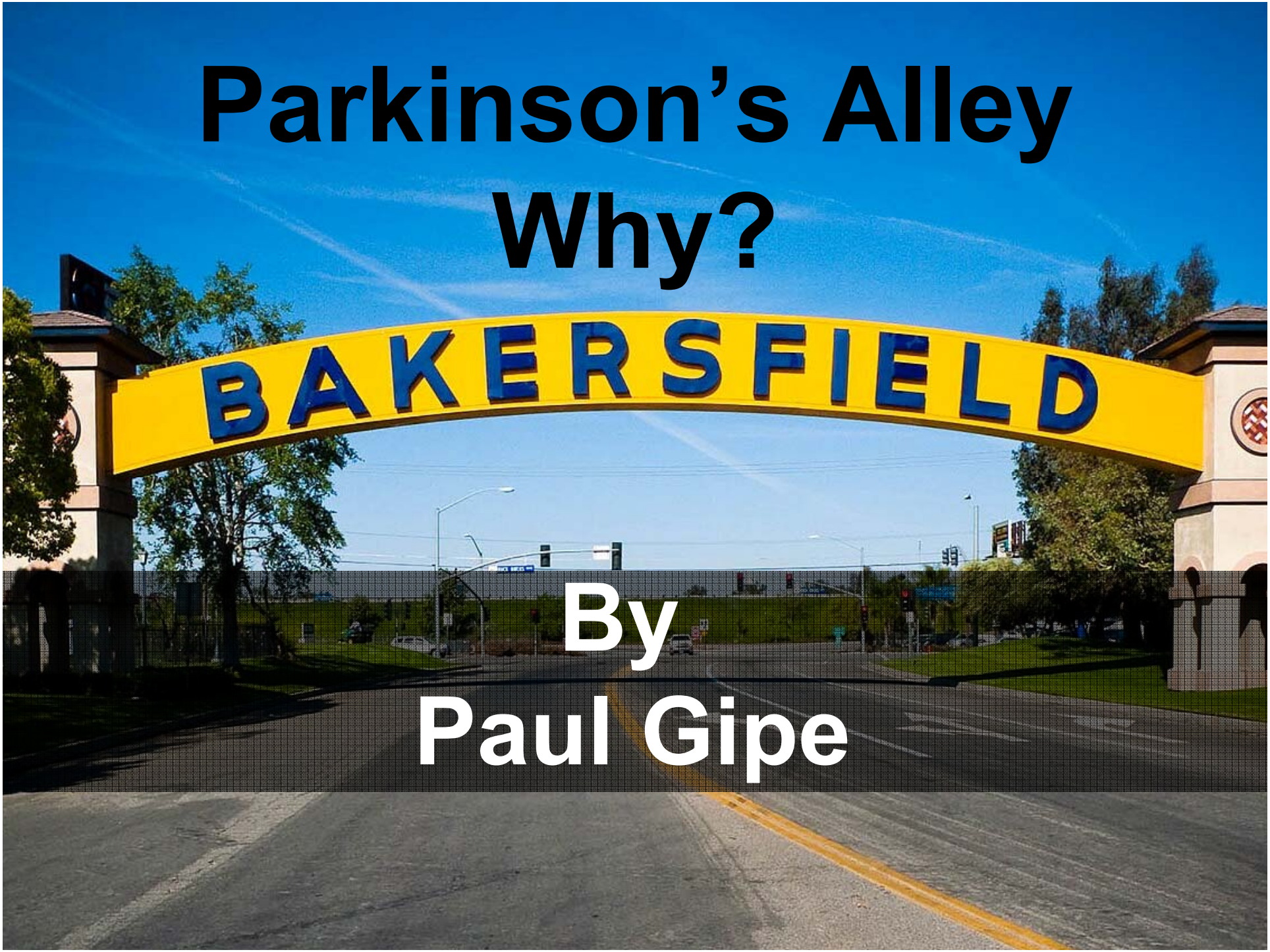
Parkinson's Alley
Why?



By
Paul Gipe

The Parkinson's Pandemic

- PD Fastest Growing Neurodegenerative Disease
- Second Only to Alzheimer's
- Debilitating Loss of Dopamine
- Progressive
- No Cure

PD is Not New

Parkinson's patient, Morocco 1889, by Jean-Martin Charcot.

Monsieur Charcot (the father of neurology) named the disease for Dr James Parkinson.

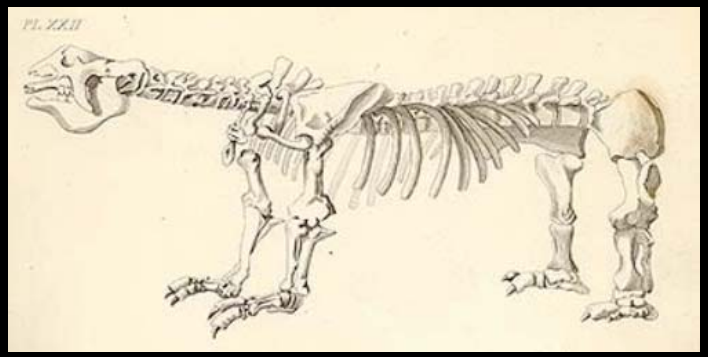
Egypt 1300 BC, China 400 BC, India 100, Hungary 1690,

Paul Gipe, wind-works.org



Dr. James Parkinson

- **Described the "Shaking Palsy" 1817**
  - English Surgeon
  - Apothecary
  - Geologist
  - Paleontologist &
- **Social Reformer**
  - Campaigned for Universal Suffrage
  - Critic of George III (Yes that George)
  - Nearly Lost His Head!



AN

ESSAY

ON THE

SHAKING PALSY.

CHAPTER I.

DEFINITION—HISTORY—ILLUSTRATIVE CASES.

SHAKING PALSY. (*Paralysis Agitans.*)

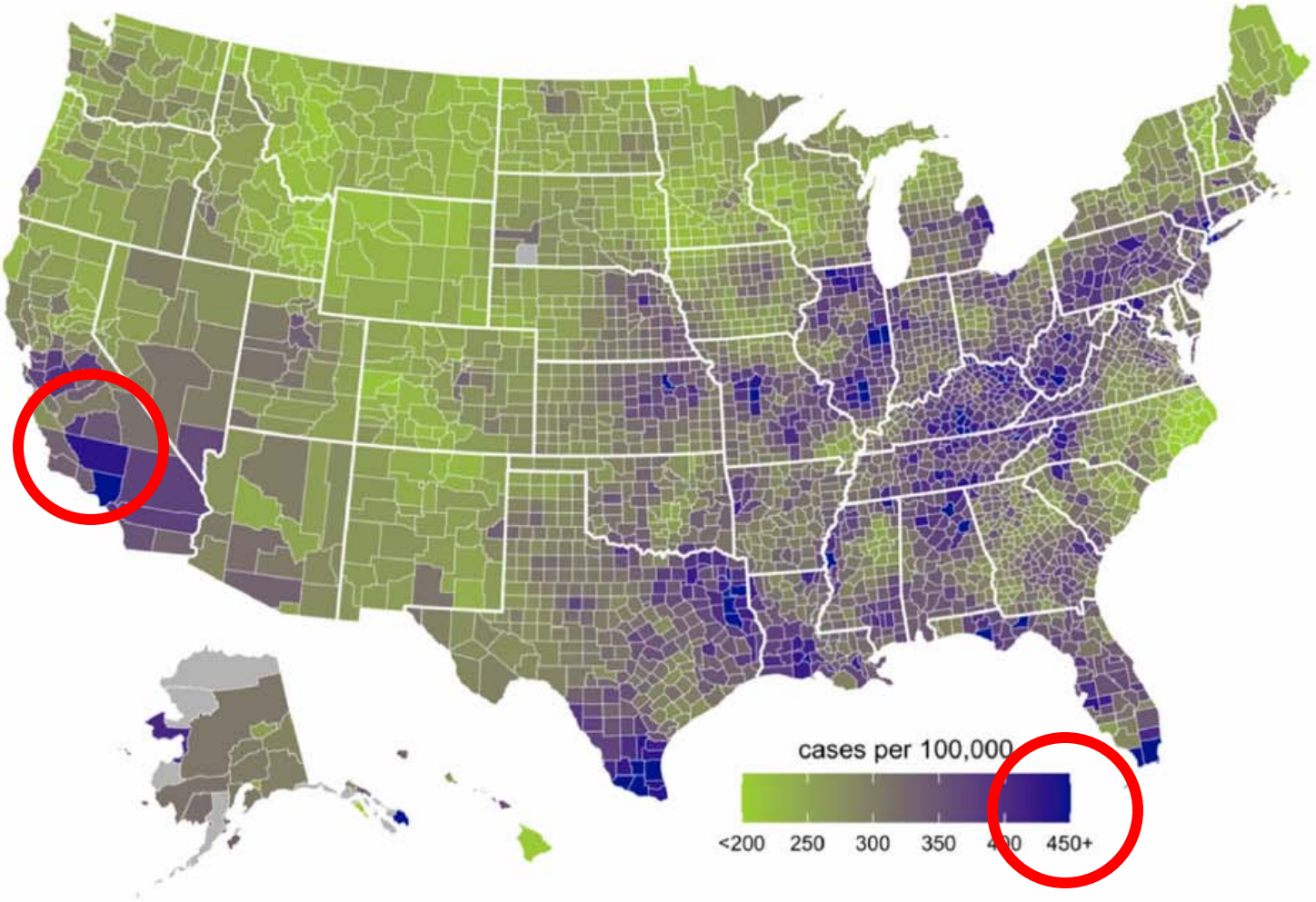
Involuntary tremulous motion, with lessened muscular power, in parts not in action and even when supported; with a propensity to bend the trunk forwards, and to pass from a walking to a running pace: the senses and intellects being uninjured.

THE term Shaking Palsy has been vaguely employed by medical writers in general. By some it has been used to designate or-

153

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Central Valley = Parkinson's Alley



2 Geographical variation in 2012 PD Incidence among 6,866,623 Medicare beneficiaries.

Organization

- What is Parkinson's Disease
- What are the Symptoms
- Risk Factors
- Causes
  - Pesticides
  - Water & Air Pollution
- Treatments
- Prevention
  - What You Can Do

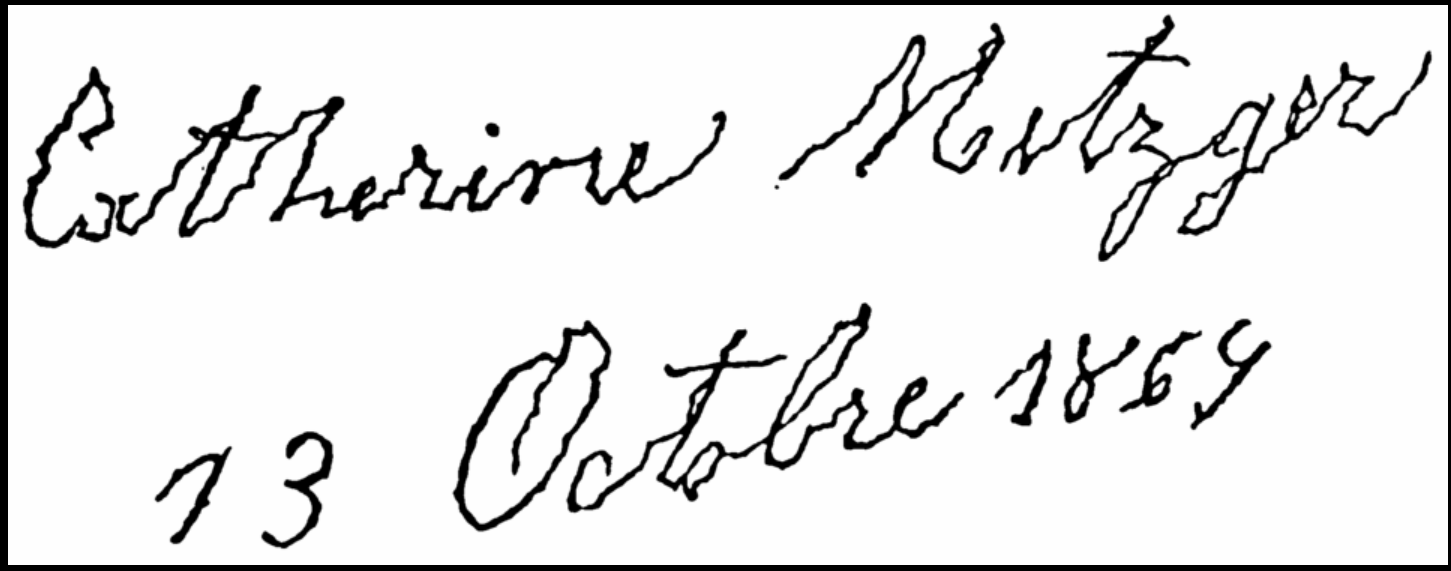
Parkinson's (PD) Symptoms

Motor Impairments	Non-Motor Impairments
• Tremor (shaking) • Rigid muscles • Difficulty walking • Decreased balance • Freezing of movement • Slowness and decreased amplitude of movment	• Cognitive imairment • Depression & Anxiety • Sleep Difficulties • Mood Disturbances • Decreased motor learning ability

