



Mandatory Bicycle Helmet Use: Experience in Victoria, Australia

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On July 1, 1990, the legislation requiring wearing of an approved bicycle (safety) helmet by all pedal cyclists, unless exempted, came into effect in Victoria, Australia. The paper describes the more important activities which paved the way for this initiative and presents some preliminary information about the effect of the legislation on wearing rates and head injuries. Since 1980 there has been promotion of helmet use through bicycle education in schools, mass media publicity, support by professional organizations and community groups, bulk purchase schemes, and government rebates for helmet purchases. The Australian Standard for bicycle safety helmets has also been changed to meet community demands for lighter helmets with more provision for ventilation. There has been a steady increase in voluntary helmet use in Melbourne from 1983 to March 1990, as follows: 5% to 70% in primary school children; 2% to 20% in secondary students; and 27% to 40% in adults. In the period after the legislation, with relatively little enforcement, these three groups have shown substantial increases in helmet use rates, rising to 70-90% in most cases. Preliminary data show that the numbers of bicyclists with a head injury have dropped in the period since the legislation came into effect. The possible contributions to this reduction, of less bicycle use and lower risk of head injury in an accident, are discussed.

On July 1, 1990 the legislation requiring wearing of an approved bicycle (safety) helmet by all pedal cyclists, unless exempted, came into effect in Victoria. It is understood that Victoria was the first state in the world to introduce such a requirement. This paper describes the more important activities during the past decade which paved the way for this groundbreaking initiative and provides preliminary information about the effect of the legislation on wearing rates and injuries.

The Legislation

The requirement to wear a helmet when bicycling in Victoria is implemented as a regulation under the Road Safety Act 1986. The Road Safety (Bicycle Helmets) Regulations 1990 amends the Traffic Regulations to insert *inter alia*:

"Bicycle Helmets to be Worn: A person must not drive a bicycle on a highway unless he or she is wearing a securely fitted bicycle helmet of a type approved by the Roads

Corporation. A person must not use a bicycle to carry another person on a highway unless that person is wearing a securely fitted bicycle helmet of a type approved by the Roads Corporation [VICROADS]. Penalty: 1 penalty unit."

The maximum penalty of 1 penalty unit (currently \$100) is rarely applied as offenders are not normally taken to court, but rather a Traffic Infringement Notice for \$15 is issued. For children, a Bicycle Infringement Notice (no monetary penalty) may be sent to the parents.

At the time of the announcement (September 1989) of the introduction of the requirement, the Australian Standard for bicycle helmets was under review [1]. VICROADS approval was introduced as an interim measure pending amendment of Standard AS 2063.2 in April 1990. This system allowed the newer, lighter-weight style helmets to be approved, without compromising safety for cyclists. Helmets satisfying the existing standard received automatic approval. However, from April 1992, certification to the new Australian Standard replaced the need for VICROADS approval.

The definition of a highway includes any area provided for separate vehicular traffic or use by the public for passage with vehicles (a bicycle is defined as a vehicle in Victorian law). In practical terms, this means that all cyclists are required to wear a helmet whilst cycling on the road, separate bicycle path, shared footway, or in a public park [1].

The regulation also provides for the following exemptions to be granted:

1. "a person participating in a race that is declared by the Roads Corporation by notice in writing served on the race organisers to be an authorised race for the purposes of this regulation"; to avoid discouraging overseas participants in international bicycle races from competing in Victoria;
2. any person who "would find it extremely difficult to comply with those requirements"; to cover medical conditions not anticipated at the time of the regulation;
3. until 1 July 1991, a person who "is a practising member of an organised religion who is wearing a headdress customarily worn by members of that religion and that headdress makes it impracticable for the person to wear a bicycle helmet";

specifically to exempt (at least temporarily) the Sikh community in Victoria, who cannot accommodate a turban with a bicycle helmet; and

4. until 1 July 1991, a person who "has a physical condition or characteristic that makes it impracticable for the person to wear a bicycle helmet"; to cover the small percentage of the population with heads larger than the maximum helmet size available.

While the regulation does not specify so, an exemption has also been granted to Postal Delivery Officers riding bicycles while delivering mail, but not while cycling to and from the Post Office [1].

Setting the Scene

A climate which favored promotion of bicycle helmets with an ultimate goal of compulsory use had been created in Victoria during the 1960's and 1970's. A law which required all motorcyclists to wear an approved helmet had come into effect in Victoria in 1961. During the 1970's the Victorian government had achieved considerable success in reducing deaths and injuries to all road users through restrictive legislation supported by publicity and enforcement, e.g., compulsory seat belt (1970) and child restraint use laws (1975), random breath testing (1976), higher penalties and licence cancellation directed against drink-driving (1978), and engine capacity limits for novice motorcyclists [2].

By the mid-1970's, a few cyclists were wearing bicycle helmets of unknown protective performance, although some imported helmets met overseas standards. In 1977 the Standards Association of Australia published its standard AS2063-1977 "General Purpose Protective Helmets (for use in pedal cycling, horse riding and other activities requiring similar protection)," but it was not until 1981 that the first helmet was certified as meeting the Standard.

An important study of the differences between the pattern of injury for motorcyclists, nearly all of whom wore helmets, and bicyclists, very few of whom wore helmets, showed significant differences. "The frequency of fractured vault of skull was significantly higher in pedal cyclists than in motorcyclists sustaining only head injury. Although motorcyclist casualties overall outnumbered pedal cyclist casualties two to three times, there were about twice as many pedal cyclists as motorcycle riders with sole head injuries" [3].

