



January 2021

# Motorcycle Helmets

## Overview

Motorcycle-related fatalities have been steadily increasing over the past 15 years. The most recent Global Status Report on Road Safety<sup>1</sup> declared that two and three-wheelers make up 28% of all global deaths.

Helmet use has been shown to consistently reduce motorcycle crash-related injuries and deaths. The most effective strategy to increase helmet use is enactment and enforcement of universal helmet laws. Universal helmet laws require all motorcyclists of all ages to wear helmets, on all roads and for all engine types, whenever they ride.

## Essential Facts

- Helmets work in preventing the risk of serious brain injury and death in the following ways:
  - Absorbing crash energy and dissipating it across a greater surface area so the impact is not concentrated in a particular area of the head.
  - Acting as a mechanical barrier between the rider's head and any external object and thus preventing direct contact.
  - Reducing the deceleration of the skull, which results in the brain hitting the skull [with much less force](#)<sup>2</sup>.
- Motorcycle helmet use can lead to an estimated 42% reduction in risk of fatal injuries and a 69% reduction in risk of non-fatal head injuries.<sup>3</sup> In 2016, helmets alone saved approximately 1,859 lives in the U.S.A. If all motorcyclists had worn helmets, an additional 802 lives could have been saved.<sup>4</sup>
- Full face helmets are the most effective at preventing head and cervical injuries and provide significant protective effects on the outcomes compared with either half-coverage helmets or open helmets.<sup>5</sup>
- Helmets should be correctly fitted and fastened to ensure their effectiveness. They should provide adequate head coverage and remain in place during normal riding.<sup>6</sup> A helmet that does not fit properly or offer sufficient cushioning can give a false sense of security to the user without providing the appropriate level of protection.
- Substandard<sup>\*</sup> helmets might not provide adequate protection to the head, because they lack the protective layers to absorb and dissipate the energy from impacts.<sup>7</sup>

<sup>\*</sup>In this factsheet, we define substandard helmets as any helmets that do not abide by the recommendations of the [UN Regulation No.22 \(Protective Helmets\)](#) and its most recent [amendments](#).



# Motorcycle Helmets

- Inability of the motorcyclist to be seen by other road users, is perceived to be an important factor associated with risk of motorcycle crashes. Using bright, fluorescent, or reflective colours or adding a light source can increase motorcycle users' visibility.<sup>8</sup>
- Helmets should be worn by motorcycle operators and passengers from all age groups. Non-compliance with standard child motorcycle helmets, wearing adult helmets or not wearing helmets at all is common among child pillion riders which make them vulnerable to severe road crash head injuries.<sup>9</sup>
- The use of motorcycle helmets by adult riders is significantly associated with the use of helmets among child passengers.<sup>10</sup> Therefore, it is important for adults to set a good example by always wearing an appropriate helmet while riding.
- The presence of enforcement (camera or police personnel) increases the correct use of helmets, especially on principal roads.<sup>11</sup>
- Though motorcycle helmet wearing rates tend to be significantly higher in city streets compared to rural roads, combined education and enforcement activities have been shown to increase wearing rates in urban and rural areas.<sup>12</sup>
- Helmet use does not affect the likelihood of a crash. However, it increases the risk of serious injury and fatality when a crash occurs, adding to the financial burden created from motorcycle crashes. In the United States, it was estimated that the total direct measurable costs from motorcycle-related crashes were approximately \$16 billion in 2010 alone.<sup>13</sup>
- Aligning with [the first of the 17 Sustainable Development Goals](#), and the efforts towards poverty eradication, a recent study in Vietnam has shown a significant correlation between the introduction of comprehensive helmet legislation and a decrease in high costs associated with traffic injury, demonstrating that comprehensive helmet legislation can decrease the burden of out-of-pocket payments and the need for access to and coverage for treatment, allowing the government and individuals to spend much needed resources elsewhere.<sup>14</sup>



# Motorcycle Helmets

## Key Messages

- Laws calling for the mandated use of motorcycle helmets have proven to be the most effective means of improving helmet use.<sup>15</sup>
- Combining strong enforcement with public education on correct helmet use and helmet quality can improve motorcycle safety.
- Active steps should be taken to increase consumer awareness, educate the consumer on how to recognize and purchase a quality helmet, make quality helmets more widely available, and continue regular and visible enforcement activities.
- A comprehensive approach to increasing helmet use is recommended and should include laws, distribution of helmets, safety sensitization, and campaigns encouraging correct helmet use.<sup>16</sup>
- Enforcement of helmet laws should be prioritized as part of a comprehensive approach to enforcing traffic safety regulations.<sup>17</sup>
- Steps to promote helmet ownership by making them more affordable should be encouraged. High helmet costs are significantly associated with non-helmet use, especially in low- and middle-income countries.
- Law enforcement and other safety officials can reinforce the need to wear a helmet through positive interactions such as free or discounted helmet distribution programs and incentives for helmet use. Publicizing helmet laws, and child/parent education on helmet fitting and the importance of wearing a helmet on every ride may enhance effectiveness.
- Raising awareness among the general population and motorcyclists about the risks and dangers associated with the non-use of helmets for riders and pillion passengers should include:
  - Deconstructing the idea that helmets are unnecessary for short distance trips.
  - Informing communities about the benefits of helmets, especially to counter the unwillingness to wear helmets due to level of comfort and aesthetic considerations,
  - Establishing and promoting the use of good quality standard helmets guaranteeing appropriate fit and stability in case of a crash.<sup>18</sup>



