OPINION

Randomised controlled trials in general practice: time for international collaboration

Martin R Underwood, Yvonne H Carter

Unintentional injury to children aged under 5 caused 428 300 deaths globally in 1990. Not surprisingly, the majority are in the developing world, with 740 deaths annually per million of the population aged less than 5, compared with 249 per million a year in developed countries. However, injuries account for 15.6% of deaths after the perinatal period in this age group in the developed regions, compared with 4.1% in developing regions.¹ Thus, although in absolute terms injuries are a problem that needs to be tackled worldwide, proportionally they are a greater problem in the developed world.

Either way, the size of the problem means there is a clear need for initiatives of proven value that can be used to reduce mortality.² The greater prosperity and relative importance of childhood injury in the developed world mean that this is where robust research is most likely to be performed. However, studies that included developing countries could inform a global injury prevention strategy.

Young children, are less competent than adults in assessing and avoiding risk; thus society has an obligation to develop initiatives to reduce their injury rate. Such initiatives can be broadly divided into:

(1) Community based interventions, that affect mainly the environment outside the home, or safety of items brought into the home, such as encouraging (or enforcing), the use of child seats in cars or improving the safety of children's toys.

(2) Educational initiatives targeted at parents to improve safety behaviour such as avoidance of burns and scalds and the correct use of child seats in cars.

Although some public policy initiatives have been tested in a comparative manner either using historical data or similar areas with no intervention as controls, few such initiatives have been evaluated using randomised controlled designs.³ Subjecting the introduction of public policy initiatives to the rigour of a controlled trial, possibly using a no intervention control district or districts, presents considerable difficulties.⁴ If a small number of districts were used in such studies it would be difficult to generalise from the results or even to be certain that any differences found were due to the intervention. The additional problems involved in ensuring adequate randomisation and an element of blinding mean that it is unlikely that such studies will be performed.

Educational and support programmes, however, can and should be subjected to rigorous scientific evaluation before they are introduced on a large scale. Roberts *et al*, in a systematic review of eight trials, calculated the pooled odds ratio of the effect of home visiting to prevent unintentional injury to be 0.74 (95% confidence interval 0.6 to 0.92).⁵ All but one of these studies selected mothers of children perceived to be at high risk of injury and all provided labour intensive interventions. Although the rate of injury among children at high risk means there is, in relative terms, a large potential benefit from such interventions, most children are not at high risk.

To achieve a significant absolute reduction in the rate of injury any programme should be universal. It is unlikely that resources will be available to fund individual professional or non-professional support, of the type analysed by Roberts, for all new mothers. A more realistic scenario is the provision of an injury prevention programme aimed at all pregnant women or parents of preschool children.

This could include additional classes, leaflets, or other educational material provided during antenatal care, the postpartum period, or routine child health surveillance. Additional support, or the provision of safety equipment, could also be targeted at families perceived to be at higher risk based perhaps, on home accident risk audits.

Existing studies have failed to demonstrate any convincing injury reductions from educational initiatives. However, an effect on parental behaviour, an interim outcome measure, has been shown.³ One review reported such positive effects in five out of seven randomised controlled trials.⁶

Nevertheless, educational and support programmes are an attractive approach to reducing childhood injury, not least because if effective they would be relatively economical. The failure of existing studies to show a reduction in injury rates may reflect inadequate sample size rather than an ineffective intervention.

In future such trials may be well advised to concentrate on those under 5 for the following reasons.

(1) A home education programme will have less impact on older children as they become more autonomous, less under direct parental control and, therefore, more likely to be injured outside the home.

Department of
General Practice and
Primary Care, St
Bartholomew's and the
Royal London School
of Medicine and
Dentistry, Queen Mary
and Westfield College
M R Underwood
Y H Carter

Correspondence and reprint
requests to:
Dr M R Underwood,
St Bartholomew's and the
Royal London School of
Medicine and Dentistry,
Department of General
Practice and Primary Care,
Medical Sciences Building,
Queen Mary and Westfield
College, University of
London, Mile End, London
E1 4NS.

e-mail: M.Underwood@
mds.qmw.ac.uk

(2) Younger children are injured more often which makes it, statistically, easier to demonstrate any benefit.

(3) Parents of younger children will be more accessible for an education and support programme than those of older children.

(4) If a cluster randomisation is used, increasing the number of individuals in each cluster will provide little statistical advantage (see below).

In the developed world one in 4000 of children aged less than 5 will have a fatal accident each year. Accordingly a trial to demonstrate a reduction in mortality as the end point would have to be unrealistically large. It would, however, be possible to test, in a randomised controlled trial, the hypothesis that:

An intensive parental educational and support programme will reduce hospital admissions, due to injury in the first five years of life by one fifth.

