NATIONAL CENTRE FOR EPIDEMIOLOGY AND POPULATION HEALTH
THE AUSTRALIAN NATIONAL UNIVERSITY

ANNUAL REPORT 1988

Acting Director
(To June 1988)
Professor Robert Porter BMed Sc Dsc Adel., MA BCh DM Oxf.,

from June 1988)
Professor John Charles Caldwell, BA NE PhD. FASSA

Executive Officer
(from June 1988)
Ms Barbara Anne Payne BA

Prior to June 1988 the Acting Director was assisted by:
Mrs Suzanne Mary Scales BA Melb (School Secretary, The John Curtin School of Medical Research); and
Mr Ronald Richard Hancock (Executive Officer, The John Curtin School of Medical Research)
ADVISORY COMMITTEE OF THE NATIONAL CENTRE FOR EPIDEMIOLOGY AND POPULATION HEALTH

Ex Officio

Professor P.F. Bourke (Chairman)
Professor R. Porter
Dr A.S. Henderson
Dr L. Smith
Vacant

Appointed by the Vice Chancellor

Dr D. de Souza (to August 1988)
Mr A. Bansemer (from August 1988)
Emeritus Professor P.H. Karmel
Professor J.C. Caldwell
Professor W.F. Doe (until August 1988)
Dr M.A. Denborough (from August 1988)
Professor C.R. Heathcote
Professor F. L. Jones

Director, Research School of Social Sciences
Director, The John Curtin School of Medical Research
Director, Social Psychiatry Research Unit
Director, Australian Institute of Health
Director, National Centre for Epidemiology and Population Health
Chief Commonwealth Medical Officer, Department of Community Services and Health
Deputy Secretary, Department of Community Services and Health
Chairman, Board of the Australian Institute of Health
Department of Demography, Research School of Social Sciences until July 1988; Acting Director, NCEPH from July 1988
Division of Clinical Sciences, The John Curtin School of Medical Research
Division of Clinical Sciences, The John Curtin School of Medical Research
Department of Statistics, Faculty of Economics and Commerce
Department of Sociology, Research School of Social Sciences


NATIONAL CENTRE STAFF

ACADEMIC STAFF

Acting Director

(from June 1988): Professor John Charles CALDWELL, BA NE PhD, FASSA

Senior Research Fellows
Alan Noel GRAY, BA (Asian Studies) BA PhD
Marjorie Gisela SANTOW, BSc Syd., PhD (jointly with Health Transition)

Research Fellows
Anne Elizabeth BYRNE, BA Tas., PhD

Postdoctoral Fellows
Ann LARSON, BA Reed, MA Georgetown, PhD (Health Transition Centre)
Margaret Suzanne MACKISACK*, BA Macq., BSc Monash, PhD

RESEARCH ASSISTANTS

Jillian Kaye BURTON*, BA
Rita Catherine COLES, BA Wollongong, Grad Dip Sc
Peter Harvey HILL*, BA
Stefanie Caroline PEARCE, BA Adel
Patricia Helen QUIGGIN, BA, MA
Joan VESPER*
Ruth ZELLER*, BEd James Cook

GENERAL STAFF

Executive Officer
Barbara Anne PAYNE, BA

Programmers
Syed Nizamuddin AHMED, BSc MSc Tech Univ Berlin
Roger Alan EDBERG, BA Portland, PhD

Clerical and Secretarial Staff
Belinda Lee RICHARDSON
Margaret Ann TUNKS

VISITING FELLOWS

Robert Matheson DOUGLAS, MA Penn., MD Adel., FRACP, FRAGP; Faculty of Medicine,
University of Adelaide and Director-elect of the Centre.

Indra GAJANAYAKE, BSc Grad Dip Stat Sri Lanka, PhD Brussel (Health Transition Centre)

(footnote: Research involves an investigation into infant mortality and nutritional status over 35 years. It seeks to examine trends in the health and nutrition of Aboriginals; the way in which childhood illness can affect adult health; and why infant mortality and general health, but not nutritional status, improved markedly in...)

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PURPOSES OF THE CENTRE

Following the Independent Review of Research and Educational Requirements for Public Health and Tropical Health in Australia undertaken by Professor Kerr L. White in 1986, the National Centre was established by the Commonwealth Government and the University in 1987 to:

* carry out research in epidemiology and population health in close association both with demographers and other social scientists and with biomedical and clinical scientists;

* develop research pursuits, in particular in:

  (i) the Epidemiology of communicable and non-communicable diseases and behavioural disorders;

  (ii) Statistics, including biometry, medical statistics and health and vital statistics;

  (iii) Sociology, including survey methods, the social welfare dimension, the sociology of medicine, the organisation of health services, and individual and group perceptions of health;

  (iv) Health Economics, including cost-benefit analysis of health care and health care delivery systems and general analysis of the health sector of the economy;

  (v) Population Studies, including studies of fertility, infertility, mortality and the social and economic aspects of demographic change;

* supervise research leading to MSc and PhD degrees in the above fields so as to generate leaders in epidemiology and population health (but not to offer degrees by coursework alone); and

* provide intensive short courses as appropriate.

The Centre’s activities will focus on Australian issues with an emphasis on fostering and investigating new ideas and approaches to the nation’s health. There will be special interest in research activities concerned with the development of intervention strategies. An active program in health economics is seen to have a high priority. Initially, it is planned that the Centre will conduct research in the following areas - ageing, aboriginal health and demography, AIDS, drug abuse, applied and theoretical medical statistics, epidemiology of cardiovascular disease and respiratory disease, aspects of women’s health in post-war Australia, nutrition, health services, resource allocation and technology assessment.

OVERALL RESPONSIBILITY FOR THE CENTRE

The Director is responsible for the overall operation of the Centre which operates under the guidance of an Advisory Committee.

