

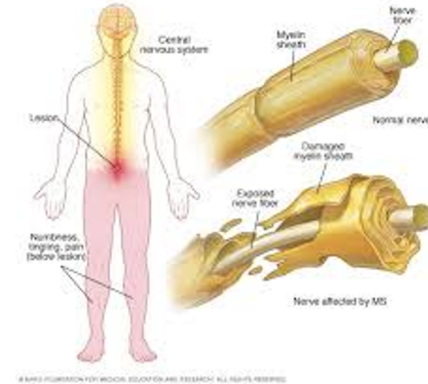
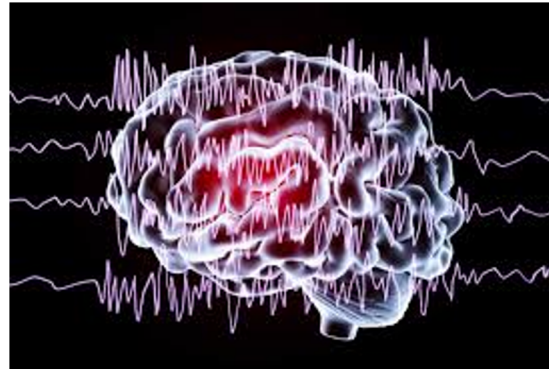
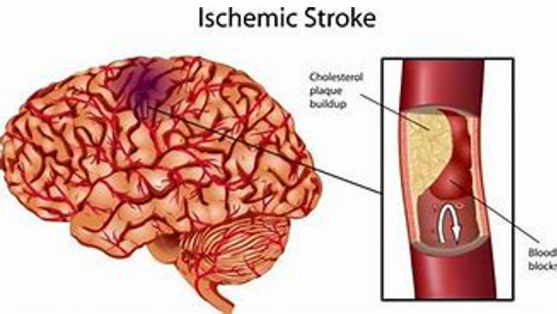
Trends in Neurological Disease Hospitalizations during Economic Downturns

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Background

Macroeconomics and Neurological Diseases

- Research Question: What is the association between macroeconomic conditions and disparities in neurological disease care and outcomes?
- Macroeconomic conditions: economic factors that influence the state of the aggregate economy
- Neurological diseases: diseases that affect the central and peripheral nervous system





Threat of neurological diseases

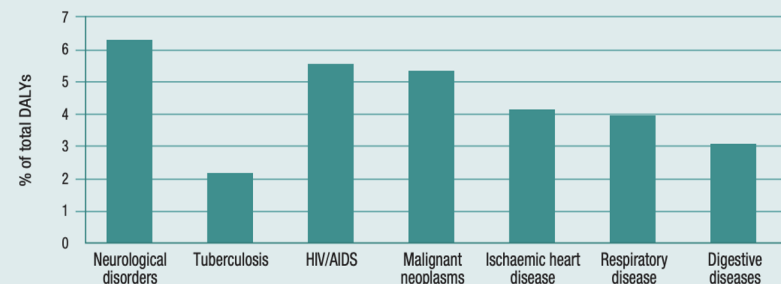
- Are very common
 - 24.3 million people are estimated to have dementia globally
 - Worldwide, 50 million people have epilepsy
 - Multiple sclerosis affects 2.5 million people in the world
 - Neuroinfections are reported by 50% of some parts of Africa and Southeast Asia
- Can affect individuals across their lifespan
- Deaths constituted 12% of deaths globally in 2015

Threat of neurological diseases cont.

Table 2.4 Number of DALYs for neurological disorders and as percentage of global DALYs projected for 2005, 2015 and 2030

Cause category	2005		2015		2030	
	No. of DALYs (000)	Percentage of total DALYs	No. of DALYs (000)	Percentage of total DALYs	No. of DALYs (000)	Percentage of total DALYs
Epilepsy	7 308	0.50	7 419	0.50	7 442	0.49
Alzheimer and other dementias	11 078	0.75	13 540	0.91	18 394	1.20
Parkinson's disease	1 617	0.11	1 762	0.12	2 015	0.13
Multiple sclerosis	1 510	0.10	1 586	0.11	1 648	0.11
Migraine	7 660	0.52	7 736	0.52	7 596	0.50
Cerebrovascular disease	50 785	3.46	53 815	3.63	60 864	3.99
Poliomyelitis	115	0.01	47	0.00	13	0.00
Tetanus	6 423	0.44	4 871	0.33	3 174	0.21
Meningitis	5 337	0.36	3 528	0.24	2 039	0.13
Japanese encephalitis	561	0.04	304	0.02	150	0.01
Total	92 392	6.29	94 608	6.39	103 335	6.77

Figure 2.1 Percentage of total DALYs for selected diseases^a and neurological disorders^b





Analysis of Literature

- No published data that considers the association between macroeconomic conditions and neurological diseases
- Previous literature indicates an association of macroeconomic conditions with other public health issues. However, they have their limitations
- What this literature has told us:
 - Unemployment rate and income inequality is linked to infanticide in South Korea
 - Unemployment rate is linked to motor vehicle fatalities, opioid-related deaths, and CVD
 - COVID-19 has affected the primary, secondary, and tertiary sectors
- Macroeconomics have an extensive impact on our lives and it is important to also consider how it impacts those with neurological diseases

