



**MELODEM**  
MEthods for LOngitudinal studies in DEmentia

MELODEM working group meeting, July 9 11am EST

**Rush  
Alzheimer's  
Disease  
Center**



# The intersection of COVID-19 and dementia: a double hit for older adults

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RADC data: [www.radc.rush.edu](http://www.radc.rush.edu)

# Acknowledgements

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Check out:

- [Epidemiology Counts, SER podcast](#)
- [Alzheimer's Association Facts & Figures Report](#)

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*Observations* | *Opinion*

# A Tsunami of Dementia Could Be on the Way

By Shannon Halloway, Bryan D. James on May 19, 2020



Credit: Getty Images

<https://blogs.scientificamerican.com/observations/a-tsunami-of-dementia-could-be-on-the-way/>

# Both the virus and measures to deal with it are threats to older adults

- COVID-19 disproportionately affects older adults
  - Risk of infection, intensity of illness, death rate

*but also...*

- Measures to prevent and treat COVID-19 disproportionately affect older adults
  - No-visitor policies at nursing homes
  - Stay-at-home orders / social isolation
  - Intensive hospitalization



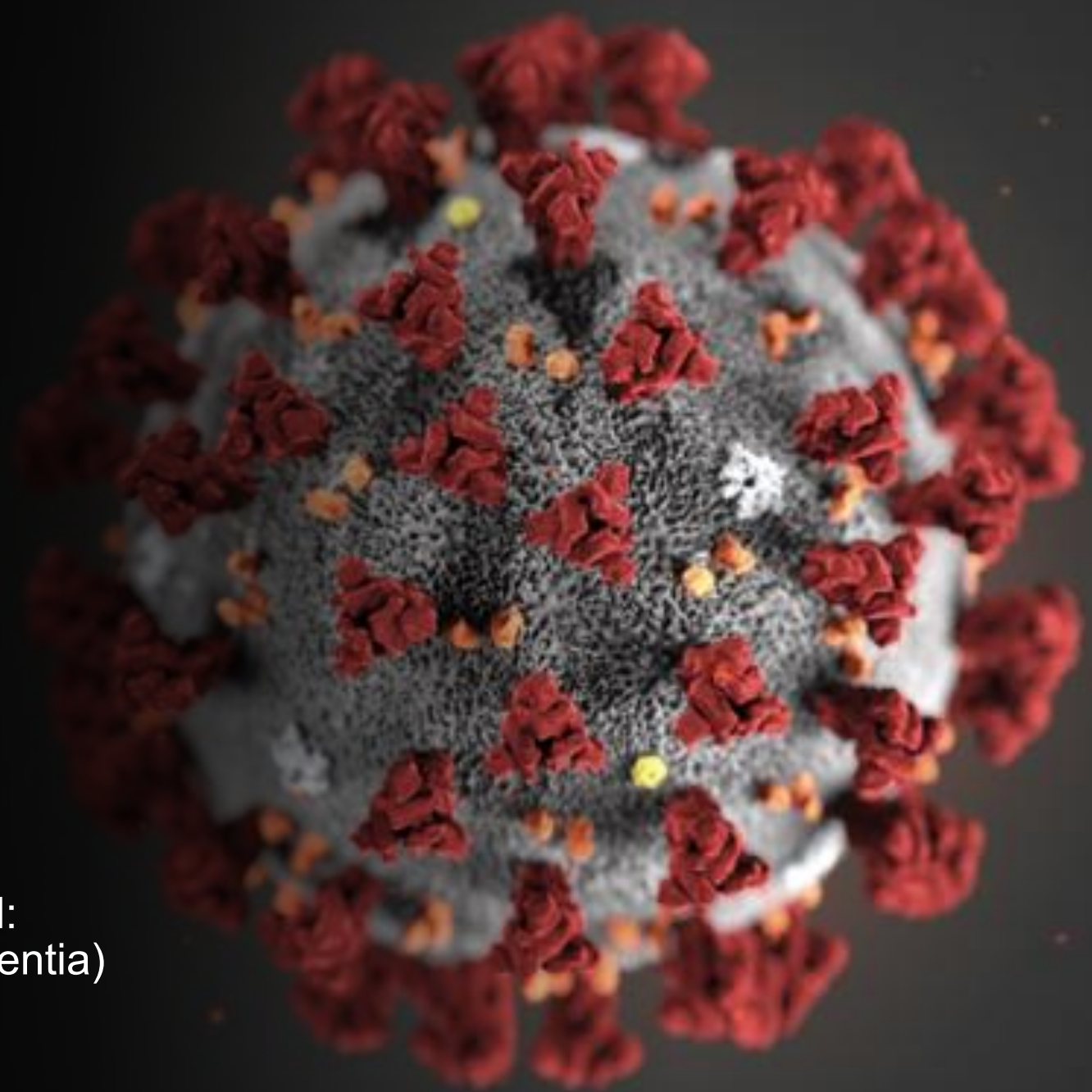
DAVID RYDER/REUTERS

## Covid-19 and dementia risk

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1. Direct effect of virus on the brain
2. Intensive hospitalizations
3. Social isolation

(A whole other important discussion not in op-ed:  
how COVID-19 impacts persons living with dementia)





CORONAVIRUS