UK figures show that 2% of children aged under 5 will be admitted to hospital with an injury annually; one quarter of these will be moderate or severe.⁷ Thus allowing for repeat admissions, about 9.6% of children will have been admitted to hospital with an injury at least once by their fifth birthday. To show a reduction in admissions by one fifth to 7.7% (significant at the 5% level and with a power of 80%), for five years of intervention and data collection, 3463 children in each group would be required.

Randomisation by family would be inappropriate because unintentional exposure of the control group to the intervention could occur if they attended the same health clinics as the intervention group,

This means that randomisation by "health care unit" is preferable (cluster randomisation). Unfortunately, because some of the differences between groups attending different health care facilities will be due to factors other than the intervention, it will be necessary to apply an inflation factor to the sample size calculation.⁸ The inflation factor for the effect of randomising by cluster is given by the formula: $1 + (\bar{n} - 1)\rho$ ($\bar{n}$ is the average number of individuals in a cluster and ρ is the intraclass correlation coefficient (ICC) a measure of the extent to which the behaviour of individuals in a cluster is affected by their cluster membership). A value of one for the ICC means that all the individuals in the cluster behave identically manner, a value of zero means that their behaviour is unaffected by cluster membership. The cluster effect can be reduced by matching the treatment and control centres for known potential confounding variables, but it cannot be avoided completely.

In the UK 98% of the population are registered with a general (family) practice. Services are free at the point of use, and provide, either directly or indirectly, most community maternal and child health services. Assuming a low ICC (ρ) of 0.01, and an average cluster size ($\bar{n}$) of 100 children (the number born annually into a typical British general practice) a doubling of the sample size is required. If the true value of ρ is larger the

sample needed would increase greatly and vice versa if smaller clusters were used.

This sample size exercise demonstrates that to perform a trial of this nature in the UK at least 70 general practices would need to be involved for five years. A trial of this magnitude is costly and unlikely to be repeated. It should be designed therefore, to be as robust and as generalisable as possible. If such a trial was performed in a single country the results could not necessarily be applied internationally. A collaborative study, involving centres in a number of different countries with different economies, health care systems, and injury risk profiles might, therefore, be preferable. If a mixture of developed and developing regions were included robust conclusions could be drawn for the main trial end points and substudies of national interest could also be performed. However, international differences will affect both the injury rate and the likelihood of a child being admitted to hospital after an injury. These differences will make calculating the sample size more complex and could increase the sample size required.

The education package should be tailored to the different risks in participating countries. For example, drowning in a swimming pool is commoner in southern compared with northern Europe, while the reverse is true for burns from domestic heaters. What would be tested is, the pragmatic hypothesis that an education and support package will reduce injuries, rather than explanatory hypotheses identifying which part or parts of the package has the effect.

Although international cooperation increases the complexity of such a trial, if positive results are found there would be a mandate to institute the programme worldwide. If negative results are found we will know conclusively that the solution to this problem lies elsewhere. The European Union through its BIOMED II programme, provides concerted action funding to allow European collaborators to meet and produce detailed trial protocols to be submitted to funding bodies in individual countries. Similar pump-priming from a supranational agency, such as the World Health Organisation would allow potential collaborators to produce a robust trial design. It is time for international cooperation to design a definitive multicentre trial to decide if an intensive parental educational and support programme will reduce the global burden of childhood injury.

We are grateful for the helpful comments of the anonymous reviewers of an earlier draft of this paper.

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DISSENT

Going international: what are the implications?

Charles Larson

In absolute terms, the magnitude of childhood mortality and disability caused by injury has become a priority public health problem, recognized by developed and, more recently, developing countries worldwide. By the year 2020, injuries will constitute one of the most important, if not the leading, causes of disease burden worldwide.¹ For this compelling reason alone, there is an urgent need for scientifically based knowledge with which to guide the development of effective injury prevention programs. This implies, at the very least, the presence of three important conditions: (1) the capacity to conduct relevant, well designed research in developing, as well as developed countries, (2) the existence of funding to support such research, and (3) the ability to effectively apply research findings to health policies and program development.

Underwood and Carter's Opinion in this issue points to the need all countries share in identifying "...initiatives of proven value". They argue that this is inhibited, not only by limited scientific support for community—or family based injury prevention programs—but by studies weakened due to inadequate sample size or non-randomized designs. Underwood and Carter do identify important exceptions, such as Robert's meta-analysis of antenatal home visitation and its relation to reduced early childhood injuries. They take the position, however, that such interventions will not significantly impact on the global problem of childhood injury because they are too expensive and high risk, as opposed to universal or population based programs. As a strategy to overcome these limitations, Underwood and Carter recommend the development of collaborative, multinational studies, which mix the experiences of developed with developing countries. They argue that a randomized field trial of a varied (site appropriate) education and support intervention package could conclusively answer whether or not such programs work.

