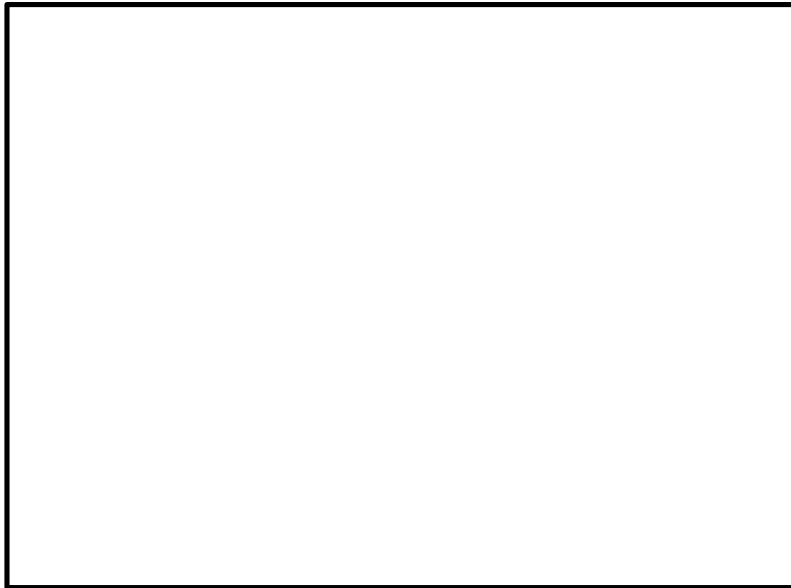




Menzies School of Health Research
Northern Territory Australia



1997-1998
Annual & Quinquennial Report
Volume I

The Logo

The logo is an abstraction,
in Northern Territory colours,
of the double helix of the DNA molecule;
it might also be called the "*ladder of life*".
This molecule provides the chemical code
for all living things, including infectious agents
which are important causes of disease.

The logo symbolises the commitment of the School
to apply the best available scientific methods
for the prevention of disease and
the promotion of public health.

Cover Design :

The inspiration for this painting came from a transmission electron micrograph of the malaria parasite, *Plasmodium falciparum*, inside a person's red blood cells. The blue line surrounding the blood cells represents the cure for malaria and the yellow dots, the continuous efforts to find this cure.

Norma "*Chidanpee*" Bengier

1998

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Menzies School of Health Research
Northern Territory Australia

1997-1998
Annual & Quinquennial Report
Volume I

Volume II

- Unit Reports & Publications (1993-July 1998) -
is available at <http://www.menzies.su.edu.au>
or as a Menzies Occasional Paper by request.

Mission Statement :

To help improve the health of the people of northern
and central Australia and regions to the near north
through multidisciplinary research and education

MEMBERS OF THE MENZIES SCHOOL OF HEALTH RESEARCH

OFFICIAL PATRON :

The Honourable Dr Neil Conn AO
Administrator of the Northern Territory

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Mrs Ann Alderslade	Mrs Marjory Edwards	Dr Kerry Kirke <i>AM</i>	Prof Robert Porter
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Hon Nick Dondas <i>AM, MP</i>	Dr Charles Kilburn	Mr Charles Perkins	Dr KC Woo
Dr Fiona Douglas	Mrs Christine King	Mr Marshall Perron	Ms Alison Worrell
Dr Rogan Draper	Mr Laurie King	Ms Elizabeth Phillips	Prof Heddy Zola

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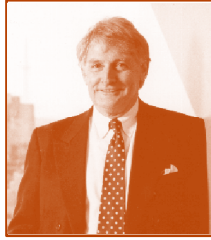
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This Annual Report incorporates Volume I of the documents prepared for the Third Quinquennial Review of the School.

Unit Reports and Publication details are available in Volume II at website <http://www.menzies.su.edu.au> (see Table of Contents, page 123 of this Report).

FOREWORD

Richard V Ryan AO



In this, my first full year as Chair of the Governing Board, the Annual Report also reports on the academic activities of the School for the full quinquennium 1993-98, to coincide with the forthcoming Quinquennial Review, required under the terms of the Menzies School of Health Research Act.

As always, the School is deeply indebted to the Northern Territory Government for providing essential infrastructure support, and to the external agencies and donors that provide funds for particular projects. Particular thanks are due to the Hon Denis Burke, Minister for Health, for his continuing personal interest in Menzies.

The School continues to play an important role in the Northern Territory through its ambitious research and education activities, in attracting over \$4 million pa in outside funding to the Northern Territory, with approximately 67% being spent on local employment. Thus the local community benefits indirectly through the economic activity generated by the School, as well as through the direct benefits of its work to the health sector.

In the latter half of 1997, Professor John Mathews, our Director, took the

opportunity to spend accumulated leave at the University of Oxford, to work on mathematical models of infectious disease. During his absence, the School was very ably directed by Prof David Kemp.

The CRC for Aboriginal and Tropical Health commenced operations in September 1997, and was officially launched in July 1998 by the Commonwealth Minister for Health and Family Services, the Hon Dr Michael Wooldridge MP. Over past years the School has undertaken projects with important implications for health policy and service delivery. The CRC will now provide a broader vehicle for researchers, health service-providers and policy makers to work in cooperation towards improving the lifestyle of Territorians.

Affiliations of the School with the University of Sydney and Northern Territory University provide training for postgraduate, graduate and undergraduate students, whose research and coursework projects are relevant to local health problems. Work experience and option-term placements are offered to students and the School also currently provides placement to 7 Aboriginal trainees of the CRC.

The School has an unqualified audit for the 1997/98 Financial Year and the Auditor-General, in his letter to the Director, commented "*I once again congratulate the School on producing its annual financial statements in such a timely manner after the end of the financial year*".

I would like to thank all my fellow Governors for their effort and support, all Committee Members, and in particular Mr Don Darben for his many years of dedicated service to the School.

The School continues to earn its reputation for high quality

multidisciplinary research. We congratulate and thank the Director and his talented staff for an excellent year, and we thank all those other friends of the School whose support has helped to make it possible.

Richard V Ryan AO
Chair
Board of Governors
Menzies School of Health Research

Thank You Don ...

The School is extremely grateful to Mr Don Darben AO for his service as a Member of the Finance Committee (1990-1998) and Chair of the Audit Committee (1994-1998). Mr Darben is retiring after many years of providing expert counsel and friendship to the School.

Don has our very sincere thanks, we wish him well in his retirement and we know that he will be a friend of the School for many years to come.

MEMBERS OF THE GOVERNING BOARD

(AS AT 30 JUNE 1998)

Chair / Treasurer :

Richard Ryan AM, BSc FCA FAIM (Nominee of the Governing Board)

Mr Ryan is a Fellow of the Institute of Chartered Accountants in Australia, Fellow of the Australian Institute of Management, Companion of the Institution of Engineers, Australia, and Companion of the Institute of Management (UK). He is Managing Director of Henry Walker Group Limited, Deputy Chancellor of Northern Territory University and a Director of Aboriginal and Torres Strait Islander Commercial Development Corporation.

L Valerie Asche MSc PhD FASM MAIBiol CBiol (Nominee of the Governing Board)

As a microbiologist Dr Asche has been a university academic, an industrial consultant and head of a diagnostic unit. In the NT she was head of the Microbiology Unit at the Menzies School of Health Research (1986-1984); a consultant for the NT Dept of Health and Community Services and is at present editor of *Recent Advances in Microbiology*.

Dayalan Devanesen AM, MBBS DPH MPH FRACMA FAFPHM FCHSE GradDip Public Sector Executive Management (Nominee of the Minister for Health Services)

Dr Devanesen is the Director of the Primary Health and Coordinated Care Branch of Territory Health Services. He commenced work in Alice Springs as a District Medical Officer in 1974 and has been involved with the development of services to Aboriginal communities. In 1985 he moved to Darwin as the Director for Community Health Services for the NT. He is the Vice President of the Royal Australian College of Medical Administrators and Chair of the NT Branch.

Stephen Leeder BSc(Med) MBBS PhD FRACP FFPHM FAFPPHM (Ex officio)

Professor Leeder is Dean of the Faculty of Medicine, Professor of Public Health and Community Medicine at the University of Sydney and a Fellow of the University Senate. At a national level Professor Leeder is a member of the National Health and Medical Research Council; he chairs one of its principal committees, the Health Advisory Committee. He is also National President of the Public Health Association of Australia. Professor Leeder is a member of the Western Sydney Area Health Board and chairs its Human Research Ethics Committee and Health Outcomes Council.

Simon Maddocks BAgSc(Hons) PhD CPAg (Nominee of the Menzies Foundation)
Dr Maddocks is Director of the University of Adelaide Roseworthy Campus and a Senior Lecturer in the Department of Animal Science. His research interests are in reproductive immunology and cell biology. He is Immediate-past President of the Sir Robert Menzies Memorial Scholars Alumni Association and a Director of the Board of the Sir Robert Menzies Memorial Foundation.

John D Mathews AM, BSc MBBS MD PhD FRACP FRCPA (Ex officio)
Professor Mathews was appointed as Foundation Director of the Menzies School of Health Research in 1984. His previous research was in New Guinea and at the Walter and Eliza Hall Institute, with postdoctoral work in Oxford and ten years as a NHMRC Fellow in the Dept of Medicine at the University of Melbourne. He has served on numerous NHMRC Committees, and as an adviser to government on Agent Orange, ionising radiation, AIDS, Aboriginal health and tropical research issues.

Ron McKay BSc PhD GDipComp GDipBus FAIM (Nominee of the Minister for Education)
Professor McKay is Vice-Chancellor of the Northern Territory University. He was appointed in 1996, following a six year term as Deputy Vice-Chancellor. Until recently, Professor McKay was also Chair and Chief Executive Officer of the Strehlow Research Centre. He is currently Chair of the Northern Territory Research and Development Advisory Council (NTRDAC).

Margaret McLean JP, Clinical Nurse Consultant RN RM DipAppSci BNurs (Nominee of the Governing Board)
Mrs McLean has worked as a clinical nurse consultant in the Elliott community and north Barkly region for the past eleven years. She is currently on secondment to the Community Care Information Systems Project of Territory Health Services where, as the Rural Informations System Manager, she is overseeing the development and implementation of an Information System into remote communities.

She is an active member of various community organisations and a past member of the Women's Advisory Council (1990-1992). Currently she is a representative on numerous steering committees and working parties, with particular relevance to health issues in remote areas.

John Paterson BSocSci (Nominee of the Administrator)
Mr Paterson is a born and bred Territorian who has worked in the field of indigenous affairs since 1979. Mr Paterson is currently on secondment to the Minister for Aboriginal Development, and Parks & Wildlife.

He was previously ATSIC Commissioner for the NT North Zone, holding various portfolio responsibilities including Indigenous Health. He continues to serve as a Regional Councillor on the Yilli Rreung Regional Council. Mr Paterson is also Chairperson of the NT Area Consultative Committee, which is a peak DEETYA advisory committee to the Federal Minister for Employment, Education, Training and Youth Affairs.

Peter Plummer BSc GDipMgt Corp Directors Dip (Nominee of the Minister for Health Services)

Currently Chief Executive Officer of Territory Health Services, Mr Plummer was previously CEO of Mines and Energy and prior to that held senior executive positions in two other economic development departments in the Northern Territory. Before coming to the NT he lived in Papua New Guinea for 16 years working in the secondary and tertiary education sectors.

Dorothy Sing RN (Nominee of the Governing Board)

Ms Sing is a certified general, midwifery and intensive care nurse, a family planning nurse practitioner and an AIDS educator. She has lived and worked in the Territory for 30 years and is currently clinical nurse consultant for the HIV/AIDS/STD Unit in Katherine.

Her particular interests being STDs and women's health, Ms Sing has been involved in the STDs in Women "T-test" pilot project.

John A Young AO, DSc MD FAA FRACP (Nominee of the Vice-Chancellor, University of Sydney)

Professor Young is Pro-Vice-Chancellor (Health Sciences) at the University of Sydney and Professor of Physiology. He is an eminent physiologist who has played an important role in international and national physiology societies.

Professor Young was Dean of the Faculty of Medicine and Chair of the MSHR Board of Governors until his appointment as Pro-Vice-Chancellor in April 1997.

Staff Representatives

1997 : Mr Jon Hartas BAppSc

1998 : Ms Bev Hayhurst MPHc BEd DipTeach AppDipTeach (Multiple-Handicapped Deaf)

Secretary to the Board

Katherine Henderson BA DipEd

PATRONS OF THE SCHOOL

A number of prominent Australians have become Patrons of the School, to assist with raising its profile throughout Australia, as well as in the Northern Territory.

Patron-in-Chief

His Excellency Sir William Deane AC KBE,
Governor-General of Australia

Official Patron

His Honour the Administrator Dr Neil R Conn AO,
Administrator of the Northern Territory

Patrons :

Northern Territory

The Honourable Austin Asche AC QC

Mr Gatjil Djerrkura OAM

Queensland

Mr Ron Archer AM

South Australia

Hon John Dawkins

Dr Lois O'Donoghue CBE AM

Mr William Scammell CBE

Tasmania

Dr John Hargrave AO MBE

Victoria

Sir Gustav Nossal AC CBE

Mr Charles Goode

Western Australia

The Honourable James Muirhead AC QC

STRATEGY PLAN 1996-2000

AIMS OF THE SCHOOL

Having established its academic name within the Northern Territory, Australia, and internationally, the School has identified the following aims as achievable by the year 2000 :

- 1 To achieve **excellence in health research, health development, health evaluation and health education** for the benefit of the people of northern and central Australia and for nearby regions in South East Asia.
- 2 To use its unique location and pool of expertise, and its strengthening rapport with Aboriginal communities and organisations, to become a **centre of excellence for the education and training of Aboriginal people** in health research, health development and health evaluation skills, and **for the consideration of ethical and cross-cultural issues with particular reference to Aboriginal health.**

STRATEGIC DIRECTIONS FOR 1996-2000

To achieve these aims, the School has set the following strategic objectives for 1996-2000.

- 1 To obtain more knowledge of **diseases** and of **public health problems** arising from adverse **environment, lifestyle, and living conditions** and from **health service delivery problems** in northern and central Australia and nearby regions.
2. To use new and existing knowledge to identify and develop more effective means for the improvement of public health, for the **prevention, detection and management** of disease, and to promote the delivery of **more effective health services** on a basis of need.
- 3 To be a partner in developing more opportunities for **postgraduate training for health professionals** and for **health education and training for Aboriginal people and for the wider community** in the Northern Territory and nearby regions.
- 4 To be a responsible and effective advocate on health issues affecting northern and central Australia and nearby regions.
- 5 To consolidate and extend the infrastructure and resources of the School, particularly through :
 - new funding for initiatives in health education;
 - program-based funding for research and development activities;
 - cooperation with other institutions and organisations;
 - provision of adequate infrastructure in Central Australia;
 - commercial arrangements to develop any ethical products based on work at the School.

DIRECTOR'S OVERVIEW

John D Mathews AM



EXECUTIVE SUMMARY

The culture of health research and education, developed around the Menzies School since 1985, has helped to deliver improved understanding and awareness of the problems of Aboriginal and tropical health in northern Australia, as well as improvements in training of health staff, in health services and preventive programs.

These achievements have only been possible because of the commitment and talent of Menzies staff, students and colleagues, and the generous financial support from Northern Territory Government and the Menzies Foundation, competitive grants from NHMRC and other agencies in Australia and overseas, and private and corporate donations. The School has also enjoyed the goodwill and cooperation of Territory Health Services and other arms of the Northern Territory Government, Aboriginal communities, medical services and organisations, the National Heart Foundation and other non-government organisations, the University of Sydney, Northern Territory University, Flinders University and other teaching institutions. The School has also interacted with the wider community in Australia, and with colleagues elsewhere in Australia, in Indonesia, New Zealand, Germany, India,

Thailand, Vietnam, Africa, Britain and USA.

The School has generated local, national and international respect and goodwill for the relevance and quality of its research. As a consequence, in this last Quinquennium the School was able to secure generous joint funding from the Northern Territory and Commonwealth Governments for its new building in Darwin. The move into the new premises, in November 1996, and the official opening by the Hon Michael Wooldridge and the Hon Denis Burke were important landmarks in the School's development.

Menzies has been recognised for its substantial research achievements towards understanding tropical and Aboriginal health problems, including malaria, melioidosis, donovanosis, otitis media and respiratory disease, kidney disease, diabetes and ischaemic heart disease, as well as rheumatic fever and other manifestations of streptococcal infection.

Important research advances in the last Quinquennium include :

- an understanding of how social, environmental and educational disadvantage translate into poor Aboriginal health through effects on nutrition, cross-infection, substance abuse and lifestyle;

- an understanding of how malnutrition, poor hearing and other health impediments contribute to poor educational, employment and social outcomes in later life.
- an understanding of how factors in pregnancy and childhood (low birthweight, malnutrition and infection) predict diabetes and obesity, renal disease and cardiovascular disease in later life for Aboriginal Australians;
- the discovery that dog scabies and human scabies are distinct populations, strongly suggesting that people cannot be infected from their dogs;
- an improved understanding of the importance of persistent bacterial infections in Aboriginal Australians : pneumococcus and haemophilus causing otitis media and respiratory infection, streptococcus causing skin sores, rheumatic fever and kidney disease; Chlamydia, gonococcus and donovanosis as causes of STD;
- an understanding of how persistent bacterial infection is driven both by social circumstances such as poor nutrition, poor hygiene, overcrowding and poor health services, and by the large number of distinct bacterial strains;
- an understanding of how concurrent infection with multiple strains of pneumococcus and haemophilus helps to explain the rapid ‘emergence’ of antibiotic resistant strains following treatment;
- evaluations of Aboriginal medical services, with recommendations to improve the quality of primary care services, specialist outreach and dialysis services;
- Successful interventions to improve health outcomes through :
 - improved community nutrition (eg. at Minjilang);
 - improved community education and prophylaxis of rheumatic fever;
 - improved awareness, diagnosis and treatment of otitis media;
 - treatment with ACE inhibitors to slow progression of renal disease;
- characterisation of the CLAG gene in *falciparum* malaria, encoding a pathogenic adhesion molecule, which in turn has led to the recognition of an entire new family of related genes with potential implications for malaria prevention.
- important work in Indonesia on disease mechanisms and the epidemiology of malaria; work on tuberculosis treatment should start in the near future.

In the past Quinquennium the School has also consolidated its linkages with academic partners and health services as the lead agency in the new Cooperative Research Centre for

Aboriginal and Tropical Health. Through its Board, with a majority of Aboriginal members, the CRC has an important agenda to discover and disseminate knowledge about Aboriginal health problems, to provide more research and training positions for Aboriginal people and to facilitate Aboriginal control of the planning and implementation of health research and health services.

In this Quinquennium, the School taught postgraduate coursework in public health to help develop skills in the local health workforce. Now the School is promoting a broader vision of public health education through a Faculty of Public Health in partnership with Northern Territory University. This Faculty will continue postgraduate teaching and promote access to accredited courses at multiple levels and to short courses to meet the needs of teachers and educators, administrators, Aboriginal people and others in need of public health knowledge and expertise.

The multidisciplinary focus of the Menzies School of Health Research has more than justified the vision of its

founders, by delivering value-for-money to its stakeholders and the wider community. However, as the School faces the new Quinquennium, it has to grapple with important strategic questions :

- How can the School best maintain its cohesion, corporate identity and shared values with so many different disciplines and cultures (eg. clinical, public health, biomedical, bureaucratic, Aboriginal) within and without its walls?
- How to continue to serve the community with a broad public health perspective while maintaining the deep biomedical expertise that underpins strategic research?
- How can the School best play its role as an academic critic of health policy, while working in partnership with health services to promote necessary improvements?
- How can the School best manage its opportunities for collaborative research, both local and overseas, when funding agencies fail to recognise the full “opportunity costs” of such collaboration?

In answering these questions, the Menzies School of Health Research will continue to provide national leadership, with a model for excellence and relevance in research that will continue into the next millennium.

THE MENZIES SCHOOL IN CONTEXT

Brief History and Legal Status

The School was established as a cooperative endeavour between the Menzies Foundation, the Northern Territory Government, and the University of Sydney. It commenced operations in January 1985 and is incorporated as a statutory body under Northern Territory legislation and controlled by an independent Governing Board. The School reports to the Northern Territory Legislative Assembly through the Minister for Health and also to an Annual General Meeting of the School. The Director is responsible to the Board for the School's overall management.

Menzies maintains a small Central Australian Unit in Alice Springs, but the major part of the work of the School is based in Darwin.

The Menzies School celebrated its Tenth Anniversary of operations in 1995. Its new, custom-designed building on the Royal Darwin Hospital campus was officially opened by the Commonwealth Minister for Health, Hon Michael Wooldridge, and the Northern Territory Minister, Hon Denis Burke, on 22 November 1996.

Functions of the School

The functions of the School are to carry out health research and education of relevance to northern and central Australia and nearby regions; a more comprehensive statement of the functions is given in the governing legislation.

Values of the School

The School is committed to :

- excellence in research to advance health knowledge;
- excellence in scholarship and teaching about health;
- the equitable use of knowledge and resources to improve health.

Previous Quinquennial Reviews

The governing legislation (Menzies School of Health Research Act, 1985) requires that the Governing Board commissions an independent Academic Review of the School at intervals not exceeding five years. The first Quinquennial Review was conducted by Prof Ross Kalucy in July 1988. The second Quinquennial Committee of Review in 1993 was Chaired by Prof

Mission Statement

To help improve the health of the people of northern and central Australia and nearby regions of South East Asia through multidisciplinary research and education.

Ken Donald. Both reviews were very successful.

School Strategy Plan 1996-2000

The School's Strategy Plan was developed after wide community and institutional consultation. As part of that planning process, the School developed its mission statement.

SCHOOL ORGANISATION AND AFFILIATIONS

The Governing Board

The Governing Board of the School, established under the legislation, is appointed by the responsible Minister as follows :

- Two nominees of the Minister for Health
- One nominee of the Minister for Education
- One nominee of the Administrator
- One nominee of the Menzies Foundation
- Four nominees of the Governing Board
- Three ex officio positions
 - The Vice Chancellor of the University of Sydney (or nominee)
 - The Dean of Medicine of the University of Sydney

- The Director of the Menzies School of Health Research.

The composition of the Board reflects the very important role of the University of Sydney in establishing the School.

Mr Richard Ryan AO, is the Chairman of the Governing Board, having succeeded Professor John Young AO, who now serves as Deputy Chairman in his capacity as Pro-Vice Chancellor of the University of Sydney, and nominee of the Vice Chancellor. The other members of the Governing Board are listed on pages 3-5.

The Governing Board meets at least twice each year, usually once in Darwin and once in Alice Springs. Committees of the Governing Board such as the Finance Committee, meet on a more regular basis. Membership of School Committees is given on pages 105-106.

CHALLENGES IN THE NORTHERN TERRITORY

Aboriginal Health Issues

Because of the disastrous state of Aboriginal health, it was always clear that the potential contribution of the School would be maximised by working on health problems of relevance to Aboriginal people. Three overlapping areas of activity were defined :

- health research, seeking new knowledge of relevance to local

health problems, whether by way of laboratory, community-based or hospital-based projects;

- health development, seeking to apply the results of research or to apply existing knowledge to improve health in demonstration projects or programs;
- health education, seeking to make relevant knowledge and understanding available to health service personnel, government decision-makers and to Aboriginal employees and people in the wider community.

Causes of Poor Aboriginal Health

Historical studies and international comparisons clearly show that social and educational factors are important determinants of health [305]. For example, health indicators began to improve in the slums of industrial Europe with the introduction of clean water supplies, sewage disposal and hygiene education in the late 19th Century, when there were almost no effective medical interventions. Nevertheless, mortality rates and morbidity rates were also greatly improved, particularly for those living in city slums, following the introduction of antibiotics in the 1940s and 1950s.

In the modern world, as argued by Jack Caldwell from ANU, countries with the poorest health have the lowest per capita incomes, and the lowest literacy rates for women. This corresponds with

the common-sense view that financial resources are needed to provide health infrastructure (adequate housing, water supplies and sanitation, health services, including antibiotics and other medical services), and that knowledge is needed within the home to make effective use of the available infrastructure and services.

The Ethics of Aboriginal Health Today

In exploring the issues affecting Aboriginal health, the School has been motivated by an ethical responsibility to work together with Aboriginal people whose health is disproportionately poor in comparison with other Australians.

For Aboriginal people, the health problems associated with living in tropical or arid regions are compounded by poverty, unemployment, poor education and social disadvantage, by poor living conditions, by a lack of resources, and by lack of access to the knowledge base to achieve a healthier lifestyle. As it stands, the health services currently available to Aboriginal people are inadequate to meet health needs related to social and environmental influences such as :

- overcrowded living conditions, with high rates of bacterial cross-infection from an early age;
- poor facilities for healthy living, and poor hygiene;
- poor food supplies and poor nutrition;

-
- excessive use of alcohol, cigarettes, petrol and kava;
 - domestic violence, homicide, suicide and accidents;
 - inadequate provision, understanding and uptake of community infrastructure and health services.

It is a matter of grave concern to Menzies that many Aboriginal children and adults do not have access to the knowledge and facilities for healthy living, and that they still suffer from treatable conditions such as otitis media, trachoma, impetigo (skin sores), STD, diabetes and hypertension which are not always diagnosed and treated.

Advisory Relationships with Aboriginal People

Until recently, there has been a paternalistic model of interaction between Aboriginal people and the dominant culture. The asymmetry of power was predicated on a belief in the superiority and monopoly of Western technological knowledge and practices. Aboriginal people struggled to preserve their traditional knowledge and culture against the impact of colonisation and loss of land, which brought infectious diseases and malnutrition and then unemployment and alcohol and substance abuse.

In this context, considerable influence was exercised by cultural 'brokers' or advisers, usually employed by government, who worked with

Aboriginal people. Now, there are Western educated Aboriginal mediators, people who are able to understand both Western ways and traditional customs and expectations, but, in the health arena to date, their numbers remain few.

The Menzies School, through its health research, development and education activities, now has considerable standing as a source of expert advice on Aboriginal health issues. From time to time, this has brought the School into potential conflict with other advisers, both Aboriginal and non-Aboriginal.

For example, until a few years ago, it was still seriously being argued, by some other advisers, that because of the social origins of most of the problems of Aboriginal health, it was not necessary to provide good medical services. Fortunately, the battle between social and medical models of health care is now over, and there is almost universal agreement that best-practice clinical care for Aboriginal people must be provided in a culturally appropriate manner. At the same time, social, environmental and educational issues are being urgently addressed at Menzies and elsewhere.

Menzies' long term aim is to facilitate improved health through the provision of improved educational opportunities. As a result, Aboriginal people will themselves be better able to evaluate expert advice when it is required.

Attitudes to Research and Scholarship in Northern and Central Australia

Early research with Aboriginal people in northern and central Australia was strongly criticised as being 'colonial' and exploitative. It was seen as being of value only to the researchers, and as having little relevance to Aboriginal people and community life. This view was clearly justified when the typical research project involved a quick visit by academics from southern universities for data collection in the field, and then a long silence while the data were converted into theses and research papers, usually without feedback to the research participants and communities. This style of research was typically planned and carried out simply to satisfy intellectual curiosity with the needs, wishes and priorities of Aboriginal people being subordinated to a researcher's overriding goal of academic advancement.

With the heightening of Aboriginal political awareness in the 1970s, which coincided with an increasing national concern about Aboriginal health problems, searching questions began to be asked by Aboriginal people, and others, about the value of 'curiosity based' research targeting Aboriginal people. In the Territory, there was deep ambivalence towards anthropological research when the potential for exploitation by others became evident. In the same period, Fred Hollows embarked on the National Trachoma

Campaign. He decided at the outset that there could be 'no research without treatment', thus offering something back to Aboriginal people. However, Hollows' service work was still criticised. It was seen as threatening by some of those who had health service responsibilities, and because it was still seen to be imposed on Aboriginal communities from outside.

From this labile and often fraught historical context, the Menzies School successfully developed an academic infrastructure supporting health research, development and education. Its activities are increasingly undertaken in collaboration with Aboriginal people in northern and central Australia.

Socio-Cultural Values and the School

Staff at the Menzies School have had to accommodate disparate values of the wider Northern Territory community. The School has had to learn about Aboriginal cultural mores, both in relation to its community work, and its relationships with Aboriginal staff. In addition the School has had to be aware of the values of some non-Aboriginal health professionals working in government and community-controlled health services, whose scepticism about academic values has led to occasional questions about the motivation of research staff.

In this context, it is important to recognise that there is always the

potential for a conflict of interests between people in service positions who identify with the status quo, and those with research values, whose *raison d'être* is to ask questions about how the status quo might be changed for the better. Furthermore, despite the best efforts of the School, the Northern Territory University and other academic institutions, there is continuing scepticism in the wider Northern Territory community, with its lingering frontier ethos, about the value of research.