Paul Gipe, wind-works.org

PD Symptom: Micrographia

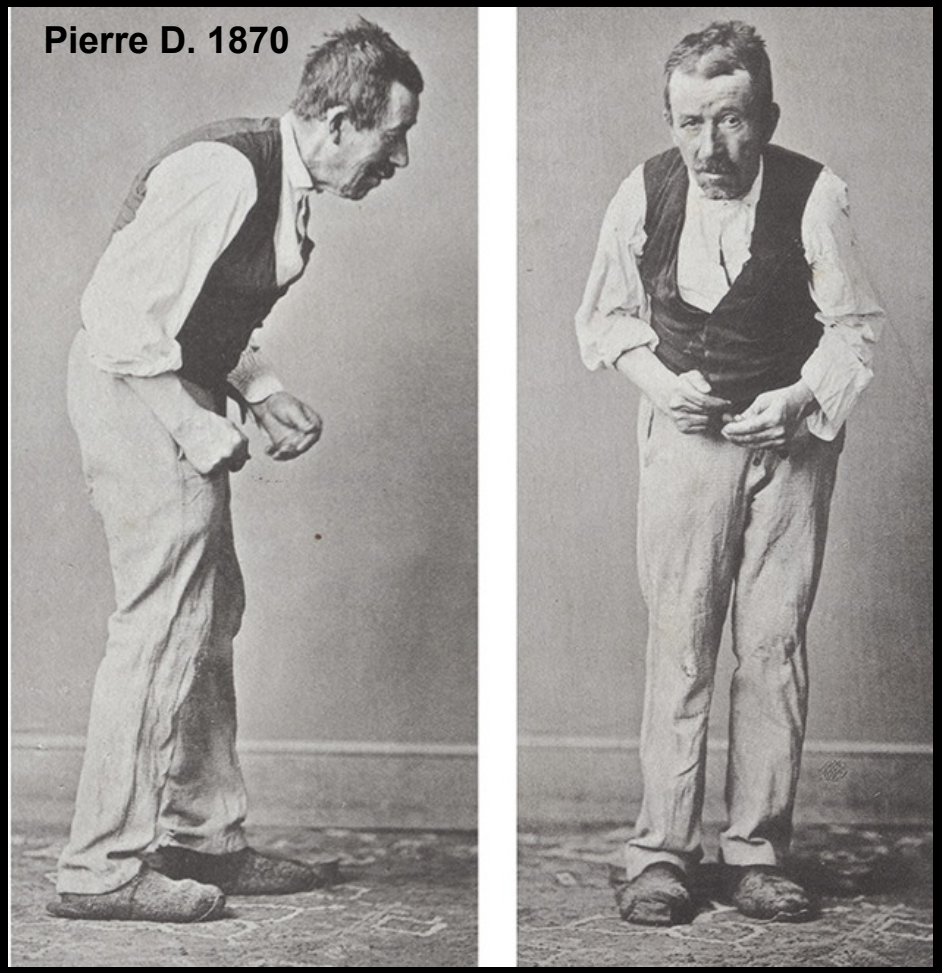
- **Small Handwriting**

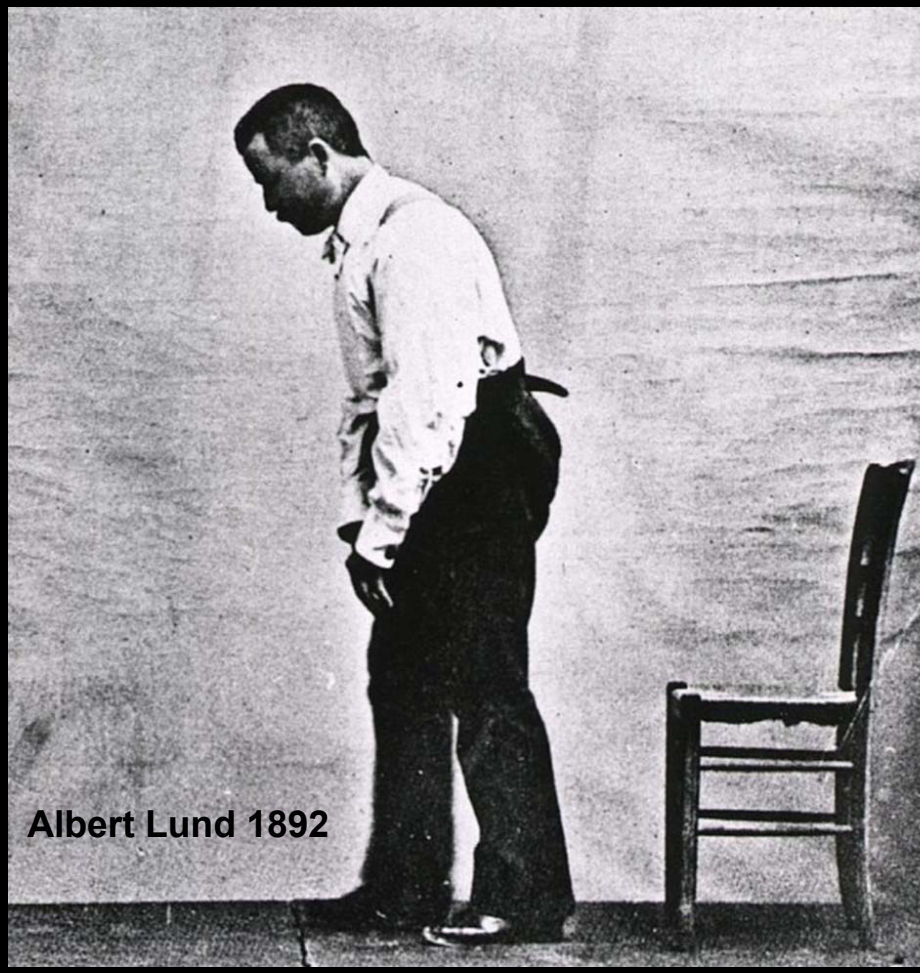


Jean-Martin Charcot, 1879

Paul Gipe, wind-works.org

PD Symptom: Stooped Posture

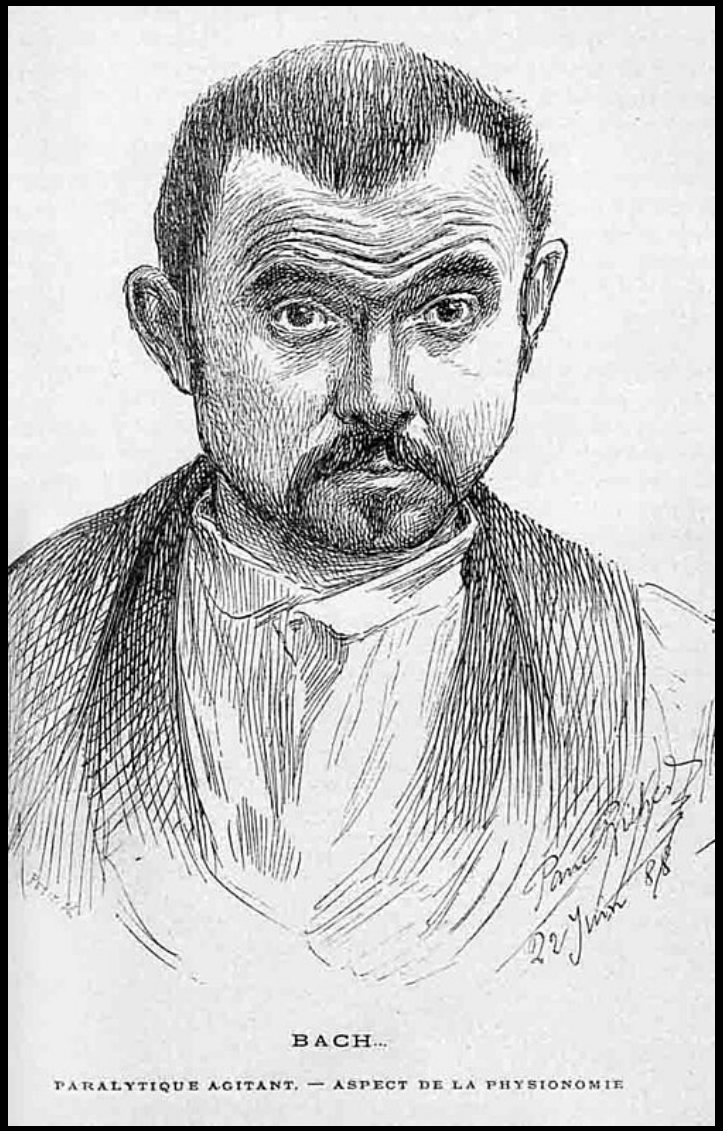




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PD Symptom: Facial Masking

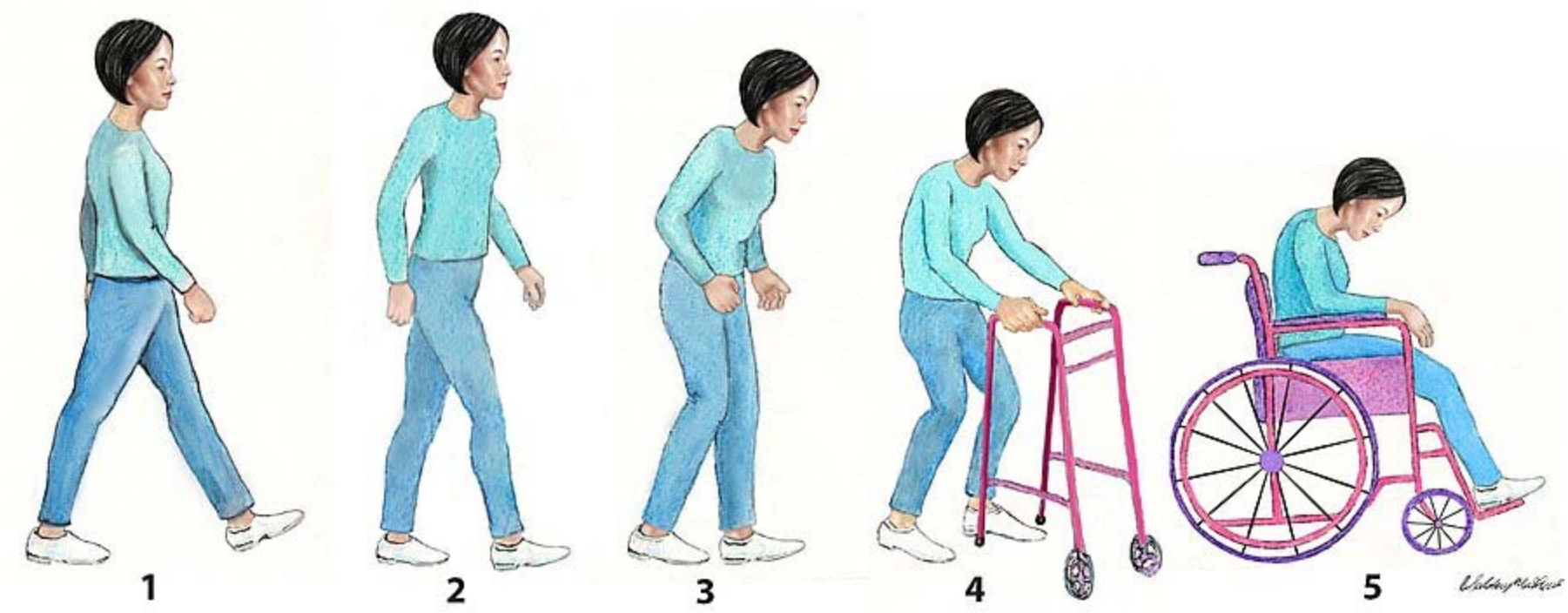
- The ‘Zombie’ Look



Jean-Martin Charcot, 1888

Paul Gipe, wind-works.org

Five Stages of Parkinson's



Paul Gipe, wind-works.org

PD, Alzheimer's, CJD

- Diagnosis Based on Symptoms
- All Have Mis-folded Proteins

  CJD: Prions

  Alzheimer's: Tau, Amyloid-β Plaque

  PD: Alpha-Synuclein = Lewy Bodies
- You Can Have Both Alzheimer's & PD!

CJD = Creutzfeldt-Jakob Disease = "Mad Cow"

Paul Gipe, wind-works.org

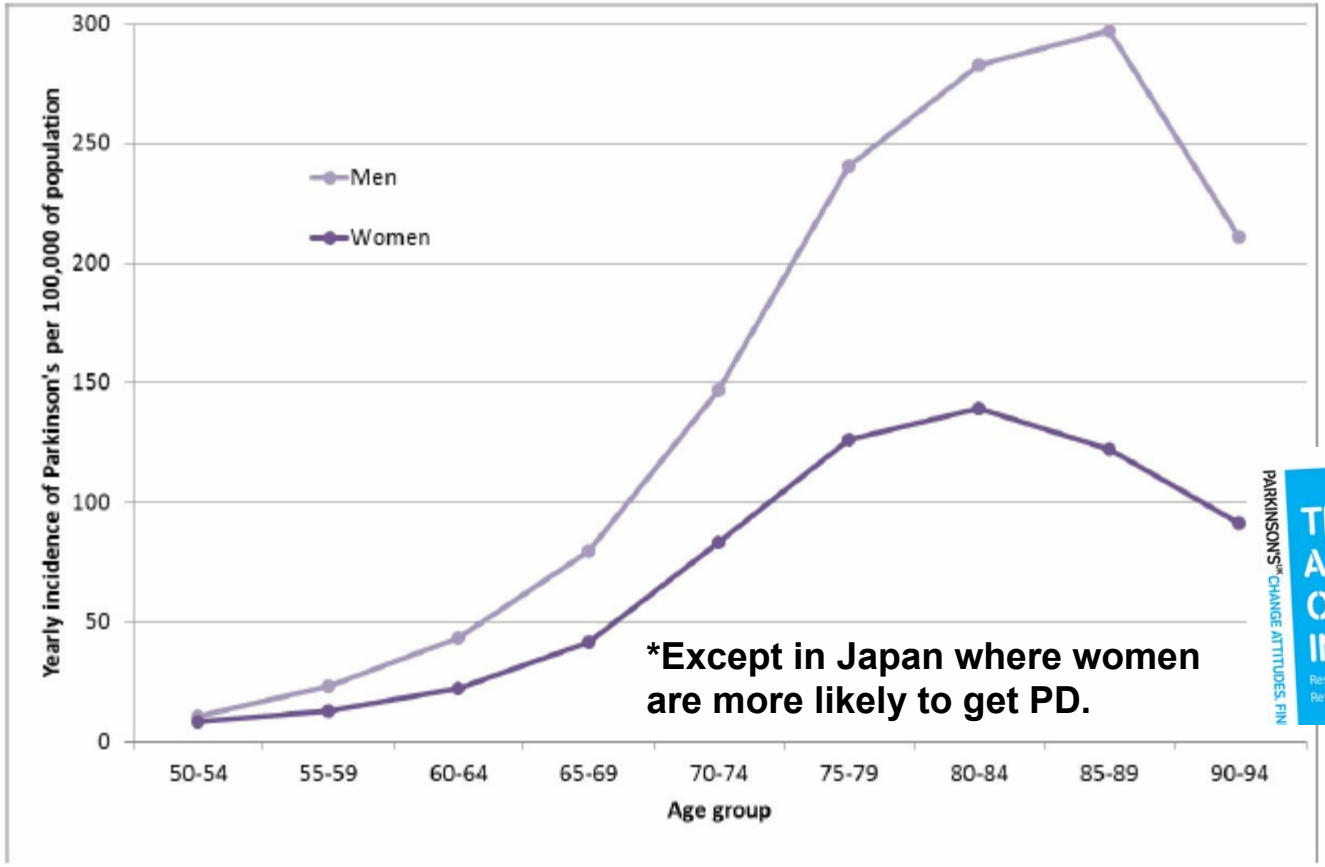
Parkinson's in USA

- >1.2 million
- 90,000 Diagnosed Yearly
- 50% Increase from Previous Estimates
- ~13% Due to Genetics

  The Remainder Due to Environmental Factors

Parkinson's by Age Group*

Figure 2 UK incidence of Parkinson's (per 100,000 per year) by age and gender (2011-2015)



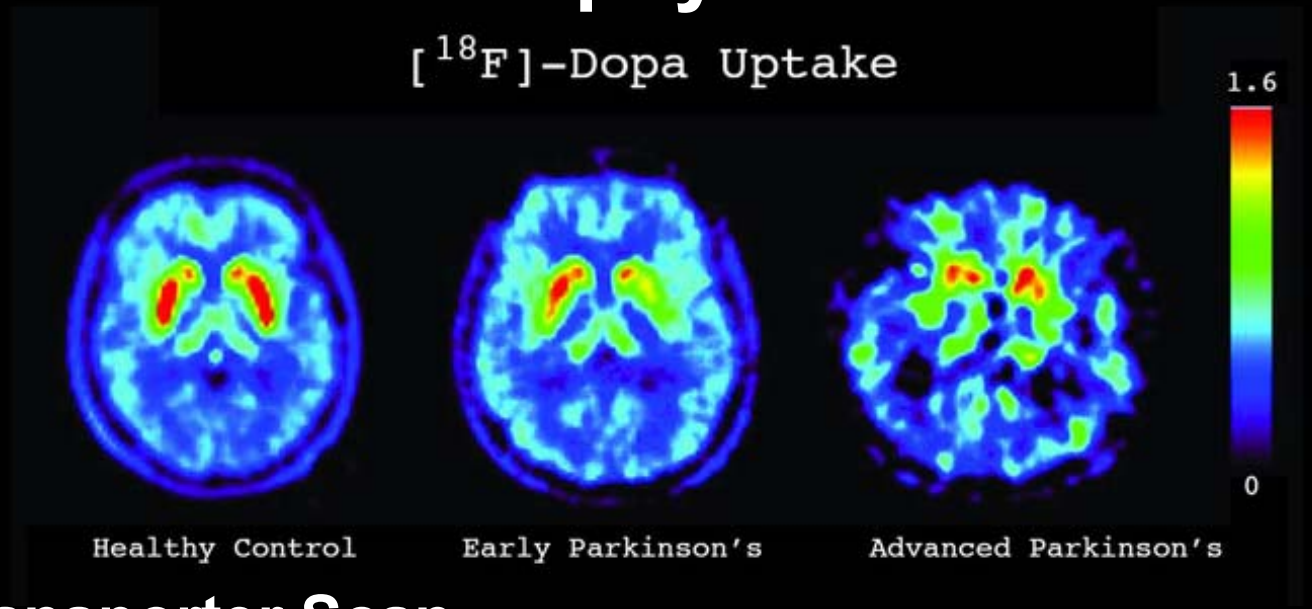
*Except in Japan where women are more likely to get PD.