At what point is a randomized field trial the appropriate design of choice? Given the lack of support from observational studies for "stand on their own" universal educational or support

injury prevention interventions, the cost and resource consumption required of a randomized field trial is not justified. This would be particularly the case in a developing country. It is important to understand that within developing countries, there also exists the great need to support descriptive and observational studies, upon which they can establish their own knowledge base. This information can then be applied to appropriately formulated injury intervention programs. This implies greatly increased funding, beyond current levels, from developed countries to support research which is not necessarily tied to their own research agendas.

While international collaboration in injury prevention research is a goal I would heartily support, I caution that such initiatives do carry the potential of doing more harm than good. This is especially the case in settings where resources are already well under optimal. Multicenter trials will be beyond the funding capacities of most developing countries, which ultimately leads to questions of who will fund and control such studies. This, by extension, then leads to consideration of a nation's research agenda and their ability to independently define and pursue health research priorities. It is also the case that well funded, internationally supported studies often engage the best, most productive of a developing nation's researchers. The potential consequence of this is to deflect a precious resource away from other, equally compelling problems.

Beyond the issues of research conduct and funding is the question of the interpretation and application of a study's results, in particular a large, multinational trial. The pooling of outcomes from highly variable settings may produce a result that has little connection with reality. This is analogous to the consideration of pooled, or mean, per capita income in developing countries, a value that is representative of almost nobody. It is conceivable that a specific intervention may be highly productive in a few settings, but not in the majority. The pooled result will rest somewhere in between, its interpretation will be difficult, and its applicability highly questionable. In the end, one

returns to the need to design studies with sufficient power to address the issue of interpopulation variability in response.

There is also the question to whom would one generalize the results of an investigation with an international study population? Will a mean change in injury rates be the appropriate outcome? Is this likely with an educational intervention in light of existing knowledge? Is the focus on preschool age children justified?

Yes, by all means we should encourage Underwood and Carter's underlying thesis of international collaboration in injury prevention

research. This should be done in many settings, and in a manner that facilitates the exchange (not just transfer) of appropriate research technologies and experience. We live in a world which, despite its unjustifiable disparities, is more than ever before vulnerable to shared determinants of health, be these economic, environmental, behavioral, or political. We all stand to gain by working together. The problem is that this is far easier said than done!

1 Murray CJL, Lopez AD. *Global burden of disease and injury*. Vol 1. Boston: Harvard University Press, 1996.

Editorial Board Member: brief biography

DINESH MOHAN

Dinesh Mohan has been involved in injury control research for the past 25 years. He obtained a bachelor's degree in mechanical engineering from the Indian Institute of Technology, Bombay, a master's degree in mechanical and aerospace engineering from the University of Delaware, USA and a PhD in bioengineering from the University of Michigan, USA. He started his research career at the Biomechanics Department of the University of Michigan Transportation Research Institute at Ann Arbor where he specialised in biomechanics of impacts and human tolerance research. He continued this work at the Insurance Institute of Highway Safety, Washington DC, where he worked with William Haddon and did projects on injuries due to free falls, baseball impacts to the head, evaluation of the effectiveness of airbags in cars, injuries to children in cars, and the clasping strength of adults in holding children in laps in cars.

Currently he is a Professor in the Centre for Biomedical Engineering at the Indian Institute of Technology, Delhi, India, and Head of the WHO Collaborating Centre for Research and Training in Safety Technology. His current interests include research on transportation injuries with a special focus on vulnerable road users and injuries in rural areas. He serves on many national and international advisory groups including the injury prevention programme of the WHO. He is a Vice President of the International Association for Accidents and Traffic Medicine and a board member of the International Research Council on the Biomechanics of Impact. He is on the editorial boards of the journals *Accident Analysis and Prevention* and *Injury Prevention*. He has published over a hundred papers and is the coauthor of the book *Injury Control: A Global View*. He has received the Association for Advancement of Automotive Medicine 1991 Award of Merit for outstanding research in traffic safety, and the International Association for Accident and Traffic Medicine award and medal for outstanding achievement in the field of traffic medicine.