The Advisory Committee has not more than 12 members. It is Chaired by either the Director of the Research School of Social Sciences or the Director of The John Curtin School of Medical Research, the Chairman being appointed by the Vice-Chancellor. Membership includes ex officio the Directors of the Centre, The John Curtin School of Medical Research, the Research School of Social Sciences, the National Health and Medical Research Council (NH&MRC) Social Psychiatry Research Unit at the ANU and the Australian Institute of Health. Other members include: four drawn from relevant areas of the Institute of Advanced Studies and The Faculties to bring expertise in sociology, statistics, economics, the biomedical sciences and clinical science; two external to the University, one of whom is a nominee of the Commonwealth Department of Community Services and Health; and one current graduate of the Centre.
This was an important year for the Centre as its first Director, Dr Bob Douglas MA, MD, FRACP, FRACGP, was appointed in September. Dr Douglas has research interests in the epidemiology and prevention of communicable diseases and organisation and evaluation of primary health and medical care. He is currently Dean of the Faculty of Medicine at the University of Adelaide, President of the Australasian Epidemiological Association and Chairman of the WHO Global Technical Advisory Group on the Control of Acute Respiratory Infections. Dr Douglas will take up appointment as Professor in the Institute of Advanced Studies and Director of the Centre in January 1989.

Professor John Caldwell, Acting Director of the Centre since July and a former head of the Department of Transition in the Research School of Social Sciences, was appointed Associate Director of the Centre in 1988. Professor Caldwell also heads the Health Transition Centre which was established by Council in March to further development of studies of the cultural and social context of the health transition in developing countries. Funded by a Rockefeller grant it was located in the Research School of Social Sciences.

In December this year Council approved that the Health Transition Centre be relocated to the National Centre for Epidemiology and Population Health, to be funded by non-NCEPH sources. The research program of the Health Transition Centre will focus largely on the contemporary Third World and on historical change and theoretical aspects of change. Its emphasis on developing countries will complement activities of the National Centre which focus on Australia.

During April-June, a number of positions at the level of research fellow and senior research fellow were advertised. As soon as the appointment of the Director had been finalised, the University moved rapidly to make a number of offers of appointment of academic staff, covering the broad areas of research set out in the Centre's mandate. Of these, three were accepted and taken up before the end of the year and at least a further four staff will take up appointment early in 1989. It is particularly pleasing to note that the Centre has attracted staff of high calibre.

1988 was important also because agreement was reached between the University and the Department of Community Services and Health concerning appropriate accommodation for the Centre. As a result, the building known as 'M' Block, adjacent to the John Curtin School of Medical Research and currently occupied by sections of the Research School of Biological Sciences, will be refurbished to house the Centre. The expected completion date is December 1989. 'M' Block was originally the nurses' home for the Canberra Community Hospital and has been noted by the Heritage Commission. The refurbishment will restore much of the original character of the building and will provide very suitable accommodation for the Centre.

In 1988 the Centre funded a number of health related research projects conducted by University staff in The Faculties and The Institute of Advanced Studies. One of these involves a study in Dubbo, NSW which aims to identify predictors of mortality, morbidity, hospitalisation and placement in long-term care for the elderly and to establish risk factors for cardiovascular diseases and fracture in the non-institutionalised elderly. Because most preventative measures are targeted at reducing risks of middle aged people there is a need to identify risk factors for older Australians so that appropriate preventative programs can be established to improve the health of our ageing population. The Centre also provided support for another program concerning the elderly. This research involved a study of the ways in which the needs and support systems of a sample of older people in Sydney changed from 1981 to 1988 as little is known about the circumstances which lead older people to use community services, enter residential care or suffer premature death. The 1981 information was gathered by the ANU Ageing and the Family Project and the Centre provided funds for a follow-up survey and examination of the NSW Registry of Death.

Three projects on Aboriginal health were supported in 1988. The first of these, in collaboration with the University of Queensland and the Queensland Department of Health, involves an analysis of Aboriginal Health in Queensland over 33 years. It seeks to examine trends in the health and nutrition of Aboriginals; the way in which childhood illness can affect adult health; and why infant mortality and general health, but not nutritional status, improved markedly in
this time. The second project, also involving collaboration with the Queensland Department of Health, concerns a study of the factors related to low birth weight and growth of Aboriginal children. The third project to receive support in 1988 was the setting up of a database for a study, in collaboration with the Aboriginal Health Unit of the NSW Department of Health, of aboriginal mortality in New South Wales 1984-1987.

Other work supported by the Centre in 1988 involved two statistical projects, one on Australian mortality statistics for diseases of the circulatory system 1931-1986 and another to establish a population model for coronary heart disease that predicts survival, disease prevalence and mortality over a period of ten years. Research on work-related neck and upper limb disorders among office workers and other research, in the area of women's health, on the risks of spontaneous abortion, perinatal and infant mortality were supported by the Centre in 1988.

Detailed reports of all the research supported by NCEPH are set out in the following section. It was agreed that no long-term programs of work would be initiated in the first year of operation so as to allow maximum freedom and flexibility for an incoming Director to determine the major themes of work of the Centre.

Provision has been made in the Centre's budget for 10 - 12 research students and, following advertisements in the national press, a number of applications for admission to PhD and MSc courses and scholarships were accepted. As a result, the Centre plans to enrol by mid-1989 at least five students and expects the number to increase by the end of the year. It had not been possible to advertise any earlier because initial appointments of academic staff (and therefore the areas in which the Centre could provide supervision) had not been finalised.

In November, in line with its role as a national centre, the Centre conducted its first national seminar, on the theme of health development. It attracted a large audience from all states drawn from practitioners, other health care professionals, administrators, community workers, academics, interest groups and the community. Keen interest has been shown in the proceedings of the seminar which should be published by March 1989. The Centre plans to conduct several national seminars in 1989 in areas of its research interest, including communicable disease and aboriginal health.

