

Spinal cord injury epidemiology

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[Spinal cord injury epidemiology](#) is changing as preventative interventions reduce injuries in younger individuals, and there is an increased incidence of incomplete injuries in aging populations. With decompressive surgery and proactive interventions to improve spinal cord perfusion, early treatment has become more intensive. Accurate data, including specialized outcome [measures](#), are crucial to understanding the impact of epidemiological and treatment trends. Dedicated SCI clinical research and data networks and registries have been established in the United States, Canada, Europe, and several other countries.

Traumatic spinal cord injuries (TSCIs) affect up to 500,000 people worldwide each year, and their high morbidity is associated with substantial individual and societal burden and socioeconomic impact ^{1) 2)}.

TSCIs most commonly affect young males and result from road traffic accidents, but recent reports also highlight their increasing incidence in older adults as a result of low-energy falls ^{3) 4) 5)}.

Kelly-Hedrick et al. reviewed four registry networks, [The NACTN Spinal Cord Injury Registry](#), [The Spinal Cord Injury Model Systems \(SCIMS\) Database](#), [The Rick Hansen Spinal Cord Injury Registry \(RHSCIR\)](#), and the European Multi-Center Study about Spinal Cord Injury Study ([EMSCI](#)). They compared the registries' focuses, data platforms, advanced analytics use, and impacts. They also describe how registries' data can be combined with [EHR](#) or shared using federated analysis to protect registrants' identities. These registries have identified changes in [epidemiology](#), recovery patterns, complication incidence, and the impact of practice changes like early decompression. They've also revealed latent disease-modifying factors, helped develop [clinical trial](#) stratification models and served as matched control groups in clinical trials. Advancing SCI clinical science for personalized medicine requires advanced analytical techniques, including machine learning, counterfactual analysis, and the creation of digital twins. Registries and other data sources help drive innovation in SCI clinical science ⁶⁾.

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