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REGIONAL REPORTS

Southern Africa (and beyond) report

I am constantly aware that most of my reports selfishly concentrate on happenings in Southern Africa. Occasionally, I am able to glean the odd item on what is happening further north from news reports, what little there is on the internet, or from that outstanding monthly, "BBC Africa". Rather than bore readers with poor excuses for this imbalance, may I rather reconfirm that I would welcome news (in any form whatsoever) related to childhood injury in Africa, and inclusion of which would allow this column to become more representative of the entire continent than it currently is. Those who are kind enough to submit news items will be personally acknowledged.

Having got that off my chest, I am thrilled to report on a fresh and exciting injury prevention campaign that has been hatched in Uganda, thanks to both support and input of local and international agencies. I am extremely grateful to Dr Olive Kobusingye, Director of the Injury Control Centre based at Makerere Medical School in Kampala, for providing me with the following information:

"Representatives from Ethiopia, Kenya, Uganda, Zambia, Zimbabwe, South Africa, and the World Health Organization (WHO) met on December 15-17 in Entebbe, Uganda at the joint WHO/Injury Control Centre Uganda (ICC-U) Working Group Meeting on Injury Prevention and Control in East and Southern Africa. Participants focused on the health sector issues of injury surveillance emergency medical systems, and health professional training in injury epidemiology and trauma care. A set of recommendations was formulated which has the potential to be a milestone for injury prevention in Africa.

The adoption of a standardized minimum data set for hospital based injury surveillance was discussed. A trauma registry form tested and used by the ICC-U will be presented to injury control workers in participating countries for input and development of a common format; it is hoped that this data set will form the core of a common trauma registry system in these countries. The single page trauma registry form includes ICD-9 categories of injury, a severity instrument (the Kampala score), victim and event information, and intentionality. Operate definitions for the registry have been written, and the form has already been tested in Uganda and Ethiopia. The trauma registry form is sufficient for base line injury measurements while at the same time keeping the form short and simple enough for a range of health workers to fill out".

Contact details for ICC-U: Dr Olive Kobusingye, Makerere Medical School, PO Box 7072, Kampala, Uganda (fax: +256 41 530022; e-mail: olive@imul.com).

DAVID BASS

Department of Paediatric Surgery,
Red Cross War Memorial Children's Hospital,
Rondebosch 7700, South Africa

Editor's note: While most Regional Reports have come from regular contributors—our team of Regional Editors—I am always delighted to receive contributions, regular or

otherwise, from others, especially from parts of the world where we do not have Editorial Board members. Please send your contributions to the editor, Barry Pless.

Pedestrian and bicyclist safety in New York City

Pedestrian and bicyclist safety in New York City (NYC) has been in the news lately. Mayor Rudolph Giuliani has raised the ire of NYC residents by increasing the fine for jaywalking from \$2 to \$50, plus making a court appearance mandatory for paying fines for this offence. In addition, the mayor has recently announced that pedestrian barriers which separate pedestrians and vehicles at certain intersections will be kept up "indefinitely". Anyone who has walked or driven the streets of New York know that its pedestrians are among the most aggressive in the world. The scene from the *Midnight Cowboy* in which Dustin Hoffman screams to an incensed driver, "I'm walking here!" exaggerates the attitude of the New York pedestrian, but only a little.

Pedestrian and bicyclist injuries are a serious and sizeable problem in NYC city. There was a 23% increase in the number of pedestrians and bicyclists killed in motor vehicle crashes in NYC last year, from 249 in 1996 to 302 according to preliminary police statistics for 1997, 3700 hospitalizations annually, and an estimated 10 000 pedestrians struck by motor vehicles but not hospitalized. Between 1994 and 1996 pedestrian deaths due to motor vehicles declined slightly from 223 to 213. In this same period motor vehicle occupant deaths decreased more substantially from 207 to 169. Despite the preponderance of pedestrian and bicyclist deaths, a study by Transportation Alternatives, a NYC watchdog group, found that most of the \$400 million of New York State and NYC funds earmarked for transportation safety in the next five years will go to improve the safety of vehicle occupants rather than the safety of pedestrians and bicyclists.

From a public health perspective, enforcement of laws as well as use of physical barriers to separate pedestrians and vehicles are perfectly respectable counter measures against pedestrian injuries. Some of the uproar is because the least lethal players in the urban drama, the pedestrians and bicyclists, feel they are being unfairly and illogically singled out. And, of course, other measures could and should be taken, including enforcement of speed limits, use of speed bumps, creation of walking streets in heavily congested areas, and stricter licensing of taxi drivers. But the public ridicule that has been heaped on the Mayor is a reminder of the critical role played by the social context in which environmental and behavioral interventions are launched.

