

What's New: NH&MRC Road Accident Research Unit

The charter of the NH&MRC Road Accident Research Unit when we were first funded by NH&MRC back in 1981 was to investigate medical aspects of road traffic accidents in Australia, including their epidemiology. We are on five year funding, and were reviewed about three weeks ago for possible renewal for a further five years.

I want to emphasise that we are on health sector funding. Now that Ian Smith's Unit has been established in Perth, we are not the only group in Australia to be conducting road accident research on other than Transport sector funding. We are somewhat more removed than Ian is from the political process in that our funds are allocated by a research council rather than directly from the Federal Government.

The report on the rural accident study which we conducted in conjunction with the South Australian Office of Road Safety and FORS came out last December. Two cases involving trucks illustrate some of the issues arising from that study.

Another characteristic of rural crashes was found also in Mary Armour's study - drivers drop a wheel off on to the unsealed shoulder and loose control coming back on. One third of all non-intersection crashes in our rural study were caused in that way and I gather the percentage was about the same in the single vehicle crash study in Victoria.

The bulk of our resources in the Unit is devoted to the study of brain injury mechanisms. We have been working with fatal pedestrian crashes in which we try to relate the nature and severity of the impact to the head to the nature and severity of injury to the brain, as determined by neuro-pathologists. This work was reported in a paper in the IRCOBI Conference this year. We have been able to show marked differences in the pattern and severity of brain injury related to the point of impact on the head. This has never been done before. The two points that we looked at in the paper were impacts on the rear of the head, impact which affectively translate the head without rotation, and impacts above the ear on the side which both translate the head and rotate it. The resulting patterns of injury and severity of injury are very different for the two types of impact. Our long term aim is to come up with impact tolerance limits for different types of impact to the head.

We have got a small study in progress, with funding from the College of Surgeons, on car occupant head injury. This will only cover about twenty cases with data collection over six months. In one crash an unrestrained rear seat passenger had a small fracture at the front of the skull. The driver had an egg shell fracture (that is, complete shattering) at the back of his skull and a broken neck - his head was literally knocked off the spine - both caused by the head of the rear seat passenger. That is the most compelling evidence I have yet seen about the desirability of ensuring that the person seated behind you is wearing a seat belt. I hope that we will be able to get continuing support for this program.

Our other major area of research is on drink driving. We have been getting data from several areas over recent years. Over the last ten years, we have breath tested 50,000 drivers by going up to them when they

stop at a red traffic light. There is a very small proportion of these non-accident involved drivers above .10 g/100 mL. By comparison, most of the fatally injured drinking drivers are above .10. We are convinced that the drink driving problem in relation to crashes and injury is centred well above .10, and we are yet to be convinced that it really matters whether the limit is .08 or .05. The argument in favour of it mattering is that if you lower the limit to .05 you shift the BAC distribution of all drinking drivers to the left. There is not yet sufficient evidence to be able to resolve that claim.

Oskana Holubowycz is now steadily working through a mammoth study of interview data on drivers admitted to hospital and trying to relate behavioural factors to high BACs. FORS is providing support to assist with this work.

Last year we had Hans Laurell from the Swedish Road and Traffic Research Institute with us for a total of nine months on funds supplied by the State Government Insurance Commission. At our request he ran a closed course study of alcohol impaired driving at night at the Edinburgh Air Base on a six kilometer circuit. We had 24 drivers and one of their tasks was to look for obstacles, or visual targets, set off to one side of the circuit. What we were trying to simulate was something along the lines of trying to see a pedestrian at the side of the road at night. When the driver saw the target he had to touch the brake. We were using the ARRB instrumented vehicles and so the detection distance could be recorded. Each driver was his own control; they drove at zero, .05 and .10 g/100 mL. At .05 there was a small reduction in detection distance, that is to say they were closer, and at .10 there was clearly a major difference. Of the 24 drivers, half of them were light drinkers and half of them were heavy drinkers (our definition of heavy drinking was five or more drinks per session). Somewhat surprisingly, our data did not support our hypothesis that heavy drinkers would perform better than light drinkers.

