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**Edgar National Centre for Diabetes Research**

**Annual Report 2005**

<b>1. Staff</b>	<b>3</b>
<b>2. Continuing research publication and dissemination</b>	<b>3</b>
<b>3. Research funding</b>	<b>4</b>
External funding attracted	4
Awards and internal funding	4
Donations and bequests	5
<b>4. Research and health promotion relevant to Maori</b>	<b>5</b>
<b>5. Collaboration</b>	<b>6</b>
<b>6. Health research workforce development</b>	<b>7</b>
<b>7. Promotion of diabetes awareness</b>	<b>7</b>
<b>8. Other contributions to the health care and research environment</b>	<b>8</b>
<b>APPENDIX 1: Research publications and presentations</b>	<b>9</b>
Publications	9
Conference presentations and posters	10
Keynote addresses	12
Book chapters	12
<b>APPENDIX 2: Media coverage</b>	<b>13</b>

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The centre has continued to flourish during the past year. Several applications for research funding have been successful, a number of papers have been published in major international journals and new national and international collaborations have been established.

Staff of the centre continue to play a key role in New Zealand and international initiatives aimed at reducing the global epidemic of type 2 diabetes and improving treatment options for those who have already developed the condition.

Several staff members received local and national recognition for their contributions to diabetes related research. Dr Kirsten Coppell was awarded the Royal Arch Centennial Award for study, as well as a Research Publication Award from the Dunedin School of Medicine. Prof Jim Mann shared the Dunedin School of Medicine Distinguished Research Award with Prof Ailsa Goulding and was awarded the Sir Charles Hercus Medal from the Royal Society of New Zealand for his extended series of related studies of nutrition in relation to diabetes and cardiovascular disease.

We are immensely grateful to those who have supported the centre financially. Despite the epidemic proportion of type 2 diabetes in New Zealand and elsewhere, support from traditional funding bodies remains inadequate.

## **1. Staff:**

Prof Jim Mann (CNZM, PhD, DM, FRACP, FFPHM, FRSNZ)  
Director

Dr Kirsten Coppell (MBChB, Dip Obs, MPH, FAFPHM)  
Senior Research Fellow

Dr Kirsten McAuley (MBChB, PhD)  
Senior Research Fellow

Ms Victoria Farmer (MSc)  
Senior Research Technician

Mr Chris Booker (BSc Hons)  
Senior Research Technician

Assoc Prof Sheila Williams (DSc)  
Biostatistician

## **2. Continuing research publication and dissemination (30 Nov 2004 - 1 Dec 2005):**

During the past year 15 papers have been published or are in press in international medical journals. Five invited keynote addresses have been given at international and national conferences. These are listed in detail in Appendix 1.

Diabetes related presentations have been made to health professionals and lay organisations in New Zealand and members of the centre have been repeatedly interviewed by local, national and international media. A BBC Panorama programme involving Prof Mann has been screened in the United Kingdom and internationally. These various forms of dissemination have helped to raise public awareness of diabetes and the profile of the centre.

### **3. Research funding:**

#### External funding attracted:

##### 2004:

- Health Research Council Programme Grant: ‘Lifestyle and nutritional approaches to reduce obesity, type 2 diabetes and its complications’. (\$1,455,000)  
Consisting of the projects:
  1. ‘The APPLE Project: Preventing obesity in children via environmental intervention’. Principal Investigator Dr Rachael Taylor.
  2. Antioxidant Treatment and the Metabolic Syndrome. Principal Investigator Assoc Prof Patrick Manning.
  3. Diets of varying macronutrient composition in insulin resistance. Principal Investigator Prof Jim Mann.
- The National Heart Foundation. ‘The APPLE Project: preventing obesity in children via environmental intervention’. (\$78,000).