Whatever their discipline, Menzies School staff have responded admirably to the disparate values and opinions impinging upon their work. Indeed, within the school, the plurality of opinion has allowed scientists to see themselves and their work through somewhat different eyes and as part of the larger picture. By understanding its critics and responding positively to them, the scientific endeavour at Menzies is enriched, and better able to communicate the value of science to the community at large. Because the work of the Menzies School is so enmeshed with the wider community, its work necessarily has different dimensions than for most other (laboratory-based) research organisations. This complexity is a continuing challenge, but it is also a strength. If the School succeeds in its task of bringing different research cultures together, it will not only have helped to solve some important problems of Aboriginal health, but it

will also have helped to show the value of a research model that integrates biomedical, socio-cultural and community perspectives. This issue is discussed elsewhere in this report.

Ethical Aspects of Aboriginal Health Research

The School has played a leading role in promoting discussion, both locally and nationally, about the ethics of health research with Aboriginal people. By establishing the first Ethics Committee in the Northern Territory, by organising the Alice Springs Workshop in 1986, and in other ways, the School has been instrumental in creating procedures to ensure that Aboriginal people are fully consulted about research activities, that research projects are relevant to their health needs and are carried out in accordance with their wishes and priorities. Pages 33-38 of this Overview give a more detailed account of ethical and cultural issues, and of the newer models for research that give greater control to Aboriginal people.

STRUCTURE AND FUNCTION OF THE SCHOOL

Unit Structure

The School organisation is based around a Unit Structure (**Figure 1**, page 18). The Head of each Unit is responsible to the Director for the supervision of all staff

within each Unit with the exception of laboratory-based Units which report to the Director through the Deputy Director. However, because of the multidisciplinary nature of most of the projects within the School, there is extensive collaboration between Units as reflected in the winning of grants, the publication of papers, and in the communal ethos of the School.

For example, the Deputy Director plays a key role in linking the best of molecular science into the projects of the Ear Health, Clinical and Public Health and Epidemiology Units, and in otherwise supporting the Director in the scientific management of the School. The Head of the Aboriginal Unit plays a key role in supporting the Director on Aboriginal matters, and in coordinating the involvement of Aboriginal staff in collaborative projects with other Units within the School. The Business Manager is responsible for the oversight of administration and services and meets with the Director and Deputy Director as the School Executive. Unit Heads and other senior staff meet every two months, and there is a monthly meeting for all School staff. Further details are given in subsequent sections.

Staff and Students

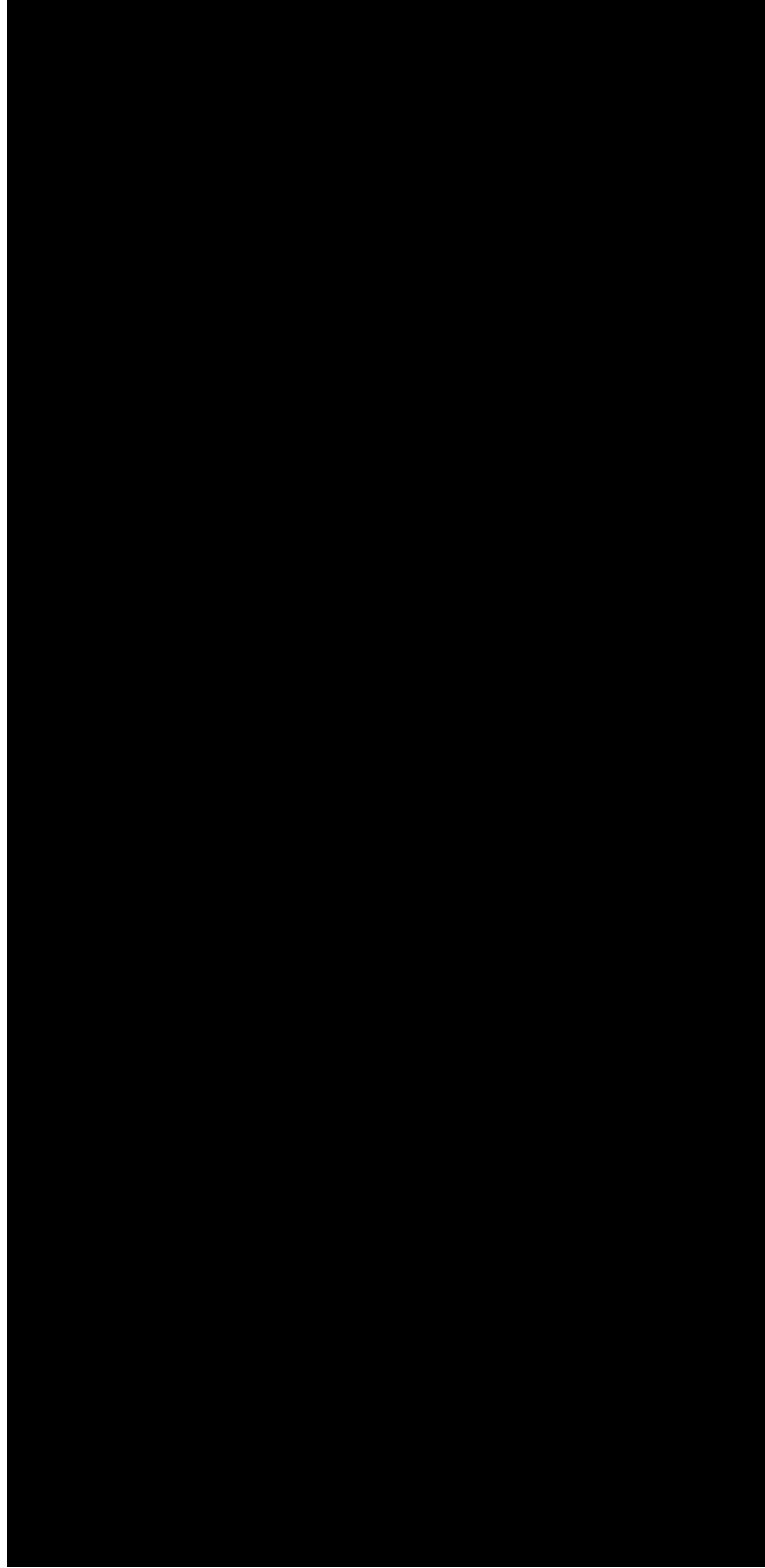
Personnel numbers at the School have grown from three in January 1985. In August 1998 there were some 71 full-time equivalent employees, 20 full-time

students at honours, masters or doctorate level, and 13 part-time research students. Some 76 staff are deployed in Darwin and 9 in Alice Springs. In addition there are 39 students currently enrolled in public health coursework, at MPH or graduate diploma level.

School staff are employed on limited term contracts, in general accordance with NHMRC guidelines for academic staff. Most senior academic staff have honorary university appointments to enable them to supervise postgraduate research students studying at the School. Conditions for non-academic staff are based on those of the University of Sydney. Senior academic staff are employed on five year contracts, renewable after an academic review; most other staff have shorter contracts, which are renewable subject to the availability of funding and to performance.

Postgraduate research students at the School enrol to study for MPH, MSc or PhD awards of the University of Sydney or Northern Territory University or Flinders University. They have access to CPRA scholarships through one or other university, awarded on the basis of honours results, and to NHMRC Postgraduate Awards, equivalent awards from other bodies, or to Postgraduate Studentships awarded competitively within the Menzies School itself.

**Figure 1. Menzies School of Health Research
Organisation Chart**



Workplace Agreement

With the move towards enterprise bargaining in the workplace, the School has had ongoing discussions with staff about the terms and conditions to be considered for incorporation in an agreement. A consultant has now been engaged to assist the School and staff, with the intention of reaching an agreement to be voted on by staff in the near future.

Academic Support and University Affiliations

The School has had a long-standing affiliation with the University of Sydney as embodied in the Menzies School of Health Research Act (1985). The University has two ex-officio positions on the Board. Reciprocally, the Menzies School of Health Research has standing as a Department of the Faculty of Medicine, and the Director of Menzies is designated as The Robert Menzies Professor of the University of Sydney. The Deputy Director also has professorial status with the University, while other senior academic staff have been accorded honorary academic status. The School has been able to enrol postgraduate research students with the University, and has otherwise received strong academic support. However, as the School is only a Department of restricted status, it has not had access to University or departmental funding, either for the supervision of students, or for research, teaching or salary

support except for a small DEET grant to develop public health teaching, negotiated by the School and channelled through the University, and a small one-off research grant from the Dean of the Faculty.

In 1993, through the goodwill of the University of Sydney, although without any funding from it, the School commenced coursework teaching for a Sydney-accredited MPH and graduate diploma.

More recently, the School has developed a new affiliation with the Northern Territory University (established in 1989) with an agreement that has accredited the MPH coursework to NTU, and provided the School with a small amount of EFTSU funding to help support the teaching. Since 1996, all new students in the public health coursework have enrolled with NTU. In addition, the School has an agreement with NTU to transfer partial EFTSU funding for any postgraduate research students enrolled with NTU and supervised at Menzies. Through the goodwill of NTU, we also have access to honours students. NTU and the School have now agreed, in principle, to establish a Faculty of Public Health at the Menzies School. This will provide a framework for the strategic planning and delivery of public health training, in partnership with Territory Health Services and other stakeholders. It would also provide academic standing

at NTU for those involved in the teaching program.

In 1996 a Clinical School for medical student training was established at the Royal Darwin Hospital by Flinders University of South Australia through an affiliation agreement with Territory Health Services. The Menzies School has an understanding that it will cooperate with the Clinical School, for example, by sharing the expenses of the position of Senior Lecturer in Public Health, and through Menzies staff contributing to clinical teaching where appropriate. The Director of the School has accepted the honorary title of Professor at Flinders University, but the School has not responded to an invitation to negotiate a formal MOU with Flinders, in part because of the importance of the local affiliation with Northern Territory University.

In 1997 a Centre of Clinical Excellence at the Royal Darwin Hospital was supported by NHMRC under the leadership of Assoc Professors David Brewster and Bart Currie, and Dr Frank Bowden.

Goodwill and Support from Northern Territory Government

When the School was first mooted in 1983, there was only the possibility of a small seeding grant from the Menzies Foundation to support the position of a Director and secretary. The School did not become viable until the Northern Territory Government generously

agreed to invest in the future by providing accommodation, library and laboratory facilities, and a cash grant towards infrastructure and operating expenses. Since then the Northern Territory Government has provided some 40% of the operating budget, with the balance largely coming from competitive grants. The School would not be viable without this Northern Territory Government support for administrative staff and senior academic positions and infrastructure costs. The Northern Territory Government also provided joint funding, with the Commonwealth, for the School's new building, the construction of which was supervised by the Northern Territory Government Construction Authority.

The Department of the Chief Minister has been particularly supportive, marking the 50th Anniversary of Indonesia's Independence in 1996 with generous funding for a five year program of cooperative research in Indonesia.

The School has also been supported by the Northern Territory Treasury with advice on financial matters, and by the Commissioner on Public Employment advising on matters related to personnel and the secondment of staff from the Public Service to the School. The finances of the School are audited by the Northern Territory Auditor. The School has also benefited through advice from the Department of Law.

Territory Health Services

When the Menzies School was established in 1985, the infrastructure funding from the Northern Territory Government was initially appropriated through the Education portfolio. More recently these funds have come via Territory Health Services. The School is also linked to Territory Health Services through the two nominees on the Board, through the direct access of the Director to the Minister for Health (Hon Denis Burke) and the Secretary of the Department (Mr Peter Plummer), through joint appointments (eg. Dr Bart Currie in Darwin and Dr John Wakerman in Central Australia), through the involvement of a number of THS staff as teachers on the MPH program, through the employment by THS of postgraduates from the School (eg. Dr Tarun Weeramanthri), through the joint Institutional Ethics Committee at the Royal Darwin Hospital, and through cooperative and collegiate partnerships in health research, development and pilot service projects. Nevertheless, it is important that the organisations have stayed separate, because they have different values and different core business, despite their common interests. This separation also allows the School to fulfil one of its key roles as an independent evaluator and/or commentator on health practice and policy in the Northern Territory.

Territory Health Services also supports the Father Frank Flynn Fellowship, to honour a great ophthalmologist, missionary and medical researcher, now living in retirement in Darwin.

Goodwill and Support from Commonwealth Government

The National Health and Medical Research Council has benefited from the committee work of the Director and senior staff. Grant success has been fuelled by the track records of the senior staff and by the growing research successes and productivity of the School itself. The School has consistently had a better than national average success rate with NHMRC grants, both through the Medical Research and the Public Health Research and Development Committees.

Over a long period, there has been considerable goodwill towards the School from the Commonwealth Department of Health. With political support from Senator Collins and others, this translated into financial support for the new building in 1994. There has also been support for the School under the RHSET and PHERP programs and, for a time, through AHMAC, for the cooperative adventure in ARHRI (see below). More recently, the School has enjoyed a cooperative relationship with the Office of Aboriginal Health, which has provided additional support towards the CRC.

The School currently enjoys the personal support of the Commonwealth Minister for Health, Hon Dr Michael Woodridge, the Minister for Aboriginal Affairs, Senator John Herron, and the Chairperson of ATSIC, Mr Gatjil

Djerrkura OAM who has graciously agreed to be a Patron of the School.

Goodwill and Support from Aboriginal Communities and Health Services

The School has developed close working relationships, through individuals and research programs, with many Aboriginal communities and organisations. There have been strong linkages with the Tiwi (otitis media and kidney research; dialysis consultancy), with Galiwinku (otitis media and education), with Maningrida (petrol sniffing, kava, scabies, rheumatic fever and health services), with Angurugu, Umbakumba and Numbulwar (Groote Eylandt Syndrome, petrol sniffing, rheumatic fever), with Millingimbi (kava), Lajamanu (Chlamydia and trachoma), Minjilang (nutrition) and Hermannsburg (nutrition and diabetes). Many other Central Australian communities have participated in health services research projects of the School. Most particularly, the Tiwi people have also supported the research of the School with funds of their own, and by leasing land at Nguui at no cost for the house provided by Menzies and used by researchers visiting Bathurst Island.

An important outcome, for some Aboriginal communities, has been that the research activity has helped to accelerate desired improvements in health infrastructure and services. For example, recognition of the epidemic of

renal disease, and demonstration of the efficacy of early treatment, has helped to drive the development of improved dialysis and treatment services for the Tiwi people. With improved funding, the Tiwi Coordinated Care Trial will evaluate the effects of the new service delivery model on health outcomes.

Such improvements in health infrastructure have allowed Aboriginal people to put their relationships with the School on a more professional footing. For example, with the formal establishment of the Tiwi Health Board, the Tiwi people have now negotiated an agreement with the School that gives legal force to their control over the research agenda and the use of samples and information.

The School has also developed strong connections with town-based Aboriginal organisations. While the late Ms Sally Ross was Head of the School's Aboriginal Unit, she was instrumental in creating Danila Dilba Medical Service in Darwin. She became its first Director. Danila Dilba's cooperation with the School was subsequently maintained through the Directorship of Ms Barbara Flick, and continues now under the present Director, Ms Pat Anderson.

The Central Australian Unit of the School has cooperated with Central Australian Aboriginal Congress, most often through research projects involving Dr David Scrimgeour and Dr

Komla Tsey with Mr John Liddle and staff from Congress.

The goodwill of Aboriginal organisations towards the School is further demonstrated by the recent participation of Danila Dilba and Congress as Core Partners with Menzies and others in the Cooperative Research Centre for Aboriginal and Tropical Health.

FUNDING AND ACCOMMODATION

School Funding

The School was established with a grant of \$100,000 pa from the Menzies Foundation, and \$900,000 pa from the Northern Territory Government. It has otherwise grown largely through its capacity to attract competitive external grants, with additional support from private and corporate donors. The increased external funding has, in turn, strengthened our case for modest increases in funding from the Northern Territory government. By 1992-93, the School budget had grown to approximately \$3.3 million, of which 45% was provided by the infrastructure grant from the NT government; most of the remainder was derived from competitive grant funding, including some \$800,000 from NHMRC and PHRDC. Total Commonwealth funding was \$998,600. From 1992-97, Professor David Kemp, as Deputy Director, added considerably to grant income through large overseas grants

from the Howard Hughes Medical Institute, the MacArthur Foundation and the Wellcome Trust. For political rather than scientific reasons, this funding has now been discontinued. New funding from NIH (USA) is currently being sought.

Nevertheless by 1998-99, the School now budgets for income of approximately \$6.0 million, of which \$2.75 million comes from the Northern Territory Government grant, including a supplement to cover the operational costs of the new building. At the time of writing, the known (budgeted) income from NHMRC and other competitive Commonwealth grants was \$1.386 million, not including any estimate for new grants to commence in January 1999, and not including income for CRC functions. (Actual 1997-98 Commonwealth competitive grant income was \$1.79 million.)

CRC cash funds are received from the Commonwealth (\$2.2 million pa for the first full year), and managed in a separate trust account on behalf of the CRC, and distributed to the CRC partners for their expenses on CRC programs. As the Centre Agent and as a CRC partner, the Menzies School will receive and expend approximately \$0.67 million on behalf of the CRC in 1998-99.

Royalties and Fundraising

At present the School does not have any royalty income resulting from

commercialisation of its research, but it has entered into an agreement with AMRAD in Victoria that will give that company first option to patent and develop any discovery from the School that may have commercial potential. In return AMRAD has issued the School with shares, it provides commercial advice to the School, and considers applications for funds to assist the School with research that may have commercial potential in the longer term. Unfortunately, the commercial potential of our work is constrained by the fact that most of the health problems under study are seen as “third world”, and as having little potential for profitable sales.

With the Governing Board, Patrons and supporters, the School is publicising the national relevance of its work for fundraising from private and corporate donors. A major initiative is to be launched in 1998-99.

Physical Facilities and New Building

When the School was first established, there was a commitment from the Northern Territory Government to provide accommodation, laboratory and library services and other facilities. From 1985, while it shared laboratory facilities with the Department of Pathology, the School was accommodated in converted nursing home accommodation in Building Four of the Royal Darwin Hospital campus. The Alice Springs Hospital provided space from 1987 for Menzies operations

in Central Australia. In 1989 Territory Health Services provided space for the formal establishment of the Central Australian Unit.

With pressure for space from Territory Health Services, the success of Menzies and the consequent increase in the School's staff numbers, Building Four rapidly become overcrowded. The first plans for a custom-designed building for the Menzies School were sketched in 1984, with a major redesign in 1987 by Daryl Jackson and by Godfrey and Spowers. Following a Value Management Study in 1989-90, it took years of lobbying before funding was approved for the construction of the new Menzies building. With the support of the Northern Territory Government and the Commonwealth, the Minister for Health in the Northern Territory, and Senator Bob Collins, funding for the new Menzies School building was finally committed by the Commonwealth on 25 April 1994, subject to matching funds from Northern Territory Government.

Largely as designed by Daryl Jackson, the new building was erected on hospital land owned by the Northern Territory Government. It was completed in October 1996, and occupied by the School in November 1996. Although construction funds were appropriated by both the Commonwealth and Territory governments because of the goodwill generated by the School, title to the

building remains with the Northern Territory Government, with the School paying nominal rental on a long-term lease basis.

Issues with New Building

The building is fully functional, except in one important respect. During final planning, and without consultation, sunshades were removed from the windows of the building as a cost-cutting measure. This means that working conditions are uncongenial in the morning in some parts of the building and, in the afternoon, in other areas. The School has been negotiating with the Northern Territory Government, as landlord, to have this defect remedied. This defect in planning is unfortunate given that funds were directed instead towards the customised fitting-out of rooms for the Health Physics section of Territory Health Services. Although used temporarily by other THS staff, the intended Health Physics rooms are now to be leased by government on a commercial basis, to a pathology service.

COOPERATIVE AND COLLABORATIVE ARRANGEMENTS

Government-supported Cooperative Initiatives

Public Health Education and Research Program (PHERP)

In 1994, the School applied for support for a teaching centre under the PHERP

program administered by the Commonwealth Department of Health and Family Services, and also for funding of two Specialty Centres under PHERP. In the event, we were funded only for the Specialty Centres in Aboriginal Health and in Communicable Diseases and Venerology. Nevertheless, by using the Specialty Centre funding, a short-term DEET grant, infrastructure funding, and more recently some EFTSU funding via NTU, the School has developed and maintained MPH coursework teaching, as well as sustaining and expanding the specialty interests and related public health research interests.

Rural Health

The School was involved, from 1993, as a participant in a what was eventually to become known as the Australian Rural Health Research Institute (ARHRI), an institute without walls involving other partners at Monash, Charles Sturt University, University of South Australia and University of Western Australia. Through the Central Australian Unit of Menzies, there were contributions by Dr Robyn McDermott. Dr Sam Heard was recruited to Menzies in Darwin, on a part-time basis, using ARHRI funds; subsequently he went on to help establish the Centre for General Practice in Darwin, and the Flinders University Department of General Practice in Darwin, and he continues to cooperate with the School on training, general practice, rural practice and medical records issues, and through

the CRC framework. Ms Colleen Hennessy was recruited from USA to direct the Alice Springs node of ARHRI in 1996, and was involved in attempts to restructure the national collaborative network of ARHRI which was dysfunctional, in part because of the multiple levels of management control. After a review of ARHRI in 1997, the Australian Health Minister's Advisory Council decided that funding would not be continued, and the ARHRI structure was dissolved. Ms Hennessy has relocated to a new position with the Health Commission of Victoria.

In restructuring its approach to rural health training and research, the Commonwealth has funded an academic Department of Rural Health in the Northern Territory, located in Alice Springs under the terms of a joint agreement between Flinders University and Northern Territory University. As Director of the Menzies School, I have been invited to serve on the Steering Committee for this new Department, which will also benefit from relevant expertise in the Central Australian Unit of the Menzies School.

The Cooperative Research Centre for Aboriginal and Tropical Health

This CRC is a joint venture with Danila Dilba Medical Service, Central Australian Aboriginal Congress, Flinders University, Northern Territory University and Territory Health Services, with the Menzies School as the

lead agency and Centre Agent. John Mathews, the Director of the Menzies School, also serves as part-time Director of the CRC. The CRC commenced operations in the second half of 1997, and the Menzies School provides accommodation for the CRC Secretariat and for a number of researchers employed on behalf of the CRC.

Collaboration Interstate and Overseas

The School has linkages with the CRC for Vaccine Technology through the streptococcal work of Dr Sriprakash, Dr Currie and others. The Director of the School serves on the Board of that CRC. There is further collaboration on streptococcal work with Prof Ed Kaplan of Minnesota, Prof Debra Bessen at Yale, Prof NK Ganguly in India, Prof GS Chhatwal from Braunschweig, Germany, and Dr Diana Martin in Auckland.

The Director and the Deputy Director (Prof Kemp) are both alumni of the Walter and Eliza Hall Institute. David Kemp remains in contact with Dr Alan Cowman and others at WEHI and also cooperates extensively with others in the international network involved in sequencing and functional analysis of the malaria genome. Prof Kemp also serves on the Board of the Australian Genome Research Facility.

More recently the School has made an arrangement with Dr Simon Foote of WEHI and the CRC for Gene Discovery,

for collaboration on a project to map the genes that may contribute to renal disease in Tiwi families. This project has been held in abeyance while a legal agreement with the Tiwi has been negotiated. Any final approval for that project to proceed will be subject to the terms of that agreement.

Through a collaboration with Dr Frank Bowden (AIDS/STD Control in Territory Health Services), Prof Kemp, Dr Sriprakash and others are involved in several STD projects that involve colleagues interstate and overseas in Indonesia and India.

Assoc Prof Bart Currie, Prof Kemp and others are involved in collaborative work on melioidosis with colleagues in Thailand and elsewhere in Australia, and collaborative work on scabies with colleagues in the USA. Bart Currie has also continued his collaborative work on snakebite toxinology and other aspects of tropical medicine during a recent period of study leave with Prof David Warrell in Oxford.

During 1997, the Director acted as adviser to the Wellcome Trust in reviewing their Units in Kenya, and he was an invited speaker at a Wellcome workshop on bacterial disease in Vietnam in 1998. He spent six months of 1997 at the Wellcome Trust Unit in Epidemiology Department of Zoology, University of Oxford, developing collaborative research themes with Prof Roy Anderson FRS and colleagues. It is

anticipated that this will lead to specific collaborative projects from 1999.

Committee and Community Work

Up to 1996, the Director had served on most of the senior committees of NHMRC, including the Medical Research Committee, the old Public Health Committee, the Special Purposes Committee, the Health Care Committee, and the Public Health Research and Development Committee. He also served on many expert advisory committees, and on numerous Regional Grant Interviewing Committees, and on the Bienenstock NHMRC Review Panel and other advisory committees for government. The Director has also been Foundation President of the NT Mental Health Association, a Vice President of the National Heart Foundation in the Northern Territory, and a member of the National Board of the National Heart Foundation. He is also a Board member of the CRC for Vaccine Technology, and the Australian Institute for Family Studies, as well as the Board of the Menzies School of Health Research.

Prof Kemp is an adviser to AMRAD, to the Australian Genome Facility, and he is an invited member of the Asia and Pacific Rim Molecular Biology Organisation.

All senior staff of the School review grants for NHMRC and other granting agencies on a regular basis, and carry out other public interest activities.

ASPECTS OF OUR CORPORATE CULTURE

Assets, Values and Ethos

Challenging Problems in Aboriginal and Tropical Health

The health problems encountered in Aboriginal Australia and in nearby tropical regions constitute both a challenge and an asset for the Menzies School. Because of its geographical proximity to those most affected, the School is very well-placed to design and deliver its important research program in partnership with Aboriginal people themselves. This provides challenging research and training opportunities for young health professionals coming to Darwin early in their career and a corresponding challenge for Aboriginal people. The School also offers collaborative opportunities to people from Indonesia and other northern neighbours.

Talent, Commitment and Values among Menzies School Staff

Because of these challenging opportunities, the Menzies School has

been able to attract talented and committed people, both as staff and as postgraduate research students. We have been extremely fortunate in being able to recruit people of great ability and motivation, and in being able to develop a communal ethos, and a commitment to excellence. In the past, staff turnover was considerable, particularly at junior and middle levels, because of the mobility of the Darwin population and the continuing need to introduce new skills into the School, and because of professional incentives for good staff to move interstate. At more senior levels, two members of staff were offered professorial appointments elsewhere, and others have moved into positions of higher responsibility and influence in health services or non-government organisations.

Academic Values and the Competitive Research Culture

The School has developed a research culture with values firmly rooted in the quest for better knowledge and deep understanding. Such values are essential in an organisation that must compete nationally and internationally for funds. Accordingly, the School is

Special Assets of the Menzies School of Health Research

- The challenging set of problems in Aboriginal and tropical health
- Our committed and expert staff
- Our multidisciplinary and collaborative ethos
- Our good relationships with Aboriginal people

committed to the process of peer assessment with its staff competing against the best in Australia. A spirit of competition among staff ensures that Menzies sustains a high level of academic achievement and productive use of resources. This applies equally to staff whose personal motivation thrives in a competitive environment and those whose personal or professional predilections lean towards collaboration and cooperation. The two are not mutually exclusive. (Related issues are discussed in the “*Freedom and Responsibility in Research*” Box next page).

Cooperation and Collaborative Values in Multidisciplinary Research

The competitive ethic in the Menzies School is leavened by an equivalent commitment to cooperation and collaboration. Without cooperation between staff with disparate but often complementary expertise, the School would run the risk of carrying out highly expert research that would be of little relevance in solving some of the practical health problems it encounters.

Specialists know more and more about less and less, and in the end know everything about nothing

while

Generalists know less and less about more and more, until in the end they know nothing about everything.

The School seeks relevance and excellence in all of its work. It must avoid the trap of either being so general that it is superficial, or of being so specific that it is irrelevant! It therefore uniquely brings together experts from different disciplines to work on health problems from a multidisciplinary perspective. If each of the experts is competitive and up-to-date within his or her discipline, and if a truly collaborative environment is achieved, then multidisciplinary programs can avoid the pitfalls of superficiality and, as Menzies has already shown, begin to make important new contributions to knowledge and to better health.

The emphasis on cooperation and collaboration within the School makes special demands upon researchers, who value the intellectual ownership of their own work. Nevertheless, because of the complementarity of skills among staff, and their growing commitment to problem-solving, it has been possible to create a collaborative and cooperative ethos that links together work in different Units of the School. Menzies special contribution has been to facilitate and encourage the mutual recognition of expertise and skills from different cultures and professional sub-cultures, from Aboriginal culture to laboratory culture and from the culture of clinical medicine to the cultures of the social and epidemiological sciences.

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Freedom and Responsibility in Research

Scientific research provides the community with a better understanding of how the world works, and with better means for solving the many problems of contemporary life. Pure research is largely driven by the curiosity of the researchers themselves, who want to understand WHY the world is as it is! Applied research, in the community interest, wants to understand HOW to change things for the better.

