

Parkinson's

19 June 2026



Outline

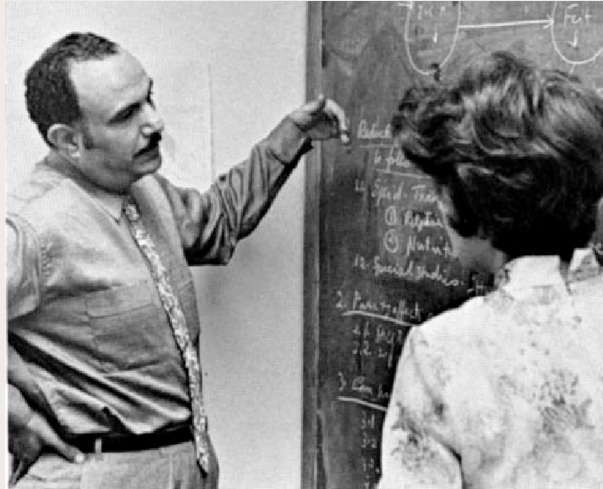
Degenerative & man-made disease

Parkinson's disease

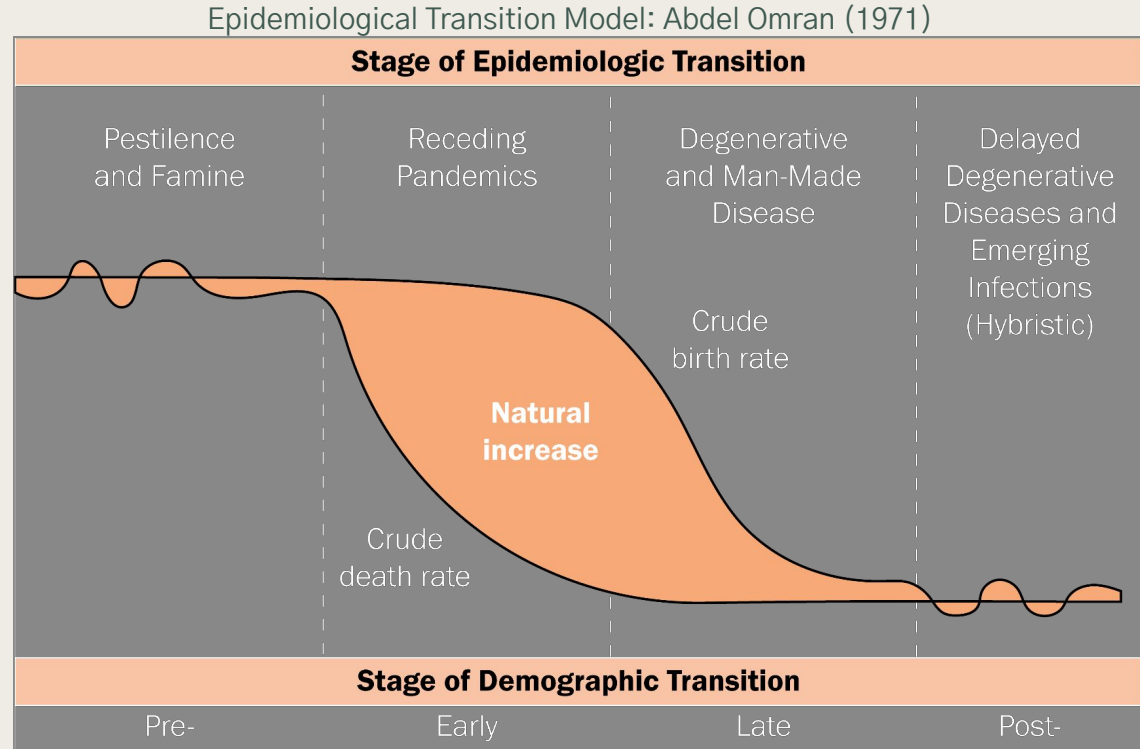
Conclusion



We are living in an age of degenerative and man-made diseases

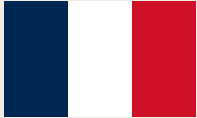


Professor Abdel Omran





In contrast to other diseases, the major descriptions of many neurodegenerative diseases are recent

