than the above figure, for not all unemployed people register with the CES. The Department of Aboriginal Affairs estimates that the unemployment rate for Aborigines is 6 times higher than that for the community as a whole, and that the actual level of unemployment could be as high as 50 per cent of the Aboriginal labour force. (DEPARTMENT OF ABORIGINAL AFFAIRS [38]).

Unemployment, because of its inter-relationship with health, housing, education and economic development, can undermine any progress made in these areas.

In 1977 the Federal government adopted a National Employment Strategy for Aboriginals (NESA), which aims to improve their access to employment training, and opportunities in both the public and private sectors.

The major components of the Strategy are:-

1. The National Aboriginal Employment Development Committee (NAEDC) which promotes the employment and training of Aborigines. It comprises representatives of industry, commerce, and the Aboriginal community.

2. Community Development Employment Programmes (CDEP) which are financed by the Department of Aboriginal Affairs. These programmes provide an alternative to unemployment benefits by making money available to Aboriginal communities to allow them to pay participants for work done on projects chosen by the community.

3. The employment and training of Aborigines in the Australian Public Service and Commonwealth statutory agencies.

The Department of Aboriginal Affairs also finances the Special Work Projects programme which provides grants to Aboriginal organisations, local government and private employers to provide jobs and training for Aborigines. In all fields of employment, Aborigines are entitled to award wages, and to the same conditions under industrial awards as Australian workers generally.

The National Employment and Training Scheme (NEAT) of the Department of Employment and Youth Affairs accounts for a major pro-

portion of training for Aborigines. Grants are given to Aboriginal organisations and other institutions to provide training specifically adapted to Aboriginal needs.

Training is given in vocational skills of use to Aboriginal communities, community management, community development, financial management, and in welfare areas.

After the first 3 years of operation, significant increases in employment occurred in particular employment categories, and there has been a steady increase in the number of Aborigines participating in Training schemes.

Another Federal Government section which may affect the high level of unemployment is the Aboriginal Development Commission, which began operating on 1 July 1980. This Commission can acquire land for Aboriginal communities and groups, lend money to Aborigines for housing and personal purposes, and finance business enterprises.

Whilst these schemes are offering more opportunities for Aboriginal employment, there is still a very high unemployment rate amongst the Aborigines, which may not be alleviated by Government-backed projects. One must consider the present social and cultural background of various Aboriginal communities, and the effects these may have on employment expectations amongst Aboriginal people. Perhaps we should be channelling more energy and money into relieving poor living conditions, which in many cases can only create a negative attitude towards employment. One is given little or no incentive to work in unskilled jobs for relatively low wages, if one can get social security payments for no work at all.

2.2.3. Education

The common practice before World War II was to exclude Aborigines from the State education system, but this has changed, and educational facilities are now available to practically all Aboriginal children (MIDDLETON [85]).

Over the last decade there has been significant progress in Aboriginal education, although much still remains to be done. The 1976 Census revealed that 60% of the Aboriginal population in NSW, aged 15 years and over, had left school by the age of 15. The figure for the corresponding age-group amongst the total population of NSW was 40.8%. (Education is compulsory in New South Wales for all children up to the age of 15 years).

In 1978, only 8.1% of Aboriginal secondary students were in senior forms, compared to 20.6% for all Australian students (DEPARTMENT OF ABORIGINAL AFFAIRS [39]).

In 1970 the Aboriginal Secondary Grants Scheme was introduced by the Department of Aboriginal Affairs, to assist Aboriginal secondary students from the beginning of the year in which they reached the school leaving age (15 years).

In 1973 the scheme was extended to all secondary students. The scheme also covers primary school students from the beginning of the year in which they reach 15 years. The scheme provides a living or boarding allowance, and a book and clothing allowance to the person responsible for the student. In addition, assistance is

provided with school fees, the cost of school excursions, and extra tuition outside school hours where this is needed.

The Aboriginal Study Grants Scheme, which has been operating since 1969, caters for those Aboriginals who, after leaving school, wish to study at any level in educational institutions or who wish to receive instruction in a course specially designed to meet an individual or community need.

A full-time grantholder receives a living allowance, and there is also provision for payment of allowances for dependants, textbooks and equipment, clothing, travel costs, some establishment expenses and tutorial assistance. The scheme also provides some assistance for those studying on a part-time basis.

The number of students using the 2 grants' schemes is increasing, and one hopes that more Aboriginal students will pursue higher education levels, and change the situation where "most Aboriginal school children have few positive stereotypes to emulate; most of their adult relatives will have poor educational standards, low work aspirations and will tend to be under-employed or unemployed." (MIDDLETON [85])

2.2.4 Alcoholism

Amongst the many problems of Aboriginal people in Australia, the effects of alcoholism rank high, and have been shown to be associated with poor child care, crime and delinquency (LICKISS [79, 80,81]; COMMENTS [30]; HUNT [64]).

In New South Wales, a survey carried out in rural areas by the Health Commission showed that in over 53% of all reported deaths of Aboriginal male adults, and in 21% of all reported deaths of Aboriginal female adults, alcohol was mentioned on the death certificate as a significant medical problem. (HEALTH COMMISSION OF NEW SOUTH WALES [58]). In the cases where alcohol was mentioned as a problem in the cause of death, it was associated with a mean age at death being 10 years less than where no mention was made of it. (TABLE 2).

TABLE 2

EFFECT OF ALCOHOL ON ADULT LIFE EXPECTANCY

(Aboriginal)

	Males	Females
Alcohol problems on death certificate	45	46
No alcohol problems on death certificate	56	56

From Health Commission of New South Wales [58].

Table 3 shows the admission rates to hospitals per 1,000 population in New South Wales, for a number of alcohol-related conditions. The table differentiates between Aborigines and non-Aborigines, and shows that for all the diseases mentioned, the Aboriginal rate was markedly higher.

Kamien [69] found a prevalence of heavy drinking in 53.2% of men and 3.1% of women, living in Bourke, New South Wales. The prevalence of problem drinkers was 31.4% for men and 3.9% for women, and there

was a high degree of physical injury resulting from the degree of aggression released by the disinhibiting effects of alcohol.

TABLE 3

HOSPITAL ADMISSIONS IN NEW SOUTH WALES, 1977

ALCOHOL-RELATED DISEASES

	Rate per 1,000 population	
	Aboriginal	Non-aboriginal
Alcoholism	15.8	1.7
Cirrhosis	1.2	0.4
Peptic Ulcer	4.2	2.4
Diabetes	7.2	2.0
Hypertension	10.4	2.9
Pneumonia	17.8	3.4
Assault	11.7	0.7
Road traffic accidents	11.9	7.9
Burns	2.5	0.5
Falls	16.5	8.6

From Health Commission of New South Wales [57]

What is the reason for this high incidence of alcoholism, and alcohol-related disorders within the Aboriginal community? Albrecht[2] proposes that although white Australians also have an alcohol problem of considerable magnitude, and that the alcohol problems of the 2 communities have certain observable similarities (eg poor work habits, family instability), there are quite significant aetiological differences. Some of these are:-

- Aboriginal communities have no indigenous rules governing the use of alcohol, for they did not develop any alcoholic beverage in their traditional lifestyle. The fact that Aboriginal groups very quickly lost effective control of their own affairs precluded the growth of any customs and rules concerning the use of alcohol.

- Aborigines use alcohol to solve their psychosocial problems, ie boredom, dysfunctioning, loss of identity. Albrecht claims that Aborigines are attracted to alcohol "since contact with whites has destroyed self-identity, self-worth and the purpose and meaning of life, as well as throwing the whole of their social system into dysfunction."

- Alcohol is used as a status symbol. Until 1963, Aborigines in Australia were not allowed into bars or hotels to drink, nor were they legally allowed to buy alcohol. Since this legislation was abolished, "citizenship" was coupled with the right to drink in hotels and to buy alcohol. Many Aborigines came to see drinking as a symbol of equality.

Kamien [6.9] observed that "although intoxicated fathers often cause family disruption and great anxiety in children, enough of the positive aspects of drinking have been experienced for children to see it as a pleasurable and manly activity....It was certainly an identification with and emulation of the adult role and was often reinforced by acceptance into the adult groups."

An attempt has been made to determine whether Aborigines have a different metabolism rate of alcohol, but there was no racial

difference discerned between Aboriginal people and those of European descent (MARINOVICH et al. [84]). The authors concluded that one must look to psychosocial factors as the cause of the high level of alcoholism in adults, and not to metabolic or genetic vulnerabilities.

2.3 HEALTH STATUS OF ABORIGINAL CHILDREN IN NEW SOUTH WALES

The World Council of Churches report on Aboriginal people in Australia[3] revealed that Aboriginal children are 10 times more likely to have otitis media than non-Aboriginal children; many more Aboriginal children have some degree of hearing loss; the prevalence of trachoma, eventually leading to blindness, is 15 times greater for Aborigines than for non-Aborigines; there is a high leprosy rate among Aborigines - in an area of north-west Australia the attack rate is 100 per 100,000 population per year, which is the highest in the world.

Many of the reasons for the poor health status of Aboriginal people can be related to malnutrition, poor housing and education, and a lack of adequate medical services in some rural parts of Australia. (JOSE and WELCH [65]; DUGDALE et al. [43]; KAMIEN [70]; HITCHCOCK and GRACEY [60]; SINCLAIR [104]; RASSABY [92]; COYNE and DARNTON-HILL [31]).

2.3.1. Hospital Morbidity Rates

A report on Aboriginal hospital morbidity in rural New South Wales revealed that Aboriginal separation rates from public hospitals were 591 per 1000 population. The comparable separation rates of non-Aborigines resident in the same areas was 245 per 1000 population, thus showing that the Aboriginal rate was almost 2½ times that of non-Aborigines. The highest rates among the Aboriginal population were for children aged under 5 years.

(The separation rate refers to the number of people dis-

charged from hospital).

Children aged less than 5 years accounted for almost a third of the Aboriginal separations, a proportion which is more than double their representation in the community (HEALTH COMMISSION OF NEW SOUTH WALES [57]).

TABLE 4: Public Hospital Separations of Children, 1977

Age specific rates per 1,000 population

Age (yrs)	Aboriginal	Non-Aboriginal	Ratio of Aboriginal to Non-Aboriginal
under 1	3193	522	6.1 : 1
1	2060	308	6.7 : 1
2	1068	220	4.9 : 1
3	595	180	3.3 : 1
4	426	171	2.5 : 1

From Health Commission of New South Wales, 1980.[57]

Table 4 shows that much of the high separation rate for Aboriginal children was contributed by infants (aged less than one year) and children aged one to two years. In both of these age groups, Aboriginal children had more than six times the separation rates for non-Aboriginal children.

For both Aboriginal and non-Aboriginal children, the separation rates decreased as the age of the children increased, but at age 4 years, Aboriginal children had a separation rate which was more than double that of non-Aboriginal children.

Readmissions made a sizeable contribution to the separation rate for Aboriginal children under five years, and Aboriginal infants aged less than one year had the highest repeat hospitalisation during the year.(TABLE 5). Table 6 shows that the main causes of hospitalisation of Aborigines aged less than 5 years were:-

- respiratory diseases (principally acute respiratory infections and bronchitis, asthma and emphysema).
- infective and parasitic diseases (chiefly enteritis and diarrhoeal diseases).
- diseases of the nervous system and sense organs (principally ear conditions).

In the 5-14 year age group, the overall separation rate dropped considerably, but respiratory diseases were still the leading cause of hospitalisation. In this age group, injuries formed a much higher proportion of the total separations.

In a survey of 120 Aboriginal children in Sydney, Lickiss [79] found a high level of present and past morbidity.

Of 69 children aged five years or more, 23 (33%) had been in hospital at least 3 times in the first 5 years of life; 12 (17%) had been in hospital at least 5 times in that period. The main illnesses causing hospital admission were respiratory infections, gastrointestinal symptoms and trauma.

TABLE 5: Aboriginal Children Aged less than Five Years Separated from Public Hospitals in Country Regions, * 1977.

Percentage of children with repeat hospitalisations during year by age at admission and number of separations.

Number of Separations during year	<1 year	1-2 years	2-4 years	Total Under 5 years
1	60.3	67.7	78.2	65.9
2	19.9	16.9	14.1	16.8
3	8.9	7.2	4.3	8.0
4	5.3	2.7	2.0	3.9
5	1.9	1.7	0.5	1.5
6	1.5	2.3	0.6	1.5
7	0.6	0.2	0.2	0.8
8	0.9	0.8	-	0.7
9	0.5	0.2	-	0.4
10	0.1	0.2	-	0.3
11	0.1	0.2	-	0.1
12	-	-	0.1	0.1
13	-	-	-	0.1
.				
.				
.				
22	-	-	-	0.1
	100	100	100	100
Number of Children	798	598	817	1090
Repeat Separations as % of Total	45.9	40.9	26.7	43.6
% of children with four or more seps.	10.9	8.2	3.4	9.4

* Hospitals in North Coast, New England, Orana & Far West, Central West and South Eastern Regions.

From Health Commission of New South Wales [57].

TABLE 6: Separations of Aboriginal Residents of Country Regions*, 1977: Diagnosis by Age and Sex - Age-Sex Specific Rates per 1,000 Population.

Disease	PERSONS								
	AGE (Years)								
	0-4	5-14	15-24	25-34	35-44	45-54	55-64	65+	Total
Infective and Parasitic	262	21	12	15	12	19	18	43	53
Neoplasms	1	1	4	7	7	15	11	45	5
Endocrine, Nutritional and Metabolic	23	0	2	9	24	37	44	90	13
Blood & Blood-forming organs	12	4	3	1	2	6	-	2	4
Mental Disorders	2	1	20	53	88	71	56	54	26
Nervous system and sense organs	105	25	10	25	51	41	39	34	38
Circulatory system	1	2	5	25	77	112	152	263	29
Respiratory system	549	64	24	47	88	98	184	319	139
Digestive System	44	18	24	47	60	48	42	51	34
Genito-urinary system	14	9	38	39	56	29	37	60	27
Pregnancy, Childbirth & Puerperium	-	1	139	83	32	2	-	-	43
Skin & Subcutaneous Tissue	60	21	10	17	16	20	14	26	23
Musculoskeletal & Connective Tissue	1	4	7	15	18	17	28	49	10
Congenital Anomalies	12	2	1	2	1	1	2	-	3
Perinatal Morbidity	19	-	-	-	-	-	-	-	3
Symptoms & Ill-defined Conditions	81	25	36	46	67	60	60	139	48
Accidents, Poisonings & Violence	75	48	84	106	80	89	65	71	73
Supplementary Classifications	45	5	21	29	32	7	4	49	21
All Diseases	1307	249	441	565	708	671	753	1296	591

* North Coast, New England, Orana & Far West, Central West and South Eastern Regions.
From Health Commission of New South Wales. [57]

2.3.2. Mortality Rates

The New South Wales Health Commission report on Aboriginal mortality [58] in country areas revealed that the infant mortality rate for Aborigines is estimated at 52 per 1,000 live births, and that for non-Aborigines the mortality rate is 12.2 per 1,000 live births.

