

Housing Instability and Brain Injury: Understanding the Connection and Opportunities for Services and Systems

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Objectives

Following the completion of this presentation, attendees will be able to:

- 1. Describe the connection between brain injury and homelessness.**
- 2. Identify 2-3 strategies to address Social Determinants of Health in people with a brain injury to prevent homelessness.**
- 3. Identify 2-3 strategies to support people with a brain injury who are experiencing homelessness.**

Intersection of
SDOH, Brain Injury,
and Housing



What can we do
about it?

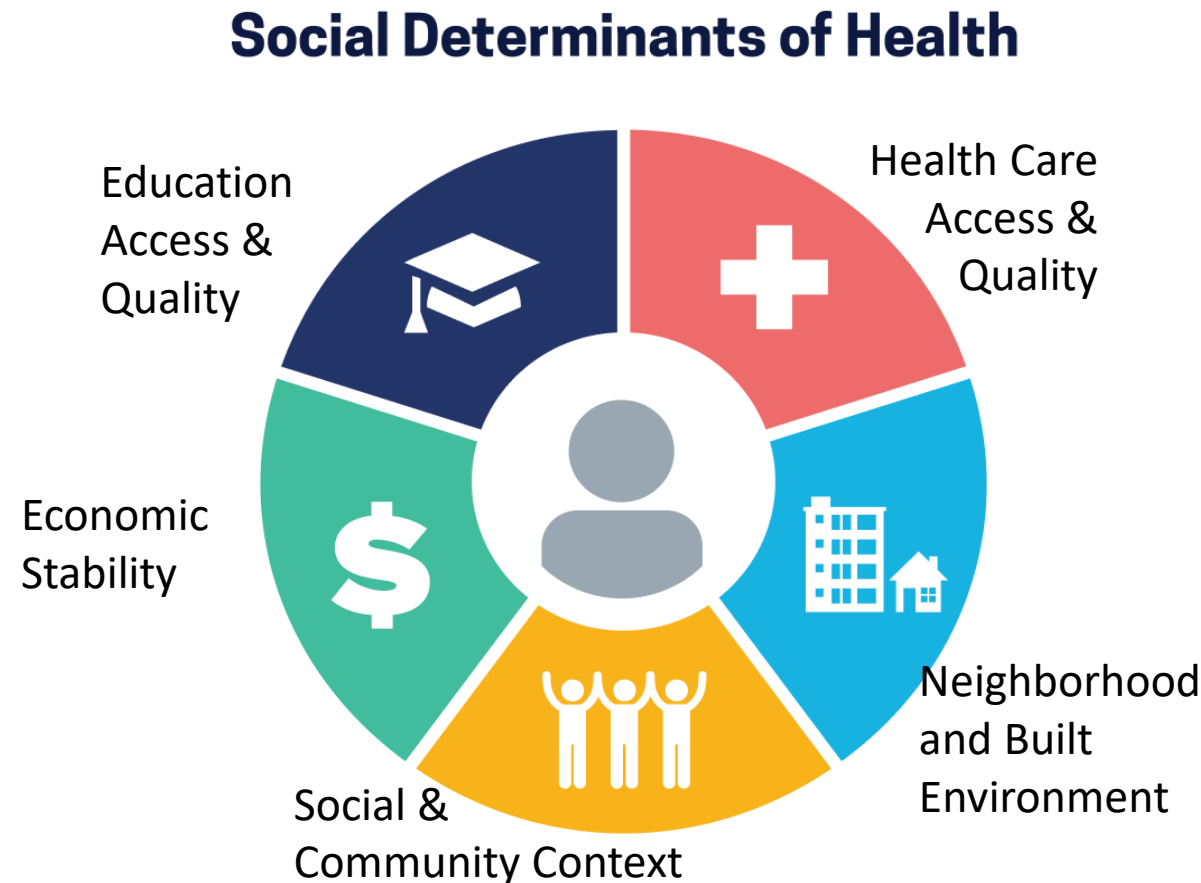


Social Determinants of Health and Brain Injury

Defining Social Determinants of Health

“Conditions in the environments in which people are born, live, learn, work, play, worship, and age that affect a wide range of health, functioning, and quality-of-life outcomes and risks.”

Social determinants of health are the primary cause of health inequities across communities.



Populations identified as having decreased reading and comprehension skills (functional literacy) include:

Lower income

BIPOC
communities

Unemployed

Older adults

Inner-city and
rural
residents

Incarcerated

Those who
didn't graduate
high school

Those living in
poverty

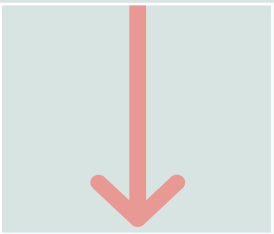
Economic Stability and Disability in the United States:



11.6% of the U.S. population is living in poverty making less than \$12,400 per year

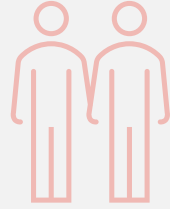


The annual income for a Supplemental Security Income (SSI) recipient is around \$9,528



People with disabilities live in poverty at more than twice the rate of people without disabilities

Social supports and networks for adults in poverty:



Are smaller



Are not as protective against
stress



Do not provide economic benefit

Transportation barriers impact those who are:



Living with a disability



Living in rural communities



Low income

Housing instability
and decreased
economic
standing is
associated with:



poorer health access



being uninsured



postponing needed care



postponing medications



higher hospitalization rates

Adverse Childhood Experiences (ACES)

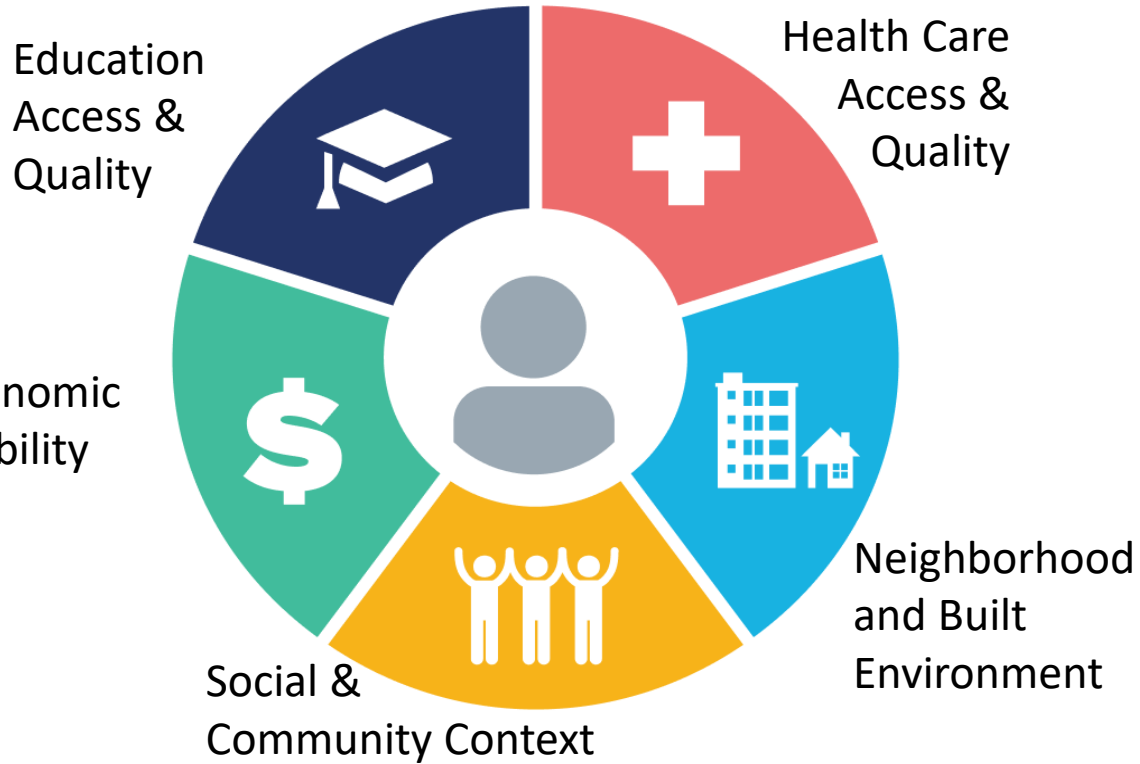
Potentially traumatic events that occur in childhood

- Experiencing violence, abuse, or neglect
- Witnessing violence in the home or community
- Having a family member attempt or die by suicide
- Experiencing discrimination

Or aspects of the environment that affect safety, stability, and bonding:

- Substance use or mental health problems
- Instability due to parental separation.
- Instability due to household members being in jail or prison
- Housing instability/homelessness
- Food insecurity