##### 2005:

- Health Research Council Project Grant: ‘Ngati Porou Hauora Prevent Diabetes Project: Post-intervention survey’. (\$201,456)
- Lottery Grants Board: ‘Ngati Porou Hauora Prevent Diabetes Project: Process evaluation’. (\$75,000)
- Eli Lilly Diabetes Research Specialist Research Grant: ‘Hospitalisation rates for diabetes and diabetes related diseases in Otago – have they changed over the last 10 years?’ (\$30,000)
- The Southern Trust. ‘The LOADD (Lifestyle Over and Above Drugs in Diabetes) Pilot study’. (\$85,000)

#### Awards and internal funding

##### 2004:

- University of Otago Research Grant, jointly awarded to Dr Kirsten McAuley, Dr Rachael Taylor and Professor Ailsa Goulding. ‘Diabetes risk, body composition and bone health of Dunedin Pacific teenagers’. (\$28,500)
- University of Otago Research Grant, joint awarded to Dr Kirsten McAuley, Dr Rachael Taylor and Professor Ailsa Goulding. ‘APPLE Project: process evaluation, cost-effectiveness and cost-utility’. (\$29,000)

##### 2005:

- 2005 Royal Arch Centennial Award, awarded to Dr Kirsten Coppel for overseas study. (\$15,000)

- University of Otago Distinguished Research Award, jointly awarded to Prof Jim Mann and Prof Ailsa Goulding. (\$50,000)
- Sir Charles Hercus Medal (Royal Society of New Zealand), awarded to Prof Jim Mann.
- Research Publication Award, Otago District Health Board and Dunedin School of Medicine Research Advisory Group, awarded to Dr Kirsten Coppel. (\$5,000)

Donations and bequests:

- The Zonta club of Otago-Dunedin and the Rotary club of Dunedin organised an art auction, the 'APPLE auction' which took place on 1<sup>st</sup> July 2005. This event raised \$50,000, which was presented to the ENCDR on 14<sup>th</sup> December 2005.
- Other anonymous individual donors, with contributions totalling \$77,000.

#### **4. Research and health promotion relevant to Maori**

The Ngati and Healthy Programme is a partnership between Ngati Porou Hauora (NPH), a primary care organisation based in Gisborne and the East Coast of the North Island, and the ENCDR. It is one of the flagship projects of the centre which aims to reduce the prevalence of diabetes amongst Maori. It was the first project of its kind to be established in New Zealand, an important feature being a carefully planned series of surveys in order to evaluate outcome. Thus it involves both health promotion and research, and two papers have already been published in a New Zealand and an international journal (N Z Med J 117: U1208; Diabetes Res Clin Pract doi:10.1016/j.diabres.2005.08.007). It has also provided a range of training opportunities. Local NPH employees have (many for the first time) been exposed to formal epidemiological research methods. Otago medical students become involved with the work of the programme when attached to NPH and it forms an important part of the teaching during the Maori Integrative Day for 3<sup>rd</sup> year Otago medical students. The Ngati and Healthy Programme formed the basis of a Memorandum of Understanding (MoU) with NPH, an agreement which antedated the MoU signed between the University of Otago and NPH. The project is a finalist for the New Zealand Health Innovation Awards 2006. Another major development with regard to research relevant to Maori has been the collaboration with the Ngai Tahu Research Consultation Committee to develop a protocol for research projects involving Maori, including not only study participation but also professional development. This protocol will facilitate future consultation and may be implemented more widely in the University. The Centre has close links with the Maori Advisory Komiti of the Department of Human Nutrition. Given the importance of diabetes amongst Maori this provides an excellent opportunity for continuing dialogue regarding the development of locally relevant research projects.

## **5. Collaboration:**

At a local level, strong collaborative links now exist with Diabetes Otago, the Otago Diabetes Research Trust, the Otago Diabetes Project Trust and several University departments other than the Departments of Medical and Surgical Sciences and Human Nutrition with which the ENCDR is closely integrated. Three of these warrant specific mention. The Otago Diabetes Project is directed by Dr Kirsten Coppell. This Project was the forerunner of the Get Checked Programme, now implemented in General Practice throughout New Zealand and has provided, indeed continues to provide, much information highly relevant to the care of people with diabetes in New Zealand, as well as useful epidemiological information. Through the Otago diabetes Project, the ENCDR has worked closely with the Eye Department at Dunedin Hospital, including the joint supervision of two medical students, one an elective final year student from Aberdeen University, the other a recipient of a summer studentship.