A later study examined the effectiveness of bicycle helmets for a sample of wearers on the basis of self-reported accidents. It concluded that the better hard shell helmets gave greater levels of protection than inferior hard shell helmets, soft helmets, or no helmets [4].

Helmet Promotion

There was a wide variety of activities to promote helmet use including education, publicity, support by professional and interested organizations, bulk purchase schemes, and helmet rebates [1, 5]. These culminated in a statement in Parliament by the Hon. Steve Crabb, Minister for Transport, in October 1984 that the government would move towards compulsory helmet

wearing legislation [6]. Some of these activities are described below and in greater detail elsewhere [5, 7].

Education

In 1980, a bicycle safety education unit (Bike-Ed) for use in primary and lower post-primary schools (students aged 9-13 years) was developed. Promotion of bicycle helmets was achieved through the use of this unit and an associated film on safer riding.

A decision by the Education Department that from January 1983 helmets must be worn when participating in all school cycling activities, including Bike-Ed, was a major turning point in the acceptance of helmets. At the time however, it was considered by some to be the death-knell for Bike-Ed as a voluntary activity because "most students would not participate if helmet wearing was compulsory." It was clear that means would have to be found to promote helmets and make them more readily available to schools if Bike-Ed was to survive and expand.

Improving Helmet Availability

During the second half of 1982, the Road Safety & Traffic Authority established a bulk helmet purchase scheme, with the co-operation of one Education Department region, which enabled parents to order helmets through schools at \$30 (approximately 33% discount). All 1,000 helmets underwritten by the scheme were sold and there was demand for more. This pilot scheme clearly demonstrated that demand for helmets could be generated by such discount schemes.

Guidelines for a modified bulk purchase scheme involving discount through arrangements with retailers were developed during 1983 and assistance was provided to a number of organizers of such schemes through Education Department Regions and individual schools. Schools were also encouraged to seek support from local service clubs for the purchase of helmets and some succeeded. Several Education Department Regions acquired trailers which contained sufficient helmets and other equipment for a Bike-Ed course, which were loaned to schools.

Publicity

In preparation for a major publicity campaign, the Road Traffic Authority commissioned research on the attitudes of cyclists to helmet wearing [8]. This concluded, first, that there are strong negative reactions by the older boys to bicycle helmets, and they have heightened sensitivity to peer group pressure. Second, the reactions of younger boys and girls, although still negative, are predicated to a much lesser degree by peer group pressure. Third, promotional activity should be targeted at the mothers of primary school age children. The key points to be communicated are the availability of helmets that meet approved safety standards; the seriousness of the head injury problem, both in collisions with cars and in single vehicle bicycle accidents; the degree of protection provided by the helmets; and the importance of the helmets for younger, less skilled bicycle riders.

Two television commercials were developed, based on this

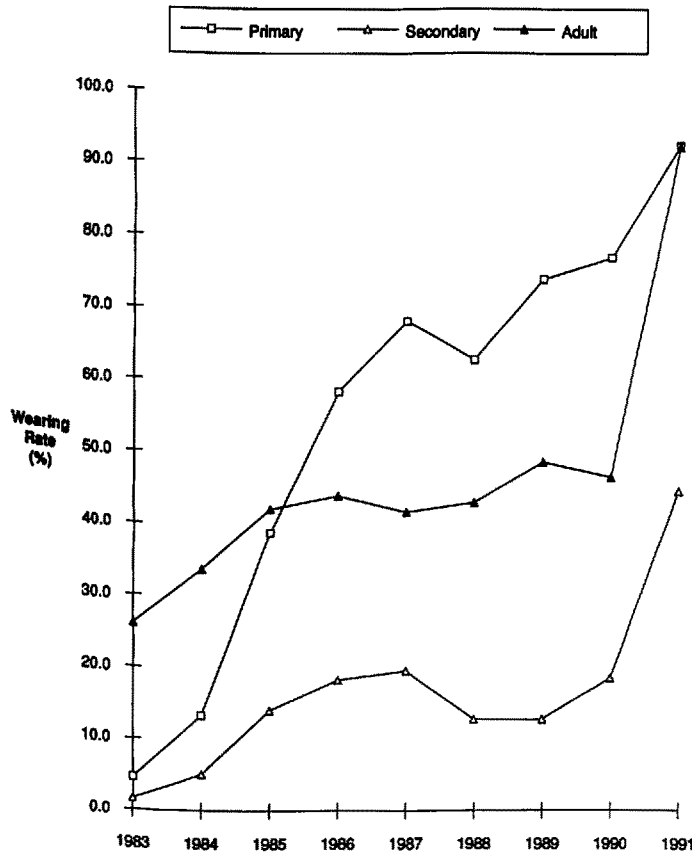


Fig. 1. Helmet wearing rates for metropolitan commuting cyclists, Victoria, Australia, 1983-1991.