Finally, we used the same methodology to study the effect of tinted windscreens using two Commodores lent to us by General Motors. We were only able to run one subject but the results showed a substantial reduction in detection distant with the tinted windscreen.

A.J. McLean
16th January, 1990.

TALK by A.J. MCLEAN given at the Road Researchers Conference at Woodend on 14/11/89.

The NH&MRC Road Accident Research Unit - our charter when we were first funded by NH&MRC back in 1981 - is to investigate medical aspects of road traffic accidents in Australia including their epidemiology. Now if you define that broadly enough it means you can just about do anything. We are on five year funding, we have got reviewed about three weeks ago - the review committee said nice things so we may be around for another five years. We have that form of existence where if we find the money the University is pleased to take credit for what we do and if we don't find the money they don't want to know us.

I would want to just emphasise that we are on health sector funding and now with Ian's Unit in Perth, we are not the only group in Australia to be conducting road accident research on other than Transport sector funding. We are somewhat more removed than Ian is from the political process in that our funds are allocated by a research council rather than directly from the Federal Government.

The rural accident study which we conducted in conjunction with South Australian now office of Road Safety and FORS. The work was done a couple of years ago but the report came out last December. Just to show two cases quickly, this is a truck accident on the Melbourne road through the Adelaide hills - a truck coming down, crossed the median here. The driver had been driving for twelve hours (said he had been driving for 12 hours) met a Ford Laser on the way across. The two elderly occupants were left staring at the sky and considerably shaken but alive. But a middle aged women in a Commodore in the next lane was left lucky, by the time the truck

stopped, having demolished a house with a Commodore trapped underneath (it had travelled 150 metres from where it first hit the Commodore).

Peter O'Connor mentioned some concern in the South Australian office of Road Safety about the FORS paper (and it was a FORS paper not an ATAC paper) on recommending increased truck speed limits and it seems to me that there are times when there can be too close a link between research and policy. There are countless examples in the United States on that issue. And I was a bit alarmed I have to say to see that the conclusions from this meeting are going to be submitted up to ATAC for approval. I would much rather see that the combined research programs sort of go up for advice rather than for approval. I could elaborate further on that, but I am sure all of you read the research "Reducing Traffic Injury - A Global Challenge" of which you will have two authors here - Gordon will be here this evening - in which we tried to address that issue at some length - there are pros and cons in both ways.

The other characteristic of the rural crashes was found also in Mary Armour's study - drivers drop a wheel off on to the unsealed shoulder and loose control coming back on - that was the car that lost control and collided with a late model car coming the other way with a family in it, and very nearly disseminated the family. One third of all no intersection crashes in our rural study were caused in that way and I gather the percentage was about the same in the single vehicle study in Victoria.

Of other work - the bulk of our activities are devoted to the study of brain injury mechanisms and we have been working with fatal pedestrian crashes which we try and relate the nature and severity of the impact to the head to the nature and severity of injury to the brain determined by

neuropathologists. We had a paper in the IRCOBI Conference this year and it is in the Proceedings from that Conference. For the first time anywhere we have been able to show marked differences in the pattern and severity of brain injury related to the point of impact on the head and the two points that we looked at in the paper were impacts on the rear of the head which affectively translate the head without rotation and impacts above the ear on the side which both translate the head and rotate it and the resulting both pattern of injury and severity of injury is very different for the two types of impact. Our long term aim with this if we keep being funded long enough, is to come up with tolerance limits for different types of impact to the head.

We have got a small study with funding from the College of Surgeons under way on car occupant head injury. This will only cover about twenty cases with data collection over six months. This happened to be the first case of a rented Falcon - another off on to the shoulder, loss of control, back across the road and into the tree. The driver was unrestrained and had fatal chest injuries but also an unrestrained rear seat passenger and the rear seat passenger had a small fracture at the front of the skull. The driver had an egg shell fracture (that is complete shattering at the back of his skull) and a broken neck - his head was literally knock off the spine by the head of the rear seat passenger. That is the most compelling evidence I have seen yet about the desirabililty of having the person behind you wear a seat belt.