Thirteen per cent of Aboriginal deaths occurred in the 0-9 year age group, a figure much higher than the 3.6 per cent of deaths in the total population, in the corresponding age group.

Since the race of children is not usually noted in city hospital records, it is not possible to obtain an accurate figure for child mortality amongst Aboriginal children in Sydney.

2.3.3. Malnutrition and Disease Patterns

Malnutrition is a disturbingly common condition amongst Aboriginal children in New South Wales, and as well as being viewed as a prime cause of much of the poor health status of Aboriginal children it has also been linked to low intellectual development. (EDWARDS [45]; EDWARDS and CRADDOCK [46]).

The effects of malnutrition are evident in high infant and child mortality and morbidity rates. It has been shown by several researchers that the excess in infant mortality is due to deaths after one month of age. (EDWARDS et al. [47]; LOVELL et al. [83]; FYSH et al. [52]).

These deaths are more attributable to post-natal causes than to congenital abnormalities, and the leading causes of death for this age group have been cited as gastroenteritis, respiratory diseases, malnutrition and other infectious diseases.

Low levels of vitamins and minerals in blood fluids have been reported in a large percentage of Aboriginal children in New South Wales (MOODIE [86]; NOBILE [89]; KAMIEN [74]; COYNE and DARNTON-HILL [32]; DOWLING et al. [42]).

Dowling et al found that Aboriginal children in Walgett had lower mean levels of plasma ascorbic acid than white children in the same area, and up to three times the proportion of children with low or deficient plasma ascorbic acid levels. Over three times the proportion of Aboriginal children had ascorbic acid intakes below FAO/WHO recommended levels (250 mg daily), compared with non-Aboriginal children.

Aboriginal children also had a significantly lower dietary intake of protein, riboflavin and ascorbic acid.

Nobile found that plasma vitamin C levels of 0.0 to 0.1 mg/100ml which are considered deficient by any standards, were found only amongst the Aborigines examined in a study carried out at Collarenebni and Walgett.

Unacceptable plasma levels of Vitamin A and Vitamin E were present in a significant number of Aboriginal children aged up to 6 years, and Nobile feels that these low levels may be a sign of either

poor nutrition or disturbance in gastrointestinal absorption resulting form infections, or a combination of both causes.

Aborigines also had a higher incidence of inadequate Vit B_2 status.

Coyne and Dowling found that in over 100 preschool age Aboriginal children in New South Wales, 42 per cent had lower deficient levels of vitamin C and 54 per cent had low levels of ferritin, which is considered to be a more sensitive measure of iron deficiency.

These poor nutritional states have been directly associated with the high prevalence of infectious and other diseases amongst Aboriginal children, including worm infestations, skin diseases, trachoma, eye and ear infections, respiratory infections, and disorders of the digestive system. (MOODIE [86]; HARRIS et al. [56]; KAMIEN [68,72]; DOWLING et al. [42])

Kamien, in a study on 410 Aboriginal children under 15 years of age at Bourke, found that all but 2 children with eye disease had acute trachoma. Fifty-six per cent of children under 5 years of age were affected, and Kamien associates trachoma with "overcrowding, uncontrolled breeding and flies and poor facilities for adequate hygiene." He claims that white Australians have a low prevalence of trachoma. Intestinal parasites were found in 63.3 per cent of 158 subjects tested for worms.

A history of recurrent upper respiratory tract infection was found in 51 (56%) children aged 1 to 4 years, in 26 (20.3%)

children aged 5 to 9 years and in eight (8.5%) children aged 10 to 14 years.

Dowling et al. [42] in a survey of children at Walgett, found that 57 per cent of Aboriginal children had trachoma, whereas only 3 per cent of the white children studied had evidence of trachoma. The prevalence of hearing loss and of all forms of ear disease was greater amongst Aborigines than amongst the whites.

The authors also noted that there was a higher incidence of absenteeism from school among the Aborigines.

Moodie [86] in a medical survey of an Aboriginal community at Nowra, reports that when mothers were questioned systematically as to what illnesses 334 children had experienced in the four weeks prior to examination, 83 per cent were stated to have had an upper respiratory tract infection of some sort; approximately 9 per cent had suffered from diarrhoea or gastroenteritis, and just over 1 per cent had suffered from a urinary infection or "kidney trouble."

Of previous serious illnesses amongst these children, the most common were pneumonia and gastroenteritis.

2.3.4. Growth Retardation

Growth retardation is also evident in many Aboriginal communities. Edwards [45] found that in Walgett, Aboriginal children examined had 49 to 65 per cent of height, weight and head circumference measurements which were less than the 10th percentile, when compared with the Caucasion children.

The age group most affected by growth retardation is between 6 months and 2 years, when the child is most susceptible to nutritional, parasitic and infectious insults.

Thirty-one per cent of the Aboriginal children were malnourished, while only 1 per cent of the Caucasian children were in that state. This was determined using the criterion that a child is considered to be malnourished if it has a growth index under 70 per cent for both weight and height (JOSE and WELCH [65]).

Rassaby [92] also found evidence of growth retardation in Aboriginal children in Sydney, using figures compiled in the Under-five's clinic at the Aboriginal Medical Service at Redfern.

Seventy per cent of Aboriginal children seen at the clinic had growth weights below the median, and 25 per cent of the children had growth weights below the 3rd percentile.

Rassaby found that of those whose weights were in the 3rd perc entile group:-

80% were 3 years of age or under

64% were anaemic

27% had lactose intolerance

60% had a parasitic infestation of the bowel

32% had at least 1 perforated eardrum

20% had had more than 2 admissions to hospital in the first year of life, with an average length of stay of 88 days.

Based on a total population figure of 17,000 Aborigines in Sydney, the Aboriginal Medical service estimated that 250 children, of 3 years of age or under, were in need of urgent nutritional intervention.

2.3.5. Infant Feeding Practices

Relatively little has been written about infant feeding practices among Aboriginal groups which may be responsible for this picture of malnutrition.

COYNE and DARNTON-HILL [32] feel that in Aboriginal communities there is a trend away from breast feeding and to inadequate weaning foods, such as is found in developing countries.

JOSE and WELCH [65] observed that in Queensland, breast feeding is practised less and less and is unusual past five months of age. They also noted that more children growing normally were breast-fed than those with retarded growth.

In a survey of 146 Aboriginal mothers in New South Wales (COYNE and DOWLING [33]), 52 per cent of the infants were breast fed at birth. This is considerably less than the 79 per cent of infants surveyed in Sydney hospitals in 1976-77 (COYNE and DARNTON-HILL [32]). By three months of age of the infant, this figure had dropped to 31 per cent, and to 16 per cent by six months.

Aboriginal infants were often bottle-fed well past a year, and highly sweetened preparations such as rose hip syrups, cordials and sweetened tea wereliberally given by bottle. Infant foods were predominantly potatoes, pumpkin and highly sweetened tinned custards

and gels.

Rassaby [92] claims that malnutrition amongst Aboriginal children in Sydney can be related to the poor nutritional status of pregnant women, the prevalence of unsatisfactory infant feeding practices, and especially the low incidence of breast feeding, which leads to a removal of protective factors in breast milk.

2.4 HEALTH STATUS OF ABORIGINAL ADULTS IN NEW SOUTH WALES

2.4.1. Hospital Morbidity Rates

The New South Wales Health Commission report on Aboriginal hospital morbidity in rural areas of NSW revealed that Aboriginal separation rates were higher than those of non-Aborigines in all age and sex groups (HEALTH COMMISSION OF NEW SOUTH WALES [57]).

Respiratory diseases, injuries and infective and parasitic diseases were the major causes of hospitalisation of Aborigines.

The Aboriginal separation rate for respiratory diseases was five times that of the non-Aborigines, and the injury rate was 2½ times greater.

Infective and parasitic diseases, which include gastroenteritis and tuberculosis, had a separation rate in the Aborigines which was 6 times that of non-Aborigines. (Table 7)

Table 8 shows public hospital separation and bed-day rates per 1000 population, and one can see that the Aboriginal rates were higher in all areas, with the combined separation rate of the Aboriginal people being almost 2½ times that of the non-Aboriginal population.

Figure 1 shows that there was a gradual increase in circulatory disease to age 25-34, and then a rapid increase to a peak at age 65 years and over. The major diseases in this group were of the hypertensive, cardiac and cerebrovascular type.

TABLE 7: Public Hospital Separations of Residents of Country Regions* 1977. Principal Diagnosis - Rate per 1,000 Population.

Principal Diagnosis	Separations per 1,000 pop.	
	Aboriginal	Non-Aboriginal
Enteritis and diarrhoeal diseases	33.6	4.9
Tuberculosis	1.2	0.2
Other Infective and Parasitic diseases	18.6	4.5
All infective and parasitic diseases	53.4	9.6
Malignant Neoplasms	2.5	7.2
Neoplasms of lymphatic & haematopoietic tissue	0.4	1.2
Other Neoplasms	2.2	3.6
All Neoplasms	5.1	12.0
Diabetes mellitis	7.2	2.0
Nutritional disorders	3.1	0.4
Other endocrine, nutritional & metabolic diseases	2.6	1.2
All endocrine, nutritional & metabolic diseases	12.8	3.6
Blood and Blood-forming organs	4.3	1.6
Alcoholic psychosis	1.3	0.2
Other psychosis	2.6	1.7
Alcoholism	15.8	1.7
Other Neuroses	6.3	3.5
Mental Retardation	0.2	0.1
All Mental disorders	26.3	7.1
Inflammatory diseases of the eye	2.4	0.6
Other diseases of the eye	2.2	2.6
Diseases of ear	20.7	2.4
Other diseases of nervous system & sense organs	12.5	5.0
All diseases of nervous system & sense organs	37.8	10.6
Chronic rheumatic heart disease	0.6	0.3
Hypertensive disease	10.4	2.9
Ischaemic heart disease	6.5	6.2
Other forms of heart diseases	5.8	4.8
Cerebrovascular diseases	2.2	3.6
Other diseases of circulatory system	3.5	5.6
All diseases of circulatory system	29.0	23.4
Acute respiratory infections	54.0	7.3
Influenza	4.4	0.9
Pneumonia	17.8	3.4
Bronchitis, emphysema & asthma	44.5	8.4
Hypertrophy of tonsils and adenoids	4.2	4.6
Other respiratory diseases	13.8	4.2

cont'd next page..

Table 7 cont'd

Principal Diagnosis	Separations per 1,000 pop.	
	Aboriginal	Non-Aboriginal
All diseases of respiratory system	138.7	28.7
Diseases of oral cavity	7.9	3.3
Peptic ulcer	4.2	2.4
Appendicitis	4.5	4.9
Intestinal obstruction and hernia	2.1	3.8
Cirrhosis of liver	1.2	0.4
Cholelithiasis & cholecystitis	3.5	2.6
Other diseases digestive system	10.5	6.3
All diseases of digestive system	33.9	23.7
Nephritis and nephrosis	0.6	1.5
Infection of Kidney	4.5	0.7
Other diseases of genito-urinary system	21.9	17.2
All diseases of genito-urinary system	27.1	19.4
Complications of pregnancy, abortion	17.7	7.4
Normal delivery	19.2	12.3
Complications of delivery & puerperium	5.6	4.0
All pregnancy, childbirth and puerperium	42.5	23.7
Diseases of skin & subcutaneous tissue	23.3	5.7
Diseases of musculoskeletal system & connective tissue	9.6	9.7
Congenital anomalies	2.7	2.5
Certain causes of perinatal morbidity	2.8	0.9
Symptoms & ill defined conditions	47.6	20.5
Accidents, poisonings & violence	73.2	29.5
Supplementary classification	20.8	13.1
TOTAL	590.7	245.3

* North Coast, New England, Orana & Far West, Central West and South Eastern Regions.

From Health Commission of New South Wales.

TABLE 8: PUBLIC HOSPITALS SEPARATIONS AND BED-DAYS PER 1,000 POPULATION

1977

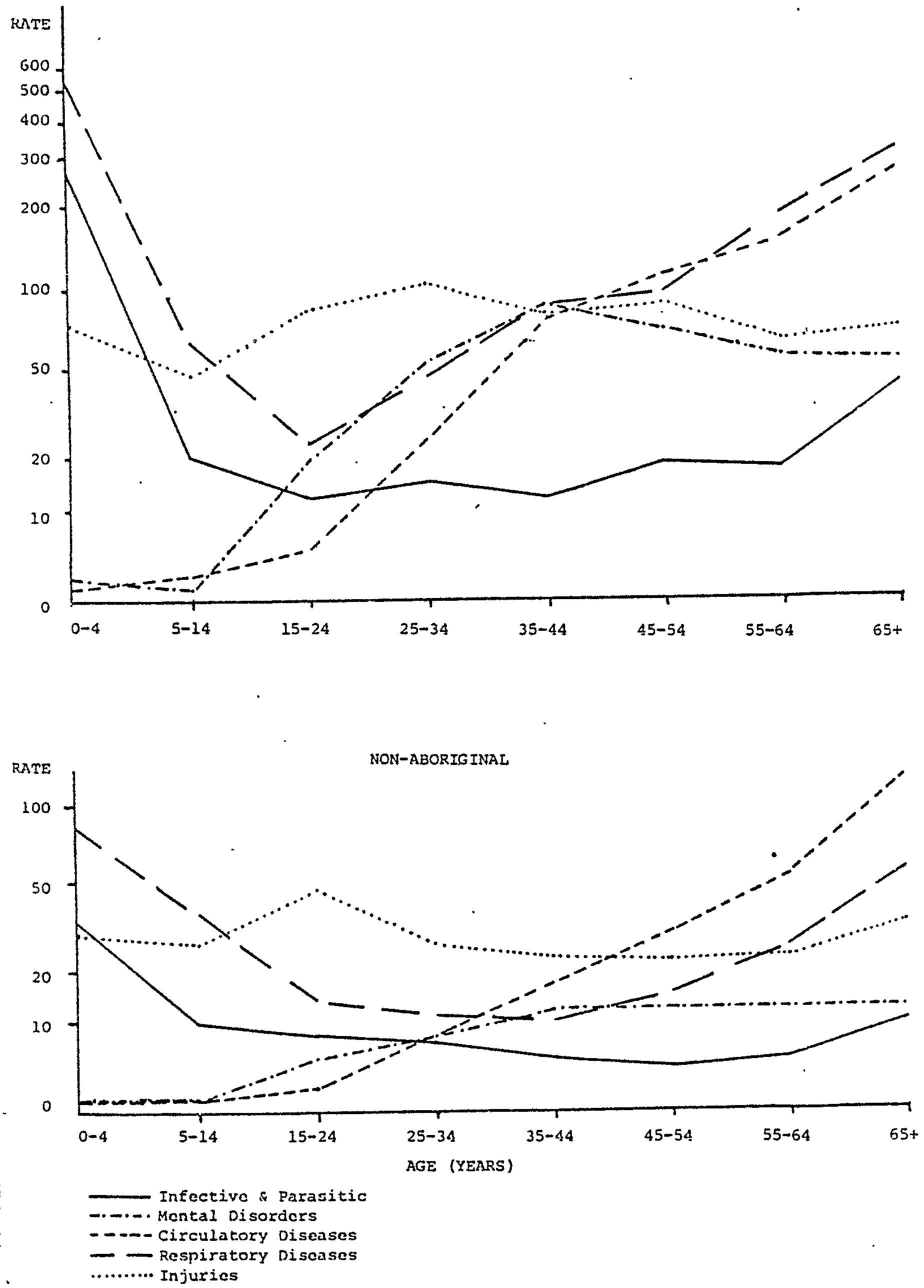
Region of Residence	Separations/1000 population*		Bed-days/1000 population*	
	Aboriginal	Non-aboriginal	Aboriginal	Non-Aboriginal
North Coast	612.3	259.4	5,684	2,212
New England	399.8	251.2	3,315	2,125
Orana & Far West	750.8	240.6	5,474	2,397
Central West	585.4	245.4	3,397	3,043
South Eastern	430.4	214.7	3,369	2,182
Combined Country [1]	590.7	245.3	4,611	2,375

[1] Combined North Coast, New England, Orana & Far West, Central West and South Eastern Regions.