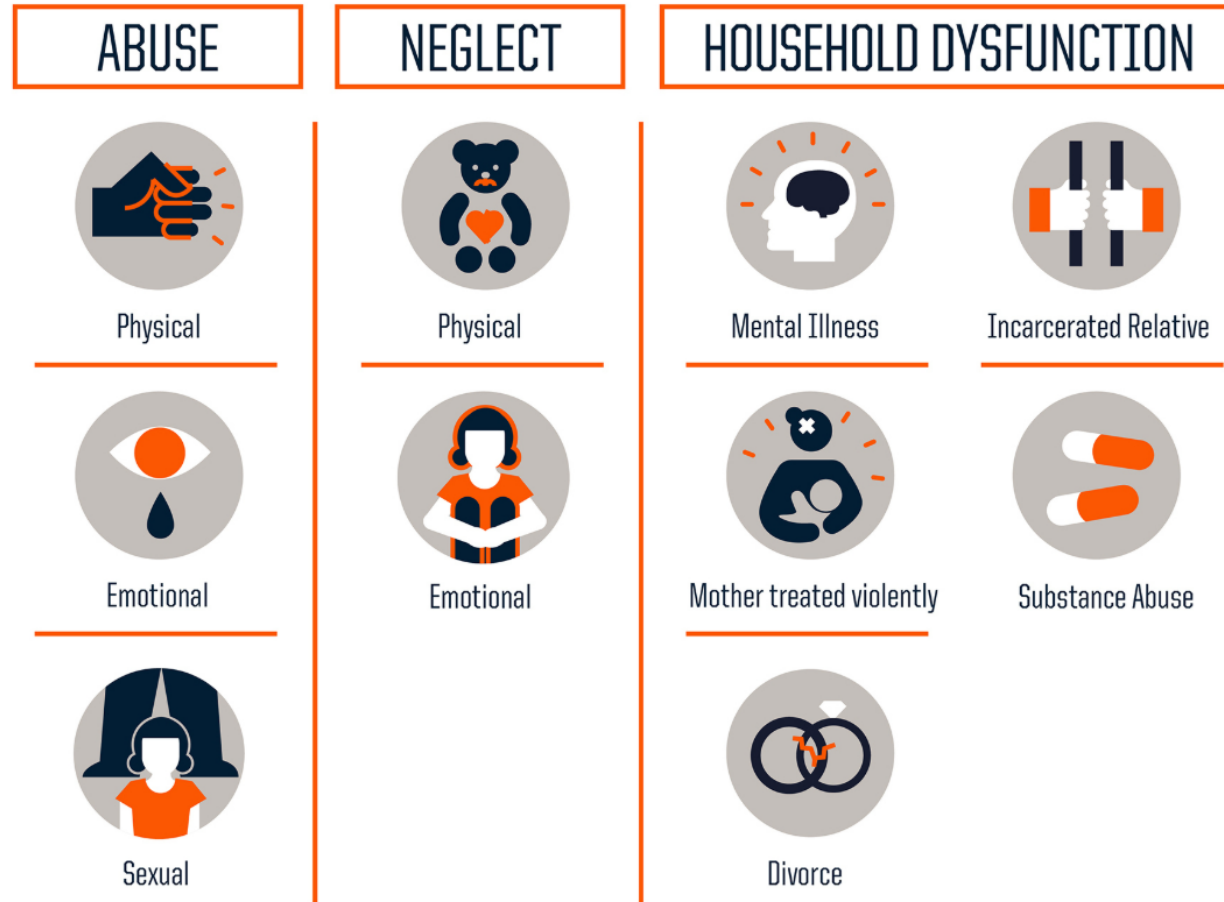
Social Determinants of Health



Social Determinants of Health
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Healthy People 2030

ACES



Source: Centers for Disease Control and Prevention

Credit: Robert Wood Johnson Foundation

Long-term health consequences and increased risk for chronic health and behavioral conditions ... and brain injury

Homelessness and Housing Instability



Where Does Homelessness Happen?

Understanding the definitions of homelessness



Shelter/Mission

Organized shelter for individuals experiencing homelessness



Street/Outside



Encampments

Typically including: residents sleeping outside in tents or other physical structures, storing belongings in the same location for a sustained period



Transitional Housing

Time-limited housing intended to support a transition to permanent housing

Vehicles



Abandoned Buildings

or other places generally not considered safe or fit for occupancy



Single Room Occupancy (SRO)/ Hotels/Motels

or other day-to-day paid housing

Considered “homeless” by the US Department of Housing and Urban Development [HUD]

Considered “homeless” by
the US Department of
Health & Human Services
(HHS)



Exiting Incarceration

with no plans for permanent housing or shelter



Exiting Treatment

with no plans for permanent housing or shelter



Supportive Housing

Permanent or long-term option designed to provide housing assistance paired with supportive services



Couch-Surfing (Doubled Up)

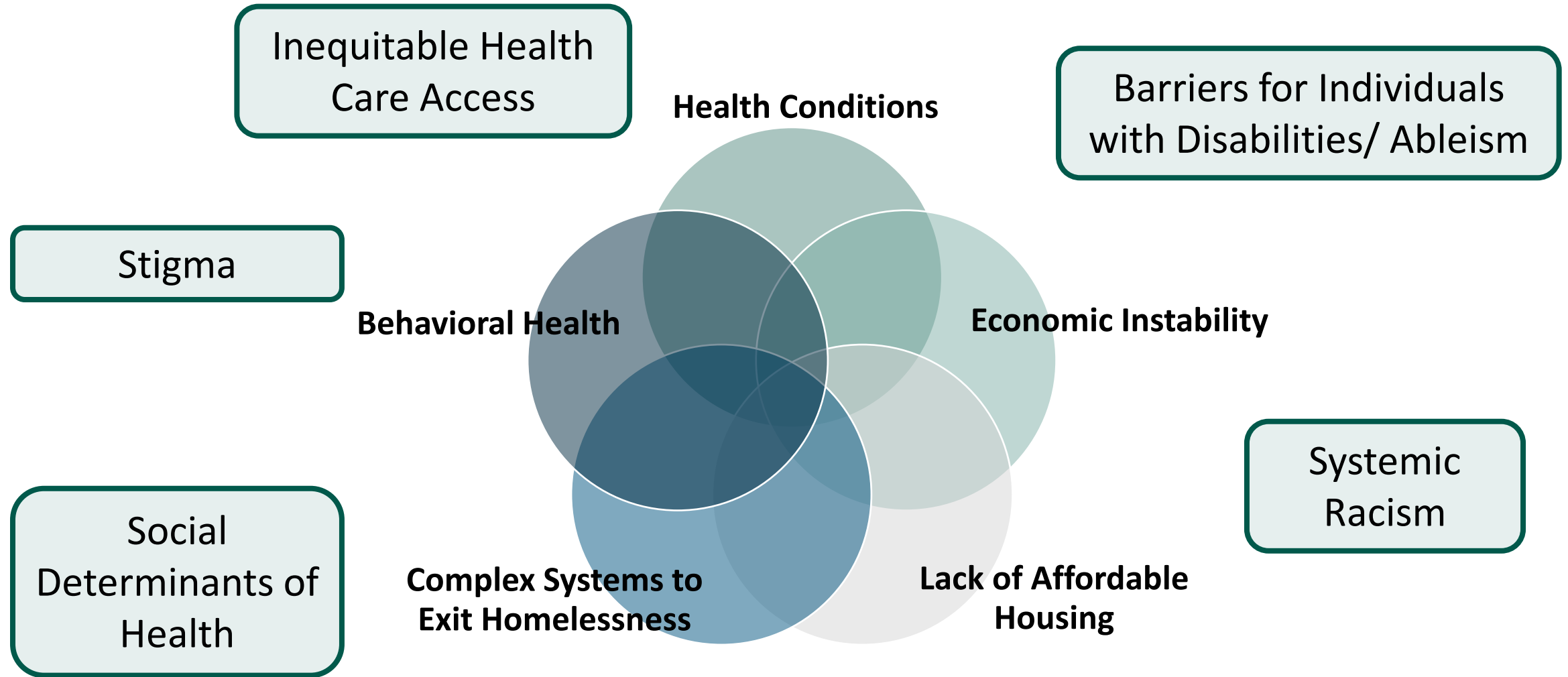
or living with others in an otherwise temporary arrangement