*Longevity gives the symptoms of PD time to appear much like lung cancer.--Dr Ray Dorsey

Diagnosis Confirmation

- Lumbar Puncture
- DaTScan*
- Nearly Here: Skin Biopsy



*Dopamine Transporter Scan

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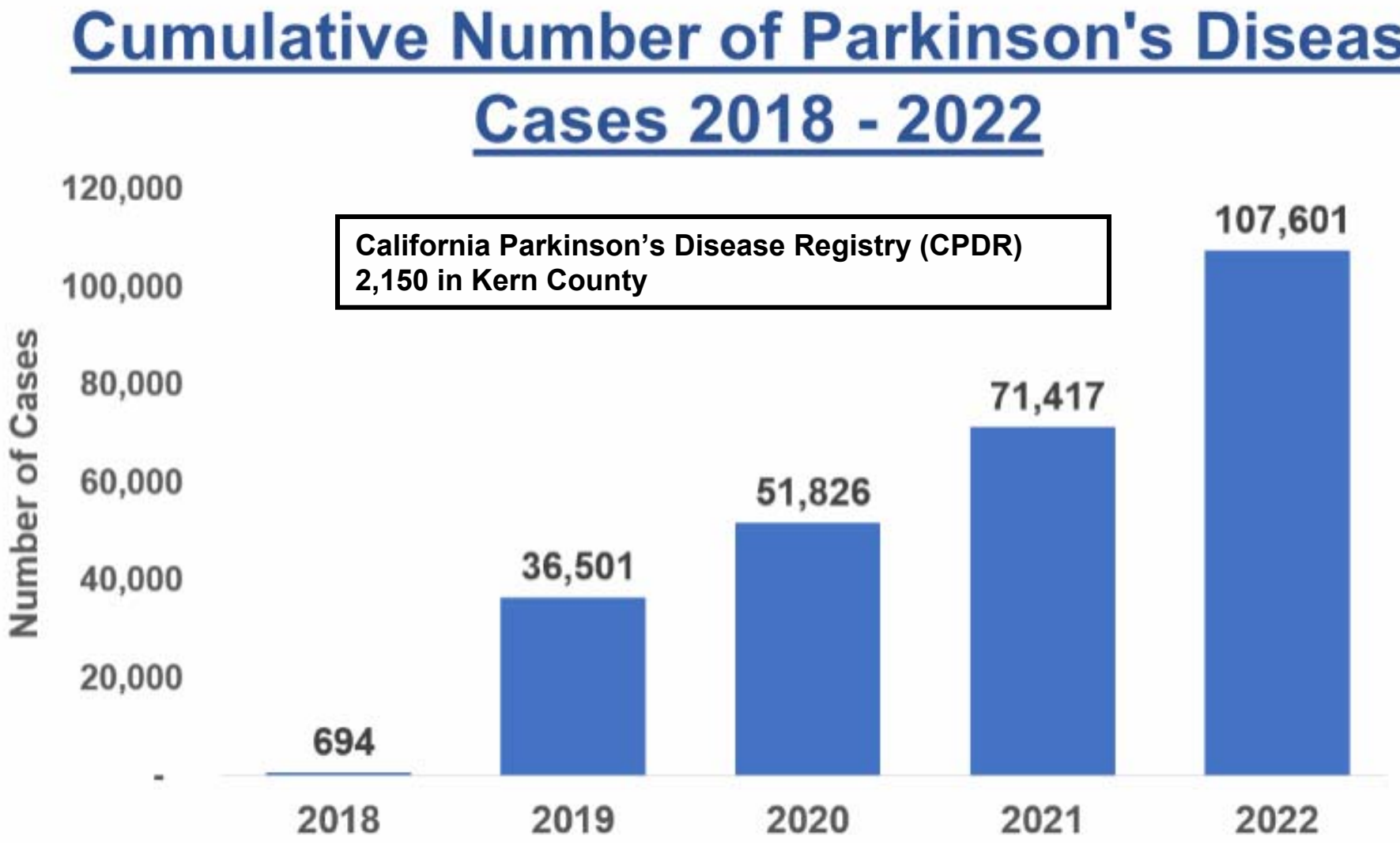
PD Risk Factors

- Age (1% of People >60 yrs)
- Head Injury
  - Boxers, Football Players
- Occupation
  - Sprayers & Flaggers, Mechanics, Military
- Location
  - Parkinson's Alley

Risk Increases with Exposure

- Accumulated “Hits”
- Environmental Exposure
- Occupational Exposure
  - Mechanics: TCE & Solvents
  - Farm workers: Pesticides
- Head Injuries
  - Boxers (Muhammad Ali)
  - Football, Soccer
  - Falls

PD in California



CPDR has a total of 107,601 unique cases.

Pesticides

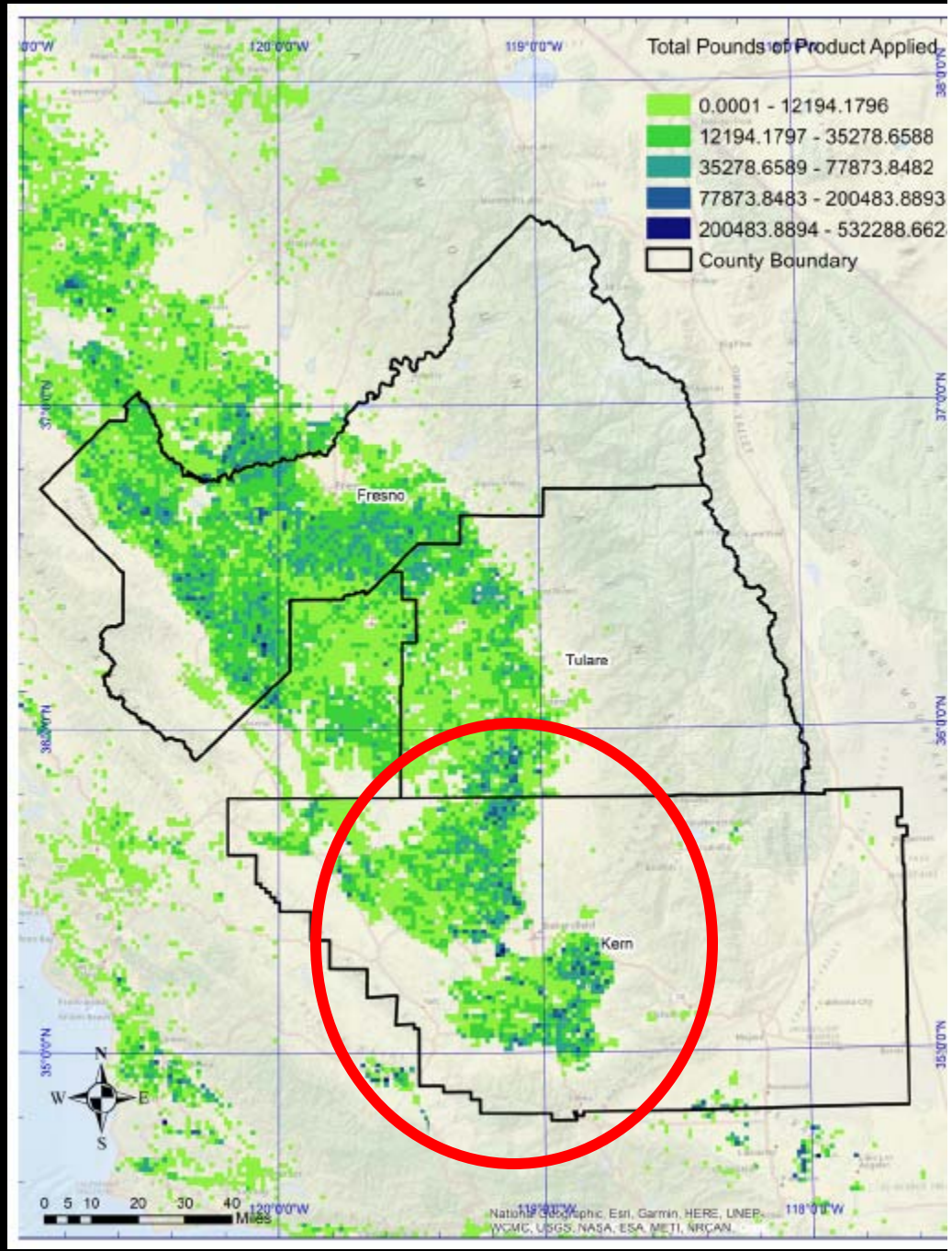


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UCLA
PEG Study

- lbs of pesticides applied.

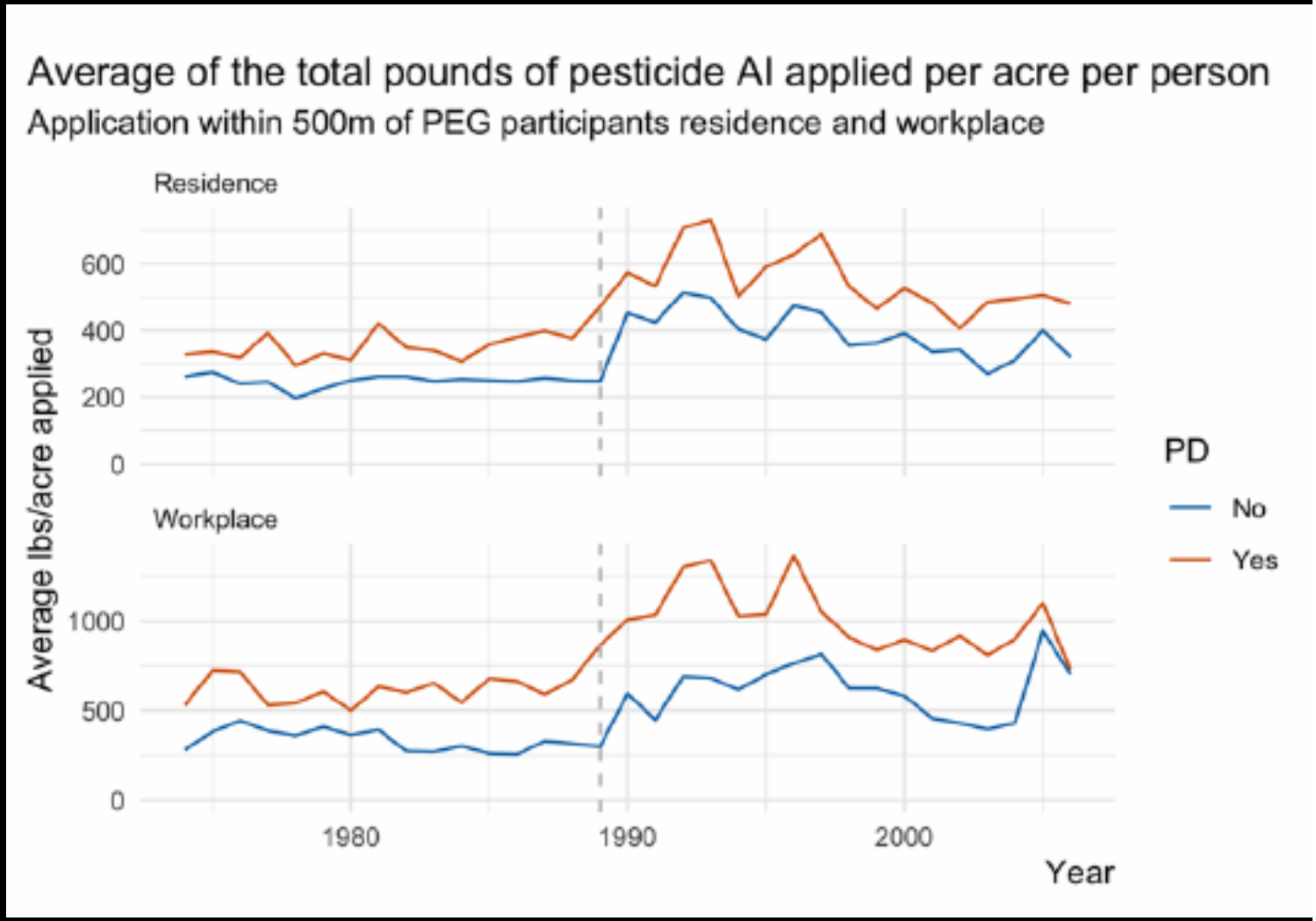
A pesticide and iPSC dopaminergic neuron screen identifies and classifies Parkinson relevant Pesticides, 2023.



PEG Study: Pesticide & PD

As lbs increase, so does PD.

Association does not necessarily equal causation.



A pesticide and iPSC dopaminergic neuron screen identifies and classifies Parkinson relevant Pesticides, 2023.

Paraquat (Defoliant)

- **Banned in 77 Countries but not USA**
- **Banned in**
  - **Norway 1981**
  - **Sweden 1983**
  - **Hungary, Austria, Denmark, Finland 1990s**
  - **European Union 2007**
  - **China 2016**
- **Banned in Vermont 2025**
- **California 2026**
  - **Registration Withdrawn—2028 Still in Use**
- **Syngenta (Chinese State-Owned)**
  - **World's Largest Producer—for Export Only**

Paul Gipe, wind-works.org

PD & Paraquat in Central Valley

International Journal of Epidemiology, 2024, **53(1)**, dyae004
https://doi.org/10.1093/ije/dyae004
Original article

IEA International Epidemiological Association

OXFORD

Original article

Agricultural paraquat dichloride use and Parkinson's disease in California's Central Valley

