

FEATURED PROGRAMME

New Zealand's Injury Prevention Research Unit: helping shape injury prevention policy and practice

David J Chalmers, John D Langley

Beginnings

The Injury Prevention Research (IPRU) was founded in 1990, as the result of a successful bid to establish New Zealand's first centre for injury prevention research. The need for such a centre was identified in a review of research on unintentional injury prepared for the then Medical Research Council of New Zealand.¹ The authors of that review argued that an analysis of national data on injury mortality and morbidity would provide the basis for establishing research and prevention priorities for New Zealand, and would be of international interest given the uniqueness of New Zealand's national data resources.

Funding

At the heart of the IPRU is a core staff of eight, comprising the Director, Deputy Director, Health Promotion Specialist, Junior Research Fellow, Biostatistician, Data Manager, Administrator, and Secretary. This core is funded jointly by the Health Research Council of New Zealand (the successor to the Medical Research Council) and the Accident Rehabilitation and Compensation Insurance Corporation (ACC)—administrators of New Zealand's compulsory, no-fault, injury compensation scheme. To this core are attached researchers and support staff funded from project grants, fellowships, and contracts. The total staff ranges from 15–25 depending on the programme of research.

Up until recently, core funding has been provided on a five year cycle with a review at the end of the third year of the cycle. This level of support has been a critical element in the IPRU's success. Differences between the core funders in terms of the expected outputs from the IPRU has resulted in the development of two separate contracts for core funding for 1999 and beyond. This split in funding will present a challenge for maintaining the core in the years ahead.

Goal and aims

The goal of the IPRU is to undertake research and health promotion activities that will contribute to reducing the incidence, severity, and consequences of injury in New Zealand. Its aims include: conducting injury prevention

research of the highest quality; facilitating the translation of research into injury control policies and practice; disseminating its findings through scholarly publications, commissioned reports, and by other means; maintaining and developing networks and working relationships with organisations and individuals with an interest in injury control; training new investigators in injury prevention research methods; educating health professionals, policy makers, and the general public about the magnitude, costs, and prevention of injury; and focusing on issues of national importance.

The human and economic losses due to injury can be reduced through activity in three main areas: injury prevention, acute care, and rehabilitation. *Injury prevention is IPRU's focus.*

Research focus

The IPRU has chosen to focus its activities around six categories of injury: road traffic related injury, sport and recreational injury, occupational injury, child and adolescent injury, intentional injury, and injury to Maori. These categories are not mutually exclusive; children and adolescents is a good example, as they regularly feature within several of the other areas. For example, using data from the Dunedin Multidisciplinary Health and Development Study (DMHDS), lifestyle factors measured in adolescence, have been used to predict traffic crashes and injury among young adults.² In another example, using data from our national injury databases to describe the epidemiology of injury on farms, it was found that over 25% of injuries involving farm motorcycles and all terrain vehicles occurred to children, and that the highest rate of injury was for young males in the 15–19 year age group.³

A further focus of the IPRU's activities is on injury surveillance. Since its establishment the IPRU has been accumulating data on serious injury. We currently have records of all deaths for the period 1977 to 1995, and all hospital inpatient injuries for the period 1978 to 1996. These national databases are unique in that they cover the entire population, are E coded, and contain narratives describing the circumstances of injury. These databases have been used extensively in research which has sought to determine the significance of specific problems and to assess the impact of various interventions.

**Injury Prevention
Research Unit,
Department of
Preventive and Social
Medicine, Dunedin
School of Medicine,
University of Otago,
PO Box 913, Dunedin,
New Zealand**
D J Chalmers
J D Langley

Correspondence to:
Dr Chalmers.

Issues directly and indirectly relating to child and adolescent injury have featured.⁴

Child and adolescent injury

New Zealand has an unenviable childhood and adolescent unintentional injury record.⁵ Over the years, the IPRU has conducted many studies in areas of relevance to childhood and adolescence: domestic hot tap water burns, fireworks, falls from horses, dog bites, falls from playground equipment, flammability of children's nightclothes, injuries at school, cycle helmet wearing, and the evaluation of community intervention programmes. The decision to work in these areas has been based on the size of the problem, the human and societal costs, the priorities of funding agencies, public and political interest, the feasibility of intervening, and the extent to which the problem is already being addressed by other agencies, both nationally and internationally.

