Dear Senate Committee

Submission No 4, Supplementary Part 4

Concerns are listed below in 3 parts about information provided to the Senate Hearing on the 16 November 2015 at Parliament House, East Melbourne.

Part A
Discussions occurred between Senator Canavan and Associate Professor Olivier concerning census data with reference to cycling to work figures of 1.14% and 1.13% for city locations between 1986 and 1991. Prof. Olivier's response to questioning about the effects of legislation on cycling levels included:

Prof. Olivier stated:
"*In addition to that, if you look at the proportion cycling to work in Australian cities, where most of the cycling is occurring, from 1986 to 1991 the proportions for cycling went from 1.14 per cent to 1.13 per cent and—"*
And
"1.14 per cent to 1.13 per cent. The difference is in the hundredths of a per cent.' He was referring to the combined data from cities with legislation and those without. He also claimed that the actual count of cyclists went up. Prof. Olivier gave the misleading impression of a very minor change due to legislation with an increase in the number cycling to work. He referred to the combined data rather than from cities that were subject to helmet legislation.

In 1991 some capital cities had introduced and enforced helmet legislation, i.e. Melbourne, Sydney, Adelaide and Hobart. Census data totals for capital cities, 1986 and 1991 (except Darwin) were reported by Mees et al[1].

The total count of people cycling to work for capital cities with enforced helmet legislation in 1991 went down compared with 1986, from 30817 to 28573. The total count of people cycling to work for capital cities without legislation in 1991 (or not enforced for Brisbane) went up compared with 1986, from 12401 to 15186. In answer to a question about the effects of helmet legislation it was misleading to claim the count went up because in the cities with enforced legislation they all went down. By 1996 when helmet laws had been enforced in all cities, the commuter cycling proportion had dropped from 1.13% to 0.89%.

Submission No 4, Table 14, includes the 1.14% and 1.13% figures and details a reduction of 1% for 'Capital cities' and 32% for the 'Rest'. Table 15 details the changes, from 1986 to 1991 for each state and territory. All states with enforced helmet legislation in 1991 had a reduction in percentages cycling to work from 54,532 (1.47% of the workforce) to 44,978 (1.22%).
NSW from 1.09% to 0.96%
Vic from 1.75% to 1.36%
SA from 2.27% to 1.95%
Tas from 0.87% to 0.76%
In contrast cycling to work in other states increased from 31,699 (2.2% of the workforce) in 1986 to 37,017 (2.4%) in 1991, but reduced to 1.74% in 1996 after the introduction of helmet laws in these states. The total number cycling to work reduced from 86201 in 1986, 81995 in 1991 and 74456 in 1996, when all states had implemented helmet legislation.

[1] Travel to work in Australian capital cities, 1976-2006: an analysis of census data Paul Mees, Eden Sorupia & John Stone December 2007 http://www.cycle-helmets.com/travel-to-work-1976-2006.pdf

Part B

Prof. Rosenfeld tabled a 2009 report 'The economic cost of spinal cord injury and traumatic brain injury in Australia'[2] that estimates costs associated with spinal cord injury (SCI) and traumatic brain injury (TBI). The report estimated a total cost for TBI of $8600 million, some 46 times higher than the estimated direct cost of hospital care of $184 million quoted in a 2008 report[3]. The executive summary of the 2008 report on TBI states: *There were an estimated 22,710 hospitalisations involving traumatic brain injury in Australia in 2004–05. These hospitalisations resulted in over 26,000 episodes of inpatient care totalling nearly 206,000 days, and estimated direct costs of hospital care of $184 million*.

The 2009 report shows in Figure 2.2 that cyclists comprise 3% of TBI cases compared with pedestrians at 11% and motor vehicle occupants at 32%. In Figure 2.4 it shows cyclists comprise 2% of SCI cases, pedestrians 2% and motor vehicle occupants at 24%. The table below compares the percentages of cases.

