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Contact: dagan.a.wright@dhsosha.state.or.us

A traumatic brain injury (TBI) is an injury caused by a blow, jolt, or penetrating object that disrupts normal functioning of the brain. These brain injuries can cause problems with speaking and understanding, movement or mobility, thinking or memory, and personality or mood.¹

It is crucial that youth suffering from a TBI receive comprehensive medical, rehabilitative, educational, and psychological care to promote healing, lessen cognitive fatigue, lessen risk for further unintentional injuries, and mitigate long term problems they may face.²

Information provided in this data brief describes the “disposition at the time of discharge data” from hospitalization and emergency department settings for Oregon residents under 22 years of age.⁴ It also discusses the primary health insurance type the patient has at the time of discharge. Both the care setting and insurance types can affect the follow-up care a patient receives for a TBI as well as serve as a point of intervention to ensure youth are referred to social and educational services needed to prevent and address needs associated with the injury. An Oregon based study in 2014 reported those with public insurance were more likely to be discharged to after hospital care compared to other major insurance groupings (private, uninsured, etc.).⁵

Between 2018-2021, there were 235 TBI-related deaths involving Oregonians younger than 22 years of age. This translates to 14,883 years of potential life lost.³

In addition, this population had 1,065 TBI-related hospitalizations and 26,794 ED discharges during this four-year time period.

“Disposition” refers to categories defining how patients are released from the hospital or emergency department (ED). Categories include: 1) discharge to some type of after care, 2) discharge to home/self-care, 3) patient discontinuing care against medical advice, 4) inpatient admission in the same hospital, and 5) “other.”

“Primary payer type” at the time of disposition refers to the source of health insurance covering the patient’s bills. Payer types include” 1) commercial insurance, 2) Medicaid, 3) Medicare, 4) uninsured, and 5) “other,” which includes several programs under the Veterans Administration along with sources not specified.

1 <https://www.cdc.gov/injury/features/traumatic-brain-injury/index.html>

2 <https://pubmed.ncbi.nlm.nih.gov/27497469/>

Kolakowsky-Hayner SA, Bellon K, Yang Y. Unintentional injuries after TBI: Potential risk factors, impacts, and prevention. *NeuroRehabilitation*. 2016 Jun 30;39(3):363-70. doi: 10.3233/NRE-161368. PMID: 27497469.

<https://pubmed.ncbi.nlm.nih.gov/33656467/>

Riccardi JS, Ciccio A. Cognitive Fatigue in Pediatric Traumatic Brain Injury: A Meta-Analysis and Scoping Review. *J Head Trauma Rehabil*. 2021 Jul-Aug 01;36(4):226-241. doi: 10.1097/HTR.0000000000000644. PMID: 33656467.

3 Premature mortality is measured by the Years of Potential Life Lost (YPLL) statistic, which is the sum of the years of life lost annually by persons who suffered early deaths. For the purpose of calculating YPLL, premature death is defined as death occurring before the age of 65.

4 Including youth up to 21 years and 364 days old. This age range is based on requirements under the Individuals with Disabilities Education Act (IDEA)⁴ ensuring that all children with disabilities are entitled to a free, appropriate public education to meet their unique need and prepare them for further education, employment, and independent living.

5 https://journals.lww.com/headtraumarehab/Abstract/2014/11000/Racial_Ethnic_and_Insurance_Status_Disparities_in.11.aspx

The information presented in this data brief can help identify differences in the level of follow-up care between youth discharged from the hospital versus those discharged from the emergency department. Additionally, it can point to possible disparities in the follow-up care youth receive based on their health insurance type. There also could be policy development especially regarding Medicaid coverage and follow-up care. In the future we hope to show these data along with medical claims and Oregon's Department of Education's Regional Inclusive Services' data to describe the medical, social/community and educational needs for youth so that policy and prevention interventions can be developed to best serve Oregon's youth with traumatic brain injury.

As Figure 1 illustrates, most TBI-related hospitalizations (81.9%) and ED visits (97.4%) are discharged to home or self-care. Unsurprisingly, more TBI-related hospitalizations are discharged (13.7%) to some other type of after care than ED discharges (2.1%). This information can be used to develop policy and outreach to youth and their families so that they are encouraged and equipped with the information they need to access educational and social service support following a TBI-related discharge.

As Figure 2 illustrates the top two payers for TBI-related hospitalizations and ED visits were commercial insurance and Medicaid, combining to cover over 80% of those discharged for each. Within that pattern, commercial insurance paid for more of the hospital visits while Medicaid paid for more of the of ED visits. Much like the disposition category, these data can be used in partnership with commercial and Coordinated Care Organizations to engage and encourage youth and families to access educational and social support.

