

Document 3 - Ottawa Public Health and E-scooter Injury Epidemiology

The role of Ottawa Public Health

Ottawa Public Health (OPH) provides comprehensive health promotion approaches, ranging from policy, to education as well as awareness raising and creating supportive environments. All of which help advance road safety as part of OPH's mandate as per the Ontario Public Health Standards to reduce the frequency, severity and impact of preventable injuries. OPH strategic plan includes a strategic direction to "Influence the Social and Physical Environments that Support Health and Well-Being", with an annual measure to promote "Healthy Communities by Design." This includes issues related to sustainable mode shifts and road safety.

OPH Epidemiology team provides quantitative support to helping understand road safety issues and identify areas for moving forward.

E-scooter Injury Epidemiology

The literature and reporting of the epidemiology of e-scooter injuries is emerging and concerning in comparison with other non-vehicular active modes of transportation (cycling and walking). There are variations in reporting and injury data collection methodologies that make comparative analysis challenging. At this time research points to a number of concerns.

1. Per trip, e-scooter use is riskier than walking and cycling:
 - A US CDC study from Austin, Texas in 2018, found that 20 riders were injured for every 100,000 e-scooter trips, making them 100 times riskier than walking and 13 times riskier than cycling. ¹
 - In Calgary, from July to October 1st, 2019, there were 33 e-scooter injuries that required ambulances. Calgary estimated that 1:1,500 e-scooter trips resulted in an ED visit and 1:100,000 e-scooter trips required hospitalization. ²
 - There have been e-scooter rider deaths reported by media in some US cities and well as in Europe.
2. Most riders are inexperienced and even experienced riders are at risk of injury:
 - The CDC study in Austin found that over 60% of those injured were novice riders (<10 rides before injury) but experienced riders were also prone to injury with approximately 15% of injuries occurring among riders with 30 or more trips of experience. ³
3. The e-scooter design and road hazards present an injury risk:
 - The e-scooter design presents a risk of instability due to a combination of small wheels, a short wheel base and a high centre of gravity, making them prone to being tripped up. Common road conditions such as potholes, uneven surfaces, gravel and debris can pose as a hazard to e-scooter riders. The motor-assisted speed of the e-scooter can be set at a maximum (unsure if this is controlled on downhills), motorized speeds coupled with inexperienced use can lead to lack of control and risk for serious injury.
 - A 2017 study of ED visits for e-scooter injuries in California found 80% were the result of a fall, including being thrown or flipped off, followed by 11% resulting from collision with an object and 9% being hit by a moving vehicle or object. ⁴
 - Among the e-scooter injuries requiring an ambulance in Calgary, the most common causes of injury were speed, losing control, hitting a pothole or stationary object. ⁵

- The CDC study in Austin found that 37% of injured riders reported that excessive speed contributed to their injury. ⁶
 - Visibility is also of concern to the rider and other cyclists and pedestrians, with respect to the compact nature of the e-scooter and rider, that e-scooters operate quietly, and with decreased visibility of the rider during night time use.
4. Head and other severe injuries of concern as well as the lack of helmet use and other protective gear:
- Nearly half (48%) of injuries in the CDC Austin study (data from paramedic response or ED visit) were head injuries, including 7% with evidence of traumatic brain injury (TBI); 70% were upper limb injuries, 55% lower limb and 18% to the chest/abdomen. Less than 1% were wearing a helmet. ⁷
 - 14% of the injured riders (paramedic response or ED visit) from the CDC Austin study were hospitalized. Nearly half of the injured e-scooter riders had a severe injury (bone fracture – 84%, nerve, tendon or ligament – 45%, spent >48hours in hospital – 8%, severe bleed – 5%, organ damage – 1%).⁸
 - 6% of e-scooter ED visits from the 2017 California study were hospitalized. ⁹
 - Use of other protective gear such as elbow pads, was not reported on in these studies but given that helmet use is low, it is theorized that use of other protective gear is also low.
5. Impaired operation:
- The CDC study in Austin found that 29% of injured riders had consumed alcohol in the preceding 12 hours. ¹⁰
6. Risk to pedestrians, particularly those with disabilities/mobility challenges:
- Riders are not the only ones susceptible to injury from an e-scooter. Pedestrians can be struck by e-scooter riders weaving through crowds or failing to stop. There have been reports of pedestrians tripping on dockless e-scooters lying on sidewalks or outside of buildings. This could impede access to the transportation when vulnerable road users require maximum sidewalk width for assisted devices.
7. There are current challenges to e-scooter injury surveillance in Ontario:
- There is not currently a robust way to study e-scooter injuries in Ontario:
 - i. Current injury classification (ICD) codes for ED visits and hospitalizations are not designed to specifically capture e-scooter injuries.
 - ii. Syndromic surveillance systems and the Canadian Hospitals Injury Reporting and Prevention Program (CHIRPP) ED visit reporting system are not currently specific enough to capture e-scooter injuries. For example, searching a term in these systems such as 'scooter' may also capture mobility devices and non-motorized scooters.
 - iii. The Ministry of Transportation Ontario's (MTO) collision reporting only captures collisions on public roads (not sidewalks and multi-use pathways) and e-scooters will not be added as a new vehicle type. Instead they will be captured under bicycles, which could also impact the precision and consistency of our cycling collision estimates.
 - iv. Public Health Ontario has been engaged on injury surveillance associated with e-scooters.