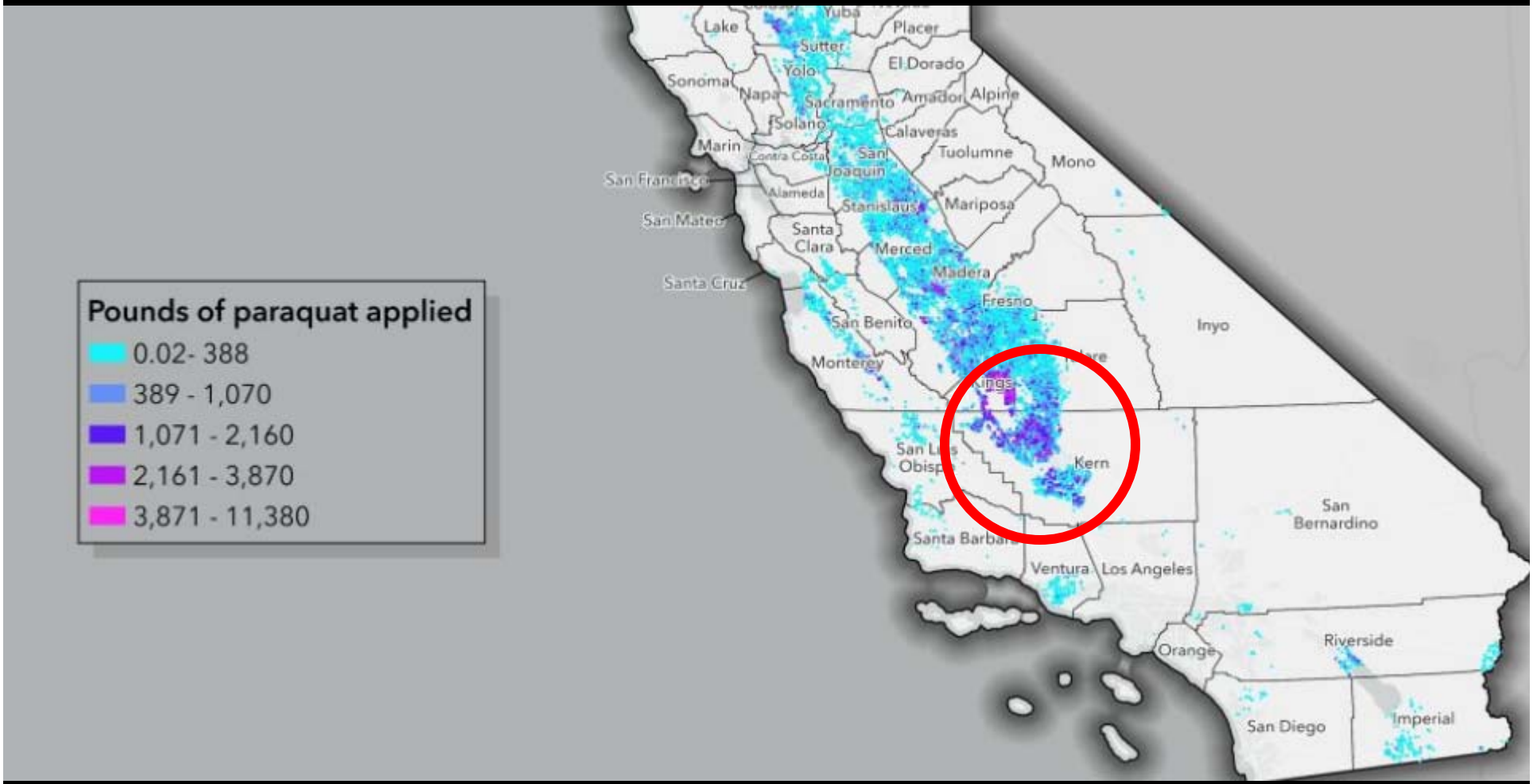
Kimberly C Paul [1,*] Myles Cockburn,[2] Yufan Gong,[3] Jeff Bronstein[1] and Beate Ritz [1,3]

[1]Department of Neurology, UCLA David Geffen School of Medicine, Los Angeles, CA, USA, [2]Department of Population and Public Health Sciences, Keck School of Medicine, University of Southern California, Los Angeles, CA, USA and [3]Department of Epidemiology, UCLA Fielding School of Public Health, Los Angeles, CA, USA

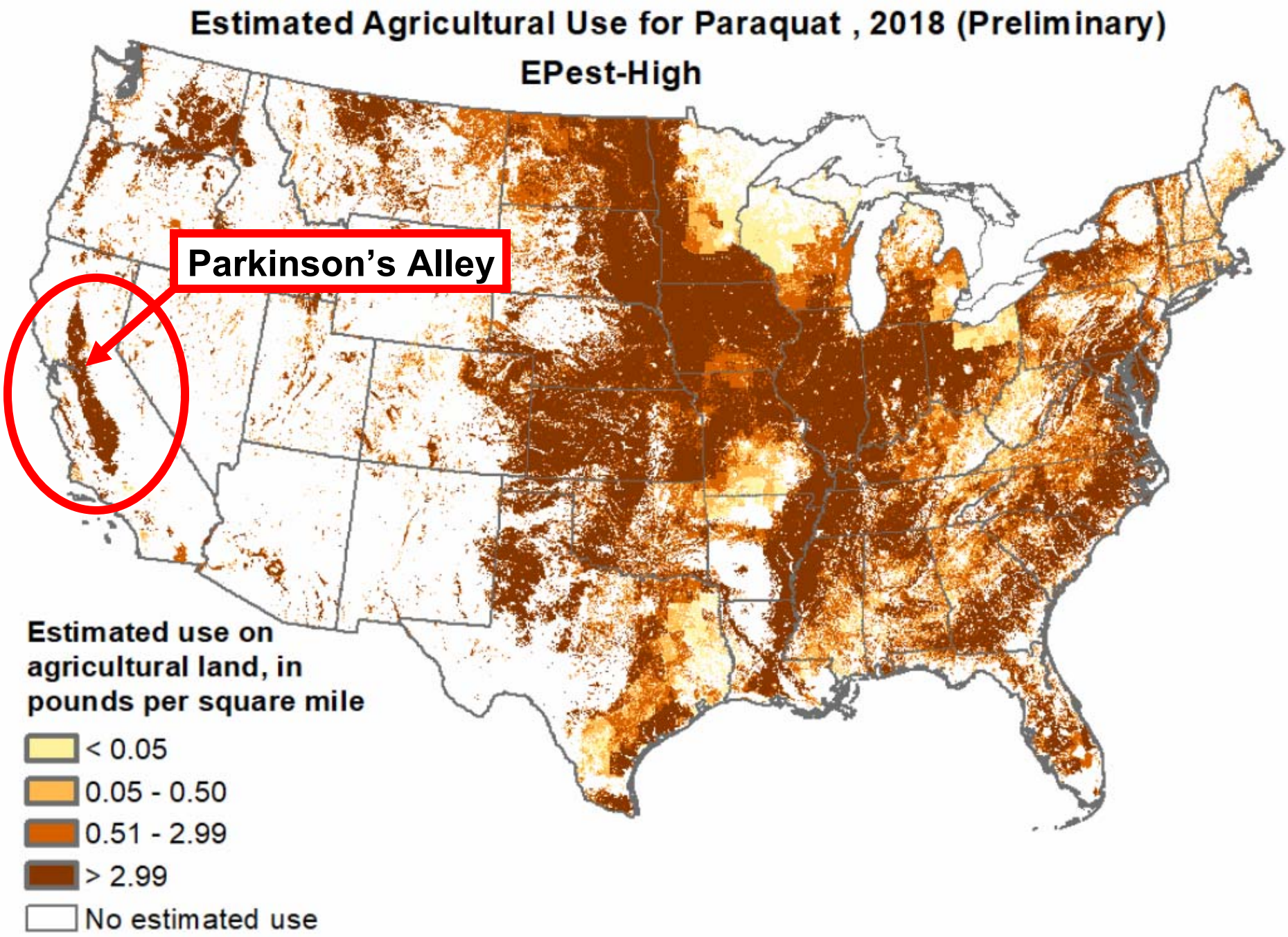
*Corresponding author. Department of Neurology, UCLA, 73-320B CHS, CAMPUS- 177220, Los Angeles, CA 90095, USA. E-mail: kimberlp@ucla.edu

Conclusion: This study provides further indication that paraquat dichloride exposure increases the risk of Parkinson's disease. (2024)

Paraquat Application in California



California Department of Pesticide Regulation

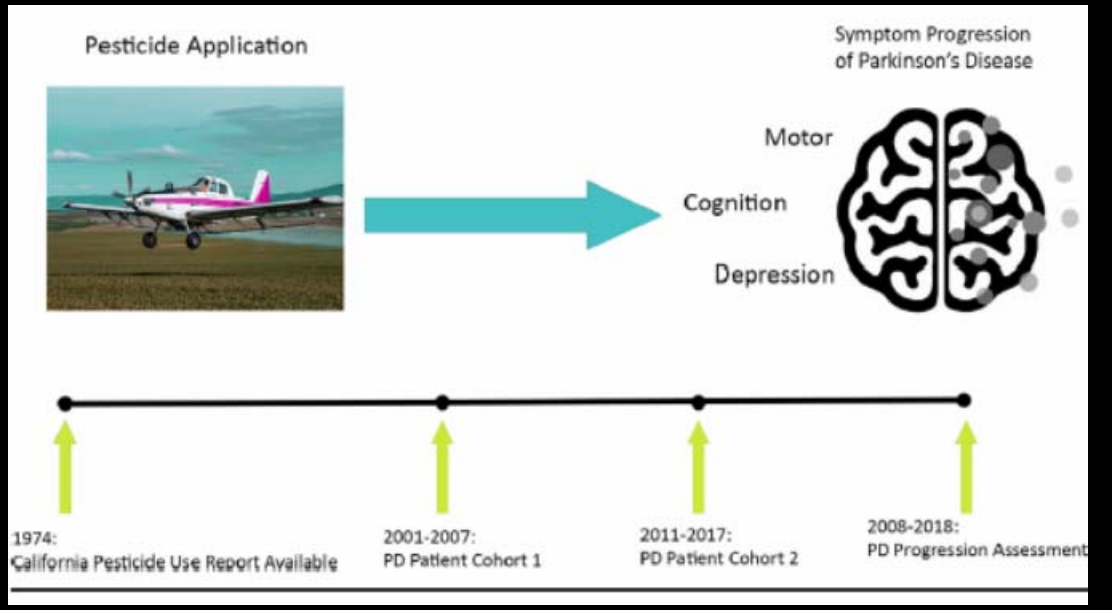

Estimated Agricultural Use for Paraquat , 2018 (Preliminary)
EPest-High
Parkinson's Alley
Estimated use on agricultural land, in pounds per square mile
< 0.05
0.05 - 0.50
0.51 - 2.99
> 2.99
No estimated use

Pesticide Exposure
UCLA PEG Study

- **Important for PD onset but may also influence progression.**
- **Exposure to ten pesticides was associated with faster PD symptom progression.**

Proximity to residential and workplace pesticides application and the risk of progression of Parkinson's diseases in Central California, 2022

Paul Gipe, wind-works.org



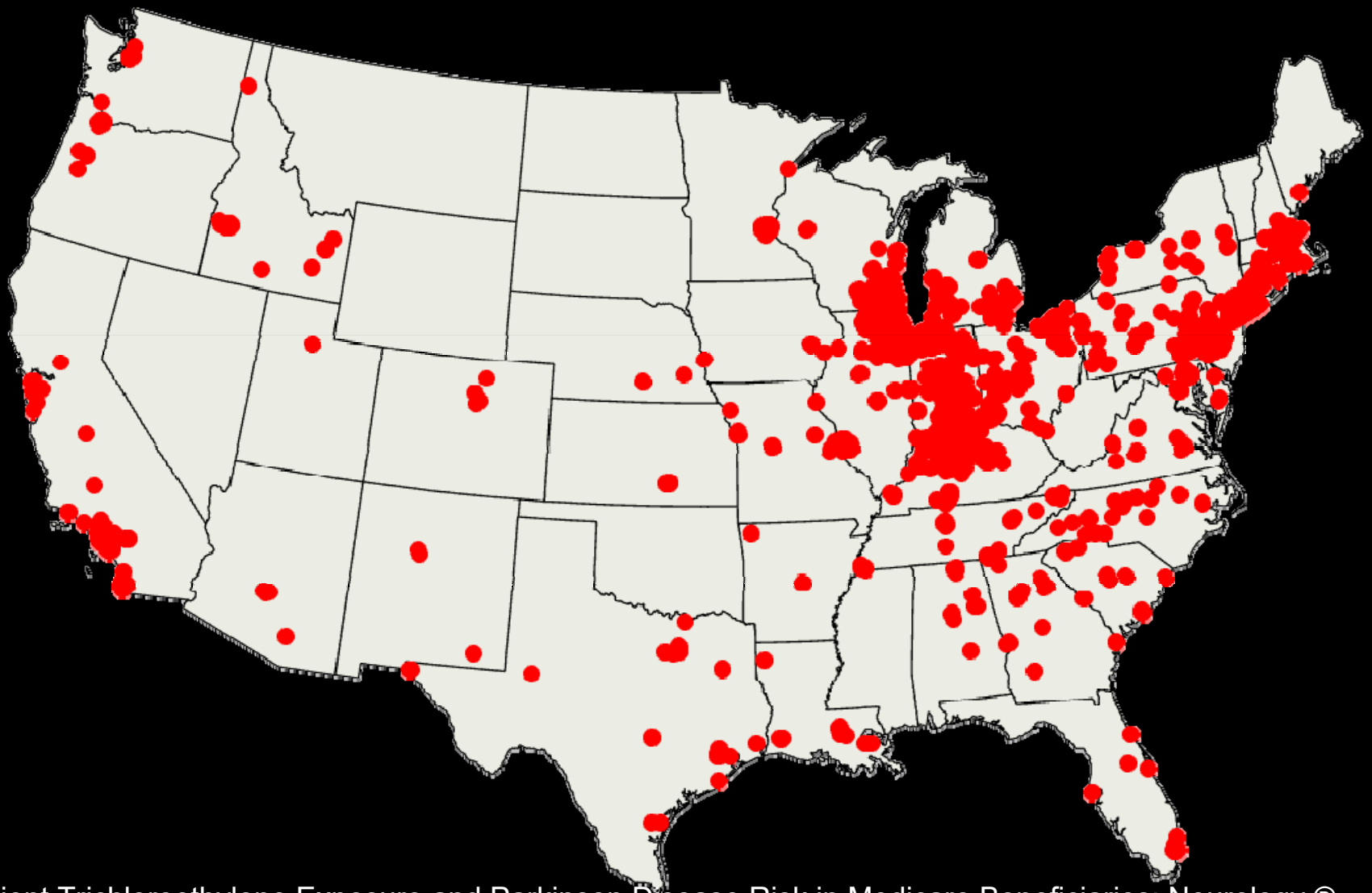
Polluted Ground Water

- **Dry Cleaning**
- **Metal Degreasing**
  - **Military & Aerospace**



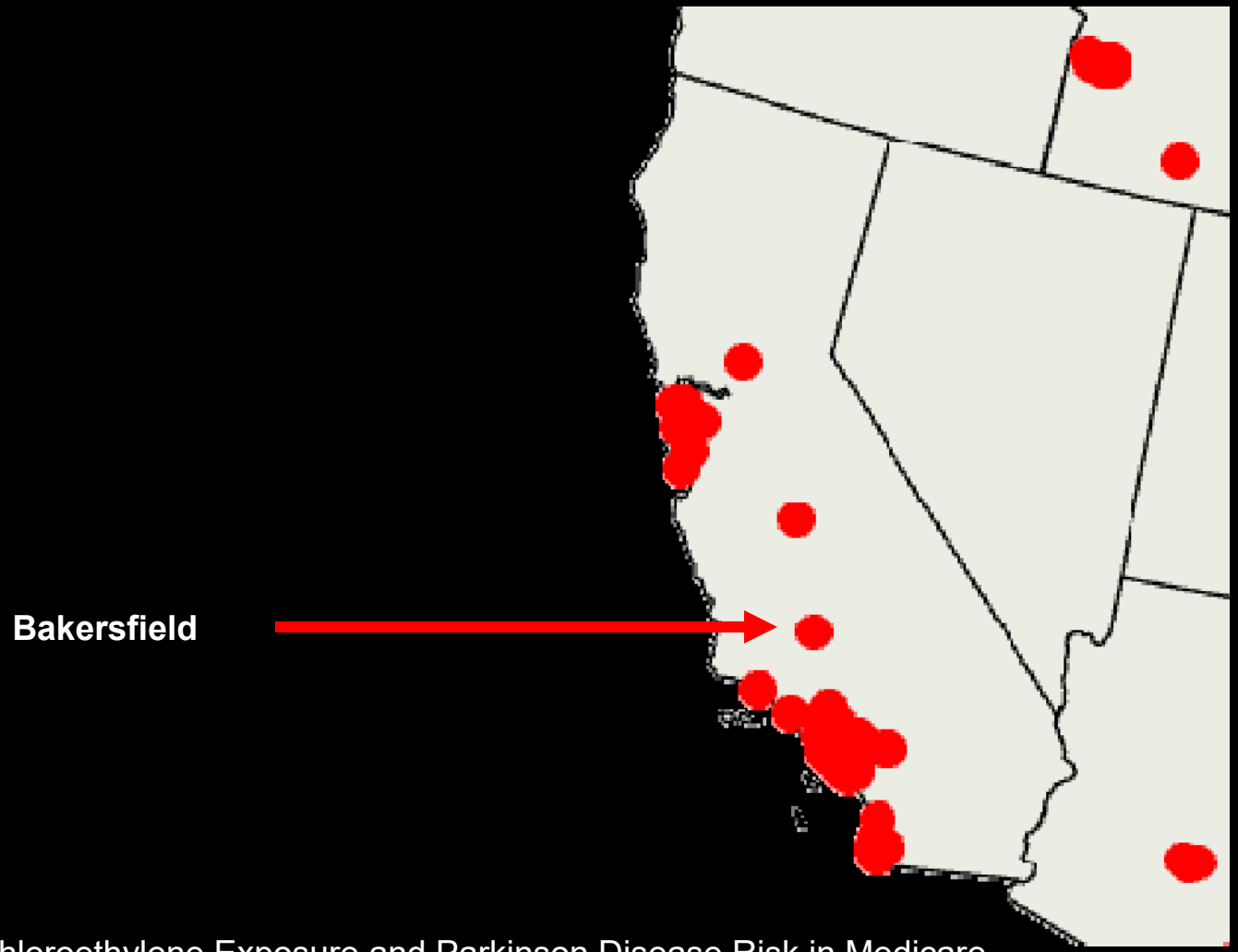
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Trichloroethylene Exposure & PD