## Scientists warn of potential wave of COVID-linked brain damage

"Given that the disease has only been around for a matter of months, we might not yet know what long-term damage COVID-19 can cause," one researchers said.

July 8, 2020, 8:23 AM CDT

By Reuters

"My worry is that we have millions of people with COVID-19 now. And if in a year's time we have 10 million recovered people, and those people have cognitive deficits ... then that's going to affect their ability to work and their ability to go about activities of daily living," Adrian Owen, a neuroscientist at Western University in Canada, told Reuters in an interview.

<https://www.nbcnews.com/health/health-news/scientists-warn-potential-wave-covid-linked-brain-damage-n1233150>

## Coronavirus pandemic could cause wave of brain damage, scientists warn

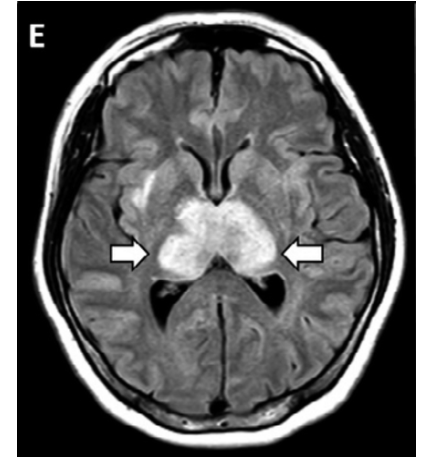


By **Jessie Yeung** and Lauren Mascarenhas, CNN

🕒 Updated 1:11 PM ET, Wed July 8, 2020

<https://www.cnn.com/2020/07/08/health/coronavirus-brain-damage-study-intl-hnk-scli-scn/index.html>

# 1. Direct effect of virus on the brain



- [Neurological symptoms](#) common: headaches, hallucinations, seizures, stroke, lingering comas
- Encephalitis (brain inflammation), [encephalopathy](#) on CT & MRI
- Entry of SARS-CoV-2 [into CNS](#) via endothelial cells
- [Is virus causing this](#), or inflammatory response, (or treatment)?  
“Whether the observed lesions were a direct consequence of virus infiltration or resulted from an immune response could not be established definitively” ([von Weyhern, et al. Lancet 2020](#))