* Excludes private hospitals

From Health Commission of New South Wales [57].

FIGURE 4 : Comparison of Aboriginal and Non-aboriginal leading causes of Hospitalisation. Age specific Rate per 1,000 population.



From Health Commission of New South Wales[57].

Respiratory diseases showed a peak among the young, with a reduction amongst older children and young adults, followed by an increase from age 35-44 years, to a further peak at 65 years and over. The main diseases in the adults were pneumonia, bronchitis, emphysema and asthma.

Mental disorders reached a peak at age 35-44 years, and the report claims that this is due to a high rate of alcoholism among males, and "alcoholism and neuroses" among females.

Hospitalisation for injuries caused by accidents, poisonings or violence showed high rates in all age and sex groups.

These statistics indicate that Aborigines in rural New South Wales would have a higher incidence of diseases whose severity warrants hospitalisation, than the non-Aboriginal community.

2.4.2. Mortality Rates

The New South Wales Health Commission report on Aboriginal mortality in country areas of New South Wales shows that the average life expectancy of a New South Wales Aborigine at birth is approximately 52 years, which is 20 years less than the life-expectancy of a non-Aborigine (HEALTH COMMISSION OF NEW SOUTH WALES [58]).

In comparison to the total population, it was found that Aborigines have a disproportionate member of deaths from pneumonia, gastroenteritis, other diarrhoeal diseases, cirrhosis of the liver, pancreatitis, cot deaths and motor vehicle accidents.

Of all deaths reported, one in four occurred before the age of 30, which is a much higher rate than that of the total population, which is 1 in 14.

TABLE 9: Percentage Distribution of Deaths by Age 1978 and 1979

Age Group	Aboriginal Population %	Total Population %
0- 9	13.0	3.6
10-19	3.4	1.3
20-29	9.0	2.0
30-39	14.1	2.2
40-49	15.3	5.0
50-59	15.8	11.5
60-69	13.0	20.7
70-79	12.4	26.6
80+	4.0	27.2
All Ages	100.0	100.0

From Health Commission of New South Wales.[58]

Table 9 also shows that over one in two Aboriginal deaths occurred before the age of 50, compared with the rate of 1 in 7 of the total population. This pattern can be related to the predominantly young population structure of the Aboriginal people (APPENDIX 3).

At every age group the death rate in the Aboriginal population is substantially higher than amongst the total population. (Table 10)

The difference is particularly significant in the 35-44 year age bracket group, where the death rate for Aborigines is 26.5 and 17.1 deaths per thousand population for males and females respectively, compared to 2.7 and 1.8 for males and females in the total population.

The age-sex standardised death rate for male Aborigines is almost 4 times greater than the total population, while the rate for females is 3½ times greater.

2.4.3. Illness Patterns

It is not known whether people in adolescence and adulthood recover completely from the early malnutrition, but it has been shown that, compared with white Australians, the Aboriginal adolescent and adult heights are less (JOSE and WELCH [65]; ABBIE [1]; DOWLING et al. [42]).

There have not been as many medical surveys carried out on Aboriginal adults, as on children, but it appears that, increasingly, the Aborigine is acquiring the degenerative disease pattern of western society.

Psychological distress, including behavioural disorders and personality defects, is now becoming widely evident amongst Aborigines. Many are regarded as lazy and indolent, when they are, in fact, "exhibiting 'psychic numbing' - a response to disaster expressed in apathy, withdrawal or depression... It is often associated with

TABLE 10

Comparison of Aboriginal and Non-Aboriginal Age Specific Death Rates for New South Wales

No. of deaths per 1,000 population

	0-4	5-14	15-24	25-34	35-44	45-54	55-64	65+
				MALES				
Aboriginal	8.3	0.3	4.7	8.8	26.5	41.7	67.2	112.8
Non-Aboriginal	3.5	0.4	1.6	1.3	2.7	7.8	19.6	70.5
				FEMALES				
Aboriginal	13.3	0.7	3.0	1.5	17.1	22.7	23.7	96.1
Non-Aboriginal	2.7	0.2	0.5	0.7	1.8	4.2	9.9	50.9
				TOTAL				
Aboriginal	10.7	0.5	3.9	5.3	21.8	32.2	46.8	107.2
Non-Aboriginal	3.1	0.3	1.1	1.0	2.2	6.0	14.6	58.9

From Health Commission of New South Wales.

an increase in drinking and overeating." (DEVESON [40]).

Obesity is also emerging as an important problem, particularly amongst the women. This is related to overconsumption of highly refined carbohydrate and other non-nutritious foods, and alcohol. (GRACEY [53]).

In a health survey of Aboriginal adults in Bourke, Kamien [72] found that 70 per cent had had a history of recent medical or dental illness, and that 79 per cent wore in need of medical attention.

Seventy per cent of the people were in need of dental treatment, which was the greatest single treatment need.

Other common conditions requiring treatment were eye disorders, skin disorders, gastrointestinal and respiratory system disorders.

Obesity was recorded in 5.3 per cent of men, and in 19.2 per cent of women. In women, the prevalence of obesity increased with age, rising from 15.4 per cent in women aged 20 to 29 years of age, to 50 per cent in women over 50 years of age.

The staple diet of Bourke Aborigines was predominantly white bread, damper made from white flour, "johnny cakes" made from the same dough and fried in dripping. These were usually eaten with golden syrup, jam or honey, sweetened white tea. (KAMIEN [75])

The source of protein was meat, fish and eggs. Fruit and vegetables were obtained generally once per week, and were usually all eaten on the day of purchase.

The children consumed large quantities of ice blocks, ice creams, sweets, potato crisps and sweetened aerated drinks.

Nobile [89] has shown that Aborigines in a rural area of New South Wales had low blood plasma levels of vitamins C, A and E, when compared with their Caucasian counterparts and that 17 of 26 Aboriginal women tested had low plasma levels of folic acid. The author found a statistically significant correlation between the plasma levels of folic acid and vitamin C in these women.

Forty-six per cent of the Aboriginal women of child-bearing age had multiple biochemical deficiencies, namely of the vitamins B_1, B_2, B_6, C and folic acid.

Lickiss [82] found many alcohol-related problems amongst Aborigines living in Sydney, including psychological and psychiatric disorders. The author feels that urbanised Aborigines are suffering from "stress and social disintegration", related to their low socio-economic status, difficulties in adapting to the urban situation, and loss of cultural indentity.

CHAPTER THREE

ORAL HEALTH STATUS OF ABORIGINES

3.1 CHANGING PREVALENCE OF DENTAL CARIES

Barrett [12] states that "under primitive conditions dental caries in Australian Aborigines was virtually non-existent in the infant, juvenile, adolescent and young periods of life."

Campbell [23], from his study of skull material and living subjects observes that "caries in the Australian Aboriginal in his native state is shown... to be considerably lower in its incidence than modern civilised man and even most primitive groups." He also states that caries is "almost completely absent among children and adolescents in their native state; with these natives it appears to be largely a disease associated with later life and senescence."

People living under "primitive" conditions chewed tough, fibrous foods which had a cleansing effect, and their teeth also showed marked occlusal fissures and grooves, thereby eliminating lodgement areas for food. The nomadic lifestyle of food-gathering and hunting did not yield many foodstuffs which could be considered a source of fermentable carbohydrate (CAMPBELL [19]).

Many studies were done on Aboriginal people living in the outback, in South and Central Australia, by members of various University of Adelaide expeditions.

Table 11 summarises the findings in relation to prevalence of dental caries in the various groups examined. Since most of the people had been in various stages of detribalisation, Table 11 groups

TABLE 11:

CARIES INCIDENCE IN ABORIGINAL SUBJECTS EXAMINED ON UNIVERSITY OF ADELAIDE FIELD EXPEDITIONS

Observers	Location	Year	Subjects	Percentage of subjects with caries	Teeth examined	Per cent of teeth with caries
GROUP 1: Almost Complete Adoption of Civilised Food Habits by Aborigines						
Campbell & Lewis 1926	Ooldea	1926	30	60.0	-	17.2
Campbell & Moore, 1930	Koolibba	1929	38	81.5	975	15.6
Reade, 1965	Koonibba	1958	171	74.0	3415	12.7
Barrett & Williamson, 1972	Yuendumu	1970	309	48.5	6144	4.4
GROUP 2: Partial Adoption of Civilised Food Habits By Aborigines						
Campbell & Gray, 1936	McDonald Downs	1930	54	68.4	1516	13.1
Campbell, 1938	Pandy Pandy	1934	29	55.0	775	8.3

Cont'd next page...

TABLE 11 (Cont'd)

CARIES INCIDENCE IN ABORIGINAL SUBJECTS EXAMINED ON UNIVERSITY OF ADELAIDE FIELD EXPEDITIONS

Observers	Location	Year	Subjects	Percentage of subjects with caries	Teeth examined	Percent of teeth with caries
GROUP 2 (con'd): Partial Adoption of Civilised Food Habits by Aborigines						
Barrett, 1953	Yuendumu	1951-2	193	30.6	4374	5.3
Cran, 1955	Yuendumu	1955	118	25.4	-	-
Heithersay, 1959	Haast's Bluff	1956	140	-	3679	10.0
GROUP 3: Natural Food Habits of Nomadic Aborigines						
Campbell 1937	Hermannsburg	1929	82	41.5	2564	4.7
Campbell 1938	Mt. Liebig	1932	61	42.6	1785	6.4
Campbell 1938	Cockatoo Creek	1931	73	34.2	2098	4.2

Adapted from a table by Reade [92].

the Aborigines according to food habits.

It was a constant finding among the researchers that an increase in caries prevalence amongst Aboriginal people can be directly related to the degree to which a civilised diet is adopted.

The notable exception in the table is the occurrence of dental caries at the Yuendumu settlement. This particular settlement was chosen to be studied because the people living there were in the process of "detribalisation", and a number of expeditions were undertaken over several years, to record any changes in the Aborigines' diet, pattern of living, and dental conditions (CAMPBELL and BARRETT [24]; BARRETT [10]; CRAN [35]: BARRETT [11]: CRAN [36,37]; BARRETT and WILLIAMSON [13]; WILLIAMSON and BARRETT [12]).

It was observed that as the diet changed, the dental caries rate increased, especially among the children and young adults. However, as can be seen in the table, the incidence of caries is still much lower than that occurring in groups experiencing similar processes of "detribalisation", and the rate was much lower than that of young people living in Australian communities.

Barrett and Williamson attribute this low rate of caries to the naturally high fluoride levels in the water supply at Yuendumu (1.3 to 1.8 parts per million). Cran [35] claims that as the Aborigines at Yuendumu become "less and less nomadic in their habits", and more dependant on a constant water supply, they should experience a caries inhibiting influence from the fluoride.

A general ovservation made by all the authors in Table 11 was that the rate of caries tended to increase with increasing age, and that caries was almost non-existent in children. However, as a more civilised diet was adopted, there tended to be an increased occurrence of caries in children and young adults (READE [93]; BARRETT and WILLIAMSON [13]).

The trend of increased caries incidence associated with increasing age was opposite to that found in the white population (CAMPBELL [23]).

Moody [87] observed that 37% of Aborigines examined on Groote Eylandt in the Northern Territory exhibited dental caries, and 37% of those examined at Roper River had dental caries. Both groups of people were living on a mission where they were provided with "white man's food", which they supplemented with native foods found in the bush.

3.2 RECENT STUDIES ON CARIES PREVALENCE AMONGST ABORIGINAL PEOPLE

In an oral health survey of the native inhabitants of the Cape York and Torres Strait Islands region of Queensland (HOMAN and DAVIES [62]) it was found that all age groups had at least 50% of persons affected by dental caries (except the 8-year old age group).

In the adult group, 9 teeth per person had been extracted, and 1 tooth per person was indicated for extraction because of dental caries.

There was a mean prevalence of 6 df deciduous teeth at age 6, and 6 DMF permanent teeth at age 12, which is in sharp contrast to earlier observations in Central Australia (CAMPBELL [23]).

D = decayed permanent tooth

M = missing permanent tooth

F = restored filled permanent tooth

d = decayed deciduous tooth

f = filled deciduous tooth

The authors state that, previously, it was believed that Torres Strait Islanders and Aborigines had a lower prevalence of dental caries than other people in Queensland, but their findings have now disproved this. The prevalence of dental caries was now parallel with children in country districts of Queensland.

The communities studied were dependent on European food, and children had "ready access to sweet biscuits, sugar, golden syrup, jam, sweets and soft drinks."

Kamien [73], in studying the patterns of illness in an Aboriginal community at Bourke, New South Wales, found that 38% of children 5-14 years of age, had gross dental caries. Although 27% of the children had complained of a toothache in the previous year, only 11% had ever attended a dentist.

In the adult population, "easily visible caries" was found in 66% of the men and 74% of the women; only 45% of the men, and 56% of the women had ever received dental treatment at any stage of their lives.

Kamien observed that the diet of the Aboriginal people was "very high in carbohydrate, and dental treatment was not easily accessible." He claimed that noone had even been encouraged to seek dental care, and the only toothbrush he was able to discover on Bourke Reserve was used for cleaning a gun.