Ambient Trichloroethylene Exposure and Parkinson Disease Risk in Medicare Beneficiaries; Neurology ® 2025;105:e214174. doi:10.1212/WNL.0000000000214174

TCE Exposure & PD



Ambient Trichloroethylene Exposure and Parkinson Disease Risk in Medicare Beneficiaries; Neurology ® 2025;105:e214174. doi:10.1212/WNL.0000000000214174

Trichloroethylene & US Marines

- **70% Greater Incidence of PD for Those from Camp Lejeune**
  - **Relative to those from Camp Pendleton**
- **Brian Grant**
  - **Professional Basketball Player**
  - **Raised at Camp Lejeune**



Brian Grant climbed Mount St. Helens in 2012 with PD

Paul Gipe, wind-works.org

Veterans at Risk

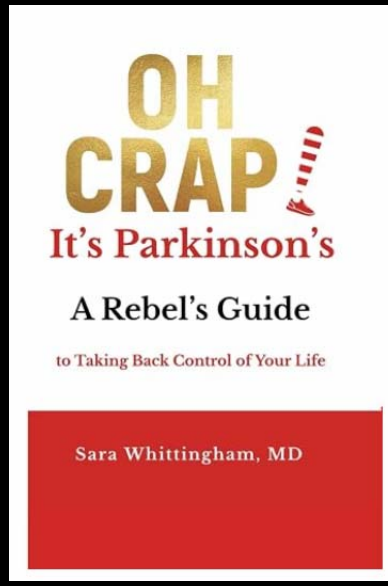
- US Marines (Camp Lejeune)
- Agent Orange (Vietnam)
- Burn Pits (Iraq & Afghanistan)
- Air Force

Dr. Jana Reed & Dr. Sara Whittingham

Athletes, Academy Graduates

Served in Afghanistan

YOPD within One Month of Each Other!



Air Pollution

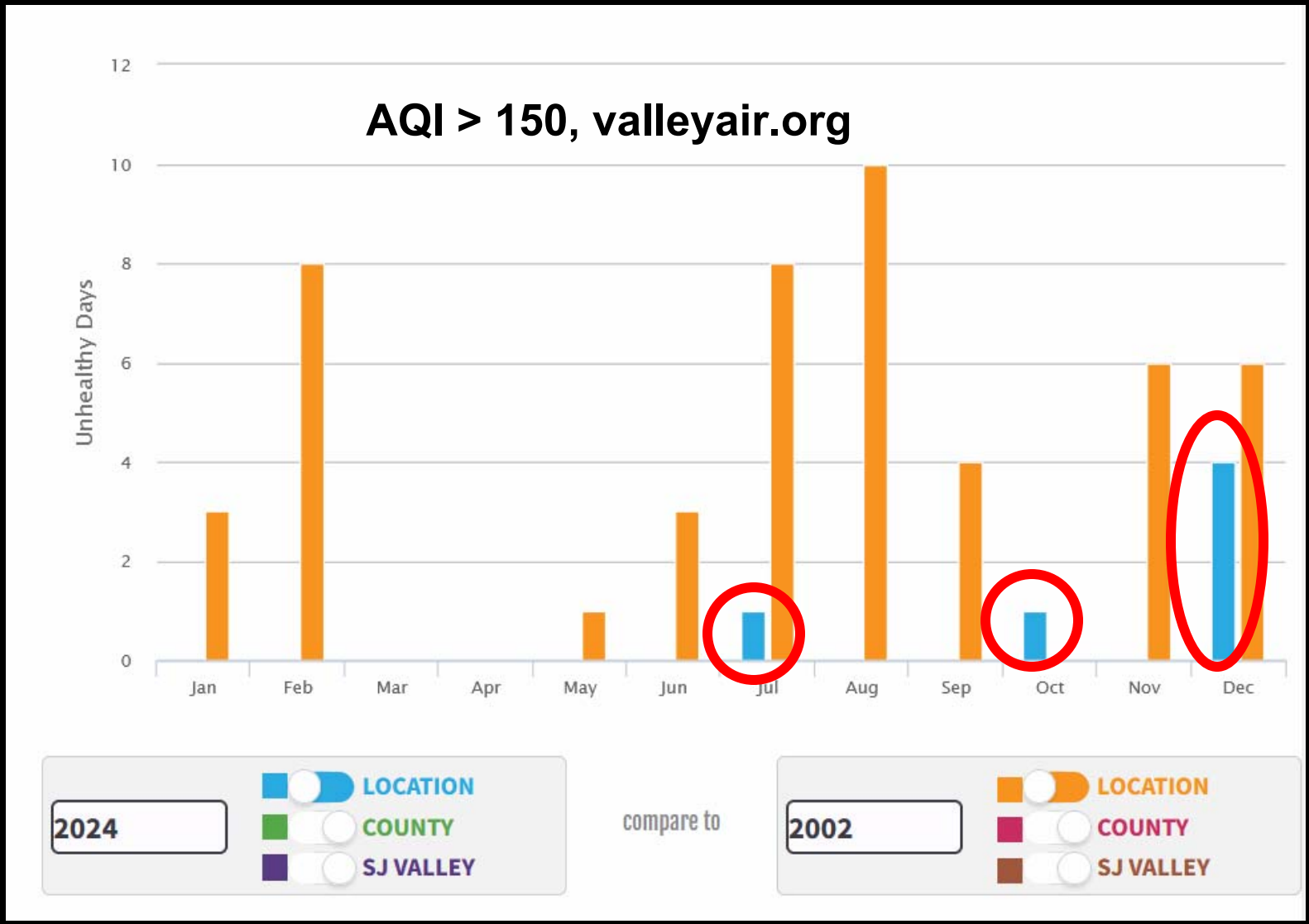
- Great Progress
- 40% Particulate Matter Reduction
- Nowhere Near Enough
- Low-Hanging Fruit has been Picked
- Hard Stuff Remains
  - Transportation



Paul Gipe, wind-works.org

California - Bakersfield (National Archives) 1923

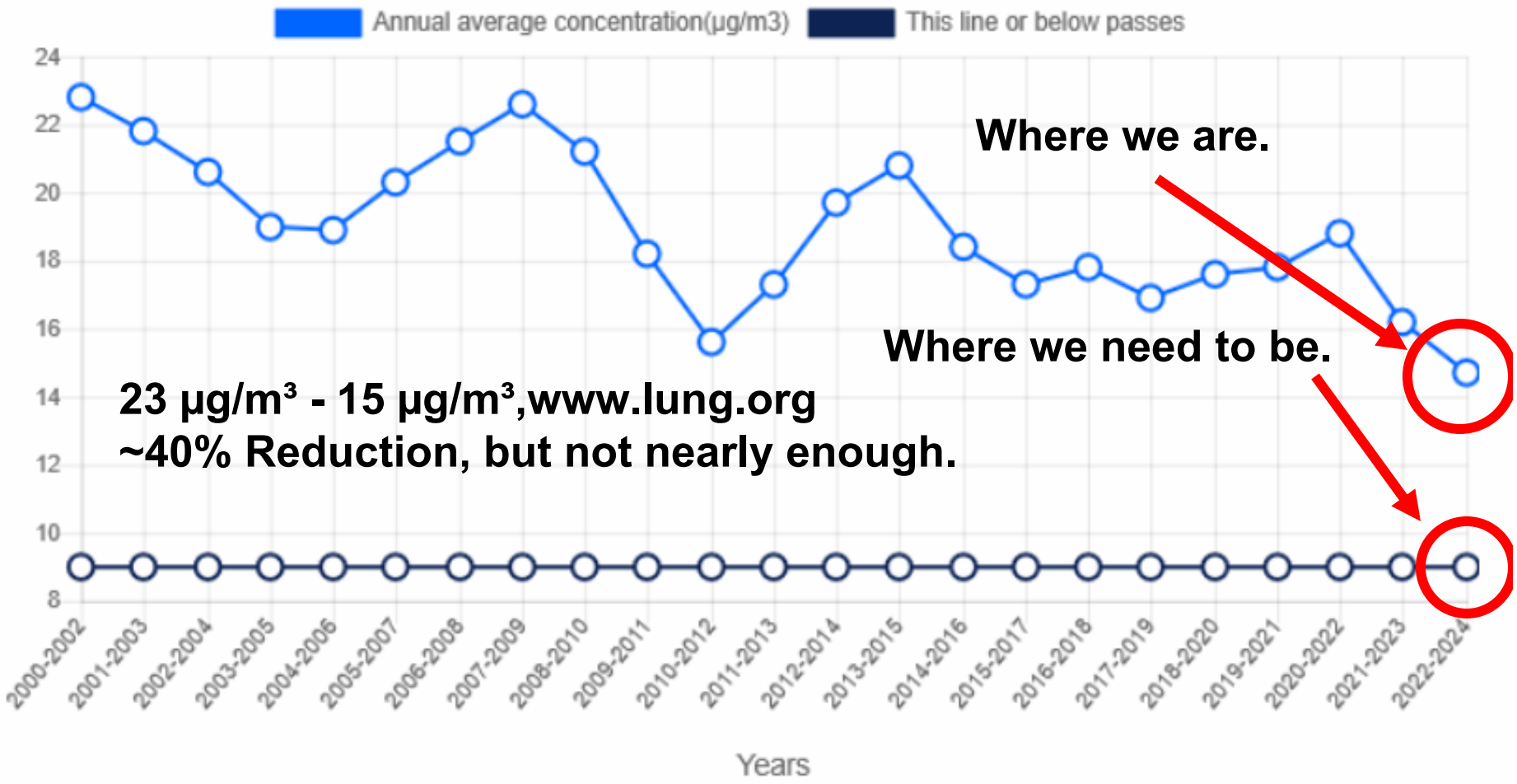
Bakersfield AQ Still Unhealthy



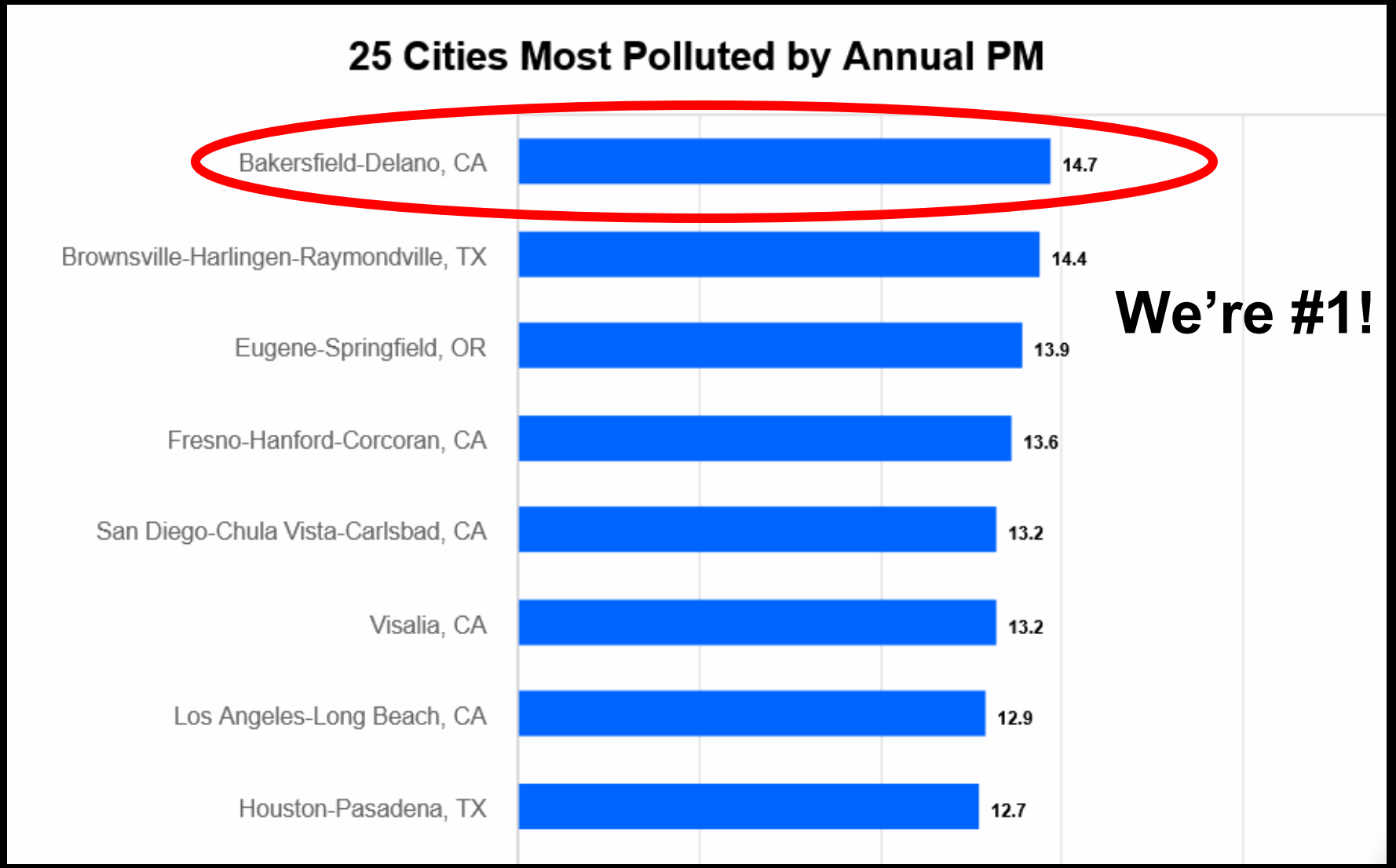
Annual PM Still Unhealthy

Kern

American Lung Association



Bakersfield We're Still #1!



American Lung Association annual survey.