At-Risk of Homelessness

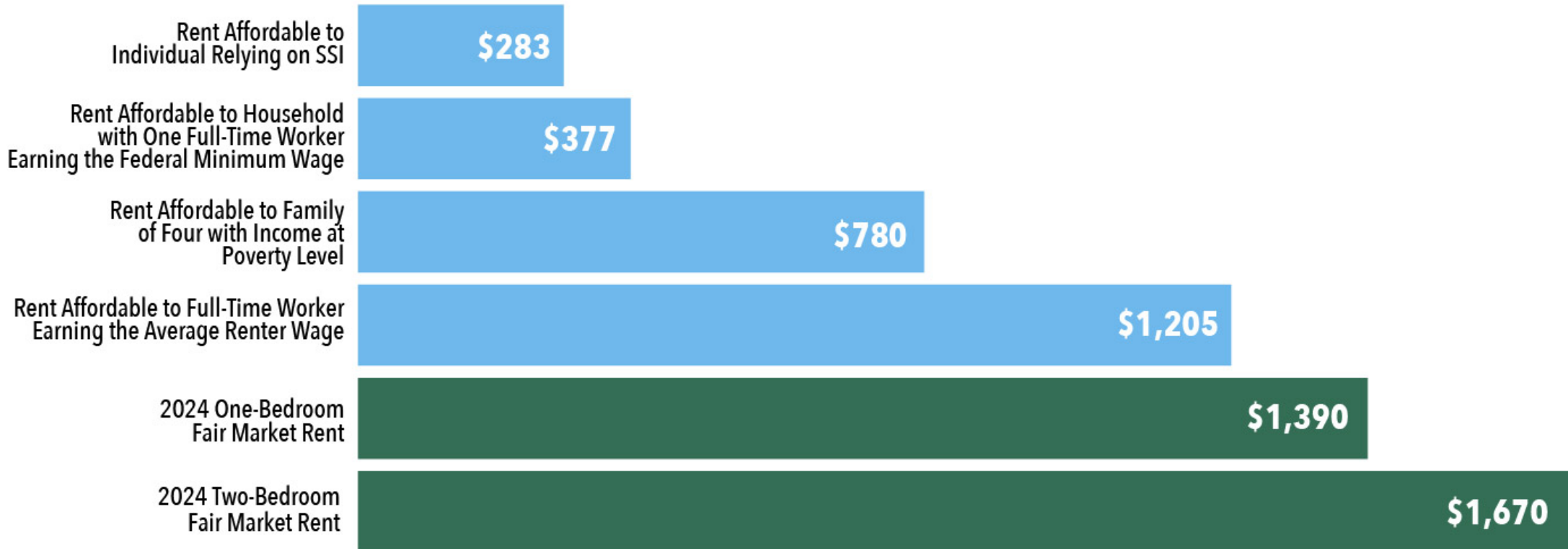
Such as facing eviction, among other [unstable situations](#)

So, what causes homelessness?



RENTS ARE OUT OF REACH

- Current affordable housing stock only meets 1/3 of demand
- 1% of housing stock is wheelchair accessible
- Less than 5% can accommodate moderate mobility disabilities



SDoH and Brain Injury: What's the Connection

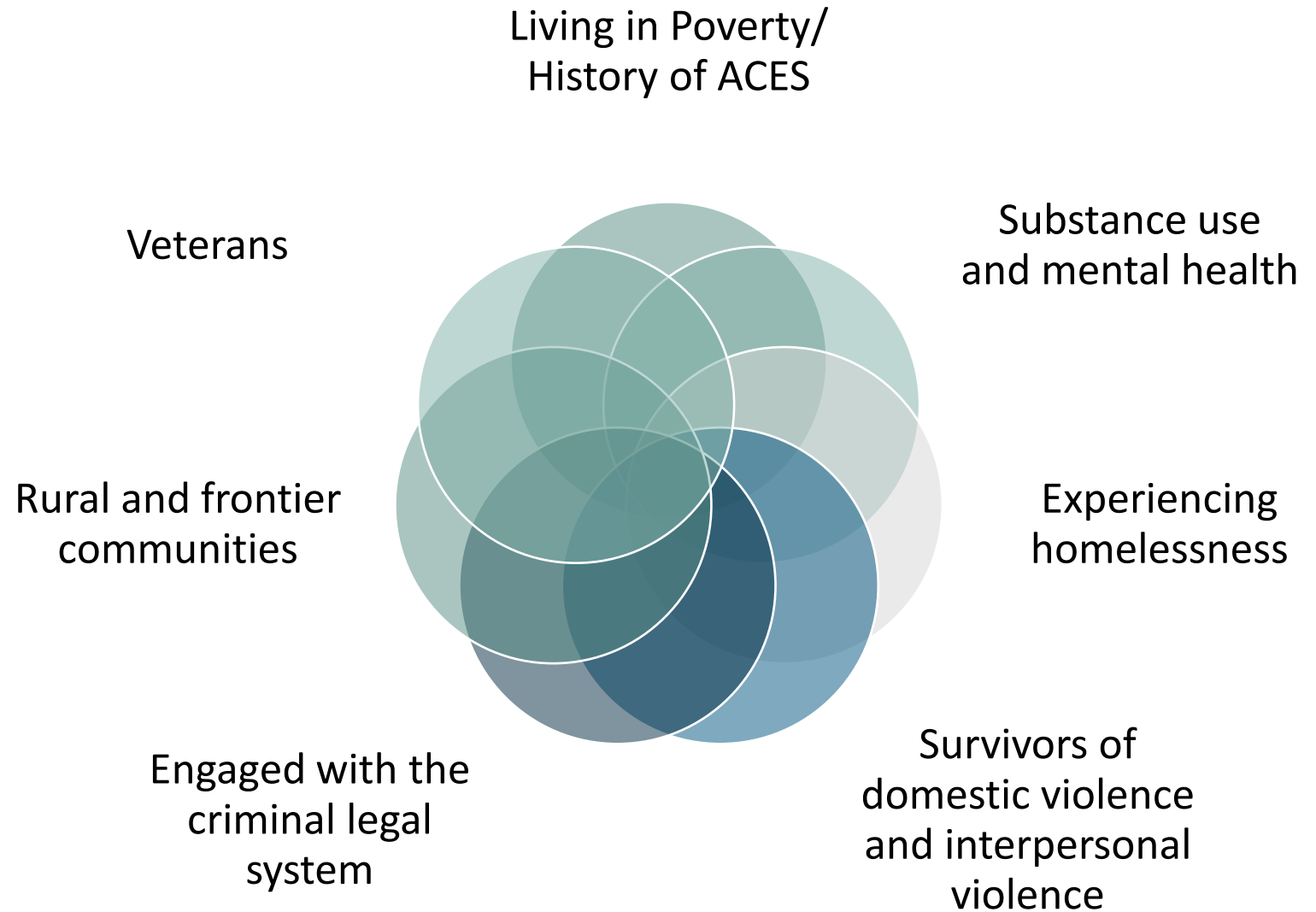
BI as a cause of homelessness

BI contributes to long-term
homelessness

BI is a consequence of
homelessness



Populations Impacted by SDoH and BI



Adults Experiencing Homelessness

More than 50% of adults experiencing homelessness have sustained a TBI

There is a high correlation of mental health symptoms and a history of BI for adults experiencing homelessness

More than 25% of adults experiencing homelessness have sustained a moderate – severe TBI

BI as a cause of
homelessness



BI contributes to long-
term homelessness



BI is a consequence of
homelessness

SDoH and Brain Injury Recovery

Contributors to brain injury recovery

Age of injury

Severity of
injury

Location of
injury

Length of
post-trauma
amnesia

Predictors of social integration and positive outcomes after BI

Social
Support

Social History/
Vulnerability

Cognitive
Reserve

Cognitive Reserve

What were literacy and education skills prior to BI?

Will the current cognitive skills impact ability to resume work?

Can the person manage complex IADLs in the community?

Can the person navigate systems to access needed resources?

Were cognitive impacts identified and treated?

Are there comorbid conditions impacting cognition?

Social Support

Is there a stable place
for the person to
discharge to or live?

Can others afford to
support the person?

Do they
transportation to
appointments?

Does the person have
someone that can
compensate for
things affected by the
BI?

Is there emotional
support?

Are the existing
support systems able
to support the
recovery process?

Healthcare Access

Does the person have access to insurance?

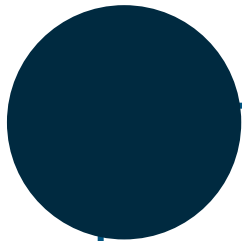
Does the insurance cover the health care needed?

Does the person live somewhere that providers can treat BI and its effects?

Can the person prioritize their healthcare?

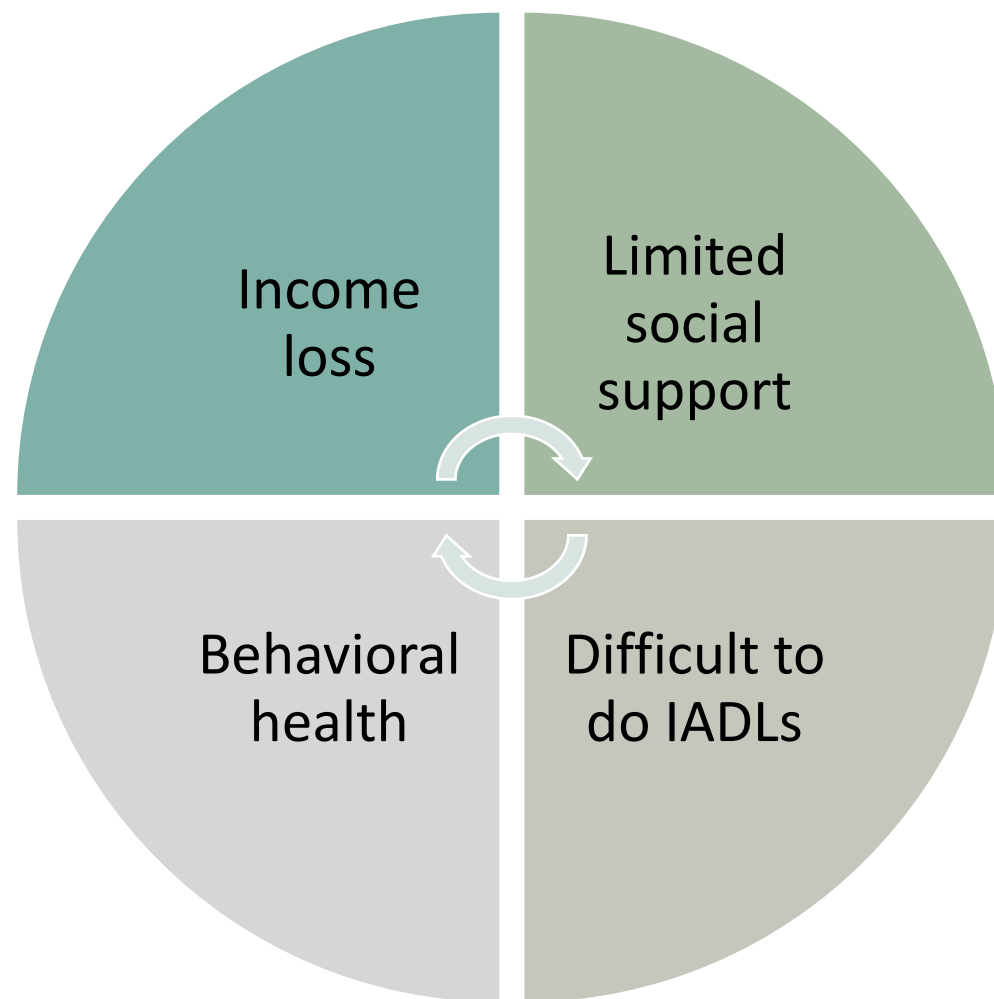
Does the health care provided accommodate for a lack of resources?