A recent survey of oral conditions of Aboriginal people in a country area of New South Wales was done by Schamschula et al.([100; 101]) whose findings reflect the deterioration of oral health of Aborigines who are "displaced from their tribal lands and unable to adapt to the rapid cultural and environmental changes". These people "conduct a lethargic existence, often entirely dependent upon social services, living in fringe communities around small towns in sparsely-populated areas", and their traditional diet has now been replaced largely by processed foods.

Amongst the children, it was observed that there was a higher prevalence and greater severity of caries in the Aboriginal population than in the Caucasian.

TABLE 12:

Mean Caries Experience and severity rating (SR) of carious lesions of Aboriginal (A) and Caucasian (C) children.

	6-8 years				10-11 years			
	A	C	t	P	A	C	t	P
n	51	31			77	52		
DIMFT	2.0 (1.6)	1.2 (1.6)	2.20	0.05	3.9 (2.8)	3.7 (2.2)	0.45	NS
SR	4.1 (4.7)	1.3 (1.8)	3.79	0.001	6.7 (5.7)	4.4 (4.2)	2.64	0.01

( ) = s.d.

From Schamschula et al. [100]

Table 12 shows the mean values for caries experience, and severity rating of the Aboriginal and Caucasian children. The severity rating (SR) of a carious lesion is based on assigning an arbitrary weight to each lesion according to its destructiveness and penetration.

In the 6-8 year age group the lesions were nearly three times as progressive and destructive in the Aboriginal than in Caucasian children. In this age group, where the first permanent molars were the only permanent teeth at risk for a substantial period, Aboriginal children had a significantly greater number of teeth affected by caries than the Caucasians.

In the 10-11 age group, the difference in the mean number of

teeth affected by caries was negligible.

In both age groups there was a substantial difference in SR, to the detriment of the Aboriginal children.

In the 6-8 year age group there were 29% of the Aboriginal, and 58% of the Caucasian children who were caries-free; in the 10-11 year age group these numbers were 5% and 6% respectively.

TABLE 13:

Proportionate distribution of the components of the DIMFT index for Aboriginal (A) and Caucasian (C) children.

	6-8 years		10-11 years	
	A	C	A	C
n	36	13	73	49
D%	97.2	94.2	73.8	55.5
I%	2.8	0.0	9.3	1.7
M%	0.0	0.0	3.1	2.3
F%	0.0	5.8	13.8	40.5

From Schamshula et al.[100]

I = Permanent tooth indicated for extraction due to caries.

Table 13 gives an analysis of the DIMFT values. In the 6-8 year age group, the D component was exceptionally high, mainly reflecting lesions in 1st permanent molars. All teeth indicated for extraction were observed in Aborigines, and Schamschula et al. feel that this was because dental care "was not available or utilised despite episodes of acute pain associated with pulp exposure." The small proportion of filled teeth was seen solely in Caucasians. The overall F: D+I ratio is 1:30, which indicates a nearly complete lack of restorative care, which was absolute in the case of Aboriginal children.

In the 10-11 year age group the D component was lower than in the 6-8 year age group for both ethnic divisions, and substantially lower in Caucasians than in Aborigines. By the age of 10-11 years the M component appeared in both ethnic groups, and the I component increased sharply in Aborigines.

The bulk of treatment needs remained unmet, for over 57% of the affected teeth required restoration or extraction in Caucasians and 83% in Aborigines.

It was found that the "emergency treatment need" classification applied to 8% of the children, nearly 90% of whom were Aborigines.

Dietary assays did not reveal significant differences between Caucasian and Aboriginal children, with respect to the frequency of carbohydrate intake in either age group.

In the study of oral health of adult Aborigines at Brewarrina

and Walgett [101], Schamschula et al. found there was a high mean caries prevalence in the younger Aborigines, with a declining total cumulative caries experience in the older age groups. The authors claim this is "typical of a community which has been exposed to increasing caries risk over the last few decades, without concurrent implementation of preventive measures."

These findings are in complete contrast with previous observations in Aboriginal communities (CAMPBELL [23]; MOODY [87]), where caries was a disease of the middle aged and elderly.

Tables 14 and 15 show the caries experience, and distribution of the DIMFT index, for the 77 dentate Aborigines examined.

The pattern of incidence of cemental caries is also in contrast with previous studies (MOODY [87]; CRAN [36]) where there was no evidence of buccal or gingival caries in the communities examined.

Table 15 shows that the greatest proportion was generally represented by the D component, with the highest value (76.7%) in the youngest age group. The proportion of I teeth was substantial in all age groups, and the M component showed a somewhat irregular, but increasing trend with age. The F component was very small in all age groups.

There were 5 subjects who were considered to be caries-free, and all were over the age of 40.

Schamschula et al. note that the 17.1 mean DIMFT per person in the 16-29 year age group is higher than any previously recorded

TABLE 14:

CARIES EXPERIENCE OF 77 DENTATE ABORIGINALS BY AGE;
Mean DIMFT Per Person

Age Stratum (Years)	n	DIMFT			
		Coronal caries only	Cemental caries	Coronal & cemental	Total
16-23 x=20.4	18	17.1 (5.9)	0.0 (0.0)	0.0 (0.0)	17.1 (5.9)
24-29 x=26.2	18	17.0 (6.7)	0.1 (0.3)	0.0 (0.0)	17.1 (6.6)
30-39 x=34.8	12	20.5 (7.8)	0.2 (0.6)	0.0 (0.0)	20.7 (6.7)
40-49 x=44.1	13	9.2 (8.5)	5.1 (9.0)	2.0 (3.5)	16.3 (10.6)
50 & over x=58.4	16	10.2 (9.9)	3.7 (4.1)	0.7 (0.9)	14.6 (10.2)

( ) = s.d.
From Schamschula et al. [101]

TABLE 15:

DISTRIBUTION OF THE COMPONENTS OF THE DIMFT INDEX FOR 77 DENTATE ABORIGINES

Age Stratum (Years)	n	DIMFT%*	D%**	I%**	M%**	F%**
16-23	18	55.6	76.7	10.0	9.8	3.5
24-29	18	55.8	59.5	15.6	20.6	4.3
30-39	12	66.4	32.1	15.6	41.4	10.9
40-49	13	50.9	61.4	2.2	34.3	2.1
50 & over	16	45.6	36.6	8.5	48.3	6.6

* Proportion of erupted teeth

** Proportion of DIMFT

From Schamschula et al. [101]

observation of Aborigines in the corresponding age group.

Caries experience in older age groups was also higher than in other previously reported studies, apart from that of Reade [93], who had assigned all lost teeth to the M category.

When comparing the data on Aboriginal caries incidence to the oral health of Australian adults of Caucasian origin, it was found that caries prevalence in the 16-29 year age group compared unfavourably with the 13.8 mean DMFT of university students in Canberra (fluoridated since 1964) in 1972 (BARNARD and BOYLES [8]), and with the 9.5 mean DMFT of university students in 1976 in Sydney, fluoridated since 1968 (BARNARD [6]).

The authors feel that although the mean caries experience of 35-44 year old dentate residents of Sydney and nearby country areas (BARNARD and MINNS [9]) was higher than in the Aboriginal corresponding age-group, the Aboriginal population is at a disadvantage in terms of restorative needs, when compared with Caucasians at all ages.

The lowest combined D and I components of the DIMFT index of the Aborigines was 45% in the 50 and over age group, and reached 87% in the 16-23 year age group. In the Caucasians, the combined D and I components range between 5 and 15%.

In the Aboriginal community there had been no decrease in the incidence of caries, as had been observed in the general community of New South Wales, caused by fluoridation of water supplies or fluoride supplementation in non-fluoridated areas.

Moodie [86] examined medically 250 past-Aboriginal children living in a New South Wales coastal community. In 1966-67, he found that "severe dental caries" was prevalent in 58% of the children, this being the second leading cause of morbidity after whip worm infestation.

3.3 PREVALENCE OF PERIODONTAL DISEASE

Early studies on oral health status of Aboriginal people were mainly concerned with quantitative data relating to caries prevalence. Observations on periodontal conditions were recorded, but much of the evidence is in subjective terms, and most authors have not quantified the severity of the disease. Since there is no universally-accepted periodontal disease index, the comparison of data is liable to subjective bias.

However, it appears that periodontal conditions of Aborigines have also been affected by their changing environment and nutrition. When Aborigines were living in a natural environment, and surviving on "bush tucker", they seem to have had a low incidence of periodontal disease. It was almost absent in children, and its prevalence tended to increase with increasing age. (CAMPBELL [15, 16, 17]). Whenever periodontal disease was present, it was generally in the form of a slight marginal gingivitis. Calculus was almost non-existant, as was periodontal recession. (MOODY, [87])

As the Aboriginal people became "detribalised", and adopted the softer European diet, their periodontal conditions started to change. Barrett [10], in his study of a tribe of Aborigines in the process of changing from a traditional lifestyle to a more Westernised one, found a high incidence of "soft hyperaemic gum margins which contrast markedly with the hyperkeratinised gum margins seen in natives living under natural conditions."

He feels that this condition is related to the " less vigorous use of jaws and teeth... such as would be provided, for example, by stripping half cooked flesh and tendons from a kangaroo cooked in native

fashion."

However, the incidences of calculus and periodontal recession in this group of people were low (CRAN [35,36]). Two studies carried out in the north of Australia have reported a very high prevalence of periodontal disease amongst Aboriginal groups in more recent times (HOMAN and DAVIES [62] ; HOMAN [61]).

The index used to assess the health of the periodontium was based on an assessment of papillary areas distal to all standing teeth. The marginal units scored were the worst affected unit in each of the twelve sections of the dentition, based on the division of each arch into one anterior and two posterior segments, on both the buccal and lingual aspects.

In the Aborigines of far North Queensland, Homan and Davies found that all children, and all but five adults showed signs of periodontal disease at the time of examination.

Forty per cent of papillary and marginal units were affected in children, and 60 per cent of both units were affected in adults. In children, periodontal disease was almost exclusively in the form of gingivitis, whereas in adults, periodontitis was the most prevalent condition.

The study in the Northern Territory revealed almost 100 per cent prevalence of periodontal disease in all age groups. It became more severe with increasing age, and resulted in considerable functional disability by the fourth decade of life.

Again, the pattern of disease changed from gingivitis to periodontitis, with increased age.

One observation which was in sharp contrast to earlier studies (MOODY [87]; CAMPBELL [22]) was that periodontal recession was prevalent, and showed a marked increase in prevalence from the 25-29 year age group to the 45-49 year age group, when it affected 68 per cent of the segments examined.

Homan feels that the "periodontal recession revealed in this survey can only be interpreted as one indicator of periodontal deterioration under present-day social and environmental conditions."

Plaque and calculus deposits were widespread in all the communities studied, and many adults' teeth were in need of extraction, due to the effects of periodontal disease.

Schamschula et al. [101] in a study of Aboriginal people living in western New South Wales, reported a "widespread and almost uniform neglect of cleaning teeth, which became more prevalent with age." On the average, one-half of the tooth crown was covered by soft deposits, and calculus was also highly prevalent, with the proportion of subgingival deposits increasing with age.

The onset of periodontal disease was early and contributed substantially to tooth less over the age of 30 years. The authors found that the mean periodontal index determined in their study was higher than in communities of predominantly Caucasian origin in Canberra and Sydney, and equalled or exceeded that in a primitive population in New Guinea, where regular oral hygiene practices were

unknown (SCHAMSCHULA et al. [99]).

Kamien [72] while carrying out a health survey of Aboriginal adults living in Bourke, found that "moderate" periodontal disease was found in 39.3 per cent of the men and in 17.4 per cent of the women. He observed that the Aborigines' diet was "very high in carbohydrate and dental treatment was not as accessible as it might have been."

Although there have not been many reports on periodontal conditions in Aborigines, we can see that there is a change in the periodontal status associated with a changed lifestyle. Whereas tough fibrous foods used to stimulate and cleanse the periodontal tissues, Aboriginal people are now exposed to softer, farinaceous foods which tend to adhere to gum margins and require very little masticatory effort. In the absence of adequate oral hygiene, this eventually leads to periodontal destruction.

3.4 OTHER FACTORS RELATING TO ORAL HEALTH

Since there have been very few dental surveys of Aboriginal people in New South Wales, there is a great paucity of information relating directly to oral health status of Aborigines.

We do not know:-

- the comparative dietary intakes of black and white communities, especially with regard to consumption of carbohydrate foods.

- the frequency of consumption of sugars and refined carbohydrates by Aboriginal people

- the frequency of toothbrushing, or use of any oral hygiene measures by Aboriginal people

- whether every Aboriginal person possesses a toothbrush

- the number of Aboriginal people who do not use a major community water supply, ie, those who rely on river, artesian or rain water

- the percentage of Aboriginal children with malocclusion, requiring orthodontic treatment

- the attitudes of Aboriginal people towards dental health and the delivery of dental services

- the utilisation of available dental services by Aboriginal people.

Very little is known about prosthetic requirements of Aboriginal people. Schamschula et al. [101] in examining 77 dentate subjects living in the Brewarrina-Walgett areas of New South Wales, found that 50% of the subjects in the 16-23 year age group, and 88% in the 20-29 year age group were in need of partial replacement of teeth.

In the 30-39 year age group all subjects needed partial or full dentures, and for those adults older than 40 years, it was considered that full dentures were the only practical form of oral rehabilitation for 60% of the subjects.

Ninety-five per cent of the prosthetic requirements were unmet.

In examining children in the same area, Schamschula et al. [100] found that Aboriginal children had approximately 2.5 times the frequency of enamel hypoplasia and opacities than the Caucasian children.

Whilst the typical defects seen in Caucasian children were "idiopathic" white spots affecting one or a few teeth, a large number of Aboriginal children had severe pitting and linear hypoplasia involving numerous teeth.

Although the nutritional status of the children was not assessed, it is pertinent to note that enamel hypoplasia can be linked to nutritional deficiency (Vitamins A,C and D in particular) exanthematons diseases (eg measles, chicken pox, scarlet fever), congenital syphilis, hypocalcemia, birth injury, local infection and trauma, ingestion of chemicals (chiefly fluoride) and idiopathic causes. (NIZEL [88]; SHAFER et al. [103]; CRAIG and POWELL [34]).

Shafer et al. state that "clinical studies indicate that most cases of enamel hypoplasia involve those teeth that form within the first year after birth, although teeth that form somewhat later may be affected."

As I have discussed in section 2.3, Aboriginal children in New

South Wales have very high morbidity rates, especially as infants, and are therefore very likely to experience some of the conditions listed above. This could explain the higher prevalence of more severe enamel hypoplasia in Aboriginal children, when compared with Caucasian children.

3.4.1. Fluoridation of Water Supplies

Table (16) shows the spread of the Aboriginal population throughout New South Wales, according to the 1976 Census. It also shows which areas receive a fluoridated water supply, and the year of commencement of fluoridation. The regions referred to in the table are the health regions of the New South Wales Health Commission.