More recently, we have received project funding from the Health Research Council of New Zealand to review our progress as a nation in the area of child and adolescent injury prevention. The aims of this project are to describe the epidemiology of childhood injury mortality and morbidity in New Zealand, including trends over time, and to compare our experience with that of other member countries of the Organization for Economic Co-operation and Development. With the cooperation of colleagues from around the world, we have obtained injury mortality data for eight other countries. Regrettably, our experience generally compares unfavourably with these countries in most categories of injury. The next step in this project is to review New Zealand's policies and practices in those areas in which our comparative performance is worst, and to identify successful policies and practices from other countries that may be adaptable to New Zealand conditions.

Types of research undertaken

IPRU's research has involved studies aimed at:

- (1) Quantifying the incidence of injury events (for example falls from horses,⁶ thermal injury to children,⁷ fireworks⁸)
- (2) Determining the costs of injury, both human and economic (for example disablement due to motorcycle crashes,⁹ cost of motor vehicle crashes¹⁰)
- (3) Determining the risk factors for behaviours and injury (for example use of motorcycles,¹¹ playgrounds¹²)
- (4) Identifying barriers to targeting risk factors, and the means of overcoming them (for example domestic hot tap water,¹³ cycle helmets,¹⁴ children and tractors¹⁵)
- (5) Evaluating the effectiveness of interventions (for example safe nightclothes,¹⁶ domestic hot tap water,⁷ graduated driver licensing¹⁷)
- (6) Determining the benefit cost ratios and the cost effectiveness of interventions (for example cycle helmets¹⁸)

In an ideal world it would be desirable to develop a research programme for a specific

injury issue which addressed each of the above in a sequential manner. In reality this is extremely difficult to achieve for a variety of reasons not the least of which are political contingencies and the lack of long term strategic planning. A not uncommon refrain has been "the board wants results yesterday and the issue may no longer be a priority 12 months from now". As a result the IPRU has had to balance its long term commitment to an issue with new opportunities for funding. As a consequence our research on specific issues has ranged from addressing most of the issues listed above to addressing only one. Where the former has applied the effort has tended to be spasmodic and not necessarily in the optimal sequence. A good example of this has been our research activity on domestic tap water temperatures. Research in this area was stimulated by a study describing the epidemiology of childhood burns.¹⁹ That study identified tap water as a significant contributor to the overall thermal injury problem. Subsequently a study of the hot water temperatures in the homes of preschoolers showed that water temperatures were, in the majority of cases, dangerously high.²⁰ After this an unexpected opportunity arose to evaluate a large scale ACC television campaign that had as its theme "hot water burns like fire". Our evaluation of that campaign, and associated interventions that were designed and implemented at the same time, identified a major barrier to bringing about change, namely that the adjustable thermostats could not be relied on to deliver water at the temperature at which they were set.⁷ In the course of this evaluation we also became aware of potential social and economic barriers to safe water temperatures and as a consequence obtained funding to investigate these further.¹³ After this there was a significant hiatus until the Health Research Council identified child health as priority area for research. We were successful in obtaining funds to determine the opinions, knowledge, and experiences of plumbers in relation to this matter. This work is currently in progress.

Communicating our findings

We use a variety of means to communicate our findings. Since 1990 we have published over 100 articles in refereed journals, and over 20 commissioned reports. While such publications are important for maintaining our academic credibility, and as a means of contributing to the international pool of knowledge on injury prevention and control, different means must be adopted for reaching other audiences. To this end we have contributed over 50 articles to professional and popular publications; have published "fact sheets" on a diverse range of topics including hot tap water burns, motorcycle injuries and injuries on farms; and have made over 30 written and oral submissions on government policy, parliamentary bills, and product standards. In addition, we present regularly at national and international conferences, organise public seminars, issue media releases, serve on ad hoc commit-

tees and editorial boards, contribute occasional lectures to undergraduate courses, and respond to numerous inquiries from government agencies, community organisations, and the general public. Our home page address on the internet is <http://www.otago.ac.nz/IPRU>. This contains information on the IPRU's research programme, publications, and comprehensive statistical summaries from our national injury databases.