	Year	Disease
	1817	Parkinson's disease
	1869	Amyotrophic lateral sclerosis
	1906	Alzheimer's disease
	1964	Progressive supranuclear palsy
	1976	Dementia with Lewy bodies

These conditions have modest genetic contributions

Disease	Most common genetic cause	Prevalence
Parkinson's disease	<i>LRRK2</i> mutation	~2%–3%
ALS	<i>C9orf72</i> mutation	~5%–10%
Alzheimer's disease	<i>PSEN1</i> mutation	<1%
Progressive supranuclear palsy (PSP)	<i>MAPT</i> mutation	<1%
Dementia with Lewy bodies	<i>GBA</i> mutation?	<1%

Source: [Van Dongen J et al. Nature Review Genetics 2012;13:640–53](#); organized by Drs. J.S. Bogers and Bastiaan Bloem, Nadide Cemre Randa et al. [IJND 2019;2:007](#), Rubika Balendra, Adrian M Isaacs [Nat Rev Neurol. 2018 Sep;14\(9\):544–558](#), Fyke, W., & Velinov, M. (2021). FMR1 and Autism, an Intriguing Connection Revisited. [Genes. 12\(8\). 1218.](#), Davis M. E. (2016). Glioblastoma: Overview of Disease and Treatment. [Clinical journal of oncology nursing. 20\(5 Suppl\). S2–S8](#), Rongve, A., Wittecler, A., Ruiz, A. et al. [Sci Rep 9, 7013 \(2019\)](#), Marco Baptista, PhD, [Practical Neurology April 2016 issue](#), Orame T. et al. [Curr Neurol Neurosci Rep. 2018 Aug 10;18\(10\):67](#) Yu Wu L. et al [Brain Communications. Volume 6, Issue 4, 2024, fcae190](#), Wen Y. et al [J Parkinsons Dis. 2021 Feb 2;11\(1\):93–105](#)



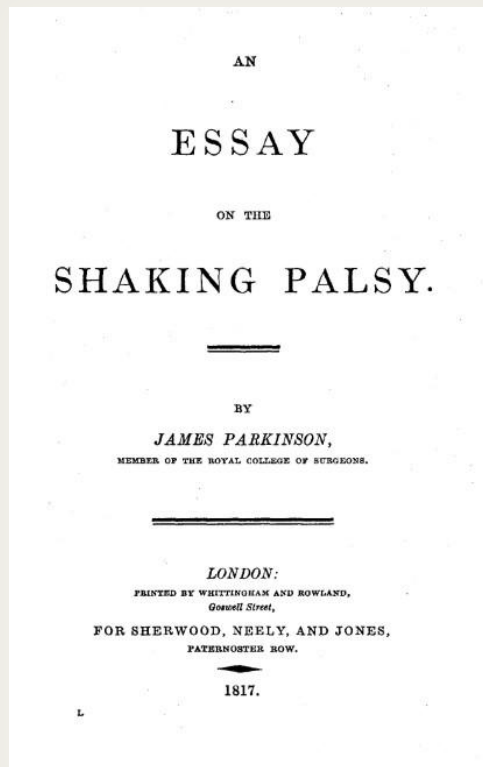
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Degenerative & man-made disease