The research life is privileged in many ways, not least for those at the Menzies School, whose major teaching responsibilities are for postgraduate research students. Such full-time researchers usually enjoy their work immensely, they enjoy the freedom to plan their workloads to suit their other interests, they usually work with a minimum of supervision, they are only indirectly answerable to the community at large which pays for their research through the various granting agencies, and they have the opportunity to travel to meet with scientific colleagues. Furthermore, in many situations they are free to change the emphasis of their research in order to capitalise on a chance or serendipitous finding that shows promise of leading to a greater understanding.

With such freedom for researchers, wherein lies the responsibility?

Peer Review Ensures Responsibility in Research

The first answer is that researchers earn their freedom by being good at doing research! Research capacity, quality and productivity are assessed by the processes of peer review, whereby a peer group of independent researchers, who are acknowledged by others to have the appropriate expertise, make judgements about the research and/or researchers in question.

Such peer review works at a number of levels. For example, the work of a postgraduate research student is reported in the first instance in a thesis and the degree will be awarded only if the work is judged by independent examiners to be of a sufficiently high academic quality, and to bring new understanding to an important area of study.

Most academic research is also communicated in written reports or 'papers' published in one of the many academic journals. However, before any such paper can be published, it must also be submitted for peer review by a number of expert but independent 'referees', who will assess the quality and importance of the work, as well as the validity of the methods and the conclusions. Work that is trivial or of poor quality will not be accepted for publication, while work that is poorly presented may be returned for rewriting or revision before being accepted. Work that is of the highest quality will generally be published in the most prestigious journals, while work that is of the lesser quality will be publishable in other journals. The number and quality of papers published in referred

continued

journals are a measure of the research output and the consequent productivity of academic researchers.

Peer review also plays the key role in the allocation of funds for research. Established researchers can only continue in the field while they are able to compete successfully for research funds against the best researchers from other institutions. For example, all senior researchers receiving salary support from NHMRC must compete for salary support every 3 to 5 years. The salaries for junior researchers are often sought by way of competitive three-year grants prepared by a responsible senior investigator.

This competitive granting system is not perfect, but it works better than any other system that has yet been devised. Judgements about the quality of proposals for new research grants depend upon the ranked assessments made by several independent scientific peers. In making their judgements, assessors are guided by the quality of the work proposed, the apparent capacity of the applicant(s) to carry out the work, and by their past productivity as judged by previously published work. The assessors have no incentive to give misleading reports because, firstly, to do so would damage their own academic credibility and thus damage their own capacity to compete for future research funds, and, secondly, because when funds for research are so limited, it is in the general interest that the assessment system should work as fairly as possible. The system is fiercely competitive. For example, in recent years NHMRC has been able to fund only one in four of the grant applications submitted for funding each year. Each year the overall quality of research submissions to NHMRC is becoming higher, as the less successful applicants become discouraged and 'drop out'.

Community Interests in Research

Although the competitive peer review system ensures that researchers are responsible and accountable to their scientific colleagues, it does not ensure that the research is carried out in accordance with the priorities of special interest groups in the community.

In recent years there has been a welcome change to ensure that the benefits of the peer review system, which enables resources to flow to the highest quality work, can be combined with the benefits of giving the community a greater control over the setting of research priorities.

In a number of ways, the flow of research has now been regulated by providing targeted funds which can only be allocated to research projects that are relevant to priority areas identified as being in the community interest. For example, the Commonwealth Government has targeted for funding AIDS, public health and other special needs areas including Aboriginal health. Such funding acts as an incentive to attract more researchers to work in the priority areas, and the operation of the peer review system within priority areas has helped to ensure that the research carried out is of the highest possible quality.

continued

The integrity of the system has been ensured by involving representatives of targeted or special interest groups in the review process, and, more recently, by setting up means for improved cooperation and consultation between researchers and community groups.

Responsibility in Research at the Menzies School

Within the School, academic responsibility is achieved by employing talented, well qualified and hard-working researchers, by requiring that most research projects are of such quality that they can attract funds through the external peer-reviewed system, and by linking the continuation of employment to research productivity, as measured by papers published in refereed journals and by research grants won in open competition with other researchers.

Community accountability is achieved through the involvement of community representatives in the processes of ethical approval for research proposals, and to an increasing extent in the setting of research priorities. For example, Aboriginal members of the Ethics Sub-Committee take a keen and critical interest in the rationale for research projects that are investigator driven, and the School is seeking to improve its mechanisms for community consultation and for developing and assisting with research proposals that are set up in response to community research priorities.

Models for More Cooperative Research

Most recently, a new and more cooperative model for research has been established through the CRC for Aboriginal and Tropical Health, with the research priorities being set by an Aboriginal majority Board. Similarly, the Legal Agreement between the Tiwi Health Board and the School will give more explicit control to the Tiwi people over current and future research.

The full scope of the multidisciplinary collaboration between different Units of the School is summarised in **Table 1**, pages 42-43. For example, there is work carried out by the ear team and others on otitis media, using skills from education, qualitative research,

audiology, speech pathology, otorhinolaryngology, microbiology, immunology, molecular biology and epidemiology. Similar collaborations have been responsible for major advances in our understanding of renal disease.

PARTNERSHIP WITH ABORIGINAL PEOPLE

The most important collaborative interface at the Menzies School is with our Aboriginal partners, of whom a small number work as employees in the Aboriginal Unit and other areas of the School and as researchers in the field or in the laboratory, and a larger number who have worked with the School as employees within other organisations or as research volunteers in participating communities. Without their specialised input, and without the support and active participation of many Aboriginal people in the work of Menzies, most of the School's achievements in public health and science would have been impossible. *The Rheumatic Fever Story* (see below) provides an excellent example of how Aboriginal people can deliver their knowledge and skills, in partnership with good science and medicine, to deliver good public health outcomes. The report from the Aboriginal Unit gives more details of projects of Aboriginal staff.

The complex story of our relationships with Aboriginal people, and of the ethical and cultural context of our partnership, needs to be heard and understood by all who have an interest in research and Aboriginal health matters. This brief account deals principally with the processes for ethical approval for our research with Aboriginal people.

Institutional Ethics Committee (IEC)

When the Menzies School was founded in 1985, there was no Ethics Committee in the Northern Territory to consider research ethics. Accordingly, at an early stage the School moved to establish a Joint Institutional Ethics Committee (IEC) to review research proposals on behalf of the Menzies School and the Royal Darwin Hospital (Territory Health Services). The IEC was constituted and has always worked in accordance with NHMRC Guidelines. It also reviews proposals by researchers from other organisations when their work is relevant locally.

Because of a heavy research emphasis on the health problems afflicting the Aboriginal population in northern and central Australia, it was also clear that the IEC would need strong Aboriginal representation. Therefore, early members of the IEC included Mrs Lorna Fejo, our first Aboriginal employee, and Mr Mick Dodson, then Director of the Northern Land Council, and subsequently Social Justice Commissioner.

Although the IEC has functioned jointly both for Menzies and Territory Health Services, Menzies has been responsible for administering its affairs except for a brief period around 1986-87. When the administration was passed back to Menzies from THS, early records of the Committee were missing.

Guidelines on Ethical Matters in Aboriginal and Torres Strait Islander Research

Back in 1985, there were the standard NHMRC Guidelines on Human Experimentation, as well as Guidelines for Epidemiological Research, but no specific guidelines for research with Aboriginal people. In 1986, with NHMRC support, the Menzies School and the Menzies Foundation organised a workshop on Aboriginal health research in Alice Springs. The workshop exposed, in very dramatic form, the great differences in expectation and understanding that existed between Aboriginal people and the research culture, the latter represented by NHMRC and the researchers present. Indeed, Aboriginal representatives at the meeting took the view, not unreasonably, that research could be seen as just another form of exploitation of Aboriginal people by the dominant white society.

As a result of that workshop, NHMRC convened a workshop for Aboriginal people, and then a working party, chaired by Mr Shane Houston, to develop research recommendations which were eventually adopted formally as NHMRC Guidelines in 1991.

The IEC, and the Menzies School itself, have always striven to interpret all NHMRC guidelines to give maximum protection to Aboriginal people. The

spirit of the recommendations from the Aboriginal working party was followed even before they were drafted and adopted by NHMRC. The School has always sought approval from each of the Aboriginal communities involved in research, as well as from the IEC.

Aboriginal Ethics Sub-Committee

From 1991, at the request of Aboriginal people, the IEC moved to establish a Sub-committee of Aboriginal representatives, to meet separately from the full IEC, and to be represented on the IEC by the Chair of the Sub-Committee. Those serving since then as Chair of the Sub-Committee in Darwin have included Ms Barbara Flick, Ms Pat Anderson, and Mr Trevor Woodhead. It has always been understood that the IEC would not approve any research proposal that had not obtained the prior approval of this Aboriginal Ethics Sub-Committee. This power of veto has always been honoured, and a number of proposals have been rejected by the IEC on the recommendation of the Sub-Committee.

Culture and Ethical Values

The rejection of some projects by the Aboriginal Ethics Sub-Committee has been influenced by Aboriginal cultural values. For example, Aboriginal people have strong cultural beliefs about the dead. Accordingly, members of the Aboriginal Ethics Sub-Committee have objected strongly to the research use of

tissue samples from deceased persons, even when such samples might have been taken some years previously, and stored (eg. as paraffin blocks).

To some researchers, such Aboriginal notions are alien. However, for Aboriginal people whose attitudes reflect the traditional beliefs of their culture, a utilitarian approach to human samples is not only outdated, but clearly offensive. Furthermore, on the international scene, the utilitarian approach to research ethics (or “the ends justify the means”) has been universally rejected since 1947, when the Nuremberg Trials exposed the Nazi atrocities perpetrated on concentration camp victims in the name of science.

The power of veto held by the Aboriginal Ethics Sub-Committee enables ethical behaviour in research to be based on respect for the individual and the collective. It ensures that such respect is extended to beliefs, such as those about human samples, as well as ensuring the protection and material well-being of human subjects.

Cultural differences in ethical decision-making have been discomfiting to those researchers whose projects may have been rejected or questioned. Nevertheless, some rejected projects have subsequently been approved, both by the Sub-Committee and the IEC itself, after the ethical and cultural issues have been clarified in a revised proposal.

Central Australian Ethics Committee

Menzies School activities in Central Australia were hospital-based from 1987. The Central Australian Unit was established in 1989. The Central Australian Ethics Committee, in partnership with Central Australian Aboriginal Congress, was established to review applications locally because the Darwin-based IEC was seen as both spatially and culturally remote and too removed from local concerns.

The Baume Report

In 1991 the Menzies School invited Professor Peter Baume to carry out a consultancy, together with the late Ms Sally Ross, and Ms Mai Katona, to review the relationships between the School and Aboriginal people. The resulting report, “*Opportunity and Benefit*”, provided the School with valuable independent opinion, and with a number of strategic suggestions and recommendations, which were later implemented. A particularly important outcome of the consultancy was the support given to the introduction of Aboriginal traineeships at Menzies, to be funded by DEET.

The report also drew attention to some negative perceptions of Menzies research amongst the Aboriginal people consulted by Professor Baume. However, it was not possible to source any of these negative perceptions to specific projects of the School, so there

were no specific complaints to be investigated.

Rumours About Research

Despite the leadership shown by the School on ethical matters in relation to research with Aboriginal people, there have, from time to time, been rumours about inappropriate research practice. For example, as recently as 1995, I was invited to Canberra by an adviser to a Commonwealth Minister to answer a rumour that the School had been “experimenting” on Aboriginal children. This was in relation to the randomised trial of long-term treatment for otitis media (ear infection), a project funded by NHMRC with a design that was endorsed by experts in Australia and overseas, and for which the ethics procedures had been approved both by the IEC and the Aboriginal Sub-Committee. There have never been any specific complaints to investigate in relation to the otitis media project. None of my enquiries about the rumour elicited any evidence whatsoever of departures from the ethics procedures approved by the IEC and the Sub-Committee.

There have also been rumours that clinical information collected in the course of the kidney disease treatment program on the Tiwi Islands was also being used for research purposes without appropriate approvals. The facts are that some of the data from the treatment program were indeed being used in de-identified form in reports

and publications to document the importance and value of early treatment for kidney disease and high blood pressure. However, as the treatment program had itself been a component of the initial program of research approved by the IEC and by NHMRC, and as informed consent was obtained from all persons acting as research volunteers before they entered the treatment program, the research accorded fully with accepted ethical practice.

Legal Agreement with Tiwi Health Board

Just as the Aboriginal Ethics Sub-Committee in Darwin would not regard itself as competent to approve research projects in Central Australia, it has also expressed reservations about approving proposals for work with the Tiwi people of Bathurst and Melville Islands. Consequently, with the recent advent of the Tiwi Health Board, the School has now negotiated a formal agreement with the Tiwi to give legal force to the control that the Tiwi people have always had over the nature of the research to be done, the conduct of the research, and the ownership of research samples and data.

The existence of the legal agreement, our commitment to it, and the penalties for non-compliance, will provide additional reassurance to the Tiwi, and also provide protection for the Menzies School and its researchers against any rumours of unethical practice.

School Position on Ethical and Cultural Matters

In all that I have written and said as Director, I have made it very clear that all personnel at the School have a particular responsibility to be

punctilious in ethical and cultural matters. I have particularly emphasised the importance of attending to process and detail when research involves Aboriginal people so as to avoid any possibility of misunderstanding.

Ethical Lessons from the Past

- Good intentions are not enough!
- Ethical standards today, quite correctly, are much higher than in the past. Much medical research published up to the 1960's would not now be regarded as ethical. The incentive and enthusiasm to do good research, and the heroic legends from the past, led some earlier researchers down a very slippery slope into ethical misconduct (see *Pappworth, M., Human Guinea Pigs, Penguin, 1969*).
- Ends do not justify means. Research practice cannot be based on utilitarian principles.
- Ethical behaviour must be based on respect for the individual, their person, and their beliefs.
- Ethical standards in research practice are more demanding than those in routine clinical practice.
- Although researchers act in good faith and themselves honestly believe that their work is being done for good and altruistic reasons, they also stand to gain personally from their research.
- Because of this personal gain, researchers will often be seen by outsiders to have motives that are mixed.
- Outsiders will also see that there is a potential for researchers with mixed motives to have a conflict of interest in ethical matters.
- The ethical procedures set up by the NHMRC, the Institutional Ethics Committee, and the School itself are important because :
 - they help to ensure that researchers are all aware of their ethical responsibilities;
 - they help to ensure compliance with those procedures, and thus provide protection for patients and research subjects;
 - they thus also help to protect researchers, and the School itself, against any claims of unethical behaviour or of conflict of interest.

Employees and research students working with the School are specifically made aware of their ethical obligations at entry in the Terms and Conditions of Employment. All research applications from the School to NHMRC are made on the condition that the applicants understand that they must comply with NHMRC guidelines. Other funding agencies refer, either explicitly or implicitly, to the NHMRC Guidelines as a condition for funding.

The School is presently drafting a formal Employee Agreement to complement the Legal Agreement it has reached with the Tiwi Health Board.

The Need for a More Cooperative Model of Research

The model for research that is 'NMHRC-based', 'researcher-driven' or 'doctor-driven' is unfamiliar to many Aboriginal people. Despite the best intentions of researchers, investigator-driven projects are often seen as invasive, threatening or exploitative, or simply as serving the interests of the researchers more than the interests of Aboriginal people. Claims of this kind can also be made, albeit in good faith, by people with different values, people from different disciplinary backgrounds, sometimes by those who are familiar with the research, sometimes by people who are not closely associated with it, and sometimes by people who purport to speak on behalf of Aboriginal people.

The internal and external cultures of the Menzies School, with disparate

institutional and cultural values, bring important issues of research practice and ethics into clear focus, providing opportunities for change and development. For example, Menzies has been active in facilitating change through its partnership in the multi-institutional, multidisciplinary, cross-cultural CRC initiative. In 1994, Menzies began working to establish a Cooperative Research Centre in partnership with Aboriginal people and other health and academic organisations. The CRC was finally established in 1997, with a majority of Aboriginal people on the Board, to ensure that research priorities would be set by Aboriginal people, acting in conjunction with researchers to create new directions for medical and scientific research among and with Aboriginal people.

MAJOR ACHIEVEMENTS OF THE SCHOOL

To provide some background, the *Past Achievements (1985-1982)* Box (page 39) summarises some of the School's important achievements prior to 1993, while the *Major Achievements in Past Quinquennium* Box (pages 40-41) summarises the important achievements of this Quinquennium. **Table 1** (pages 42-43) summarises the matrix of mutual interests and collaborations between Units and the key investigators involved in many of the projects active over that period.

Menzies School of Health Research Past Achievements (1985-1992)

- 1985 School wins first ever NT research grant from National Health and Medical Research Council (NHMRC) to study chlamydial disease.
First Ethics Committee for the NT established in Darwin along NHMRC guidelines.
- 1986 First NT survey of heart disease risk in Darwin carried out with National Heart Foundation support
First Aboriginal member of staff appointed.
NHMRC sponsored workshop in Alice Springs to discuss Aboriginal health research.
- 1987 Major descriptions of trachoma and chlamydial disease, and controlled trial of trachoma treatment.
DNA sequence of chlamydial plasmid - a world-wide first!
Study of the infectious causes of diarrhoea amongst children admitted to Alice Springs Hospital.
- 1988 Central Australian Unit established in Alice Springs to carry out public health research.
First description of the harmful effects of kava drinking in Arnhem Land.
- 1989 Major grant from NHMRC over five years to understand the causes of ear infection (otitis media) and hearing disability occurring in the majority of Aboriginal children.
NHMRC support for kidney research with Tiwi and other Aboriginal communities; high rates of kidney failure could be related to streptococcal skin infections and poor nutrition in childhood.
- 1990 Aboriginal diet and health improved by community action at Minjilang to promote healthier food and to educate store managers.
The movement disorder on Groote Eylandt shown to not be associated with manganese exposure from the GEMCO mine.
- 1991 Wet season outbreaks of mosquito-borne Ross River virus infection, and of melioidosis described in cooperation with Territory Health Services.
Described very high rates of rheumatic fever and heart disease due to high rates of streptococcal infection.
DNA sequences of local streptococci shown to differ from overseas types.
- 1992 Howard Hughes and Wellcome support to Professor David Kemp, appointed as Deputy Director to continue his work on molecular aspects of malaria and other infections.
Following reports of scrub typhus caught in Litchfield Park in 1990-92, the NT Government introduces preventive measures.

Menzies School of Health Research
Major Achievements in Past Quinquennium
(1993-1998)

1993 First Australian isolate of *Chlamydia pneumoniae*.

Menzies School of Health Research signs an agreement with the Australian Medical and Research Development Corporation (AMRAD) allowing it first option to patent and develop any discovery with commercial potential.

Early onset of ear disease shown to be due to infection with haemophilus and pneumococcal bacteria in the weeks after birth; persistence of otitis media probably due to carriage of these bacteria throughout childhood.

Commencement of training by coursework for Master of Public (MPH) and Diploma of Public Health (DPH) degrees.

1994 Genetic (DNA) fingerprints used to identify at least 47 types of haemophilus bacteria causing ear and chest infection.

Multiple types of haemophilus and pneumococci shown to be carried at same time. Antibiotic resistant pneumococci shown to be hiding behind sensitive strains.

Genetic (DNA) fingerprinting also developed to study streptococcal infection and melioidosis.

1995 Dr Wendy Hoy appointed as NHMRC Senior Research Fellow with 5 year grant to study kidney disease prevention. Research links kidney disease to low birth weight, malnutrition, childhood infection and adult obesity.

Major NHMRC funding for a trial of early treatment of ear disease.

Discovery that Groote Eylandt movement disorder is genetically (DNA) identical to Machado-Joseph disease from Portugal; it probably came from Portugal via Indonesia and the Macassans.

Molecular mechanism proposed to explain chromosomal deletions in chromosome 9 of malaria parasite (*P. falciparum*).

ATSIC consultancy to explore the feasibility of community dialysis to treat kidney failure at Nguuiu; a second ATSIC consultancy to assist Maningrida to plan an improved health service.

1996 DNA exchange between haemophilus shown to contribute to diversification of strains.

Trial of new alcohol regulations in Tennant Creek following study by Dr Peter d'Abbs.

Completion of major report on control of petrol sniffing in Arnhem Land.

Prof David Kemp elected as a Fellow of the Australian Academy of Science - first ever in the Northern Territory.

continued

Inauguration of twin Fellowships in Infectious Diseases for 5 years of cooperative research on malaria and tuberculosis with health authorities in Indonesia.

Launch of education package on Rheumatic Fever prepared by Aboriginal Unit staff.

Central Australian Unit moves to new accommodation; increased activity in health services evaluation.

Custom-designed new building on Royal Darwin Hospital campus (November).

- 1997 Successful culture of the bacterium causing Donovanosis, a sexually transmitted infection leading to gross disfigurement and the rapid diagnosis of Donovanosis by a new PCR technique, facilitating improved treatment.

Improved understanding of the treatment of scabies infection.

Epidemiological studies of streptococcal skin sores, rheumatic fever and acute nephritis; large numbers of streptococcal strains described.

Development and application of a pneumatic video-otoscope for the validation of diagnosis of ear disease in Aboriginal infants.

Success with medication adherence and with monitoring of ear disease and bacterial infection in a randomised placebo-controlled trial of long-term amoxycillin.

Collaborative study of otitis media in day care centres of suburban Darwin.

Research review of remote area health services and of the efficiency and effectiveness of ambulatory care services in Central Australia.

Review of the educational and cross cultural issues of relevance to the health of Aboriginal Australians.

Treatment with ACE inhibitors controls hypertension and progression of renal disease; high rates of compliance achieved with Tiwi patients.

CRC for Aboriginal and Tropical Health commences operations.

- 1998 Identification and sequencing of CLAG (adhesion) gene in *falciparum* malaria, with multiple paralogues on other malaria chromosomes.

Dog and human scabies mites shown to be distinct populations using DNA techniques.

Aboriginal renal disease linked to developmental defects in the kidney and to serological evidence of past streptococcal infection.

Launching of video version of educational package for rheumatic fever, prepared by Aboriginal staff.

Epidemiological and theoretical models for population biology of multiple types of pneumococcus, haemophilus and streptococci.

N.B. These achievements have benefited greatly from advice, cooperation and collaboration of many health service and research colleagues.

Table 1. Matrix of Mutual Interests and Collaborations Between Units and Key Individuals

	Molecular Genetics Unit	Molecular Parasitology Unit	Computing & Biostatistics*	Far-Health & Education Unit	Clinical Unit	Repat Unit	Public Health & Epidemiology Unit	Central Australian Unit	Health Sciences Unit	Aboriginal Policy
Malaria Genetics		Kemp <i>et al</i>								
Scabies Genetics		Kemp, Walton			Currie, Carapetis					Thomsen, Bailey
Bacterial Genetics group A streptococcus	Sripakashi, Goodfellow	Gardner			Currie, Carapetis	Hoy	Mathews			
meliklosis		Kemp, Myers			Currie					Mayo
haemophilus		Kemp, Smith-Vaughan		Leach <i>et al</i>			Mathews			Martin
pneumococcus				Leach <i>et al</i>	Currie		Mathews			
chlamydia		Kemp, Hutton					Mathews			
strepococcus		Kemp, Hutton, Carter			(Bowden)					
gonococcus		Kemp, Arch			(Bowden, Skov)					
STD Treatment					(Bowden, Skov)					
Trachoma Treatment				Leach	Currie		Mathews			
Ears and Hearing				Yonowitz, Morris						Koops
diagnosis				Nienhuys, Yonowitz <i>et al</i>						
education and vaccination				Leach, Morris, Yonowitz, K Kemp			Mathews			Koops
trial of early treatment				Leach <i>et al</i>	Currie <i>et al</i>	Hoy <i>et al</i>	Mathews			
Epidemiological Modelling	Sripakashi <i>et al</i>	Kemp <i>et al</i>	Reeve, Daly, McBroom							
Indonesian Projects		Kemp			Arstey	Hoy <i>et al</i>	Dorling, Mathews			
Renal Disease risk factors										

	Molecular Genetics Unit	Molecular Parasitology Unit	Computing & Biostatistics	Ear Health & Education Unit	Clinical Unit	Renal Unit	Public Health & Epidemiology Unit	Central Australian Unit	Health Social Sciences Unit	Aboriginal Policy
treatment						Hoy <i>et al</i>				
early origins					Seyers	Hoy	Mathews, Mackerras			
Low Birth Weights					Seyers	Hoy	Mathews			Bailey
Rheumatic Fever	Siprakash <i>et al</i>				Currie, Carapetis		Mathews			Angeles, Bengier
Nutrition						Hoy	Mackerras, Baillie			
Smoking					Currie, Clough					
Kava					Clough, Burns		Mathews		d'Abbs	
Alcohol					Clough, Burns				d'Abbs	
Health Services Evaluation					Burns, Currie			Wakeman, Warchivker, McDermott, Springgour	d'Abbs	
Cochrane Collaboration				Morris						
Cultural and Social							Dorling			
STD social network										
death and dying									Weeramanthri	
intensive care									K Kemp	
Historical and Social Issues							Mathews	Tsey	d'Abbs	
Education & Health							Mathews	Tsey		Katona, Thomsen, Angeles, Bengier
Health Promotion					Currie, Burns, Weeramanthri	Hoy, Hayhurst	Mackerras, Baillie			
Public Administration							Mathews Henderson+	Wakeman, Tsey	d'Abbs, Lee	
Public Health Teaching			Lukitsch		Currie, Anstey		Mathews, Baillie, Mackerras	Tsey	d'Abbs	Katona

* The Computing Unit provides support for all projects and administrative services.

+ Business Manager

MAJOR THEMES OF THE LAST QUINQUENNium*

Understanding Aboriginal Health

Historical, Social and Biological Determinants of Health

John Mathews has reviewed the historical and social influences on health, and argued that the health of Aboriginal Australians is poor for the same reasons that health was poor for white people in the urban squalor of 19th Century slums in London or Sydney [305]. The importance of this historical analogy is that it removes any blame from Aboriginal people themselves for the poor state of their collective health. It would be as irrational to blame Aboriginal people for their situation as it would be to blame our own predecessors for the social and environmental circumstances contributing to ill health among poor people last Century. Furthermore, an understanding of the factors leading to the health transition in the affluent western world, largely completed by 1960 (**Figure 2**),

can help us to understand the steps that will enable Aboriginal people to achieve the same health transition.

Work of many colleagues at the Menzies School [eg. 103, 184, 185, 294, 298, 305, 328] shows how the social and environmental circumstances of Aboriginal people have been translated into poor health outcomes as a result of poor nutrition, bacterial infection, and substance abuse, which in turn are dependent on social disruption, lack of resources, poor education and poor hygiene. Some of the factors that explain why Aboriginal health is not improving quickly are summarised in **Figure 3**.

Time Lags in the Health Transition

An historical analysis of the health transition highlights some important

* References in [square brackets] are cited in **Volume II** of this document - available on website <http://www.menzies.su.edu.au>

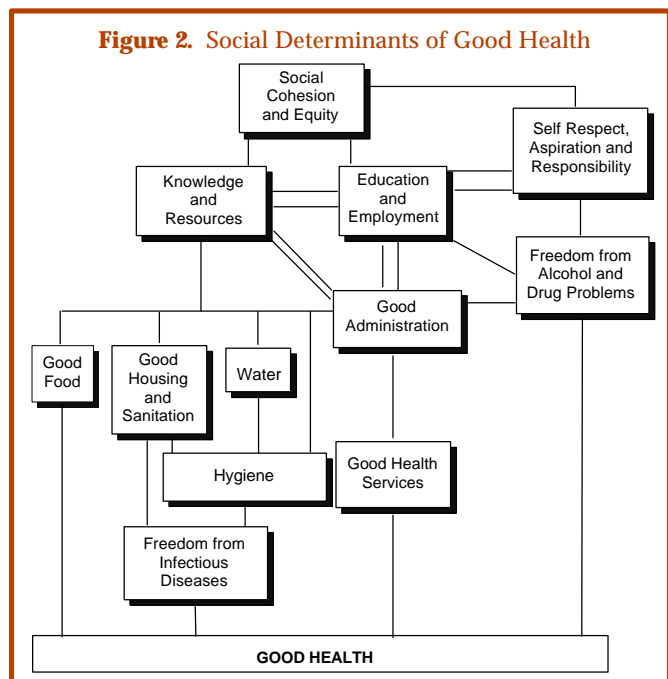
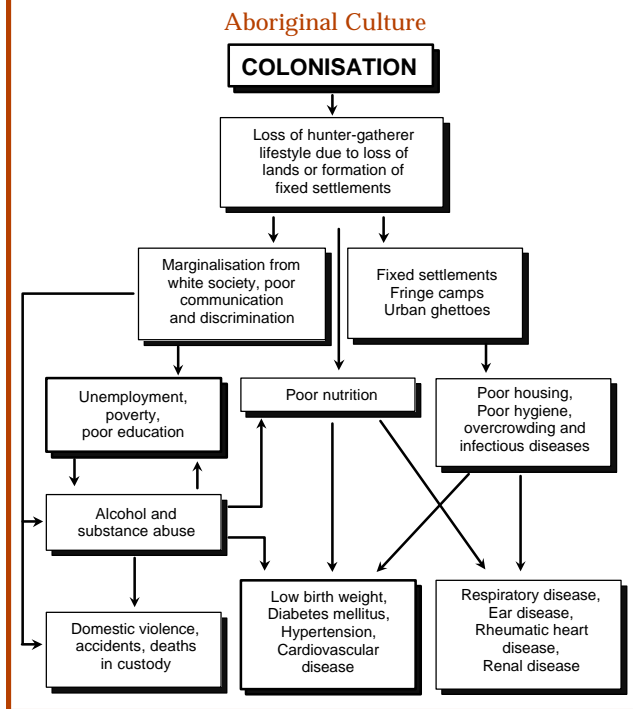


Figure 3. Historical Impacts of White Society on

ambiguities about the time delays between the action of a “cause” and its “effect” on human health. New evidence suggests that the causes of disease in adult life act not only from childhood, but also from before birth. Thus poor health in a mother can act on an unborn infant, leading to disease in adult life in the next generation (**Figure 4**).