POLLY E BIJUR

Kennedy Center, Room 920,
Albert Einstein College of Medicine,
1410 Pelham Parkway South,
Bronx, NY 10461, USA

British green papers highlight injury prevention

In February 1998, the British government published two green papers (consultative policy statements) for England and Scotland: *Our Healthier Nation* and *Working Together for a Healthier Scotland*. These outline a strategic approach to public health that build on earlier target setting exercises that have met with limited success.

The green papers are especially noteworthy in that the New Labour administration explicitly recognises the strong association between poverty and poor health and the need to tackle the former (as well as lifestyle and behaviour) in the context of a comprehensive health promotion strategy.

For England, 12 year targets will be set to reduce mortality and morbidity in four priority areas: heart disease and stroke, accidents, cancer, and mental health (suicide). Targets do not feature prominently (although they are not ruled out) in the Scottish paper which, in addition to the above four areas, flags up a number of others, particularly teenage pregnancy and dental health.

The green papers have been broadly welcomed by public health professionals. Disappointment has been expressed however on two main counts. First, no targets have been set to monitor progress towards reducing the widening socioeconomic inequalities in health in the UK. Second, the proposed action seems weak on specific, sustained, and adequately resourced measures designed to make a major impact on the underlying social, environmental, and economic causes of ill health. Moreover, while the poorer health (including injury) record of the Scots is acknowledged, this is not backed up by a commitment to mount a proportionately more vigorous health improvement programme north of the border.

For injury prevention professionals, the statements are a mixed blessing. On the positive side, "accidents" have held their place as priority areas in both England and Scotland. Unfortunately, the writers of the green papers have clung to an outmoded and discredited terminology, have offered virtually no new ideas to address the injury problem, and have proposed targets that are likely to be met in the absence of any further policy initiatives whatsoever. Cynics might argue that therein lies the huge political appeal of the target setting exercise!

DAVID STONE

The PEACH Unit,
Department of Child Health,
Yorkhill Hospital, Glasgow G3 8SJ
Scotland, UK

LETTERS TO THE EDITOR

Safety strategies

EDITOR,—Jan Shield is to be commended for rallying the troops in favour of "active" safety strategies,¹ and most of her arguments in favour of education and enforcement would undoubtedly be valid in a developed country. However I would like to offer two contrasting viewpoints on the subject which are based primarily on personal observations related to the challenges of traffic safety confronting us in a cash strapped, developing country.

Firstly, in support of passive measures is the increasing strain placed on the human and financial resources essential to conceive and sustain education programmes and law enforcement, particularly in developing countries. As such, traffic calming measures are likely to be more effective than nothing—simply because there is no other affordable solution to undisciplined traffic flow on a

particular thoroughfare. Twelve months ago, the community in which I live opted for a system of restricted entry through the suburb to reduce to number of "rat runners" speeding along a particular route during the early morning. At the time the system was put in place, law enforcement of the system was sufficiently regular to be taken for granted, and to ensure an 86% reduction in traffic flow. Then, three months ago, the traffic department underwent severe rationalisation, and overtime for all officers was abolished. Now there is no enforcement of the restricted entry system and the "rat runners" are back in force. In retrospect, a passive measure such as closure of the main access road would obviously have been the better choice. In South Africa, where formal education is limping along on a shoestring budget, and law enforcement (for a multitude of reasons) is virtually non-existent in some areas, the option of passive safety measures must be placed high on any agenda—certainly where traffic safety is concerned.

Against what I have argued above is a word of caution. Just as active measures may fail, so may the too hasty adoption and construction of a passive device which is inappropriate for the identified purpose. Possibly because environmental modification may be the quickest and cheapest solution to an injury hazard—a form of instant gratification—the device too hastily chosen may fail dismally to counter that hazard simply because of a lack of adequate research into the hazard itself, or failure to consult expert opinion before firing up the cement mixer. Again, in South Africa, I notice a growing trend for traffic calming measures to be demanded by community groups, often in response to a spate of casualties in a residential area, or because a particular intersection has been identified as a "black spot". Lay people may go one step further and put pressure on a municipality to construct a specific kind of device, speed humps being particularly popular, although by no means a panacea where the hazard may be compounded by a complexity of factors of which vehicle speed is only one. Also, piecemeal engineering may simply divert a hazard elsewhere so that it becomes the problem of a neighbouring suburb instead.

The most effective passive strategies may simply require forward planning rather than hoping vainly that a "finger in the dyke" approach will plug the gaps later on. Resorting to an ad hoc solution reflects that town planners eschewed safety considerations from the outset and the attitude that condones such blinkered thinking must be discouraged.

