EPH59

DEVELOPMENT AND VALIDATION OF A CASE IDENTIFICATION ALGORITHM FOR HAND TRAUMA PATIENTS USING HEALTH ADMINISTRATIVE DATA AND THE EPIDEMIOLOGY OF HAND TRAUMA IN A UNIVERSAL HEALTHCARE SYSTEM

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INTRODUCTION

- Hand trauma is a common injury that can impact function, quality of life, and healthcare utilization.
- In the absence of a national registry, health administrative data offer a practical and cost-effective way to study hand trauma across large populations.

OBJECTIVES

Our primary objectives were:
1) to develop and validate an administrative data algorithm for the identification of hand trauma cases using clinical diagnoses documented in medical records as the reference standard .

2) to estimate the incidence of hand trauma in a universal public healthcare system from 1993 to 2023 using a population-based research cohort constructed using a validated case identification algorithm.

METHODS

- This retrospective study linked a random sample of patients from an urban tertiary-care hand trauma center in Toronto, Ontario, to provincial health administrative data.
- Various combinations of physician fee-for-service procedure codes, physician diagnostic billing codes, hospitalization records, and emergency room records were tested, optimizing sensitivity, specificity, positive predictive value, and negative predictive value.
- Using the optimal algorithm, age- and sex-standardized incidence rates of hand trauma among men and women, and by age group were calculated from 1993 to 2023.
- Age- and sex-standardized rates by area of patient residence were also determined.

RESULTS

- Among 301 patients included in the study, 147 (49%) had hand trauma.
- The most common injury type was fractures or dislocations involving the phalanges, carpus, radius, or ulna (57%), followed by tendon injuries (12%), ligamentous injuries (8%), crush injuries (5%), and spaghetti wrist injuries (4%).
- The optimal algorithm for identifying hand trauma cases in Ontario's health administrative data was:
  "(2 specific physician diagnostic billing codes in 1 year with at least 1 billed by any hand trauma specialist) OR (1 specific or general physician diagnostic billing code and 1 fee-for-service procedure code in 1 year with at least 1 billed by any hand trauma specialist)."

Sensitivity: 73.8% (95% CI 66.6-81.0)	**PPV: 78.1% (95% CI 71.2-85.0)**
Specificity: 80.1% (95% CI 73.8-86.5)	**NPV: 76.1% (95% CI 69.5-82.7)**

- The greatest increase was observed in males and individuals aged 0–19 and 80+, with higher incidence rates in Southern compared to Northern Ontario.

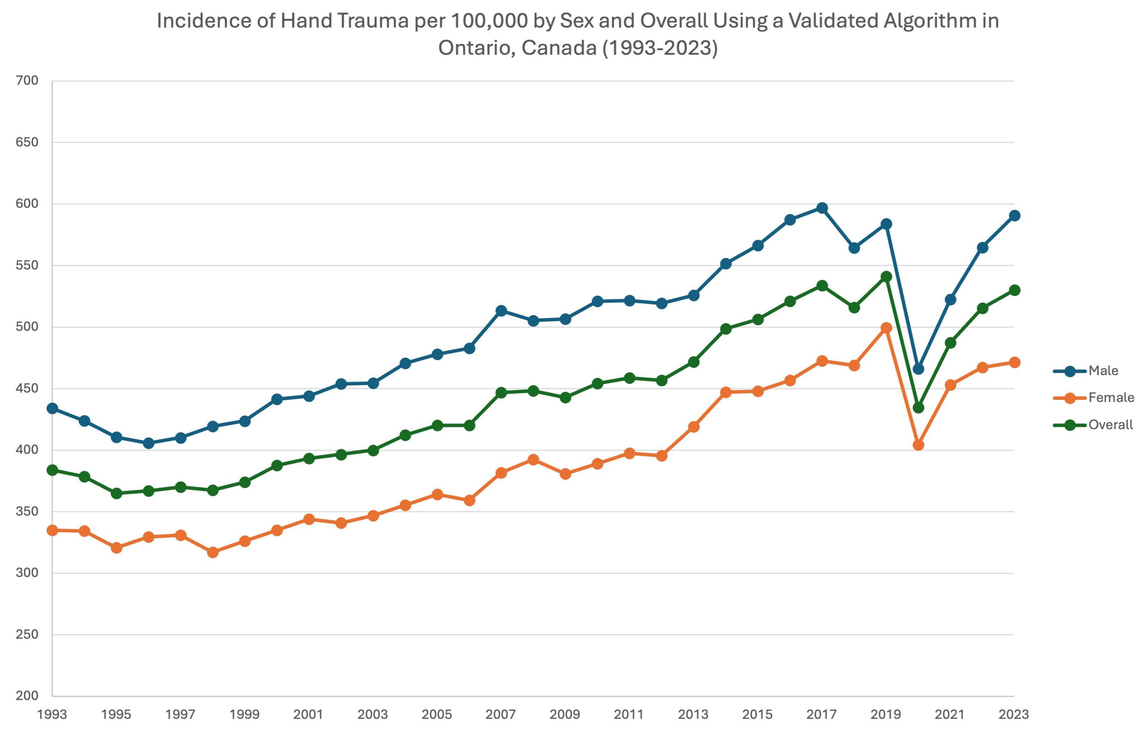

Figure 1: The age/sex-standardized incidence per 100,000 increased from 384 (95% CI 380-388) in 1993 to 530 (95% CI 527-534) in 2023

CONCLUSIONS

Our algorithm enabled identification of hand trauma cases using health administrative data suitable for population-level surveillance and health services research, revealing a rising burden of hand trauma from 1993 to 2023. These findings underscore the importance of improving access to specialized hand trauma care and enhancing injury prevention efforts, particularly in high-risk demographics and underserved regions. Additionally, leveraging administrative data for long-term outcome tracking could provide valuable insights into post-injury complications, healthcare utilization patterns, and long-term functional recovery, allowing for better resource allocation.

REFERENCES

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