Incidence of *De Novo* Depression Following Traumatic Brain Injury is Highest within 1 Year Post-injury

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BACKGROUND

Traumatic brain injuries (TBI) can result in substantial cognitive disruptions.[1] Depression is one of the most common complications after TBI,[2] known to hinder patient recovery and increase healthcare costs and resource utilization.[3,4] While pre-injury depression is a documented risk factor for post-injury depression,[2] it is suspected that many cases of post-injury depression are *de novo* diagnoses[5]

OBJECTIVES

We aimed to assess the incidence of *de novo* depression for three years post-TBI

METHODS

- De-identified patient data from a U.S. electronic health record database (Cerner Real-World Data) was extracted
- We included adults (≥18 years old) who sustained a TBI for the first time in 2017 and had at least 1 documented visit to a healthcare professional within 1 year both before and after injury
- We excluded those who previously experienced another serious neurological event (e.g., stroke, brain tumor, or neurodegenerative disease), had been diagnosed with depression, or used anxiolytic/antidepressant medications
- Cases of *de novo* depression were identified by either a diagnosis of a major depressive disorder (MDD) via ICD-10 codes (**Table 1**) or the receipt of an antidepressant or anxiolytic medication



RESULTS

- A total of 10,399 patients experienced a TBI in 2017, of whom 52% were female
- The median age of patients who sustained a TBI was 39 years, but injury was most prevalent among patients aged 60+ (43.4% of cases)
- By 3 years post-injury, 861 patients (8.3%) were identified as having *de novo* depression, accounting for 7.3% of all males and 9.2% of all females
- The median age of those identified as having post-TBI *de novo* depression was 45
- The incidence of *de novo* depression decreased with time following a TBI, with 71.3% diagnosed by the end of Year 1 post-injury, a further 19.0% by the end of Year 2, and 9.7% by the end of Year 3 (**Figure 1**)
- The rate of *de novo* depression was 7.3% in Year 1, 0.8% in Year 2, and 0.3% in Year 3 (**Figure 2**)

CONCLUSIONS

- Over two-thirds of patients who experienced a TBI in 2017 were identified as having *de novo* depression within 1-year post-TBI
- To ensure timely diagnosis, healthcare providers should consider closely monitoring patients for symptoms of depression following their injury
- Future studies can further assess patients with TBI for additional psychiatric symptoms to gain a more comprehensive understanding of the epidemiology of mental health disorders

TABLE 1. ICD-10 codes used to identify cases of depression

Diagnosis	**Code(s)**
Depressive episode	F32.0, F32.1, F32.2, F32.4, F32.5, F32.9
Recurrent major depressive disorder	F33.0, F33.1, F33.2, F33.40, F33.41, F33.42, F33.9
Dysthymic disorder	F34.1