Shaping injury prevention policy and practice

IPRU is funded as a research organisation and as such is not directly involved in the delivery of injury prevention programmes. Rather our mission is to undertake strategic and applied research that is aimed at shaping the development of policy and practice which will bring about optimal gains. A good example in this respect has been our work on playground safety.

The IPRU has had a long history of research in the area of playground injury. Initially this involved highlighting the significance of falls from playground equipment as a public health problem.²¹ This was followed by surveys of playgrounds to identify the height of equipment and the nature of the surfaces onto which children fell.²²⁻²³ Subsequently, the IPRU conducted the first study world wide to demonstrate the critical height at which the risk of injury in falls increased significantly.¹² In conjunction with health promotion agencies, a playground safety manual was produced and distributed to all early childhood education centres, schools, and local government authorities in New Zealand.²⁴ Concurrently, the IPRU has been active in formulating and promoting standards for playground safety.

On the whole IPRU has had a good working relationship with those involved in formulating policy and practice. Occasionally, however, our objective of reducing harm to individuals conflicts with commercial objectives. For example, lowering one's tap water temperature not only reduces the risk of injury, it also reduces energy consumption. This can be significant as electricity is the most common primary source of energy in New Zealand homes and the heating of hot water consumes approximately 40% of this energy. Electricity suppliers are in the business of increasing demand for electricity not reducing it. It was this situation that led to a threat of litigation against IPRU if a consumer electrocuted themselves in the process of adjusting their hot water temperature thermostat.

Other conflicts have arisen primarily because of an unwillingness on the part of a third party to act on an injury hazard we have identified. For example we undertook a study of the height and surfacing of school playground equipment which showed that 88% of the equipment was mounted over non-impact absorbing surfaces. In addition 23% exceeded the recommended safe height of 2.5 metres.²² When the results of our research were published by the local newspaper the response in the press by a

representative of the local schools was "high equipment with concrete underneath ensures children play safely" and by implication reducing height and making surfaces more impact absorbent would increase the risk of injury. Our media response was "if you believe this why don't you have sharpened bamboo sticks under the equipment to ensure the children play even safer". Sometimes views such as these need to be addressed directly due to their pervasiveness and persistence.

Training and education

In addition to training staff both on the job and through formal and informal course work, IPRU provides a training environment for those interested in developing careers in public health research—particularly relating to injury control. Since 1990, the IPRU has produced three PhD graduates and is currently supervising three postgraduate students.

Given the shortage of public health researchers and practitioners working in the area of injury control, various means are used to attract newcomers to the field as well as raising awareness of injury control issues. These include lecturing in undergraduate and postgraduate courses, assisting with student projects, and presenting public seminars.

Collaboration

A strength of the IPRU is its location in the Department of Preventive and Social Medicine at the University of Otago. Not only is this the largest teaching department in the university's medical school, but it also has a strong public health research workforce with specialist research units in occupational and environmental health, cancer epidemiology, and Maori health (Maori being the indigenous people of New Zealand). It recently became host department to the Dunedin Multidisciplinary Health and Development Research Unit (DMHDRU). DMHDRU manages an internationally recognised longitudinal study of the health, development, and wellbeing of a large sample of New Zealanders (DMHDS).²⁵

With the exception of cancer epidemiology, IPRU collaborates with researchers in all four groups. Of particular note have been its collaborative studies based on the DMHDS. These have ranged from descriptive studies of injuries and safety behaviour through to studies examining the importance of psychological and social factors for childhood and adolescent injury.²⁵ The IPRU also collaborates with other researchers locally, nationally, and internationally.

The IPRU is a member of the International Collaborative Effort on Injury Statistics (ICE), and is contributing to an international comparative study on drownings and the prevention of drowning (WET ICE).

Conclusion

While not generally involved in the promotion of injury prevention measures at the community

level, the IPRU nevertheless has an active role in shaping injury prevention policy, and practices. It does this through the dissemination of information, advocacy, training, and education. Fundamental to this role, however, is its strategic and applied research. The funding of the core has been critical to ensuring its success.