According to these figures, 19615 Aboriginal people (48.5% of the Aboriginal population) in New South Wales live in areas with fluoridated water supplies. However in some towns, such as Brewarrina and Moree, there are people living on Reserves who do not draw on community water supplies. Hence it is not possible to obtain an accurate estimation of Aboriginal population served by fluoridated water.

TABLE 16: Spread of Aboriginal Population Throughout New South Wales (according to 1976 Census), and year in which fluoridation was commenced(in those areas with fluoridated water supplies).

Region	Area	Population	#Commenced Fluoridation
Inner Metropolitan	Leichhardt	580	1968
	Sydney	410	1968
	Marrickville	810	1968
Southern Metropolitan	Randwick (including La Perouse)	880	1968
	South Sydney	960	1968
	Botany	220	1968
	Hurstville	190	1968
	Canterbury	470	1968
	Rockdale	190	1968
	Sutherland	340	1968
Western Metropolitan	Campbelltown	440	1968
	Liverpool	750	1968
	Blacktown	1740	1968
	Fairfield	630	1968
	Parramatta	586	1968
	Penrith	760	1969
North Coast	Tweed	240	1977
	Casino	180	-
	Kyogle	240	1975
	Lismore	190	-
	Richmond River	200	1969
	Tinterbar	170	-
	Coffs Harbour	390	-
	Copmanhurst	115	1964
	Grafton	250	1964
	Maclean	170	1964
	Nambucca	300	1964
	Kempsey	760	-
	Manning	290	-
New England	Tamworth	360	1963
	Quirindi	120	-
	Armidale	510	1974
	Guyra (including Tingha,190	320	-
	Inverell	180	-
	Walcha	100	1970
	Boolooroo	330	-
	Moree	1140	-
	Namoi	250	-
	Narrabri	210	-
Orana	Dubbo	706	-
	Wellington	320	1966
	Coonamble	340	-
	Walgett (including Collarenebri		

cont'd next page

TABLE 16 Cont'd...

Region	Area	Population	Commenced Fluoridation
	& Lightning Ridge)	1260	-
	Bourke	850	-
	Brewarrina (including Goodooga & Weilmoringle)	1000	-
	Wilcannia	380	-
	Menindee	125	-
Central West	Lake Cargelligo	440	-
	Condobolin	450	1963
	Cowra	180	1968
Riverina	Wagga Wagga	220	1971
	Griffith	400	1965
	* Narranderra	230	-
Murray	Wentworth	310	-
	Deniliquin	190	-
	Albury	210	-
South Eastern	Bega	120	1965
	Eurobodalla	360	-
	Inlay	180	-
	Numballa	50	-
Illawarra	Wollongong	710	1969
	Shell Harbour	240	1969
	Shoalhaven	760	1967
Hunter	Cessnock	100	1971
	Lake Macquarie	410	-
	Maitland	260	1971
	Newcastle	670	1971
	Port Stephens	250	-

- Water supplies not fluoridated

* Naturally fluoridated water supply

From Commonwealth Department of Health. [31]

****

CHAPTER FOUR

DENTAL SERVICES AVAILABLE IN NEW SOUTH WALES

4.1 HEALTH COMMISSION OF NEW SOUTH WALES

There is no dental service provided by the Health Commission of New South Wales, specifically for Aboriginal people. However, there are a number of community dental services throughout New South Wales which may be utilised by Aborigines, as well as other members of the population.

4.1.1 School Dental Scheme

The present school dental scheme is an expansion of one that was already in existence. In 1973, when the Labor government was in power, the Australian School Dental Scheme was launched, which made possible the development of the scheme in all States. At that stage, the bulk of funding was from the Commonwealth government, ie 100% of capital expenses; 100% of recurrent expenses; and 90% of running costs. The balance was paid by each State.

There has been a shift in funding, and the scheme is now funded totally by the State, using money from the sum allocated by the Commonwealth government to each State for all health services.

Initially, the service was intended for children at infant and primary school levels, with the aim of expanding the service to cover preschool children, and high school children up to the age of 15 years.

At present it treats children 5-12 years of age, and reaches about 30% of this age-group in the State (WRIGHT [114]).

There are 83 fixed clinics in the State and 66 mobile units (APPENDIX 1). Six of the mobile units are nearing completion, and will then be allocated to the health regions.

Each fixed clinic treats children at a designated school, and children from nearby schools. The mobile clinics work in areas which are not served by a fixed clinic.

The bulk of the manpower for the School Dental Scheme is comprised of dental therapists, who are supervised by a principal dental officer in each area. The aim of the scheme is to provide a three-fold dental service, ie:-

-Prevention
-Education
-Treatment

However, much of the work at present is at the treatment and education stages, with the aim that the service would ultimately be a totally preventive one.

4.1.2 Hospitals and Institutions

Dental services are provided to inmates of Government institutions (including psychiatric hospitals, reformatories and prisons), and to Wards of the State. Prisoners with a prison sentence greater than 5 years are eligible for free dental treatment whilst in prison, and those with a shorter sentence may receive emergency treatment only.

There are established dental clinics in the following hospitals, to treat outpatients:-

Royal North Shore
Ryde
Hornsby
Maitland
Wallsend
Cessnock

Gosford
Mona Vale
Manly
Westmead
Manning River District (Taree)
Mt. Druitt
Nepean
Royal Newcastle

These clinics provide treatment for eligible pensioners and the indigent. A pensioner with a medical entitlement card (for which eligibility is determined by the Commonwealth government) is eligible for free treatment; other persons are subjected to a means test.

There is also a clinic at the Royal Alexandra Hospital for Children, which provides treatment for children only.

There are 2 hospitals with clinics for inpatients:-

- Prince of Wales Hospital
- Royal Prince Alfred Hospital

Another programme run by the Health Commission provides free dentures to old age pensioners, who are at a large geographical distance from the United Dental Hospital, and also includes the "domiciliary handicapped." (BARNARD [7]). A pensioner who requires dentures is seen by a private practitioner, after the patient registers at the local hospital as an outpatient. The private practitioner is reimbursed, for the prosthetic treatment, through the hospital's budgets.

Anybody who suffers from tuberculosis also receives free dental treatment, funded by the Health Commission through the services of private practitioners.

4.1.3 Other Services

There is an aerodental service based at Broken Hill, which

was initially an extension of the former school dental scheme, ie the scheme in existence before the commencement of the present school dental service.

The aerodental service provides dental treatment to people who are geographically isolated in the far west of New South Wales, and also extends to cover the north-eastern area of South Australia, and south-eastern Queensland.

In 1972 the Aboriginal Dental Scheme was initiated, which was financed by the Federal government and administered by the State Health Commission.

The aim of the scheme was to provide basic dental services to Aborigines, through private practitioners. The treatment was free, and the private practitioners were reimbursed by the government for services rendered.

However, the cost of the scheme quickly escalated, to the extent that in 1975 the budget allocated for the whole year was spent in the first quarter. The scheme was consequently stopped, and there has been no further Aboriginal dental service provided by the Health Commission.

4.2 UNITED DENTAL HOSPITAL OF SYDNEY

The United Dental Hospital of Sydney provides a full range of services for the indigent; general dental treatment for all school children under 16 years of age; a pre-school service; specialist consultation and treatment for certain referred patients including handicapped persons. A limited number of patients is accepted for teaching purposes, irrespective of a means test.

There is also an after hours emergency clinic in the evenings, on Sundays and public holidays.

4.2.1 Travelling Dental Clinics

4.2.1.1 Travelling Dental Clinics - RAIL

The United Dental Hospital has two travelling rail dental clinics, which travel across the New South Wales rail network system. Treatment is provided free to eligible pensioners and dependents in country areas. The clinics have yearly itineraries, and the towns visited in 1979-80 were:-

Armidale
Uralla
Quirindi
Murrurrundi
Scone
Kempsey
Wauchope
Muswellbrook
Coffs Harbour

(from UNITED DENTAL HOSPITAL [107]).

4.2.1.2 Road Mobile Unit

This clinic covers the South Coast on a yearly itinerary, and provides treatment for patients with similar eligibility to those treated by the rail clinic. Areas visited in 1979-80 were:-

Moruya district
Bega district
Batemans Bay
Shoalhaven, Nowra

Pambula district
Braidwood district

Milton-Ulladulla

(from UNITED DENTAL HOSPITAL [107])

4.2.2 Day Nursery Clinics

These clinics are established at all Day Nursery schools, and provide treatment for the children attending these schools as well as children from surrounding nurseries and kindergartens. In 1979-80, the day nurseries and kindergartens treated were:-

Woolloomooloo DN
Marrickville DN
Globe kindergarten
Crusader kindergarten
Paddington DN

Deborah Little Child Care Centre
St. Peters DN
Erskineville DN
Forest Lodge DN
Mosman DN

Melanie Alexander DN
Surry Hills DN
North Sydney
Denham Street
South Marrickville Neighbourhood Centre
Waverley DN
Peter Pan kindergarten
Gardiner Child Care Centre
Poet's Corner Kindergarten

(from UNITED DENTAL HOSPITAL [107])

4.3 DENTAL HEALTH EDUCATION EDUCATION AND RESEARCH FOUNDATION

The Dental Health Education and Research Foundation (DHERF), in 1974, trained 3 Aboriginal girls as dental health educators, using funds initially from the Federal government.

One girl stayed for 3 years, and then completed a dental therapist training course. She is now working in one of the school dental clinics.

Another girl who was trained as a dental health educator left to work with the Health Commission, though not in the dental section.

A third girl who was trained is now working as a dental health educator with the Health Commission in the Orana region based at Dubbo.

The educators do not work specifically with Aboriginal communities, but with the general community.

There has been no further training of Aboriginal dental health educators, due to a lack of funding, but the DHERF has produced a dental health pamphlet aimed at the Aboriginal community, using photographs of Aboriginal people in the presentation.

There have been 40,000 copies of the booklet distributed throughout Australia.

4.4 PRIVATE PRACTICE

Aborigines have access to private practice services, in the same way as any other member of the community. However, there is a financial barrier which prevents many of them seeking the services of a private dentist.

Health insurance funds are offering more coverage for dental services to subscribers. It is not known how many Aborigines are insured with these schemes in New South Wales.

The Government-subsidised services available through private practice have already been outlined in the section on services provided by the Health Commission.

There is another service provided through private practitioners, with the Department of Veterans' Affarirs, a department of the Federal government.

Treatment is provided to eligible veterans for service-related disabilities, and those on a full disability pension. The treatment is free, and the dentist, who must be registered on the dental panel of the Department of Veteran's Affairs, is reimbursed by the Department, on a fee for service basis.

It is not known how many Aborigines, if any, are eligible for this service.

4.5 ABORIGINAL MEDICAL SERVICE

There is a dental clinic at the Aboriginal Medical Service (AMS) at Redfern, which treats Aborigines and Torres Strait Islanders.

The AMS was set up in 1971 by Aboriginal people, and all the staff, apart from doctors and nursing sisters, were Aborigines. It was initially funded by private donations, and staff worked on a voluntary basis. It then received funding from the Federal government, and staff were then maintained on a regular salary basis.

The Board, which is the governing body of the service, is composed of Aboriginal people, and determines policy and decision-making.

The dental clinic was opened in 1978, and was set up with assistance from the Faculty of Dentistry, University of Sydney. As well as providing dental treatment for Aboriginal people, the clinic was intended to be used by dental undergraduates. However, the teaching function of the clinic was not fulfilled.

The clinic currently (October, 1981) employs 2 dentists full-time, 1 orthodontist part-time, 1 dental therapist, and 4 assistants and reception staff.

The clinic provides a broad range of services, but has no general anaesthetic facilities. A limited member of patients requiring dental treatment under general anaesthesia is seen at the Rachel Foster hospital, Redfern. Patients may also be referred to the United Dental Hospital for treatment requiring general anaesthesia.

Treatment provided is free to the Aboriginal people, with the exception that patients are sometimes required to pay the laboratory fees for any gold work, crown and bridge work, and chrome-cobalt castings, if the Administrator feels that they have sufficient income to cover the costs.

The initial set of dentures made for a person is free, but any replacements must be paid for.

There is a long waiting-list for children requiring orthodontic treatment, for the orthodontist, who comes from Newcastle, only visits the clinic for one afternoon every 5 weeks.

The AMS also has a mobile dental clinic which operates in the country areas of New South Wales. It has 2 fully-equipped surgeries, and is staffed by one of the dentists from the Redfern clinic, and 2 Aboriginal assistants.

The range of treatment services provided on the mobile clinic is more limited than that provided in Redfern. No crown and bridge work is done, and any patient which the dentist considers to be in need of more specialised treatment is referred to the clinic at Redfern.

The mobile unit is set up in a country area with a large Aboriginal population, and stays in that area until such time as the dentist feels that treatment needs have been met.

The unit has just finished working in Moree, and is now working in Armidale.

There are plans to expand the dental services by:-

- opening a dental clinic at the Aboriginal Medical Service at Kempsey
- operating another mobile unit in country areas
- starting a part-time service to Aboriginal prisoners, for a half-day per week, in prisons in and around Sydney.

4.6 OTHER DENTAL CLINIC SERVICES

There are a number of organisations, communities, Friendly Societies, and groups which provide services for special groups in the community. Many clinics employ part-time dentists, or have part-time dentists working in an honorary capacity. Some clinics are listed below, where facilities are subsidised, and staffed by salaried dentists (BARNARD [7]).

Broken Hill Town Dental Clinic

- sited in district hospital
- financed by weekly contributions paid by members to the clinic

Broken Hill Mines Dental Clinic

- clinic for employees, with member contributions subsidised equally by employers
- treatment is free to members and dependents, with some fees paid for certain types of treatment

Hibernian Society

- 4 clinics in Sydney, 1 in Canberra
- treatment is for members and dependents only, and they receive 35% rebate based on ADA (NSW) fees

Legacy

- provides dental services, from 1 clinic, for children of ex-servicemen who died as a result of war
- financed by charity

Sydney City Council

- Sydney City Council Staff Dental Clinic provides dental

treatment for employees of council

- employees who belong to the Dental Fund pay a weekly sub-subscription, and pay 60% of ADA schedule of fees
- employees who are not members pay full ADA scale

Western Shires

- Dental Service employing 2 dentists to visit 12 centres:-

North Section:-	South Section:-
Brewarrina	Balranald
Engonia	Hillston
Goodooga	Euston
Louth	Lake Cargelligo
Weilmoringle	Wentworth
Tottenham	Goolgowi

- 9 shires are involved: Balranald , Brewarrina, Carrathool, Cobar, Darling, Lachlan, Walcool, Walgett, Wentworth
- patients pay ADA schedule fees
- 50% of operating loss is paid by the Commonwealth government, there is a $25,000 subsidy form the State government, and the balance is met by constituent shires.

It is not known how many Aborigines make use of these services, nor how many are enrolled in subsidised dental schemes provided by various Friendly Societies, organisations, etc.