	Motor vehicle	Motor cyclist	Pedestrian	Cyclist
% TBI cases (Vic)	32	8	11	3
% SCI cases (Vic)	24	18	2	2
% average TBI/SCI	28	13	6.5	2.5

On average cyclists comprise the smallest road user group who sustain TBI and SCI. The report does not indicate if costs have changed (or relate to risk per km cycled) for cyclists following helmet requirements. Submission No4, page 24 details 'length of stay' (LOS) and 'total patient days', with cyclists having the lowest average LOS , less than half that of pedestrians, 3.0 v 8.8 days, and also the lowest total for patient days. Data from Canada reported; '*Of note, while the length of stay for cycling injury admissions overall has decreased (from 4.6 to 4.2 days) over the decade of study, the length of stay in hospital for head injuries due to cycling has risen 4.3 to 6.9 days'*. Cyclist's average length of stay in hospital for head injuries increased from 4.3 days in 1994/95 to 6.9 days in 2003-04[4] during a time of increased helmet usage. Clarke 2007[5] reported; *Neck injury data indicates helmets use may not provide any benefit. Attewell stated; "Three studies provided neck injury results that were unfavourable to helmets with a summary estimate of 1.36(1.00, 1.86), but this result may not be applicable to the lighter helmets currently in use". A combination of helmet factors increase the risk of a neck injury, size, mass, gripping the road surface, bending moment and overall accident rate*." The evidence is mixed regarding if helmet use results in an increase total cost for both TBI and SCI.

The 2009 report may have inflated the costs to arrive at a cost for TBI some 46 times higher than the '*estimated direct costs of hospital care of $184 million'*. The report may be unreliable. It was reported that head injuries in South Australia were a diminishing problem for all road users[6], so alternatives to helmets may provide the best outcome.

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[2] The economic cost of spinal cord injury and traumatic brain injury in Australia' https://www.tac.vic.gov.au/about-the-tac/our-organisation/research/tac-neurotrauma-research/vni/the20economic20cost20of20spinal20cord20injury20and20traumatic20brain20injury20in20australia.pdf

[3] Helps Y, Henley G & Harrison JE. 2008. Hospital separations due to traumatic brain injury, Australia 2004–05. Injury research and statistics series number 45. (Cat no. INJCAT 116) Adelaide: AIHW http://www.aihw.gov.au/workarea/downloadasset.aspx?id=6442458806

[4] Head Injuries in Canada, A Decade of Change, Canadian Institute of Health Information, August 2006 https://secure.cihi.ca/free_products/ntr_head_injuries_2006_e.pdf

[5] Clarke CF, The Case against bicycle helmets and legislation, VeloCity Munich, 2007. http://www.ta.org.br/site/Banco/7manuais/colin_clarke_cycle_helmet.pdf

[6] North B, et al, Head injuries from road accidents – a diminishing problem (letters), Med J Aust.Vol 158, March 15, 1993.

Part C
Prof. Rosenfeld tabled an editorial from the Medical Journal of Australia in 2013, 'Head injury prevention for bicyclists — helmets make a difference'[7]. It reports' *'Unfortunately, with increasing participation there has been a concurrent increase in injury, with 10 552 bicyclists admitted to hospital in Victoria between July 2001 and June 2006.*'

Details reported in 2010 also raised concerns[8];
'In 2007, pedal cyclists comprised 14.6 percent of serious injuries in road-based traffic crashes in Australia [3]. Over the period 2000 to 2007, based on data from the Australian Institute of Health and Welfare (AIHW) National Hospital Morbidity Database, serious injury rates for cyclists (per 100,000 population) increased by 47%, while for all other modes (motorcycles aside), rates either remained steady or declined [3]. The extent to which the increase in cyclist serious injuries is attributable to increased rates of cycling is currently unknown, though there appears to have been no commensurate increase in bicycle travel in Australia [4, 5].

And also
'The traffic-related fatality and serious injury rates for cyclists in this study are high in comparison with many other wealthy countries [6, 22]. While sample sizes preclude a direct comparison with other locations, the cyclist fatality rate of between 4 and 7 per 10^8km in Sydney3 is several times greater than in the Netherlands (1.1 per 10^8 km), Denmark (1.5) and Germany (1.7), though comparable to the USA (5.8) [6]. The cyclist serious injury rate in Melbourne of between 124 (police data) and 315 (hospital data) per 10^8km cycled4 is very much greater than in the Netherlands (14), Denmark (17) and Germany (47), though, once again, comparable to the USA (375) [6].'