The links with the Department of Preventive and Social Medicine is also particularly noteworthy since discussion with Dr Tai Sopoaga and colleagues in Samoa may lead to initiatives being established similar to those already developed with Ngati Porou. Funding is currently being sought. In addition the Centre together with the Departments of Preventive and Social Medicine and Women's and Children's Health is leading an initiative aimed at enhancing the University's research relating to obesity prevention. A third important developing consultation is with the departments of Biochemistry and Microbiology. Victoria Farmer, Senior Research Technician in the Centre, is working with Assoc Prof Glen Buchan and Dr Tony Merriman developing a project which intends to investigate possible links between intestinal microflora and the onset of type 1 diabetes.

At a national level, collaboration with the University of Canterbury and Christchurch School of Medicine provides an opportunity for Dr Kirsten McAuley to extend her work on the identification of individuals with insulin resistance. Her initial work led to the development of what is now known in the international literature as the McAuley Index, a simplified approach to quantifying the degree of insulin resistance, the abnormality underlying most cases of type 2 diabetes. Dr McAuley's clamp work has been used to test a new model of glucose and insulin and together with the Christchurch team a new one hour test for measuring insulin sensitivity is being developed.

Chris Booker is the local coordinator for two national research projects with international connections – TrialNet and the Type 1 Diabetes Genetic Consortium. TrialNet is an international study funded by the American National Institutes of Health and Juvenile Diabetes Research Foundation, which aims to enrol relatives of people with type 1 diabetes to enable monitoring of the natural history of the disease. This is deemed to be an area in which there is a paucity of knowledge after the failure of two large recent trials to show any effect on the incidence of type 1 diabetes, with the potential for future studies to enrol participants at high risk in studies of new therapies with the potential to prevent type 1 diabetes. The Type 1 Diabetes Genetic Consortium, also an international

collaboration headed from the United States, aims to identify new genetic influences on type 1 diabetes by examining families in which more than one sibling have type 1 diabetes.

We maintain close contact with all the major diabetes research groups in New Zealand and envisage establishing a more formal network of diabetes researchers in New Zealand when the Executive of the New Zealand Society for the Study of diabetes moves once again to Otago in 2006 and staff of the Centre take key roles in the running of the Society.

At a national level members of the Centre have been involved in advisory roles to the Ministry of Health and in a number of capacities with both Diabetes New Zealand and the National Heart Foundation. For example Jim Mann chairs the Scientific Advisory Committee of the Foundation.

Internationally the well established relationship with the German Diabetes Research Institute at the University of Düsseldorf continues and the development of a new research project (Lifestyle Over and Above Drugs in Diabetes – LOADD) provides the opportunity to strengthen the existing associations with the Universities of Kuopio (Finland), Aarhus (Denmark), Naples and Uppsala, provided the project can attract international funding. Jim Mann chairs the international group of the European Association for the Study of Diabetes which has generated and updates evidence-based guidelines for the nutritional management of people with diabetes.

## **6. Health research workforce development:**

Chris Booker is proposing to enrol for the degree of Doctor of Philosophy. Dr Nathan Joseph (General Practitioner working with Ngati Porou Hauora) is enrolled for the degree of Masters of Medical Science. Three PhD students (two in the Department of Human Nutrition, one in the Department of Mathematics) and three MSc students have been wholly or partially supervised by staff of the Centre (two of the MSc students have completed their projects and graduated). In addition the Ngati and Healthy project and the APPLE Project (A Pilot Programme of Lifestyle and Exercise), which is another of the Centre's flagship projects, have provided excellent training opportunities for research support staff.

## **7. Promotion of diabetes awareness:**

Members of the Centre have made a major contribution to the promotion of diabetes awareness through media exposure (newspapers, radio and television, locally, nationally and internationally – see examples in appendix 2), and presentations to health professional and lay groups. A website for the Centre has been developed which will be expanded in 2006 to further promote diabetes awareness and information regarding recent developments.

## **8. Other contributions to the health care and research environment:**

An in depth review regarding the relationship between saturated and *trans* unsaturated fatty acids and heart disease was undertaken by Chris Booker and Jim Mann for Food Standards Australia New Zealand in order to inform debate regarding relevant health claims.

A video relating to the reduction of cardiovascular risk in diabetes was produced for use by general practitioners.

Prof Michael Lean, Professor of Human Nutrition in the University of Glasgow and an international authority on obesity has expressed an interest in being involved with the work of the Centre. His future involvement would substantially enhance our potential to contribute to national and international attempts to reduce the risk of obesity and related non-communicable diseases.