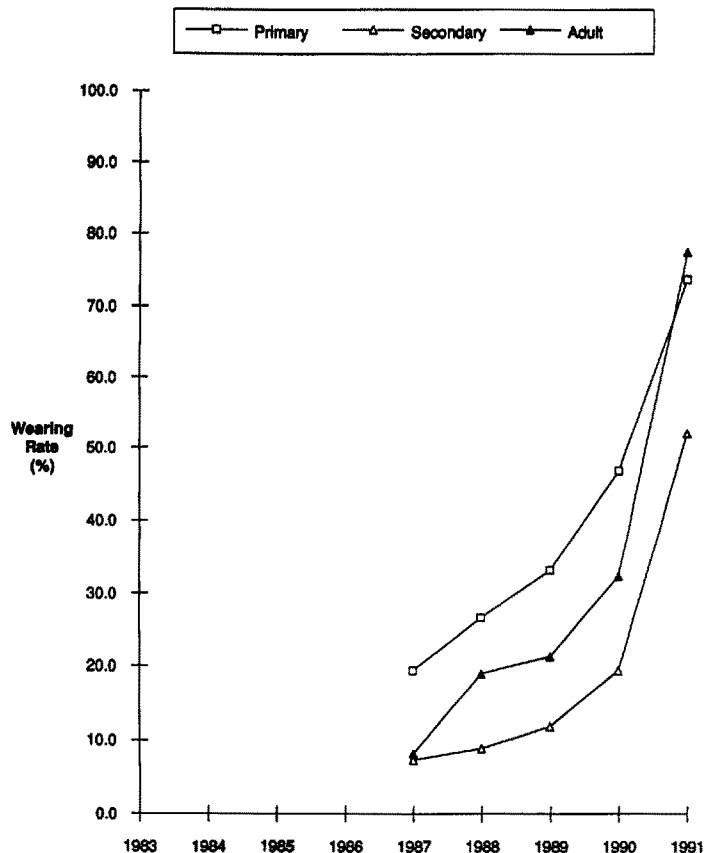


Fig. 2. Helmet wearing rates for metropolitan recreational cyclists, Victoria, Australia, 1987-1991.

and further research. In March 1984 the commercials were launched using TV and radio, supported by a pamphlet. The initial campaign lasted about two months, but the commercials continued to appear for many more months.

Further Helmet Promotion Activities

In order to coordinate and support a wide range of further helmet promotion activities, the Road Traffic Authority established a helmet promotion task force whose membership included representatives from the Bicycle Institute of Victoria, Brain Foundation, Child Accident Prevention Foundation of Australia, Education Department, Police Department, Royal Australasian College of Surgeons, Royal Automobile Club of Victoria, State Bicycle Committee, bicycle retailers, helmet importers, and helmet manufacturers. This group had been built up in part from those organizations and individuals who had attended earlier meetings on helmet promotion convened by the Royal Australasian College of Surgeons, which had been actively promoting both helmet rebate schemes and compulsory use legislation for several years.

The main helmet promotion activity during 1984 was further provision of assistance to organizers of bulk helmet purchasing schemes, mainly in Education Department Regions, but generally using designated retailers. At least 20,000 helmets were sold through these schemes at savings of about \$10 each.

Guidelines for operating such bulk purchase schemes were provided to assist organizers [9].

Helmet Rebate Scheme

Early in December 1984, the Minister for Transport announced that the government would pay a rebate of \$10 to all purchasers of an Australian made, Standards Association approved bicycle helmet. The scheme was to operate for purchases made from December 11 to 29, which was traditionally the peak time for helmet sales. The television and radio publicity campaign was re-run during this period with the mention of the \$10 rebate added to the TV commercials. A total of more than 37,000 rebates were paid and many others purchased helmets but did not bother to claim.

At the end of 1984, four imported helmets had received Standards Association approval but these helmets were not included in the rebate scheme. The importers were vehemently opposed to the initial scheme and there was public demand for extension of it. A \$5 rebate scheme began on February 25, 1985 covering all approved helmets purchased between the end of the previous scheme (i.e., December 29, 1984) and March 9. Over 5,000 rebates of \$5 were paid under this scheme.

Subsequent lobbying by Australian manufacturers and importers about which helmets should be covered, plus the views of some bicycle groups that no helmet rebates should be offered

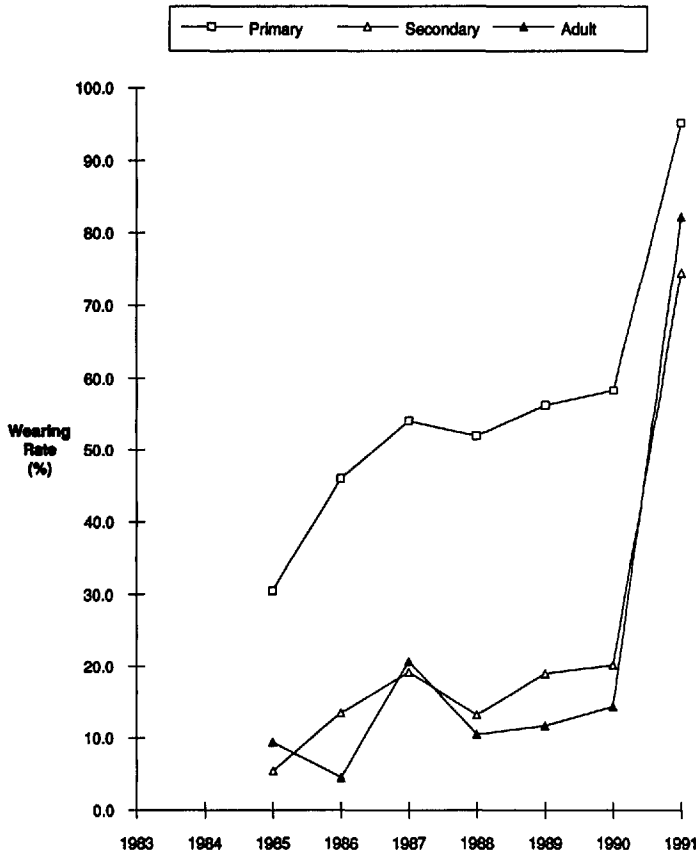


Fig. 3. Helmet wearing rates for country commuting cyclists, Victoria, Australia, 1985-1991.