Is there bias in the care provided or from providers?



51% - 92% of those
experiencing homelessness
experienced their first TBI
before their first experience
of homelessness or marginal
housing

How does this result in homelessness?



(Stubbs et al., 2022; Young et al., 2020; Zeiler et al., 2021)

Trajectories into Housing Instability and Homelessness

Factors correlating to homelessness and brain injury include:

Gender

Education
level

History of
ACES

Substance
use

Physical
environment

(Zeiler et al., 2021)

BI as a cause of
homelessness



BI is a consequence of
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BI contributes to long-
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Associations of ACEs, BI, and Homelessness

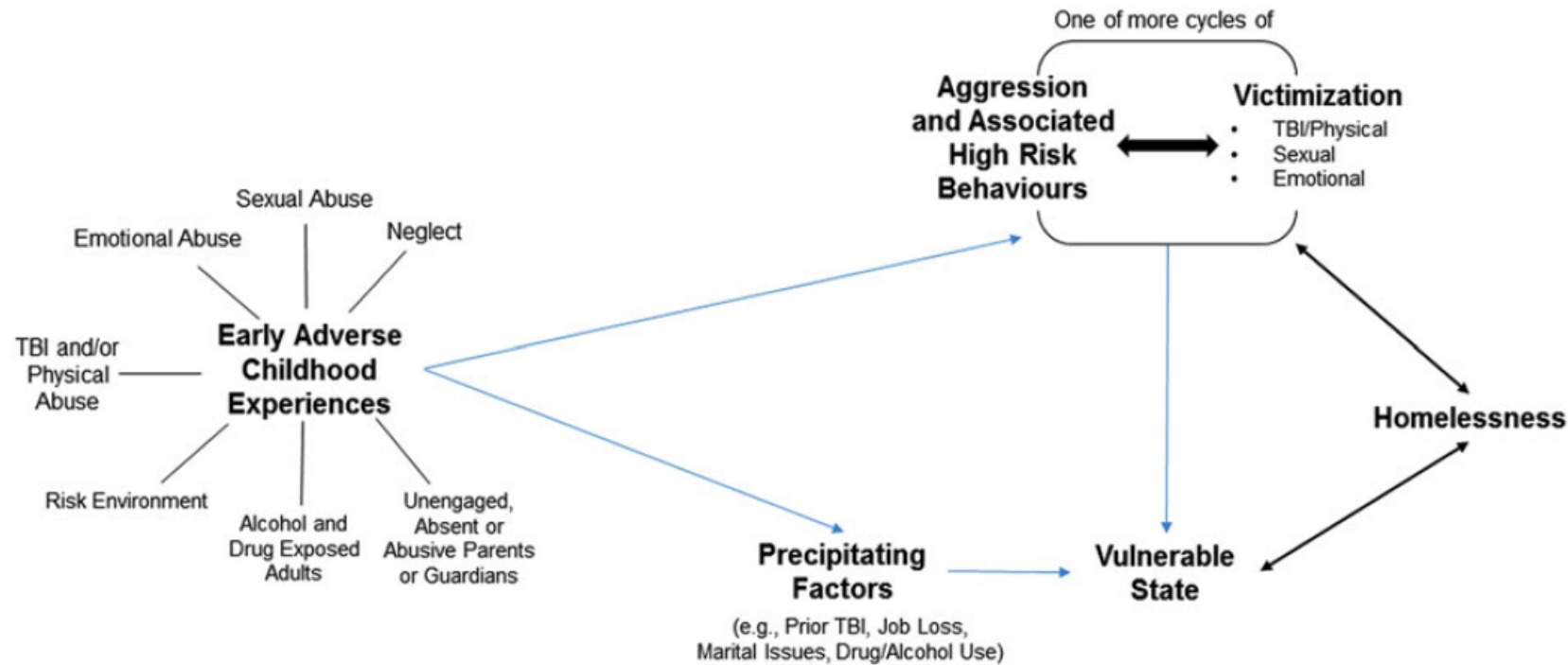


FIG. 2. Proposed web of association between early adverse childhood experiences/influences (including TBI), cycles of aggression and victimization, and homelessness. Early adverse childhood experiences are shown to be associated with violent behaviors or other precipitating factors, which may make a person vulnerable to homelessness or TBI. Homelessness itself may create a vulnerable state and/or increase the likelihood of aggressive behaviors or victimization. TBI, traumatic brain injury.

Brain Injury Risk While Homeless

Causes are more likely to be injuries sustained outside (e.g. on the street) or by assault as a result of environmental risk

Homelessness increases substance use – which increases risk for brain injury

Sustaining a brain injury while homeless increase mortality risk after injury

Barriers to health care for those experiencing homelessness or housing instability include:

Cost

Lack of insurance coverage

Feeling labeled, stigmatized, or invisible to health care providers

Limited or poor transportation

Lack of access to telephones & mail

Inability to take time off work

Difficulty reaching their provider through the phone

Feeling discriminated against

Forgetting the appointment

Wait times at the office

Difficulty scheduling an appointment

Health Literacy

Disability and Homelessness

25-40% of people experiencing homelessness have a disability

When denied access to shelter (because shelters are inaccessible or because the shelter feels they are inappropriate/unsafe to stay there) –
70% of people with disabilities stay in outside locations

High levels of health conditions, chronic illness, and geriatric conditions are risk factors for functional impairment and developing challenges with function at earlier ages

BI as a cause of
homelessness



BI is a consequence of
homelessness

BI contributes to long-
term homelessness



Homeless Services & Systems

Shelter

- Emergency shelter
- Low-barrier shelter
- Recovery/abstinence based shelter
- Transitional housing
- Encampments/outside

Housing

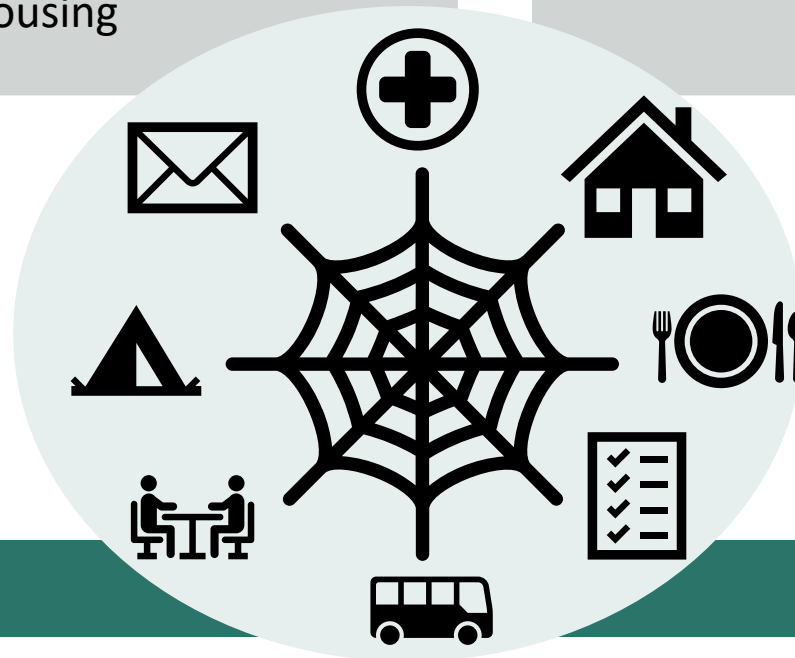
- Continuum of Care
- Coordinated Entry
- Permanent Supportive Housing
- Affordable/subsidized housing

Health Care

- Health center
- Street medicine
- Free clinics
- Medical respite care

Basic Needs

- Day centers
- Drop-in centers
- Meal programs
- Mail
- Social Services
- Case management