ENCDR senior staff are involved with teaching of medical and other health science students and are regularly asked to review papers for publication and research funding applications.



## APPENDIX 1: Research publications and presentations

### Publications (staff of the ENCDR underlined):

Chisholm A, McAuley K, Mann J, Williams S and Skeaff M. Cholesterol lowering effects of nuts compared with a Canola oil enriched cereal of similar fat composition. *Nutr Metab Cardiovasc Dis*. 2005. 15(4): 284-92.

Coppell KJ, Anderson K, Williams S, Manning P and Mann J. Evaluation of diabetes care in the Otago region using a diabetes register, 1998–2003. *Diabetes Res Clin Pract*. 2005. In press.

Coppell K, McBride K and Williams S. (2004). Under-reporting of diabetes on death certificates among a population with diabetes in Otago Province, New Zealand. *N Z Med J* 117: U1217.

McAuley KA, Hopkins CM, Smith KJ, McLay RT, Williams SM, Taylor RW and Mann JI. Comparison of high-fat and high-protein diets with a high-carbohydrate diet in insulin-resistant obese women. *Diabetologia*. 2005. 48(1): 8-16.

McAuley KA, Smith KJ, Taylor RW, McLay RT, Williams SM and Mann JI. Long-term effects of popular dietary approaches on weight loss and features of insulin resistance. *Int J Obes Relat Metab Disord*. 2005. 30(2):342-9.

Mann JI, Tipene-Leach DC, Pahau HL, Joseph NR, Abel S, McAuley KA, Coppell KJ, Booker CS and Williams SM. Insulin resistance and impaired glucose metabolism in a predominantly Maori community. *Diabetes Res Clin Pract*. 2005. In Press.

Mann J. The Indo-Mediterranean diet revisited. *Lancet*. 2005. **366**(9483): 353-4.

Mann J. Orlistat and the prevention of diabetes. *International Diabetes Monitor*. 2005. **17**(3): 40-41.

Mann J, McAuley K and Taylor R. (2004). Obesity and diabetes: questions remain but action should not be delayed. *N Z Med J* **117**: U1218.

Mann JI, De Leeuw I, Hermansen K, Karamanos B, Karlstrom B, Katsilambros N, Riccardi G, Rivellese AA, Rizkalla S, Slama G, Toeller M, Uusitupa M and Vessby B. (2004). Evidence-based nutritional approaches to the treatment and prevention of diabetes mellitus. *Nutr Metab Cardiovasc Dis*. **14**(6): 373-94.

Mann JI and Riccardi G. Evidence-based guidelines on diet and diabetes. 2004. Editorial comment. *Nutr Metab Cardiovasc Dis*. **14**: 332-333.

Marcell TJ, McAuley KA, Traustadottir T and Reaven PD. Exercise training is not associated with improved levels of C-reactive protein or adiponectin. *Metabolism*. 2005. **54**(4): 533-41.

Skeaff CM, Thoma C, Mann J, Chisholm A, Williams S and Richmond K. (2005). Isocaloric substitution of plant sterol-enriched fat spread for carbohydrate-rich foods in a low-fat, fibre-rich diet decreases plasma low-density lipoprotein cholesterol and increases high-density lipoprotein concentrations. *Nutr Metab Cardiovasc Dis* **15**(5): 337-344.

Tipene-Leach D, Pahau H, Joseph N, Coppell K, McAuley K, Booker C, Williams S and Mann J. (2004). Insulin resistance in a rural Maori community. *N Z Med J*. **117**: U1208.

Venn BJ, Mann JI. (2004). Cereal grains, legumes and diabetes. *Eur J Clin Nutr* **58**:1443-1461.

### **Conference presentations and posters (presenter underlined):**

#### *Presentations:*

Booker C, Coppell K, Anderson K, Williams S. 'Outcomes after seven years for a cohort of individuals with type 2 diabetes: a retrospective observational study'. Medical Sciences (MedSci) NZ Conference, Queenstown, NZ. 6-9<sup>th</sup> December 2005.

Booker C, Coppell K, Manning P, Anderson K. 'Outcomes after seven years for a cohort of individuals with type 2 diabetes: a retrospective observational study'. Oral presentation at the Department of Medical and Surgical Sciences Research Day, University of Otago, NZ. 9<sup>th</sup> June 2005.