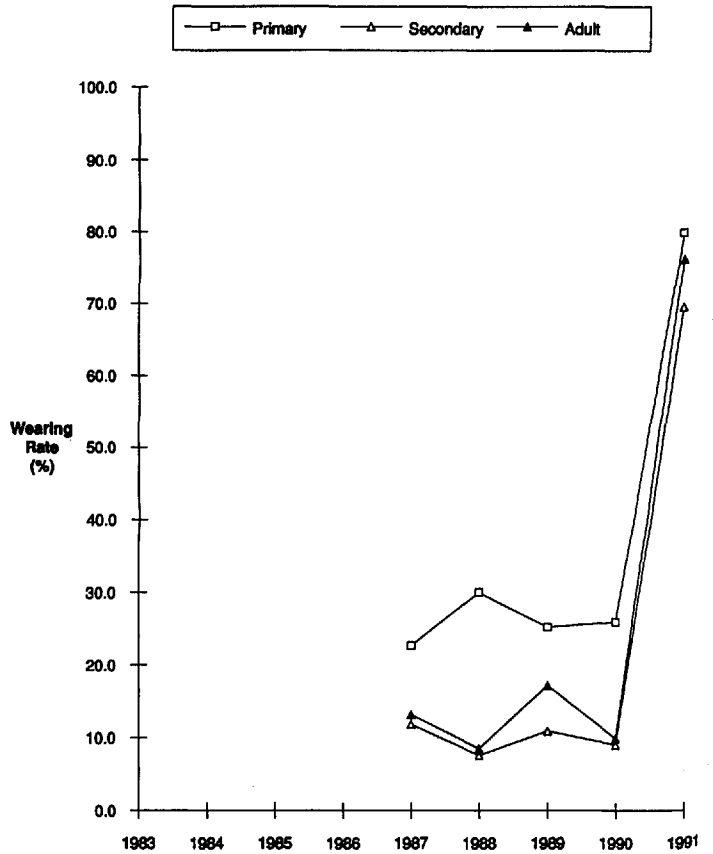


Fig. 4. Helmet wearing rates for country recreational cyclists, Victoria, Australia, 1987-1991.

until lighter, cooler helmets with better retention systems were available, almost prevented the launch of any further schemes. Ultimately compromises were reached and further \$10 rebate schemes were undertaken in December 1985, 1986 and 1987, and from December to February in 1988 and 1989 resulting in a total of more than 168,000 helmet rebates from all schemes [1].

The Australian Standard was amended in 1990 by deleting the penetration test, which allowed soft shell helmets and larger holes to enable better cooling air circulation.

Increased Helmet Wearing

In order to measure progress in helmet wearing a series of observation surveys were carried out initially in the Melbourne metropolitan area and later in several regional cities in Victoria. The metropolitan surveys were of adult commuter cyclists on arterial roads near the central business district and of primary and secondary school students on the approaches to a sample of schools. Hence the student surveys could be biased towards higher wearing rates [10]. Later, recreational riding surveys were also included [11]. The results are shown in Figures 1 and 2. The country surveys began in 1985 in 10 regional cities and showed considerable variation between cities [11]. The results are shown in Figures 3 and 4.

The surveys shown in Figures 1-4 were generally taken in March each year, so the 1991 results reflect the situation some

eight months after the helmet wearing law was introduced. Some surveys in July and October 1990 reported even higher wearing rates, particularly for secondary school students, but these surveys have not been included because of their limited size. Nevertheless, the increases in helmet wearing rates after introduction of the law are remarkable, especially as up to the time of the surveys there had been relatively little enforcement. They confirm that if the community understands the benefits of a safety measure and a reasonable proportion have been persuaded to adopt it voluntarily, then compulsory use can be achieved, if proper foundations have been laid.

Although the Hon. Steve Crabb, Minister for Transport, in launching the second helmet rebate scheme said in February 1985, "We are now aiming to get usage rates to at least 40% in all categories so that it will be possible to make the use of bicycle helmets compulsory. The Government hopes to be in that position by July 1," it took a further 5 years for the law to be introduced. During this period there were additional multimedia publicity campaigns, helmet rebate schemes, "Safe Cycle" promotions by the Victoria Police and promotion of bicycle safety in schools [1]. There were also additional studies which provided further information about the effectiveness of helmets in reducing injuries [12-15]. All of these were important, but probably the single most significant contribution was the report of the Parliamentary Social Development Committee.