Additional Factors Impacting Cognition

Medical

Developmental Disability

HIV

Substance use

Mental health diagnosis

Medical interventions/being in an ICU

Chronic Conditions

Environmental

Unstable, unsafe, or inadequate housing

Poor nutrition / Lack of access to food

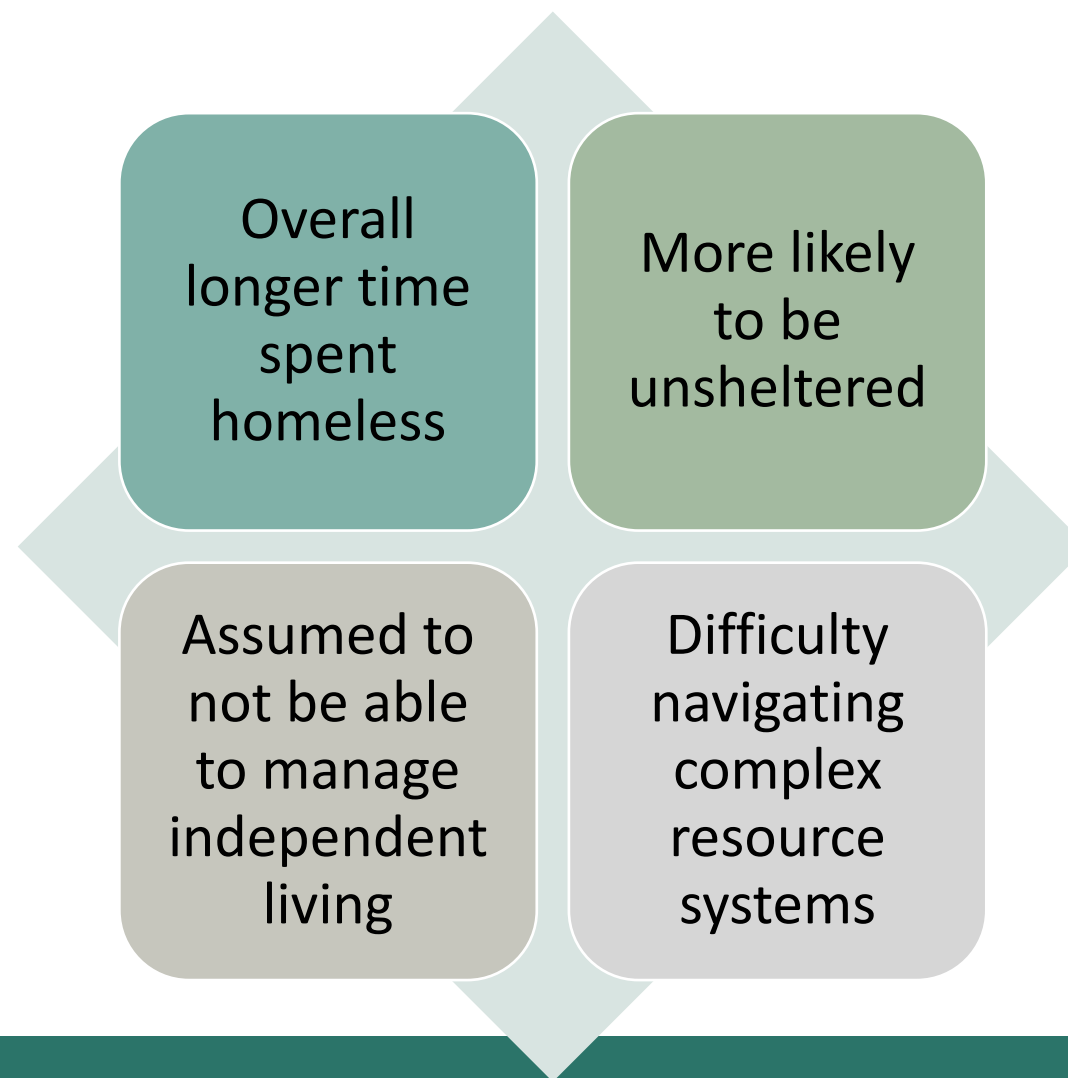
Sleep deprivation

Trauma

Stress

Low literacy

What happens after a person becomes homeless?

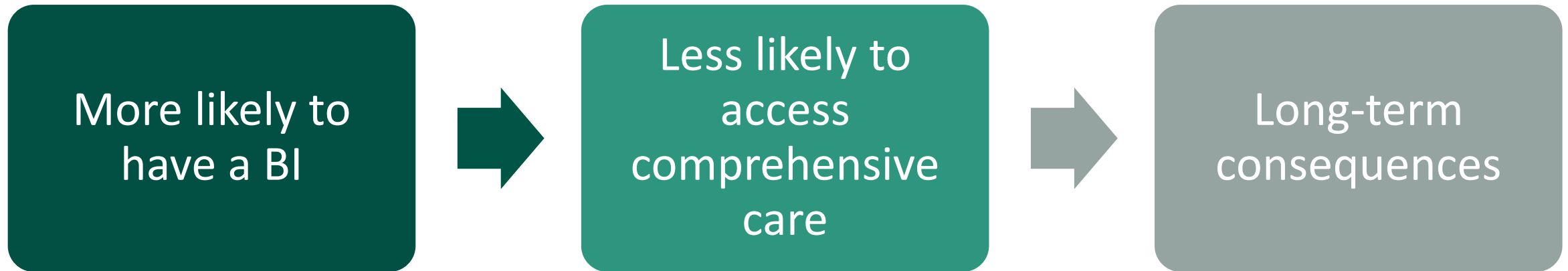




Addressing SDoH and Housing within Brain Injury Services

What do we know about approaches for BI in people experiencing homelessness?

- Most unhoused patients who receive treatment for a BI do not have access to or attend rehabilitation services post injury
- Overall have lower rehabilitation outcomes when hospitalized in acute care brain injury units
- Brain injury practice guidelines do not integrate the needs of those impacted by DOH



Approaches to Care: Aligning Models

- Recognizes the likely existence of brain injury
- Accommodates for effects of brain injury

Brain Injury

- Minimizes the harms associated with substance use
- Focuses on low-barrier access to services

Trauma-Informed

Harm Reduction

- Recognizes the likely existence of trauma
- Responds to trauma and avoids re-traumatization

Addressing BI & Homelessness

Levels of Intervention

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graph LR; A[Levels of Intervention] --- B[Prevention]; A --- C[Community Supports]; A --- D[Response]; A --- E[Advocacy];
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Prevention

Identify SDOH needs when a BI occurs

Identify needed resources to support recovery

Community Supports

Make traditional supports more accessible

Develop additional resources to address social and community-based needs

Response

Recognize and address BI in housing/homeless service programs

Connect with services/organizations to address needs

Develop models of integrated care

Advocacy

Advocate for flexible delivery of services at all levels

Integrate services and systems – “de-silo”

Recognize Multiple Impacts on Ability to Engage in Services

Effects of Brain Injury

- Cognition – executive function
- Ability to return to work
- Ability to self-manage



Social Supports

- Who is the available support system?
- Are they able to support and how?
- Are they unsafe or unsupportive?

Social Determinants of Health

- Is there housing?
- Are there other forms of income or finances?
- Are services accessible?



Priorities and Capacity

- Are there other needs the person needs to address first?
- Are they capable of following what was recommended?

Include these considerations as part of the treatment plan.

What might this look like?

Social Supports

- Ask questions to both the person and support systems about what is realistic
- Adapt practices if caregiver is not available
- Be willing to engage with “informal” caregivers



Assess Effects of Brain Injury

- Evaluate executive function and functional cognition
- Complete observational functional assessment of more complex skills/ IADL and work
- Evaluate skills needed to return to community



Priorities and Capacity

- Use motivational interviewing to identify concerns and needs
- Approach without judgment
- Integrate person into the goal setting



SDOH

- Screen for SDOH as part of intake and treatment planning process
- Engage with community resources who can meet these needs
- Assess accessibility of services to those affected by SDOH



Identify and Address Brain Injury within Homeless Services and Programs

Screen for Brain Injury

- Integrate screening in regular practices
- Use a recommended screening for the population

Train Providers & Staff

- How to screen
- Strategies to compensate for and address needs of clients with BI
- How to safely engage and address behavior and emotional needs



Ensure Accessibility of Services

- Are systems easy to navigate?
- Are services accessible to all types of needs?

Build Partnerships

- Identify services for people with BI and eligibility criteria
- Facilitate connections and warm-handoffs

Include these considerations when adapting and developing services.

What might this look like?

Ensure Accessibility of Services

- Adopt “no wrong door” policies
- Use health literacy guidelines throughout the organization
- Simplify systems and processes



Screen for Brain Injury

- Use researched tools such as the OSU TBI-ID
- Integrate process into systems to ease burden on providers (such as EHRs or HMIS)
- Develop processes to follow-up on results (documentation, care plan changes, referrals)



Build Partnerships

- Creating a direct referral system between agencies
- Case conferencing to determine who might be eligible for services
- Work collaboratively to address needs



Train Providers & Staff

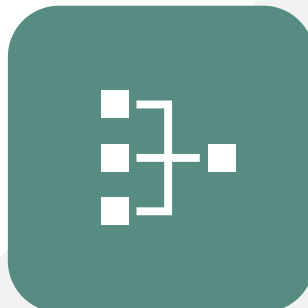
- Agency wide screening
- Trauma-informed care and motivational interviewing
- Learn specific accommodations and strategies for cognitive and emotional/behavioral needs



Advocacy

Integrate Services

- “De-silo” medical and mental health services
- Improve communications among services and providers



Enable Providers

- Give opportunity for training, practice, and collaboration
- Increase provider flexibility within systems

Educate Across Systems

- Educate systems that people encounter (criminal justice, substance use recovery etc.) on brain injury



Advocate for Affordable & Accessible Housing

- Does our community have adequate affordable housing?
- Does our community have adequate accessible housing?