American Lung Association Most Polluted Cities 2026

- We're Still # 1
- Central Valley: 1, 4, 5
- LA, Houston

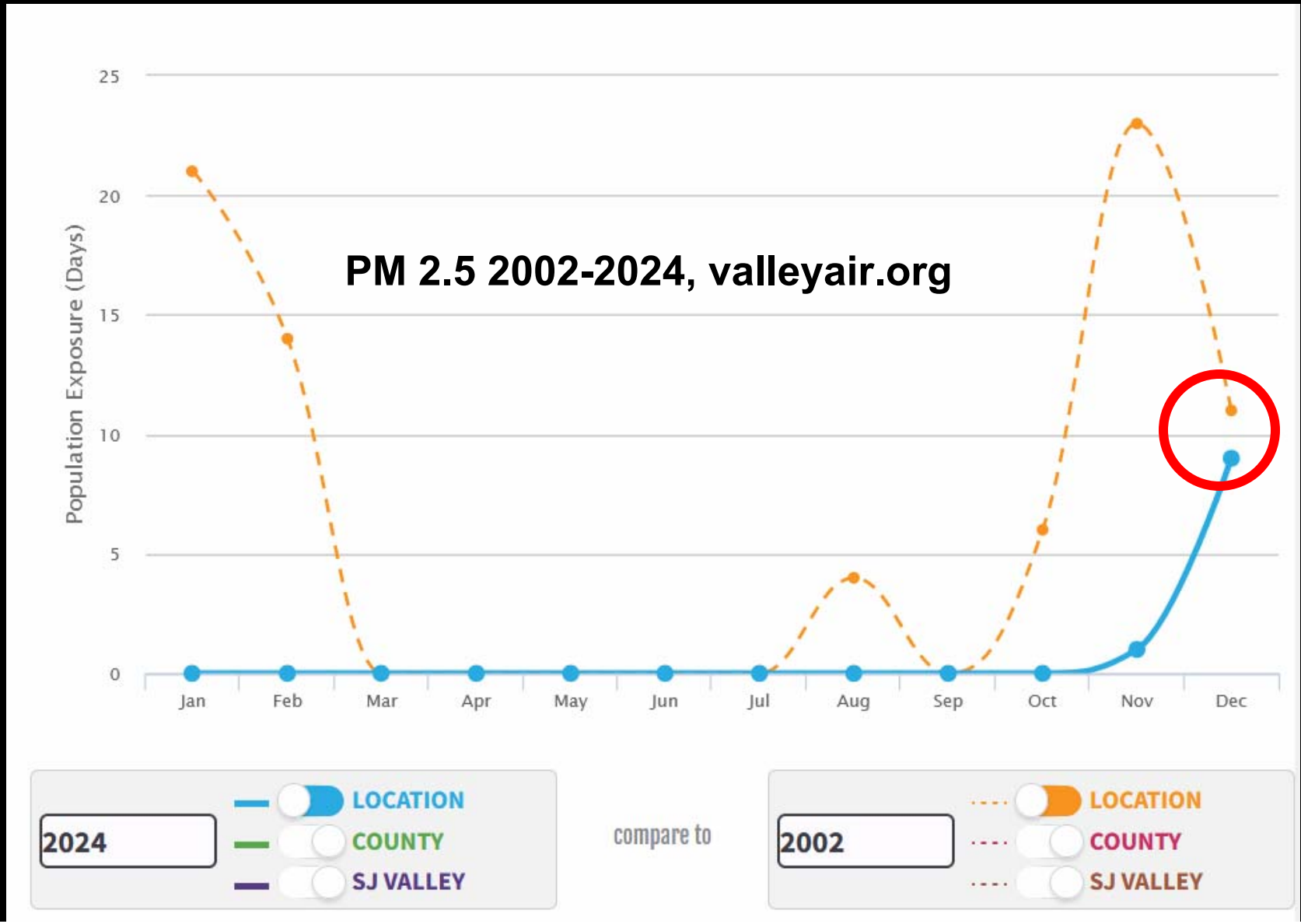
Laggards

By Year-Round Particle Pollution

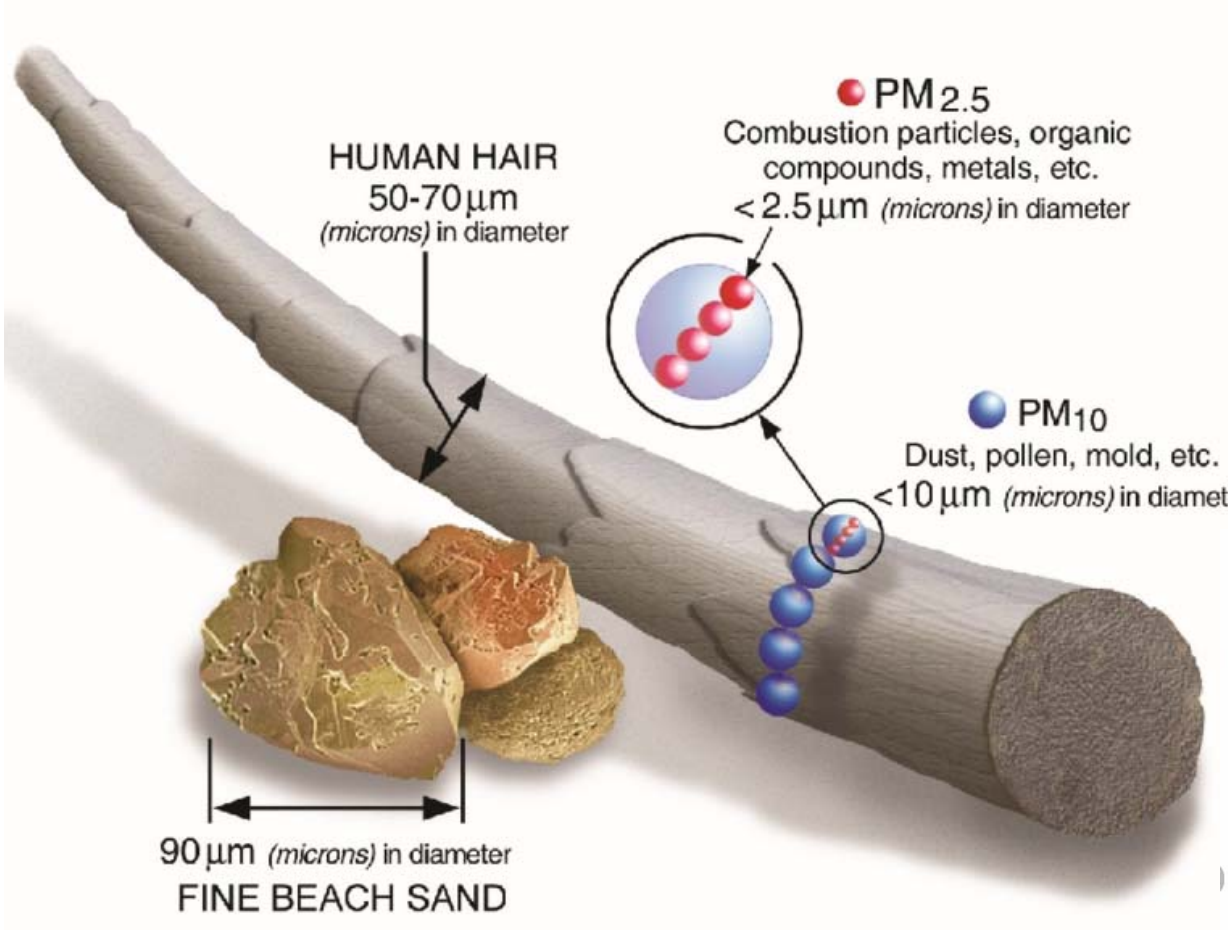
#1: Bakersfield-Delano, CA
#2: Brownsville-Harlingen-Raymondville, TX
#3: Eugene-Springfield, OR
#4: Fresno-Hanford-Corcoran, CA
#5: San Diego-Chula Vista-Carlsbad, CA
#5: Visalia, CA
#7: Los Angeles-Long Beach, CA
#8: Houston-Pasadena, TX

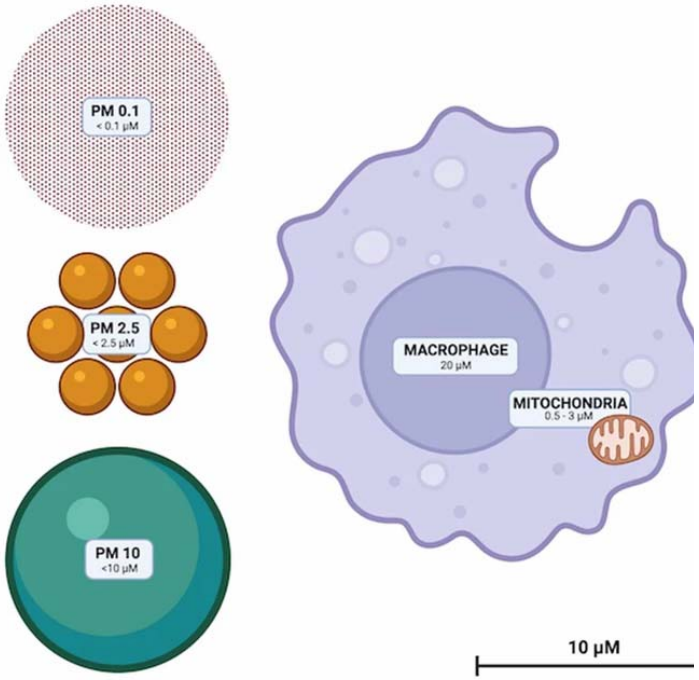
Paul Gipe, wind-works.org

Bakersfield Population Exposure $PM_{2.5}$



Particulates: Size Matters 2.5µm





Paul Gipe, wind-works.org

Particulates: Size Matters

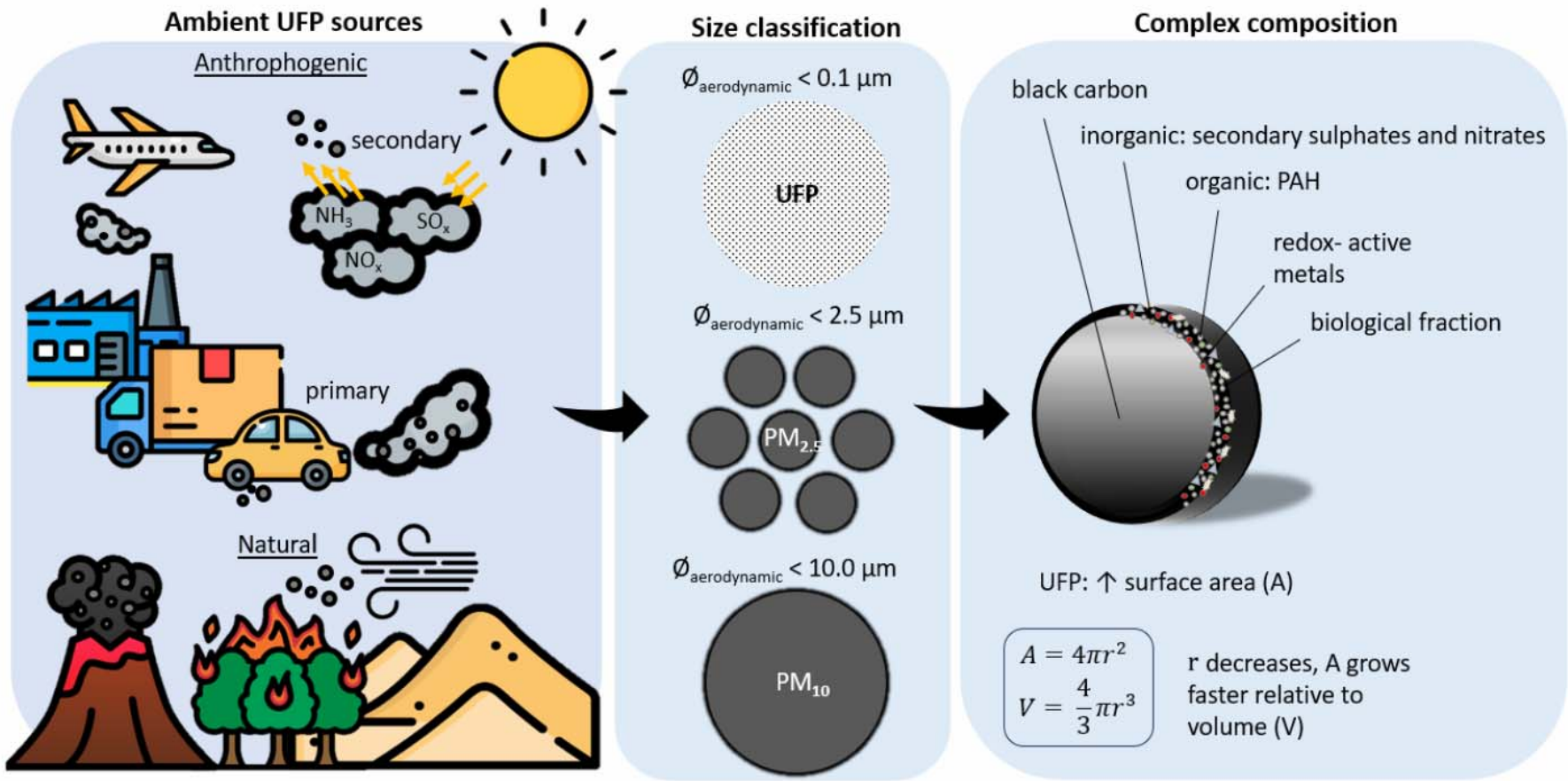
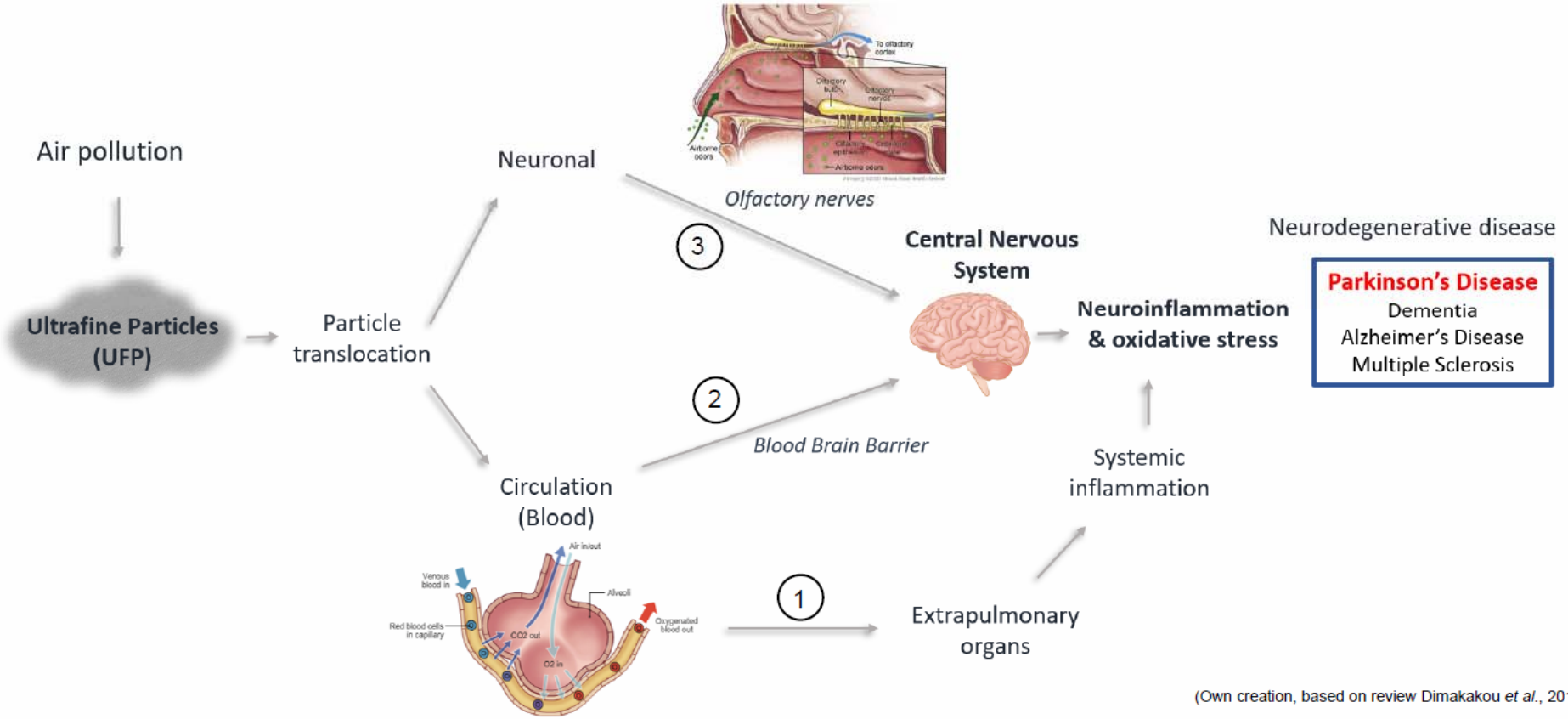