## 2. Intensive hospitalization

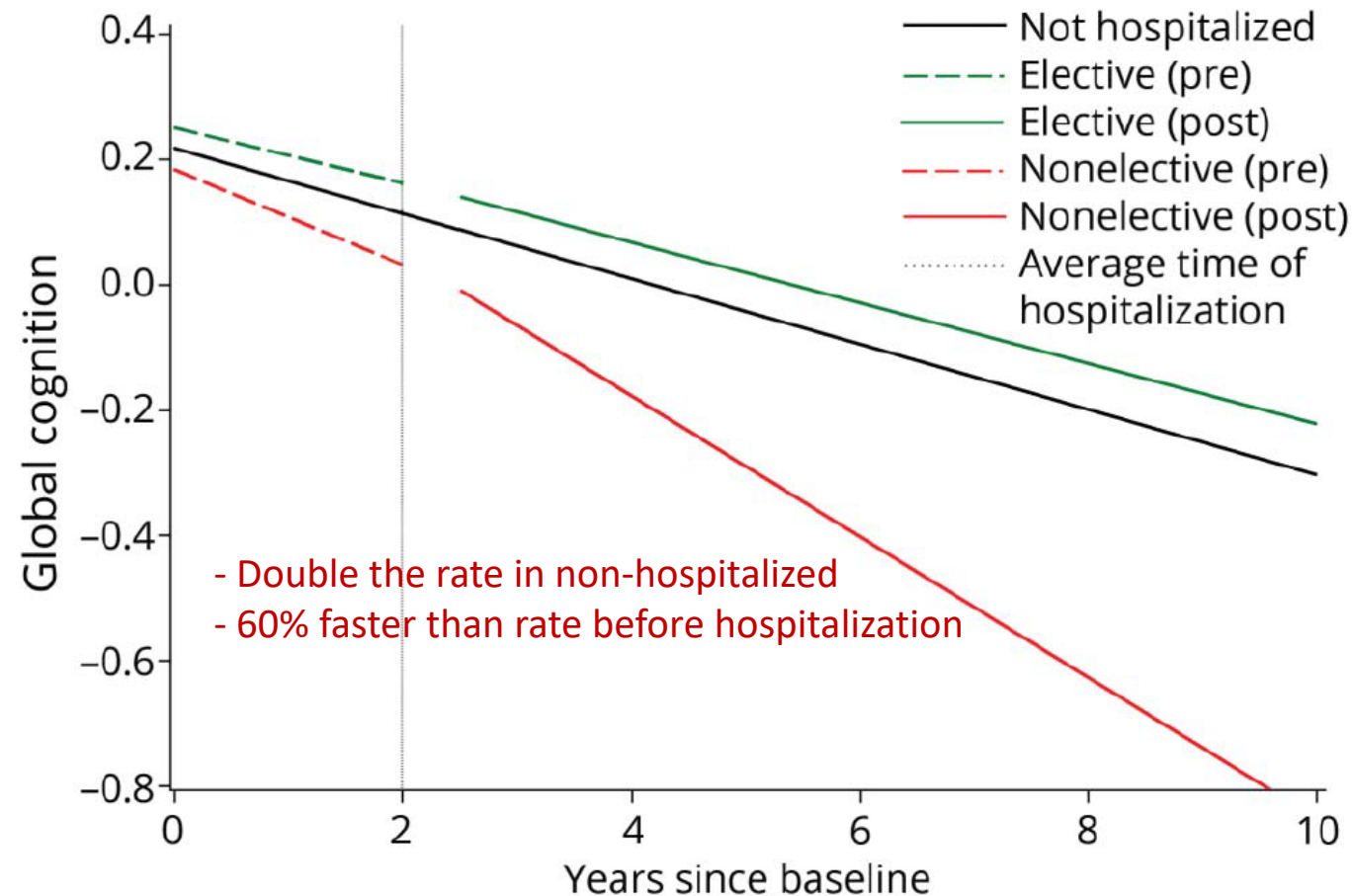
- Survivors of [critical illness & ICU hospitalization](#) often develop long-term cognitive impairment
- [>1/3](#) of people discharged from ICU have dementia a year after discharge
- [Post-ICU syndrome](#) (30-50%) : anxiety, depression PTSD, delirium



