Traumatic brain injury incidence and mortality: a large population-based study

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Background
Traumatic brain injury (TBI) is a severe condition that represents a major global public health concern.

Objectives
Provide a comprehensive epidemiological outlook encompassing TBI incidence, healthcare provision and mortality.

Methods
Population-based study in Veneto (4.9 million inhabitants), Italy, from 2012 to 2021. Hospital discharge and mortality records were used to assess incidence and mortality. Kaplan-Meier survival estimator and Cox regression models were fitted to investigate determinants of mortality.

Results
Between 2012 and 2021, there were 37,487 incident TBI cases, corresponding to an age-standardized rate of 77.30/100,000 people (95% CI 76.52-78.09), higher among males, with an exponential growth after age 70. Leading causes were domestic (33.1%) and traffic accidents (17.7%), the first predominating among the elderly and children, while the latter in males 15-24 and older people. After rates stably declined between 2012 and 2019, the study captured a sharp decrease especially for traffic and occupational accidents in males, due to COVID-19 lockdown in 2020. Overall, 48.9% TBI patients were hospitalized in a specialized trauma center, with 2.6% requiring a transfer after accessing a spoke hospital. Over a 3.7 years median follow-up, 16,145 deaths were recorded, with higher mortality for those undergoing neurosurgical interventions, regardless of their access point. Risks of death increased with age, male gender, and comorbidities.

Discussion
TBI incidence is characterized by distinct patterns, affecting particularly older individuals and males. Minimal hospital transfers with comparable survival irrespective of access point suggests an effective patient management within the network. The study underscores the critical need for acute-phase support and prolonged care strategies for older TBI patients.

Keywords: Epidemiology; Incidence; Mortality; Regional trauma network; Traumatic brain injury.

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