Mortality rates from acute infectious diseases for the Australian population as a whole were falling dramatically by the 1920s (**Figure 5**) presumably because of improvements in living conditions, water supplies and hygiene leading to less cross-infection. It is likely that for such immediate (acute) infections there was a direct

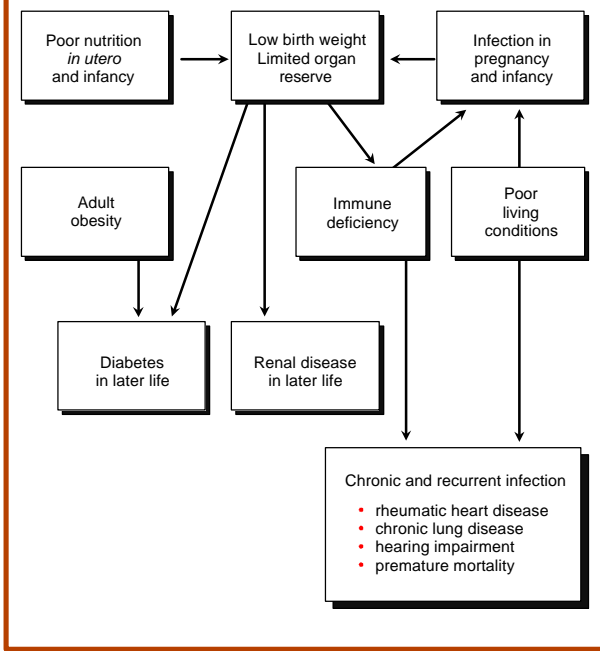
(immediate) causal connection between environmental improvement and a reduction in mortality.

Mortality rates from renal failure (genitourinary disease) did not begin to decline until the 1940's, possibly because the social and environmental improvements contributing to the decline in acute infectious diseases did not have an immediate effect on renal failure. There is clinical evidence that Group A streptococcal infection can lead to progressive kidney damage, with renal failure following progressive deterioration in

kidney function over a period of many years. The time-lag between the improvements in infectious disease control and improvements in renal disease mortality is some 25 years or more (see **Figure 5**), suggesting that if similar social changes were driving both processes, there could be a 25 year gap between the initiation event(s) and the onset of renal failure. On the other hand, it might be argued that the rates of renal failure began to fall most precipitously after the introduction of penicillin for treatment of streptococcal infections from 1945.

Renal failure rates for Aboriginal Australians (**Figure 5**) are very high, and still rising, presumably because the social and environmental causes are still

Figure 4. Hypothetical Relationships Between Antenatal Factors and Disease in Later Life



in adult life. In our grandparents' generation, it was understood that many health problems had their origins in social deprivation, malnutrition and infection during pregnancy, infancy and childhood [184]. Subsequent research suggested that malnutrition exacerbated the effects of infection and vice versa.

The linkages between malnutrition, infection and social deprivation have been manifest since historical times by low birth weight and stunted growth, by high rates of infant and childhood mortality, by delayed puberty, and short adult height. For example the average height for a man in

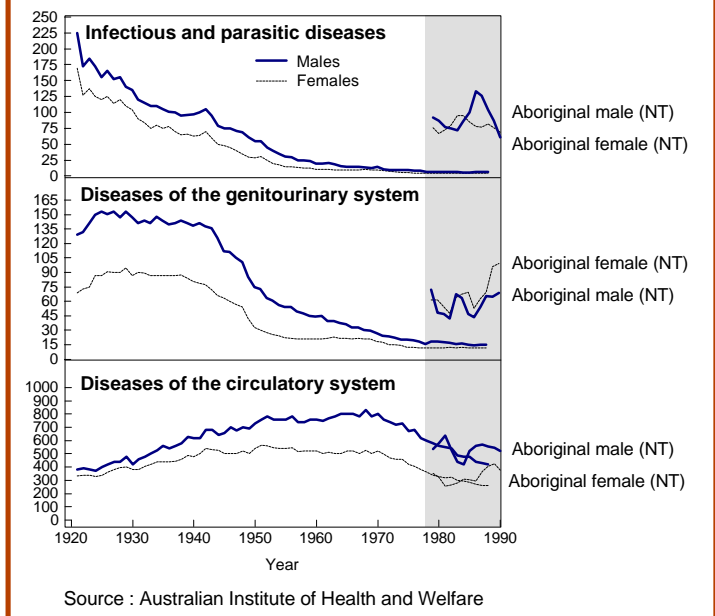
operating, and also because of improved diagnosis in recent years. Modelling of data from the Tiwi population suggest that proteinuria develops from very early in life, at an average age of 18.8 years in those with serological evidence of past group A streptococcal infection [350].

Causes of Disease Acting From Early in Life (“The Barker Hypothesis”)

Paediatricians know that poor health in infancy and childhood is a precursor of poor health

Shakespeare’s time (ca 1600) was only 64in (163cm), and even during World

Figure 5. Australian Deaths per 100,000 Population



War II, army recruits from the British working class were significantly shorter than men in the 'officer' class [305].

The role of low birth weight (LBW) as a predictor of poor health in later life has been re-emphasised by David Barker from Southampton (UK) and his colleagues. Barker has recently summarised evidence suggesting maternal malnutrition during pregnancy can impair foetal growth and metabolic development and contribute to hypertension, non-insulin dependent diabetes mellitus (NIDDM), hypercholesterolaemia and cardiovascular disease in later life. Low birth weight (LBW) has been the most convenient, but not necessarily the best, measure of such influences on the foetus. The combination of LBW with adult obesity appears to confer the highest risk of NIDDM and other disorders [184, 185, 305, 358, 359]. There is now evidence to suggest that LBW is best regarded as a marker of adverse influences operating during pregnancy (eg. maternal malnutrition, maternal infection or substance abuse). It may be these influences, rather than LBW *per se*, that contribute to adverse health effects in later life.

Dr Sue Sayers has carried out an important prospective study of Aboriginal infants born at the Royal Darwin Hospital, and shown that the high rates of low birth weight are due to growth retardation, rather than to high rates of premature birth [309,

386A]. Her data are consistent with the view that intrauterine growth retardation is due to malnutrition, maternal infection and substance abuse. From the work of Dr Wendy Hoy and others with the Tiwi, LBW is predictive of NIDDM, proteinuria, and presumably renal disease and cardiovascular disease in Aboriginal adults [184, 305, 359].

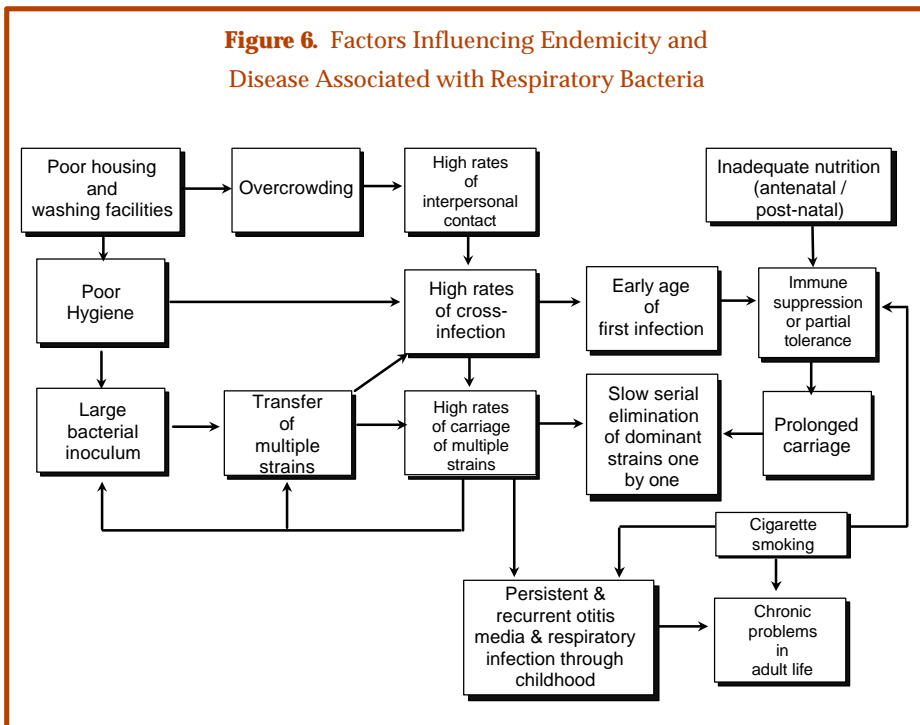
Although the precise mechanisms underlying these association are poorly understood, there are a number of ways in which the Barker hypothesis could be extended to account for these observations. For example, work from the Dunn Nutrition Unit in The Gambia suggests that infants from pregnancies in a "hungry season" were more likely to die as children or adults as a result of infectious disease. However, there was no observed increase in mortality from diabetes or renal or cardiovascular disease, possibly because of the low rates of adult obesity in the Gambia. Another possibility is that in the Gambia, where infant mortality rates are still very high, those LBW infants who are most vulnerable have not survived to be at risk of cardiovascular-renal disease and diabetes at a later age. Some of these implications and hypotheses are already under test in ongoing projects in the School.

Understanding Bacterial Endemicity

An important theme has been the clinical, epidemiological and molecular

research leading to an improved understanding of bacterial endemicity and the diseases resulting from it. For example, the onset of otitis media in Aboriginal infants within a few weeks of birth is clearly linked to the onset of nasopharyngeal colonisation with *S. pneumoniae* and *H. influenzae* [102]. It is likely that the persistence of nasal infection, otitis media, and disease of the lower respiratory tract is linked to the persistence of bacterial colonisation throughout childhood and into adult life. Simply put, in Aboriginal and other disadvantaged populations, the persistence of bacterial carriage and cross-infection is driven by poor social circumstances (overcrowding, limited facilities for washing, poor hygiene) and by the large numbers of bacterial strains

circulating (**Figure 6**). For example, in populations of only a few hundred Aboriginal people, up to 30 different serotypes of pneumococcus and at least 50 immunologically distinct strains of non-encapsulated *H. influenzae* are endemic. Detailed modelling studies suggest that each strain is maintained indefinitely, even in relatively small populations, because with high rates of carriage, there are always a few carriers of each strain left to infect the susceptibles replenished by the birth process (see Public Health Unit Report for more details). Furthermore, because of the carriage of multiple serotypes or strains at the same time by the same host individual, some of the strains can be “hidden” (from the immune system). This “free ride”, which gives an extra



survival advantage to hidden strains, and contributes to endemicity, can be interpreted as a form of cooperation between bacterial strains. There are important evolutionary implications.

Clinically, nasal discharge in infants and children is a marker of chronic otitis media, and also a major source of cross infection for others (Morris P, *et al* in preparation). The factors which perpetuate infection in the lower respiratory tract, leading to chronic bronchitis, and/or bronchiectasis, may include immune deficiency (possibly related to malnutrition), anatomical damage from intercurrent viral infections, bacterial sequestration, and antigenic diversification (*eg.* of *H. influenzae*) *in situ*.

There are also multiple strains of *S. pyogenes* (group A streptococcus), classified by Vir-typing and emm-sequence typing rather than by classical M-serotyping, with some 100 of strains identified, predominantly from skin sores of Aboriginal children in Northern Australia [*eg.* 97, 234]. For these GAS strains, it is clear that at any one time in a single community, there are up to 60% of school age children infected, with up to 12-13 strains resident in each community, and larger numbers of strains circulating between communities. Candidate 'nephritogenic' strains have been identified. Epidemiological models have also been developed to help explain population immunity, the distinction between skin

and throat infection, and the age distribution of rheumatic fever (see Molecular Genetics Unit and Public Health Unit reports for more details).

Understanding Antibiotic Resistance

Much is already known about the genetic basis of antibiotic resistance in bacteria; some resistance genes are carried on bacterial plasmids, others are chromosomal. Less is known about the population biology of antibiotic resistant strains and their behaviour under antibiotic selection in human populations. Work from Dr Leach and colleagues has provided important empirical data. For example, during the pilot phase of the antibiotic treatment trial for otitis media in the Tiwi community, an antibiotic resistant clone of a 6B pneumococcal serotype was detected amongst the infants under study, and because of the antibiotic selection, it was preferentially carried and preferentially transmitted to young infants [179]. Fortunately, no untoward complications were recorded, and the resistant 6B clone virtually disappeared from the community after the pilot studies were completed. Likewise, at Lajamanu, after azithromycin was used for trachoma treatment, there was a marked increase in the prevalence of azalide resistant strains. Again the resistant strains "disappeared" after the antibiotic selection was removed [365]. The "disappearance" of resistant strains, in the absence of antibiotics, is of great importance; it is probably due

to the fact that in the absence of antibiotics, a resistant strain is at a (slight) selective disadvantage, and gets pushed out by other competing strains. Modelling studies suggest that the competitive exclusion by other strains will be greatest in human populations which are endemically infected with multiple strains, because in this situations, all strains are competing with each other. In contrast, in affluent populations, where the prevalence of carriage is much lower, resistant strains will be able to persist for longer even in the absence of antibiotic selection. For instance, when the overall prevalence of infection is low, a resistant strain of 6B would be competing for the same host niche only with the prevalent sensitive strain of 6B; in this case, if the resistant strain were more prevalent than the sensitive strain, it could even drive out the latter, rather than vice versa.

The population biology of antibiotic resistance is made even more complex by the phenomenon of ‘multiple concurrent carriage’, whereby a particular person in an endemically infected population can carry multiple strains (serotypes) of the same bacterial species (eg. *H. influenzae* or *S. pneumoniae*) at the same time [179, 259, 313, 365]. Typically, there is a dominant (more frequent strain) with a secondary (‘hidden’) strain at lower frequency (eg. 13 % of colonies), and even a tertiary strain (eg. 1-2% of colonies). Clearly, in an endemically infected host

population, antibiotic resistant strains can ‘hide’ behind sensitive strains, and be rapidly revealed when selection is imposed through antibiotic treatment. This phenomenon helps to explain the sudden ‘appearance’ of antibiotic resistance in the Tiwi [179] and Lajamanu [365] studies.

Understanding Scabies in Dogs and People

Skin infections associated with scabies infestation are frequent in Aboriginal communities, particularly amongst children. Aboriginal dogs are also frequently infected. Because of the belief that dog scabies was a source of infection for people, a number of scabies control program have previously treated dogs rather than treating people. Now, using advanced genetic techniques [324], Ms Shelley Walton and colleagues have shown that populations of scabies mites from dogs in Australia and America do not overlap with populations of scabies derived from people in those same areas. This strongly suggests that scabies from dogs cannot infect people, and that control programs for human scabies must work with people to reduce overcrowding and cross-infection, and to coordinate the timing of treatment of infected individuals.

In cooperation with the Minjilang Aboriginal community and health

service colleagues, Dr Jonathan Carapetis has shown that community based programs, including treatment with permethrin, can achieve sustainable reductions in scabies prevalence, and also in the rates of streptococcal impetigo [278].

Understanding Melioidosis

Through Dr Bart Currie and others, the School previously cooperated with health service colleagues to study the clinical significance and epidemiology of melioidosis, resulting from infection with the bacterium *Burkholderia pseudomallei*. This is an important cause of disease and death in people with defence mechanisms weakened by diabetes, alcohol or old age. The organism is derived from the soil, with a risk of epidemics in the wet season. Dr Currie and clinical colleagues have shown that with increased awareness, melioidosis can be diagnosed early and treated with effective antibiotics.

In collaborative studies, it has been possible to show that different outbreaks of melioidosis tend to be caused by one of a number of distinct virulent clones of *B. pseudomallei* (see Clinical Unit report for more details). For example in one Aboriginal community, there was molecular evidence for a point-source outbreak of melioidosis probably due to contamination of the water supply. In future, such water-borne outbreaks can be prevented by chlorination of the water supply.

Interventions to Improve Aboriginal Health

Minjilang and Other Nutritional Interventions

At the request of the community, Mandy Lee and Annie Bonson worked with health workers and community women, and other colleagues, to document the poor nutritional status at Minjilang and to demonstrate the benefits to nutrition and health that followed the introduction of a healthy food policy in the store, together with community education about healthy food practices [103]. These health benefits were sustained in subsequent years [180, 241] and the Minjilang study has been used as a model for nutritional interventions in other Aboriginal communities, with similar projects by the School at Hermannsburg and other locations.

The *Tiwi for Life Program*, growing out of the work of Dr Wendy Hoy with the Tiwi people, will specifically emphasise the importance of healthy food policy and community education in nutrition.

Evaluation of the Strong Women, Strong Baby Program

Mrs Lorna Fejo, the first Aboriginal employee at Menzies, moved subsequently to work with Territory Health Services, where she developed the *Strong Women, Strong Baby, Strong Culture Program* in partnership with

senior Aboriginal women and with Mrs Cheryl Rae and other health colleagues. Through this program, Aboriginal women in remote communities have been encouraged to improve their diet, to stop smoking, and to participate in regular antenatal care, so as to improve the subsequent health of their babies.

Dr Dorothy Mackerras from Menzies has evaluated the program and shown that in participating communities there was a significant increase in birthweight over the study, and a significant decrease in the frequency of low birth weight in comparison with non-participating communities. However, it was not possible to identify the particular changes associated with the *Strong Women, Strong Baby* program that were responsible for the benefits observed [368].

Rheumatic Fever Prevention

Dr Jonathan Carapetis, Dr Bart Currie and colleagues documented rates of rheumatic fever in Aboriginal communities which were much higher than any previously reported [207, 224]. This disastrous situation was attributed to the high rates of (skin) infection with group A Streptococci, to the poor quality of primary health care services, and to the lack of effective penicillin prophylaxis in those with a prior history of rheumatic fever. To remedy this situation, the School developed a rheumatic fever awareness and educational program, through Mr

Geoffrey Angeles and Ms Norma Benger and other members of the Aboriginal Unit. Brochures, posters and video materials were developed to educate patients, families, health workers and medical staff about the importance of penicillin prophylaxis and other measures for rheumatic fever prevention [211-213]. Subsequently, a rheumatic fever register and control program has been established by Territory Health Services, with support from the Commonwealth Government.

Diagnosis and Treatment of STD and Donovanosis

In partnership with Dr Frank Bowden of Territory Health Services, the School has helped to develop improved methods for the diagnosis and treatment of STDs. Dr Bowden has shown the utility of using molecular methods to detect STD infection (*eg.* in tampons collected from Aboriginal women), leading in turn to more effective treatment and reduced prevalences of STD.

Donovanosis, a mutilating bacterial STD can now be diagnosed by PCR, using swabs rather than biopsies, as a result of collaborative work with the School. Improved diagnosis and treatment [281, 341], the latter following the introduction of azithromycin, has now brought about a major reduction in donovanosis prevalence.

Diagnosis and Treatment of Otitis Media

Otitis Media (infection of the middle ear) affects all Aboriginal infants and children from soon after birth, often with persistent purulent discharge and with hearing loss and educational disability throughout life. At any one time, some 80% of rural Aboriginal children have evidence of persistent OM. From the work of Dr Amanda Leach and others, it is now clear that the onset of OM follows bacterial colonisation of the nose and ear canal after birth [102], and that the persistence of the infection is due to the large number of bacterial strains that serially infect each child [197, 259, 298].

Improved methods of diagnosis, including pneumatic video-otoscopy, have been developed by Dr Al Yonovitz and colleagues, and used by Dr Peter Morris and others in an NHMRC-funded trial of treatment of Aboriginal infants with persistent OM. Control subjects have received standard treatment for each clinically diagnosed episode of acute OM; "trial" infants receive standard treatment plus long-term amoxicillin for up to 24 weeks. Although the randomisation code has not yet been broken, it appears that there are fewer ear perforations in participating children than otherwise expected.

In another collaborative study with Dr Sue Skull and colleagues at NCEPH and

THS, high rates of otitis media have also been diagnosed in pre-school children attending day care centres in Darwin, although the rates are not as high as in Aboriginal communities. It seems likely that the slightly lower rates of OM in day care centres and the somewhat better responses to treatment in non-Aboriginal children, are due to the smaller numbers of bacterial types (typically 3 or less) that are able to survive at any one time in a day care centre, compared with very large numbers of types (typically 30 or more) that survive and queue up to infect children in Aboriginal communities.

Treatment of Trachoma with Azithromycin

In collaboration with health workers at Lajamanu, and with other colleagues, Dr Andrew Laming screened children of pre-school and primary school age for trachoma. Those with trachoma were offered treatment with azithromycin, a new long-acting azolide antibiotic, effective after only a single dose. Following treatment there was a dramatic decline in the prevalence of trachoma, for up to two months of follow up [178]. Subsequently there was a slow increase in trachoma as treated individuals became re-infected as a result of contact with untreated compatriots. Partly as a result of this study, azithromycin has now been adopted as the standard treatment for trachoma in the Northern Territory and recently elsewhere in Australia.

As well as studying the effects of azithromycin on trachoma, Dr Amanda Leach and colleagues were also able to study the effects of azithromycin (given for trachoma) on the prevalence of pneumococcal carriage [295] and of streptococcal skin infections in treated children. Following treatment both infections decreased in prevalence for some two months until children became re-infected with other strains.

These results shown that antibiotic treatment can have major impacts on bacterial disease, but that treatment regimes need to take account of the frequency of re-infection. Detailed modelling studies are in progress.

Early Treatment of Renal Disease

Proteinuria, as a marker of renal disease tends to become progressively heavier as kidney function deteriorates, eventually culminating in renal failure. At present some 50% of Tiwi adults have proteinuria and some 2% are on renal dialysis to stay alive. Over several generations the epidemic of renal disease may be controllable through public health measures such as improved nutrition and improved infection control, particularly in pregnancy. However most Aboriginal people with renal disease do not have access to “best practice” medical treatment that might halt progression of their renal disease in the shorter term. Dr Wendy Hoy, as an adjunct to the NHMRC-funded research program, has

introduced treatment with ACE-inhibitors for Tiwi people in the early stages of renal disease, and shown that compliance with treatment is possible and that this treatment markedly reduces the rate of deterioration of kidney function. This important finding is of great practical relevance for all Aboriginal people in the early stages of renal disease, and should greatly reduce the financial burden of providing dialysis.

Chronic Diseases Network

The work from Dr Hoy, Dr Currie and others has helped in the planning of the Chronic Diseases Network of Territory Health Services, under the leadership of Dr Tarun Weeramanthri. The network is providing specialist backup for primary health care services, and trialing “best practice” protocols and service delivery mechanisms for diabetes, renal disease, cardiovascular diseases, and other chronic diseases. Dr Weeramanthri is an alumnus of the Menzies School, and continues to cooperate in areas of mutual interest and through the CRC.

Heart Disease Prevention

John Mathews has been associated with the National Heart Foundation in the Northern Territory for many years, and has advocated the importance of preventive programs of relevance for Aboriginal people. More recently, Dr Jonathan Carapetis joined the NHF

Board, and helped to develop a national NHF strategy for the prevention of rheumatic heart disease. In 1997, Dr Chris Burns, having completed his PhD with Menzies, was appointed as Director of the NHF in the Northern Territory. He has given Aboriginal heart health a very high profile with the national body, and is cooperating with THS, the Tiwi Health Board, and with Menzies on smoking prevention initiatives, and other aspects of healthy lifestyle.

Cancer in Aboriginal Australians

From the limited data available from cancer registries, Aboriginal Australians are at particularly high risk of lung cancer, liver cancer and cancer of the cervix [305A]. For example in the Northern Territory new (incident) cases of lung cancer for Aboriginal men and women up to the age of 54 years are four fold more frequent than expected from the corresponding Australian rates. Liver cancer is increased 10-12 fold in incidence, and 4-10 fold in mortality amongst Aboriginal people in NT and WA. Cervical cancer incidence is increased 2-3 fold and mortality is increased 4-10 fold. These findings reflect high rates of cigarette smoking, hepatitis B infection, and high rates of STD. Preventive measures must include smoking control, better nutrition, hepatitis B immunisation, and better strategies for the prevention of STDs.

Furthermore, for Aboriginal Australians, the ratio of cancer deaths

to new cases of cancer is much higher than for non-Aboriginal Australians, most particularly for cancer of the mouth/pharynx, oesophagus/stomach, colon, for melanoma, breast, uterus, cervix, and possibly testis. This is probably because of the poor quality of medical care for Aboriginal people, leading to delays in cancer diagnosis and treatment and thus to very poor survival. There is thus a strong rationale to improve the quality of medical and cancer services for Aboriginal Australians, to ensure that such services are accessible and culturally appropriate, and to develop more effective means to promote the uptake of services by Aboriginal people [305A]

Social and Cultural Issues which Inhibit Health Advancement

As summarised in **Figure 7**, many of the pathways which perpetuate the poor state of Aboriginal health can be traced back to social and cultural factors, to poor communication between non-Aboriginal and Aboriginal Australians, and to the consequences of such poor communication, which include poor education, unemployment, poverty, unhealthy lifestyle, as well as health services which are in inadequate supply, culturally inappropriate, or of low professional standard.

Language, Cultural and Knowledge Barriers

For many Aboriginal people in Northern Australia, English is a second or third

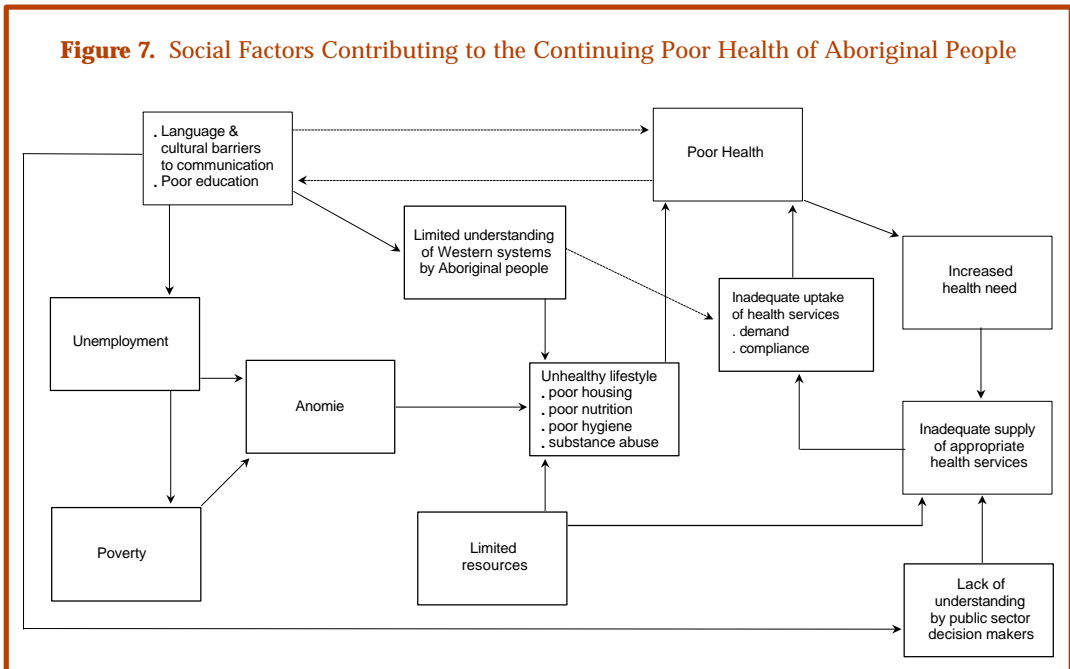
language. Without interpreter services, a hospital admission can be alienating for a patient and could compromise the ability of medical and nursing staff to console and treat their patient. Mrs Kath Kemp, a postgraduate student at Menzies, is currently engaged in a special study of the issues that arise for Aboriginal patients and their relatives as a result of admissions to the intensive care units of the Royal Darwin and Alice Springs Hospitals.