Photo: Godofredo A. Vásquez, Houston Chronicle

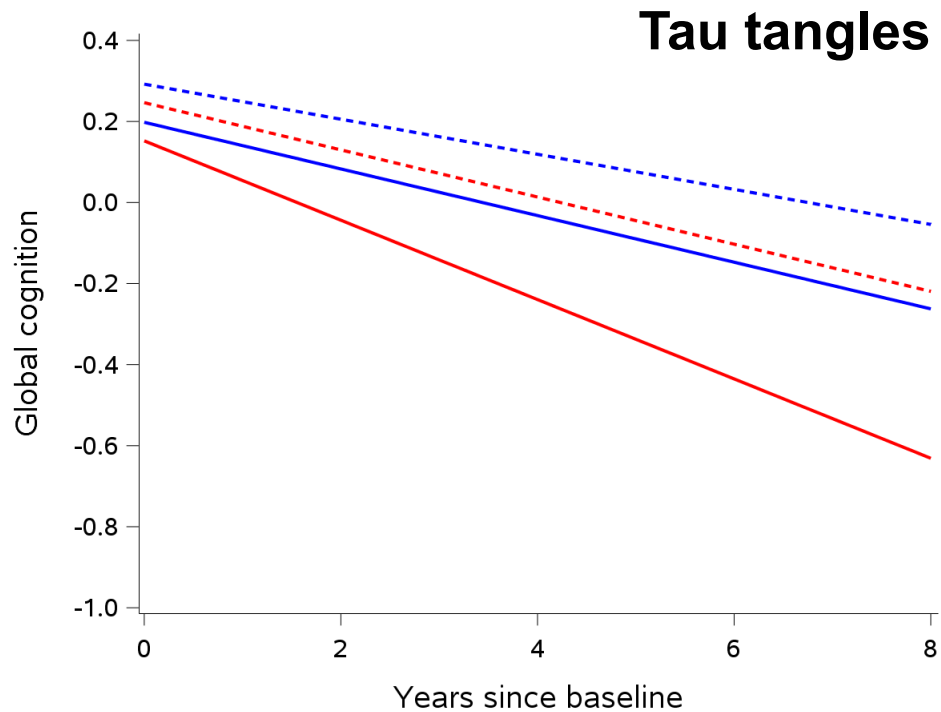


**Figure 3** Rate of decline in global cognition in those who had elective hospitalization, nonelective hospitalizations, or no hospitalization

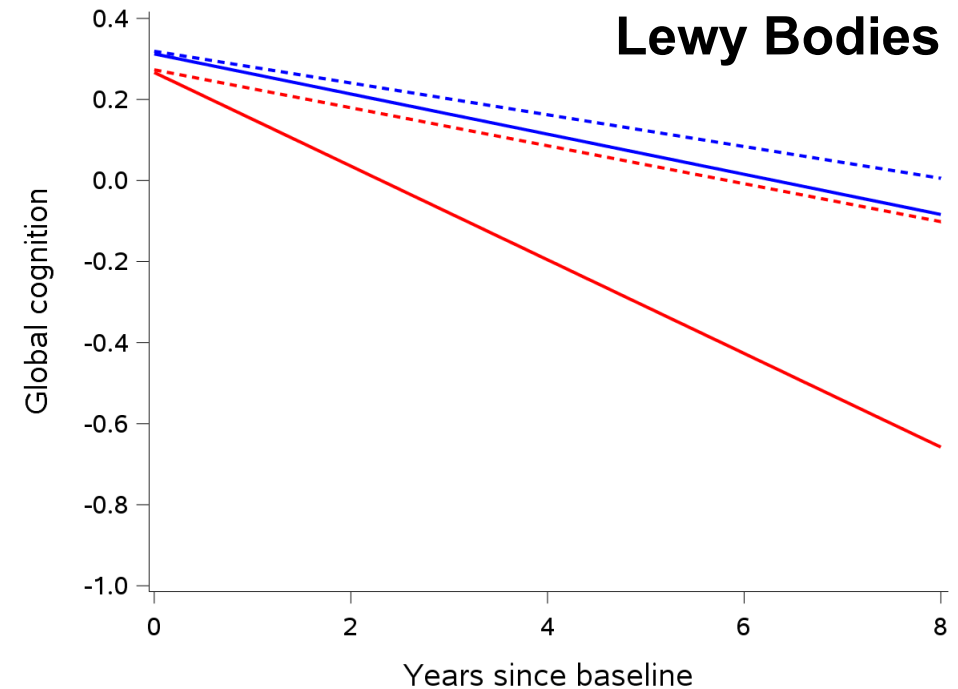


(James, et al. *Neurology*, 2019)

# Rate of hospitalization moderates effect of neurodegenerative pathology



Not hospitalized (blue) vs mean hospitalization rate of 0.5 per year (red);  
25<sup>th</sup> percentile tau tangle density (dotted) vs 75<sup>th</sup> tangle density (solid).