CHAPTER FIVE

POSSIBLE APPROACHES TO EXPANSION OF DENTAL HEALTH SERVICES TO ABORIGINES

5.1 TRADITIONAL VIEW OF HEALTH CARE IN ABORIGINAL SOCIETY

The general Australian community understands health care to be the health centre or large hospital situated locally, or the local doctor's surgery.

In traditional Aboriginal society, health care was a different concept, requiring a relationship which involved social acceptance of the person providing the service, as well as confidence in the fact that the person has something worthwhile to contribute.

The traditional healer in Aboriginal society was the medicine-man. This person was not a sorcerer, but rather the one to restore health to an individual who has been afflicted by the evils of sorcery.

The medicine-men had great power and prestige among the people, their power and wisdom were trusted, and their diagnoses and manipulations were eagerly sought by the people of the tribe.(HAMILTON [55])

The older medine-men of a tribe decided who would be eligible for training as a future medicine-man, by recognising in an individual certain qualities desirable for this role. Some medicine-men attained this position through inheritance, and others had an experience of being "called" - an aspirant had a vision, which could be interpreted by a medicine-man as showing that he was in fact "called", and after further psychic experiences, the aspirant was eventually trained in the profession (ELKIN [49]).

Aborigines believed that illness, death and even accidents, were caused by magical or animistic actions. They knew nothing about the germ-theory of disease, and scarcely recognised natural causes of sickness, death and accidents.

In the case of death of a very old person or a baby, they seldom worried about looking for a cause, and for some ordinary aches and pains (eg colds, headache, sore eyes) a magical cause was not sought, and ordinary medical treatment was applied. This was generally in the form of mixtures, poultices, steam-baths, liniments, bandages, heat and cold (ELKIN [48])

In the case of serious disturbances of a person's health and life, it was often believed that the cause was due to a sorcerer who could steal, by magical means, the essential life spirit in dreams, or remove specific substances from the victim's body, such as the heart's blood or kidney fat.

When a person was ill he advertised this by the way in which he sat or lay in a public place, outside his shelter in full public view. When it became known that he was ill, the local medicine-man would gather around to offer sympathy and aid.

The medicine-man would not treat the individual so much, but the threat of that individual's illness to the corporate group. He also acted as an agent of law, order and conformity. (CAWTE [28])

The group structure was extremely important, and an individual was seen as part of a whole community. Even the medicine-men lived with the rest of the tribe, and partook of daily rituals.

Hamilton [55], claims that Aborigines did not view health as "one of the inalienable rights of life", and they do not give the individual "the supreme value that Europeans do."

Eastwell [44] reported that, in Arnhem Land, the diagnostic function of the medicine-man was to ascertain the origin of the spirit or sorcery causing illness, and to interpret this cause in cultural terms such as breach of taboo, sacrilege or wrong behaviour. The medicine-man's interpretation of the illness was designed to censure greater social conformity in the individual, and thus the solidarity of the corporate group.

5.2 WHY AN ABORIGINAL DENTAL SERVICE?

One may well question the validity of a dental service for Aboriginal people, when they are such a small section of the total population in New South Wales (0.8%).

However, the Aboriginal people at present are seeking self-determination and recognition as a distinct sector of our community, with their own community-support schemes, and community-based health services.

Many Aboriginal people are reluctant to avail themselves of services provided by the white community, and of ten sense hostility and insensitivity to cultural beliefs at some of these establishments. (TATZ [106]; SAMISONI [96]; BRISCOE [14]; REID [94]; KAMIEN [70])

Hamilton [55] puts forward another point of view and suggests that "until Aborigines are given real control over resources and are able to make important decisions affecting their own well-being, any marked improvement in health cannot be expected. While they feel themselves subjected to external pressures which they do not want but do not know how to combat they will respond with any means at their disposal. A passive resistence to health services is one of the few means they have with which to express their distress at the pressures on them. They know that health is one of the few matters affecting them about which Europeans feel concern. Their refusal to take medicines, to present for treatment, to continue courses of antibiotics or carry out the many procedures expected of them, will attack an area of European sensitivity. Unfortunately, they are not really aware of the disastrous results this can have on their own community.

Until the establishment of Aboriginal-controlled health services, the Government was the main provider of specific health services to Aboriginal people. These were generally organised and staffed principally by non-blacks.

Reid [94] claims that "it is well recognised that the structural attributes of bueaucracies militate against the transferral of responsibility and authority to their clients."

As long as this situation exists, Aboriginal people will not respond well to services provided for them by non-blacks and the appalling levels of health experienced by so many Aborigines will continue.

Realising that it is not possible to have purely Aboriginal-staffed medical services, due to a lack of any trained Aboriginal doctors or dentists, one must realise that if a service were controlled and administered by blacks, it would not tolerate the employment of any professional staff who were insensitive or unaware of the particular cultural beliefs and needs of the Aboriginal community.

This in turn would lead to a greater acceptance of the service by the Aboriginal community, and it is in this context that we must provide a dental service, one which is administered and staffed principally by Aboriginal people.

5.3 EXPANSION OF SERVICES.

Unfortunately there is very little coordination between the Aboriginal Medical Service and the Health Commission at the present time. The Aboriginal community ultimately wants control over the delivery of health care services to its own people, and is shunning any direct Government involvement.

This communication breakdown creates problems in formulating a coordinated approach to the expansion of dental services to the Aboriginal community.

Before one can begin to contemplate delivery of a preventive dental programme, let us consider the 3 levels of prevention currently accepted for dentistry (TABLE 17).

These are:-

1. Primary prevention:- concerned with health promotion and specific disease prevention

2. Secondary prevention:- concerned with early detection and treatment of disease

3. Tertiary prevention:- concerned with disability limitation and rehabilitation .

To overcome immediate needs of Aboriginal people, we are working at the tertiary level, especially when treating adult Aborigines. From this level we can hope to gain their confidence in dental services, and thus start to provide services at the primary and secondary levels.

To achieve this would involve community participation, and any dental programme, to be effective in controlling and reducing the

TABLE 17: APPLICATION OF PREVENTIVE MEASURES TO DENTAL HEALTH

PRIMARY PREVENTION		SECONDARY PREVENTION
Health promotion	Specific protection	Early diagnosis and treatment
Dental health education Education for periodic dental examination. Good standards of nutrition, adjusted to developmental phases of life. Attention to personality development. Genetic counselling Provision of optimum living conditions.	Attention to personal oral hygiene. Use of environmental controls, such as water fluoridation, topical application of fluorides, and other preventive measures. Protection against occupational and recreational hazards, eg. use of mouth guards. Use of specific, essential nutrients (of which fluorine is one) Protection from carcinogens, eg. anti-smoking measures.	Case-finding measures, such as radiographs. Screening surveys, such as oral cancer screening programmes. Dental recall systems. Treatment of decayed teeth. Professional cleaning of the teeth. Elimination of infections Provision of orthodontic appliances and space maintainers.

Modified from: Leavell, H.R. and Clark, E.G. (1958): Preventive medicine for the doctor in his community. 2nd ed., New York, McGraw Hill.

TABLE 17 (Cont'd)

TERTIARY PREVENTION	
Disability limitation	Rehabilitation
Treatment to control dental caries and periodontal disease and to prevent further complication and sequelae Provision of appliances to restore function and appearance. Treatment of other oral diseases and conditions.	Education of individuals to appropriate use of dentures. Pre-surgery and post-surgery education for surgery patients.

incidence of dental disease, should be a part of a community-based overall health programme.

I will discuss possible methods of provision of dental care, in relation to short-term and long-term goals.

5.3.1. Short-Term Goals

Short-term goals involve mainly the treatment of existing dental problems of Aboriginal children and adults, especially those that are causing pain and discomfort. In so doing, dental operators should attempt to create an awareness of the causes of dental disease, and possible methods of prevention.

These goals can be achieved by encouraging greater utilisation of existing dental services, by Aboriginal people.

At present there is very little, if any liaison between Aboriginal health workers and principal dental officers of the Health Commission of New South Wales. I feel that a greater link between the two should be established, so that the Aboriginal health worker is made aware of the government dental services available, and conditions of eligibility for these services.

The health worker could then advise the Aboriginal community of all the services available, and which people may be eligible for treatment. The health worker would, thus, be acting as a "cultural link" between the community and the dental services, thereby encouraging more Aboriginal people to seek dental treatment.

This sort of liaison would be of particular significance in

areas with established school dental clinics, or areas which are soon to be visited by a mobile school dental clinic, the travelling dental train or road mobile unit of the United Dental Hospital.

Another short-term goal would be the supply of fluoride tablets to children who do not use a fluoridated water supply. These tablets could be issued at schools, under supervision of a teacher, or a dental health educator.

5.3.2 Long-Term Goals

Whilst the aim of the short-term goal is to treat existing dental disease and to eliminate the "backlog" of dental treatment, the aim of the long-term goal is to establish Aboriginal community-controlled health services, of which dental services form an integral part.

The emphasis of these services would be on primary and secondary prevention, and nutrition-counselling should be considered a very important factor in delivery of these services.

Long-term goals may be summarised as:-

- the fluoridation of all major water supplies in New South Wales

- the continuing supply of fluoride tablets to those children who do not have access to a fluoridated community water-source.

- the establishment of Aboriginal-controlled medical services, with a dental clinic, employing at least one dental officer in areas with a large concentration of Aboriginal population

- the employment of Aboriginal dental health educators in areas with a large Aboriginal community

- the use of dentally-trained Aboriginal health workers to work in remote, small communities

- the use of weekly 0.2% NaF mouthrinsing programmes in schools, (HOROWITZ et al. [63]) or once-a-term brush-ins with a 10 per cent SnF_2 - $ZrSiO_4$ toothpaste (WOODS et al. [113]).

I shall discuss further the use of Aboriginal dental health educators and dentally-trained Aboriginal health workers.

5.3.3 Aboriginal Dental Health Educators

Aboriginal dental health educators could receive training at one of the established Aboriginal medical services with a dental clinic. Dental officers and staff could act as training personnel.

The role of the dental health educator would be to work in rural Aboriginal communities, where they would have contact principally with Aboriginal children and their mothers, so that they may teach the principles of prevention to mothers as well as to children.

The dental health educators should have a reasonable knowledge of nutrition, so that they can advise the mothers on the principles of sound nutrition for their children.

Some knowledge of traditional Aboriginal diet would also be an advantage, so that they could outline the changes in nutrition which have occurred in the Aboriginal community, and the need for stricter attention to diet.

The dental health educator would also supervise any weekly mouthrinsing programmes or brush-ins at schools.

5.3.4 Dental Training of Aboriginal Health Workers

If the delivery of health-care services to the Aboriginal community is going to be in the control of Aboriginal people, then trained Aboriginal health workers previously working for the Health Commission should be a part of this service.

Some of these people could receive training in certain basic dental skills, in a programme similar to the one in use in the Northern Territory (Northern Territory Department of Health Annual Report 1979/1980) [90].

This programme was modelled on the one used in Papua New Guinea for the training of dental operators with graded skills. (SCHAMSCHULA and BARMES [97]; BARMES and SCHAMSCHULA [5]; SCHAMSCHULA et al. [98]).

In the Northern Territory the dental training course for Aboriginal health workers is meant to be a dynamic curriculum, with changes made whenever necessary.

It is stated in the Report of the Second Regional Dental Officers Conference, Darwin [91] that the Aboriginal health worker is "a person acceptable to his/her community as a health agent. Providing that the AHW does not identify closely as a nurse, doctor, health inspector or dentist they are covered by WHO tradition and the several Registration Boards are not involved. It is understood that should an AHW seek recognition by registration with a Board he/she would be required to meet the education entry standard and enrol in the formal courses of instruction that are freely available leading to registration in a particular discipline."

Progress through the course is not time-related, and training is directly task-oriented with progress through training schemes solely dependent upon the individual health worker concerned.

The course in dental training is biassed towards the needs of children, and prevention of oral disease. Certain treatment procedures are also included, so that a health worker may render necessary treatment when non-Aboriginal dental staff are available.

The outline of the dental training course for Aboriginal health workers is outlined in Appendix II.. A health worker is trained at level 1, and may progress through to levels 2 and 3.

This system could be applied in New South Wales, with training performed at the Redfern Aboriginal Medical Service by the dental officers. Aboriginal health workers with dental training could be established in community health clinics, or they could travel to more isolated Aboriginal communities, with portable dental equipment.

The workers would be employed solely to treat Aboriginal communities, under periodic supervision of a locally-based dentist employed by the Aboriginal Medical Service.

However, there may be opposition to this scheme from the dental profession in New South Wales.

5.4 Discussion of Provision of Dental Services

It is well-recognised that there is a need for Aboriginal community-based health services, with Aborigines involved in the design and delivery of these services. (BRISCOE [14]: HAMILTON [55]: SAMISONI [96]; WEBBER [109] ; VINER [108]).

The need for establishment of dental services has also been recognised, as well as "a need to develop preventive dental health programs as part of health education to improve the general level of dental health among Aborigines." (AUSTRALIAN DEPARTMENT OF HEALTH [4]).

Whilst the priority for expansion of dental services may not be as great as that for expansion of medical services, to try to alleviate some of the appalling health problems, any dental service should be integrated with existing medical services.

This type of combined service would have maximum utilisation of staff, and would provide to the community a combined health programme, in which dentistry could be seen as part of overall health. The aim of this service would be primary and secondary prevention of disease.

Health education is very high on the list of priorities for the establishment of a preventive health service, and should always include some dental health education. Nutrition-counselling should also place some emphasis on the role of nutrition in preventing dental disease, and the importance of a healthy dentition in the mastication of food.

If one is constantly suffering from toothache or some other

dental discomfort, then one may be dependent on soft, non-abrasive foods, which are often nutritionally-deficient.

School children should be one of the prime targets for the delivery of dental services, so that they may have a reasonable chance of growing up with a healthy dentition. Mothers of young children should receive strong attention from dental health educators and nutrition-counsellors.

Traditionally, we have seen that health of an individual was of community concern, and that the traditional healer was a part of that community. Community-based and controlled Aboriginal health services would be an extension of the traditional customs.

Any dental services offered must be acceptable to the community, and to achieve this involves education of the community as to expectation of services provided by dental operators, and involvement of the community in any decisions on community-based dental programmes.

By handing over control of health services to the Aboriginal community, much Government bureaucracy would be eliminated, and the Aboriginal people would be one step closer to the self-determination which they are currently actively seeking.

CONCLUSION

It can be seen that Aboriginal people today are facing many problems in a predominantly "white-man's" society. Many Aboriginal people of New South Wales are living in a "twilight zone" - they have lost, to a large degree, their cultural identity, and yet they are not totally accepted by the wider community in which they live. This is a factor which has been an obstacle in the formulation of the delivery of comprehensive health care programmes to Aboriginals.

