

# LIMBIC-CENC RETROSPECTIVE DATABASE STUDY

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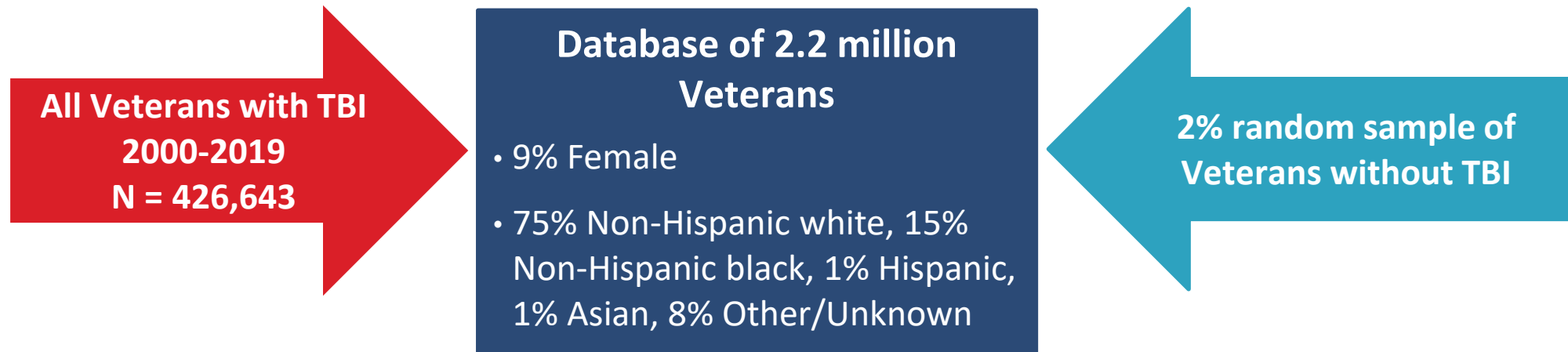
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# BLUF

- **Main Aims**: Augment and maintain database of all TBI diagnoses and a random sample of non-TBI all era Veterans with VHA data in order; to identify subgroups at greatest risk and resilience for mental health and neurodegenerative outcomes after mTBI, to examine and elucidate complex associations between mTBI and comorbidities and to develop prognostic models for several outcomes after TBI.
- **Current Status**: Finalized updated database and regulatory requirements; completed several analyses and more underway. Published important paper on TBI and sleep. Participating in Special Issue. New analyses starting.
- **1-year Goals**: Complete data acquisition, conduct analyses and publish on TBI and Sleep; analyze and publish on TBI, cardiovascular disease and dementia; engage new investigators.
- **End of Cycle Goal**: Develop prognostic models to predict which veterans are at risk for dementia and mortality after TBI

# Progress: LIMBIC-CENC Database



- Expanded and updated through 2019
- Contains inpatient/outpatient diagnosis codes and medication data for all 2.2 million Veterans, for use in defining outcomes, comorbidities, and examining treatment
- TBI and TBI severity defined using Defense and Veterans Brain Injury Center (DVBIC) definitions for TBI case detection
- TBI severity: 82% Mild, 17% Moderate, and 1% Severe/Penetrating