What might this look like?

Enable Providers

- Include time for training within regular working hours
- Provide opportunity to engage in shared learning
- Allow for time to learn and implement strategies learned



Integrate Services

- Provide brain injury services within homeless services and/or integrate social services into BI programs
- Community case conferencing across programs and entities



Advocate for Accessible and Affordable Housing

- Housing developed should meet the needs of the community
- Develop regulations that support equitable affordable housing development



Educate Across Systems

- Provide training in all entities that will encounter individuals with brain injury and/or SDOH
- Develop partnerships for learning and support



References

- Adshead, C. D., Norman, A., & Holloway, M. (2021). The inter-relationship between acquired brain injury, substance use and homelessness; the impact of adverse childhood experiences: an interpretative phenomenological analysis study. *Disability and rehabilitation*, 43(17), 2411–2423. <https://doi.org/10.1080/09638288.2019.1700565>
- Akaberi, S. M., Nguyen, E., Carr, G., Spearman, R., & Shadduck, S. (2024). Implementation and outcomes of a statewide TBI screening program for underserved populations. *International journal for quality in health care: journal of the International Society for Quality in Health Care*, 36(2), mzae047. <https://doi.org/10.1093/intqhc/mzae047>
- Allen, M. E., Call, K. T., Beebe, T. J., McAlpine, D. D., & Johnson, P. J. (2017). Barriers to care and healthcare utilization among the publicly insured. *Med Care*, 55, 207-214.
- American Occupational Therapy Association. (2019). Cognition, cognitive rehabilitation, and occupational performance. *American Journal of Occupational Therapy*, 73(Supplement 2), 7312410010. <https://doi.org/10.5014/ajot.2019.73S201>
- Ang, N. B., & Wasserman, J. A. (2021). Prevalence of traumatic brain injury among the guests at a low-barrier homeless shelter. *BMC research notes*, 14(1), 44. <https://doi.org/10.1186/s13104-021-05452-8>
- Baggett, T. P., O'Connell, J. J., Singer, D. E., & Rigotti, N. A. (2010). The unmet health care needs of homeless adults: A national study. *American Journal of Public Health*, 100(7), 1326-1333. doi:10.2105/AJPH.2009.180109
- Bennett, N., Chung, J. S., Lundstern, M. S., & Bymaster, A. (2024). Traumatic Brain Injury and Its Risk Factors in a Homeless Population. *Archives of physical medicine and rehabilitation*, 105(12), 2286–2293. <https://doi.org/10.1016/j.apmr.2024.07.017>
- Brenner, L. A., Hostetter, T. A., Barnes, S. M., Stearns-Yoder, K. A., Soberay, K. A., & Forster, J. E. (2017). Traumatic brain injury, psychiatric diagnoses, and suicide risk among Veterans seeking services related to homelessness. *Brain injury*, 31(13-14), 1731–1735. <https://doi.org/10.1080/02699052.2017.1376758>
- Carroll, Á., O'Brien, S., Harrington, D., Cheallaigh, C. N., Lawlee, A. M., & Sukumar, P. (2021). The Unmet Rehabilitation Needs in an Inclusion Health Integrated Care Programme for Homeless Adults in Dublin, Ireland. *International journal of environmental research and public health*, 18(15), 7917. <https://doi.org/10.3390/ijerph18157917>
- Centers for Disease Control. (2020). *About Social Determinants of Health*. <https://www.cdc.gov/socialdeterminants/about.html>
- Chan, V., Estrella, M. J., Baddeliyanage, R., Shah, R., Babineau, J., & Colantonio, A. (2022). Rehabilitation among individuals experiencing homelessness and traumatic brain injury: A scoping review. *Frontiers in medicine*, 9, 916602. <https://doi.org/10.3389/fmed.2022.916602>

References

- Chan, V., Estrella, M. J., Hanafy, S., Colclough, Z., Joyce, J. M., Babineau, J., & Colantonio, A. (2023). Equity considerations in clinical practice guidelines for traumatic brain injury and homelessness: a systematic review. *EClinicalMedicine*, 63, 102152. <https://doi.org/10.1016/j.eclinm.2023.102152>
- Chan, V., Toccalino, D., Omar, S., Shah, R., & Colantonio, A. (2022). A systematic review on integrated care for traumatic brain injury, mental health, and substance use. *PloS one*, 17(3), e0264116. <https://doi.org/10.1371/journal.pone.0264116>
- Cocozza Martins, D. (2008). Experiences of homeless people in the health care delivery system: A descriptive phenomenological study. *Public Health Nursing*, 25, 420–430.
- Cusimano, M. D., Korman, M. B., Carpino, M., Feher, A., Puvirajasingam, J., Zhang, S., Hwang, S. W., & Tepperman, L. (2021). The Temporal Relations of Traumatic Brain Injury, Victimization, Aggression, and Homelessness: A Developmental Trajectory. *Neurotrauma reports*, 2(1), 103–114. <https://doi.org/10.1089/neur.2020.0050>
- Davis, B. A. (2020, February 25). *Discrimination: A Social Determinant of Health Inequities*. <https://www.healthaffairs.org/doi/10.1377/hblog20200220.518458/full/>
- Dell, K. C., Staph, J., & Hillary, F. G. (2021). Traumatic brain injury in the homeless: health, injury mechanisms, and hospital course. *Brain injury*, 35(10), 1192–1200. <https://doi.org/10.1080/02699052.2021.1958009>
- Eshun, E., Burke, O., Do, F., Maciver, A., Mathur, A., Mayne, C., Mohamed Jemseed, A. A., Novak, L., Siddique, A., Smith, E., Tapia-Stocker, D., & FitzGerald, A. (2024). Exploring the Role of Rehabilitation Medicine within an Inclusion Health Context: Examining a Population at Risk from Homelessness and Brain Injury in Edinburgh. *International journal of environmental research and public health*, 21(6), 769. <https://doi.org/10.3390/ijerph21060769>
- Estrella, M. J., Kirsh, B., Kontos, P., Grigorovich, A., Colantonio, A., Chan, V., & Nalder, E. J. (2021). Critical Characteristics of Housing and Housing Supports for Individuals with Concurrent Traumatic Brain Injury and Mental Health and/or Substance Use Challenges: A Qualitative Study. *International journal of environmental research and public health*, 18(22), 12211. <https://doi.org/10.3390/ijerph182212211>
- Evans, G. W., Boxhill, L., & Pinkava, M. (2008). Poverty and maternal responsiveness: The role of maternal stress and social resources. *International Journal of Behavioral Development*, 32, 232-237.
- Fazel, S., Geddes, J. R., & Kushel, M. (2014). The health of homeless people in high-income countries: Descriptive epidemiology, health consequences, and clinical and policy recommendations. *Lancet*, 384(9953), 1529-1540. [https://doi.org/10.1016/S0140-6736\(14\)61132-6](https://doi.org/10.1016/S0140-6736(14)61132-6)

References

- Ford, J. A., Turley, R., Porter, T., Shakespeare, T., Wong, G., Jones, A. P., & Steel, N. (2018). Access to primary care for socio-economically disadvantaged older people in rural areas: A qualitative study. *PLOS One*, 13, e0193952.
- Formosa, A., Dobronyi, I., & Topolovec-Vranic, J. (2021). The educational needs of Canadian homeless shelter workers related to traumatic brain injury. *Work (Reading, Mass.)*, 70(4), 1165–1175. <https://doi.org/10.3233/WOR-205111>
- Fearn-Smith, E. M., Scanlan, J. N., & Hancock, N. (2023). Exploring and Mapping Screening Tools for Cognitive Impairment and Traumatic Brain Injury in the Homelessness Context: A Scoping Review. *International journal of environmental research and public health*, 20(4), 3440. <https://doi.org/10.3390/ijerph20043440>
- Felitti VJ, Anda RF, Nordenberg D, et al. Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults. The Adverse Childhood Experiences (ACE) Study. *Am J Prev Med*.1998;14:245–258.
- Gicas, K. M., Jones, A. A., Thornton, A. E., Petersson, A., Livingston, E., Waclawik, K., Panenka, W. J., Barr, A. M., Lang, D. J., Vila-Rodriguez, F., Leonova, O., Procyshyn, R. M., Buchanan, T., MacEwan, G. W., & Honer, W. G. (2020). Cognitive decline and mortality in a community-based sample of homeless and precariously housed adults: 9-year prospective study. *BJPsych open*, 6(2), e21. <https://doi.org/10.1192/bjo.2020.3>
- Gordon, W.A., Spielman, L., et al. (2017). The Relationship between TBI and Criminality in Juvenile Offenders. *JHTR*. 32(6).
- Haderlie, Chloe and Alyssa Clark. “Illiteracy Among Adults in the US.” Ballard Brief. November 2017. www.ballardbrief.org.
- Haskins, E. C., Trexler, L. E., Cicerone, K., Dams-O'Connor, K., Langenbahn, D., & Shapiro-Rosenbaum, A. (2012). *Cognitive Rehabilitation Manual: Translating Evidence-Based Recommendations into Practice*. ACRM Pub.
- Henly, J. R., Danziger, S. K., & Offer, S. (2005). The contribution of social support to the material well-being of low-income families. *Journal of Marriage and the Family*, 67, 122-140
- Hurstak, E., Johnson, J. K., Tieu, L., Guzman, D., Ponath, C., Lee, C. T., Jamora, C. W., & Kushel, M. (2017). Factors associated with cognitive impairment in a cohort of older homeless adults: Results from the HOPE HOME study. *Drug and alcohol dependence*, 178, 562–570. <https://doi.org/10.1016/j.drugalcdep.2017.06.002>
- Kaplan-Lewis, E., & Percac-Lima, S. (2012). No-show to primary care appointments: Why patients do not come. *Journal of Primary Care and Community Health*, 4, 251-255

