

More than 50 percent of injury-related deaths in rural Ontario occur before patients reach hospital

January 26 2010

It's known that people who live or work in rural areas are more likely to suffer and die from serious injuries compared to those in more urban environments. But while time and distance play a role in these higher mortality rates, new research suggests that limited access to early, high-quality trauma care in many smaller Ontario hospitals may be a factor.

Researchers from St. Michael's in Toronto looked at 3,486 trauma-related deaths that occurred in Ontario between 2002 and 2003, which was the most recent data available for analysis. (A [traumatic injury](#) is caused by something outside the person's body—for example, a leg crushed by machinery or a head injury caused by a fall from a ladder.)

"We wanted to see what happened to these patients after they were injured and also to learn more about the settings in which death was most likely to occur," explains study investigator Dr. Avery B. Nathens, director of trauma services at St. Michael's and Canada Research Chair in Systems of Trauma Care.

The researchers say that interventions designed to improve the skills and resources available in rural emergency departments could reduce [mortality rates](#) from serious traumatic injury. "We also need to understand why the transfer process takes so long," Dr. Nathens adds. "If we can reduce this, we can save lives."

The study found that more than half of the deaths occurred before the injured person reached a hospital [emergency department](#) (ED). These "pre-hospital" deaths were twice as likely among patients injured in the most rural locations and in those with limited access to timely trauma centre care.

"But even when people survived long enough to reach hospital, we noted a threefold increase in the risk of ED death if the injury occurred in a region with limited access to trauma centre care," says Dr. Nathens, who is also a professor of surgery at the University of Toronto. "This means people were more likely to die before ever reaching an [operating room](#) or being admitted to hospital."

According to the data, most deaths (54%) occurred before any hospital contact. Motor vehicle collisions were responsible for over half of all deaths. While only 15 percent of Ontario's population lives more than one hour away from a trauma centre, this small proportion of the population accounted for 37% of all trauma-related deaths during the study period. This finding highlights the higher risk of death associated with delayed access to trauma centre care.

Although all patients in the study group ultimately died, the researchers considered those who succumbed to their injuries in EDs or later in hospital were "potentially salvageable," because they had potential access to life-saving interventions.

Other research shows that care in a designated trauma centre is associated with a 25% lower risk of death among severely injured patients. Ontario has nine designated Level I adult trauma centres, all located in urban areas.

But delivering timely, appropriate trauma care is a challenge in Ontario, where 90 percent of the province is considered rural, says Dr. Nathens.

In Ontario, there is no requirement that smaller, more rural hospitals have a trauma team to assist in providing early care to stabilize severely injured patients such that they can survive long enough to benefit from the highest level of trauma care available in trauma centres. Nor do Ontario hospitals require that emergency department staff in these smaller centres have any special training in the treatment of severely injured patients.

St. Michael's is partnering with the Ontario Telemedicine network to evaluate the usefulness of telemedicine in helping community hospitals deliver better early care to severely injured patients.

The new study, entitled "Identifying Targets for Potential Interventions to Reduce Rural Trauma Deaths: A Population-Based Analysis," was and published online last month in the *Journal of Trauma*.

Provided by St. Michael's Hospital

Citation: More than 50 percent of injury-related deaths in rural Ontario occur before patients reach hospital (2010, January 26) retrieved 25 April 2024 from <https://medicalxpress.com/news/2010-01-percent-injury-related-deaths-rural-ontario.html>

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