When Aboriginal patients die, particularly in hospital, there are additional difficulties with communication with next-of-kin, particularly if there is a need for a coronial autopsy. Dr Tarun Weeramanthri, while working for his

PhD at Menzies, cooperated with Ms Ada Parry and other Aboriginal people to develop plain language information and procedures to assist medical staff to explain causes of death to Aboriginal people, and also worked with the Coroner to ensure that the official communication and procedures relating to coronial autopsies are as culturally sensitive as possible.

Primary care services for Aboriginal people are often provided by Aboriginal Health Workers, usually from the client's own community. This solves many communication difficulties, but it can sometimes introduce other complications arising from cultural obligations. Another dilemma is that the knowledge and skills of Aboriginal

Figure 7. Social Factors Contributing to the Continuing Poor Health of Aboriginal People



Health Workers may not yet be adequate to cope with all the complexities of preventive and clinical care in primary health care practice.

If doctors or nurses are introduced into the primary health care setting in remote locations, they can only work effectively if they have a two-way working partnership with the health workers to ensure that communication is effective. If this is not the case, the risk is there that highly skilled people may yet fall back into a form of paternalism and thus fail to pass on an appropriately high level of skills to health workers.

Most importantly, Aboriginal people, particularly in remote communities, are still caught between the two cultures. On the one hand they are not able to practice the hunter-gatherer lifestyle of the past, and, on the other, they have neither the resources nor the requisite knowledge to adopt the healthy lifestyle practices now virtually taken for granted by other Australians. They have not had the opportunity to learn about the benefits of lifestyle changes. Neither have they had the opportunity to reap the benefits of improved health services. As a consequence, both the demand for and the uptake of services have been low, and as a consequence, the availability and quality of health services have been slow to improve.

Education and Aboriginal Self-Determination

Health education can help to solve some of the problems standing in the way of health improvement for Aboriginal people. Firstly, there is a need to educate the non-Aboriginal decision-makers about Aboriginal cultural issues, and public health issues, so that they can more fully understand the need for special measures and strategies to facilitate change. The most important single strategy is to strengthen the supports for Aboriginal self-management and self-determination, so that Aboriginal programs and services are designed and implemented in a culturally appropriate manner. Aboriginal self-determination in turn requires that there be major improvements in the quality of education and training, so that more Aboriginal people can acquire the knowledge and professional skills they need to deal with the dominant culture, and to improve both their economic and health prospects.

The adequacy and appropriateness of different general education models for Aboriginal children in remote communities is still being questioned. Attendance rates are low, and educational outcomes are poor, partly because of poor health, hearing disability and poor nutritional status. Furthermore, the history of the 'stolen generation' has suggested to some commentators that a western model of

education will result in the destruction of traditional Aboriginal culture. Others argue that Aboriginal children need to acquire the knowledge and skills of Western education in order not to be disadvantaged in the modern world; such education could in fact help them to maintain traditional Aboriginal culture. These complex issues are presently being explored in partnership with educational authorities by Menzies and the CRC through the work of Dr Komla Tsey, Prof Marcia Langton, Dr Anne Lowell and others in the CRC Education and Health Program [see also 305, 322].

Dr Al Yonovitz and Dr Lesley Yonovitz have DEETYA support for an important project to identify hearing impairment in children in Northern Territory schools, and to promote the introduction of relevant teaching and rehabilitation practices with teachers.

Aboriginal Imprisonment

Aboriginal people are more likely to experience police custody or imprisonment than other Australians, often because of alcohol-related offences [305, 329, 397]. Imprisonment is also associated with poor education, unemployment, hearing impairment and other disabilities afflicting the Aboriginal population. Higher rates of imprisonment for Aboriginal people lead to a disproportionate number of Aboriginal deaths in custody investigated by The Royal Commission

into Aboriginal Deaths in Custody. An important lesson from history is that prison provides no real solution to problems that are of social and economic origin. Just as the prisons of the Industrial Revolution failed to cure the social ills of that time, prison has added to rather than diminished the problems of Aboriginal Australians. National reconciliation and Aboriginal self-determination must be sought through frank discussion, improved intercultural communication and above all through suitable educational programs that are designed to improve understanding and to provide increased employment, self-respect and better health for Aboriginal Australians.

Lifestyle and Aboriginal Health

It has been argued that poor Aboriginal health has been caused simply by the spiritual harm caused by loss of traditional lands [204]. However, in the Northern Territory, some communities which retain complete access to their traditional lands have the worst health outcomes, so that lack of land access and traditional lifestyle does not provide a complete explanation. Aboriginal elders have grave concerns about the disastrous social and health effects of colonisation. They mourn the passing of the traditional lifestyle, the lessening commitment of young people to preserving ceremonies, and the distractions of TV, petrol sniffing, alcohol, kava and gambling and

appreciate how these and other changes in belief and lifestyle have translated into poor health. There is particular concern about the high rates of suicide amongst young men, presumably because of the stress of being “between two cultures”. Aboriginal elders also understand the crucial importance of developing effective strategies to deal with the dominant culture while working to maintain traditional culture.

Aboriginal Substance Abuse

Alcohol: The stereotype of alcoholism is often associated with Aboriginality and with blame in the public eye. It is a commonplace that Aboriginal society has been devastated by the effects of alcohol over recent generations, because alcohol was new to the culture, and there had been no previous opportunity to learn how to accommodate to it. Contemporary Aboriginal society continues to suffer disproportionately from domestic violence, and from many other social and health problems associated with misuse of alcohol, petrol, kava and other substances [70, 71, 77, 78, 114, 134, 210, 220, 272, 273, 329, 397]. Yet Aboriginal people lost between two cultures should not be blamed for becoming alcoholic, just as we do not blame those veterans from World War 2 or from the Vietnam conflict whose lives were blighted by the trauma of war and who sought solace in alcohol.

Despite the problems some Aboriginal people do experience with alcohol, and despite popular stereotypes, the empirical evidence suggests that Aboriginal Australians, including most women, are less likely to drink alcohol than non-Aborigines. Sadly, however, when Aboriginal people do use alcohol, they are more likely to be heavy drinkers [71].

Many people see alcohol misuse as the central, most urgent issue facing Aboriginal people today, while others view it as a symptom of deeper traumas wrought by colonial dispossession, and continuing lack of opportunities in employment, education and housing. Today, it is acknowledged that alcohol misuse is both a symptom and a cause of personal and social distress. This creates special problems, because just as it is true that alcohol misuse will probably remain widespread until social issues are adequately addressed, it is equally true that if alcohol misuse is rampant, it is all but impossible to generate employment opportunities or effective educational programs [305].

Recent years have seen the emergence of innovative Aboriginal-controlled initiatives to combat alcohol misuse. These include conventional approaches such as residential treatment programs, outreach programs, educational campaigns, as well as less orthodox strategies, such as night patrols by voluntary Aboriginal workers in town camps and drinking areas, using

Aboriginal means to resolve conflicts. Such night patrols cooperate with local police and thus help to improve local relationships between Aborigines and non-Aborigines. In other instances, Aboriginal groups have sought to use liquor licensing laws to reduce the accessibility of alcohol [273]. These Aboriginal initiatives reflect a growing determination by Aboriginal people to find appropriate solutions to their own problems.

Staff from Menzies have evaluated a number of social initiatives to reduce or ameliorate the impact of alcohol on Aboriginal people : Dr Peter d'Abbs was involved with the Tennant Creek initiative [273], and also in evaluating a community initiative in Derby [397]. Dr David Scrimgeour worked with the CAAAPU project in Central Australia.

Petrol Sniffing : Epidemics of petrol sniffing have been a continuing problem amongst adolescents and young adults in a number of Top End and Central Australian Aboriginal communities leading to occasional deaths from burns or overdose, and to a chronic load of intellectual and/or neurological disability in persistent sniffers. The phenomenon is often explained as a symptom of adolescent revolt against the elders and traditional culture. It is also associated with break ins, property damage and theft, and with sexual liaisons that would not be approved by elders.

Dr David Scrimgeour, from the Central Australian Unit of Menzies, carried out an early evaluation of the success rate of the HALT petrol sniffing program. Dr Bart Currie has carefully documented the health sequelae of petrol sniffing in those admitted to hospital, and in collaboration with the Maningrida and Groote Eylandt communities, he and Chris Burns completed an important population-based study of the social factors associated with petrol sniffing, and the neurological and psychomotor sequelae. They were also able to study these effects over time, to study the sequelae at Maningrida before and after the cessation of petrol sniffing due to the replacement of petrol by Avgas, and to compare the effects of sniffing unleaded petrol with those from sniffing leaded petrol [78-82, 141-142, 220]. In his PhD thesis Chris Burns produced a very valuable commentary on the changes in the Maningrida community that seemed to contribute to the end of petrol sniffing.

Kava Drinking : Kava (crushed root from *Piper methysticum*) is a psychoactive and potentially addictive substance. An aqueous slurry of kava has been used as a traditional drink in many parts of the South Pacific for hundreds of years. Because kava drinking does not cause the violence associated with alcohol abuse, kava was introduced, as a substitute for alcohol, into Arnhemland Aboriginal communities in the early 1980's by

Uniting Church missionaries from the South Pacific. It is now heavily used in some communities, giving rise to major social concerns about the neglect of children by kava users and its economic impact.

In the previous Quinquennium, research carried out by Menzies showed that heavy kava users were malnourished, with skin rashes, and evidence of induced abnormalities in the kidney, liver and blood. There is anecdotal evidence that kava users may be at increased risk of death from heart disease.

Subsequently Dr Peter d'Abbs advised the Northern Territory Government on the regulation of kava sales, and he later evaluated the impact of the policies introduced [70, 210, 327]. Dr Chris Burns, Dr Bart Currie and Mr Alan Clough have recently commenced an epidemiological study to define the role of kava use as a risk factor for heart disease.

Cigarette Smoking : Smoking rates in Aboriginal communities are now much higher than elsewhere in Australia, with little understanding at community level of the effects of smoking on fetal growth, respiratory disease, heart disease and cancer. Some progress has been made through the Strong Mother Strong Baby Program, and other initiatives. The Tiwi for Life Program is about to plan a major campaign against smoking, with the Menzies School

involved through Dr Rowena Ivers and Dr Ross Baillie working with Dr Chris Burns of the Heart Foundation.

Nutrition

Nutrition for Aboriginal people deteriorated when flour and sugar and tea and fatty meat replaced the traditional diet during the years of mission and pastoral influence. Following the advent of the cash economy, the poor quality of store food for Aboriginal people in remote communities has perpetuated the damage to health, with deficiencies of micronutrients from fresh food (such as folic acid and vitamin C) and over-consumption of sugar and saturated fats [103, 104]. Simply put, many of the current generation of Aboriginal mothers have lost the traditional knowledge and skills from their hunter-gatherer past, but have not been able to replace that loss with the knowledge and skills necessary to best feed themselves and their children with western foods. Because of this lack of Aboriginal awareness, there has been little consumer pressure to improve the quality of food available in stores, and not enough attention to nutrition education through school and adult education programs. The Strong Mother, Strong Baby, Strong Culture Program is a very important development, but it needs to be more strongly supported through the education system, and by making food suppliers more aware of their

responsibilities to Aboriginal people. Such changes are essential if Aboriginal nutrition, particularly for pregnant women, is to improve sufficiently to help protect future generations against chronic diseases such as diabetes, heart disease, and kidney disease.

Exercise

Lack of exercise probably contributes to the adult obesity which is an important risk factor for chronic disease, but it is also an important indicator of the changes in traditional lifestyle: the decrease in hunting and gathering, the sedentary fixed settlements, the lack of employment opportunities for many, and time spent on activities such as gambling, TV and substance abuse. Many Aboriginal elders can see such the destructive effects of adopting such negative aspects of a western lifestyle. They need support, through the education system, so that Aboriginal people can access the positive side of western culture through education and employment opportunities, sporting and artistic activities. This will complement and help to preserve ceremonial traditions and lifestyle.

Health Hardware and Hygiene

In recent years there has been a welcome increase in the availability of houses for Aboriginal people, with water for washing of clothes and people, and more adequate toilet facilities. The knowledge and skills

needed to supply, maintain and use this health hardware has been summarised, particularly for a Central Australian context, in the book "*Housing for Health*" (Paul Pholeros, Stephan Rainbow and Paul Torzillo, Health Habitat, 1993). Their messages need to be widely understood and assimilated by politicians, administrators, community managers, educators, and teachers, and they need to be shared more widely with Aboriginal people through school and adult education programs.

Despite the improvements, there is still a long way to go. Much Aboriginal housing is still inadequate and overcrowded, with up to 10-15 people per house. Services are often inadequate and poorly maintained, and people may not be able to clean themselves, their children, their utensils and their clothes. This exacerbates the high rates of infected skin sores, the high rates of transmission of bacteria through infected nasal discharge and sputum, and the high rates of diarrhoeal disease in infants and children.

Health Services Research Themes

The Menzies School has been involved in health services and evaluative research through staff with the Central Australian Unit, Clinical Unit, Social Policy Unit, the Renal Unit and the Ear Health Unit, with commentaries from the Public Health and Epidemiology Unit. Details can be found in the relevant Unit reports and publications.

What follows is a brief commentary on the scope of the work.

Best Practice Procedures

Peter Morris has systematically reviewed the randomised controlled trials and other studies that are directly relevant to Aboriginal health problems [384]. Methods to improve otitis media diagnosis [9, 138, 381] and management [382] have been specifically studied. The management of scabies [286, 295, 296], worms [284] and trachoma [178], improved strategies for rheumatic fever prophylaxis [230] and the optimum use of antibiotics [290] have been studied by Bart Currie and colleagues. Wendy Hoy and colleagues have recently shown the great value of treatment with ACE inhibitors in delaying the onset of renal failure. There have been reports of the value of community interventions to improve housing [108, 189], to prevent and treat scabies [278], trachoma [178], and renal disease [386], and to improve nutrition at Minjilang [103] and at Hermannsburg [126, 127]. A new non-invasive method for the diagnosis of donovanosis has been described [341], and azithromycin introduced as a more effective treatment by Frank Bowden and colleagues. Methods to improve the quality of death certification have been introduced by Tarun Weeramanthri and others [326], and counselling services recommended for relatives of deceased Aboriginal people [252]. Interpreter services have

been recommended for hospital inpatients [364].

Reviews of Health Policy and Practice

Peter d'Abbs and others have reviewed many aspects of alcohol policy [135, 209, 272, 273, 328, 329, 397, 398], and the CAAAPU initiative in Central Australia was reviewed by Miller and Rowse [190]. Kava policy and practice has also been reviewed [70, 210, 327], and there has been a commentary on petrol sniffing programs by Chris Burns (PhD thesis, 1996). Aged care services [167, 263, 391], mental health services [392], and the needs for sexual assault services have also been reviewed [163, 232, 233]. The Tristate (NT, SA & WA) STD program was reviewed by David Scrimgeour [312]. The role of Aboriginal Health Workers was commented upon by Komla Tsey [262]. The work of Jonathan Carapetis and colleagues on rheumatic fever provided an important example of the long standing problems with delivery of effective primary care services [279-280], made recommendations for improved prophylaxis [230], and enlisted the aid of Geoffrey Angeles and others in the Aboriginal Unit to develop an awareness program for patients, relatives and health staff [211-213].

Health Economics Issues

The inadequacy of funding for Aboriginal health services is now widely appreciated [202, 257, 264]. John

Deeble's recent national study showed that total per capita expenditure on health for Aboriginal Australians was about equal to that of others in the same social class. However, this underestimates the shortfall for Aboriginal people in northern and central Australia, because of their poorer health and greater health need and because of the greater cost of delivering services to remote locations. Ilan Warchivker showed a wide variation in per capita expenditure on remote area services in Central Australia, with the worst services receiving only one third of the resources [266] of health services at Nganampa, which are reasonably well served on a per capita basis. The importance of needs-based funding [186], the importance of providing improved hospital access [248], and the possibility of outcome-based resources allocation have all been identified [306]. An important issue has been to find the means to achieve horizontal equity in the face of vertical fiscal imbalance [187, 247]. The Commonwealth has agreed to cash-out the average Australian Medicare and PBS benefit in the two Coordinated Care Trials in the Northern Territory. Even though this will not adequately address the need, it is a step in the right direction. Detailed work is in progress to look at the balance between short and long-term costs and benefits, for example in relation to the expenditure to prevent renal disease (in the longer term), while dialysis is needed in the short term. Such work will require

continued close cooperation between medical and economic experts.

Consultation and Planning Studies

Reports from David Scrimgeour and others have identified the importance of community control for effective primary care services [194, 195, 310], the potential value of the outstation movement in improving health [378], the importance of housing for health [108, 189], and the potential for the CDEP program to contribute to improved health outcomes [51]. Menzies has been involved in several important consultation and planning exercises, and made recommendations about how services might be improved. Prof John Mahony acted as consultant in 1992, and recommended to THS and the Commonwealth that community dialysis should be available on the Tiwi Islands. David Scrimgeour worked with Dr Jeannie Devitt in Central Australia to review community attitudes to dialysis services. Chris Burns and colleagues carried out an extensive review of health services for Maningrida with detailed recommendations for the future [335], and John Wakerman and colleagues have extensively reviewed and made recommendations to improve remote area health services in Central Australia [396]. None of these reports has been fully implemented, presumably because of funding limitations.

Coordinated Care Trials Evaluation

Through Dr Peter d'Abbs, the School is contracted to do the local evaluation of

the Katherine West Coordinated Care Trial, and it is also cooperating with Northern Territory University on the Tiwi evaluation.

Research Highlights in Tropical and International Health

Genetic Transformation to Identify CLAG (Sticky) Genes in Malaria

In 1988, while still at the Walter and Eliza Hall Institute in Melbourne, David Kemp started his search for the genes in *Plasmodium falciparum* that cause that malaria parasite to stick to the blood vessels in the brain and cause cerebral malaria. Professor Kemp has continued that search, with NHMRC support, since coming to Darwin in 1992. By growing malaria in the laboratory, he and his colleagues had shown that the stickiness of malaria parasites was lost in those which had lost a small part of the ninth chromosome. This told the researchers where to search for the elusive gene in those parasites that were still able to stick. By using DNA markers to make a map of that region on chromosome 9, they were eventually able to find and sequence a gene that looked as if it coded for a transmembrane molecule that could be the sticky (CLAG) molecule.

Their next task was to prove it! The first approach was to block the function of the CLAG gene by shooting a CLAG-specific but back-to-front DNA signal into malaria cells that would normally

be sticky. The transfection technique for shooting such a gene into malaria had recently been perfected by Dr Alan Cowman at WEHI. David Kemp and his team (Katharine Trenholme, Don Gardiner, Deby Holt, Liz Thomas, Mark Mayo and others) quickly got the technique to work in Darwin, and were able to show that the back-to-front signal was able to specifically block the correct signal, and inhibit parasite sticking! In a second approach, the team was able to specifically interrupt (or “knockout”) the CLAG gene, and show that this also inhibited stickiness. A third approach, that of restoring the CLAG gene to a malaria parasite that has lost it, is also possible. However, such a gene transfer will not necessarily restore stickiness, because of a possible need for other genes, adjacent to CLAG, which may also be absent from the non-adherent (non-sticky) parasites. Nevertheless, Prof Kemp and his team have clearly shown that CLAG is necessary (but not necessarily sufficient) for causing stickiness (cytoadherence) in *falciparum* malaria.

This work has important implications. Now that the structure of the CLAG molecule is known, it may be possible to design a vaccine that would induce immunity and thus prevent the symptoms of cerebral malaria, which is often fatal for children in endemic regions or for adults visiting from non-malarious countries. Another possibility is that it may be possible to find drugs

that bind to CLAG, inhibit stickiness, and thus stop cerebral malaria.

The story does not end there, as Prof Kemp and his team have now shown that there is a whole family of genes in malaria with DNA sequences similar to CLAG. These genes do not affect stickiness in blood parasites, but with their similar structures, they may have similar functions at other stages of the malaria lifecycle, and thus offer additional targets for vaccine or drug development. *Watch this space !*

Research in Indonesia

To mark the 50th Anniversary of Indonesian Independence, the Northern Territory Government is providing support for Dr Nick Anstey, based at Menzies, and Dr Emiliana Tjitra, working out of Nusa Tenggara Timur. Their collaborative research, both in Darwin and in Indonesia, focuses on malaria and tuberculosis, identified as high priority health problems by the Indonesian authorities. Dr Anstey has also been successful in obtaining prestigious support from NIH, the top US funding agency, for his work on the clinical epidemiology and new methods for diagnosis in malaria. A new project to look at tuberculosis treatment, and to assess the importance of antibiotic resistance in TB isolates from Indonesia, is likely to receive additional funding from AUSAID, via WHO in Indonesia. Further details of this important work are given in the Clinical Unit report.

Other International Health Initiatives

Through Dr Bart Currie, Dr Nick Anstey, Dr KS Sriprakash, Prof David Kemp, Professor John Mathews, Dr Amanda Leach and others, the Menzies School has linkages with overseas research in the Gambia (MRC Laboratories), Vietnam and Thailand (Wellcome Research Units), New Guinea (Institute of Medical Research), Kenya (Wellcome Units), South Africa (Institute of Medical Research), Germany, India, with WHO in Geneva, and with other research groups in Oxford, London and Atlanta which share research interests in malaria, bacterial diseases and other international health problems.

CHALLENGES FOR THE NEXT QUINQUENNium

Strategic Planning and Priorities for the Future

In 1996, the School developed a five year strategic plan, with mechanisms to allow the work of the School to address important areas of health need, but also to allow our work to be driven by the availability of funding and the skills and interests of staff. It can be seen that the School has already made substantial progress in meeting many of the Objectives identified in the 1996 Plan, but this Overview does not attempt a detailed accounting against those

objectives. In the year following this Review, the School will review and revise its Strategic Plan in the light of these review documents, and the feedback and comments from the Review Committee.

Public Health Education and Training

An important priority for the next quinquennium is to sustain and develop the framework for transferring knowledge and skills from the Menzies School into the health workforce and the wider community, and to thus help to support the necessary improvements in health policy and practice in northern Australia and nearby regions.

This can be achieved by :

1. Consolidating and enhancing the current public health graduate coursework program (MPH and graduate diploma) taught by the Menzies School in partnership with NTU. A Coursework doctorate in public health has also been mooted.
2. Extending the range of public health teaching by developing short courses and non-graduate entry accredited courses in partnership with THS, other health services, and with NTU. Such new courses would be accessible to educators, teachers, administrators and service providers in all areas of relevance to health.
3. Working in partnership with educational authorities and adult

educators to ensure that their courses have access to relevant public health knowledge.

4. Working in partnership with professional colleges and other professional bodies to ensure that their training programs have access to the most relevant public health knowledge.
5. Continuing to provide employment and training opportunities in areas of relevance to public health through:
 - postgraduate research opportunities;
 - employment opportunities in research, particularly for Aboriginal people;
 - the CRC traineeship program.
6. Strengthening our partnerships with health service organisations, the NHF and other non-government organisations involved in public health education.
7. Working with the health education ITAB of NTETA to develop new coursework options for vocational trainees.

Funding Issues

At present our core public health education activities are funded through the Menzies infrastructure grant, through Specialty Program Grants from PHERP (Health and Family Services) and through EFTSU funding via NTU.

To sustain the program at its present level we need to ensure :

- continuation of PHERP funding;
- an extended agreement with NTU to establish Menzies as a Faculty of Public Health with access to ETSU funding;
- maintenance of our infrastructure grant from the Northern Territory Government.

To develop the program further along the lines indicated, we need to strengthen our partnerships with THS, NTU and other organisations, so that joint proposals can be made to PHERP, DEETYA, NTETA and other bodies to obtain funding for new initiatives.

Health Services Research

Health services will continue to improve incrementally as a result of improved training programs for health staff, improved funding levels, and the development and implementation of improved health policies and practices.

Nevertheless, there is a need for ongoing research to provide better understanding in certain key areas:

1. What funding mechanisms for health services will allow financial resources to flow to the areas of greatest health need ?
2. What models for service delivery can increase both the supply and demand

for services, so that the uptake of available services rises to meet the health needs of Aboriginal clients?

3. Can the relative costs and benefits of improved education, improved health infrastructure and improved health services be used to justify the public expenditure required to improve health for Aboriginal people? If so, over what time frames?

For example, the huge public costs of dialysis for patients with renal failure have been growing exponentially over the last few years. It now seems clear, from Dr Hoy's early results, that treatment with ACE inhibitors can dramatically reduce the need for dialysis. The short term economic implications are already clear.

At a deeper level, it is also clear that renal disease can be prevented as well as treated, and that the strategies for prevention must include better nutrition and better control of bacterial infections, most particularly in pregnancy. Clearly, time frames for preventions will often be years, or generations, whereas the time frame for improvement through treatment can be shorter. These issues need to be explored in greater detail through a collaboration between medical scientists and health economists.

4. Can treasuries and health administrators actually come to understand that “best practice” health services must be provided for Aboriginal people because it is the right thing to do, rather than insisting on a double standard that requires (short-term) evidence of benefit for Aboriginal people of a kind that it is not required with most health services provided for other Australians.
5. Once a decision is made to provide more adequate resources, there is still a need to use the strategies of “evidence based practice” to identify the most effective intervention strategies. Dr Peter Morris has already taken a keen interest, and has used the Cochrane Centre in Adelaide to review evidence based practice for otitis media, nasal discharge and bronchitis. An important principle is that the international literature will not always provide the best guide for Aboriginal health interventions. Because the social and environmental context for many Aboriginal people is so different from the context in more affluent and developed populations, there can be profound differences in aetiology and natural history of disease and in the response to treatment. It was for this reason that NHMRC funded our randomised trial of OM treatment in Aboriginal infants.

More generally, evaluative studies, whether literature-based, or based on the acquisition of new primary data, must be planned and interpreted on the basis of the broadest possible understanding of the underlying social and biological processes. Unthinking “meta-analyses” could sometimes be extremely misleading.

Through the CRC and otherwise, the Menzies School will strengthen its linkages with the Cochrane Centre and others with the skills to help strengthen “evidence based practice” for Aboriginal health services.

6. Important questions must be addressed to provide a more effective interface between Aboriginal people and the health care system. Typically there is poor communication. Health care staff often have little understanding of the expectations of Aboriginal clients, who in turn have unreal expectations. As a result, compliance with change or treatment is usually poor, and both clients and staff become disillusioned.

Research on issues relating to patient compliance is continuing under the auspices of the CRC, and Menzies is involved in the evaluation of the Coordinated Care Trial in the Katherine West Region through Dr Peter d’Abbs.

Funding Issues

Future work will be funded by developing collaborative partnerships with other stakeholders.

Infectious Disease

Molecular Epidemiology and Population Biology

The molecular studies of bacterial infection will be continued, with the integration of important theses:

- **molecular epidemiology** to identify the patterns of spread and responses to interventions;
- **immunological studies** to identify the important target antigens for protective immune responses. There is a strong theoretical rationale for the view that for multiple strain species colonising mucosal surfaces (eg. GAS, pneumococcus, and haemophilus), species-specific immune responses will protect against systemic (invasive) disease, whereas strain-specific responses are required to terminate mucosal carriage.
- **genetic studies** of bacterial target antigens in relation to the strain structure of bacteria. There is already evidence that the genes for target antigens subject to immune selection will be in strong linkage disequilibrium because of the effect

of immune selection in shaping strain structure. This principle explains the very strong linkage disequilibrium between alleles at the emm (M) and the opacity factor (OF) loci in group A streptococci. A genetic search for target genes (antigens) in linkage disequilibrium can identify new genes that are likely to be subject to strong (immune) selection. This genetic work will be facilitated by the availability of DNA sequences for genomes of virtually all the pathogens of interest.

- **strain structure of bacteria** : for bacterial species that colonise or infect a (mammalian) host, the strain structure will be strongly influenced by the host immune response, which modulates the competition between bacteria which would otherwise compete for the same ecological niche. Recent developments have highlighted the complex phylogeny of bacteria : far from being clonal, as often envisaged, recombination has been important for many species.
- **models for bacterial competition and strain cooperation** : Bacteria of the same species compete for the same ecological niche unless the niche is subdivided by geographic division or by host factors. The host immune response facilitates niche diversification and has helped to drive strain diversification of bacterial species. Nevertheless, some of the features of the population

biology of multiple bacterial strains (eg. concurrent carriage of multiple serotypes of pneumococcus) can be interpreted as a form of “cooperation” between strains, whereby the presence of one strain promotes the survival of another strain. Indeed it can be argued that with bacterial species characterised by multiple strains, there is a balance between the cost of competitive pressures and the benefit of cooperation, mediated by immune mechanisms. For example, enhancing antibodies directed against (strain invariant) Rmp antigen in the gonococcus can be interpreted as an immune mechanism for cooperation between strains.