References

- Kiernan, S., Ní Cheallaigh, C., Murphy, N., Dowds, J., & Broderick, J. (2021). Markedly poor physical functioning status of people experiencing homelessness admitted to an acute hospital setting. *Scientific reports*, 11(1), 9911. <https://doi.org/10.1038/s41598-021-88590-0>
- Kucukboyaci, N. E., Long, C., Smith, M., Rath, J. F., & Bushnik, T. (2018). Cluster Analysis of Vulnerable Groups in Acute Traumatic Brain Injury Rehabilitation. *Archives of physical medicine and rehabilitation*, 99(11), 2365–2369. <https://doi.org/10.1016/j.apmr.2017.11.016>
- Lam, J., Hurwitz, M., Ngankam, D., & Leland, N. (2024). Interdisciplinary rehabilitation for the transition out of homelessness with a traumatic brain injury. *BMJ case reports*, 17(12), e262462. <https://doi.org/10.1136/bcr-2024-262462>
- Lubbers, M. J., Small, M. L., & García, H. V. (2020). Do Networks Help People To Manage Poverty? Perspectives from the Field. *The ANNALS of the American Academy of Political and Social Science*, 689(1), 7-25. <https://doi.org/10.1177/0002716220923959>
- Ma, Z., Bayley, M. T., Perrier, L., Dhir, P., Dépatie, L., Comper, P., Ruttan, L., Lay, C., & Munce, S. E. P. (2019). The association between adverse childhood experiences and adult traumatic brain injury/concussion: a scoping review. *Disability and rehabilitation*, 41(11), 1360–1366. <https://doi.org/10.1080/09638288.2018.1424957>
- Matheson, F. I., McLuhan, A., Riccardi, J. S., Kirby, A., & McMillan, T. M. (2024). Implementing Interventions for Women and Youth with Traumatic Brain Injury at Transition from Custodial Settings: A Call to Action. *Neuropsychiatric disease and treatment*, 20, 1169–1177. <https://doi.org/10.2147/NDT.S409794>
- McHugo, G. J., Krassenbaum, S., Donley, S., Corrigan, J. D., Bogner, J., & Drake, R. E. (2017). The Prevalence of Traumatic Brain Injury Among People With Co-Occurring Mental Health and Substance Use Disorders. *The Journal of head trauma rehabilitation*, 32(3), E65–E74. <https://doi.org/10.1097/HTR.0000000000000249>
- McMillan, T. M., Laurie, M., Oddy, M., Menzies, M., Stewart, E., & Wainman-Lefley, J. (2015). Head injury and mortality in the homeless. *Journal of neurotrauma*, 32(2), 116–119. <https://doi.org/10.1089/neu.2014.3387>
- Mejia-Lancheros, C., Lachaud, J., Aubry, T., Wiens, K., O'Campo, P., Stergiopoulos, V., & Hwang, S. W. (2022). Multi-trajectory group profiles of well-being and associated predictors among adults experiencing homelessness and mental illness: findings from the At Home/Chez Soi study, Toronto site. *Social psychiatry and psychiatric epidemiology*, 57(1), 67–81. <https://doi.org/10.1007/s00127-021-02093-x>
- Mejia-Lancheros, C., Lachaud, J., Stergiopoulos, V., Matheson, F. I., Nisenbaum, R., O'Campo, P., & Hwang, S. W. (2020). Effect of Housing First on violence-related traumatic brain injury in adults with experiences of homelessness and mental illness: findings from the At Home/Chez Soi randomised trial, Toronto site. *BMJ open*, 10(12), e038443. <https://doi.org/10.1136/bmjopen-2020-038443>

References

- Merrick MT, Ford DC, Ports KA, et al. Vital Signs: Estimated Proportion of Adult Health Problems Attributable to Adverse Childhood Experiences and Implications for Prevention — 25 States, 2015–2017. *MMWR Morb Mortal Wkly Rep* 2019;68:999-1005. DOI: <http://dx.doi.org/10.15585/mmwr.mm6844e1>
- Merryman, M. B., & Synovec, C. (2020). Integrated Care: Provider referrer perceptions of occupational therapy services for homeless adults in an integrated primary care setting. *Work (Reading, Mass.)*, 65(2), 321–330. <https://doi.org/10.3233/WOR-203084>
- Moskowitz, D., Vittinghoff, E., & Schmidt, L. (2013). Reconsidering the effects of poverty and social support on health: A 5-year longitudinal test of the stress-buffering hypothesis. *Journal of Urban Health*, 90, 175-184.
- Nagel, D., Vaccaro, M., et al. (2021). Brain Injury in Justice-Involved Youth: Findings and Implications for Juvenile Service Professionals. National Partnership for Juvenile Services. <http://npjs.org/jajjs/>
- Nelson LD, Temkin NR, Barber J, et al. Functional Recovery, Symptoms, and Quality of Life 1 to 5 Years After Traumatic Brain Injury: Findings From the TRACK-TBI Study. *JAMA Netw Open*. 2023;6(3):e233660. doi:10.1001/jamanetworkopen.2023.3660
- Nemeth, J. M., Glasser, A. M., Hinton, A., Macisco, J. M., Wermert, A., Smith, R., Kemble, H., & Sasser, G. (2023). Brain Injury Is Prevalent and Precedes Tobacco Use among Youth and Young Adults Experiencing Homelessness. *International journal of environmental research and public health*, 20(6), 5169. <https://doi.org/10.3390/ijerph20065169>
- Nickasch, B. & Marnocha, S. K. (2009). Healthcare experiences of the homeless. *Journal of the American Academy of Nurse Practitioners*, 21, 39–46.
- Nikoo, M., Gadermann, A., To, M. J., Krausz, M., Hwang, S. W., & Palepu, A. (2017). Incidence and Associated Risk Factors of Traumatic Brain Injury in a Cohort of Homeless and Vulnerably Housed Adults in 3 Canadian Cities. *The Journal of head trauma rehabilitation*, 32(4), E19–E26. <https://doi.org/10.1097/HTR.0000000000000262>
- O'Connor, T. A., Panenka, W. J., Livingston, E. M., Stubbs, J. L., Askew, J., Sahota, C. S., Feldman, S. J., Buchanan, T., Xu, L., Hu, X. J., Lang, D. J., Woodward, M. L., Thornton, W. L., Gicas, K. M., Vertinsky, A. T., Heran, M. K., Su, W., MacEwan, G. W., Barr, A. M., Honer, W. G., ... Thornton, A. E. (2022). Traumatic brain injury in precariously housed persons: Incidence and risks. *EClinicalMedicine*, 44, 101277. <https://doi.org/10.1016/j.eclinm.2022.101277>
- O'Donnell, O. (2024). Health and healthy system effects on poverty: A narrative review of global evidence. *Health Policy*, 142, 105018. <https://doi.org/10.1016/j.healthpol.2024.105018>
- Park, S., Kim, S., Kim, H. K., Tabarsi, E., Hom, B., Gallagher, S., Ugarte, C., Clark, D., Schellenberg, M., Martin, M., Inaba, K., & Matsushima, K. (2024). Unhoused and Injured: Injury Characteristics and Outcomes in Unhoused Trauma Patients. *The Journal of surgical research*, 301, 365–370. <https://doi.org/10.1016/j.jss.2024.06.021>