Towards the end of this year, Professor Robert Porter, Director of The John Curtin School of Medical Research and Acting Director of the Centre from its establishment to July 1988, announced that he would be resigning to take up appointment as Dean of the Faculty of Medicine at Monash University. Professor Porter was instrumental in setting up the Centre. It is doubtful that, without his enthusiasm and the very considerable effort he made, the Centre would have been established so successfully. The Advisory Committee wishes to acknowledge the enormous contribution made by Professor Porter in establishing the Centre. There is no doubt that a good start has been made and that with the appointment of the first Director and members of academic staff the Centre now has the opportunity to become the "centre of excellence" envisaged by the Minister of the Department of Health, Dr Blewett, in his press release of April 1987.¹

¹. News release following an agreement between the University and the Commonwealth of Australia which initiated the establishment of the Centre on 2 April 1987.
Work-related neck and upper limb disorders among office workers
Principal investigator: Dr G. Bammer
Director's Unit
Research School of Social Sciences

Levels and correlates of spontaneous abortion, perinatal, infant and subsequent mortality in Australia
Principal investigators: Dr M.D. Bracher
Australian Family Project
Research School of Social Sciences
Dr M.G. Santow
Department of Demography
Research School of Social Sciences (until 29 November 1988)
NCEPH (from 30 November 1988)

Australian mortality statistics for diseases of the circulatory system 1931-1986
Principal investigators: Professor C.R. Heathcote
Department of Statistics
Faculty of Economics and Commerce
Dr. T.J. O'Neill
Department of Statistics
Faculty of Economics and Commerce

Social support and mortality in later life
Principal investigator: Dr H.J. Kendig
Urban Research Unit
Research School of Social Sciences

Predictors of mortality, morbidity, hospitalisation and placement in long-term care for the elderly:
The Dubbo Study
Principal investigators: Dr John McCallum
Sociology Department, RSSS
A/Professor L. Simons
Lipid Research Department,
St Vincent's Hospital/University of New South Wales
Professor R. Heller
Department of Community Medicine
University of Newcastle
Dr J. Eisman,
Garvan Institute of Medical Research,
St. Vincent's Hospital/University of New South Wales
A/Professor G. Berry
Department of Public Health,
University of Sydney
Factors related to low birth weight and growth of Aboriginal children
Principal investigators: Dr K. Streatfield
Child Survival Project
Department of Demography
Research School of Social Sciences

Dr R. Streatfield
Aboriginal Health Program
Queensland State Health Department

Aboriginal mortality in New South Wales 1984-1987
Principal investigator: Dr A. Gray
Department of Demography
Research School of Social Sciences (until 20 November 1988)
NCEPH (from 21 November 1988)

Analysis of Aboriginal health in Queensland over 33 years
Principal investigators: Dr A.E. Dugdale
Department of Child Health
University of Queensland

Dr K. Streatfield
Child Survival Project
Department of Demography
Research School of Social Sciences

Dr I.A. Musgrave
Deputy Director-General
Queensland State Department of Health

A population model for coronary heart disease
Principal investigators: Dr M.S. Mackisack
NCEPH

Professor C.R. Heathcote
Department of Statistics
The Faculties

Professor A.J. Dobson
Faculty of Mathematics
University of Newcastle

Health transition: cultural, social and behavioural determinants of morbidity and mortality decline
Professor J.C. Caldwell
Health Transition Centre
National Centre for Epidemiology and Population Health
WORK-RELATED NECK AND UPPER LIMB DISORDERS
AMONG OFFICE WORKERS

Dr G. Bammer
Director's Unit
Research School of Social Sciences

Ms J.K. Burton
Research Assistant (part-time)
(.until March)

Mr P.H. Hill
Research Assistant (part-time)
(until July)

Ms S.C.P. Pearce
Research Assistant (part-time)
(from August)

BACKGROUND

Work-related neck and upper limb disorders are a poorly investigated occupational health problem, which aroused much interest when an epidemic of these disorders was noted in the Australian workforce in the early 1980s. In 1985, the Research School of Social Sciences funded a position to study these disorders and the National Centre for Epidemiology and Population Health (NCEPH) contributed to the support of the study in August 1987 and totally funded it from July to December 1988 when the project ended. The project has centred around a case study of the Australian National University and investigated the association between the introduction of visual display unit VDU technology and the increased incidence of disorders among office workers. Comparisons have also been made with University office workers in other countries and research reports about this disorder have been analysed.

RESEARCH IN PROGRESS

Substantial progress was made with a major analysis of the prevalence and causes of these disorders among office workers and this will form the basis of an invited keynote address which Dr Bammer will give at the second international conference 'Work With Display Units' in Montreal in September 1989. The analysis of the role of VDU technology in producing an epidemic of these disorders at the Australian National University in the early 1980s was also substantially advanced. In addition, Dr Bammer continued collaborative work with Dr Brian Martin of the University of Wollongong to examine these disorders from a sociology of science perspective.

Dr Bammer presented the results of her work at three conferences and one workshop: the tenth Congress of the International Ergonomics Association in Sydney, the second National Conference on Social Science Research on Occupational Health and Safety in Adelaide, the first International Conference on Ergonomics, Occupational Safety and Health and the Environment in Beijing and the Workshop on Medical Controversy Studies in Wollongong. At the first of these she also co-organised and co-chaired (with Professor Asa Kilborn of the National Institute for Occupational Health and Safety) a forum for work-related neck and upper limb disorders, at which speakers from ten countries participated. Following the conference she organised the first meeting for an
international collaborative study on these disorders, at which a formal network of researchers linking developed and developing countries was established. There are 17 participant research groups representing 13 countries and the network aims to share experience and to identify likely problems before they become major issues.