FIGURE 1. Incidence and timing of post-TBI *de novo* depression

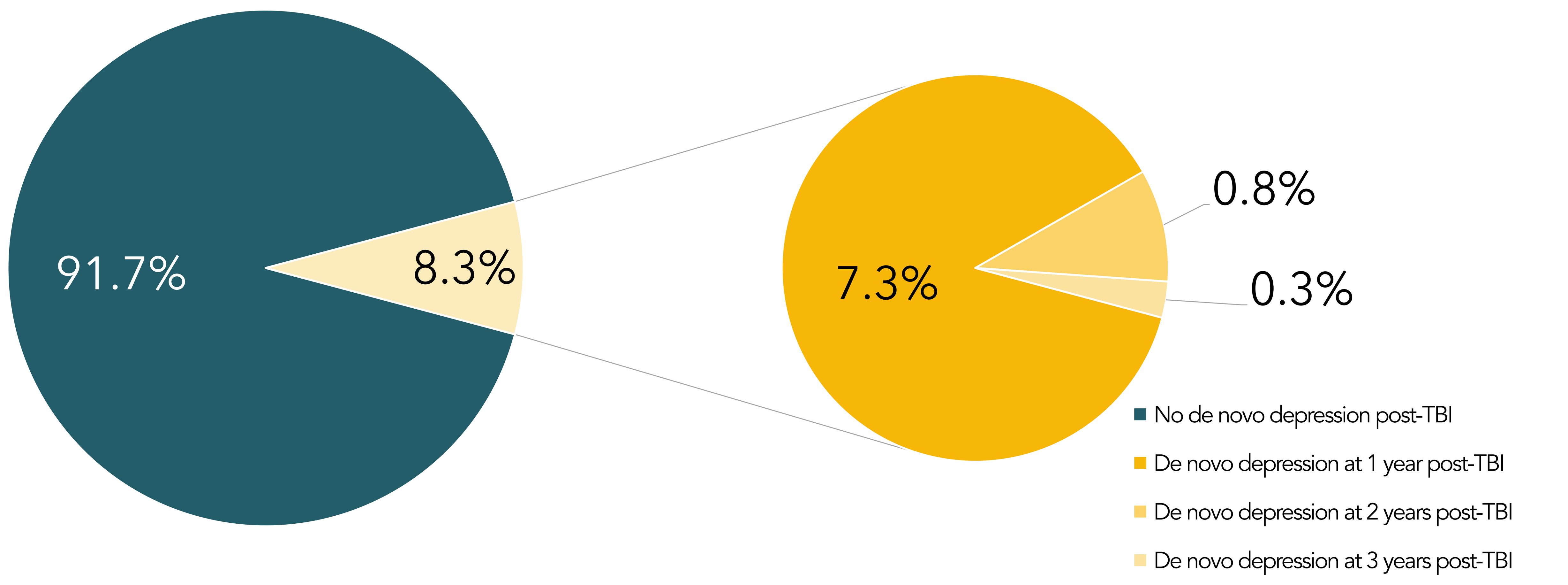
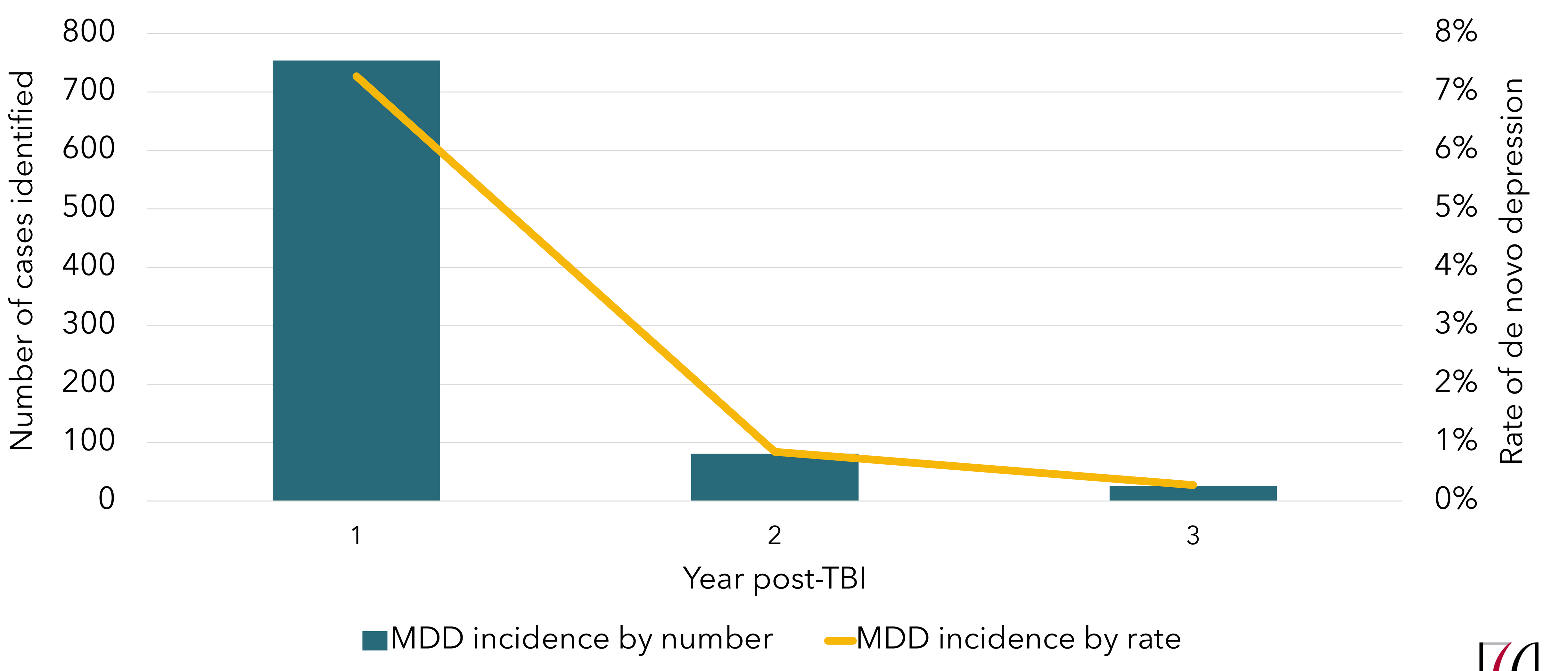

91.7%
8.3%
7.3%
0.8%
0.3%
No de novo depression post-TBI
De novo depression at 1 year post-TBI
De novo depression at 2 years post-TBI
De novo depression at 3 years post-TBI

FIGURE 2. Yearly incidence of *de novo* depression post-TBI


800
700
600
500
400
300
200
100
0
Number of cases identified
8%
7%
6%
5%
4%
3%
2%
1%
0%
Rate of de novo depression
1
2
3
Year post-TBI
MDD incidence by number
MDD incidence by rate

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