If one considers all the problems faced by many Aborigines in New South Wales - including inadequate housing, poor employment opportunities, poor standards of health and high incidence of disease - then to some people perhaps the levels of dental disease and treatment needs do not appear to be of particularly significant concern. But if we are concerned with the health of an individual, we must, of course, consider the health and well-being of the individual as a whole, and we must therefore include dental health services in any organised health programmes.

We do not know the prevalence of dental disease amongst Aboriginal people, since very few dental surveys have been carried out, although it seems that data collected so far have pointed to an increase in levels and severity of dental disease in the Aboriginal community. Not only has this been an increase relative to the good state of oral health found in the Aborigines living in their natural state, but it has also been found to be more severe than in the general community.

More extensive dental surveys must be carried out, to enable the planning of adequate dental health services for Aboriginal people, and to create an understanding of the incidence and spread of dental disease amongst the Aboriginal people of New South Wales. With such data it would be possible to plan services, taking into consideration the three phases of prevention of disease.

As I have stated in the thesis, it would be desirable to integrate dental health services with general health services, to provide care to cover all aspects of health; and it is highly desirable, if not essential, that these services are controlled either to a large degree, or entirely, by the Aboriginal community. This would involve a major reshuffle in the administration of present services as the control of Aboriginal health is passed from the Government to the Aboriginal people. The establishment and maintenance of several Aboriginal-run medical services throughout the State have demonstrated that Aboriginal people have the will and resourcefulness to control such services.

At the present time there is very little co-ordination between State Government-controlled Aboriginal health services, and those provided by the AMS. If greater co-ordination and co-operation between these two bodies are not possible, then one must very soon start to consider the plight of Aboriginal health services, and the ultimate control of them by the Aboriginal people.

As I have outlined in the thesis, there is a possibility to utilise available manpower resources, e.g. Aboriginal health workers, dental health educators - and to expand their range of skills and

duties to provide dental health and education services. There is already one Aboriginal dental therapist, and we can hope that this would set an example, so that more Aboriginal people will seek training in dental and medical skills.

As mentioned earlier in the thesis, if an Aboriginal dental health service were Aborigine-controlled, then any non-Aboriginal staff employed would need to be seen as sympathetic to the beliefs and attitudes of the Aboriginal community, thereby inspiring more confidence amongst the community to seek dental treatment.

Young Aborigine high-school students should be encouraged to pursue further training and education at a tertiary level, so that there is an increase in skilled and professional Aboriginal manpower.

However, before any dental health service can be planned at this stage, it must be emphasised that more data is needed concerning the levels of oral health in the Aboriginal community in New South Wales. Unless we have this data, it is impossible to set targets and goals, and to evaluate the types and numbers of manpower requirements, facilities and equipment necessary for the delivery of dental health services.

Services at present are being provided on an ad hoc basis, on the assumption that every Aboriginal community is in need of dental treatment, without consideration of the quality and quantity of treatment needed. Prevention and dental health education are hardly considered, and it is really in these fields that we must

start to concentrate our services, especially in the case of school children.

To conclude, we know there is a need for dental health services to Aborigines in New South Wales, although at present we do not know the extent of that need. Any service provided would be more successful if it were organised and controlled by the Aboriginal community, and if it were integrated into a community-health programme. In the meantime, Aboriginal people should be made more aware of any dental services for which they are eligible, and utilisation of such services should be encouraged.

BIBLIOGRAPHY

1. ABBIE, A.A.--

Metrical characteristics of a Central Australian tribe.

Oceania 27:220-243, 1957.

2. ALBRECHT, P.G.E.--

The social and psychological reasons for the alcohol problem among Aborigines. Paper given at Farrar Hall, 14-17 May, Monash University, for the Centre for Research into Aboriginal Affairs, 1972.

3. AUSTRALIAN COUNCIL OF CHURCHES.--

Justice for Aboriginal Australians. Report of the World Council of Churches team visit to the Aborigines, June 15 to July 3, 1981. Australian Council of Churches, Sydney, 1981.

4. AUSTRALIAN DEPARTMENT OF HEALTH.--

Workshop on Aboriginal Medical Services, Albury, New South Wales, 5-7 July, 1974. (p.39) Aust. Govt. Publishing Service - Canberra, 1974.

5. BARMES, DE and SCHAMSCHULA, R.G.--

Dental education in Papua-New Guinea. Part II. Integrated dental officer and dental nurse courses.

Aust. Dent. J., 12:1, 34-41 (Feb) 1967.

6. BARNARD, P.D.--

Oral health of first year dental students University of Sydney, 1976.

Dent. Outlook, 3:6-8. 1977.

7. BARNARD, P.D.--

Facts and Figures. Australian Dentistry 1980. Australian Dental Association, North Syuney, April 1981.

8. BARNARD, P.D. and BOYLES, J.R.--

Dental survey of students at the Australain National University, 1972.

Aust. Dent. J., 21:352-354, 1976.

9. BARNARD, P.D. and MINNS, M.--

Community dental health survey Sydney metropolitan area - 1972.

Aust. Dent. J., 19:274-279, 1974.

10. BARRETT, M.J.--

Dental observations on Australian Aborigines: Yuendumu, Central Australia, 1951-52.

Aust. J. Dent., 57:3, 131-138, 1953.

11. BARRETT, M.J.--

Dental observations on Australian Aborigines: water supplies and endemic dental fluorosis.

Aust. Dent. J., 1:2, 87-92, 1956.

12. BARRETT, M.J.--

Features of the Australian Aboriginal dentition.

Dental Magazine and Oral Topics, 85:1, 15-18, 1968.

13. BARRETT, M.J. and WILLIAMSON, J.J.--

Oral health of Australian Aborigines: survey methods and prevalence of dental caries.

Aust. Dent. J., 17:1, 37-50, 1972.

14. BRISCOE, G.--

Towards a health programme for Aborigines. Paper given at a research seminar of Aboriginal health, Centre for Research into Aboriginal Affairs. Monash University, 14-17 May,1972.

15. CAMPBELL, T.D.--

Observations on the teeth of Australian Aborigines. Hermannsburg, Central Australia.

Aust. J. Dent., 41:1, 1-6, 1937.

16. CAMPBELL, T.D.--

Observations on the teeth of Australian Aborigines. Cockatoo Creek, Central Australia.

Aust. J. Dent., 42:2, 41-47, 1938.

17. CAMPBELL, T.D.--

Observations on the teeth of Australian Aborigines. Mt. Liebig, Central Australia.

Aust. J. Dent., 42:3, 85-89, 1938.

18. CAMPBELL, T.D.--

Observations on the teeth of Australian Aborigines. River Diamantina, South Australia.

Aust. J. Dent., 42:4, 121-125, 1938.

19. CAMPBELL, T.D.--

Food, food values and food habits of the Australian Aborigines in relation to their dental conditions. Part I. Introduction.

Aust. J. Dent., 43:1, 1-15, 1939.

20. CAMPBELL, T.D.--

Food, food values and food habits of the Australian Aborigines in relation to their dental conditions. Part II. Habits of food preparation and consumption.

21. CAMPBELL, T.D.--

Food, food values and food habits of the Australian Aborigines in relation to their dental conditions. Part III. Essential food factors.

Aust. J. Dent., 43:3, 73-87, 1939.

22. CAMPBELL, T.D.--

Food, food values and food habits of the Australian Aborigines in relation to their dental conditions. Part IV. Jaws and dentition.

Aust. J. Dent., 43:5, 141-156, 1939.

23. CAMPBELL, T.D.--

Food, food values and food habits of the Australian Aborigines in relation to their dental conditions. Part V. Dental caries.

Aust. J. Dent., 43:6, 177-198, 1939.

24. CAMPBELL, T.D., and BARRETT, M.J.,--

Dental observations on Australian Aborigines: a changing environment and food pattern.

Aust. J. Dent., 57:1, 1-6, 1953

25. CAMPBELL, T.D., and GRAY, J.H.--

Observations on the teeth of Australian Aborigines.

Aust. J. Dent., 80:8, 290-295, 1936

26. CAMPBELL, T.D., and LEWIS, A.J.--

The Aborigines of South Australia: dental observations recorded at Ooldea.

Aust. J. Dent., 30:12, 271-376, 1926

27. CAMPBELL, T.D., and MOORE, A.P.R.--

Adelaide University field anthropology: Koonibba, South Australia.

Aust. J. Dent., 34:4, 123-127, 1930

28. CAWTE, J.--

Australian Aboriginal medicine before European contact.

Annals of Int. Medicine, 82:3, 422-423, 1975

29. CLELAND, J.B.--

The ecology of the Aboriginal inhabitants of Tasmania and South Australia.

Aust. J. Sci., 2: 97-101, 1940

30. COMMENTS--

Alcohol abuse in an Aboriginal community

Med. J. Aust., 1: 289-290

31. COMMONWEALTH DEPARTMENT OF HEALTH--

Fluoridation of water in Australia 1980.

Australian Government Publishing Service, Canberra 1981.

32. COYNE, T. and DARNTON-HILL, I.,--

Australian Aborigines, nutrition and changing disease patterns.

New Doctor, 12: 32-37, 1979

33. COYNE, T. and DOWLING, M.--

Infant feeding practices among Aboriginals in rural New South Wales.

Proc. Nutr. Soc., 3:91

34. CRAIG, G. and POWELL, K.,--

Blemishes on anterior teeth.

Dental Outlook, 6:3, 25-28 & 34, 1980

35. CRAN, J.A.--

Notes on the teeth and gingivae of Central Australian Aborigines

Aust. J. Dent., 59: 356-361, 1955.

36. CRAN, J.A.--

Notes on the teeth and gingivae of Central Australian Aborigines

Aust. Dent. J., 2: 277-282, 1957

37. CRAN, J.A.--

The relationship of diet to dental caries.

Aust. Dent. J., 4: 182-190, 59

38. DEPARTMENT OF ABORIGINAL AFFAIRS--

Background notes No. 10 (Jan) 1981. Phillip in-print 828782.

39. DEPARTMENT OF ABORIGINAL AFFAIRS--

Background notes No.9 (revised). May 1981 Phillip in-print. 824782.

40. DEVESON, A.--

Australians at Risk, Stanmore NSW, Cassell Aust, 1978 (p. 293-294)

41. DOWLING, M. and WARD, J.--

Housing of Aborigines in New South Wales in 1976 and its relation to their health.

Unpublished paper prepared in Aboriginal Health section for the Health Commission, 1977.

42. DOWLING, M., WARD, J., RING, I., COYNE, T., and HEYWOOD, P.,--

A survey of the health of pre-school and primary school children in a mixed race community in NSW - including a trial of daily ascorbic acid supplementation.

Health Commission of New South Wales, Aboriginal Health Section. NSW Govt. Printer, 1980.

43. DUGDALE, A.E., PRESTWOOD, U., and STUART, J.E.--

43. cont'd

Neonatal and infant mortality rates among Australian Aborigines.

Med. J. Aust., 2:13, 633-635, 1973.

44. EASTWELL, H.--

The traditional healer in Arnhem Land.

Med. J. Aust., 2: 1011-1017, 1973

45. EDWARDS, L.D.--

Malnutrition and disease in pre-school Aboriginal children in the Walgett area of New South Wales.

Med. J. Aust., 2: 1007-1011, 1970.

46. EDWARDS, L.D., and CRADDOCK, L.J.--

Malnutrition and intellectual development. A study in school-age Aboriginal children in Walgett, New South Wales.

Med. J. Aust., 1: 880-884, 1973.

47. EDWARDS, R., ROBERTS, R.W., and SCHLAFRIG, G.--

The mortality of young children in Western Australia. The Aborigines contribution.

Aust. Paediat. J., 6: 76-80, 1970.

48. ELKIN, A.P.--

The Australian Aborigines.

Sydney, Angus and Robertson. Paperback edition, 1974, 397p (p. 310-320).

49. ELKIN, A.P.--

Aboriginal Man of High Degree.

St. Lucia, University of Queensland Press, 1977. 2nd edition, 185p (p. 3-17)

50. ELPHINSTONE, J.J.--

The health of Australian Aborigines with no previous association with Europeans.

Med. J. Aust., 2: 293-301, 1971.

51. FOX, L.--

The Aboriginals. Melbourne, Thomas Nelson (Australia) Limited. 112p (p. 11)

52. FYSH, W.J., DAVISON, R., CHANDLER, D., and DUGDALE, R.E.--

The weights of Aboriginal infants, a comparison over 20 years.

Med. J. Aust. Spec. suppl., 1: 13-15, 1977.

53. GRACEY, M.--

Undernutrition in the midst of plenty: nutritional problems of young Australian Aborigines.

Aust. Paediat. J., 12: 180-182, 1976.

54. GRACEY, M.--

Nutritional problems of Australian Aborigines.

Proc. Nutr. Soc. Aust., 2: 11-16, 1977.

55. HAMILTON, A.--

Health in the traditionally-oriented community. Paper presented at a research seminar of Aboriginal health, Centre for

55. cont'd

Research into Aboriginal Affairs. Monash University, 14-17 May, 1972.

56. HARRIS, M.J., DUFFY, B.J., and BEVERIDGE, J.--

Studies on the small bowel of a group of New South Wales Aboriginal children.

Med. J. Aust., 1: 356-359, 1970.

57. HEALTH COMMISSION OF NEW SOUTH WALES--

Aboriginal hospital morbidity in New South Wales, 1977.

Working paper No.1 N.S.W. Govt. printer 1980.

58. HEALTH COMMISSION OF NEW SOUTH WALES--

Aboriginal mortality in country areas of New South Wales, 1978, 1979. Working paper No.2. NSW Govt. printer 1980.

59. HEITHERSAY, G.--

A dental survey of the Aborigines at Haast's Bluff, Central Australia.

Med. J. Aust., 1: 22, 721-730, 1959.

60. HITCHCOCK, N.E., and GRACEY, M.--

The setting for unsatisfactory health and nutritional standards in Australian Aborigines.

Med. J. Aust. Spec. Suppl., 2: 20-23, 1975.

61. HOMAN, B.T.--

Changing periodontal status in a changing environment.

J. Dent. Res. 56. Spec. No. C46-54, 1977.

62. HOMAN, B.T. and DAVIES, G.N.--

An oral health survey of Aborigines and Torres Strait Islanders in far north Queensland.

Aust. Dent. J., 18: 75-87, 1973.

63. HOROWITZ, H.S., CREIGHTON, W.E., and McCLENDON, B.J.--

The effect on human dental caries of weekly oral rinsing with a sodium fluoride mouthwash.

Archs. Oral Biol., 16: 609-616, 1971.

64. HUNT, H.--

Alcoholism among Aboriginal people.

Med. J. Aust. Spec. Suppl., 1: 1-3, 1981.