# Motorcycle Helmets

## References

- <sup>1</sup> World Health Organization. (2018). Global status report on road safety 2018: Summary (No. WHO/NMH/NVI/18.20). World Health Organization.
- <sup>2</sup> World Health Organization. (2006). Helmets: a road safety manual for decision-makers and practitioners. World Health Organization.
- <sup>3</sup> Liu, B. C., Ivers, R., Norton, R., Boufous, S., Blows, S., & Lo, S. K. (2008). Helmets for preventing injury in motorcycle riders. *Cochrane database of systematic reviews*, (1).
- <sup>4</sup> National Highway Traffic Safety Administration. (2017) Motorcycles (Traffic Safety Facts Research Note. Report No. DOT HS 812 492). U.S. Department of Transportation, Washington, DC.
- <sup>5</sup> Chaichan, S., Asawalertsang, T., Veerapongtongchai, P., Chattakul, P., Khamsai, S., Pongkulkiat, P., & Sawanyawisuth, K. (2020). Are full-face helmets the most effective in preventing head and neck injury in motorcycle accidents? A meta-analysis. *Preventive Medicine Reports*, 101118.
- <sup>6</sup> Thai, K. T., McIntosh, A. S., & Pang, T. Y. (2015). Factors affecting motorcycle helmet use: size selection, stability, and position. *Traffic injury prevention*, 16(3), 276-282.
- <sup>7</sup> Bao, J., Bachani, A. M., Viet, C. P., Quang, L. N., Nguyen, N., & Hyder, A. A. (2017). Trends in motorcycle helmet use in Vietnam: results from a four-year study. *Public health*, 144, S39-S44.
- <sup>8</sup> Wells, S., Mullin, B., Norton, R., Langley, J., Connor, J., Jackson, R., & Lay-Yee, R. (2004). Motorcycle rider conspicuity and crash related injury: case-control study. *Bmj*, 328(7444), 857.
- <sup>9</sup> Sivasankar, S., Karmegam, K., Shamsul Bahri, M. T., Sadeghi, H. N., Kulanthayan, S., Emilia, Z. A., & Ya, S. M. (2016). Children Pillion Rider Safety Awareness among Motorcycle Users in Malaysia. *International Journal of Vehicle Structures & Systems (IJVSS)*, 8(3).
- <sup>10</sup> Kulanthayan, K. M., Teow, H. F., Selvan, H. K. T., Yellappan, K., & Ulaganathan, V. (2020). Determinants of standard motorcycle safety helmet usage among child pillion riders. *Transportation research part F: traffic psychology and behaviour*, 74, 408-417.
- <sup>11</sup> Guzman, L. A., Ortiz, A. I. V., Mesa, V. G., Camargo, J. P., Allen, K. A., & Hyder, A. A. (2020). The relationships between correct helmet use, enforcement presence, and mortality in a Latin-America city: The case study of Bogotá, Colombia. *Traffic injury prevention*, 21(7), 500-505.
- <sup>12</sup> Xuequn, Y., Ke, L., Ivers, R., Du, W., & Senserrick, T. (2011). Prevalence rates of helmet use among motorcycle riders in a developed region in China. *Accident Analysis & Prevention*, 43(1), 214-219.
- <sup>13</sup> Government Accountability Office. (2012). Motorcycle Safety: Increasing Federal Funding Flexibility and Identifying Research Priorities Would Help Support States' Safety Efforts.
- <sup>14</sup> Olson, Z., Staples, J. A., Mock, C., Nguyen, N. P., Bachani, A. M., Nugent, R., & Verguet, S. (2016). Helmet regulation in Vietnam: impact on health, equity and medical impoverishment. *Injury prevention*, 22(4), 233-238.
- <sup>15</sup> Baeseman, Z. J., & Corden, T. E. (2014). A social-ecologic framework for improving bicycle helmet use by children. *Wmj*, 113(2), 49-51.
- <sup>16</sup> Kraemer, J. D. (2016). Helmet laws, helmet use, and bicycle ridership. *Journal of Adolescent Health*, 59(3), 338-344..
- <sup>17</sup> *ibid.*
- <sup>18</sup> Thai, K. T., McIntosh, A. S., & Pang, T. Y. (2015). Factors affecting motorcycle helmet use: size selection, stability, and position. *Traffic injury prevention*, 16(3), 276-282.