Not hospitalized (blue) vs mean hospitalization rate of 0.5 per year (red);  
Without neocortical Lewy bodies (dotted) vs with neocortical Lewy bodies (solid).

(James, et al. *Annals Neurology* 2019)

CORONAVIRUS

# 'Post intensive-care syndrome': Why some COVID-19 patients may face problems even after recovery

People who remain in the ICU for weeks may end up with memory problems and trouble thinking clearly.

ICU patients need "to have humans around to orient them, to calibrate them, to touch them, to look in their eyes, and make them understand what's happening," Dr. E. Wesley Ely, a professor of medicine and critical care at Vanderbilt University, said.

"But that's exactly what the COVID patients won't get because they're all being isolated."

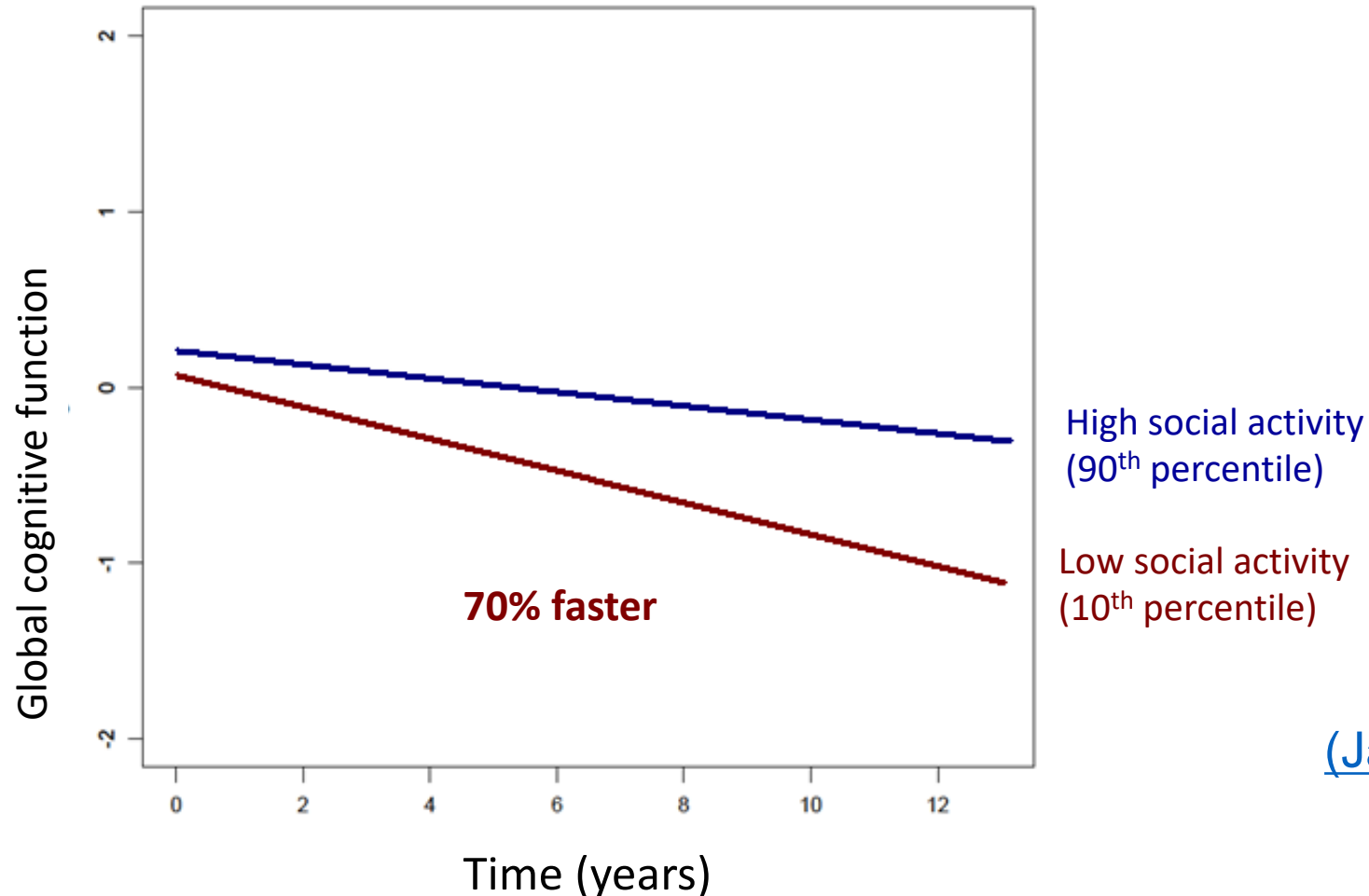
### 3. Social isolation



From Harvard Gazette

- Social distancing, shelter-in-place, nursing home visitation limits → social isolation for vulnerable older adults
- Social isolation and loneliness are known risk factors for cognitive decline and dementia in old age
- Stay-at-home orders and public park closures inhibit regular physical activity / exercise, known promoters of brain health
- Stress and depression also linked to cognitive decline