65. JOSE, D.G. and WELCH, J.S.--

Growth retardation, anaemia and infection, with malabsorption and infestation of the bowel. The syndrome of protein-calorie malnutrition in Australian Aboriginal children.

Med. J. Aust., 1:8, 349-355, 1970.

66. KALOKERINOS, A.--

Aboriginal health - a country doctor's view.

Ahead, 11:1, 8-10, 1974.

67. KALOKERINOS, A.--

Personal communication 5.5.81.

68. KAMIEN, M.--

Ear disease and hearing in Aboriginal and white children in two schools in rural New South Wales.

68. cont'd

Med. J. Aust. Spec. Suppl., 1: 33-37, 1975.

69. KAMIEN, M.--

Aborigines and alcohol. Intake, effects and social implications in a rural community in Western New South Wales.

Med. J. Aust., 1: 291-298, 1975.

70. KAMIEN, M.--

Cultural chasm and chaos in the health care services to Aborigines in rural New South Wales.

Med. J. Aust. Spec. Suppl., 2: 6-11, 1975.

71. KAMIEN, M.--

The physical health of Aboriginal children in Bourke, New South Wales.

Med. J. Aust. Spec. Suppl., 1: 33-37, 1976.

72. KAMIEN, M.--

The physical health of Aboriginal adults in Bourke, New South Wales.

Med. J. Aust. Spec. Suppl., 1: 38-44, 1976.

73. KAMIEN, M.--

The Dark People of Bourke. A study of planned social change. New Jersey, USA, Humanities Press Inc, 1978, 342p. (p. 88-90).

74. Ibid., p. 108-110.

75. Ibid., p. 108-110

76. Ibid., p. 176

77. Ibid., p. 178

78. KAMIEN, M., and CAMERON, P.--

An analysis of white and Aboriginal children under 5 years of age admitted to the Bourke District Hospital from September, 1971 to August, 1972.

Aust. Paediat. J., 10: 343-349, 1974

79. LICKISS, J.N.--

Health problems of Sydney Aboriginal children.

Med. J. Aust. 2: 995-1000, 1970.

80. LICKISS, J.N.--

Aboriginal children in Sydney: the socio-economic environment

Oceania, 41: 201-228, 1971.

81. LICKISS, J.N.--

Social deviance in Aboriginal boys.

Med. J. Aust., 2: 460-470, 1971.

82. LICKISS, J.N.--

Health problems of urban Aborigines: with special reference to the Aboriginal people of Sydney.

Social Science and Medicine, Great Britain, 9: 313-318, 1975

83. LOVELL, S., CHANDLER, D., and DUGDALE, A.E.--

Infant death rates in Queensland 1962 to 1972.

Med. J. Aust. 2: 405-408, 1976.

84. MARINOVICH, N., LARSSON, M.D., and BARBER, K.--

Comparative metabolism rates of ethanol in adults of Aboriginal and European descent

Med. J. Aust. Spec. Suppl., 1: 44-46, 1976.

85. MIDDLETON, H.--

Aborigines p. 356-382. (In DAVIES, A.F., ENCEL, S., and BERRY, M.J., eds. Australian Society; A Sociological Introduction. Melbourne, Longman Chesline Pty Limited, 3rd ed, 1977, 490p).

86. MOODIE, P.M.--

Disease in a part-Aboriginal community. Paper given at a research seminar of Aboriginal health, Centre for Research into Aboriginal Affairs. Monash University, 14-17 May, 1972.

87. MOODY, J.E.H.--

Supplementary data supplied to the nutrition group of the Arnhem Land scientific expedition, 1948.

Aust. J. Dent., 53:3, 145-152, 1949.

88. NIZEL, A.E.--

The science of Nutrition and its application in Clinical Dentistry.

Philadelphia, Saunders, 3rd ed. 1972, 476p (p. 136)

89. NOBILE, S.--

Blood vitamin levels in Aboriginal children and their mothers in western New South Wales.

Med. J. Aust., 1: 601-607, 1974.

90. NORTHERN TERRITORY DEPARTMENT OF HEALTH.--

Annual report for the financial year 1979/80.

Govt. printer of the Northern Territory.

91. NORTHERN TERRITORY DEPARTMENT OF HEALTH.

Report of the second regional dental officers conference, Darwin, 1981.

92. RASSABY, L.--

Malnutrition amongst Aborigines in the inner-city of Sydney.

New Doctor, 8: 36-38, 1978.

93. READE, P.--

Dental observations on Australian Aborigines, Koonibba, South Australia.

Aust. Dent. J., 10: 5, 361-320, 1965.

94. REID, J.--

Aboriginal health and politicians brief cases.

Med. J. Aust., 1; 319-321, 1979.

95. RUDDOCK, P.--

Aboriginal Health.

The Australasian Nurses Journal, April, 4-10, 1980.

96. SAMISONI, M.T.--

Aboriginal and Islander attitudes to public health care institutions.

The Australian Nurses Journal, 7:5, 45-48, 1977.

97. SCHAMSCHULA, R.G. and BARMES, D.E.--

Dental education in Papua-New Guinea. Part I. The concept.

Aust. Dent. J., 11:2, 73-80, 1966.

98. SCHAMSCHULA, R.G., BARMES, D.E., and VEROLI, P.--

Dental education in Papua-New Guinea. Part III. Dental Technician and orderly courses; Auxiliary training for periodontal disease prevention.

Aust. Dent. J., 13:3, 237-240, 1968.

99. SCHAMSCHULA, R.G. BARMES, D.E., KEYES, P.H. and GULBINAT, W.--

Prevalence and interrelationships of root surface caries in Lufa, Papua-New Guinea.

Comm. Dent. Oral. Epidemiol., 2: 295-304, 1974.

100. SCHAMSCHULA, R.G., COOPER, M.H., ADKINS, B.L., BARMES, D.E. and AGUS, H.M.--

Oral conditions in Australian children of Aboriginal and Caucasian descent.

Comm. Dent. Oral Epidemiol., 8: 365-369, 1980.

101. SCHAMSCHULA, R.G., COOPER, M.H., WRIGHT, M.C., AGUS, H.M., and UN, P.S.H.--

Oral health of adolescent and adult Australian Aborigines.

Comm. Dent. Oral Epidemiol., 8: 370-374, 1980.

102. SCOTT, M.P.--

Native foods of the North West. A paper given at the 45th ANZAAS congress. Perth. Aug. 1973.

103. SHAFER, W.G., HINE, M.K., and LEVY, B.M.--

A Textbook of Oral Pathology. Philadelphia, W.B. Saunders Company, 3rd ed., 1974, 853p. (p. 48-55).

104. SINCLAIR, H.--

Factors affecting Aboriginal nutrition.

Med. J. Aust. Spec. Suppl., 1: 1-4, 1977.

105. SYKES, B.--

An analysis of some of the difficulties confronting Aboriginal community-controlled nutrition programmes.

Proc. Nut. Soc. Aust., 2: 32-36, 1977.

106. TATZ, C.M. --

The health status of Australian Aborigines: the need for an interdisciplinary approach.

Med. J. Aust., 2: 191-196, 1970.

107. UNITED DENTAL HOSPITAL OF SYDNEY--

Annual report of the 76th year of operation, 1979-80.

108. VINER, R.I.--

Developing Aboriginal Responsibility. Australasian Nurses Journal, August: 2-3.

109. WEBBER, D.L.--

Aboriginal health courses.

Aust. J. Social Issues, 12:3, 178-185, 1977.

110. WESTERN, J.S.--

Discrimination dispersing the equality myth. p.1-33 (in WILSON, P.R. ed. Of Public Concern; Contemporary Social Issues. St. Lucia, Queensland, University of Queensland Press, 1977, 270p.

111. WILD, J.--

Personal communication, 26/10/81

112. WILLIAMSON, J.J. and BARRETT, M.J.--

Oral health of Australain Aborigines: emdemic dental fluorosis.

Aust. Dent. J., 17:4, 266-268, 1972.

113. WOODS, R., MARTIN, N.D. and BARNARD, P.D.--

A community dental health project. 1. Self-applied SnF_2 - $Zr\ Si\ O_4$ prophylactic paste and dental caries in primary school children.

Aust. Dent. J., 21:3 205-210, 1976.

114. WRIGHT, N.--

Personal communication 15/10/81.

APPENDIX 1

Locations of Fixed School Dental Clinics in New South Wales, According to Health Regions of the Health Commission of New South Wales.*
Number of Mobile Clinics in Brackets.**

Inner Metropolitan (3)
- Canterbury
- Clempton Park
- Marrickville
- Rozelle

Southern Metropolitan (6)
- Arncliffe
- Chifley
- Daceyville
- Hurstville
- La Perouse
- Lugarno
- Mascot
- Newtown
- Rockdale

Northern Metropolitan (4)
- Beecroft
- Borowra
- Dee Why
- Gosford
- Mona Vale
- Naremburn
- Ryde East
- Queenscliff
- The Entrance

Western Metropolitan (7)
- Airds (Kentlyn)
- Bidwell
- Cartwright
- Mount Druitt
- Parramatta
- Richmond
- Springwood
- St. Mary's

North Coast (4)
- East Murwillumbah
- Grafton
- Kempsey
- Lismore
- Tyalla (Coffs Harbour)
- Woolgoolga

New England (3)
- Armidale
- Glen Innes

New England Cont'd
- Gunnedah
- Inverell
- Moree
- Narrabri
- Tamworth
- Tamworth West

Orana & Far West (7)
- Broken Hill
- Dubbo South
- Nyngan

Murray (5)
- Albury
- Edward (Deniliguin)
- Hume (Albury)

Riverina (6)
- Griffith North
- Leeton
- Mount Austin
- Narranderra
- Sturt
- Tumut

Central West (5)
- Bathurst
- Cowra
- Forbes
- Orange
- West Wyalong

South Eastern (3)
- Cooma
- Goulburn
- Queanbeyan
- Young

Illawarra (4)
- Berkeley
- Bulli
- Mittagong
- Nowra
- Ulladulla
- Wollongong

Hunter (3)
- Adamstown

Hunter Cont'd

Beresfield
Biriban (Toronto West)
Cessnock
East Maitland
Edgeworth
Gateshead
Kurri Kurri
Muswellbrook
Raymond Terrace
Scone
Singleton

* Wright [114]
** Wild [111]

APPENDIX II

OUTLINE OF DENTAL TRAINING COURSE FOR ABORIGINAL HEALTH WORKERS

An AHW undertaking Part I dental course (Level 1) shall be trained to:

1. clean, sterilise and maintain equipment and instruments
2. give oral hygiene instruction with aid of disclosing tablets
3. recognise plaque, calculus, dental decay and gum disease - understand role of plaque in dental disease
4. scale teeth of calculus using hand instruments
5. use low-speed dental equipment for oral prophylaxis
6. topically apply fluoride to teeth using disposable tray
7. keep written records of work undertaken and of patients to be referred to a dentist

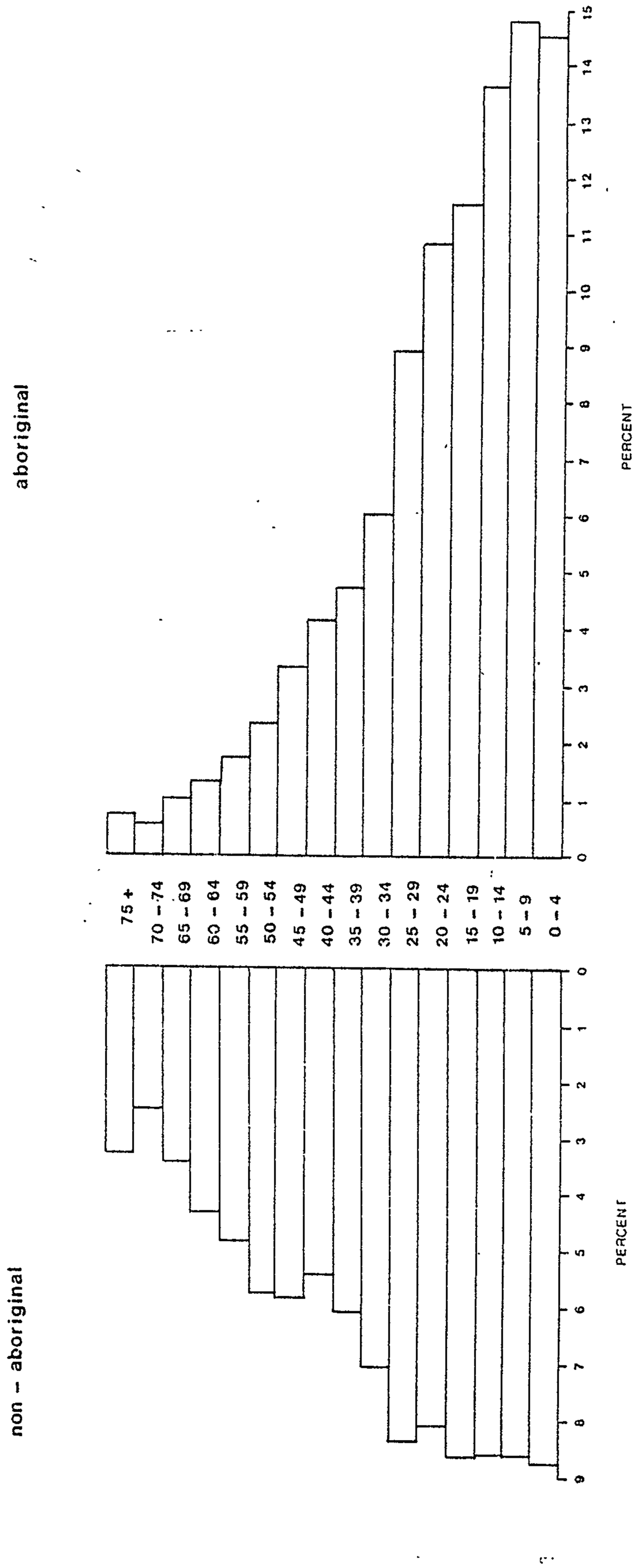
An AHW undertaking Part 2 dental course (Level 2) shall be trained to:

1. make a diagnosis of dental pain; to treat when able or refer
2. administer local anaesthetics using infiltration or block technique
3. remove gross decay using low speed dental equipment and hand instruments; place temporary filling
4. atraumatically treat carious deciduous teeth using silver fluoride, stannous fluoride technique
5. extract periodontally involved teeth; extract under supervision non-impacted teeth with bulk of crown present
6. continue procedures learned in Part 1 training

An AHW undertaking Part 3 dental course (Level 3) shall be trained to:

1. undertake uncomplicated extractions using forceps only
2. restore teeth with plastic materials
3. refer treatment beyond training to dentist (referral book)
4. organise community programmes of regular dental examination, treatment and referral in the adult population as an educational and interceptive measure
5. continue procedures learned in earlier training especially preventive measures.

APPENDIX III



From Health Commission of New South Wales.[58]