

Traumatic brain injury

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Traumatic brain injury: a priority for public health policy



The *Lancet Neurology* Commission¹ draws attention to the devastating impact of traumatic brain injury (TBI) on patients and their families, and the huge public health burden and economic cost of TBI globally. About 50–60 million new TBI cases are estimated to occur annually, with 2.5 million occurring in the European Union.¹ The burden of TBI is greatest in low-income and middle-income countries, where 90% of trauma-related deaths occur.^{2,3} The Commission sets priorities for prevention, clinical care, and research, calling for a combination of innovative research methods and global collaboration to address the huge but poorly recognised public health challenge of TBI, with steps to ensure that developments in care and progress in research are effectively translated into clinical practice and public health policy.

The Commission¹ identifies a range of challenges in relation to prevention, clinical care, and research that need to be addressed to reduce the global burden of TBI. Although TBI is a largely preventable condition, efforts are needed to correct deficiencies in epidemiological monitoring worldwide to understand the full scale of the problem, in order to develop effective policies for population-based or targeted prevention and to allow appropriate allocation of health-care resources. Furthermore, the Commission underlines the association between TBI and neurodegenerative diseases, which strengthens the case for prevention. TBI is perhaps one of the best established environmental risk factors for dementia: evidence suggests that moderate and severe head injuries in young people are associated with an increased risk of Alzheimer's disease and other dementias in later life.⁴

At the clinical level, TBI-related disabilities pose formidable challenges for treatment and rehabilitation; highly developed systems of care are needed for optimum management of patients with TBI, with continuity from prehospital to postacute care. Current clinical protocols do not sufficiently take into account differences between patients or their different stages of disease process. New evidence-based guidelines should emphasise implementation of best practice in the context of an understanding of individual pathophysiology and clinical needs—a step towards precision medicine for TBI. Moreover,

several obstacles need to be overcome to ensure that health-care professionals follow available guidelines, including professional habits that might run counter to new approaches to care, peer-group influence, and organisational barriers.⁵ Validation and implementation of new prognostic models are needed for benchmarking of care and to allow appropriate management of individual patients.

Investment in research, with development and use of new research methods, including new approaches to data sharing and collaboration, will be an essential part of efforts to prevent TBI and to transform the quality of clinical care for patients. For example, comparative effectiveness research might allow existing variations in systems of care and clinical management to be used to identify best practices. The development of the Common Data Elements for TBI research is an important step forward. Research projects and patient records are currently generating an impressive amount of data worldwide. Although difficult to implement, use of a set of standardised protocols would be highly beneficial to TBI research. However, progress will depend on a regulatory framework that does not impose barriers to such collaborative approaches to research. In the European Union, for example, the General Data Protection Regulation, which will take effect in 2018, does not provide clear solutions concerning research data collection with incapacitated patients in the emergency setting.⁶

It is worth noting that, over the past few years, financial support for neurotrauma research has been substantial. For example, the International Initiative for Traumatic Brain Injury Research (InTBIR)—a concerted effort of the European Commission, the Canadian Institutes of Health Research, and the National Institutes of Health to coordinate and leverage clinical research activities on TBI—has contributed approximately €75 million for research from 2012 to 2018,¹ representing a welcome uplift from the past. However, support is still strikingly low when compared with funding for other neurological conditions. For instance, the global funding for Alzheimer's disease was estimated by the International Alzheimer's Disease Research Portfolio⁷ to be €2.9 billion for the period from 2008 to 2014.⁸ Research funding for frontotemporal

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For more on **Common Data Elements for TBI** see https://www.commondataelements.ninds.nih.gov/TBI.aspx#tab=Data_Standards

dementia, a disease with a global incidence of less than 300 000 people per year, was estimated to be about €368 million in the period from 1998 to 2008.⁹ The substantially higher number of people affected by TBI globally, in addition to the huge cost burden, justifies a considerable increase in funding to support neurotrauma research.

This Commission¹ has the overall goal of providing expert recommendations to policy makers, among others. Translation into policy of research-based knowledge about TBI and other public health issues remains a challenge,¹⁰ not least because politicians are influenced not only by research findings, but also by a range of other factors, including financial concerns, commonplace knowledge, ideology, constituency input, and public perceptions. Additionally, policy makers tend to take small steps, to build on existing policies rather than establish wide reforms of the type needed to tackle TBI, such as reforms to public health policy, prevention strategies, clinical services, and research support. Researchers need to acquire a sound understanding of the political process in order to communicate effectively with policy makers.¹¹ Moreover, research findings in TBI need to be better explained to the public—the end-recipients of policy decisions. While public awareness of TBI has increased, it has not yet been sufficient to prompt policy changes. Therefore, patient groups need to strengthen their lobbying activities. Public health advocates for TBI should also pay more attention to the full range of strategies that are used to implement policies and maintain them over time.¹² For example, the complex problem of TBI requires intersectoral policies that necessitate collaboration between different branches of political and managerial authorities to achieve specific health objectives, despite challenges such as political disputes and bureaucratic inertia. Furthermore, such intersectoral health policies must be durable and able to withstand bureaucratic and political changes.¹² Improvements in communication and understanding among the various stakeholders could help policy makers to arrive at evidence-based decisions and to take bolder steps to address the huge burden of TBI.

In conclusion, there is a need to raise awareness of the scale of the challenges posed by TBI, which encompass approaches to prevention, systems of care, clinical management, and research strategy. These efforts need to go beyond a clinical audience and address patients

and their caregivers, politicians, research funders, and other stakeholders. However, it is leadership at the policy-making level that will ultimately determine how well health systems are prepared to face the future challenges of TBI. Implementation of policies for better prevention and improved systems of care, and commitment to long-term investment in TBI research across a range of disciplines, are urgently needed. The course of action to reduce the burden of TBI must be driven by political leaders with visionary ideas about the direction of policy, who are able to invest in the future of public health, even though the results of such action will stretch beyond their policy cycle.

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