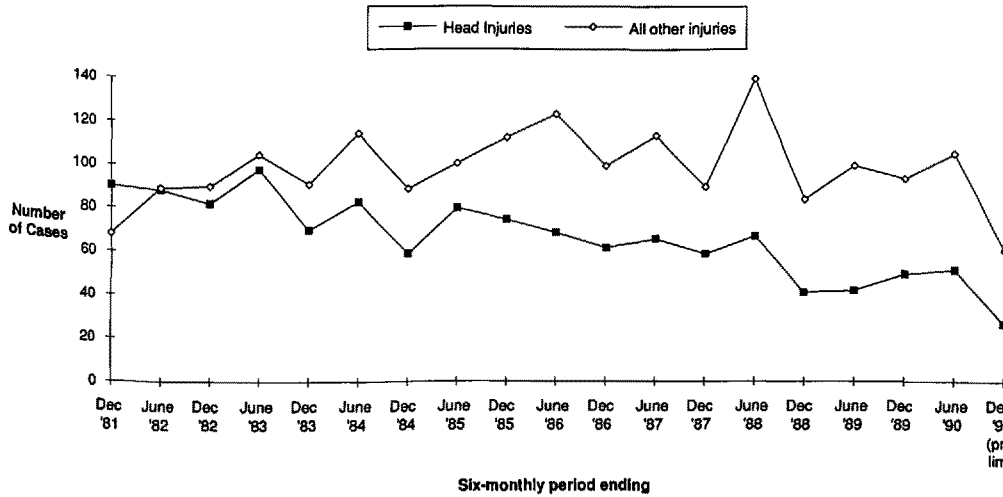


Fig. 5. Number of severe bicyclist casualties registered with the Transport Accident Commission, Victoria, Australia, July 1981–December 1990.

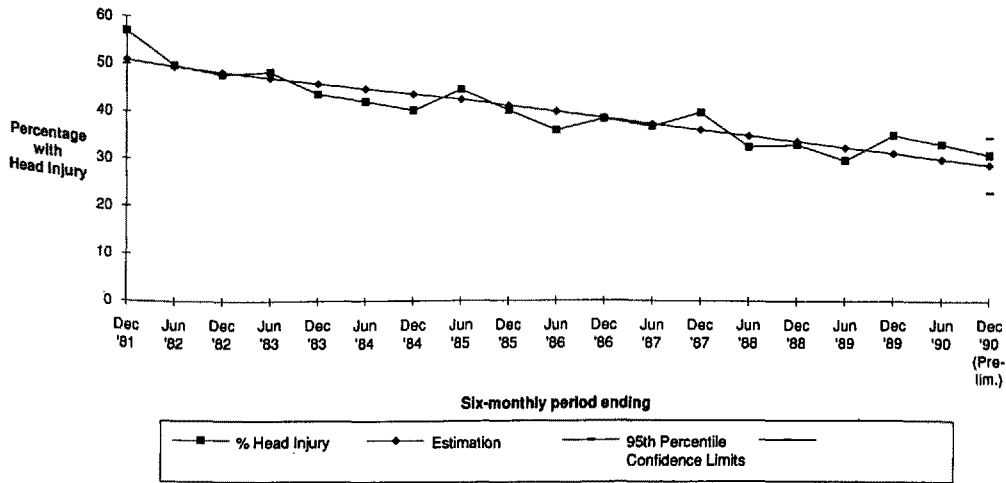


Fig. 6. Percentage of severe bicyclist casualties with head injury, Victoria, Australia, July 1981–December 1990.

Parliamentary Social Development Committee

During 1986 and 1987, the Social Development Committee of the Parliament of Victoria conducted an inquiry into child pedestrian and bicycle safety. In their submission to the inquiry, the Road Traffic Authority and the Victoria Police supported compulsion as a long-term solution to the problem of encouraging all bicyclist groups to wear helmets. The submission pointed out that the prerequisites for a successful law include a specific bicycle helmet standard which is agreed to by the user groups and able to be enforced at law, a sufficient range of styles and sizes in approved helmets to accommodate a wide range of head sizes, a reduction in overall price levels if undue hardship is to be avoided, and a significant increase in wearing rates. Other submissions also supported compulsory wearing.

The Committee's First Report on the Inquiry, tabled in December 1986, included eleven recommendations associated with bicycle helmet use, of which the key ones were:

“That mandatory helmet use by bicyclists be introduced as soon as possible”, and

“That the RTA [Road Traffic Authority] should report to the Minister of Transport within six months of the tabling of this report with a detailed and comprehensive strategy, including a phased timetable, to introduce mandatory helmet usage. Such a report should consider: the impact of such legislation on the diverse categories of bicycle users; methods of reducing costs of bicycle helmets to users.” [16]

Following extensive canvassing of comment from cyclists and the community generally, and detailed review of the key issues, the Road Traffic Authority developed a strategy in December 1987 which recommended that legislation be introduced to require the mandatory wearing of bicycle helmets while cycling, from January 1, 1989. After further deliberation, the Minister for Transport and the Minister for Police and Emergency Services announced in September 1989 as part of a package of Road Safety Initiatives that a new regulation requiring cyclists to wear bicycle helmets would take effect in Victoria from July 1, 1990.

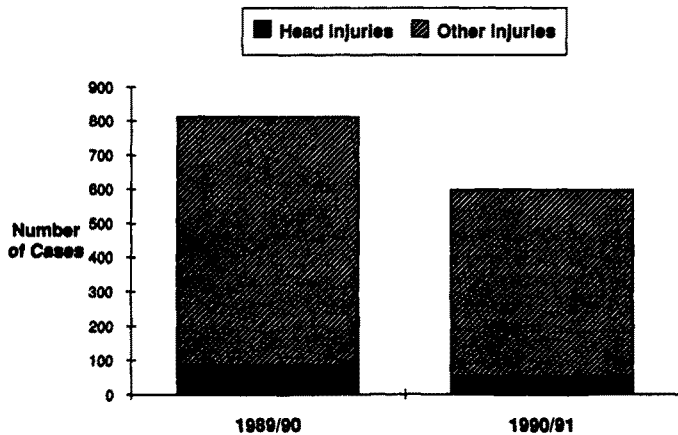


Fig. 7. Child bicyclist presentations to Victorian Injury Surveillance System hospitals, Melbourne, Australia, 1989-90 versus 1990-91.