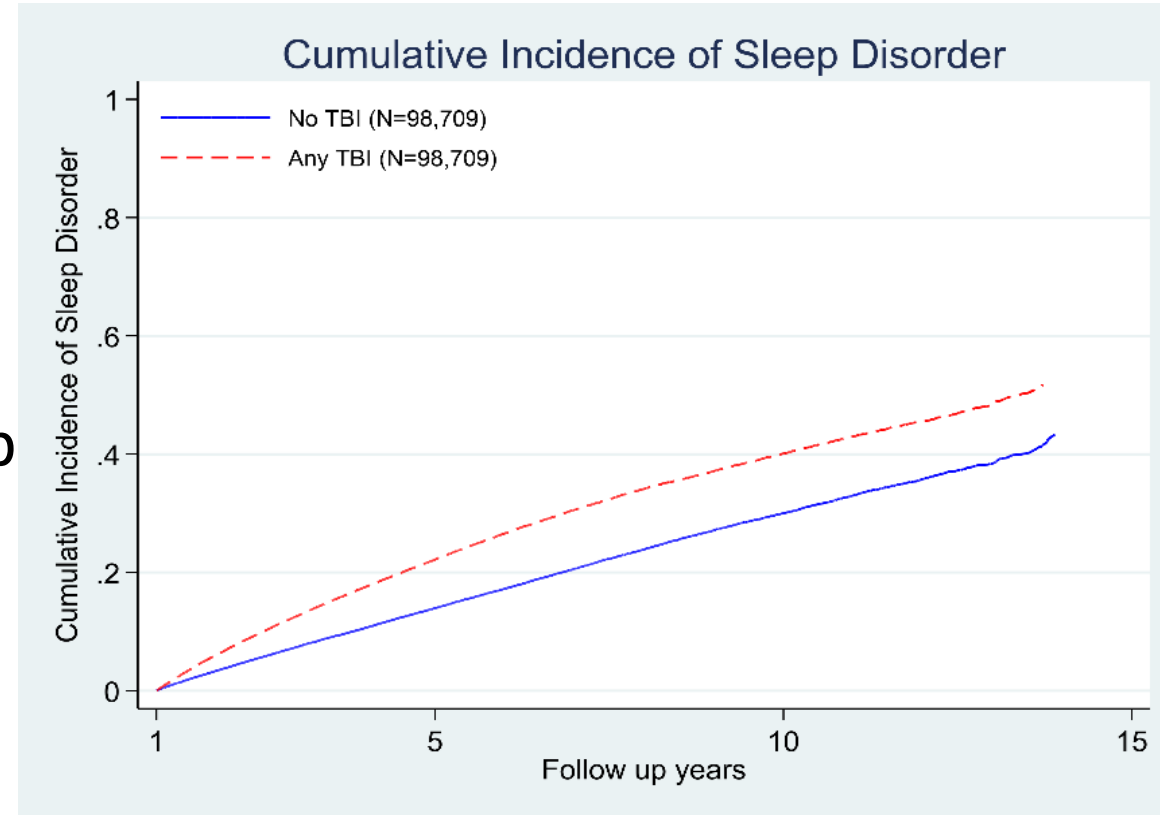
## Progress: TBI & Sleep Disorders in US Veterans

- Sleep complaints are common after TBI, but there are relatively few studies examining long-lasting sleep disorders after TBI
- We examined the longitudinal association between TBI and incident sleep disorders in Veterans
- Age-matched sample of Veterans with and without TBI (average 49 years old)
  - n=98,709 per group
  - Excluded prevalent sleep disorders at baseline
  - All had at least 1 year of follow-up; average of 5 years



# TBI and Risk of Sleep Disorders in Nearly 200,000 US Veterans

- Veterans with TBI were 41% more likely to develop any sleep disorder, adjusting for demographics and medical and psychiatric conditions: HR=1.41 (1.37-1.44)
- Veterans with TBI were more likely to develop
  - Sleep apnea HR=1.28 (1.24-1.32)
  - Insomnia HR=1.50 (1.45-1.55)
  - Hypersomnia HR=1.50 (1.39-1.61)
  - Sleep-related movement disorders HR=1.33 (1.16-1.52)

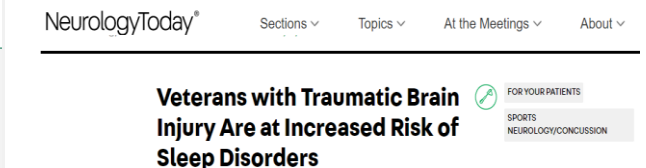


# TBI and Risk of Sleep Disorders in Nearly 200,000 US Veterans

- This study is the first to show a longitudinal association between TBI and risk of sleep disorders in Veterans
- Early identification and prevention strategies for sleep disorders are needed to improve quality of life and long-term outcomes in TBI patients