Figure 4: Ambient ultrafine particle sources, Size classification, and Complex composition of UFP. (Own creation)

Emma Thereens, University of Lille, PhD Thesis 2025

Paul Gipe, wind-works.org

PM < $2.5_{\mu m}$ & Parkinson's



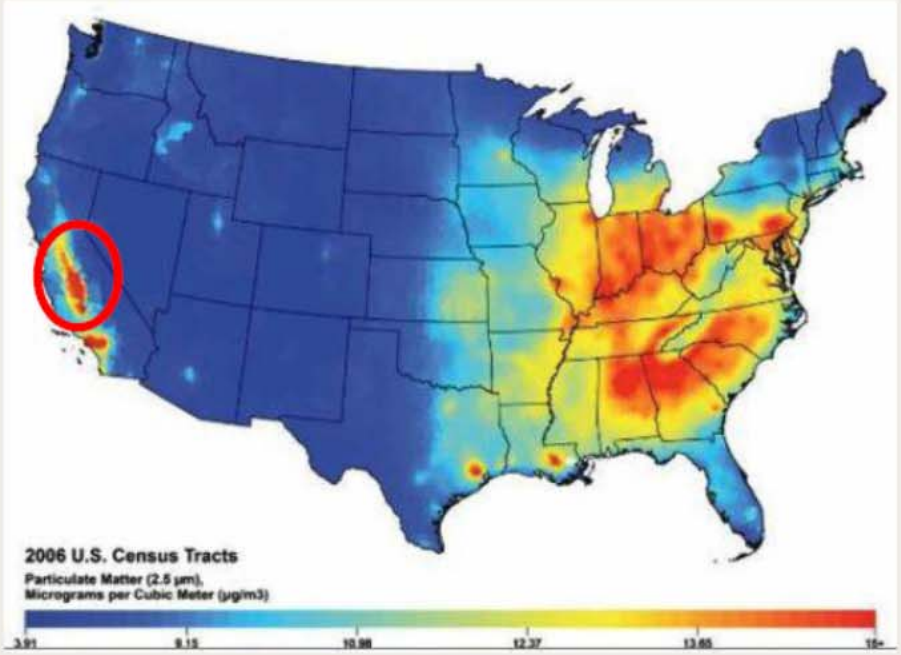
(Own creation, based on review Dimakakou *et al.*, 2018)

Paul Gipe, wind-works.org

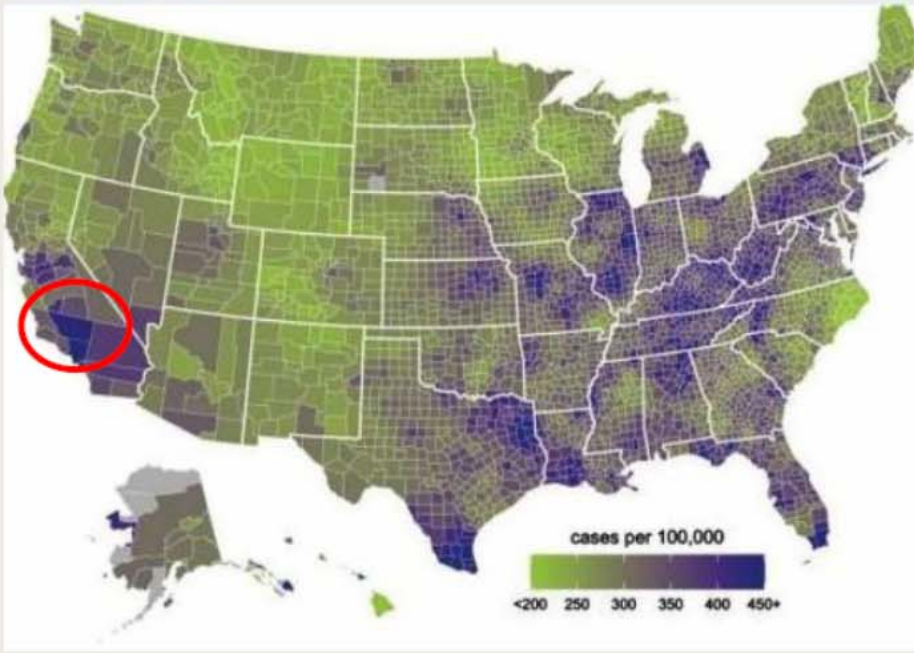
Emma Thereens, University of Lille, PhD Thesis 2025

$PM_{2.5}$ Exposure Increases PD Risk

Particulate matter 2.5 exposure map, 2006



Parkinson's incidence map, 2012

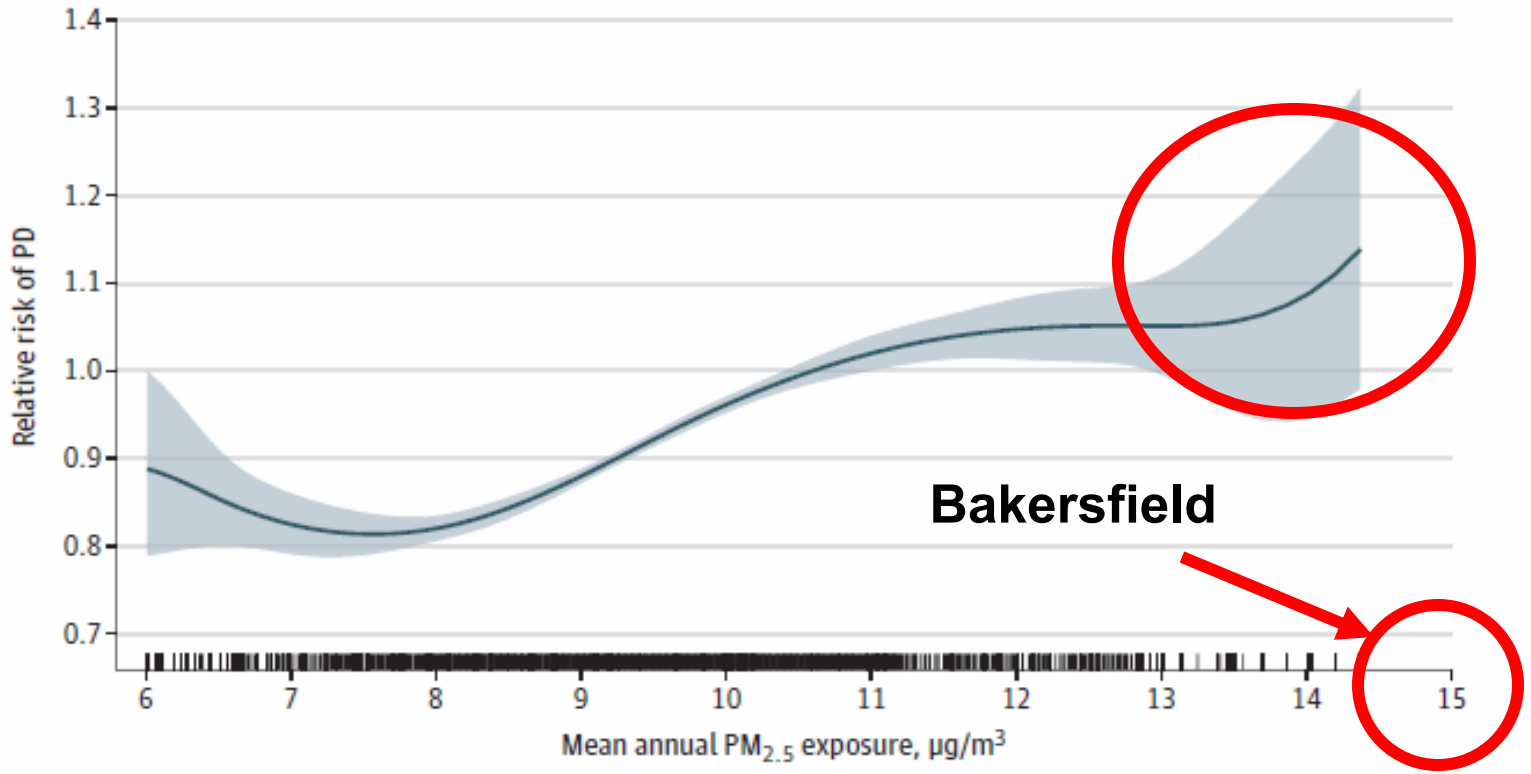


Long-term effects of PM2·5 on neurological disorders in the American Medicare population: a longitudinal cohort study 2020 and Dr Ray Dorsey.

Paul Gipe, wind-works.org

Population Exposure to $PM_{2.5}$ & PD

Figure 1. Risk of Parkinson Disease (PD) vs Controls by Mean Annual Exposure to Particulate Matter With a Diameter of 2.5 µm or Less ($PM_{2.5}$)

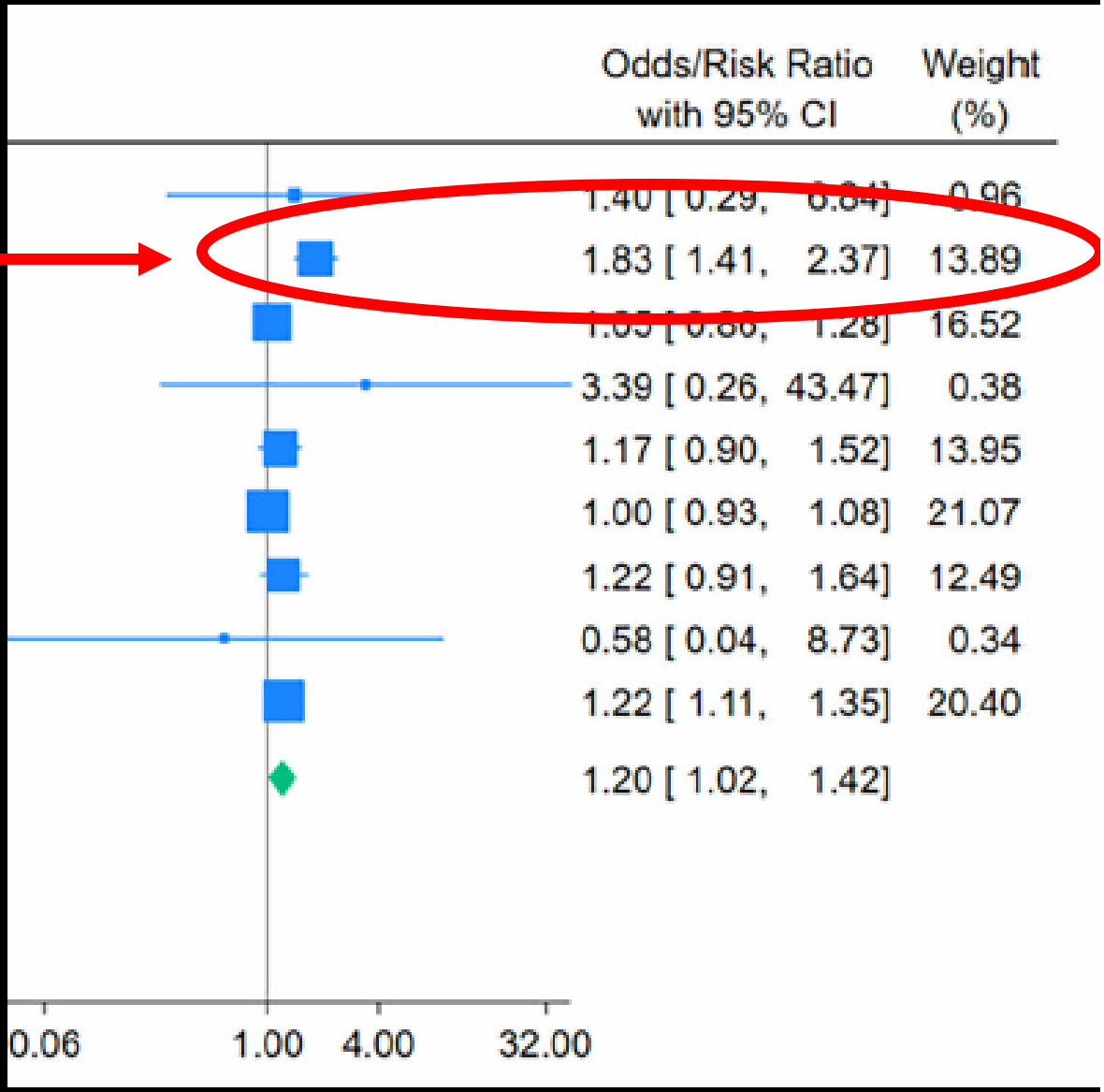


JAMA Network Open. 2024;7(9):e2433602. doi:10.1001/jamanetworkopen.2024.33602

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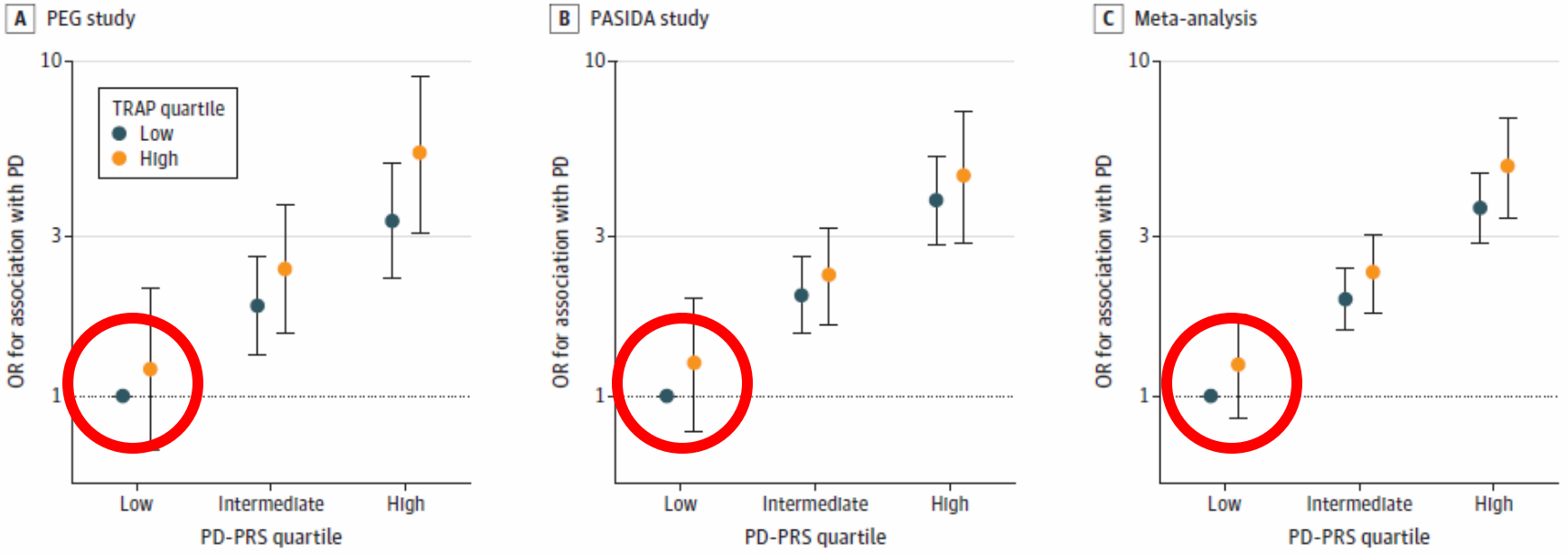
$PM_{2.5}$ Exposure & PD

UCLA PEG Study



The exposome and Parkinson's disease: the role of air pollution and socioeconomic status—a systematic review, 2026-09-05.