I am hoping that we will be able to get continuing support to keep this program under way and I might mention - and many of you will know - the literature review we did for FORS on head and neck injury in car occupants - one of our recommendations was that protective head gear be

developed suitable for use in a passenger car. I am willing to wager a small amount that within ten years, it will not be uncommon for car occupants to wear some form of protective head gear, because head injury is the leading cause of death among car occupants and the mere fact that you are sitting in a tin can, doesn't mean you necessarily much better protected than the motorcyclist.

On alcohol, we have been getting data from several areas over recent years and this is a summary of that information. What we have here is the percentage of driving from vertical axis blood alcohol concentration that way - this is from our roadside surveys, and over the last ten years, we have breath tested 50,000 drivers by going up to them, when they stop at a red traffic light and saying we are not the police but from the university doing a study on drinking and driving - would you please blow in this? The poor b..... don't have a chance --- the point I would draw attention to is whether you look at .05 or .1. There is a very small proportion of non accident involved drivers are above .1. These are drivers involved in casualty crashes at least over 15 years old from the in-depth study. This is more current data on drivers admitted to hospital and these are drivers fatally injured. You can see the fatally injured drivers (the great bulk of them) are above .1 and people working in the field will be sick to death of hearing us say this, but we are convinced that the drink driving problem in relation to crashes and injury is centre well above .1 and we are yet to be convinced that whether the limit is .08 or .05 we are yet to be convinced that it matters. The argument in favour of it mattering is that if you lower the limit to .05 you shift the distribution to the left and I guess we believe there is not yet evidence to be able to resolve that matter.

Those of you interested in alcohol will know to talk to Oskana, but she is now steadily working through with the system with FORS a mammoth study of interview data on interviewing drivers admitted to hospital before knowing what their blood alcohol levels were and then trying to relate behavioural factors to high BACs.

Last year we had Hans Laurell from the Swedish Road and Traffic Research Institute with us for three months on funds supplied by the State Government Insurance Commission and we had him run a closed course study at the Edinburgh Air Base on a six kilometer circuit. We had 24 drivers and one of their tasks was to look for obstacles, now the obstacles were actually visual targets about that size covered with matt black cloth set off to one side of the circuit. And the driver when they saw the target had to touch the brake and we were using the ARRB instrumented vehicles doing this and at zero BAC each driver at his own control - zero, .05 and .1. At zero BAC we had that sort of competency and .05 there was a reduction in detection distant, that is to say they were closer and I guess what we were trying to simulate was something along the lines of trying to see a pedestrian at the side of the road at night. But obviously significant difference .1 there was clearly a major difference. Hans Laurell before he came to Australia and since he has been back in Sweden is campaigning vigorously for zero BAC for drivers left shaking his head saying that Australians must be different to Swedes, but we would like to do this study again because we think we have learnt quite a lot in doing that and anybody interested in why we want to do it again I will be happy to talk about later. Of the 24 drivers, half of them were light drinkers and half of them were heavy drinkers and definition of heavy drinking was five or more drinks per session which I strongly suspect is micky mouse. We are aware of some people who consider 20 drinks a session to be normal but possibly because of our definition of light and heavy drinkers, we got some

surprising results - this is the detection distant begin, the higher the better and heavy drinkers perform worse than light drinkers. But you will notice they also perform worse when sorber, so we are not quite sure what to make of this but we have got a similar result with number of mistakes and number of mistakes would be if they touched the brake when in fact there was not a target there. We got that sort of thing which again suggested that the heavy drinkers were worse and I guess all we can really say is that our data did not support our hypothesis that heavy drinkers do better than light drinkers.

And the final thing which is mentioned I think in the brief summary that I listed using the same methodology, we had a look at the effect tinted windscreens using two Commodores lent to us by General Motors. We were able to show a substantial reduction in detection distant with the tinted windscreen which is a longer story than I have time to talk about now. We were only able to run one subject and I am not sure whether General Motors will let us have the cars again but we will see.