There is currently a backlog of over two million subsidised houses in South Africa. These can be constructed either according to an inexpensive generic plan which creates lots of accommodation, and many attendant hazards, or by careful planning that can ensure that safety features are built into the scheme as a whole, for example sufficient recreational space and play areas, shorter streets, restricted access for through traffic, etc. In that effective, enduring passive safety measures do indeed require foresight, research, and careful consideration, these should not be either resorted to, or denigrated as a "cop out", or even worse, as a quick fix.

DAVID BASS

Department of Paediatric Surgery,
Red Cross War Memorial Children's Hospital,
Rondebosch 7700, South Africa
(e-mail: DAVEB@redxch.wcape.gov.za)

1 Shield J. Have we become so accustomed to being passive that we've forgotten how to be active? *Inj Prev* 1997;3:243-4.

Challenge of drowning prevention in low and middle income countries

EDITOR,—We read the editorial on "The challenge of drowning prevention" with great interest.¹ There is no doubt that drowning is a major but under recognised cause of premature loss of life and disability. This has been borne out by the Global Burden of Disease Study which highlights the scale of the problem, by region and by age and sex characteristics.² It is worth examining their findings further.

At a worldwide level, Murray and Lopez estimated that drowning was responsible for about half a million deaths in 1990 and ranked 20th as a leading single cause of mortality, after road traffic accidents (9th), self inflicted injuries (12th), and violence (17th) as the other injury related causes.³ Mortality rates from drowning were highest for children under 5 in China, followed by countries belonging to the "other Asia and islands" region, and sub-Saharan Africa, with the lowest rates in the "established market economies" (EME).⁴ In this age group, the mortality rate ratio between China and the EME was 13:1 in boys and 22:1 in girls.

The large degree of variation between the different regions in the study must belie an even greater variation, both between and within countries, given the different geography and populations. There is great diversity in the circumstances in which drowning occurs in these different areas. Whereas swimming pools, sailing, and water sports may be priority areas in the EME, in low income countries attention must need to be paid to drowning in streams, wells, dams, cisterns, and while fishing.^{1,4} Clearly there are a huge range of different environmental and behavioural circumstances. The obvious intervention to keep the child who cannot swim away from water must have a different interpretation in the different regions. Although swimming pools could be fenced in EME countries, the fencing of waterways would be impractical in countries where this runs into thousands of kilometres. This is not to say that there are no common approaches. As the editorial rightly points out, education about the risks, closer supervision, and training in resuscitation are important first steps which could be applied globally. Researchers also need to study the circumstances under which drowning occurs and the first aid and health care response, within countries and cross nationally. Data on good practice need to be collated so that appropriate interventions which are transferable to other low and middle income countries can be easily identified. Whatever the intervention there is an urgent need to get drowning higher on the agenda for policy makers and researchers.

*The Global Burden of Disease Study used the eight global regions identified by the World Bank for the World Development Report 1993 with similar levels of socioeconomic development, epidemiological homogeneity, and geographical contiguity: the EME, former socialist economies of Europe, India, China, other Asia and islands, sub-Saharan Africa, Latin America and the Caribbean, and the Middle East crescent (which includes North Africa, the Middle East, Pakistan, and the Central Asian republics of the former Soviet Union).

DINESH SETHI
ANTHONY ZWI
Health Policy Unit,

London School of Hygiene and Tropical Medicine,
Keppel Street, London WC1E 7HT, UK

- 1 Pless IB. The challenge of drowning prevention [Editorial]. *Inj Prev* 1997;3:237-9.
- 2 Murray CJL, Lopez AD. *Global health statistics: a compendium of incidence, prevalence, and mortality estimates for over 200 conditions*. Volume II. Cambridge: Harvard University Press, 1996.
- 3 Murray CJL, Lopez AD. Mortality by cause for the eight regions of the world: Global Burden of Disease Study. *Lancet* 1997;349:1269-76.
- 4 Celis A. Home drowning among preschool age Mexican children. *Inj Prev* 1997;3:252-6.

Injuries in less industrialised countries

EDITOR,—I read with interest the report by Mohan published in December.¹ I agree that "Priorities for injury control have to be based on intelligent assessments of official statistics...". This is what prompted me to call attention to the improper use of the word "rate" as presented in the second paragraph, where the author writes "...the rate in India (8.6) is..." in reference to table 1 "Distribution of deaths as a percentage of regional total".

Rates and proportions (expressed as percentages) are different. A rate is the ratio of two different quantities (generally symbolised by the equation a/b) while a proportion is the result of dividing two quantities where the numerator forms part of the denominator (symbolised by the equation a/(a + b)). A proportion multiplied by 100 is a percentage.