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- ¹ Austin Public Health. Dockless electric scooter-related injuries study, 2019. Austin, Texas. Available at: http://www.austintexas.gov/sites/default/files/files/Health/Web_Dockless_Electric_Scooter-Related_Injury_Study_final_version_EDSU_5.14.19.pdf Accessed Feb 13, 2019.
- ² Calgary. Transportation Report on Shared e-Bike and E-Scooter Mid-Pilot Report. December 2019. Available at <https://pub-calgary.escribemeetings.com/FileStream.ashx?DocumentId=117277>
- ³ Austin Public Health. Dockless electric scooter-related injuries study, 2019. Austin, Texas. Available at: http://www.austintexas.gov/sites/default/files/files/Health/Web_Dockless_Electric_Scooter-Related_Injury_Study_final_version_EDSU_5.14.19.pdf Accessed Feb 13, 2019.
- ⁴ Trivedi TK., Liu C., Antonio ALM., et al. Injuries associated with standing electric scooter use. *JAMA Emergency Medicine* 2019. Available at: <https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2722574?guestAccessKey=c8d43986-1131-4af7-b3bc-a9f9415cd3b3> Accessed Feb 13, 2019.
- ⁵ Calgary. Transportation Report on Shared e-Bike and E-Scooter Mid-Pilot Report. December 2019. Available at <https://pub-calgary.escribemeetings.com/FileStream.ashx?DocumentId=117277>
- ⁶ Austin Public Health. Dockless electric scooter-related injuries study, 2019. Austin, Texas. Available at: http://www.austintexas.gov/sites/default/files/files/Health/Web_Dockless_Electric_Scooter-Related_Injury_Study_final_version_EDSU_5.14.19.pdf Accessed Feb 13, 2019.
- ⁷ Austin Public Health. Dockless electric scooter-related injuries study, 2019. Austin, Texas. Available at: http://www.austintexas.gov/sites/default/files/files/Health/Web_Dockless_Electric_Scooter-Related_Injury_Study_final_version_EDSU_5.14.19.pdf Accessed Feb 13, 2019.
- ⁸ Austin Public Health. Dockless electric scooter-related injuries study, 2019. Austin, Texas. Available at: http://www.austintexas.gov/sites/default/files/files/Health/Web_Dockless_Electric_Scooter-Related_Injury_Study_final_version_EDSU_5.14.19.pdf Accessed Feb 13, 2019.
- ⁹ Trivedi TK., Liu C., Antonio ALM., et al. Injuries associated with standing electric scooter use. *JAMA Emergency Medicine* 2019. Available at: <https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2722574?guestAccessKey=c8d43986-1131-4af7-b3bc-a9f9415cd3b3> Accessed Feb 13, 2019.
- ¹⁰ Austin Public Health. Dockless electric scooter-related injuries study, 2019. Austin, Texas. Available at: http://www.austintexas.gov/sites/default/files/files/Health/Web_Dockless_Electric_Scooter-Related_Injury_Study_final_version_EDSU_5.14.19.pdf Accessed Feb 13, 2019.