Booker C, Coppell K, McBride K. 'Outcomes after six years – the 1998 type 2 diabetic cohort enrolled on the Otago Diabetes Register'. Oral presentation at the New Zealand Society for the Study of Diabetes 29<sup>th</sup> Annual Scientific Meeting, Rotorua, NZ, 4-6<sup>th</sup> May 2005.

Coppell K, Williams S, Anderson K, Mann J. 'Weight and weight-related problems – the Otago Diabetes Register'. Medical Sciences (MedSci) NZ Conference, Queenstown, NZ. 6-9<sup>th</sup> December 2005.

Coppell K, Anderson K, Booker C. 'Weighty problems of diabetic patients enrolled on the Otago Diabetes Register'. Otago Obesity Research Consortium Conference and Workshop, Dunedin, NZ. 24-25<sup>th</sup> November 2005.

Coppell K, Anderson K, Williams S, Manning P, Mann J. 'Changes in diabetes care over a 6-year period in the Otago region, New Zealand. Oral presentation at the New Zealand Society for the Study of Diabetes 29<sup>th</sup> Annual Scientific Meeting, Rotorua, NZ, 4-6<sup>th</sup> May 2005.

Farmer V, McAuley K, Smith K, Taylor R, McLay R, Williams S, Mann J. 'Long term effects of popular dietary approaches on weight loss and features of insulin resistance'. Otago Obesity Research Consortium Conference and Workshop, Dunedin, NZ. 24-25<sup>th</sup> November 2005.

McAuley K, Smith K, Taylor R, McLay R, Williams S, Farmer V, Mann J. 'Long term effects of popular dietary approaches on weight loss and features of insulin resistance'. Medical Sciences (MedSci) NZ Conference, Queenstown, NZ. 6-9<sup>th</sup> December 2005.

McAuley KA, Smith KJ, Hopkins CM, Taylor RW, Mann JI, Williams SM, Henshaw G, Cooke RT. 'High fat, high protein diets in relation to weight loss and risk of type 2 diabetes and cardiovascular disease'. Oral presentation at the New Zealand Society for the Study of Diabetes 29<sup>th</sup> Annual Scientific Meeting, Rotorua, NZ, 4-6<sup>th</sup> May 2005.

McAuley KA, Smith KJ, Hopkins CM, Taylor RW, Mann JI, Williams SM, Henshaw G, Cooke RT. 'High fat, high protein diets in relation to weight loss and risk of type 2 diabetes and cardiovascular disease'. Oral presentation at the 4<sup>th</sup> World Congress on Prevention of Diabetes and its Complications, Chennai, India, 11-13<sup>th</sup> February 2005.

Tipene-Leach D, Pahau H, Joseph N, Abel S, Coppell K, McAuley K, Booker C, Williams S, Mann J. 'Insulin resistance and impaired carbohydrate metabolism in a rural Maori community'. Oral presentation at the Public Health Association Conference, Wellington, NZ, July 2005.

Tipene-Leach D, Pahau H, Joseph N, Abel S, Coppell K, McAuley K, Booker C, Williams S, Mann J. 'Insulin resistance and impaired carbohydrate metabolism in a rural Maori community'. Oral presentation at the New Zealand Society for the Study of Diabetes 29<sup>th</sup> Annual Scientific Meeting, Rotorua, NZ, 4-6<sup>th</sup> May 2005.

Tipene-Leach D, Pahau H, Joseph N, Abel S, Coppell K, McAuley K, Booker C, Williams S, Mann J. 'Impaired carbohydrate metabolism and related risk factors in a rural Maori community'. Oral presentation at the 4<sup>th</sup> World Congress on Prevention of Diabetes and its Complications, Chennai, India, 11-13<sup>th</sup> February 2005.

*Poster presentations:*

Anderson K, Coppell K, Booker C. 'Weighty problems of diabetic patients enrolled on the Otago Diabetes Register'. Poster presentation at the New Zealand Society for the Study of Diabetes 29<sup>th</sup> Annual Scientific Meeting, Rotorua, NZ, 4-6<sup>th</sup> May 2005.