The 2013 editorial mentions; '*A prospective study of 1710 Victorian helmeted and unhelmeted casualties showed that the risk of head injury, including serious injury, was reduced by at least 39% by wearing a helmet.'*

A reply I submitted in 2012 to the Canadian Medical Association included the following;
'The Coroner's study mentions 'Another large study involving 1710 cycling collisions found a trend toward a protective effect of helmets, but included only 14 fatalities.' The McDermott 1993 report was primarily based on hospitals in Melbourne and Geelong and included 14 deaths. Cyclist deaths in Melbourne and Barwon areas (Barwon includes Geelong) for the period 1987-89 totaled 37 and 9 respectively, 46 in total. The report failed to include more than half the deaths. In Victoria young children tended to have high wearing rates, pre law in 1989, 5-12 yrs about 60% wearing when cycling to school, 30% for recreational use. For 13-18 yrs, about 15% and 12% wearing. It appears that females had a slightly higher wearing rate than males. In most accidents the younger age group would be cycling slower and have less distance to fall. Their average length of hospital stay is significantly shorter than for older cyclists.[5] The protective effects of helmets may have been overvalued in the report.[9]'
Note- data collection was for approximately 16 months from the period 1987-89.

Cyclehelmets.org also provides commentary on this paper stating;
'This paper does not provide reliable evidence that helmets reduce head injuries[10]*.'*

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[7] Head injury prevention for bicyclists — helmets make a difference, MJA 522 199 (8) · 21 October 2013
[8] Cycling injuries in Australia: Road safety's blind spot?, J Garrard J, Greaves S and Ellison A, Journal of the Australasian College of Road Safety – August 2010 http://www.cycle-helmets.com/cycling-blind-spot.pdf
[9] Essential to provide full information, CMAJ response 11.12.2012 http://www.cmaj.ca/content/184/17/E921/reply#cmaj_el_713725
[10] Commentary by Cyclehelmets.org, The effectiveness of bicycle helmets: a study of 1710 casualties http://www.cyclehelmets.org/1165.html

The MJA editorial also mentions;
'In Australia, unlike the Netherlands, motor vehicle drivers have generally not been exposed from a young age to bicyclists in traffic and may be less aware of bicyclist vulnerability. Despite these differences, in 2009, 185 bicyclist fatalities occurred in the Netherlands (population 17 million)[8] and 31 in Australia (population 22.7 million).[9]'

The MJA editorial suggests that cyclists may have a lower proportion of head injury by wearing helmets and that the fatality rate in Australia may even be better than in the Netherlands. It fails to mentions the rate of cycling, e.g. about 1% to 2% of trips in Australia and about 26% of trips in the Netherlands[11,12] are by bicycle. The population/trip ratio equates to approximately 17 x 0.26 for the Netherlands versus 22.7 x 0.015 for Australia, 4.42 v 0.34, or about 13 to 1. The MJA misleads by omitting the important consideration of the level of cycling activity. The editorial does not provide reliable evidence that helmets improve overall safety.
http://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0ahUKEwj0k42furXJAhWCbhoKHRsjC8AQFgggMAA&url=http%3A%2F%2Fwww.fietsberaad.nl%2Flibrary%2Frepository%2Fbestanden%2FCyclingintheNetherlands2009.pdf&usg=AFQjCNEdbP9-cMRvDKoDOgQt1MFCEv4dwA&sig2=frpjIjWUzJ4LYUSy9gfzTw&bvm=bv.108194040,d.ZWU

[11] Pucher, Garrard, and Greaves, Bicycling in Sydney and Melbourne, http://sydney.edu.au/business/__data/assets/pdf_file/0004/63616/cycling-down-under.pdf
[12] Cycling in the Netherlands 2009 - Fietsberaad http://www.fietsberaad.nl/library/repository/bestanden/CyclingintheNetherlands2009.pdf