Effect on Bicyclist Injuries

The initial effects of the law on bicyclist head injuries have been measured by examining data from three sources: Transport Accident Commission (TAC) claims for "no fault" injury compensation from cyclists who were killed or hospitalised following collision with a motor vehicle in Victoria; Victorian Injury Surveillance System (VISS) records of child cyclist presentations at the Emergency Departments of three hospitals in Melbourne (Royal Children's Hospital, Western Hospital Sunshine and Footscray campuses, and the Preston and Northcote Community Hospital); these records cover cyclists treated in Emergency Departments as well as those admitted, and also cover cyclist injuries from crashes not involving a motor vehicle; and Health Department records of acute presentations by bicyclists to public hospitals in Victoria resulting in admission (preliminary data provided in April 1991); admissions from crashes not involving a motor vehicle are included, but private hospital admissions are not.

Transport Accident Commission Claims

Bicyclist claimants were classified into those sustaining a head injury, and those sustaining any other injury, on the basis of up to five injury codes recorded using the ICD-9 system. Figure 5 shows that the number of cyclists killed or admitted to hospital with head injuries has fallen consistently between July 1981 and June 1990 as the usage of helmets has increased. In the 6 months following the introduction of the mandatory wearing law (July to December 1990), the number of cyclists with head injuries has decreased by 46% relative to the corresponding period during 1989.

The possible explanations for the recent decreases are: the number of cyclists on the road, and hence at risk of involvement in crashes, has decreased, possibly having been discouraged from cycling by the requirement to wear a helmet; the wearing of helmets has made cyclists more conspicuous, or the helmets and associated publicity have made cyclists ride more carefully, thus reducing their risk of collision; or the presence of the helmet has reduced the risk of serious head injury for cyclists involved in collisions.

These alternative explanations were addressed by examining the proportion of killed and admitted cyclists who sustained a head injury (Fig. 6). The downward trend in the proportions before the law was introduced was statistically significant ($p < 0.001$). The trend line was extrapolated to predict the proportion which would have been expected in July-December 1990 in the absence of the law and 95% confidence limits for the prediction were calculated. The actual proportion of seriously injured cyclists with a head injury is inside the prediction limits.

The progressive reduction in bicyclist head injuries relative to cyclists with other injuries is also shown in Figure 5. Since the early 1980's, the number of head injuries has fallen consistently, while the number of other injuries has increased, then remained essentially constant. The exception is the period July-December 1990, when the cyclists with other injuries decreased by 35% (and the number with head injuries by 46%) relative to the corresponding period in 1989. This is tentative evidence that the number of cyclists involved in collisions, either due to a reduction in bicycle use or a reduction in risk, has decreased during the post-law period. However, it should be noted that the total number of road traffic injuries in 1990 was about 20% below the 1989 level.

Victorian Injury Surveillance System Records

Figure 7 shows that the number of cyclists <15 years of age presenting to VISS hospitals with a head injury has decreased substantially between 1989/90 and 1990/91. During the post-law period (July 1990 to June 1991), there were only 52 child cyclist presentations with head injuries. This is a 40% reduction compared to the previous year (July 1989 to June 1990).

As above, there may be alternative explanations for these decreases. However, Figure 8 shows that the proportion of cyclist presentations who had a head injury during each month in the post-law period was generally well below the trend line fitted to January 1989 to June 1990 proportions. While none of these post-law proportions fell below the lower 95% prediction limit, collectively their deviations from the trend line were consistently below the line to a statistically significant degree (testing the sum of the deviations, $p < 0.01$). This represents evidence that there was a real reduction in the risk of injury to the head of child cyclists involved in crashes in the catchment area of the VISS hospitals during the post-law period. The lowest quarterly percentage with head injury occurred during the January-March 1991 quarter, averaging 5%.

It is also apparent that the number of child cyclists involved in crashes and presenting to the VISS hospitals has decreased (Fig. 7). The total number of child cyclists presenting decreased by 26% between July 1989 to June 1990 and the corresponding twelve month period after the law. Some of this decrease was due to the reduction in cyclists with head injuries, but even the number who did not sustain a head injury fell by 25% during the post-law period.

Admissions to Public Hospitals

Acute admissions by bicyclists were classified into those sustaining a head injury, and those sustaining any other injury, on the basis of up to five injury codes recorded using the ICD-9 system. Figure 9 shows that the number of bicyclist admissions