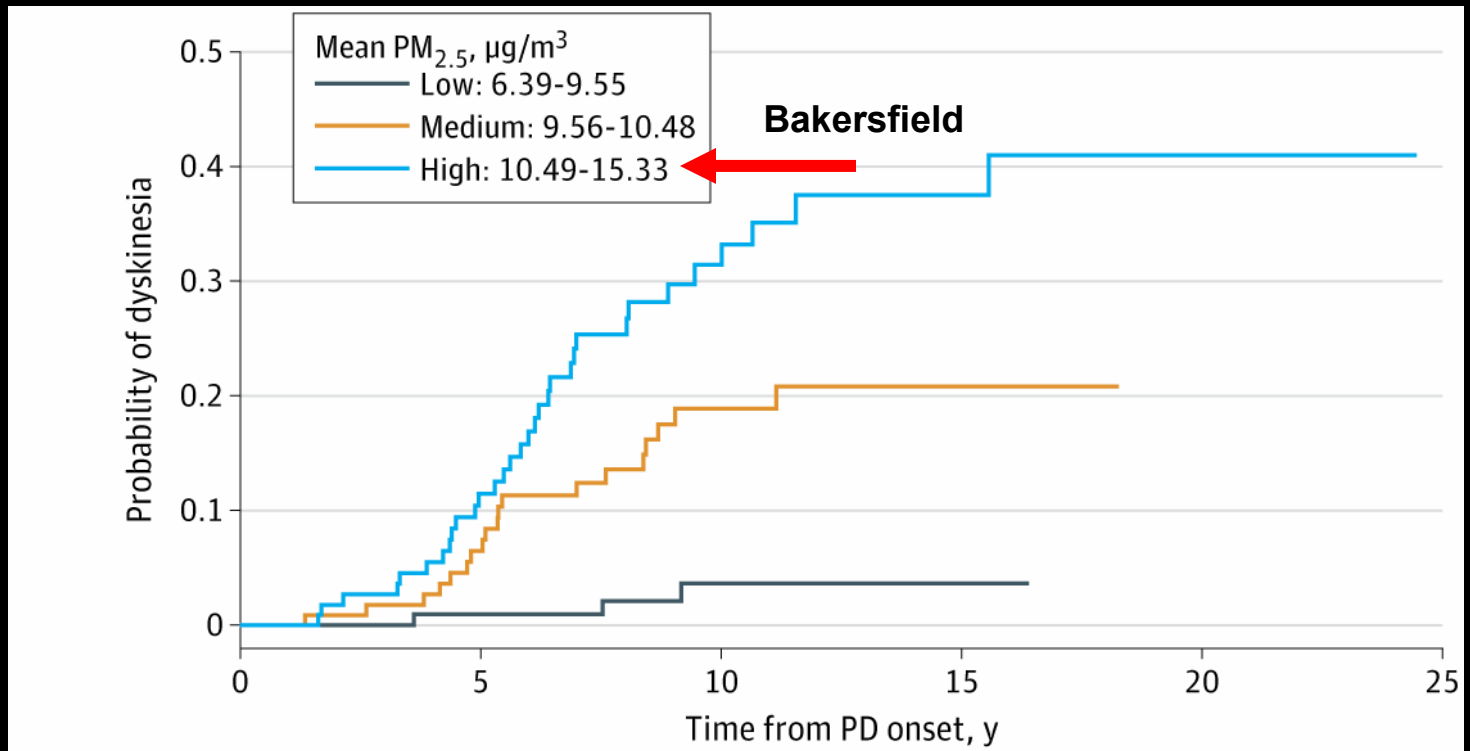
Risk of PD from Genetic Predisposition & Long-Term Traffic-Related Air Pollution Exposure



PEG = Central Valley
PASIDA = Denmark
PD-PRS = Parkinson's Polygenic Risk Score
OR = Odds Ratio

Interaction Between Traffic-Related Air Pollution and Parkinson Disease Polygenic Risk Score, 2025-03-17

Symptoms Worsen with Poor AQ



No. at risk						
Low	115	99	52	2	0	0
Medium	115	97	53	10	0	0
High	116	85	40	19	5	0

Air Pollution and Parkinson Disease in a Population-Based Study, 2024

Paul Gipe, wind-works.org

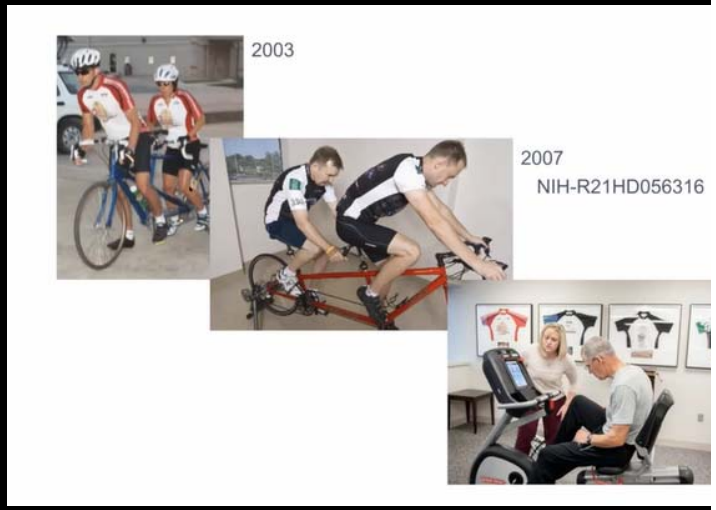
PD Treatment Today

- **Reducing Symptoms**
  - **Levodopa/Carbidopa (1960s)**
    - **Dopamine Replacement**
  - **Dopamine Agonists (Helpers)**
- **Reducing Progression**
  - **Only One Therapy Today—Vigorous Exercise**

Dr Jay Albert & Cathy Frazer

- High-Cadence Cycling
- “Forced Exercise”
- 2003 RAGBRAI* finisher





*Des Moines Register's Annual Great Bike *Ride* Across Iowa

Paul Gipe, wind-works.org

PD Treatment: Vigorous Exercise



PD Treatment Tomorrow

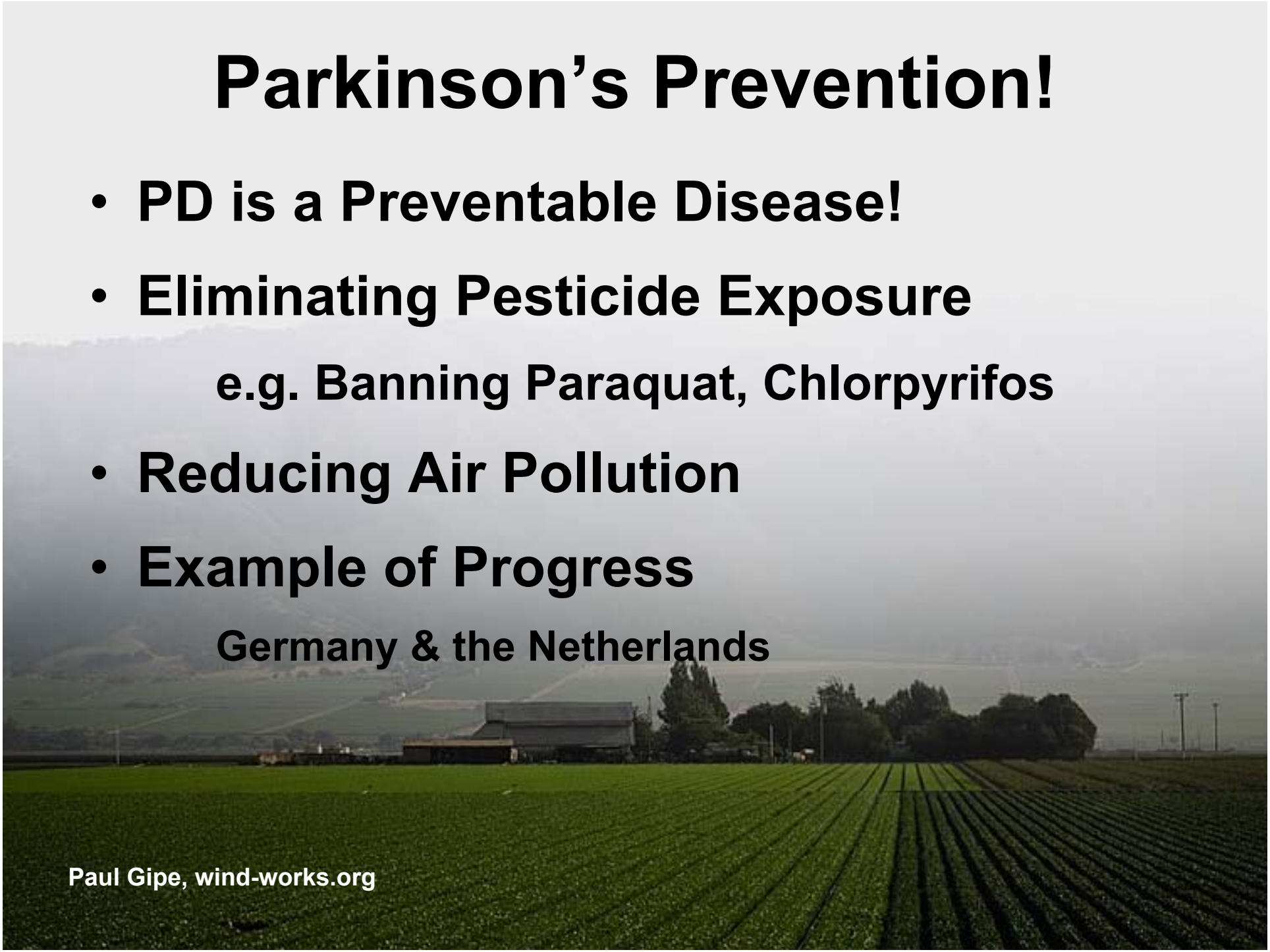
- **Disease Modifying Therapies**
  - Altering the Course of the Disease
  - Biomarkers & Precision Medicine
  - Stem Cells (Not Ready for Prime Time)
    - Japan in Stage Three Trials
- **Precision Medicine**
  - Dialing in Treatment Unique for Each Person

Parkinson's Prevention!

- PD is a Preventable Disease!
- Eliminating Pesticide Exposure

  e.g. Banning Paraquat, Chlorpyrifos
- Reducing Air Pollution
- Example of Progress

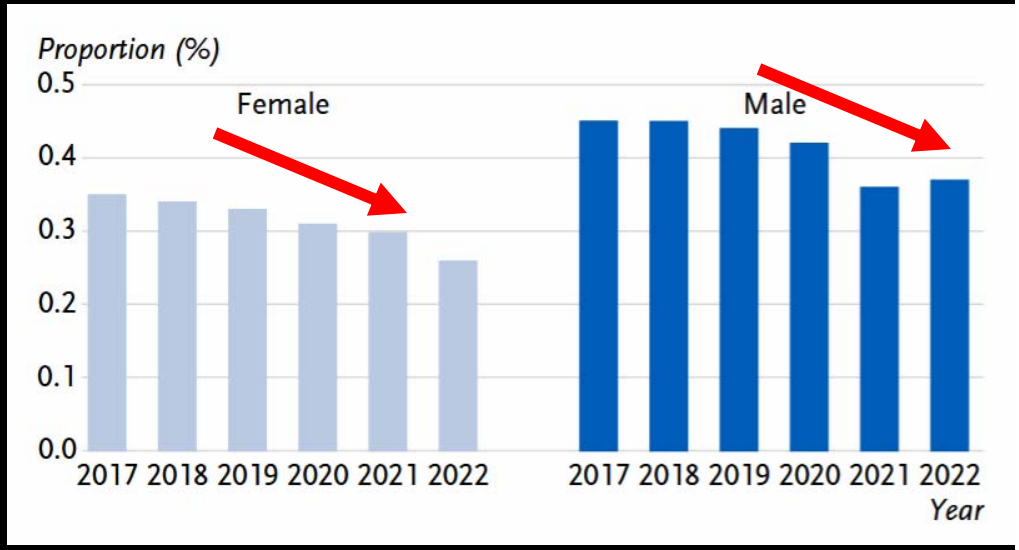
  Germany & the Netherlands



Paul Gipe, wind-works.org

Parkinson's in Germany

- **PD = Occupational Disease**
  - **For Those Who Work w/ Pesticides (2026)**
- **Paraquat Banned**
- **Declining Rate of Occurrence!**



Parkinson disease – Prevalence, trends and regional patterns in Germany. An analysis based on routine data from the statutory health insurance 2025

Paul Gipe, wind-works.org

Air Pollution is a Modifiable Risk Factor (ie We Can Do Something About It)

- Cars → EVs
- Diesel Trucks → Electric Trucks
- Diesel Locos → Electric Rail

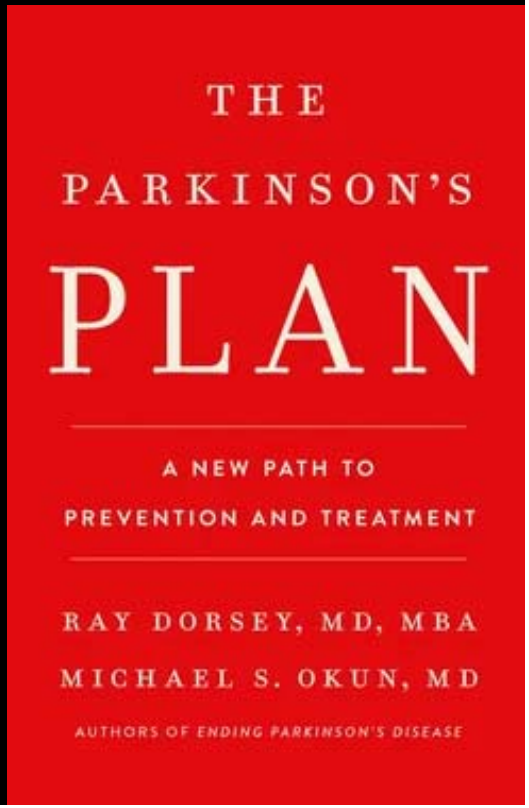


Paul Gipe, wind-works.org



The Parkinson's Plan by Drs Ray Dorsey & Michael Okun

- **0-10-100 goals by 2035**
  - 0 increase in PD
  - 10 x > Research
  - 100% of PwP Access to Levodopa
- **Prevention-Treatment-Care-Cure**



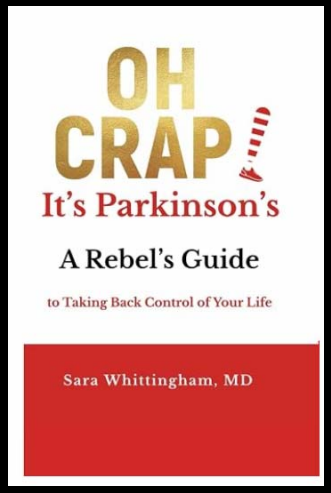
Paul Gipe, wind-works.org

Living Well with Parkinson's

- **Inspirational Examples**
  - Jimmy Choi (Ninja Warrior)
  - Michael J Fox
  - Sara Whittingham (Oh Crap)
  - Andre Tal (Brazil)
  - Dr. Annelien Oosterbaan (Netherlands)



- **Coping**



Coping with Parkinson's

- You're Not Alone
- Find Community
- Find Purpose
- Make the Most of What You Have
- Train for Life
- Learn to Pivot

Paul Gipe, wind-works.org

Bakersfield Parkinson's Support