# Less socially active people have faster rates of cognitive decline

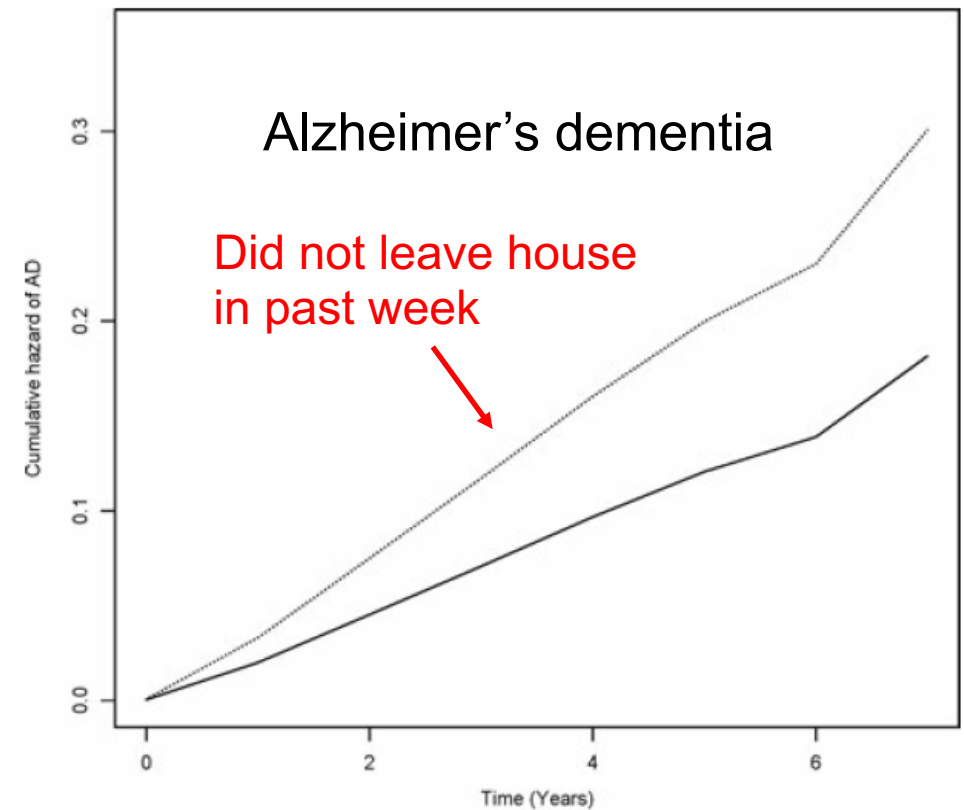
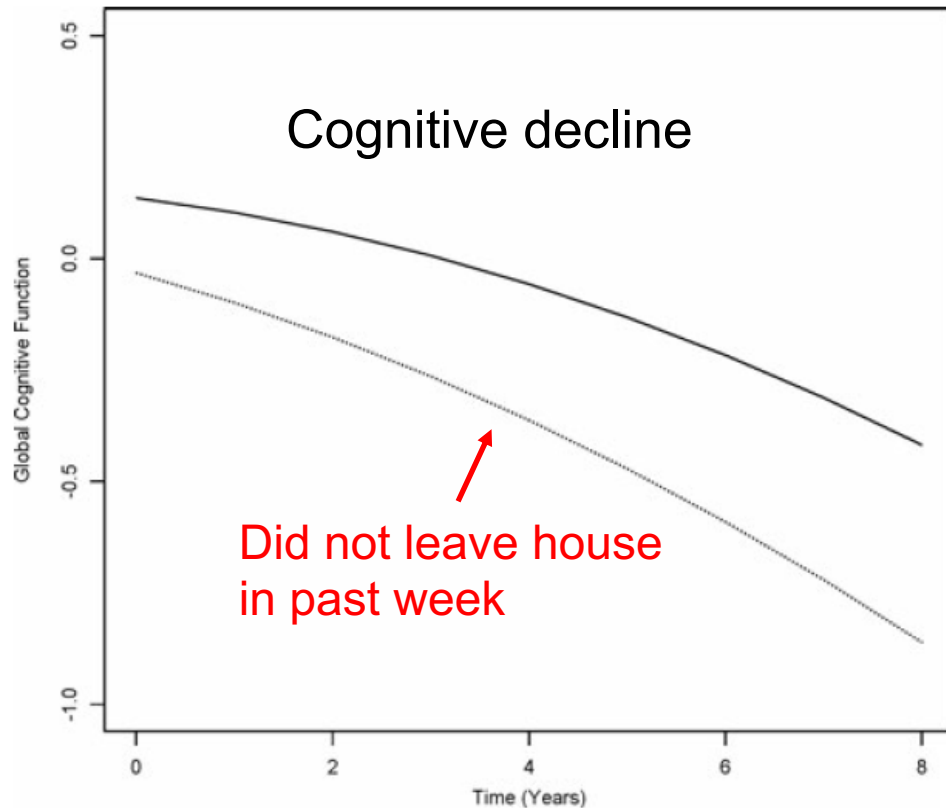


[\(James, et al., JINS 2011\)](#)



# Constricted life space

## How far you travel from home on a daily basis



(James, et al. *Am J Geriatr Psychiatry* 2011)

# What we can do

- More research on how COVID-19 may affect the brain
  - Agencies have started prioritizing research on brain effects of COVID-19: [National Institutes of Health](#), [American Heart Association](#), [COVID-Neuro Network](#)
- Health care teams should consider interventions that alleviate consequences of intensive hospitalization on the older brain
  - [Validated protocols](#) to address ICU delirium (not overly burdensome)
  - Interrupting sedative medications daily; orienting patients to surroundings
  - [Psychological support](#) incorporated into discharge planning for [post-traumatic stress](#)
- Collective efforts to alleviate social isolation
  - Retirement facilities & nursing homes can promote [safe activities](#) ([walking](#) outdoors)
  - Community-based organizations can help provide social support, check on isolated seniors, and assure essential needs (eg groceries) are met
  - Student volunteer programs to teach older adults to use smart phones/webcams

# Thank you!

- Questions/comments: [bryan\\_james@rush.edu](mailto:bryan_james@rush.edu)



# Bonus content: AD, COVID, and “cause of death”

## **Coronavirus Pandemic Led to Surge in Alzheimer’s Deaths**

15,000+ more Americans with [Alzheimer's disease and dementia](#) [died](#) in recent months than otherwise would have, 18% higher than average, and not all of these excess deaths were linked to COVID-19.