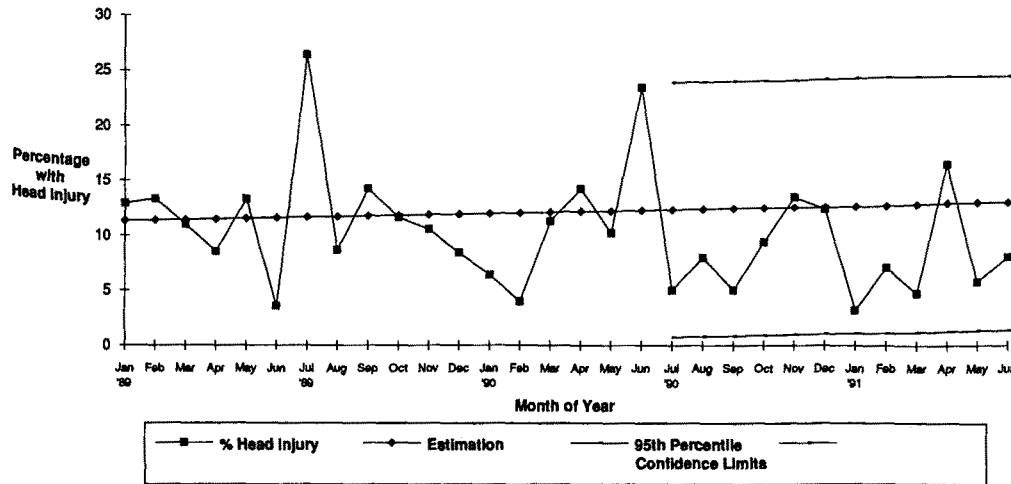


Fig. 8. Percentage of child bicyclist presentations with head injury to Victorian Injury Surveillance System hospitals, Melbourne, Australia, January 1989–June 1991.

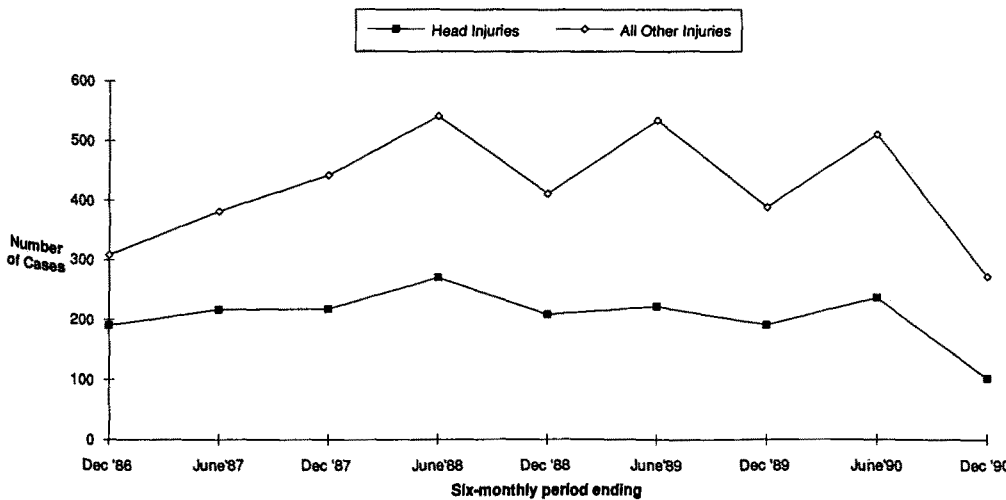


Fig. 9. Bicyclist admissions to public hospitals, July 1986–December 1990.

with head injury fell substantially during the post-law period, as did the number with other injuries. When July–December 1990 was compared with the corresponding months in 1989, head injuries decreased by 47% and cyclists with other injuries decreased by 30%.

Figure 10 shows that the proportion of bicyclist admissions who sustained a head injury has fallen during the period July 1986 to December 1990. The proportion during July–December 1990 was compared with the pre-law trend and was found to lie below the trend line but within the 95% prediction limits. The deviation of the actual proportion below the trend was not statistically significant.

Discussion

The initial results show a reduction in the number of bicyclists with head injuries following the introduction of the mandatory helmet wearing law in Victoria on July 1, 1990. However, the mechanisms by which this reduction was achieved seem to be two-fold: a reduction in the number of cyclists involved in crashes resulting in injury requiring hospital treatment, and a

reduction in the risk of head injury for cyclists who were injured.

The extent of the reduction in bicyclist claims to TAC for injuries other than to the head (35%) supports the first mechanism. This mechanism is also supported by the 25% decrease in presentations to VISS hospitals by child cyclists without head injury, and the 30% reduction in hospital admission of cyclists with injuries other than to the head. There is anecdotal evidence that some cyclists have been discouraged from cycling because they do not own or do not wish to wear a helmet.

In addition, there is evidence that the risk of head injury to cyclists involved in crashes has been reduced (the second mechanism), at least for child cyclists. There was a statistically significant decrease in the proportion of child cyclist presentations to VISS hospitals who sustained a head injury in crashes during the 12 month post-law period, with the lowest proportion occurring during the March 1991 quarter. For cyclists of all ages, the proportion of those admitted to hospital who sustained a head injury was below the trend line during the first 6 months of the post-law period, although the fall was not statistically significant. However, the proportion of TAC claims from se-

