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Is the TMPM-ICD9 revolution in trauma risk-adjustment compatible with imperfect administrative coding?

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Source
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Abstract

BACKGROUND:

TMPM-ICD9 is the latest injury-severity measure based on empirical estimation from ICD-9-CM codes. It is candidate to replace expert-based AIS measures worldwide because of easier accessibility and better predictive performances. In Italy and other countries administrative ICD coding is generally less complete than dedicated AIS coding. We attempted to ascertain how this affects TMPM performances.

METHODS:

Discrimination (c statistics) and calibration (calibration curves, Akaike's criterion) of hierarchical logistic regression models for hospital mortality comprising TMPM or ISS were compared using trauma-registry data on 3570 patients of years 2007-2009. The completeness of AIS vs. ICD-9-CM coding was also investigated through the ratio of the respective numbers of codes per patient. Model discrimination was further analyzed after stratification according to the above ratio (>1 and ≤ 1).

RESULTS:

The models with TMPM showed worse performances. The differences, concerned calibration (graphical evidence) in univariate models and discrimination (-1.2% of area under the ROC curve, $p<0.05$) in models completed with age, gender, mechanism of injury, motor GCS and systolic pressure. In parallel, ICD coding was less complete than AIS, as expected: 68% of patients had a ratio >1. The discrimination of TMPM vs. ISS models improved when the ratio changed from >1 to ≤ 1.

CONCLUSIONS:

The predictive performances of TMPM-ICD9 vs. ISS were lower than in the previous studies; the sub-optimal quality of ICD coding was a main cause. Imperfect administrative coding may hence hamper the TMPM-ICD9 revolution, although in our setting the negligible differences and the ready availability of administrative data may still give reason for adopting TMPM-ICD9.