Project



Aims

- Overall Research Question: What is the association between macroeconomic conditions and disparities in neurological disease care and outcomes?
- Aim 1: Examine the rates of hospitalization for common neurological conditions before, during, and after the Great Recession of 2007-2008.
 - Hypothesis 1: hospital care for common neurological conditions increased during the Great Recession
- Aim 2: Determine whether local macroeconomic factors such as local unemployment, associated with differences in hospitalization for common neurological conditions during the Great Recession
 - Hypothesis 2: local unemployment is associated with greater increases in acute care for neurological conditions, especially for conditions which require 1) high intensity outpatient care or 2) expensive treatments



Methods - Macroeconomic Conditions

- Macroeconomic indicators
 - Gini index: Used as a gauge of economic inequality through measuring income distribution
 - Ranges from 0, meaning perfect equality, to 1, meaning perfect inequality
 - Unemployment rate: Percent of the labor force that is currently unemployed but could be employed
 - Excludes those who are not looking for work but includes those who are discouraged, marginally attached, unemployed for 15+ weeks



Methods - Data Collection

- State-level gini index data from 2006-2010 from American Community Survey
- County-level unemployment rate data from 2005-2010 from the Bureau of Labor Statistics
- STATA allows for the conversion of county-level and state-level data to the ZIP code-level



Methods - Data Collection before STATA

State	Gini Index	Year
Alabama	0.4717	2006
Alaska	0.417	2006
Arizona	0.4535	2006
Arkansas	0.4602	2006
California	0.4663	2006
Colorado	0.4496	2006
Connecticut	0.4796	2006
DC	0.5365	2006



Methods - Data Collection after STATA

2005	19103	6.6999998
2005	19104	6.6999998
2005	19105	6.6999998

2007	19103	6.0999999
2007	19104	6.0999999
2007	19105	6.0999999

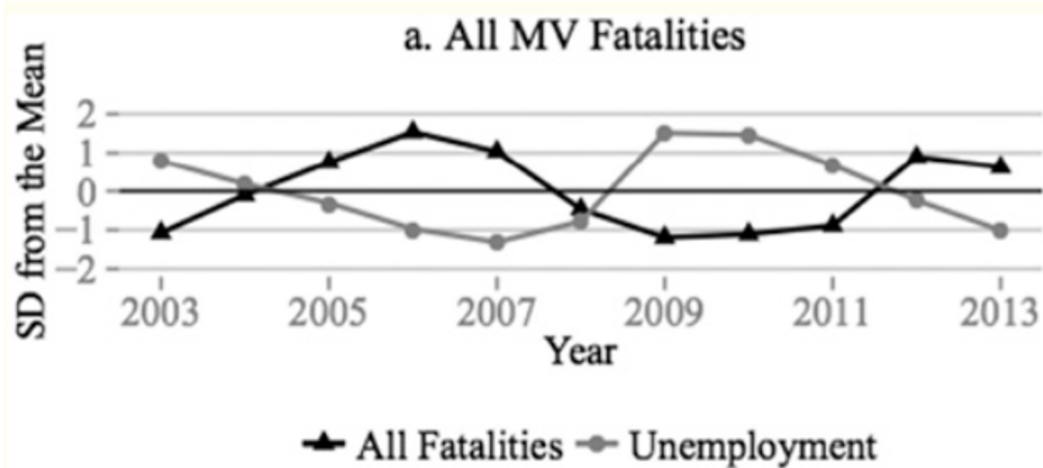
2010	19103	10.6
2010	19104	10.6
2010	19105	10.6



Methods - Analyses

- Primary Analyses
 - Descriptive and regression analyses estimating the annual incidence of hospitalization for major neurological conditions
- Secondary analyses
 - Regression analyses examine the associations of local unemployment rate and income inequality with hospitalizations over time
 - Consider whether hospitalizations are avoidable

Anticipated Results





Potential Implications

- Identify “economic sensitive” neurological conditions
 - Not currently known
- Provide insight for health professionals to adjust care planning for economic hardships
- Make providers more aware to potential health effects of economic hardships
- Destigmatize social risk factors for health inequity
- History repeats itself- COVID-19. Currently no plan because of knowledge gap.



My Role

- Analyzed prior literature
- Began writing my publication
- Gathered state-level data for income inequality
- Gathered county-level data for unemployment
- Sit back and learn



Lessons Learned

- Research is valuable and can be fun
- Impact of neurological diseases and macroeconomics
- Getting more familiar with different code and software
- It's okay to ask for help
- One of the greatest things that we have on Earth is one another



Thank You

- Joanne Levy, Evelyn Fabian, LDI & the SUMR program
- SUMR 20' Cohort
- Ann Fischer
- Allison Willis
- Ali Hamedani
- Danielle Abraham
- Neuroepidemiology Lab
- Family & Friends
- God



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Data sources

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- <https://www.bls.gov/lau/#tables>