

# Cannabis and Health

Module 12: Neurocognitive/Brain Disorders Part II

Lecture 2: Epidemiology of Parkinson's Disease and  
Alzheimer's Disease

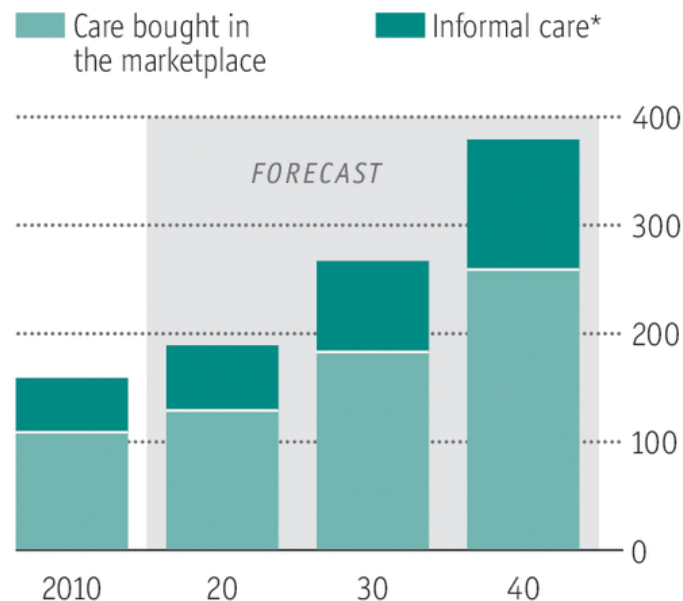
# Epidemiology: Alzheimer's



- Approximately 30 million people worldwide with AD
- 6% of those 65 and older
  - Increases to >30% by age 85
- AD is one of the most financially costly diseases
  - Total global costs of dementia are > \$800 B, equivalent to 1.1% of global GDP
  - The total cost as a proportion of GDP varies, from 0.2% in low- and middle-income countries to 1.4% in high-income
  - Projected to rise in near future

## A grey future

Annual cost of looking after dementia patients in the United States, \$bn



Source: *New England Journal of Medicine*

Economist.com

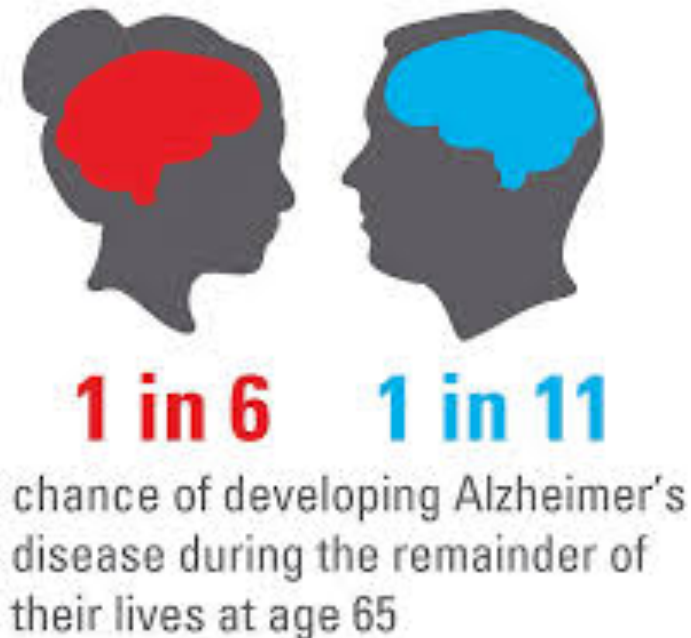
\*Wages forgone by voluntary caregivers

# Epidemiology: Alzheimer's

- The costs associated with dementia are correlated with the aging population
  - Clearly this an increasing concern for politicians, healthcare professionals and society more broadly
- The biggest piece is for long-term care
- Results in about 2 million deaths per year
- Large-scale studies show age-specific prevalence of AD may be decreasing (one study in UK, one in US)
- The absolute number of individuals with AD increased from 21.7 worldwide in 1990 to 46.0 million in 2015
  - Projected to reach 82 million in 2030 and 152 in 2050

# Epidemiology: Alzheimer's

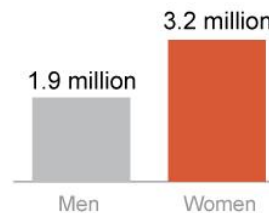
- Women are much more likely to develop dementia/AD than men (2 of 3 AD patients are women).
  - Not due to women living longer – found even after controlling for age.