During the year Dr Bammer was also invited to join an interdisciplinary working group which is preparing a major review of these disorders. She is the only Australian member of this group which comprises researchers from the Scandinavian countries, the USA and England and she is the only member with experience in the social sciences.

PUBLICATIONS


Bammer, G. Supplementary bibliography on work-related neck and upper limb disorders (also known as repetitive strain injuries or RSI). Contains about 1500 references.


OTHER

In September Dr Bammer chaired and was guest speaker at the first national meeting of RSI support groups and associations at which a national body was formed. She made submissions to the National Occupational Health and Safety Commission on research questions in six national priority areas and to the ACT Administration, Department of Arts, Sport, the Environment, Tourism and Territories, on ACT Occupational Health and Safety Legislation. Further she was a member of the University’s Occupational Health and Safety Policy Committee and of the Occupational Strains Subcommittee and was actively involved in the formulation of a number of policies. At the Centenary ANZAAS Congress in Sydney she co-organised and chaired a session on 'Social Aspects of Cancer' and spoke at a session on Science Shops in Australia. She also gave invited talks to a number of organisations in the ACT concerning work-related neck and upper limb disorders and science shops.

* not a member of this University
# member of another department
The risk of spontaneous foetal death is related in a complex manner to maternal age, gravidity, contraceptive use and infecundity. Yet there are few retrospective studies which illuminate the relation between this risk and a range of demographic, behavioural, physiological and socio-economic factors firstly because the events of interest are frequently under-reported, and secondly because insufficient information is sought both on their timing, and on these other critical factors.

In recognition of the importance of this issue, and the possibility of making a real contribution in this area, the women's questionnaire in the Australian Family Project of the Research School of Social Sciences obtained from each female respondent the number and type of foetal losses, and their placing relative to live births. Over 16 per cent of pregnancies terminated in either spontaneous abortion or stillbirth, a level which coincides with that recorded in the best prospective clinical studies.

Analysis which quantifies the effects on pregnancy outcome of maternal age and gravidity forms the first of a series of papers reporting the findings of the foetal mortality projects, and will appear in Social Biology in 1989. The paper shows first that the increase in foetal loss ratios with gravidity reflects an effect not of increasing risk with each pregnancy, but of a heterogeneous risk of foetal loss in the population, combined with the limiting of family size when a certain number of live births has been achieved. This means that women with a higher propensity to abort will become an increasingly greater proportion of the sample at the higher gravidities and explains why previous experience of foetal loss is the strongest predictor of subsequent loss. Secondly, it demonstrates that risk does not increase with maternal age before the mid-thirties. Rather, the elevation of loss ratios in the teens over those in the twenties, which is observed also in many other studies, is caused by a simple selection effect: for pregnancies to occur before age 20 they must be closely spaced, and are thus more likely to be foetal losses which take women out of reproductive circulation for a shorter period than live births.

While gravidity is unimportant per se, and maternal age is not important until at least age 35, preliminary analyses suggest that pregnancies which are initiated very soon after a previous termination suffer excessive risk. A comprehensive analysis of the effect of spacing requires adequate controls for both contraception and infecundity, data on both of which were collected by the Australian Family Project, and this work will form the second paper of the series. Exploratory analyses of the Project's unique contraceptive histories were undertaken by Dr Santow after she joined the National Centre, and indicate that this line of work will also be extremely rewarding. A by-product will be the charting of generational change in contraceptive use in Australia which has obvious implications for fertility, but which also bears strongly on the health of Australian women.
Santow, M.G. and Bracher, M.D.

"Do gravidity and age effect pregnancy outcome?", Working Paper No.4, Australian Family Project, ANU, 30pp. (Forthcoming Social Biology)
Since 1907, Australian mortality has been coded according to the International Classification of diseases (ICD) procedures. These are revised every decade or so and it is not always clear what adjustments must be made to obtain a long sequence of comparable figures. The present project concerned the construction of such a set of mortality figures for Diseases of the Circulatory System (ICD9 codes 390-460) over the period 1931-1985 for Australian males and females aged 35 - 84. This involved recoding cause of death statistics in terms of the 9th revision (ICD9), which has been in force since 1979. The codes adjusted were ICD8, 1968-69; ICD7, 1950-67; ICD6, 1959-57; ICD5, 1940-49; ICD4, 1931-39.

The initial stage of the project was the entering of the data into an appropriate database on a microcomputer. This had to be done manually, since the Australian Bureau of Statistics was unable to supply the data in electronic format for the timespan contemplated for this project. The data is now available in several formats:

(a) text file
(b) excel file for both Macintosh and IBM PCs
(c) R Base file for IBM PCs

R Base is a full relational database. In the R Base database, we have coded the relationships to the ICD codes across the revisions, so, for example, an instruction can be issued to extract all data from the third and fourth revisions which corresponds to male, 45-49, ICD codes 410-414 from the ninth revision.

Revised figures for the eighth revision 1968-78 were obtained using the proportions published by the Australian Bureau of Statistics in Table 10, of their Causes of Death, 1979. Appropriate regression methodology has been designed to adjust earlier data to the ninth revision ICD codes. This involved the use of logistic regression within each revised period. Generally the investigators found that Australian figures required less adjustment than has been found in the U.S. case. Some delay was incurred whilst ABS records were searched for details of double coding done for some of the changeover years. Unfortunately, it appears that such records have been lost or destroyed.

One paper has been submitted for publication and a second paper giving cause-deleted life tables is in preparation. It is also proposed to produce sets of tables of statistics adjusted to ICD9. These tables are too expensive for normal publication and will be collated together in booklet form. Copies of this, together with the data tapes, will be lodged at the NCEPH office.

The investigators acquired computer software and research assistance with the funds received. The investigators wish to express their appreciation to NCEPH for this support.