Coppell K, McBride K, Williams S. 'Under-reporting of diabetes on death certificates amongst a diabetic population in Otago, New Zealand'. Poster presentation at the New Zealand Society for the Study of Diabetes 29<sup>th</sup> Annual Scientific Meeting, Rotorua, NZ, 4-6<sup>th</sup> May 2005.

**Keynote addresses:**

Mann J. Medical Sciences (MedSci) NZ Conference, Queenstown, NZ. 6-9<sup>th</sup> December 2005. Symposium address: "The metabolic syndrome: a clinical reassessment".

Mann J. Otago Obesity Research Consortium Conference and Workshop, Dunedin, NZ. 24-25<sup>th</sup> November 2005. Keynote address.

Mann J. 18th International Congress of Nutrition, Durban, South Africa, 19-23<sup>rd</sup> Sept 2005. Keynote address: "Evidence based Nutrition Recommendations for the treatment and prevention of type 2 diabetes".

Mann J. 18th International Congress of Nutrition, Durban, South Africa, 19-23<sup>rd</sup> Sept 2005. Keynote address: "Translation of evidence into dietary recommendations".

Mann J. European Association for the Study of Diabetes, Diabetes and Nutrition Study Group: Denmark, 30<sup>th</sup> June - 1<sup>st</sup> July 2005. "Dietary protein and diabetic renal disease".

**Book chapters:**

Prof Jim Mann and Dr Kirsten McAuley (2005). Nutrition: its relevance in development and treatment of the metabolic syndrome. In: *The Metabolic Syndrome*. Christopher D Bryne, Sarah H. Wild (eds). John Wiley and Sons, Ltd, Chichester, England. pp 333-352.

Mann J (2004). Cardiovascular Disease. In: *Public Health Nutrition*. MJ Gibney, BM Margetts, JM Kearney & L Arab (eds). The Nutrition Society Textbook Series, Blackwell Science Publishing Company, Oxford, UK. pp 317 - 329

## **APPENDIX 2: Media coverage**

Examples of media coverage attracted by the Centre and its activities:

New Zealand Herald, 30-31<sup>st</sup> October 2004: 'Zone diet wins in varsity study'

Otago Daily Times, 3<sup>rd</sup> November 2004: 'Short-term success of Atkins diet a surprise'

Dominion Post, 1<sup>st</sup> November 2004: 'High-fat diet surprises researchers'

New Zealand Herald, 17<sup>th</sup> December 2004: 'East Coast diabetes time bomb'

Otago Daily Times, 18-19<sup>th</sup> December 2004: 'Expert warns diabetes, obesity "problems of the 21<sup>st</sup> century"'

Otago Daily Times, 21<sup>st</sup> December 2004: 'Diabetes – death link could be stronger'

Consumer magazine January/February 2005: 'The low-carb craze', p14-17.

Diabetes (magazine of Diabetes New Zealand), Autumn 2005: 'News, views and research: East Coast diabetes time bomb' p6: 'Zone diet wins in varsity study', p20.

Otago Daily Times, 9<sup>th</sup> August 2005: 'Notable event for diabetes centre'

Otago Daily Times, 10<sup>th</sup> August 2005: 'Simple changes can help beat obesity'

Otago Daily Times, 15<sup>th</sup> August 2005: 'Diabetes review planned'

Stuff.co.nz (supplied by Fairfax New Zealand, Ltd), 17<sup>th</sup> August 2005: 'New study gives thumbs down to low-carb diet'

Otago Daily Times, 6<sup>th</sup> October 2005: 'No excuse for underfunding: expert'

Otago Daily Times, 22<sup>nd</sup> December 2005: '\$100,000 shot in arm for obesity study'

Stuff.co.nz (supplied by Fairfax New Zealand, Ltd), 18<sup>th</sup> December 2004: 'Urgent action needed on diabetes epidemic – expert'

Agencies for Nutrition Action Update, January 2005: '2004 Wrap Up: Diabetes projects'

BBC Panorama: The Trouble With Sugar, first broadcast on BBC One on Sunday, 10 October 2004 at 22:15 BST, and later broadcast in New Zealand.

Staff of the centre have also been interviewed on a number of television broadcasts, including TNVZ's One News and Breakfast programmes, TV3 News, and Channel 9 News, as well as on radio broadcasts such as National Radio's Nine 'till Noon programme.