Rates and proportions are not synonyms. It seems the author meant to say "percentage" and not "rate". This mistake could confuse those beginning in the field of epidemiology, prompting them to think that "percentage" and "rate" are synonymous: they are not.

ALFREDO CELIS
Public Health Department, CUCS,
University of Guadalajara,
Sierra Mojada #950,
Colonia Independencia, Centro Mídico,
44242, Guadalajara,
Jalisco, Mexico

- 1 Mohan D. Injuries in less industrialised countries: what do we know? *Inj Prev* 1997;3:241-2.

BOOK REVIEW

Target Risk: Dealing with the Danger of Death, Disease and Damage in Everyday Decisions. By Gerald J S Wilde. (Pp 234.) Toronto: PDE Publications, 1994. ISBN 0-9699-12404.

In *Target Risk*, Professor Gerald Wilde of Queen's University in Ontario, Canada assembles an impressive body of theory and evidence to support a provocative conclusion: the only effective strategy for achieving substantial and durable reductions in the rate of injury in a population is to increase people's desire to be safe and healthy. Traditional measures of injury prevention—engineering, education, and enforcement—are doomed to failure because they do not alter the "target levels of risk" that govern risk taking behaviors. The process of "risk homeostasis" will ultimately undermine all non-motivational countermeasures, since people will alter behaviors to achieve an equilibrium between the overall amount of risk they perceive and their overall desired level of risk. The key to success, Wilde argues, is "expectationism": promoting people's interest in their future wellbeing in order to motivate adoption of smaller risk targets.

Wilde is not arguing that people enjoy or seek risk of injury. Like behavioral decision analysts and economists, he postulates that people select or accept risk targets in order to achieve other desired ends in life. When safer highways are built, drivers trade some or all of the extra safety for faster travel speeds and more relaxation (and inattention) in driving. When road conditions deteriorate (due to ice or fog), people sense elevation in risk and respond by slowing down and driving with more care. Using variations on this adaptation theme, Wilde challenges the effectiveness of most mainstream injury prevention measures: seat belt laws, antilock brakes, traffic lights, driver training/education, crack-downs on drinking and driving, highway design improvements, motorcycle helmet laws, you name it! Even more provocatively, Wilde hints that any long term progress that might be made in fatal injury could be offset by increases in the risk of fatal diseases (since people's overall risk target is maintained).

Technical specialists will certainly find fault with Professor Wilde's handling of a variety of complex empirical questions. For example, I thought his discussion of the association between the business cycle and injury frequencies was fair and insightful, yet his assessment of the effectiveness of safety belt use laws was highly selective, one sided, and arguably deceptive. Professor Wilde also has a tendency to see risk homeostatic explanations behind all empirical anomalies. Again, on safety belt use laws, Wilde notes that if belts are 50% effective in saving lives, and if belt use rates increased 50 percentage points following laws, why didn't laws cause an immediate 25% decline in occupant fatality counts? (Wilde is correct that few jurisdictions have experienced 25% reductions in fatalities after belt laws.) Aha, Wilde asserts, maybe drivers offset the benefit of the safety belts by taking more risks. Some alternative explanations that Wilde ignores are (a) the most crash prone drivers (for example, drunks and young males) may be least likely to comply with the law, (b) the 50% increase in use is an exaggeration, and even (c) the 50% effectiveness number may be biased upward (we once thought belts might be 60-90% effective).

Yet I would urge specialists to overlook Wilde's handling of detailed technical matters because such focus can cause the reader to shortchange Wilde's overall message. It is a message that the field of injury prevention needs to hear. We spend remarkably little effort on bottom-up approaches to motivating safety (for example, incentives) and inordinate resources on top-down measures aimed at protecting people from their folly (for example, helmet laws and speeding controls). A deeper understanding of the motivational barriers that frustrate injury prevention measures is critical to the advancement of our field. Professor Wilde makes a lasting contribution by shedding some light on this neglected area.

This book has a length of 234 pages. It is comprehensive in topic coverage. The topics are as follows: the concept of homeostasis, compact theory of risk taking, theory of risk homeostasis, deductions and data, intervention by education, remedy by engineering, enforcement action, risk homeostasis in the laboratory, individual differences, and motivating for safety and health.

JOHN D GRAHAM
Harvard School of Public Health,
Boston, USA

PEDNET

One of the strengths of the pedestrian e-mail network, PEDNET, is the diverse background of the participants. Last month, a physicist, Alan Streater (ads4@lehigh.edu), used his analytical skills to examine how major newspapers covered 42 motor vehicle pedestrian deaths. He termed his analysis "quick and dirty" but it provides insight into the quality of coverage.