Modelling of Bacterial Carriage and Infection

The wealth of molecular data on GAS, pneumococci, haemophilus, *B. pseudomallei*, and Chlamydia is allowing us to build dynamic models to explain the observed patterns of endemicity. Models allow us to calculate the force of infection, the clearance rate and to understand how these can be changed by treatment of other interventions. An important challenge has been to develop models for multiple strain bacteria that are complex enough to reflect reality, but simple enough to be mathematically tractable. We have already made substantial advances. For example it is possible, with a single strain-specific

parameter for clearance rate, to explain the differentiation of pneumococcal serotypes into “paediatric” = early age of infection, and “adult” = later age of infection. Another population parameter (host and environment specific) serves to fully define the behaviour of this simplest class of models.

Other complications, such as “hidden” carriage, can be incorporated into models for bacterial competition and cooperation (see Public Health Unit Report). Clearance rates that depend upon the age of the host are also possible.

Relevance of Models for Community Interventions

Once plausible models are in place, they can be used to guide and model intervention strategies. For example simply by calculating the force of pneumococcal infection, it is possible to understand something about the state of social and environmental factors driving endemicity. The force of infection (θ) was about 24 yr⁻¹ in New Guinea infants, about 12 yr⁻¹ in Aboriginal children, but only about 3 yr⁻¹ in Darwin day care centres. These differences in θ can be partitioned into contributions from the number of strains endemic in the local community, and contributions from the local environment (hygiene and overcrowding). On this basis, a major difference between a day care centre and an Aboriginal community is the

number of strains endemic, rather than hygiene/ overcrowding. The mean number of strains retained is itself mainly a function of population size, as there is a high rate of stochastic loss in small populations.

Thus an important conclusion from the modelling is that the endemicity of pneumococci could be improved by reducing the number of strains in each local community, which in turn can be effected by reducing the number of children in effective contact with each other. This has implications for policy and practice in day care centres, and also for the “outstation movement”, where Aboriginal families disperse to live in smaller groups in their traditional homelands, rather than in larger communities in overcrowded circumstances.

Treatment Interventions

Theoretical arguments suggest that in the presence of endemic infection, the community benefit would be maximised by treating all infected individuals on the same day to minimise the risk of subsequent re-infection for those treated. Such a strategy is also likely to minimise the aggregate treatment used in a given community, and to thus minimise the risk of new resistance emerging.

Despite the generic plausibility of these arguments, which would apply as much to the treatment of head lice in

Darwin schools as to the treatment of bacterial infections in Aboriginal communities, it is not socially acceptable to recommend that all children should be screened and treated on the same day. Indeed, those who have suggested that such strategies be discussed have been labelled as “racist”.

The way ahead is to fit models to the most relevant data available (eg. the azithromycin trial for trachoma [298]), to try and estimate what would have been achieved in the longer term if it had been possible to treat all the children, and to stimulate a more broadly based discussion of the issues. In fact, more detailed modelling suggests that if treated children had not been subject to pneumococcal re-infection from untreated children, there would have been a sustained reduction in pneumococcal infection, not only because of the direct effects of treatment on individual children, but also because of the loss of many of the pneumococcal strains from the community concerned. As a result, it could take months or even years for the lost strains to be re-introduced into the community in question.

These predictions need to be tested by applying improved models to a larger number of relevant data sets.

Modelling Antibiotic Resistance

Models have already been fitted to explain how “hidden” strains of

antibiotic resistant pneumococci can be revealed by antibiotic treatment [179, 298]. The fall in prevalence of resistant strains following the removal of antibiotic selection pressure [298] was explained in terms of the competitive pressure from the resurgent antibiotic-sensitive strains. Such competitive pressures would be expected to be more important in communities where many pneumococcal strains were endemic and less important where pneumococcal strains were epidemic or sporadic.

There is another important conclusion from the emergence of resistant strains : namely that the treatment has been effective in inhibiting the growth of sensitive strains *in vivo*! It is an empirical question to determine when the presumed effects of antibiotic treatment on sensitive strains are sufficiently beneficial to justify the costs, both short-term and long-term, of positive selection of antibiotic resistant strains. We already have relevant data from the randomised controlled trial of otitis media treatment, and from other studies, that will help us to address this question. We already can say that there is no evidence of harm to any of the subjects in the OM study as a result of positive selection, by treatment, of antibiotic resistant strains.

With good molecular characterisation of resistant strains, good clinical data on outcomes, and plausible biological models, we are uniquely placed to continue work in this important area.

Modelling of Vaccine Effects

We have already shown that following the introduction of Hib vaccine, there was a temporary disappearance of Hib from infants in the Ngiuu population (Leach AJ, PhD Thesis) followed by its reappearance subsequently in children not yet vaccinated. We interpret this to mean that carriage of Hib was maintained sporadically in older children or adults not offered immunisation, and that it crept back from them to be carried by the younger (not fully immunised) infants.

However, because of immunisation, the overall force of Hib infection has fallen dramatically, so that there will only be a minority of infants exposed prior to completing immunisation, and hence at risk of invasive Hib disease. This is consistent with the precipitous fall in invasive Hib disease amongst Aboriginal infants and children admitted to the Royal Darwin Hospital.

These data will be reported in more definitive form.

Conjugate pneumococcal vaccine has not yet been available in Australia. In collaboration with THS, the School has been developing plans for its evaluation and use : there is particular interest to study its effect on pneumococcal carriage and otitis media incidence in Aboriginal infants and children.

Theoretical predictions based on the multiple strain model for pneumococci (see Public Health Report), together

with limited data from overseas, suggest that a major effect of conjugated vaccine will be to drive out the vaccine strains from the population of immunised children, but for the vaccine strains to be replaced by non-vaccine strains, at least on a short-term basis. The clinical impacts of this will be uncertain, although it is likely that there will be a great potential benefit of vaccine as many of the antibiotic resistant strains will be counted amongst the vaccine serotypes eliminated.

New vaccines must be designed with understanding of the immunology and population biology, particularly for bacterial pathogens characterised by multiple strains. A plausible strategy for developing a vaccine against such pathogens has been to look for an antigen that is common to all strains, and to incorporate that in a putative vaccine. Some modelling theory, as well as empiric data, can call that strategy into question. For example, there are theoretical reasons for supposing that such common antigens might be conserved in order to promote cooperation between strains. One plausible example is the putative effect of antibodies against Rmp, an invariant gonococcal antigen, in enhancing infection by one gonococcal strain after prior infection by other strains.

Clearly, if natural infection can induce enhancing antibodies directed against conserved bacterial antigens, this must

also cast doubt on the strategy of a protective vaccine based on particular conserved antigen. Research is clearly needed to distinguish between enhancing and protective antigens.

Mechanisms of Disease

Bacterial virulence is poorly understood at the population level. In particular, the attack rate for invasive pneumococcal disease for Aboriginal infants and children is very high, even when the high force of infection is taken into account. It is not known whether the high attack rate is related to early age of exposure (due to high force of infection), large inoculum size (due to heavy bacterial loads and poor hygiene), to the concurrent carriage of multiple strains, to host susceptibility or to other poorly understood factors.

Biological theory suggests that virulence *per se* is not in the interests of bacteria that depend on transmission from host to host because death of the host is usually an evolutionary dead end. On the other hand it is often argued that bacterial factors leading to virulence (eg. rapid growth rate) will be correlated with competitive success. For bacteria that have diversified into multiple strains, an efficient evolutionary strategy would be for systemic spread of infection (virulence) to be limited by an immune response that was directed against shared (species-specific) antigens, but for mucosal carriage (the basis for continuing strain survival and

transmission to a new host) to be limited by a strain-specific immune response. Such a model is consistent with some features of pneumococcal epidemiology. More detailed work is planned, and specifically to test the model in relation to the age incidence of invasive pneumococcal disease.

Chronic mucosal disease : Persistent mucosal carriage of pneumococci and non-encapsulated *H. influenzae* in Aboriginal children and others in disadvantaged situations can be explained in terms of the queuing and sequential clearance of large numbers of strains over the first 7-10 years of life. During this period of persistent mucosal carriage in the upper respiratory tract, there is continuing inflammation, with chronic nasal discharge, otitis media, sinusitis and probably bronchitis.

Little is known about the mechanisms leading to infection and mucosal damage in the bronchi, but there is clinical evidence of a high prevalence of bronchiectasis and productive, purulent cough is very frequent in Aboriginal adults. It seems likely that there is spread of bacterial infection into the lower bacterial tract, perhaps related to processes such as:

- intercurrent viral infections in infancy (eg. RSV) leading to anatomical damage in mucosal surfaces and providing a nidus for bacterial growth.

- partial sequestration of the nidus from normal mucosal (immune) responses, with impaired bacterial clearance.

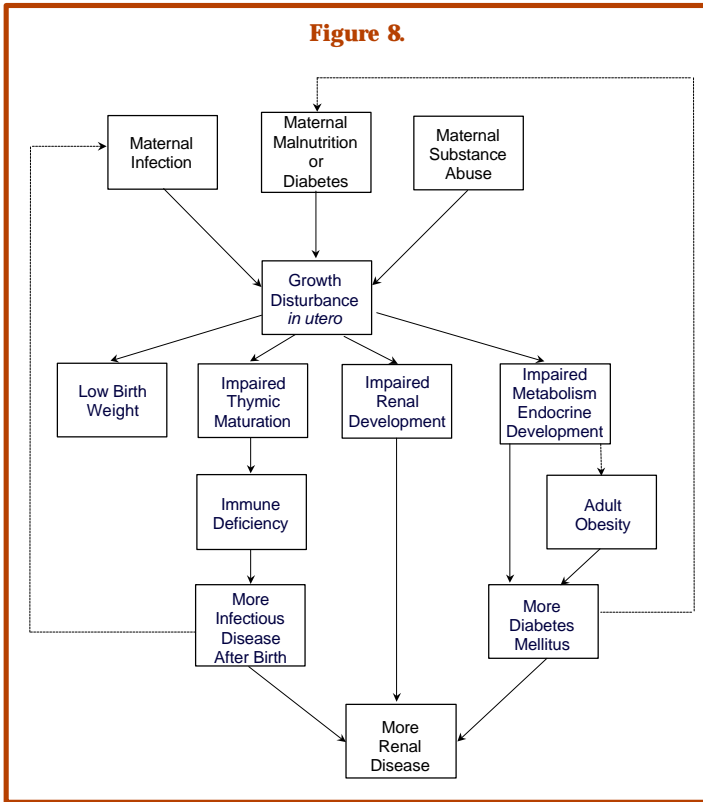
- immunological selection *in situ* on the sequestered bacterial population, leading to further antigenic diversification (eg. of P₂ antigens of *H. influenzae* [313])

- further anatomical damage as a result of chronic infection and inflammation.

Several projects are now being developed to look at mechanisms - eg. recovery of samples from lower respiratory tract by bronchoscopy; bacteriological and immunological studies, and development of models to explain the observed patterns of antigenic diversity in different subjects and in different parts of the respiratory tract over time.

Mechanisms of Intergenerational Disease : Influences in the mother during pregnancy can apparently have profound effects on the infant, both as a child, and as an adult. It is likely that adverse maternal influences include malnutrition and infection, leading to intrauterine growth retardation, organ impairments (eg. kidney, thymus, islets of Langerhans), predisposing to kidney disease, infections, diabetes and vascular damage in later life (see **Figure 8**). The mechanisms and pathways are poorly understood : micro-nutrient (eg. folate)

Figure 8.



or calorie deficiency in the mother could impair organ development in utero; maternal infection could trigger cytokine release leading to damage to vital foetal organs.

These questions can be addressed by collaborative research looking at :

- specific nutrient deficiencies in pregnancy, evidence of infection in pregnancy, and cytokine levels, and their relationship with proxy outcomes such as birth weight, and organ sizes assessed by ultrasound. Such studies would only be ethical if designed to provide relevant therapeutic interventions at the earliest possible stage. Nevertheless,

it would be possible to relate the changes in birth outcome to the success of the intervention, including the degree of compliance.

- longer term studies based on Dr Sue Sayers' cohort of Aboriginal children followed from 1987, and follow up of the Tiwi population;

- appropriately designed animal studies.

Research in International Health

The ongoing work on malaria is extremely competitive

internationally, and will go from strength to strength. Professor Kemp has submitted a malaria grant to NIH that should be very competitive.

Once the malaria genome is completely sequenced, the molecular work will shift to focus increasingly on functional aspects, on the significance of genetic diversity between strains, on devising new strategies for understanding the population biology, and on more effective interventions.

There will be increasing attention, world-wide, to the problems of antibiotic resistance in malaria, tuberculosis and other diseases of major global significance. Understanding of

the population biology of resistance will become of increasing importance, and our own “foot-in-the-door” with work on antibiotic resistance of pneumococci will provide an important model for work in other systems.

The clinical and molecular studies on melioidosis, donovanosis and other exotic infections are also of very high quality and international significance, even though it has been difficult to obtain competitive funding in Australia, probably because of the parochialism of the system here. As the current work is published in good journals, there should be every prospect of grant success in the very near future. An unfortunate fact is that because of Wellcome Trust regulations, we are unable to apply to them for tropical health research carried out in Australia; it should be possible however, to develop collaborative projects with investigators in developing countries that would be eligible for Wellcome Trust support.

Sustaining Our Corporate Culture

The dedicated and talented staff of the Menzies School are our greatest asset, with a wide range of disciplinary and cultural expertise that allows the School to take a very broad view, and to solve problems that range from the social to the molecular. However the breadth of expertise inside and outside the School is also a potential threat, as people from different backgrounds inevitably bring differences in understanding and expectations. If we are to maintain and enhance our sense of corporate identity and cohesion, we need to be proactive,

with strategies to improve the quality of communication and understanding between staff from different backgrounds. Clinically qualified staff need to understand that as researchers, they fulfil a very important role, but that this role is slightly different from that of a service provider. Likewise, non-laboratory staff need to value the skills of those who work in the laboratory, just as all staff must value the professional cultural skills of our Aboriginal staff, and the skills of other researchers who may not work in the laboratory.

The secret of success for Menzies is that the whole is greater than the sum of the parts. We add value to our broad view of public health by cooperating, but we must work hard to sustain our unique culture of cooperation between so many disciplines.

Value Adding in Central Australia

Our small but active Unit in Central Australia has a special contribution to make to the life of the School, having already made major contributions to health services research and evaluation studies. An academic department of Rural Health is being established in Alice Springs, under the aegis of Flinders University of South Australia and Northern Territory University. It has been suggested that there would be great benefit to Central Australia if the Menzies Unit and the Department of Rural Health were co-located in the proposed new building, with a partnership agreement to coordinate their activities and those of the CRC.

Relationships With Other Organisations

The School enjoys good relationships with many organisations, but two organisations are of particular significance. Territory Health Services, the major provider of public sector health services in the Northern Territory, is effectively our landlord, and also a major partner and client of the School. There are many areas of common interest, with a number of joint appointments between the two organisations. However, in areas of relevance to health policy and practice, research carried out by the School is directed towards improvement and change, most obviously in relation to health services for Aboriginal people. Thus the School can be in the position of a critic of the status quo in Territory Health Services. In the past, such well-intended commentary and criticism has occasionally been misinterpreted, with some strain between individuals involved. However, with the more recent commitment to change within the department, working relationships are friendly, the School is more understanding of the constraints under which the department must work, and the department understands that the School will tend to take an academic (idealist) position on health service policy because it does not have to find funding and make it happen.

The other key relationship is with Northern Territory University. At present the Menzies School is finalising a partnership agreement which would establish Menzies as a Faculty of Public

Health of the Northern Territory University, to give academic titles to staff, and allow the public health teaching to be expanded. This is a welcome development for both Menzies and NTU, and it will be of great potential benefit to health and education in the Northern Territory.

Funding for the Next Millennium

The viability of the Menzies School depends upon its infrastructure support from the Northern Territory Government, its competitive grant income from local and overseas agencies, and donations from the private and corporate sector. The School has been very successful, both in national and international terms, in winning grants, and it is poised to consolidate and build upon its competitive income. However, it would be non-viable without the generous support from the Northern Territory Government. The interests and reputation of the Northern Territory will be best served by sustaining the public sector support for the Menzies School into the next millennium, and by helping the School to promote its corporate image and to seek additional levels of funding from the private and business sectors and from overseas agencies.

With its substantial track record, the School is confident that it will be able to continue to provide national and international leadership in research, and to make major advances in health knowledge for people in northern and central Australia and nearby regions.

EDUCATION AND TRAINING

POSTGRADUATE STUDIES

Postgraduate Students at the MSHR carry out a fundamental core of our research activities, as is true in most Australian academic institutions. A total of 56 such students were enrolled at some point during the past quinquennium and 30 are currently enrolled. Diversity and success are the two most obvious qualities of our postgraduate students. A high proportion (22/56, 39%) have a medical background and a similarly large proportion (20/56, 36%) are “mature aged”, often with advanced experience in other medical areas such as nursing or pathology. Several of these students, for example Sue Hutton and Amanda Leach in the past, and Deby Holt and Heidi Smith-Vaughan at the moment, are employees of the MSHR who have taken the opportunity to upgrade their qualifications. Louise Martin (undertaking a BSc Hons part time over 1997 and 1998) and Halijah Mokak (commenced the MPH coursework program in 1997, but is currently studying for a Master of Applied Epidemiology degree at ANU) were our first Aboriginal postgraduate students and Geoffrey Angeles has just enrolled in the MPH coursework program.

The diversity of thesis topics (pages 91-97) reflects the diversity of interests of the various units in the School; progress on these is described in the Unit reports

and so they are not described further here. However an important feature is that a considerable number of students are co-supervised and “belong” to more than one Unit. Such students as Don Gardiner, Heidi Smith-Vaughan and Shelley Walton have carried out successful projects that have required the collaborative input of two or three Units to provide the appropriate clinical, molecular and epidemiological resources. A very substantial segment (28%) of our publication output during the last quinquennium has our past and present postgraduate students as first authors.

The School has academic links to the University of Sydney dating to its origins and so the majority of students have been enrolled there. Newer links with the Northern Territory University (which was established after the School) and Flinders University (which commenced training medical students in the Northern Territory this year) have resulted in the enrolment of students in these Institutions. A Postgraduate Studies Committee, chaired by Prof Kemp, with representation from the NTU, is responsible for student admissions.

Of the current postgraduate students, 11 have scholarships funded from outside sources and so this represents a substantial segment of the School’s research funding. The number of

Honours students has increased over the past few years, a positive result in terms of the future of the School. However mounting concern over the lack of career structure in the current Australian academic environment is likely to have a negative impact on future enrolments.

PUBLIC HEALTH COURSEWORK

Background to the Development of the Coursework Program

In line with the mission of MSHR a coursework program in public health was established at the school in 1993. The program was based on the Graduate Diploma and Master of Public Health courses at the University of Sydney, students were enrolled through the Faculty of Medicine at the University of Sydney, and the program was taught with some assistance from the Department of Public Health. The intention of having the program more firmly based in the Territory was realised when the program was accredited by the Faculty of Science at the Northern Territory University in 1995, and students were enrolled with this Faculty from 1996. Menzies, however, has retained full responsibility for the planning and operation of the program, and the Sydney course has been substantially adapted to suit the particular needs of people working in Central and Northern Australia.

Aim of the Program

To provide and support public health training throughout Central and Northern Australia (and neighbouring regions) in a form that is appropriate to the specific needs of this area. To this end the program pays particular attention to Indigenous health, to populations living in tropical environments, and to populations living in remote environments.

Mode of Delivery and Structure of the Program

The program is taught predominantly in external mode, with a residential requirement of one week in each semester. Students may enrol for a Graduate Diploma in Public Health, involving coursework only, or a Master of Public Health, involving coursework and a treatise. The coursework is required to be completed in a minimum of two years and a maximum of four years, with the treatise requiring completion between six months and two years. Coursework requirements for the Graduate Diploma and the Masters are the same, and Graduate Diploma students who are performing satisfactorily may upgrade their enrolment to the Masters.

Slightly more than half of the coursework is made up of core and compulsory units. Students choose from a wide range of elective units to

make up the balance of the coursework (see page 90).

There are plans to include the following new elective units next year :

- Environmental health in Central and Northern Australia.
- Gender and Health.
- Education and Health.
- Vaccination.
- Epidemiological modelling.
- Special project unit/Reading unit.
- Demography and health planning in the NT/"extended" demography.

Students are also able to access approved units from other institutions in Australia, and are also able to accredit approved short courses towards their degree. The links with Flinders University include cooperative organisation and teaching of some units and short courses.

Interest has been expressed in Menzies running more short courses that could be available to a wider audience than Graduate Diploma and MPH students, but which could be accredited towards the Graduate Diploma or the MPH. Suggestions for topics for inclusion in short courses include :

- Evidence based health/systematic reviews.
- Evaluation of health programs.

- Economic evaluation of health programs.

- Priority setting in health.

- Integrated health service delivery to provide comprehensive services.

- Information systems.

- Leadership in public health.

- Public health and chronic disease.

Staff and Program Management

The program is coordinated by Ross Bailie, with Liz Stubbs providing academic administrative support and Audrey Langlands providing general administrative support. Accountability for the coursework programs is currently to the University of Sydney Faculty of Medicine for students enrolled prior to 1996, and to the Northern Territory University Faculty of Science for students enrolled since 1996. The MSHR Coursework Management Committee has immediate responsibility for coursework management, and reports to the MSHR Postgraduate Studies Committee. Membership of the Coursework Management Committee includes unit coordinators, administrative support and student representatives as follows :

- *Dr Ross Bailie*
Program Coordination
- *Ms Liz Stubbs*
Academic Administration
- *Mrs Audrey Langlands*
General Administration

- *Dr Joan Cunningham*
- *Ms Jenny Powers*
- *Dr Peter d'Abbs*
- *Dr Komla Tsey*
- *Dr John Wakerman*
- *Dr Dorothy Mackerras*
- *Prof John Mathews*
- *Dr Janice Money*
Student Representative
- *Ms Pam Gollow*
Student Representative

Reaccreditation of the program with the Joint Academic Planning and Courses Committee of NTU, which is due within the next year, will require the establishment of a Course Advisory Committee that has the additional representation of two “community representatives from outside the university”, and possibly from the Vocational Education and Training (VET) sector.

Teaching Staff

Twenty eight people are currently involved in teaching on the program, and include full time MSHR staff (6), part time MSHR staff (6), and staff who contribute to the program on a “casual” or contract basis, but who are principally employed by other organisations (or are self-employed) (16). Part time and casual staff are employed, at least in part, by THS,

Flinders University, ABS, NTU, University of Sydney, University of Newcastle and Royal Darwin Hospital (RDH).

Current teachers in the program, their main institutional affiliation and their teaching responsibilities are listed below.

Ms Ann Alderslade
Chief Librarian, THS Central Library
- teaches literature searching.

Dr David Ashbridge
Deputy Regional Director,
Operations North, THS - teaches
History and Philosophy of Public
Health.

Mr Anthony Barnes
National Director, NCATSIS,
Australian Bureau of Statistics -
teaches part of Demography.

Dr Ross Bailie
Course coordinator - teaches
Approaches to Problems in Public
Health and Case Studies in Public
Health.

Dr Frank Bowden
Public Health Program Director,
CRC in Aboriginal Health - teaches
STD including HIV.

Professor David Brewster
Clinical Dean, Flinders University
Northern Territory Clinical School -
teaches Child Health.

Dr John Condon
Director, Epidemiology Branch, THS
- teaches part of Demography.

Dr Joan Cunningham

Director of Research, NCATSI, ABS
- teaches Research Methods
(epidemiology).

Assoc Prof Bart Currie

Head, Clinical Unit, MSHR; Staff
Specialist RDH - teaches Vector
Borne Infections.

Dr Peter d'Abbs

Social Scientist, MSHR - teaches
Introduction to Sociology and
Health; Introduction to Alcohol and
Other Drugs; Alcohol and Other
Drugs in Indigenous Australians.

Ms Beverley Hayhurst

Project Manager, Renal Unit, MSHR
- teaches Health Promotion and
Communication Skills.

Dr Sam Heard

Director, GP Education and
Research Unit, Flinders University
NT Clinical School - teaches Health
Surveillance Systems and Records;
Models of Health Service Delivery.

Dr Paul Kelly

DMO, Darwin Remote Services, THS
- teaches International Health and
Development.

Dr Vicki Krause

Program Director, Centre for Disease
Control, THS - teaches Mycobacterial
Infections.

Mr Abron Lukitsch

System Administrator, Computing
Unit, MSHR - teaches Introduction
to Computers.

Mr Colin Macdougall

Department of Public Health,
Flinders University - teaches
Principles of Management and
Planning.

Dr Dorothy Mackerras

Epidemiologist, MSHR - teaches
Nutritional Epidemiology; Nutrition
Issues in the Developing World;
Treatise Development.

Prof John Mathews

Director, MSHR - teaches
Approaches to Problems in Public
Health and Case Studies in Public
Health.

Dr Angela Merianos

Head, Immunisation and
Surveillance, Centre for Disease
Control, THS - teaches Epidemiology
of Communicable Disease.

Ms Jenny Powers

Biostatistician, University of
Newcastle - teaches Biostatistics.

Ms Cheryl Rae

Manager Public Health, THS -
teaches Nutrition Issues in the
Developing World.

Dr Gary Robinson

Lecturer, Department of Sociology,
NTU - teaches Introduction to
Sociology and Health.

Mr Alan Shiell

Senior Lecturer in Health Economics,
Department of Public Health,
University of Sydney - teaches
Introduction to Health Economics.

Dr David Scrimgeour

Medical Officer, Traveller's Vaccination Centre (previously Senior Research Officer, MSHR, Alice Springs) - teaches Epidemiology of Non-communicable Disease.

Dr Komla Tsey

Head, Alice Springs Unit, Menzies School of Health Research - teaches research Issues in North and Central Australia; Aboriginal Traditions of Health, Healing and Nurturing; Aboriginal Society, Culture and Health; Public Order and Public Health Among Aboriginal People; Political Economy of Aborigines in Central and Northern Australia.

Dr John Wakerman

Senior Research Fellow, MSHR Alice Springs Unit - teaches Health Services in Northern Australia and Beyond; Principles of Management and Planning.

Dr Tarun Weeramanthri

Community Physician, THS - teaches Epidemiology of Non-communicable Disease; Ethics of Medical Research and Service in Aboriginal Settings.

Mr Peter Whelan

Senior Medical Entomologist, Medical Entomology Branch, THS - teaches Vector Borne Disease.

There are a number of other people who are currently developing new units for delivery next year, or who will be taking over existing units. They include Dr Gill

Hall and Dr Sandy Thomson (Population Health Unit, Alice Springs, THS), Dr Anthea Duquemin, Coralie Mathews (Faculty of Education, NTU), Dr Steve Guthridge (Darwin Remote Services, THS), Alison Laycock (Aboriginal Health Strategy Unit, THS), Prof Ram Vemuri (Faculty of Business, NTU), Carol Beaver (THS), Dr Christine Connors (Darwin Remote Services, THS) and Robin Williams (Faculty of Aboriginal and Torres Strait Islander Studies, NTU).

Student and Graduate Profile

Graduates and currently enrolled students are predominantly based in the Territory (34 of 52). Others are spread across Australia and overseas, including WA (3), SA (3), Qld (3), NSW (2), Victoria (1), Tasmania (1), Indonesia (1), New Zealand (1), Pakistan (1), Israel (1), and the UK (1). Those students and graduates in the Territory are predominantly in Darwin (25 of 34), with 5 in Alice Springs, and one in each of Tennant Creek, Bathurst Island, Nhulunbuy, and Batchelor.

The background of students is extremely varied, and includes 14 medical graduates (working in a range of capacities), nurses (working in a range of capacities), environmental health officers, occupational therapists, nutritionists, public servants in policy and planning roles, dentists, academics, teachers, librarians, audiologists, nurse/health educators, women's health

workers, researchers and program coordinators.

Graduates of the program and students who have submitted their theses are currently working in the following capacities :

- Research Officer, Australian Cochrane Centre, Adelaide.
- Dentist, Aboriginal Health Service, Queensland.
- Senior Project Officer, AIDS/STD Control, Darwin.
- Research Fellow, London School of Hygiene and Tropical Medicine, UK.
- Women's Health Coordinator, Australian Volunteers Abroad, Pakistan.
- Doctor, Wellington, New Zealand.
- Master of Applied Epidemiology (NCEPH, ANU) student, placed with THS, Darwin.

Treatise Topics of Current (if decided) and Graduate Students

- Adverse pregnancy outcomes and maternal syphilis.
- The genetic structure of *Plasmodium falciparum* populations and its impact on the transmission and epidemiology of malaria in endemic areas.

- An evaluation of the Northern Territory breast screening programs.

- Prospective study of Group A Streptococcus carriage following intervention with azithromycin for trachoma.

- The opinions and attitudes of Darwin pool owners towards risk, responsibility and swimming pool fencing.

- Healthy adults checks - clinic-based preventive health in remote Aboriginal communities.

- Care provided by general practitioners for women experiencing first trimester miscarriage.

- Where do Aboriginal persons in the Top End prefer their mentally ill to be cared for and why?