Leng et al., *Neurology*, 2021



# Progress: TBI, Cardiovascular Disease, and Risk of Dementia among Older US Veterans

- CVD and TBI are both important risk factors for dementia; however, little is known about how they interact on this risk
- Age, sex, and race-matched sample of Veterans aged 55+ with and without TBI (mean age=67 years), with no dementia at baseline
  - N=195,416 per group
  - At least 1 year of follow-up; average=6.6 years
- Preliminary Results:

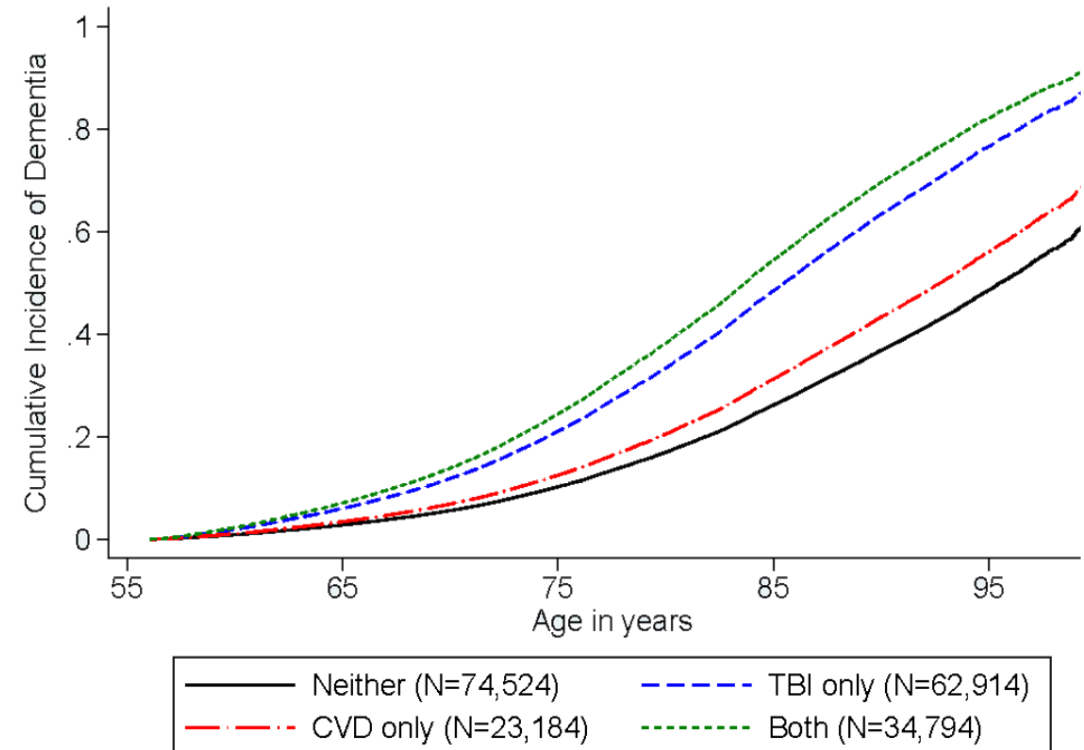
CVD and CV risk factors are 2X higher in people with TBI

TBI only: HR=2.35 (2.26-2.43)

CVD only: HR=1.26 (1.20-1.33)

TBI + CVD : HR=2.83 (2.72-2.94)

Additive effect between TBI and CVD; no interaction



# Summary and Next Steps

## Research Deliverables:

- Completed the updated (2019) and larger database: 2.2 million veterans
- Completed analysis and publication on TBI and sleep disorders
- Finalizing analysis and manuscript on cardiovascular disease, TBI, and risk of dementia for Special Issue.

## 1 Year Goal:

- New collaboration with investigators on exciting projects with our database of more than 2.2 million Veterans
- Examine interactions between TBI, comorbidities, mental health, and long-term outcomes

## End of Cycle Goals:

- Develop prognostic models to predict which veterans are at risk for dementia and mortality after TBI
- Support junior investigators





# QUESTIONS