- 1 Langley J, McLoughlin E. *A review of research on unintentional injury: a report to the Medical Research Council of New Zealand*. Auckland: Medical Research Council of New Zealand, 1987.
- 2 Begg D, Langley J, Williams S. A longitudinal study of lifestyle factors as predictors of injuries and crashes among young adults. *Accid Anal Prev* (in press).
- 3 Marshall SW, Clarke J, Langley JD, et al. Overview of injury on New Zealand farms. *Journal of Agricultural Safety and Health* 1996;2:175-190.
- 4 Langley JD. Experiences using New Zealand's hospital based surveillance system for injury prevention research. *Methods of Information in Medicine* 1995;34:340-4.
- 5 Langley JD, Smeijers J. Injury mortality among children and teenagers in New Zealand compared with the United States of America. *Inj Prev* 1997;3:195-9.
- 6 Buckley SM, Chalmers DJ, Langley JD. Injuries due to falls from horses. *Aust J Public Health* 1993;17:269-71.
- 7 Waller AE, Clarke JA, Langley JD. An evaluation of a program to reduce home hot tap water temperatures. *Aust J Public Health* 1993;17:116-23.
- 8 Clarke JA, Langley JD. Firework related injury in New Zealand. *N Z Med J* 1994;107:423-5.
- 9 Clarke JA, Langley JD. Disablement resulting from motorcycle crashes. *Disabil Rehabil* 1995;17:377-85.
- 10 Langley JD, Phillips D, Marshall SW. Inpatient costs of injury due to motor vehicle traffic crashes in New Zealand. *Accid Anal Prev* 1993;25:585-92.
- 11 Reeder AI, Chalmers DJ, Marshall SW, et al. Psychological and social predictors of motorcycle use by young adult males in New Zealand. *Soc Sci Med* 1997;45:1357-76.
- 12 Chalmers DJ, Marshall SW, Langley JD, et al. Height and surfacing as risk factors for injury in falls from playground equipment: a case-control study. *Inj Prev* 1996;2:98-104.
- 13 Clarke JA, Waller EA, Marshall SW, et al. Barriers to the reduction of domestic hot water temperatures. *Safety Science* 1995;18:181-92.
- 14 Plumridge E, McCool J, Chetwynd J, et al. Purchasing a cycle helmet: are retailers providing adequate advice? *Inj Prev* 1996;2:41-3.
- 15 Langley JD. Tractors, motorcycles, ATVs: inconsistencies in legislation for child safety. Examples from New Zealand. *Inj Prev* 1996;2:2-6.
- 16 McLoughlin E, Langley JD, Laing RM. Prevention of children's burns: legislation and fabric flammability. *N Z Med J* 1986;99:804-7.
- 17 Langley JD, Wagenaar AC, Begg DJ. An evaluation of the New Zealand graduated driver licensing system. *Accid Anal Prev* 1996;28:139-46.
- 18 Hansen P, Scuffham PA. The cost-effectiveness of compulsory bicycle helmets in New Zealand. *Aust J Public Health* 1995;19:450-4.
- 19 Langley J, Tobin P. Childhood burns. *N Z Med J* 1983;96:681-4.
- 20 Dickson N, Martin M, Waller AE. Hot water temperature in Dunedin homes with preschool children. *N Z Med J* 1990;103:452-4.
- 21 Chalmers DJ, Langley JD. Childhood falls from playground equipment resulting in admission to hospital: descriptive epidemiology. *Safety in the Built Environment London* 1988: 226-37.
- 22 Langley J, Crosado B. School playground climbing equipment—safe or unsafe? *N Z Med J* 1982;95:540-2.
- 23 Langley J, Crosado B. Two safety aspects of public playground climbing equipment. *N Z Med J* 1984;97:404-6.
- 24 Jambor T, Chalmers D, O'Neill D. *The New Zealand playground safety manual*. Wellington: Accident Rehabilitation and Compensation Insurance Corporation, 1994.
- 25 Silva PA, Stanton WR, eds. *From child to adult*. Dunedin: Oxford University Press, 1996.