PUBLICATIONS RELATED TO THE PROJECT:

BACKGROUND

This study examines survival rates and changes of social support in a sample of 825 older people in Sydney over the course of six and a half years. A survey by the ANU Ageing and the Family Project identified respondents’ health and social support in 1981. A 1988 follow-up investigation, supported by the NCEPH, identified subsequent mortality, use of community services and institutionalisation, living arrangements, and emotional and practical support from family and friends. With these two sources of information, it will be possible to examine a number of questions hitherto unexplored on a longitudinal basis in Australia. For example, what kinds of family support reduce the risk of dying or of entering a nursing home? How much does widowhood increase the risks of institutionalisation? Does use of community services facilitate longer residence in the community? Does the strength of emotional ties with family members influence the likelihood of receiving practical support from them if older people become disabled? How do changing health or family circumstances influence older people’s sources of emotional support? Information on these and related questions will shed some light on the social and policy factors which influence independence and support over the course of later life.

RESEARCH IN PROGRESS

Instrumental design and pilot testing of fieldwork on approximately 100 respondents, was carried out with support from the Urban Research Unit in RSSS late in 1987. An outcome rate of approximately 85 percent was achieved for either obtaining a complete questionnaire or identifying respondents in the New South Wales death register. In 1988, staff for the project were appointed, the questionnaire and fieldwork procedures were further refined and finalised, and the main fieldwork was completed and analysis begun.

PUBLICATIONS

No publications have been produced as yet from this research. However, related publications in the field of ageing have been published during the year, and a paper ‘Determinants of community and Residential Care: A Longitudinal Study of Older People’ was prepared for presentation at The Social Welfare Policy in Australia Conference in July 1989.
The cardiovascular diseases, heart disease and stroke, are the major killers of older Australians. In an Australian population of women 60 years and over, approximately 200 heart attacks (50 fatal plus 150 non-fatal) per 1000 persons over a five year period would be expected. Osteoporotic fracture, particularly for older women, is a major cause of hospitalisation and placement in care. About 110 hip fractures per 1000 persons 60 years and over (25 in men and 85 in women) and several-fold higher incidences of spinal and upper limb fractures would be expected over a five year period. These three causes, coronary heart disease, stroke and osteoporotic fracture account for the major health problems of old age.

Despite this there is contradictory evidence about risk factors mostly based upon small numbers in studies of all adults. These studies generally take no account of new risk factors including social support. As a consequence, most preventative measures are actually targeted at reducing risks of middle aged people. There is a need to identify risk factors for older Australians so that appropriate preventative programs can be established to improve the health of our ageing population.

Consequently the City of Dubbo was chosen as the research site. All persons 60 years and over (approximately 1950 men and 2250 women) are being interviewed and given a medical examination. Subsequent to the establishment of this baseline information the target population will be monitored for another five years. The goals are to identify predictors of mortality, hospitalisation and placement in long-term care and to establish risk factors for cardiovascular diseases and fractures in the non-institutionalised elderly.
Between June and August the survey instrument was designed and pre-tested at the Sydney Jewish Centre on Ageing and in Canberra. As the interviews are conducted by volunteer local interviewers, training sessions were undertaken by Dr McCallum on 19 August 1988 for the main group of volunteers and, subsequently, on 28 October 1988 for a supplementary group. Between 11 and 13 July Professor Simons and Dr McCallum conducted job selection interviews for office manager, assistant nurse and receptionist, rented premises and recruited volunteers. Beginning in July, local GPs were used to identify old (60+) persons on the electoral roll. The baseline interviews and examinations began on Monday 29 August and continue at a rate of around 50 a week. Because of the requirement of fasting for blood tests, respondents come into the office in the mornings only. Recruitment rates are estimated at around 75 per cent and later "mopping up" may improve these. Planning the strategy and tactics of the prospective phase is now in progress. Results from medical investigations and survey interviews are being coded and results from the first 148 cases are now available. The target for completion of the baseline study is the end of 1989 by when procedures for the prospective phase will be completed.

RESULTS

Some 40 per cent of respondents were men and 60 per cent women, of whom 68 per cent were had lived most of their last 20 years in Dubbo. Ninety-three percent were Australian born and the mean age was 68 years. Sixty two per cent were married and 31 per cent were widowed. Some 31 per cent lived alone and 55 per cent with one person, leaving 14 per cent who lived with more than one other person.

About 40 per cent had smoked tobacco regularly and nearly 70 per cent drank alcohol. The rates of ever having had specific diseases were:

- arthritis, rheumatism: 64%
- eye diseases: 23%
- respiratory diseases: 26%
- high blood pressure: 37%
- high blood cholesterol: 13%
- heart attack: 18%
- cancer: 27%
- diabetes: 7%
- stomach ulcers, gall bladder problems: 30%
- liver disease: 9%
- kidney, bladder, prostate diseases: 22%
- anaemia: 16%
- stroke: 3%
- skin disorders: 15%
- hip fracture: 5%

As well as hip fractures, some 20 per cent had broken other bones since the age of 50 years and 23 per cent had experienced a fall in the last year. Some 50 per cent rated their health now as very good or excellent, and as better than most people their age but only 14 per cent rated their health now as better than last year.

About 12 per cent were now in paid work - working a mean of 5 hours a week. Nearly 70 per cent had no post-school education and the mean school leaving age was 15 years. The median family income was $10,000 to $12,000 per year but 78 per cent owned their own homes outright. Some 80 percent had no difficulties with finances. In social support, 74 per cent had weekly or more contact with children and 53 per cent had weekly or more contact with grand-children. Finally 45 per cent had pets.