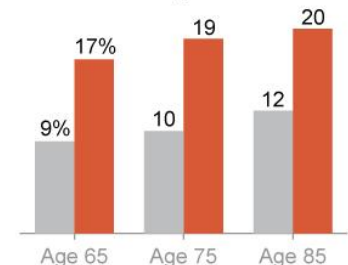
## Gender and Alzheimer's disease

Women make up a larger share of Alzheimer's patients than men and have a greater risk of developing the disease as they age.

Number of people ages 65 and older in the U.S. with Alzheimer's:



Percent chance a person will develop Alzheimer's during his or her remaining lifetime:



SOURCE: Alzheimer's Association

AP

# APOE and EOAD

- Early onset (EOAD) consists of two types – (very early onset is referred to by some as a Type 2 AD)
- APOE $\epsilon$ 4 is a gene that confers risk for EOAD
- Different APOE genetic groups confer different levels of risk
- Parietal lobe dysfunction is an early characteristic of non-amnestic EOAD.

# Epidemiology: Alzheimer's

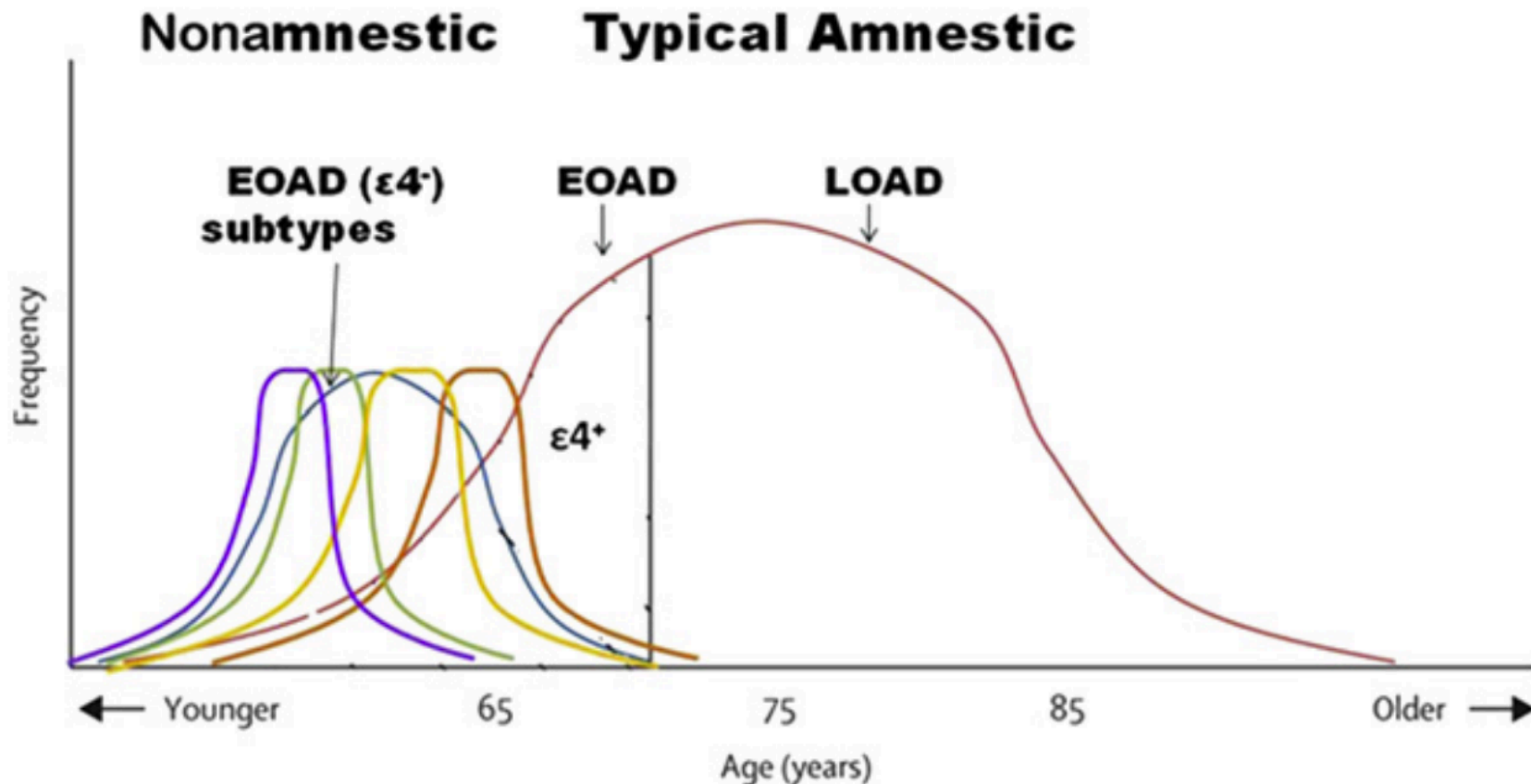
Archives of Medical Research 43 (2012) 677–685

