## Monitoring traumatic brain injury in China

Traumatic brain injury (TBI) has been recognised as a public health problem in China, but more population-level evidence on care utilisation and quality of care is needed.[1] To better monitor health-care outcomes after TBI, we propose the use of data from the hospital quality-monitoring system, with a minor change on the standardised format of the front page of inpatient medical records.

The hospital quality-monitoring system is a national database managed by the National Health Commission that collects information from the front page of inpatient medical records from all tertiary hospitals in China since 2013. This information has already been used as the data source for the national reports on the quality and safety of health care from 2015 to 2017,[2] as well as the annual reports from the China kidney disease network.[3] Data submission was mandatory for over 900 tertiary hospitals from 31 provinces and the system had collected over 40 million records by the end of 2015.[3] The template of the front page of inpatient medical records contained primary and secondary diagnoses coded using the international classification of diseases (ICDs), as well as data on operations, meaning that the records of patients with TBI (which include information on comorbidities and treatments) can be identified. Information on masked patient identifier and discharge status (ie, transfer to other hospitals or death) are also included so that further analyses on the in-hospital mortality and readmission of patients with TBI are feasible.

One of the potential problems of using the front page of inpatient medical records to analyse outcome quality measures of TBI (eg, mortality, readmission, and safety indicators) is that there are no data in these records to indicate the severity of TBI. The front page of inpatient medical records contains six variables, that especially pertain to patients with craniocerebral injuries,[4] including the duration of coma before (ie, in days) and after (ie, in hours and minutes) hospitalisation.

It would be very helpful if one of these variables could be changed to the injury severity score, which is internationally recognised and would allow to document the severity of the brain injury. These data for severity would then serve as an important variable for clinical research and risk adjustment. This change is also necessary because software cannot be used to convert diagnostic codes into severity scores (such as the abbreviated injury scale). To do so, diagnoses would need to be coded in the clinical modification of the US ICD-10 (ICD-10-CM) instead of the ICD-10-CM of China, which does not include anatomic injury codes.[5] We believe that, by use of the hospital quality monitoring system database and promotion of such change on the front page of inpatient medical records, research on TBI can be more diversified and the treatment outcomes of TBI can be better explored in China.

We declare no competing interests.

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1 Jiang J, Gao G, Feng J, et al. Traumatic brain injury in China. *Lancet Neurol* 2019; **18:** 286–95.
2 National Health Commission. 2017 National report on the services, quality and safety in medical care system. Beijing: Scientific and technical documentation press, 2018.
3 Saran R, Steffick D, Bragg-Gresham J: The China kidney disease network (CK-NET): "Big data—big dreams". *Am J Kidney Dis* 2017; **69:** 713–16.
4 National health and family planning commission of the people's republic of China. Requirements on the national survey system of health resources and medical services (2012 version). http://www.nhc.gov.cn/mohbgt/s6693/201301/d09bc944bb57409f8522f94874694e5c.shtml (accessed July 6, 2018).
5 Clark DE, Black AW, Skavdahl DH, Hallagan LD. Open-access programs for injury categorization using ICD-9 or ICD-10. *Inj Epidemiol* 2018, **5:** 11.

## Authors' reply

We thank Xueyan Han and Huixuan Zhou for their interest in our Review and for their invaluable concerns on data collection for traumatic brain injury (TBI) in China. They propose that, to better monitor health-care outcomes for TBI, data from the hospital quality-monitoring system (with a minor change on the standardised format of the front page of inpatient medical records) ought to be used.

However, we deemed the data from the hospital quality-monitoring system insufficient, both spatially and temporally, for our Review, which intended to present a whole picture of the country spanning previous decades. Xueyan and Huixuan mention a very good example of data collection on kidney disease from the hospital quality-monitoring system, which involved over 900 tertiary hospitals. However, patients with kidney disease are admitted in tertiary hospitals, but the majority of patients with TBI are admitted in local hospitals due to the urgency and severity of their presentations. Besides, by the end of 2017, there were 2340 tertiary hospitals and 8422 secondary hospitals which were affiliated with a medium size city, county, or district. Additionally, no data before the year 2013 are available in the hospital quality-monitoring system. The hospital quality monitoring system is therefore, at least for the moment, not a good data source for monitoring TBI.

We noted with interest that Xueyan and Huixuan suggest to amend details (ie, by including the injury severity score) on the front page of inpatient medical records to enhance information collection for TBI. It would actually be more helpful if the hospital quality-monitoring system included the Glasgow coma scale (to show clinical features), cranial CT characteristics (to show imaging features), and intracranial pressure (to show pathophysiological features) for every patient with TBI. In brief, improvement of the front page of