He categorized the wording in the reports into neutral, slightly biased against the pedestrians (for example, pointing out twice that it was dark or that the pedestrian was not on a crosswalk), or very biased against pedestrians (for example, "darted out", "ran out into traffic", etc). He found the wording was mostly neutral in 26 out of 42 (62%), partially biased in five cases (12%), and clearly biased in 10 cases (24%). In six cases (14%) the report provided additional wording to excuse the driver, such as "it was raining and hard to see". There were no cases in which wording appeared to exonerate the pedestrian in any way.

Alan had a disturbing observation—that newspaper reporters obtain their understanding of the fatality from police reports. He sees the need for a more careful analysis of biased language in newspaper coverage and, perhaps more importantly, police reports. The consequences of this bias may be more than just public perception; this bias may also jeopardize the prosecution of dangerous drivers. He also recommended comparing interregional and international differences in bias. He also reported the coverage of charges filed. A driver was reported to be charged in only one case out of 42 (2%). In all other cases (98%) the police apparently did not even issue a traffic ticket to the driver at the scene of the crash or shortly thereafter. In six cases, the crash was reported to be still under investigation, implying there is still a chance that some of these drivers might be charged later. Two cases were hit and run, and in one case the driver died. This analysis closely matches Amy Lightstone's recent analysis of drivers who kill child pedestrians. She found that 214 out of 237 drivers were not cited (90%).¹ Can something be done to change this obviously dangerous situation?

Again, the diversity of PEDNET participants provides insight into addressing driver behavior. Osias Baptista Neto (techtran@ouro.alcance.com.br) reported that Brazil has reduced casualties dramatically after a change in traffic law at the beginning of the year. The new laws recognize that vehicular homicide may be unintentional but none the less results from risky behavior. Killing another person in a traffic crash results in imprisonment for two to four years, and a suspension or revocation of the driving license. It increases the penalty by half for striking a pedestrian in a crosswalk or on the sidewalk (pavement). He reports that preliminary data show a 70% drop in casualties in the major cities like Sao Paulo, Belo Horizonte, and Curitiba. His report illustrates the benefits of global comparisons of injury control efforts. *Injury Prevention* connects the English speaking world, but extra effort is required to reach beyond the barrier of differing language.

The barrier is especially significant with legal terms and concepts. However difficult to analyze, injury prevention specialists need to

examine international differences in how legal systems treat motor vehicle injuries.

PETER JACOBSEN
PO Box 712433,
Los Angeles,
CA 90071-7433, USA

1 Lightstone AS, Peek-Asa C, Kraus JF. Relationship between driver's record and automobile versus child pedestrian collisions. *Inj Prev* 1997;3:262-6.

Correction

We regret that a production error occurred in the March issue; this resulted in three addresses being omitted. The missing addresses are as follows:

- Charles Larson (Going international: what are the implications? p 4), Pediatrics, Epidemiology and Biostatistics, Montreal Children's Hospital, 2300 Tupper, Montreal, Quebec H3H 1P3, Canada.
- Robert W Platt (ANOVA, *t* tests, and linear regression, p 52), McGill University/Montreal Children's Hospital, 2300 Tupper, Montreal, Quebec H3H 1P3, Canada.
- Chester S Jones (Children and personal watercraft: injury characteristics and potential countermeasures, p 61), Health Sciences, University of Arkansas, 308 HPER Building, Fayetteville, AR 72701, USA.

CALENDAR

18-22 October 1998. Fourth International Symposium: Rural Health And Safety In A Changing World, Delta Bessborough Hotel, Saskatoon, Saskatchewan, Canada. Organized by the Centre for Agricultural Medicine, University of Saskatchewan in cooperation with the Canadian Coalition for Agricultural Safety and Rural Health, Committee on Occupational Health in Agriculture of the International Commission on Occupational Health, and others. This conference seeks to capture the emerging science of health, safety, and sustainability in agriculture and rural life, and to probe beyond these issues to address the thriving and survival issues of the future. In addition to abstracts from scientists, health care workers and others, abstracts are also invited from rural people with views on this topic. *Further details:* Fourth International Symposium: Rural Health and Safety in a Changing World, Centre for Agricultural Medicine, RUH, PO Box 120, Saskatoon, Saskatchewan S7N 0W8, Canada (e-mail: symposium.98@usask.ca, web site: www.usask.ca/medicine/agmedicine/symp98.html).

Notice to authors: a new section Brief reports

All editors would like to publish as many worthy papers as possible, with minimal delay. To facilitate this, in future, the journal will include a section entitled "Brief reports". These will be peer reviewed and when approved, publication will be expedited.

Please note: papers being submitted for this section should not exceed 1500 words.