- Factors which enhance the role of women in Baha'i community health worker training.

- Pitjantjatjara women's experiences with birthing in Alice Springs.

- Compliance in a cross-culturally set randomised controlled trial from the perspective of the research subjects and the researchers.

- A report to government on planning and evaluation of primary health care services in THS.

-
- Review of the THS Aboriginal Environmental Health Worker Program.
 - Mathematical modelling of syphilis in the NT.

Enrolments and Progress

Overall, for the five intakes that we have had to the program to date, we have had 70 students enrol in the program. Forty three of these have been Masters students. Three masters students and two graduate diploma students have graduated, with an additional three masters students having submitted their treatises. Seven masters students and seven graduate diploma students have withdrawn from the program, giving a withdrawal rate of 16% for masters students and 26% for graduate diploma students. **Table 1** summarises the progress of students up to February 1998.

Funding for the Program

DEETYA Funding

Menzies does not have a DEETYA profile, and cannot claim HECS fees directly. Students enrolled through the University of Sydney bring no funding to Menzies, as they are regarded by the University of Sydney as being “above quota”. In accordance with the Memorandum of Understanding signed between MSHR and the Northern Territory University, the University

passes on 90% of HECS funding to MSHR up to a maximum of 5 EFTSUs (this is based on an average annual enrolment of 15 students taking an average of 3 years to complete the coursework).

IPHERP Funding

Two Specialty Program Grants were awarded to MSHR in 1995 for three years and extended for one year to include 1998. The grants were to support research and education in STD/HIV and communicable disease, and Aboriginal health, and have been used in part to fund the coursework teaching program.

Other Funding

The Father Frank Flynn Fellowship has been used to support the program coordinator between 1994 and 1997, and other program staff in 1998. Other MSHR staff that have a major commitment to the program are supported out of core funds.

Strengths

Major strengths of this program are the enthusiasm and quality of the teaching staff and of the students. The applied nature of the program, and its focus on regional needs derives substantially from the involvement of teachers whose principal activities are as practitioners of public health, and the involvement of students that are employed in public health related occupations. Learning is

Table 1. Progress of students (as of February 1998)

Year Enrolled	Graduated	Treatise Submitted	Coursework Completed	Coursework In Progress	Withdrawn	Total
1993/4	3	3	6	4	(2)	15+(2)
1995	(2)*		2	5	4+(3)	11+(5)
1996				5+(4)	3	8+(4)
1997				4+(7)	(2)	4+(9)
1998				5+(7)		5+(7)
Total				23+(18)	7+(7)	43+(27)
* numbers in brackets indicate graduate diploma students						

thus focused on regional and local issues of immediate relevance to the students. Furthermore, the diverse backgrounds of students means that students are exposed to a range of alternative perspectives, and students learn a great deal from each other. Networks that are established between students, and between students and teachers have benefits that extend beyond the course and into the work environment and the years ahead. Students also appreciate the breadth of the subjects that can be studied through the program.

Challenges for the Program

Major challenges for the program include meeting the needs of students and staff who are studying or teaching in addition to being employed full time. Students in particular, and staff to a lesser extent, are based in locations across the Territory and Australia. Communications with some of these locations are difficult. Travel and accommodation for residential involves substantial costs for students, and

leaving family for a week in each semester is difficult for some students.

Competition for students between universities, and the increasing cost of education, appears to have resulted in some universities minimising the requirements for duration of courses and students workload in order to attract students. Students regard the workload for this program as being heavy in comparison with what is reported by their colleagues studying similar courses at other institutions. These factors are a challenge to achieving and maintaining high standards and student enrolment in the program.

A major challenge for public health (and the health system generally) is the facilitation of access to public health education and training for Indigenous people. Historical and ongoing disadvantage, particularly in education, makes it difficult for Indigenous people to meet the entry requirements for many education and training programs

in health, and difficulties with literacy and numeracy are barriers for those enrolled in courses at many levels. Public health, as a field of expertise, is particularly inaccessible because it is primarily taught at a postgraduate level. Our challenge is therefore to get public health teaching introduced in more generic health education and training programs at certificate, diploma and undergraduate levels, to raise the profile of public health teaching in education and training programs for specific health professions, and to establish effective bridging programs that will allow Indigenous people to access public health training at more advanced levels.

And, of course, acquiring more stable funding for the program.

Opportunities

The increasing attention being paid to the health of Aboriginal Australians at a national level, the associated developments in education and training in health, and the emphasis placed by Federal and Territory Governments on Public Health present a real opportunity to raise the profile of public health education and training. There is an opportunity to expand the scope and improve the quality of public health education and training both within courses targeting specific categories of health workers and within generic health (and public health) courses. The

establishment of the Department of Rural Health in Alice Springs; the Northern Territory Clinical School of Flinders University; closer links between MSHR, NTU, Flinders University, Aboriginal Medical Services, and THS through the CRC; and the review of the Public Health Education and Research Program are all developments that are enhancing the opportunities for public health education and training. Furthermore, there are opportunities for establishing education and training links with North Queensland, Western Australia and possibly South East Asia.

Plans for the Future

As described above, we have plans to introduce new units to meet the needs of people working in an evolving public health environment. We also have plans to make the program as flexible as possible to meet the needs of the diverse range of students that have an interest in studying public health. This flexibility should include increasing the options for level of entry and exit from the program, including offering short courses for people who have a specific interest in a topic, but who do not want to enrol in a full course of study. Increasing flexibility will require restructuring of the program, and this will be done as part of the process of having the program re-accredited with NTU within the next six months.

We also have plans for the establishment of a Faculty of Public Health that will provide a forum for the planning and coordination of public health education and training, and will provide people that teach on the program with some academic support for, and recognition of, their teaching activities. This Faculty would provide a base from which to address the

challenges and take advantage of the opportunities identified above.

The extent to which we can explore the opportunities presented above is dependent on the outcomes of the PHERP Specialty Program review, the review of the PHERP Centres and Consortia and on other funding opportunities that arise in the next few years.



Garry Myers and PhD supervisor, Sri Sriprakash, celebrate the submission of Garry's thesis.

**Graduate Diploma / Master of Public Health
Coursework Program Units 1997/98**

STRANDS	UNITS
<u>Core and Compulsory Units</u>	
Research Methods (Quantitative)	Computing Skills and Literature Searching Introductory Biostatistics Epidemiology and Research Methods
Research Methods (Qualitative)	History and Philosophy of Public Health Sociology, Ethics and Health Research Issues in North and Central Australia
Health Services	Health Care Services Management Principles and Practice Communication Skills Health Promotion in Cross-Cultural Settings Introductory Health Economics
Public Health Practice	Demography and Health Information Approaches to Problems in Public Health Case Studies in Public Health
<u>Elective Units</u>	
Aboriginal Culture and Health	Aboriginal Traditions of Health, Healing and Nurturing Aboriginal Society and Culture Public Order and Public Health among Aboriginal People The Political Economy of Aborigines in Central and Northern Australia
Specific Health Issues	International Health and Development Child Health Nutrition Issues in the Developing World Nutritional Epidemiology Introduction to Alcohol & Other Drug Issues Alcohol & Other Drug Issues among Indigenous Australians Epidemiology of Communicable Disease Epidemiology of Non-Communicable Diseases STD including HIV Mycobacterial Infections Vector Borne Infections
Health Services Planning & Research	Models of Health Service Delivery Ethics of Medical Research and Service in Aboriginal Settings Health Surveillance Systems and Records Needs Analysis and Resource Allocation Evaluation of Health Programs

RESEARCH DEGREES AWARD/D					
Year	Name	Degree	Title	Conferring Institution	
1997-98	BURT Tim	PhD	Health Effects of Manganese Exposure in East Arnhem Land	University of Sydney	
	CHAVES Nadia	BMedSci	Diabetes Audit in an Aboriginal Health Care Setting : Can't Contribute to Practice Development?	Monash University	
	MYERSCOUGH Mark	MMed	Investigation of the Pharmaceutical Properties of Some of the Plants Traditionally Used by Aboriginal Australians in the Top End of the Northern Territory to Treat Tropical Illnesses	University of Sydney	
1996-97	BASTIAN Ivan	PhD	A Human T-Lymphotropic Virus (HTLV-I) Amongst Australian Aborigines	University of Sydney	
	BURNS Chris	PhD	An End of Petrol Sniffing?	University of Sydney	
	de CLOUETT Simone	BSc(Hons)	Constructing a Shuttle Vector for the rRNA Operons of Group A Streptococci	Flinders University of SA	
	GARDINER Don	PhD	Molecular Epidemiology of <i>Streptococcus pyogenes</i> in the Northern Territory	University of Sydney	
	HARUMAL Pearly LEACH Amanda	BSc(Hons) PhD	Studies on the Malarial Gene for Sequestrin Prospective Studies of Respiratory Pathogens, Particularly <i>Streptococcus pneumoniae</i> in Aboriginal and Non-Aboriginal Infants : Impact of Antibiotic Use and Implications for Otitis Media	Northern Territory University University of Sydney	

Year	Name	Degree	Title	Conferring Institution
	WALKER Kate	BMedSci	Trends in Birthweight and Infant Weights : Relationship Between Early Undernutrition, Skin Lesions, Streptococcal Infections and Renal Disease in an Aboriginal Community	Melbourne University
1995-96	BOSWELL Judith	PhD	A Prospective Audiological Study of Otitis Media in Aboriginal and Non-Aboriginal Infants	University of Sydney
	BURGESS Paul	BMedSci	A Follow-Up Cohort Study of 440 Aboriginal Adults on a Central Australian Rural Community : Anthropometry, Cardio-vascular, Renal and Diabetes Screening	Melbourne University
	HUTTON Sue	MScMed	<i>Chlamydia pneumoniae</i> in the Northern Territory of Australia	University of Sydney
	KILE Emma	BMedSci	Relationships Between Low Birthweight Morbidity and Mortality in Aboriginal People	Monash University
	MACKENZIE Grant	BMedSci	RDH Discharge Summary and Continuity of Care Project	Melbourne University
	McCONNEL Fred	MPH (research)	Otitis Media in Australian Aboriginal Children - Training and Validation in Otoscopy for Research	University of Sydney
	POWELL Anne	BMedSci	Low Birthweight and Adult Health	Monash University
	WEERAMANATHRI Tarun	PhD	Out of Sadness, Hope - A Cause of Death Validation Study and Public Health Audit of Adult Aboriginal Deaths in the Northern Territory	University of Sydney

Year	Name	Degree	Title	Conferring Institution
1994-95	LOWELL Anne	PhD	Communication and Learning in an Aboriginal School : The Influence of Conductive Hearing Loss	University of Sydney
	REES Megan	BMedSci	Development of Nutrition Programs in Aboriginal Communities	Monash University
	WAN Xinan	PhD	Epidemiology of Hepatitis B Infection in the Northern Territory	University of Sydney
1993-94	MATHEWS Sarah	PhD	The Study of Chlamydial Promoters and Gene Regulation in Chlamydia	University of Sydney
	RELF Wendy	PhD	Molecular Biology of M Protein Genes of <i>Streptococcus pyogenes</i> : Application to Typing	University of Sydney
	WEBB Daryl	MSc(prelim)	Core Proteins of HTLV-1	University of Sydney
1992-93	LEE Mandy	PhD	Survival Tucker : Aboriginal Dietary Intake and a Successful Community-Based Nutrition Intervention Project	University of Sydney
	TAI Keat-Song	MPH (research)	Epidemic Polyarthritis in the Northern Territory	University of Sydney

CURRENT RESEARCH STUDENTS		Institution of Enrolment	
Name	Degree	Title	
Submitted 1998			
CARAPETIS Jonathan	PhD	Ending the Heartache : The Epidemiology and Control of Acute Rheumatic Fever and Rheumatic Heart Disease in the Top End of the Northern Territory	University of Sydney
MYERS Garry	PhD	Analysis of a Chlamydial Gene Cluster Encoding Novel Membrane Proteins	University of Sydney
WALTON Shelley	PhD	<i>Sarcoptes scabiei</i> : A Molecular Approach to Immunological and Epidemiological Aspects	University of Sydney
Current			
ATHAL Sreedeevi	MPH(research)	Otitis media and speech perception in a cross-language context	University of Sydney
ATHAL Venkatesh	MPH(research)	Behavioural and electrophysiological studies in binaural hearing with Aboriginal children	University of Sydney
BAKER Philip	PhD	Evaluation of screening and treatment of renal disease in Aboriginal Australians	University of Sydney
BARCLAY Jillian	PhD	Royal Flying Doctor Service - The nurses' story	University of Sydney
CASS Alan	M/PhD	Investigation into renal disease in Aboriginal populations	Flinders University of SA
DORLING Mary	PhD	Medical anthropology - Socio-cultural study of transmission dynamics of HIV infection in, Kupang, Indonesia	University of Sydney

Name	Degree	Title	Institution of Enrolment
FRIED Ofra	MPH(research)	Cross cultural issues affecting the medical management of terminally ill Aborigines in Central Australia	University of Sydney
HIBBLE Megan	MScMed	Molecular characterisation of <i>Streptococcus pyogenes</i> in the Northern Territory	University of Sydney
HOLT Deborah	PhD	Genetics of <i>Plasmodium falciparum</i>	University of Sydney
IVERS Rowena	PhD	Quit smoking programs in the bush	Northern Territory University
JAROSS Nandor	MPH(research)	Diabetic retinopathy in the Top End of Australia in the light of ophthalmic services in the Top End : An analysis of current and future needs in relation to current and predictive prevalence and pattern of eye disease	University of Sydney
KEMP Kath	PhD	Cross-cultural communication within the health care system : In particular Intensive Care	University of Sydney
LAM Tai Pong (Daniel)	PhD	A study of the effects of land migration on the health of the water people in Hong Kong and implications for clinical practice	University of Sydney
LEA Tess	PhD	A native ethnography of the bureaucratic governance of Aboriginal health in the Northern Territory	University of Sydney
LOW CHOY Jodie	MSc	Veterinary aspects of melioidosis	University of Sydney
MAGUIRE Graeme	M/PhD	Infections of the lower respiratory tract	University of Sydney
MARTIN Louise	BSc(Hons)	Investigation into the variation in surface molecules of <i>Haemophilus influenzae</i>	Northern Territory University

Name	Degree	Title	Institution of Enrolment
McDONALD Stephen	M/PhD	Investigation into renal disease in Aboriginal populations	Flinders University of SA
MORRIS Peter	PhD	Health services for the improved management of otitis media in an Aboriginal community	University of Sydney
ONG Michael	BMedSci	Descriptive epidemiology of heart disease in NT Aborigines	Melbourne University
SAYERS Susan	PhD	Risk factors and outcomes of Aboriginal infants born at the Royal Darwin Hospital	University of Sydney
SINGH Gurmeet	M/PhD	Investigation into renal disease in Aboriginal populations	Flinders University of SA
SMITH-VAUGHAN Heidi	PhD	Typing of bacterial strains colonising the nasopharynx of infants in the Top End of the Northern Territory	University of Sydney
THOMAS David	PhD	The interrelatedness of Aboriginal health research and the histories of colonialism and racism	Northern Territory University
TJITRA Emiliana	PhD	Clinical epidemiology of malaria in Eastern Indonesia	Northern Territory University
WEIR Richard	PhD	Classification and identification of viruses isolated from mosquitoes in the Northern Territory, 1982-1992, using several serological techniques	University of Sydney
WHITE Andrew	M/PhD	Investigation into renal disease in Aboriginal populations	Flinders University of SA

Name

YOU Judy

Degree

MSc

Title

Analysis of cost components of maintaining and treating Aboriginal patients on renal dialysis in the NT

Institution of Enrolment

Northern Territory University

SCHOLARLY PROFILES



COOPERATIVE RESEARCH CENTRE FOR ABORIGINAL AND TROPICAL HEALTH

The Cooperative Research Centre for Aboriginal and Tropical Health is a public good Centre funded mainly through the Commonwealth Government's Cooperative Research Centres Program. Other cash and in kind support is provided through the six core partners in the unincorporated joint venture. Menzies School of Health Research, as a core partner, is also the Centre host and provides Centre Agent services and accommodation for the secretariat and executive of the CRC.

Among other important Centre objectives such as high educational and research performance targets, it is important to emphasise the following Centre Objectives (CRC for Aboriginal and Tropical Health, August 1997, pp. 10 and 11) :

The Parties (core partners) agree that the poor health of Aboriginal people is due to poverty, to educational and social disadvantage, to alienation, and to a health care system that has largely failed to address the needs of Aboriginal people.

The Parties further agree that Aboriginal and tropical health problems may be improved by appropriate research, including research to discover new ways to apply existing knowledge in order to improve health.

The Parties further agree that Aboriginal health would be improved through participation by Aboriginal people in searching for more effective means to develop holistic solutions including :

- a) the appropriate use of traditional Aboriginal knowledge and values;
- b) more appropriate means for Aboriginal community control in accordance with the principles of the Alma-Ata Declaration and the Ottawa Charter;
- c) more effective means for primary, secondary and adult education to support indigenous control over health, housing, community development and employment programs;
- d) more effective school and community-based programs to support indigenous choices towards improved nutrition, healthy life-styles, and more effective usage of health services;
- e) culturally appropriate health services that are developed through research involving Aboriginal people to achieve comprehensive health care initiatives that meet standards of professional best-practice and promote self determination;
- f) more effective means to inform politicians, bureaucrats,

educators, health professionals, and the wider Australian community, about the social, economic, historical and biological determinants of health; and

- g) more effective cooperation between health, education and other sectors and between levels of government.

PROGRESS STATUS

Technically the Centre commenced on 1 July 1997, but in reality the Centre did not have the Agreements finalised until late September 1997. Project commencements were not possible until the Commonwealth funding was transferred on 29 September 1997. In the lead up time to these critical events a national advertisement was authorised by the Director in order to gain an early indication of the potential field for employment. The response was very encouraging and allowed for early interviews to be convened in October and November 1997.

Currently the Centre has recruited four senior research fellows, three staff in the electronic communications field, an Aboriginal trainee Research Assistant, seven Aboriginal people under the Australian Traineeship System, two short term contract staff and is providing financial support for two honours students. As indicated later in this brief report the Centre will

implement a comprehensive Education and Training strategy in the next financial year. The importance of this area is high and every effort will be made to maintain the energy and innovativeness of the approaches to training of Aboriginal people.

The level of sustained input from other institutions who are not core partners has been encouraging. It is expected that there will be an increase in interest with further exposure of the Centre's objectives and activities. Several presentations about the Centre have been conducted, including the official launch of the Centre in early July 1998.

CRC MANAGEMENT TEAM

The Management team of the Centre currently are :

Prof John Mathews AM
Director

Dr Peter d'Abbs
Deputy Director (Dr d'Abbs has resigned to allow for the appointment of a full time Deputy Director)

Ms Terry Dunbar
Business Manager

Mrs Liz Williams
Administrative Officer

Ms Jane Whelan
Administrative Trainee

CENTRE COOPERATIVE ARRANGEMENTS

Both Danila Dilba Medical Service and Central Australian Aboriginal Congress, through their affiliation with the representative body AMSANT (Aboriginal Medical Services Association of the Northern Territory), enjoy strong collaborative arrangements with each other and the other member organisations of AMSANT. Collaborative efforts are further strengthened by the two core partners sharing a Senior Research Fellow (Dr Jeannie Devitt) who operates between Darwin and Alice Springs. Part of her responsibility is to increase the interactions between Menzies School of Health Research, Flinders University and various sections of Territory Health Services.

The Centre's Education and Training Coordinator is negotiating with institutions such as Batchelor College, Northern Territory University and others to investigate potential opportunities to explore both short term, degree and postgraduate courses.

Other close affiliations exist with the Institute for Aboriginal Development, Queensland University of Technology, Kormilda College, Northern Territory Education Department, Yipirinya School.

With regard to the high level of coordination activities that has

eventuated to date, it is obvious that this has the potential to continue increasing as new projects are approved and awareness of the Centre activities is publicised. Clearly with the cross flow of information at Executive Committee meetings, between the Program Leaders and participating members from core partners there will be the discovery of new ideas and a facilitation of readiness to thoroughly explore collaborative research agendas. The Director recently had the opportunity, when undertaking his sabbatical leave in Oxford, to promote the Centre and type of research being performed. This exchange also lead to the establishment of a working party to develop a funding proposal to access support from the Wellcome Trust. This proposal seeks to fund the further investigation of sensitive issues such as the ownership of research by Aboriginal people; differences in values and perceptions about research, between researchers and research subjects; and how to improve communication and understanding of the costs and benefits of research by all concerned.

Two other senior staff members (Drs Bart Currie and Frank Bowden), have both spent time studying in Oxford during the past 12 months.

The Flinders University of South Australia (Flinders) has several senior research staff whom are either involved in the development of new projects or as a Program Leader. Three Core

Partners, Menzies, Territory Health Services and Flinders University, are all represented at the Executive Committee forums. Danila Dilba Medical Service and Congress in Alice Springs recently, through the employment of a Senior Research Fellow, have had and will continue to have high level roles to play across all activities of the Centre.

The CRC management team regularly attend the Indigenous Education Council of the Northern Territory (IECNT) to promote the activities of the Centre's Indigenous Education and Health program and to glean information or to report back on any potential collaboration opportunities.

RESEARCH AND RESEARCHERS

During the first year of operation the Centre Management Board has approved seventeen projects with fifteen projects receiving Centre cash contributions. Of the fifteen projects receiving cash contributions, the Menzies School of Health Research is implementing nine. More detailed progress of these projects will be available in the Centre's Annual Report.

EDUCATION AND TRAINING

The CRC has sponsored 7 Aboriginal trainees for one year (cost per annum : approximately \$70,000, including PAYE etc; plus an initial outlay of

\$15,000 for computers and \$17,000 in overhead costs etc.). Three of these are in the administrative area, 1 in computing, 2 in non-laboratory research and 1 is a laboratory trainee. Two have already commenced some studies at NTU and 1 at Batchelor College; the remainder are planning to start some studies in the second semester.

In the 1998/99 financial year it is anticipated that there will be a focus on recruiting postgraduate students, with a strategy to gain Indigenous students. Other innovate methods of introducing people to the world of science will be explored vigorously.

Using some funding from the Commonwealth, the Public Health Strategies Unit at THS is currently planning a database of public health/primary health courses available in the NT, regardless of level or provider. It is planned for this to list modules, units or courses from Certificate 1 to Masters level. The goal is to allow greater use and re-use of what is currently available so that new modules are only developed when necessary. The current funding (till end June, 1998) allows the project to be scoped and a plan for a data-base format to be drawn up with Information Technology group at THS. Future funding will be sought, possibly as a specific CRC-funded project.

Qualitative research/evaluation methods are frequently identified as a

training need. At present, we are trialing an NTU course from the Faculty of Education in the MPH course. Based on experiences with this, it may be possible to use this course, or an adaptation of it, for wider CRC staff training. However, a pre-Masters version would be also need to be developed to meet the needs of many people. Consultants could also develop a short course on qualitative and quantitative research methods for CRC Indigenous staff and stakeholders.

The Cochrane Collaboration Centre at Flinders is going to run some of their lay and non-lay courses in interpreting medical literature and research for partners' staff in the NT.

OPTIONS FOR 1998/99

The CRC is actively considering funding possibilities for further study for appropriately qualified Aboriginal people. These include :

PhD Degree : The PhD at NTU has no 'course' fees, but does have a \$200/year amenities fee. Research students can apply for a living allowance scholarship, which is currently \$15,880pa tax-free (full-time). Depending on the student's background (eg. if MBBS) the postgraduate award can be up to \$24,000 pa, tax free. At least two reserved for Indigenous students.

Honours Degree : same conditions as PhD, but only 1 year; research scholarship in a health-science related field at any Core partner (including research in allied health professions areas, as most of these are taught at the Bachelor's level).

MPH Degree : At present, the total cost of the coursework MPH degree through NTU is \$5,223 up front HECS payment (\$7,363 deferred payment) plus \$100 pa amenities fee for part-time students. It would be unusual to offer a living allowance for a part-time degree, and it would not be tax-free. NTU currently does not offer living allowance scholarships for coursework masters students. However, it may be possible for an MPH student to do enough units in one year to be classified as a full-time student, (even though the degree is technically offered only as a part-time degree) - would this allow a tax-free scholarship, even though it is a course work degree? Students are also required to attend the 2 one-week residential sessions each year in Darwin; this may be up to 8 trips, as 4 years is the maximum amount of time for the coursework component of the MPH.

Trainee Aboriginal Health Workers : Another possibility under consideration is the provision of prizes for trainee Aboriginal Health Workers, at the various certificate levels, for the best research project work.

FIRST YEAR REVIEW

Positive and encouraging comments contained in the First Year visit Report were well received by the CRC Board and Staff of the Centre. Further to the Report, the Business manager has compiled complementary meeting notes for file. The Report and response papers were presented at the 11 June 1998 Board Meeting and subsequently to the Core Partners.



COLLABORATIVE WORK WITH THE ABORIGINAL POLICY AND HEALTH EDUCATION UNIT AT MENZIES

The Aboriginal management staff of the Centre regularly meet with the team members of the Menzies Aboriginal Policy and Health Education Unit. This opportunity has been invaluable and many training opportunities are discussed at these forums. It proves mutually beneficial for the Centre and Menzies to foster an environment that is supportive of the Indigenous staff members. The Business Manager and Ms Mai Katona, Head of the Aboriginal Unit, will continue to collaborate closely on operational policy issues.



Top : Hon Dr Michael Wooldridge addresses the official launch of the CRC.

Bottom (L-R) : Leah Ahmat, Liz Williams, Masun Nasir and Jane Whelan at the CRC launch.

1997 ANNUAL GENERAL MEETING

The 1997 Annual General Meeting of the Menzies School of Health Research was held on 17 October 1997.

Chair of the Board of Governors, Mr Richard Ryan AM, welcomed everyone to the twelfth Annual Meeting of the School and noted the apologies. Minutes of the 1996 Annual General Meeting were circulated and confirmed.

Acting Director of the School, Professor David Kemp FAA, presented the 1996-1997 Annual Report for acceptance by the meeting. The major highlight reported on was the establishment of the Cooperative Centre for Aboriginal and Tropical Health, led by Professor John Mathews. The cooperating partners are Northern Territory University, Territory Health Services, Flinders University, Danila Dilba Medical Service and Central Australian Aboriginal Congress. The CRC will provide a framework for intersectoral multidisciplinary research to promote best practice in Aboriginal and tropical health, improve the knowledge and skills of the health workforce, and to promote an improved range of education and training opportunities.

The Treasurer, Mr Richard Ryan congratulated the Director and staff on the financial management of the School.

1997 ORATION

The School's Annual Oration and Dinner Dance was held on 17 October 1997 at the MGM Grand Casino, Darwin. Speaking to an audience of some 175 people, His Honour the Administrator Dr Neil R Conn AO, Administrator of the Northern Territory spoke on the subject "*The Future of the Northern Territory, with Hindsight and 2020 Vision*".

Dr Conn commenced by considering what an Oration was expected to be. He pointed out that the "Pocket Oxford Dictionary indicates that to *orate* can be to *hold forth* or *harange*, while the Collins English Dictionary has as one definition of *oration*: *any rhetorical, lengthy or pompous speech, with rhetorical* defined elsewhere to mean *concerned with effect or style rather than content or meaning*".

In his speech, Dr Conn projected that the population of the NT would be at least 300,000 by 2020 and went on to provide some fascinating insights into our demographic and economic future, projecting that the Territory will be a "small but increasingly influential State of the Australian Federation" by the year 2020.