With such preliminary data it can only be assessed whether or not measures are working. The actual results are not in themselves representative of the population. The Life Satisfaction A Index factored into four meaningful factors including general satisfaction and dissatisfaction measures.
The four Self Esteem questions all loaded on one factor and the Centre for Epidemiological Studies Depression Index factored into four meaningful factors. These factors correlate well with subjective health measures. Further analysis is needed to examine the relationship between subjective and objective health measures.

PUBLICATIONS

Publications will become available after the completion of the baseline study. A preliminary set of findings may be reported at the International Association of Gerontology Meeting, Acapulco, Mexico, in July 1989.
FACTORS RELATED TO LOW BIRTH WEIGHT AND GROWTH OF ABORIGINAL CHILDREN

Dr K. Streatfield
Child Survival Project
Department of Demography
Research School of Social Sciences

Dr R. Streatfield
Aboriginal Health Program
Queensland State Health Department

Ms M. Korzy
Child Survival Project
Department of Demography
Research School of Social Sciences

BACKGROUND

It is well established that infants born with relatively low body weight are at increased risk of perinatal and infant mortality, 'failure to thrive', and 'slow learner' problems. The important question of whether or not these low birth weight children (less than 2,500 grams) later 'catch up' to their normal birth weight fellows is thought to possibly depend on whether their birth weights are low due to being born 'early' (premature) or due to slow foetal development (small-for-dates).

The data on birth weight, gestational age, and subsequent growth needed to separate out these factors are generally unavailable in populations where low birth weight is common.

Among the Australian population as a whole, about 5-6 per cent of infants are born of low birth weight, whereas among the study population of Aboriginal infants, the proportion has averaged around 20 per cent over the last decade. This situation, with 'Third World' levels of low birth weight in combination with accurate and detailed birth weight, growth and related data, permits a number of important problems to be explored, and appropriate policies for the reduction of the level of low birth weight births to be developed.

The studies planned and partially completed on this data include:

i) demographic factors related to low birth weight;

ii) the relationship between birth weight and future growth of children (differentiating premature and small-for-dates);

iii) the relationship between mother's birth weight and growth to the birth weight and future growth of her children.

WORK IN PROGRESS

The study is proceeding in stages. The first stage involved entry into the computer of data on all births of children on eight Aboriginal communities in Queensland between 1978 and 1987. Analysis of these data has been carried out on the trends in low birth weight over time, and in regard to the relation between various demographic factors and the incidence of low birth weight (see below for details).
The second stage involves entry into the computer of birth weight and detailed growth data recorded in ten regular age intervals on some 3,000 children. For a proportion of these children data are available on the birth weight and growth of their mothers (see Objective 3, above). These weight, height and age data have been converted to indicators of nutritional status for each child at each age interval.

The above (second stage) data entry of one community at a time is almost complete, and preliminary analysis of the relation between birth weight and future growth has been carried out.

RESULTS

The analysis of the first stage data set revealed that one in five of the study children were of low birth weight (LBW). This level had fluctuated but had not decreased over the decade, 1978-87. Among the eight communities studied, the proportion of LBW infants ranged from one in eight (13.0%) to more than one in three (37.8%).

As mentioned above, LBW can be due to prematurity or slow foetal development, or both. There was considerable variation in the proportion of children born premature (at less than 38 weeks gestation), from 39.3% in the community with the highest incidence of LBW infants, down to 18.7%.

If only 'full-term' births are examined, then the proportion of LBW births ranges from 14.8% down to only 5.9% in the community with the highest incidence of LBW. This indicates that in this latter community, the cause of the extremely high level of LBW is primarily prematurity, whereas in another community with a similarly high level of LBW, the cause is almost equally due to prematurity and slow foetal development. The implications are quite different.

The data clearly indicated that both male and female children were suffering from retarded foetal development as at all gestation stages (32 to 42 weeks) the average birth weights of the study infants fell below the 50th centile of the Commonwealth Dept of Health intrauterine growth charts, though none fell below the critical 10th centile.

The analysis of the impact of demographic factors on incidence of low birth weight (LBW) showed an expected pattern of increased incidence of LBW among younger mothers (under 20 years), but an unexpected decreasing incidence of LBW with increasing parity. Length of gestation was very closely linked to incidence of LBW with in excess of four out of five infants born at gestation less than 36 weeks being LBW compared to around one in twenty of those born at 39 weeks or more.

When considering physical development, the available indicator is Apgar Score, a composite measure of the newborn infant’s respiratory capacity, heart rate, reflexes, muscle tone, etc., taken at 1 and 5 minutes after birth. In a range of 0 to 10, a level of less than 7 is considered a state of moderate to severe (<4) "depression". The analysis showed that there was a clear threshold effect where only birth weights below 2,000 grams were linked to such depression. This raises the question, can Aboriginal children be "small but healthy" compared to Caucasian children. The pattern of Apgar score according to mother's age and parity confirm that young maternal age is an important risk factor for LBW, but if low parity is such a risk factor, as implied by incidence of LBW, it does not operate through reduced physical development.

The preliminary data analysis on the second stage data set indicate that low birth weight infants do not catch up with the growth of their normal birth weight fellows. Within the first year or so the LBW infants remain substantially disadvantaged in comparison with normal infants. Thereafter the growth of the LBW children tends to approach that of normal children but always remains some 10 per cent below it. The LBW deficit is greater for boys than girls, though both sexes showed parallel growth projectiles.

Analysis of the complete data set will differentiate between premature and small-for-gestational age LBW infants, and may well permit testing of the hypothesis that while the premature LBW infants do recover in terms of subsequent growth, the small-for-gestation infants do not.

It is also planned to examine the apparent trend where child growth rates have been improving over time, while average birth weights have not, indicating that health programs must not neglect
antenatal care to the mothers in their concern to ensure satisfactory growth of the infants and children.

**PUBLICATIONS**


This Research Note will be submitted to the Medical Journal of Australia in the near future.