## REVIEW ARTICLE

Early-onset Alzheimer's Disease: Nonamnestic Subtypes and Type 2 AD

Mario F. Mendez

- 4-5% are early-onset cases.



# Epidemiology: Parkinson's

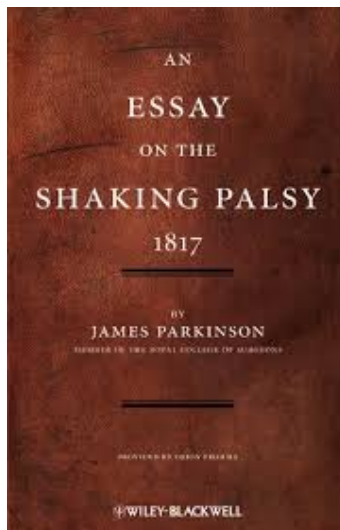
Global, regional, and national incidence, prevalence, and years lived with disability for 310 diseases and injuries, 1990–2015: a systematic analysis for the Global Burden of Disease Study 2015

GBD 2015 Disease and Injury Incidence and Prevalence Collaborators\*

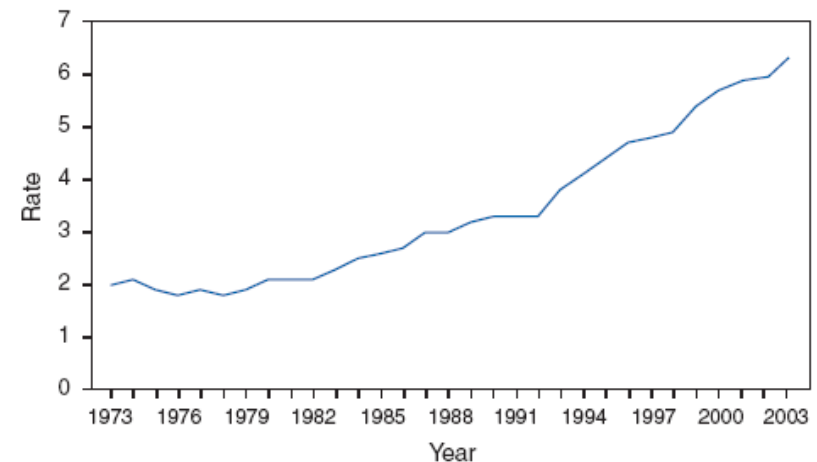
Background Non-fatal outcomes of disease and injury increasingly detract from the ability of the world's population to [Lancet 2016; 388: 1545–602](#)



- The Parkinson's is named after the English doctor James Parkinson, who published the first detailed description in *An Essay on the Shaking Palsy*, in 1817
- In 2015, PD affected 6.2 million people and resulted in about 117,400 deaths globally