Figure 1. Percent of Disposition Category at TBI-Related Discharge from Hospital and ED for Youth <22 Years of Age Oregon 2018-2021

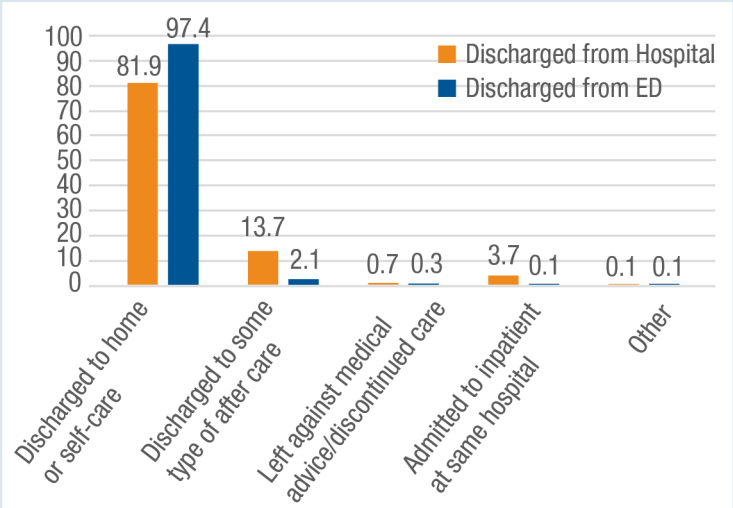
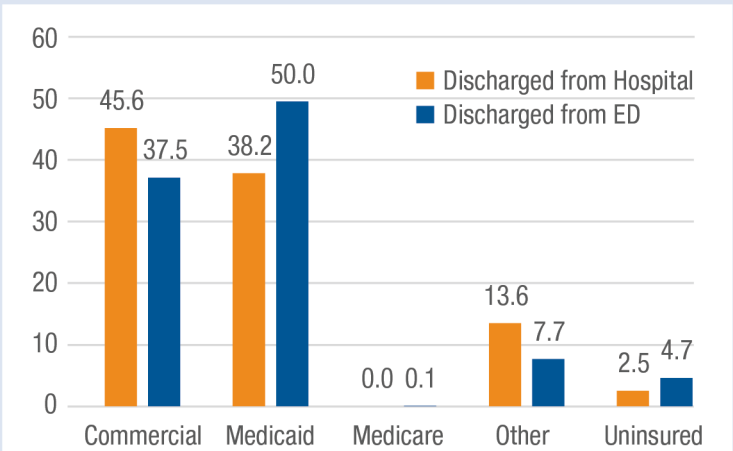


Figure 2. Percent of Primary Payer Category at TBI-Related Discharge from Hospital and ED for Youth <22 Years of Age Oregon 2018-2021



Data Sources and Descriptions

Death Data

[Center for Health Statistics](#) (CHS)

Death certificates are registered with CHS. Death certificates are completed and signed by a physician, physician assistant, nurse practitioner, or medical examiner. Information is reported in two ways: “resident deaths,” which include the deaths of all Oregon residents, even if the death happened out of state; and “occurrence deaths,” which include all deaths that happened in the state, including those who died here but were not Oregon residents. The data presented in this report are for “resident deaths.”

Hospital and ED Discharge Data

[Oregon Association of Hospitals and Health Systems](#) (OAHHS)

Discharge data includes hospital and emergency department (ED) information. Hospitals and EDs report data to OAHHS on visits and stays **when** there is a charge for services. This information includes diagnosis, care received, and demographic information. Hospital and ED discharge data **do not** overlap. If a patient goes to an ED first and then is admitted to the hospital, their information will appear in the hospital discharge data only.

Population Estimates

[National Center for Health Statistics](#) provides estimates of population size down to a county level. There is an approximately 18-month delay for this information. For example, estimates for 2021 will be released in summer 2022. These population estimates are used as the denominator when calculating rates (in this case per 100,000 residents). For example, the count of events (i.e., injury, hospitalization, or ED visit) for a given age group, sex, region, race, or ethnicity would be divided by the population estimate for the respective age group, sex, region, race, or ethnicity population estimate.

More Information

<https://www.cdc.gov/traumaticbraininjury/index.html>

<https://www.cdc.gov/traumaticbraininjury/health-disparities-tbi.html>

<https://www.oregon.gov/oha/PH/PREVENTIONWELLNESS/SAFELIVING/Pages/index.aspx>

<https://cbirt.org/>



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