The paper above was presented to the Annual Conference of the *Australian Population Association* in the section on Aboriginal Health, Brisbane, September 2, 1988.

**RELATED MATTERS**

In the process of gathering the clinic records for this study, additional but related data on health have also been collected and are currently being analysed. The topics being studied include:

i) the patterns of incidence, screening procedures, and treatment of *rheumatic fever* among 5-15 year old children in Yarrabah community, Cairns. This is a condition which can cause heart disease in adult life, and which appears to be undergoing a resurgence, not only among Aborigines but among middle class whites.

ii) data from regular screenings of adults in Yarrabah community for blood pressure, diabetes, and anthropological measures for the calculation of body mass index (BMI). An alarmingly high proportion of adult Aborigines are being found to have *diabetes*, and it is hoped that a simply estimated indicator such as adult BMI can be used for widespread screening to detect those at high risk.

iii) also in Yarrabah data from childhood screenings of adults with diabetes and high blood pressure incidence data to determine if there are patterns of childhood physical development (especially obesity) which may be linked to increased risk of diabetes and high blood pressure in later (adult) life.

It is hoped that findings from these related studies will be published through the NCEPH working paper series when it appears.

Finally, the investigators thank NCEPH for their support of this study. Now that the data have been computerized, the work can be continued within the Child Survival Project and in the AHP, Cairns. The investigators are confident that the findings will prove of great value in evaluating the impact of the various health interventions which the AHP has instituted, and in developing future effective interventions. Hopefully the findings will contribute to an accelerated improvement of Aboriginal health.
ABORIGINAL MORTALITY IN NEW SOUTH WALES 1984-1987

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Ms J. Vesper
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BACKGROUND

The last analysis of Aboriginal mortality in New South Wales was for the years 1980-81. The project addresses the need for accurate current estimates and for information on the development of mortality trends in the Aboriginal population, in order to assess the impact of health interventions and plan new initiatives. There are two main sources of information on Aboriginal deaths in the State of New South Wales, namely notifications of deaths for registration and a reporting system operated by the Aboriginal Health Unit of the Department of Health. Both systems fail to identify all Aboriginal deaths.

Involvement of the National Centre for Epidemiology and Population Health (NCEPH) was initially limited to provision of a Research Assistant (Ms Vesper) to work on the initial stage of database construction and evaluation. Later in 1988, Dr Gray and Mr Hogg worked on an analysis of Aboriginal mortality in western New South Wales using the database.

The aims of the study are:

1. to produce estimates of Aboriginal mortality in New South Wales in 1984-87, classified by age, sex and cause;
2. for adult deaths, to supplement these estimates with a small number of explanatory variables obtained by field investigation;
3. to examine trends in Aboriginal mortality in the State by comparing results with the 1980-81 study;
4. to compare characteristics of Aboriginal mortality in New South Wales with those in other States and Territories.
In the initial stage of the project, until mid-1988, a linked base of death records from the two main data sources was constructed and, with the assistance of field staff of the NSW Department of Health in western New South Wales, these data were supplemented with additional information. The data bases were found to be less adequate than expected, but by the end of this initial stage complete data were available for the western part of the State and a framework was available for the rest of the State.

During the second half of the year, analysis of Aboriginal mortality in western New South Wales was completed by Dr Gray and Mr Hogg. Work in progress is aimed at extending this analysis to southern New South Wales, then New England and the north coast, and finally the metropolitan area. This staged approach was adopted because it was realized that useful information could be made more immediately available in this way.

**PUBLICATIONS**

ALYSIS OF ABORIGINAL HEALTH IN QUEENSLAND
OVER 33 YEARS

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BACKGROUND

The Aboriginal Health Program of the Queensland Health Department has been collecting data on the health and nutrition of Aboriginal children since 1972. Additional information has been gathered from the Infant Welfare Clinics and from the hospitals on the settlements from 1952 onwards.

In this project the data are being analysed to examine trends in the health and nutrition of Aboriginals, the way in which illness during childhood can affect adult health, what nutrition or illness factors can be used to predict child survival, and finally, how can infant mortality decline by around 80 per cent in three decades, and health levels improve markedly, without noticeable improvement in nutritional status.

The data have been collected by teams of trained personnel including Aboriginal health workers. Most of the data are in two forms. Firstly the AHP data sets include:

1. Personal file: there are data on 30,698 subjects. The thirty-one variables include location, name, date and place of birth, sex, birth weight, birth order, duration of breastfeeding, date and cause of death (if appropriate), and name of mother.

2. Medical history file: there are 69 variables on each subject. These include height, weight, arm circumference, haemoglobin, blood pressure, etc. There are 35,515 records on 17,704 subjects.

3. Faecal examination file: there are 28,978 examinations on 14,700 subjects. Each examination records the worms, ovae and cysts found in the faecal specimen.

Secondly there are:

1. Records for Infant Health Centres: at some Infant Health Centres, records go back to 1952. Almost every infant visited the clinic every week from birth to one year, and then monthly until the age of three years. At each visit, they were weighed and details of feeding, immunizations and illnesses recorded.

2. Records at hospitals: many settlements have hospitals where the people have gone for in-patient and out-patient treatment. The records are very comprehensive but give the principal diagnosis. Records are available from the early 1950s.
Data from the main AHP files have been transferred from the University of Queensland mainframe computer to a microcomputer. Records from the Infant Health Clinic and hospital at the Cherbourg community have been computerized and examined in conjunction with the main AHP data from the same community.

The analyses conducted thus far throw some light on the important question of whether or not nutritional status (anthropometric) indicators can be used to predict the likelihood of subsequent illness in children, that is, whether poorly nourished children can be said to be at greater risk of certain types of illness, or death, in either the short or long term. The intention is that health clinic staff could use nutritional status indicators to trigger an appropriate health intervention.