References

- Reid, K. W., Vittinghoff, E., & Kushel, M. B. (2008). Association between the level of housing instability, economic standing, and health care access: A meta-regression. *Journal of Health Care for the Poor and Underserved*, 19, 1212-1228.
- Satz, P. (1993) Brain reserve capacity on symptom onset after brain injury: A formulation and review of evidence for threshold theory. *Neuropsychology*, 7, 273–295.
- Sharbafshaaer M. (2018). Impacts of cognitive impairment for different levels and causes of traumatic brain injury, and education status in TBI patients. *Dementia & neuropsychologia*, 12(4), 415–420. <https://doi.org/10.1590/1980-57642018dn12-040012>
- Song, M. J., Nikoo, M., Choi, F., Schütz, C. G., Jang, K., & Krausz, R. M. (2018). Childhood Trauma and Lifetime Traumatic Brain Injury Among Individuals Who Are Homeless. *The Journal of head trauma rehabilitation*, 33(3), 185–190. <https://doi.org/10.1097/HTR.0000000000000310>
- St. Ivany, A., Bullock, L., Schminkey, D., Wells, K., Sharps, P., Kools, S. (2018). Living in fear and prioritizing safety: Exploring women’s lives after traumatic brain injury from intimate partner violence. *Qualitative Health Research*, 28 (11) 1708-1718.
- Stern, Y. (2009). Cognitive reserve. *Neuropsychologia*, 47(10), 2015–2028. doi: 10.1016/j.neuropsychologia.2009.03.004
- Stone, B., Dowling, S., & Cameron, A. (2019). Cognitive impairment and homelessness: A scoping review. *Health & social care in the community*, 27(4), e125–e142. <https://doi.org/10.1111/hsc.12682>
- Stubbs, J. L., Thornton, A. E., Silverberg, N. D., Seveck, J. M., Barr, A. M., Honer, W. G., & Panenka, W. J. (2020). Traumatic Brain Injury: An Underappreciated Determinant of Health in Individuals Who are Homeless or Precariously Housed. *World neurosurgery*, 137, 474–475. <https://doi.org/10.1016/j.wneu.2020.02.133>
- Stubbs, J. L., Jones, A. A., Wolfman, D., Chan, R. C. Y., Vila-Rodriguez, F., Vertinsky, A. T., Heran, M. K., Su, W., Lang, D. J., Field, T. S., Gicas, K. M., Woodward, M. L., Thornton, A. E., Barr, A. M., Leonova, O., MacEwan, W., Rauscher, A., Honer, W. G., & Panenka, W. J. (2023). Differential age-associated brain atrophy and white matter changes among homeless and precariously housed individuals compared with the general population. *BMJ neurology open*, 5(1), e000349. <https://doi.org/10.1136/bmjno-2022-000349>
- Stubbs, J. L., Thornton, A. E., Gicas, K. M., O'Connor, T. A., Livingston, E. M., Lu, H. Y., Mehta, A. K., Lang, D. J., Vertinsky, A. T., Field, T. S., Heran, M. K., Leonova, O., Sahota, C. S., Buchanan, T., Barr, A. M., MacEwan, G. W., Rauscher, A., Honer, W. G., & Panenka, W. J. (2022). Characterizing Traumatic Brain Injury and Its Association with Losing Stable Housing in a Community-based Sample. *Canadian journal of psychiatry. Revue canadienne de psychiatrie*, 67(3), 207–215. <https://doi.org/10.1177/07067437211000665>
- Substance Abuse and Mental Health Services Administration. (2016). Chronic substance use and cognitive effects on the brain: An introduction. *In Brief*, 9(1). <https://store.samhsa.gov/product/In-Brief-Chronic-Substance-Use-and-Cognitive-Effects-on-the-Brain-An-Introduction/SMA16-4973>

References

- Reid, K. W., Vittinghoff, E., & Kushel, M. B. (2008). Association between the level of housing instability, economic standing, and health care access: A meta-regression. *Journal of Health Care for the Poor and Underserved*, 19, 1212-1228.
- Satz, P. (1993) Brain reserve capacity on symptom onset after brain injury: A formulation and review of evidence for threshold theory. *Neuropsychology*, 7, 273–295.
- Sharbafshaaer M. (2018). Impacts of cognitive impairment for different levels and causes of traumatic brain injury, and education status in TBI patients. *Dementia & neuropsychologia*, 12(4), 415–420. <https://doi.org/10.1590/1980-57642018dn12-040012>
- Song, M. J., Nikoo, M., Choi, F., Schütz, C. G., Jang, K., & Krausz, R. M. (2018). Childhood Trauma and Lifetime Traumatic Brain Injury Among Individuals Who Are Homeless. *The Journal of head trauma rehabilitation*, 33(3), 185–190. <https://doi.org/10.1097/HTR.0000000000000310>
- St. Ivany, A., Bullock, L., Schminkey, D., Wells, K., Sharps, P., Kools, S. (2018). Living in fear and prioritizing safety: Exploring women’s lives after traumatic brain injury from intimate partner violence. *Qualitative Health Research*, 28 (11) 1708-1718.
- Stern, Y. (2009). Cognitive reserve. *Neuropsychologia*, 47(10), 2015–2028. doi: 10.1016/j.neuropsychologia.2009.03.004
- Stone, B., Dowling, S., & Cameron, A. (2019). Cognitive impairment and homelessness: A scoping review. *Health & social care in the community*, 27(4), e125–e142. <https://doi.org/10.1111/hsc.12682>
- Stubbs, J. L., Thornton, A. E., Silverberg, N. D., Sevic, J. M., Barr, A. M., Honer, W. G., & Panenka, W. J. (2020). Traumatic Brain Injury: An Underappreciated Determinant of Health in Individuals Who are Homeless or Precariously Housed. *World neurosurgery*, 137, 474–475. <https://doi.org/10.1016/j.wneu.2020.02.133>
- Stubbs, J. L., Jones, A. A., Wolfman, D., Chan, R. C. Y., Vila-Rodriguez, F., Vertinsky, A. T., Heran, M. K., Su, W., Lang, D. J., Field, T. S., Gicas, K. M., Woodward, M. L., Thornton, A. E., Barr, A. M., Leonova, O., MacEwan, W., Rauscher, A., Honer, W. G., & Panenka, W. J. (2023). Differential age-associated brain atrophy and white matter changes among homeless and precariously housed individuals compared with the general population. *BMJ neurology open*, 5(1), e000349. <https://doi.org/10.1136/bmjno-2022-000349>
- Stubbs, J. L., Thornton, A. E., Gicas, K. M., O'Connor, T. A., Livingston, E. M., Lu, H. Y., Mehta, A. K., Lang, D. J., Vertinsky, A. T., Field, T. S., Heran, M. K., Leonova, O., Sahota, C. S., Buchanan, T., Barr, A. M., MacEwan, G. W., Rauscher, A., Honer, W. G., & Panenka, W. J. (2022). Characterizing Traumatic Brain Injury and Its Association with Losing Stable Housing in a Community-based Sample. *Canadian journal of psychiatry. Revue canadienne de psychiatrie*, 67(3), 207–215. <https://doi.org/10.1177/07067437211000665>

References

- Stubbs, J. L., Thornton, A. E., Sevic, J. M., Silverberg, N. D., Barr, A. M., Honer, W. G., & Panenka, W. J. (2020). Traumatic brain injury in homeless and marginally housed individuals: a systematic review and meta-analysis. *The Lancet. Public health*, 5(1), e19–e32. [https://doi.org/10.1016/S2468-2667\(19\)30188-4](https://doi.org/10.1016/S2468-2667(19)30188-4)
- Synovec, C. E., & Berry, S. (2020). Addressing brain injury in health care for the homeless settings: A pilot model for provider training. *Work (Reading, Mass.)*, 65(2), 285–296. <https://doi.org/10.3233/WOR-203080>
- Topolovec-Vranic, J., Schuler, A., Gozdzik, A., Somers, J., Bourque, P. É., Frankish, C. J., Jbilou, J., Pakzad, S., Palma Lazgare, L. I., & Hwang, S. W. (2017). The high burden of traumatic brain injury and comorbidities amongst homeless adults with mental illness. *Journal of psychiatric research*, 87, 53–60. <https://doi.org/10.1016/j.jpsychires.2016.12.004>
- Twamley, E. W., Hays, C. C., Van Patten, R., Seewald, P. M., Orff, H. J., Depp, C. A., Olsen, D. C., & Jak, A. J. (2019). Neurocognition, psychiatric symptoms, and lifetime homelessness among veterans with a history of traumatic brain injury. *Psychiatry research*, 271, 167–170. <https://doi.org/10.1016/j.psychres.2018.11.049>
- Walker, W. C., Stromberg, K. A., Marwitz, J. H., Sima, A. P., Agyemang, A. A., Graham, K. M., Harrison-Felix, C., Hoffman, J. M., Brown, A. W., Kreutzer, J. S., & Merchant, R. (2018). Predicting Long-Term Global Outcome after Traumatic Brain Injury: Development of a Practical Prognostic Tool Using the Traumatic Brain Injury Model Systems National Database. *Journal of neurotrauma*, 35(14), 1587–1595. <https://doi.org/10.1089/neu.2017.5359>
- Waltzman, D., Miller, G., Xu, L., Haarbauer-Krupa, J., Hammond, F. (2025). Health and Health Care Utilization Outcomes for Individuals With Traumatic Brain Injury: A 1-Year Longitudinal Study. *Journal of Head Trauma Rehabilitation* (10). <https://doi.org/10.1097/HTR.0000000000001008>
- Young, J. T., & Hughes, N. (2020). Traumatic brain injury and homelessness: from prevalence to prevention. *The Lancet. Public health*, 5(1), e4–e5. [https://doi.org/10.1016/S2468-2667\(19\)30225-7](https://doi.org/10.1016/S2468-2667(19)30225-7)
- Zeiler, K. J., Gomez, A., Mathieu, F., & Zeiler, F. A. (2021). Health Determinants among North Americans Experiencing Homelessness and Traumatic Brain Injury: A Scoping Review. *Neurotrauma reports*, 2(1), 303–321. <https://doi.org/10.1089/neur.2021.0010>

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