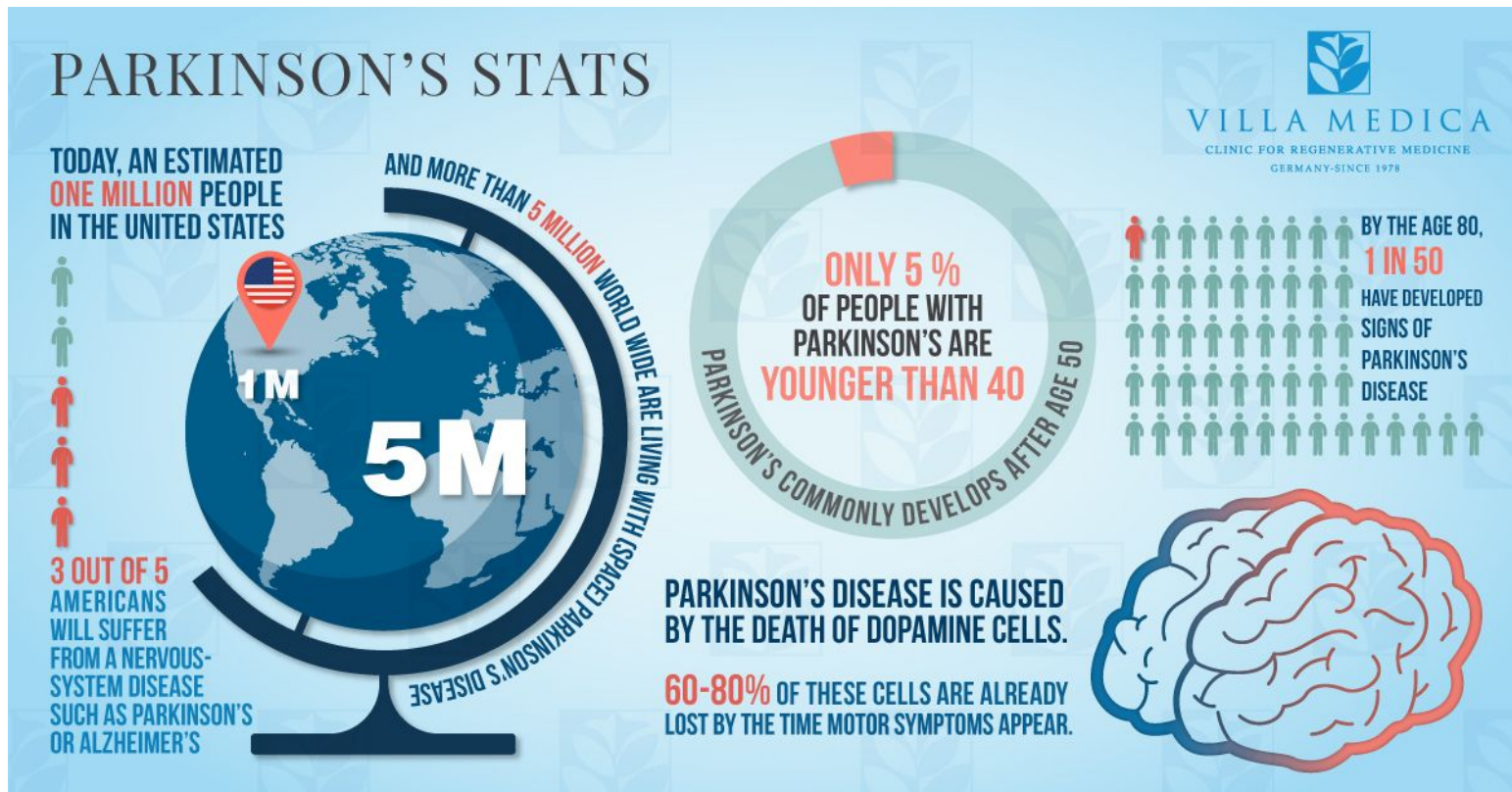


Age-Adjusted Death Rates\* for Parkinson Disease — United States, 1973–2003†



# Epidemiology: Parkinson's

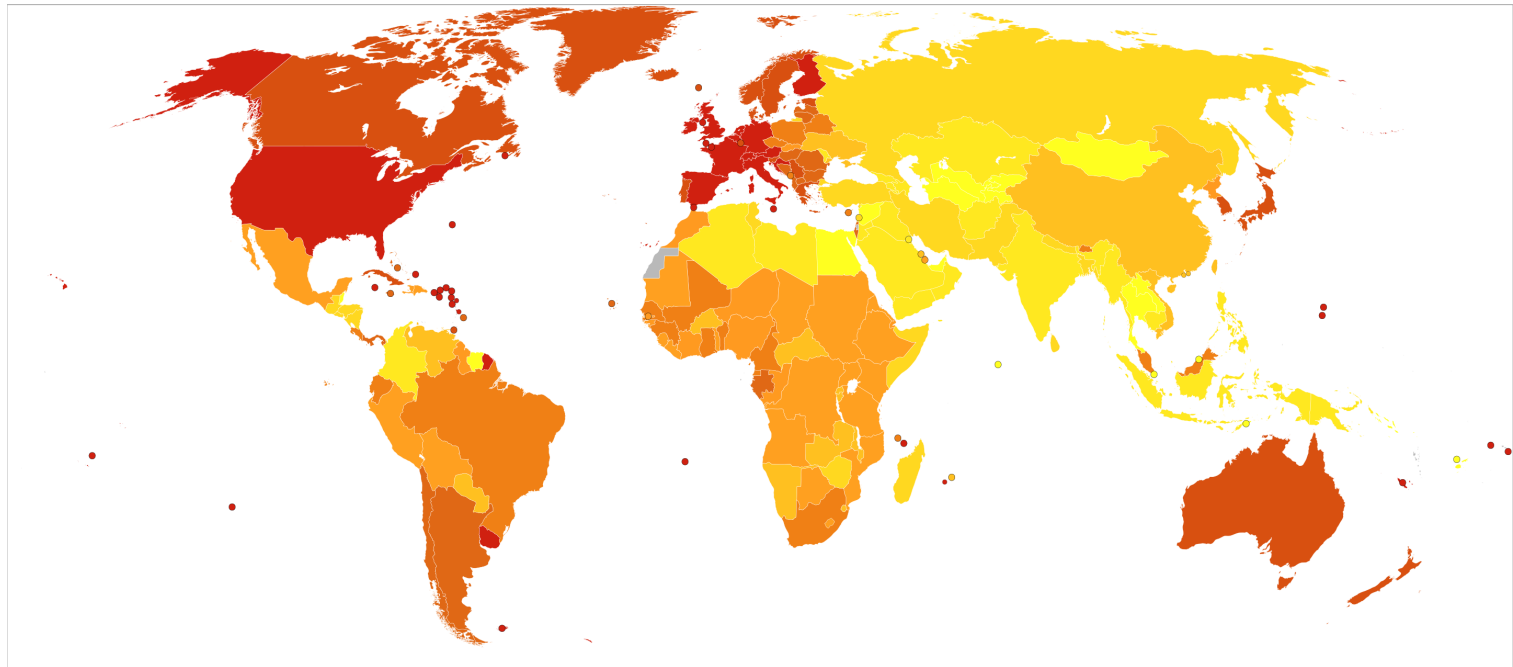
- PD is more common in Europe and North America than in other countries.
  - Global maps of the disease impact show this effect...





# Epidemiology: Parkinson's

- PD is more common in Europe and North America than in other countries.
  - Deaths per million (~100)