The study found that the nutritional status indicator, weight-for-age, was not a good predictor of illness or death, except in cases of serious malnutrition, when the situation is already clinically obvious. A more powerful predictor of diarrhoeal disease (with vomiting, potentially leading to dehydration), or respiratory disease, is a previous bout of these illnesses. This predictive power is greatest for children aged two years or older (risk ratio more than 3 for diarrhoea and vomiting). Children with a history of one of these illnesses, combined with low weight-for-age, were at particular risk of developing such illnesses in the future (risk ratios more than 5). These combined predictors showed high sensitivity (i.e. low risk of false negatives) but low specificity (i.e. high risk of false positives).

The major analysis will continue on the AHP data files to elucidate the important factors in the improvements in Aboriginal health over recent years, and in identifying persistent health problems. This work which started with a NCEPH grant will continue with a three year grant from the NH&MRC.

Part of the analysis will continue to focus on the clinic data from Cherbourg community in the study of the infant mortality decline from around 250 infant deaths per 1,000 live births in the 1950s to 30 per 1,000 in the 1980s.

**PUBLICATIONS**


**RELATED MATTERS**

The investigators wish to thank NCEPH for their generous support in this study. This support has been important in recently obtaining a three year grant from NH&MRC to continue the work. The investigators are now confident that the work will result in a thorough exploitation of this unique data set. It is hoped that the findings will benefit the Aboriginal community in terms of continued improvements in health and will place the important work of the Queensland Aboriginal Health Program in proper perspective.
A POPULATION MODEL FOR CORONARY HEART DISEASE

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The Faculties

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BACKGROUND

Over the last 15 or so years the rate of mortality from coronary heart disease (CHD) has been falling in several western countries. The WHO has set up a monitoring project (MONICA) to record all incidents of Acute Myocardial Infarction (AMI) in certain study regions, and to classify them using information about clinical and social factors. MONICA has two centres in Australia, in the Hunter region, N.S.W. and in Perth, W.A., from which three years' data are now available. The present study has been designed to make use of data on previous history of CHD and survival time after AMI from the MONICA data base, along with data from the National Heart Foundation of Australia Risk Factor Prevalence Survey (1983), to estimate parameters for a Markov population model and to use these estimated parameters to drive a computer simulation that predicts survival, disease prevalence, and mortality over a period of ten years.

The study involves several elements: a probabilistic model for the population; parameter estimation for the model; designing and writing a set of computer programs to simulate the evolution of the model over time; and conducting and interpreting experiments using the simulation to investigate the effects of possible interventions changing the model parameters, or of mis-specifications in the model.

WORK IN PROGRESS

The model for the health states of the population has been defined in detail and the process by which its evolution will take place has been established. The model assumes that the movement of individuals in the population between states is governed by independent Markov chains, and investigates the behaviour of aggregates of such individuals, classified by sex and age to capture some of the strong age and sex variation in the incidence of AMI. The states between which individuals move are, having no history of CHD; previously had one or more AMI; having a history of CHD (angina) but not AMI; having an AMI but surviving the event for at least 28 days; dying suddenly (within 24 hours) of AMI; having an AMI and dying within the first 28 days, but later than the first 24 hours; or dying of other causes than AMI. Some predictions can be produced from theory for survival under this model, and where no theory is available, in more complex situations, computer simulation is used.

Parameters of this model are, the initial proportions of the population in each of the 'alive' states at age 35, and the transition probabilities between the states for each 5-year age class. These have been estimated in a variety of ways, using the MONICA data. Detailed discussion of the model
The model is actually of more general applicability to disease processes of a progressive nature; it is a natural generalisation of the chain binomial model used in epidemic models; we will refer to this generalisation as the chain multinomial cohort process and it is intended to carry out a theoretical investigation of this process independently of its application to CHD.

A suite of FORTRAN programs has been written to simulate the evolution of the model under various assumptions, and to generate and display numerically and graphically predictions for disease prevalence, case fatality rates and proportionate mortality rates for AMI. The simulations actually follow the development of the health states in several one year age cohorts over a period of ten years, and also show the health states in the population divided by age class, over the same simulated time period.

Several simulation experiments have been carried out to investigate the effect of bias in the estimates on the evolution of the population over time, and also to see whether other specifications for the possible passage of individuals from one health state to another have a drastic effect on the predictions made. Results from these are presented in the papers listed below.

**PUBLICATIONS**

No publications have yet appeared from this project, but the following are in preparation:


Mackisack, M.S. Modelling a population subject to CHD. Report to the National Centre for Epidemiology and Population Health.

As well as this, the suite of FORTRAN programs to execute the model simulation will be documented to be available for interested users. (Contact M.S. Mackisack or C.R. Heathcote for further information.)
Professor J. C. Caldwell
Health Transition Centre
National Centre for Epidemiology and Population Health

Professor Caldwell devoted much of his time to the establishment of both NCEPH and the Health Transition Centre: the Centre is also concerned with public health, especially in the Third World; one immediate research priority has been the AIDS crisis, especially in Africa. Professor Caldwell's own research emphasized factors influencing the health transition, utilizing three decades of field research and, in particular, recent work in Sri Lanka.

He attended the African Population Conference in Dakar and also presented papers on health issues to:

- The Third Takemi Symposium on International Health, in Tokyo;
- the IDRC/Rockefeller Foundation/Ford Foundation/Population Council meeting on "Institutional Development in Population and Health in Sub-Saharan Africa", at Saly Portudal, Senegal;

Professor Caldwell continued the supervision of PhD students, whose thesis topics included aspects of child survival.

He provided advice to outside bodies as a senior consultant to the Rockefeller Foundation on the establishment of its global health transition project, and has been organizing an international conference at NCEPH for May 1989 on the social and behavioural determinants of health.

PUBLICATIONS