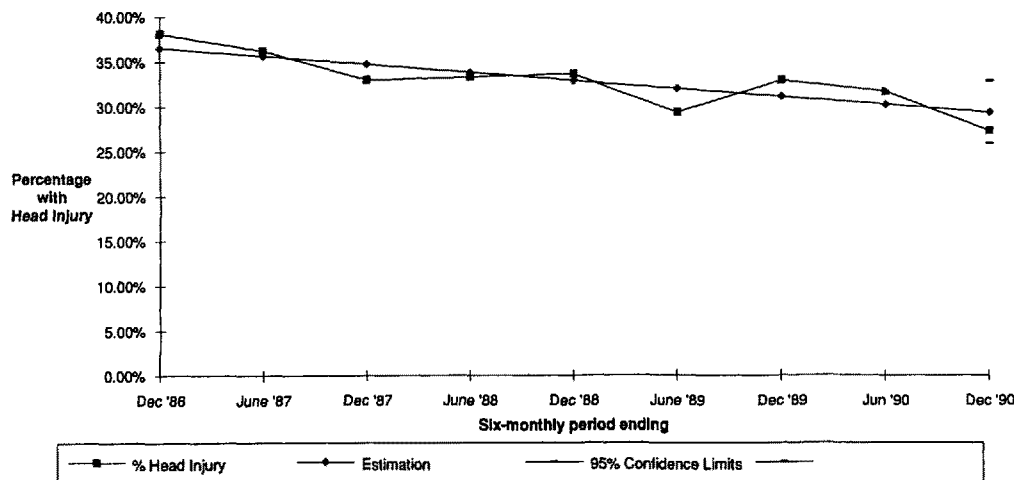


Fig. 10. Percentage of bicyclist admissions with head injury, Victoria, Australia, July 1986–December 1990.

verely injured cyclists who sustained a head injury in collisions during the same 6 months was slightly above the trend estimate.

The use of a full year of post-legislation data of cyclist injuries, when available, is necessary to confirm these results with higher levels of statistical significance. The additional data will also allow disaggregation by the cyclist age group and region of Victoria, so that the changes in cyclist injuries can be related to the specific increases in helmet wearing rates shown in Figures 1–4.

The successful implementation of the bicycle helmet use laws is the latest in a series of mandatory use laws during the past three decades, where the Victorian Government has taken a lead. The strategies and activities necessary to achieve the ultimate goal were multi-faceted and involved support from a wide range of community and professional organizations. It is important in seeking the introduction of similar measures to recognize the need for such a widely based approach and the need for patience and perseverance.

Conclusions

The mandatory bicycle helmet wearing law implemented in Victoria on July 1, 1990 has been successful in building on past efforts to promote helmet use by bringing helmet wearing rates to new high levels for all cyclist age groups throughout Victoria. The introduction of the law has been accompanied by an immediate reduction in the number of bicyclists with head injuries. Apparently this has been achieved through a reduction in the number of cyclists involved in crashes (possibly through a decrease in bicycle use or increased conspicuousness) and a reduction in the risk of head injury of child cyclists involved in crashes. Further analyses to confirm these initial trends will be done as additional data become available.

Résumé

A partir du 1er Juillet, 1990, la législation rendant obligatoire le port d'un casque (dit de sécurité) pour toute personne se déplaçant avec un deux-roues à pédale, sauf exceptions, a pris effet dans le province de Victoria, Australie. Cet article décrit les actions principales qui ont amené à créer cette loi ainsi que

quelques résultats de l'effet de cette législation comme son respect et son influence sur le taux des accidents. Depuis 1980, on a enseigné l'utilité du casque dans les lycées, à travers les médias, les clubs de rencontre professionnels et locaux. Il y a eu aussi une publicité promotionnelle importante avec possibilité d'achat en grand nombre ainsi que des prix de réductions sous certaines conditions. Le standard de casque en Australie a évolué ces derniers temps-ci de façon à répondre aux demandes de la communauté pour des casques plus légers, et mieux aérés. L'utilisation volontaire des casques n'a cessé d'augmenter à Melbourne entre 1983 jusqu'en Mars 1990: 5 à 70% chez les élèves en primaire, 2 à 20% chez les élèves en secondaires, et 27 à 40% chez les adultes. Dans la période suivant cette législation, sans contrôle draconien, ces taux sont passés à 70–90% dans la plupart des cas. Les résultats préliminaires montrent que le pourcentage des traumatismes crâniens a diminué depuis que cette loi est passée. Les contributions de l'utilisation du casque, de la diminution de l'utilisation du vélo, ainsi que le risque moindre de traumatisme crânien en cas d'accident sont discutés.

Resumen

El 1 de julio de 1990 entró en vigencia en Victoria, Australia, la legislación que requiere el uso de un casco de seguridad por todos los ciclistas, a menos que estén exentos. El presente artículo describe las principales actividades que prepararon el terreno para esta iniciativa legal y presenta información preliminar sobre el efecto de la legislación sobre las tasas de uso del casco y las tasas de lesiones craneoencefálicas. A partir de 1980 se ha hecho promoción al uso de cascos a través de programas educacionales sobre ciclismo en las escuelas, a través de los medios masivos de publicación, con el soporte de las organizaciones profesionales y los grupos comunitarios, programas de compra al por mayor y reembolsos gubernamentales por la compra de cascos. El estándar Australiano de seguridad de los cascos de seguridad ha sido modificado con el objeto de acceder a las demandas de la comunidad sobre cascos más livianos y mejor ventilados. Se ha registrado un sostenido incremento en el uso voluntario de cascos en Melbourne entre 1983 y marzo de 1990: 5% a 70% en niños de escuela primaria; 2% a 20% en

estudiantes de secundaria; y 27% a 40% en adultos. En el período siguiente a la legislación, con relativa menor necesidad de imposición autoritaria, estos grupos han demostrado sustanciales incrementos en las tasas de uso del casco, con ascenso a 70-90% en la mayoría de los casos. Los datos preliminares demuestran que el número de ciclistas con trauma craneoencefálico ha descendido en el tiempo transcurrido desde la vigencia de la legislación. Se revisan las eventuales contribuciones a este fenómeno por menor uso de bicicletas y menor riesgo de lesión craneana en el accidente.

Acknowledgments

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