Deaths from Parkinson disease per million persons in 2012

0-1	2-4	5-6	7-8	9-10	11-12	13-17	18-36	37-62	63-109
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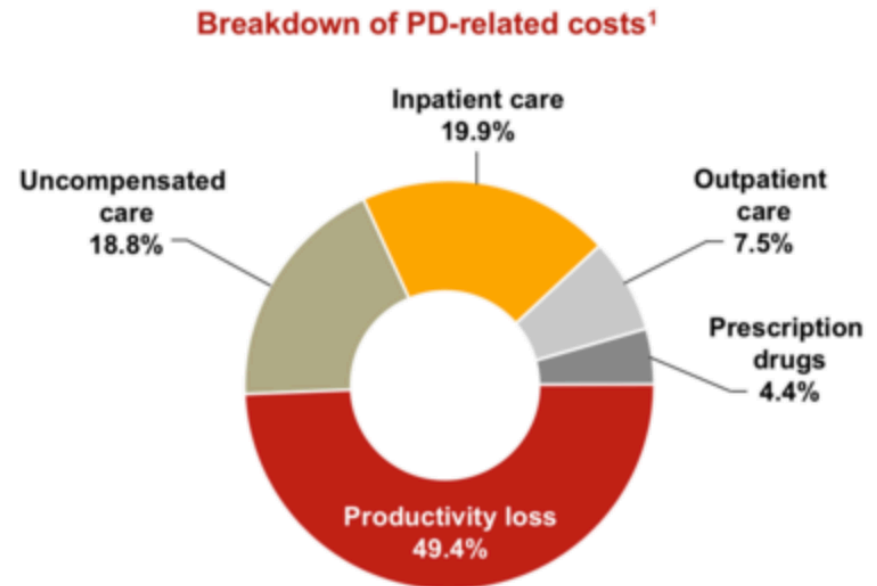
# Epidemiology: Parkinson's

## The economic impact of Parkinson's disease

Leslie J. Findley\*

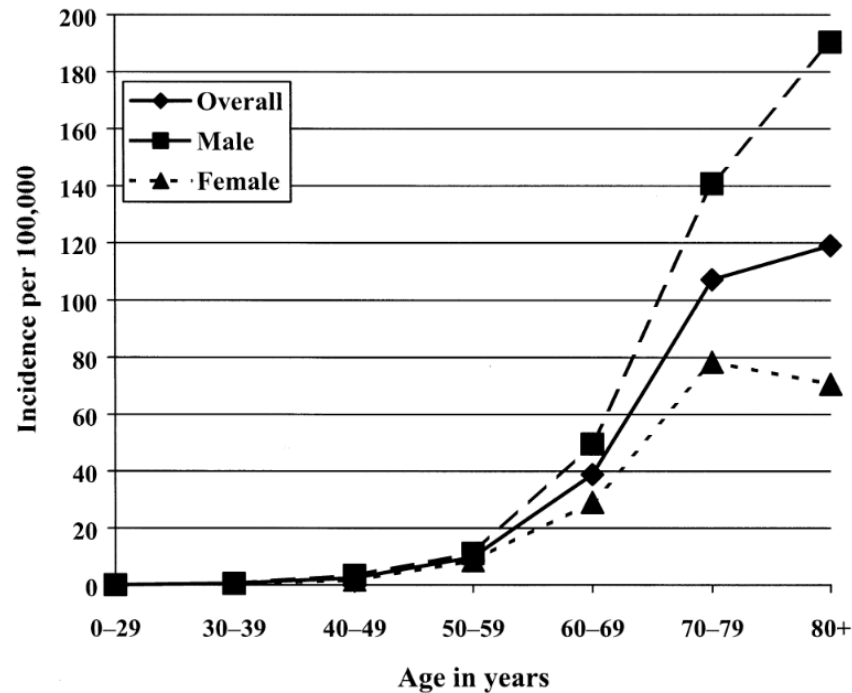
*The Essex Neurosciences Unit, Queens Hospital, Rom Valley Way, Romford, Essex RM7 0AG, UK*

- The costs of PD to society are high
  - The annual cost in the US is around \$23B
  - The largest share of direct cost comes from inpatient care
  - Medication costs are substantially lower
  - Also indirect costs, due to reduced productivity and caregiver burden



# Epidemiology: Parkinson's

- PD typically occurs in people age 60+.
  - About 1% of all over 60 are affected.
  - The average life expectancy after diagnosis is 7-14 years.



**FIGURE 1.** Incidence of Parkinson's disease by age and gender  
Kaiser Permanente 1994-1995

# Conclusions

- Global burden and impact of Alzheimer's is huge and increasing as the population increases
- Though not as prevalent as AD, PD also has a substantial socioeconomic impact