MEMBERSHIP OF SCHOOL COMMITTEES

AUDIT COMMITTEE

Mr Don Darben AO (Chair)
Mrs Sue Bradley
Mr Harry Giese AM MBE
Ms Clare Milikin
Mr Richard Ryan AO

COURSEWORK MANAGEMENT COMMITTEE

Dr Antonia Bagshaw (Chair until Dec 1997)
Dr Ross Bailie (Chair from Jan 1998)
Dr Joan Cunningham
Dr Peter d'Abbs
Ms Pam Gollow (Student Rep)
Mrs Audrey Langlands (Secretary)
Dr Dorothy Mackerras
Prof John Mathews AM
Dr Janice Money (Student Rep)
Ms Jenny Powers
Dr David Scrimgeour (until Apr 1998)
Dr Komla Tsey
Dr John Wakerman

FINANCE COMMITTEE

Mr Richard Ryan AO (Chair)
Mrs Sue Bradley
Mr Don Darben AO
Mr Harry Giese AM MBE
Mr Ken Simpson
Mrs Jane Large

INSTITUTIONAL BIOSAFETY COMMITTEE

Prof David Kemp (Chair)
Dr Val Asche
Dr Karen Gibb
Dr Antje Haase (until Nov 1997)
Mrs Sue Hutton (from Nov 1997)
Mr Lodi Heoben
Dr Gary Lum
Dr Lorna Melville
Dr KS Sriprakash
Ms Elizabeth Stubbs (Secretary)

JOINT INSTITUTIONAL ETHICS COMMITTEE (RDH & MSHR)

Dr Alan Ruben (Chair until Aug 1997)
Ms Kate Ross (Chair from Aug 1997)
Ms Pat Anderson (until May 1998)
Dr Nick Anstey
Dr David Ashbridge
Dr Chrissie Berryman
Dr David Brewster
Ms Peggy Cheong
Dr John Condon (from Aug 1997)
Ms Terry Elms (until July 1997)
Dr John Harrison (until Nov 1996)
Mr Ian Hillock
Ms Mai Katona (from Nov 1997)
Mr Jack McTaggart
Ms Clare Martin, MLA
Prof John Mathews AM
Dr Peter Morris
Ms Sandi Smiles
Ms Elizabeth Stubbs (Secretary)
Reverend Jim Taylor
Mr Peter Thomsen (until Nov 1997)
Dr Katharine Trenholme
Prof Jenny Watson
Mr Trevor Woodhead (from May 1998)

Aboriginal Ethics Sub-Committee

Ms Pat Anderson (Chair until May 1998)
Mr Trevor Woodhead (Chair from May 1998)
Ms Katrina Hodgson (from 1997)
Ms Mai Katona
Ms Merle Kennedy (from 1997)
Ms Sandra Kitching
Mr Desi McKenzie
Dr Peter Morris (Scientific Advisor)
Mr Peter Thomsen
Ms Liz Williams (from 1998)

POSTGRADUATE STUDIES COMMITTEE

Prof David Kemp (Chair)
Dr Antonia Bagshawe (1997)
Dr Ross Bailie (1998)
Mr Phil Baker (Student Rep, 1998)
Dr Joan Cunningham
Assoc Prof Bart Currie
Dr Peter d'Abbs
Dr Dorothy Mackerras
Prof John Mathews AM
Dr KS Sriprakash
Ms Elizabeth Stubbs (Secretary)
Dr Komla Tsey
Ms Shelley Walton (Student Rep,
1997)
Assoc Prof Charles Webb

SHOWING OFF ...



PHYSICALLY CHALLENGED

F^{IRST}

This year Menzies entered two teams in the Life Be In It Corporate Challenge : Menzies *Mostly Malaria* and *Bugs & Germs*. After 6 weeks of walking, running and sweating over the 4.5km course, *Mostly Malaria* picked up first prize for most improved team, while *Bugs & Germs* came 6th in a field of over 100 teams.



Top :
Mostly
Malaria

Left :
Bugs &
Germs

L^{AST}

After 3 years of being awarded the wooden spoon for last place in the National Heart Foundation's Humpty Doo to Darwin relay race, this year's team demonstrated a dramatic improvement over the 50km course : *They still finished last, but were only 45 minutes behind the second last team, instead of the 90 minutes of the previous year!*

A^{ND SOMEWHERE BETWEEN}

The "Menzies" 5th Division mixed touch football team continued to develop its talent and finished the season in second place. A loss in the first semi-final saw the team battling to win a second semi and make the grand final. However grand final day dawned dark and gloomy and the team was defeated 9-3.

Undaunted by its grand final loss, the Menzies team is currently planning its attack on 4th Division teams and seeking sponsorship for the coming season.

B^{ARELY A DAY GOES BY ...}

when these two unlikely gentlemen miss their evening walk along the Nightcliff foreshore, in search of the meaning of life, and trimmer waistlines. Funder please return to ... *Al Yonovitz and Dave Kemp!* (Good on you guys - we have noticed the difference.)



FINANCIAL STATEMENTS

1997-1998

In 1997-98 the Menzies School of Health Research achieved an operating surplus of \$76,511.

The School received 47% of its income in endowments from Territory Health Services and the Menzies Foundation. A further 28% was received from the Commonwealth Government, the major sources of these funds are the National Health and Medical Research Council and the Department of Health and Family Services. Non-government grants increased from 5% to 8%, whilst income from donations and interest on investment decreased from 6% to 5%. The remaining income is received from overseas grants and the Cooperative Research Centre for Aboriginal and Tropical Health.

Administrative expenses associated with supporting both Alice Springs and Darwin-based personnel remain at around 1% of total expenditure. The increase in expenses on building maintenance arises because now, for the first full year, the School has sole responsibility for the maintenance of the new building. Purchase of items necessary for the occupation of the new building in November 1996 significantly increased equipment minor expenses in the 1996-97 Financial Year. The increase in field expenses is largely attributed to international research projects involving extended travel to Indonesia. Laboratory and travel expenses decreased marginally to 8%. As for similar institutions elsewhere in Australia, the School's major expense is staff salaries and stipends. In 1997-98 staff salaries, scholarships and related expenses remained at 67% of total expenditure.

**MENZIES SCHOOL OF HEALTH RESEARCH
FINANCIAL STATEMENTS
FOR THE YEAR ENDED 30 JUNE 1998**

STATEMENTS ON BEHALF OF THE BOARD OF GOVERNORS

In our opinion the attached income and Expenditure Statement and balance Sheet including Notes to and Forming Part of the Financial Statements of the Menzies School of Health Research are properly drawn up so as to give a true and fair view of :

- (a) the financial affairs of the Menzies School of Health Research as at 30 June 1998; and
- (b) the Receipts and Expenditure of the organisation for the year ended on that date.

RV Ryan AO
Chair
Board of Governors

31 August 1998

LV Asche
Member
Board of Governors

31 August 1998

MENZIES SCHOOL OF HEALTH RESEARCH
BALANCE SHEET AS AT 30 JUNE 1998

	1997/98	1996/97
	\$	\$
Current Assets		
Cash on Hand (Note 2)	700	700
Cash at Bank (Note 2)	2,623,184	2,151,940
Trust Account (Note 4)	227,280	0
Trade Debtors (Note 3)	297,378	342,857
Other Debtors (Note4)	0	51,500
Prepaid Expenses (Note 5)	29,295	31,539
Accrued Revenue (Note 6)	182,304	77,715
Investment (Note 7)	3,540	3,540
Total Current Assets	3,363,681	2,659,791
Non-Current Assets		
Property, Plant and Equipment (Note8)	880,772	812,511
Total Non-Current Assets	880,772	812,511
TOTAL ASSETS	4,244,453	3,472,302
Current Liabilities		
Bank Overdraft (Note 2)	0	16,832
Trust Account (Note 4)	227,280	0
Accrued Expenses (Note 9)	349,069	40,752
Trade Creditors (Note 10)	157,694	128,436
Receipts in Advance (Note 11)	1,439,515	1,288,773
Provision for Long Service Leave (Note 1d)	90,940	81,986
Provision for Recreation Leave (Note 1d)	380,255	409,760
Provision for Leave Fares (Note1d)	27,000	0
Total Current Liabilities	2,671,753	1,966,539
Non-Current Liabilities		
Provision for Long Service Leave (Note 1d)	89,135	98,709
Total Non-Current Liabilities	89,135	98,709
TOTAL LIABILITIES	2,760,888	2,065,248
Net Assets	1,483,565	1,407,054
Accumulated Funds		
Surplus/(Deficit) at the Beginning of July 97	1,407,054	1,420,342
Surplus/(Deficit) at the End of June 1998	76,511	(13,288)
TOTAL ACCUMULATED FUNDS	1,483,565	1,407,054

NOTE : The Balance Sheet should be read in conjunction with the accompanying Notes.

MENZIES SCHOOL OF HEALTH RESEARCH
INCOME AND EXPENDITURE STATEMENT
FOR THE YEAR ENDED 30 JUNE 1998

	1997/98 \$	1996/97 \$
Income		
Commonwealth Government Grants	1,731,472	1,472,951
NT Government Grants	2,808,641	2,995,587
Menzies Foundation	110,000	130,000
Non-Government Grants	497,929	252,504
Cooperative Research Centre (Note 4)	204,178	51,500
Overseas Grants	196,763	107,631
Donations	18,301	38,317
Interest and Dividends	138,576	166,590
Reimbursements	427,360	76,175
Sundry Income	35,858	40,862
	6,169,078	5,332,117
Expenditure		
Administration - Darwin	64,154	44,532
Administration - Alice Springs (Note 1g)	9,890	21,862
Board Expenses	3,317	15,828
Building Maintenance	280,411	197,320
Computing	77,479	92,508
Consultants	55,875	49,047
Cooperative Research Centre Contribution (Note 4)	100,000	0
Cooperative Research Centre (Note 4)	0	51,500
Depreciation	287,542	218,285
Equipment (Minor)	17,798	209,005
Field Expenses	166,156	86,866
Fundraising	55,722	42,067
Insurance	49,282	50,638
Laboratory Expenses	320,708	276,608
Library	56,879	50,233
Personnel Expenses	44,116	36,072
(Profit)/Loss on Sale of Plant and Equipment	(3,570)	(32,554)
Public Relations (Printing etc)	57,737	58,925
Safety	2,546	2,367
Staff Salaries	4,111,350	3,548,545
Telephone/Facsimile	90,881	82,566
Travel	172,356	168,124
Vehicles	35,247	35,343
Visitors and Seminars	12,466	32,496
Visual Aids	24,225	7,222
	6,092,567	5,345,405
Net Surplus/(Deficit)	76,511	(13,288)

NOTE : The Income and Expenditure Statement should be read in conjunction with the accompanying Notes.

MENZIES SCHOOL OF HEALTH RESEARCH
STATEMENT OF CASH FLOWS FOR THE YEAR ENDED 30 JUNE 1998

	1997/98	1996/97
	\$	\$
Cash Flows from Operating Activities		
Payments		
Salaries and On-Costs	(3,849,591)	(3,361,158)
Suppliers	(1,733,664)	(1,477,035)
Cooperative Research Centre	0	(51,500)
Receipts		
Donations	59,250	38,317
Interest and Dividends	141,538	167,791
Reimbursements	341,606	76,175
Sundry Income	28,188	40,863
Net Cash Flows Used in Operating Activities	(5,012,673)	(4,566,547)
Cash Flows from Investing Activities		
Payments for Purchase of Equipment	(285,959)	(579,849)
Payments for Purchase of Vehicles	(17,230)	(120,071)
Proceeds from Sale of Vehicles	6,050	92,850
Proceeds from Sale of Equipment	0	1,000
Net Cash Flows Used in Investing Activities	(297,139)	(606,070)
Cash Flows from Research Grants		
Commonwealth Government	1,794,218	1,538,845
NT Government	467,966	412,917
Non-Government	755,695	434,592
Cooperative Research Centre	305,009	0
Net Cash Flows Provided by Research Grants	3,322,888	2,386,354
Cash Flows from Endowments		
Endowment - NT Government	2,335,000	2,357,000
Endowment - Menzies Foundation	140,000	100,000
Net Cash Flows Provided by Endowments	2,475,000	2,457,000
Net Increase in Cash Held	488,076	(329,263)
Cash at Beginning of Year	2,135,808	2,465,071
Cash at End of Year	2,623,884	2,135,808

NOTE : The Statement of Cash Flows should be read in conjunction with the accompanying Notes.

MENZIES SCHOOL OF HEALTH RESEARCH
NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS
FOR THE YEAR ENDED 30 JUNE 1998

1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

The Menzies School of Health Research was established as a body corporate under the Menzies School of Health Research Act, No 60 of 1985.

Statement of Economic Dependency

The management of grant funded projects by the School is dependent on continued funding from the Northern Territory Government and other granting bodies.

Set out hereunder are the significant accounting policies adopted by the School in preparation of its accounts for the year ended 30 June 1998. Accounting policies adopted are consistent with last year, unless otherwise stated.

a. Basis of Preparation of Financial Statements

These financial statements have been prepared in accordance with the historical cost convention.

b. Stocks

Stocks of consumable scientific and administrative items purchased in the normal operations are not taken into account at course of balance date as assets, but are written off at the time of purchase.

c. Revenue Recognition

Grant and Donation Income received for specific research is matched to the incidence of the related expenditure as follows :

- i. revenue received but unexpended for projects commenced but not complete by the year end, is carried forward in "Receipts in Advance".
- ii. revenue received for projects to be commenced in the following financial year, is carried forward in 'Receipts in Advance'.
- iii. all other project-related income is fully expended in the year of receipt.
- iv. all grant income (revenue, capital and specific purpose) are recognised as income in year of receipt. However, where unexpended funds are required to be refunded to the funding body, grant monies are recognised as income to the extent of the expenditure of such grants. The unexpended is disclosed as a liability.

d. Employee Benefits

Provision is made for long service leave, annual leave and airfares estimated to be payable to employees. The amounts provided have been apportioned between current and non-current, the current provision being the portion that is expected to be paid within the next twelve months.

In the case of long service leave, employee entitlements vest after the completion of ten years service. A special pro-rata entitlement may be paid in lieu of long service leave on resignation of employment after seven or more years of service. In accordance with accounting standard AAS30 - Accounting for Employee Entitlements - the School has calculated long service leave entitlements not settled at 30 June 1998 on a present value basis.

Sick leave entitlements are non-vesting. Experience shows that sick leave taken is less than the entitlement accruing, so that no liability has been recognised.

e. Superannuation

Employee's superannuation entitlements are principally provided through the Northern Territory Government and Public Authorities Superannuation Scheme (NTGPASS), the Commonwealth Superannuation Scheme (CSS) and the Superannuation Scheme for Australian Universities (SSAU). Benefits from these Schemes are supplemented by an additional "5% productivity" benefit from the Northern Territory Supplementary Superannuation Scheme (NTSSS). The NTSSS benefit is also provided to employees who are not NTGPASS or CSS members, provided they are employed for at least 3 months. Scheme membership among employees at 30 June 1998 was as follows :

NTSSS	78
NTGPASS (plus NTSSS)	43
CSS (plus NTSSS)	1
SSAU	24

The cost of employer-financed benefits in the NTGPASS, NTSSS and CSS is met by the Northern Territory Government with administration being undertaken by the Northern Territory Superannuation Office.

f. Income Tax

The income of the School is exempt from income tax pursuant to the provisions of Section 23(e) of the Income Tax Assessment Act.

g. Administration - Alice Springs

To maintain consistency in the presentation of Administration - Darwin and Administration - Alice Springs, there is a change in treatment. Without this change in treatment, the effect would be as follows :

	1997/98	1996/97
Total Administration - Alice Springs	112,817	174,566

2. CASH

For the purposes of the Statement of Cash Flows, the School considers cash to include cash on hand and in banks. Cash and cash deposits at the end of the reporting period are reconciled to the Balance Sheet as follows :

NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS 30 JUNE 1998 (CONT.)

a. Reconciliation of Cash

	1997/98	1996/97
Cash on Hand	700	700
Overdraft	nil	(16,832)
Cash Deposits	2,623,184	2,151,940
Total Cash	\$2,623,884	\$2,135,808

b. Reconciliation of Net Cash Used in Operating Activities to Operation Results

	1997/98	1996/97
OPERATING RESULT	76,511	(13,288)
Changes in :		
(Inc)/Dec Trade Debtors	96,979	(331,016)
(Inc)/Dec Prepaid Expenses	2,244	20,261
(Inc)/Dec Accrued Revenue	(104,589)	115,681
Inc/(Dec) Trade Creditors	15,602	83,429
Inc/(Dec) Accrued Expenses	308,317	(34,675)
Inc/(Dec) Receipts in Advance	150,742	177,397
Inc/(Dec) Provision for Recreation Leave	(29,505)	68,125
Inc/(Dec) Provision for Long Service Leave	(620)	5,163
Inc/(Dec) Provision for Leave Fares	27,000	nil
Income from Research Activities	(3,322,888)	(2,386,355)
Income from Endowments	(2,475,000)	(2,457,000)
Depreciation	287,542	218,285
(Profit)/Loss on Sale of Plant	(3,570)	(32,554)
Assets purchased by grantor in USA on our behalf	(41,438)	nil
Net cash flows used in operating result	\$(5,012,673)	\$(4,566,547)

3. TRADE DEBTORS

Trade debtors constitute normal trade debtors in addition to those with an obligation to the Menzies School of Health Research.

	1997/98	1996/97
Total Trade Debtors	\$297,378	\$342,857

4. COOPERATIVE RESEARCH CENTRE

The Cooperative Research Centre for Aboriginal and Tropical Health is a joint venture funded by the Commonwealth of Australia, Territory Health Services, Northern Territory University, Flinders University of South Australia, Danila Dilba Biluru Butji Binnilutlum Medical Service Aboriginal Corporation, Central Australian Aboriginal Congress Inc., and the Menzies School of Health Research.

The Menzies School of Health Research, in its role as the Centre Agent for the Cooperative Research Centre, established a trust account in the name of the

Cooperative Research Centre for Aboriginal and Tropical Health. All funds from the Commonwealth of Australia and other contributing partners are received by the School in trust, on behalf of all the partners. Funds received by the School are shown in the School accounts. Receipts, expenditures and balances of the Cooperative Research Centre Trust Account, managed by the School are summarised below :

	1997/98	1996/97
Receipts	1,077,542	nil
Expenditure	850,262	nil
Balance in Trust Account	\$227,280	nil

	1997/98	1996/97
Total Other Debtors	nil	\$51,500

5. PREPAID EXPENSES

	1997/98	1996/97
Salary	nil	340
Insurance	735	nil
Conference	220	nil
Maintenance Agreements	1,079	784
Office Expense	160	nil
Publications	27,101	23,888
Subscriptions	nil	1,492
Travel	nil	4,857
Motor Vehicle	nil	178
Total Prepaid Expenses	\$29,295	\$31,539

6. ACCRUED REVENUE

Accrued revenue is estimated as due to the Menzies School of Health Research.

	1997/98	1996/97
Reimbursements	17,495	48,803
Bank interest	15,951	18,912
Grants	148,858	nil
Endowments	nil	10,000
Total Accrued Revenue	\$182,304	\$77,715

7. INVESTMENTS

Investments comprise of 1,060 shares in The Australian Gas Light Company donated to the School in 1992 by Miss Elizabeth Phillips, and are valued at cost. Dividends are brought to account as they are earned.

NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS 30 JUNE 1998 (CONT.)

Current Value of Investment is as follows :

	1997/98	1996/97
1060 Shares @	\$10.20	\$7.80
Total Investment	\$10,812	\$8,268

8. NON-CURRENT ASSETS

- i. Plant and equipment are brought to account where the value is greater than two thousand dollars and depreciated over 3-5 years using the straight line method.
- ii. Motor vehicles are depreciated on a diminishing value basis at the rate of 22.5% per annum.

		1997/98	1996/97
Buildings - at cost	\$473,977	\$473,977	
Accumulated Depreciation	(211,246)	(132,898)	
		262,731	341,079
Computer Equipment - at cost	\$439,659	\$321,532	
Accumulated Depreciation	(305,388)	(234,697)	
		134,271	86,835
Laboratory Equipment - at cost	\$557,631	\$375,094	
Accumulated Depreciation	(254,073)	(159,925)	
		303,558	215,169
Office Equipment - at cost	\$74,768	\$47,038	
Accumulated Depreciation	(30,954)	(20,794)	
		43,814	26,244
Vehicles - at cost	\$177,420	\$169,159	
Accumulated Depreciation	(41,022)	(25,975)	
		136,398	143,184
Total Non-current Assets		\$880,772	\$812,511

9. ACCRUED EXPENSES

	1997/98	1996/97
Salaries and On Costs	257,069	40,247
Administration	92,000	505
Total Accrued Expenses	\$349,069	\$40,752

10. TRADE CREDITORS

	1997/98	1996/97
Total Trade Creditors	\$157,694	\$128,436

11. RECEIPTS IN ADVANCE

Income in Advance	1997/98	1996/97
Commonwealth Grants	nil	124,437
NT Government Grants	60,000	97,434
Non-Government Grants	nil	14,583
Overseas Grants	nil	60,910
Donations	10,000	30,000
Total Income in Advance	\$70,000	\$327,364
Unexpended Income		
Commonwealth Grants	699,246	526,533
NT Government Grants	168,798	233,877
Non-Government Grants	219,844	173,744
Overseas Grants	100,015	24,749
CRC	106,907	nil
Consultancy	11,170	nil
Deposits	80	nil
Donations	63,455	2,506
Total Unexpended Income	\$1,369,515	\$961,409
Total Receipts in Advance	\$1,439,515	\$1,288,773

12. CAPITAL EXPENDITURE COMMITMENTS

Capital Expenditure Commitments as at 30 June 1998 include purchases of a capital nature which have not been received by close of business on 30 June 1998.

	1997/98	1996/97
Computer Equipment	\$85,645	nil
Laboratory Equipment	\$11,277	nil
Motor Vehicles	\$12,902	nil
Total Capital Equipment Commitments	\$109,824	nil

13. PROVISION FOR CONTINGENCIES

Negotiations are currently in process with respect to two agreements (Enterprise Bargaining Agreement and Services and Lease Agreement). Contingent upon the outcome of these agreements, the School may be liable for additional costs yet to be determined.

14. FINANCIAL INSTRUMENTS

a Significant Accounting Policies

Details of significant accounting policies and methods adopted, including the criteria recognition, the basis of measurement and the basis on which revenues

NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS 30 JUNE 1998 (CONT.)

and expenses are recognised, in respect of each class of financial asset, financial liability and equity instrument are disclosed in Note 1 to the accounts.

b. Interest Rate Risk

The following table details the School's exposure to interest rate risk at 30 June 1998 :

	Average Interest Rate %	Variable Interest Rate	Fixed Less than 1 Year	Fixed 1 to 5 Years	Fixed More than 5 Years	Non Interest Bearing	Total
Financial Assets							
Cash	3.90	373,884					373,884
Trade Receivables						297,378	297,378
Short Term Deposits	5.05	2,250,000					2,250,000
Listed Shares						3,540	3,540
		2,623,884	0	0	0	300,918	2,924,802
Financial Liabilities							
Trade Payables						506,763	506,763
Employee Entitlements						587,330	587,330
	0	0	0	0		1,094,093	1,094,093

c. Credit Risk

Credit risk refers to the risk that a counterparty will default on its contractual obligations resulting in financial loss to the School. The carrying amount of the financial assets recorded in the balance sheet, net of any provision for losses, represents the School's maximum exposure to credit risk.

d. Net Fair Value

The net market value at 30 June 1998 of each class of financial asset and financial liability, is their carrying amount as stated in the balance sheet of the School, determined in accordance with the accounting policies disclosed in Note 1 to the accounts, with the exception of listed shares whose aggregate net fair value is \$10,812.

15. RIGHTS AND OBLIGATIONS

In April 1993 the School became a member of the Australian Medical Research and Development Corporation (AMRAD), giving AMRAD first refusal to develop products and to acquire the intellectual rights to such products arising from research (except for intellectual property rights of Aboriginal persons).

In consideration of the School agreeing to enter into this agreement, AMRAD allotted to the Victorian Medical Consortium Pty Ltd acting as trustee of the Institutes of Biotechnology Trust 166,667 fully paid shares of \$1 each in the capital of AMRAD at a premium of 200 cents per share being the equivalent of a \$500,000 share holding in AMRAD.

The School has the right on the 9th anniversary (2002) to have the shares transferred to it from the trustee or to sell the shares and receive the proceeds.

AMRAD, listed on the Australian Stock Exchange since December 1996, has the right to review the School's contributions to the Consortium, and remove the School as beneficiary to shares if no contributions or endeavours to make contributions have been made.

16. RENTAL ARRANGEMENTS

In 1984 the Northern Territory made a commitment to provide the Menzies School of Health Research with premises and facilities for its work. Through the goodwill arising out of the School's past and its on-going record of research and education, funds were appropriated in 1995 by the Commonwealth of Australia and the Northern Territory Government to construct the new building on Northern Territory Government land at the Royal Darwin Hospital site. Following occupation of the new building in November 1996, and as a result of the aforementioned goodwill, a nominal rental is to be charged for the premises. A lease agreement reflecting this goodwill is currently under negotiation.

17. IN KIND CONTRIBUTIONS

The School provides in kind contributions to the Cooperative Research Centre for Aboriginal and Tropical Health for research and administrative services.

**AUDITOR-GENERAL'S REPORT
TO THE MINISTER FOR HEALTH,
FAMILY AND CHILDREN'S SERVICES**

**MENZIES SCHOOL OF HEALTH RESEARCH
YEAR ENDED 30 JUNE 1998**

Scope

I have audited the accompanying financial statements of the Menzies School of Health Research for the financial year ended 30 June 1998 comprising Statement on behalf of the Board of Governors, Balance Sheet, Income and Expenditure Statement and Statement of Cash Flows together with Notes to and forming part of the financial statements. The Board of Governors is responsible for the financial statements. I have performed an independent audit of these financial statements in order to express an opinion on them to the Minister for Health Services.

My audit has been conducted in accordance with Australian Auditing Standards to provide reasonable assurance whether the financial statements are free of material misstatement. My procedures included examination, on a test basis, of evidence supporting the amounts and other disclosures in the financial statements, and the evaluation of accounting policies and significant accounting estimates. These procedures have been undertaken to form an opinion whether, in all material respects, the financial statements are presented fairly in accordance with Accounting Standards and other mandatory professional reporting requirements and the requirements of the Menzies School of Health Research Act so as to present a view which is consistent with my understanding of the financial position of the Menzies School of Health Research and the results of its operations and its cash flows.

The audit opinion expressed in this report has been formed on the above basis.

Audit Opinion

In my opinion, the financial statements present fairly the financial position of the Menzies School of Health Research as at the 30 June 1998 and the results of its operations and its cash flows for the year ended on that date in accordance with Accounting Standards, other mandatory professional reporting requirements, and the Menzies School of Health Research Act.



Iain Summers
Auditor-General for the Northern Territory
8 September 1998

Darwin, Northern Territory

DONATIONS, 1997-1998

The Menzies School of Health Research wishes to gratefully acknowledge the generosity of the following Donors to the School during the 1997-1998 Financial Year.

Your contributions to our research and education activities will benefit the health of our community, both now and in the years to come.

Scholarship

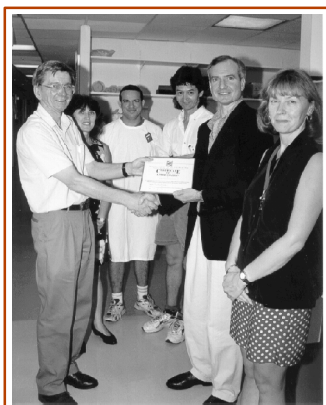
Mrs M Edwards	\$40,000
---------------	----------

*In June 1996 these funds were kindly donated to establish a two year scholarship. The funds are brought to account in the financial statements as they are expended. In the 1997-1998 Financial Year, the amount of \$19,051 was brought to account, with the remainder included as "receipts in advance".

Specific Purpose Donations

These funds are brought to account in the financial statements as they are expended. In the 1997-1998 Financial Year, the amount of \$1,600 was brought to account, with the remainder included as "receipts in advance".

Anonymous	(Fundraising sub-committee)	\$40,000
Mr M Nicholson & Ms A Hill	(Malaria research)	15,000
		<u>\$55,000</u>
Nabalco Pty Limited	(Kava research field travel)	\$1,600
		<u>\$1,600</u>



General Purpose (Research) Donations

Country Women's Association of NT	\$150
Dorothy & Bill Irwin Charitable Fund	1,000
Mrs S Frey	1,000
Mr RJ White AO	500
	<u>\$2,650</u>

Prof John Mathews (L) presented Mr Mark Nicholson with a Certificate of Appreciation when he visited the School's Molecular Parasitology laboratory in June 1998.

Donations of \$2:00 or more to the Menzies School of Health Research are tax deductible under Section 78(1)(a)(x) of the Income Tax Assessment Act

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Menzies School of Health Research
Northern Territory Australia

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- MSHR Newsletter** : An informal update on School activities, produced approximately quarterly.
- Notification of Occasional Papers** : Such as commissioned works, conference proceedings, etc. Such reports usually incur a nominal fee to cover production costs.
- MSHR Oration Notice** : The Oration is a speech, dinner and dance evening held in Darwin each October/November to coincide with the Governing Board and Annual General Meetings.
- MSHR Annual General Meeting Notice** : The Annual General Meeting of the School is held in Darwin each October/November to coincide with the Governing Board Meeting.

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Menzies School of Health Research
Northern Territory Australia

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- 3/97 :** **Scrimgeour D, Rowse T, Lucas A.** *Too Much Sweet. The Social Relations of Diabetes in Central Australia.* Alice Springs : Menzies School of Health Research 1997 \$15:00
- 1/98 :** **Tsey K, Scrimgeour D, McNaught C.** *An Evaluability Assessment of Central Australian Mental Health Services: Towards a more informed approach to mental health service planning and evaluation in Central Australia.* Alice Springs : Menzies School of Health Research 1998 \$7:50
- 2/98 :** **Mackerras D.** *Evaluation of the Strong Women, Strong Babies, Strong Culture Program. Results for the period 1990-1996 in the three pilot communities.* Darwin : Menzies School of Health Research 1998 \$10:00

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