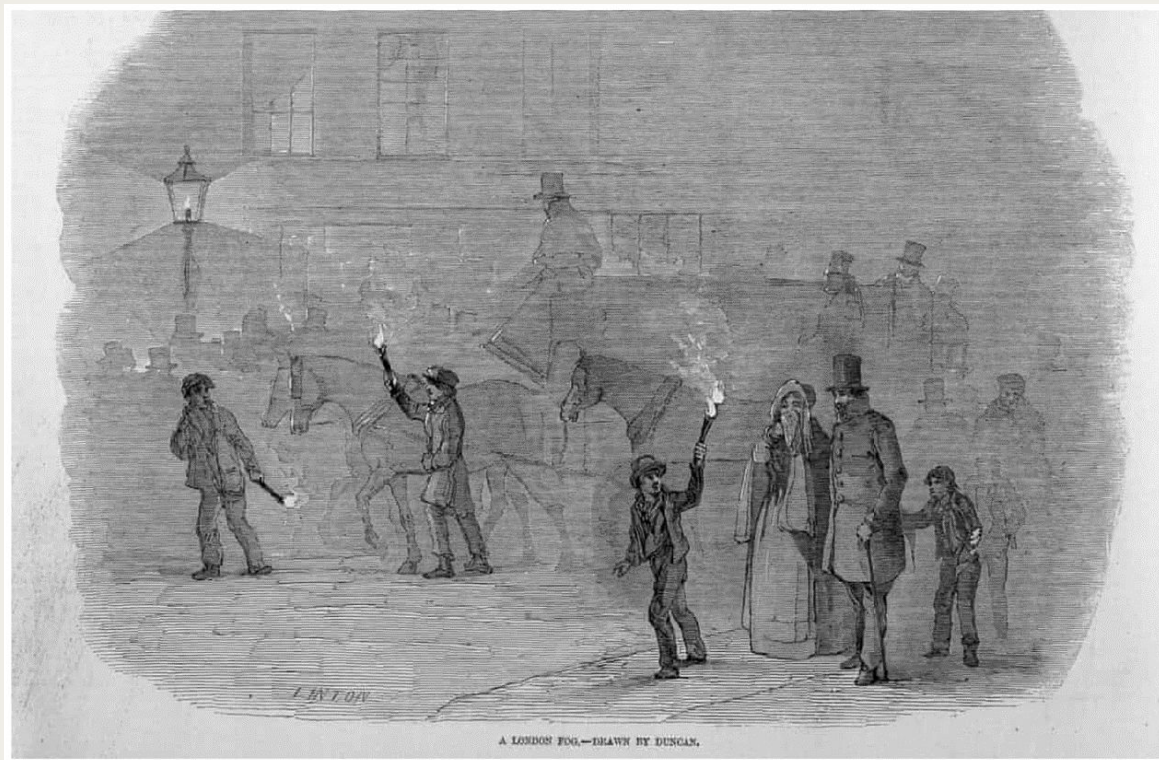
Parkinson's disease

Conclusion

Parkinson's disease was once rare...

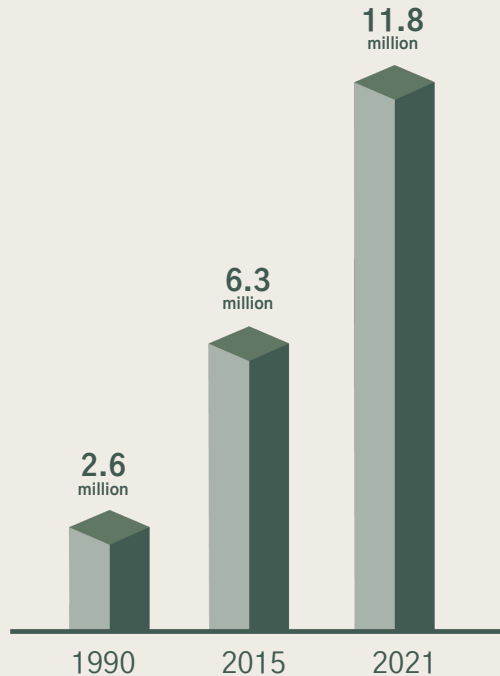


An Essay on the Shaking Palsy, 1817

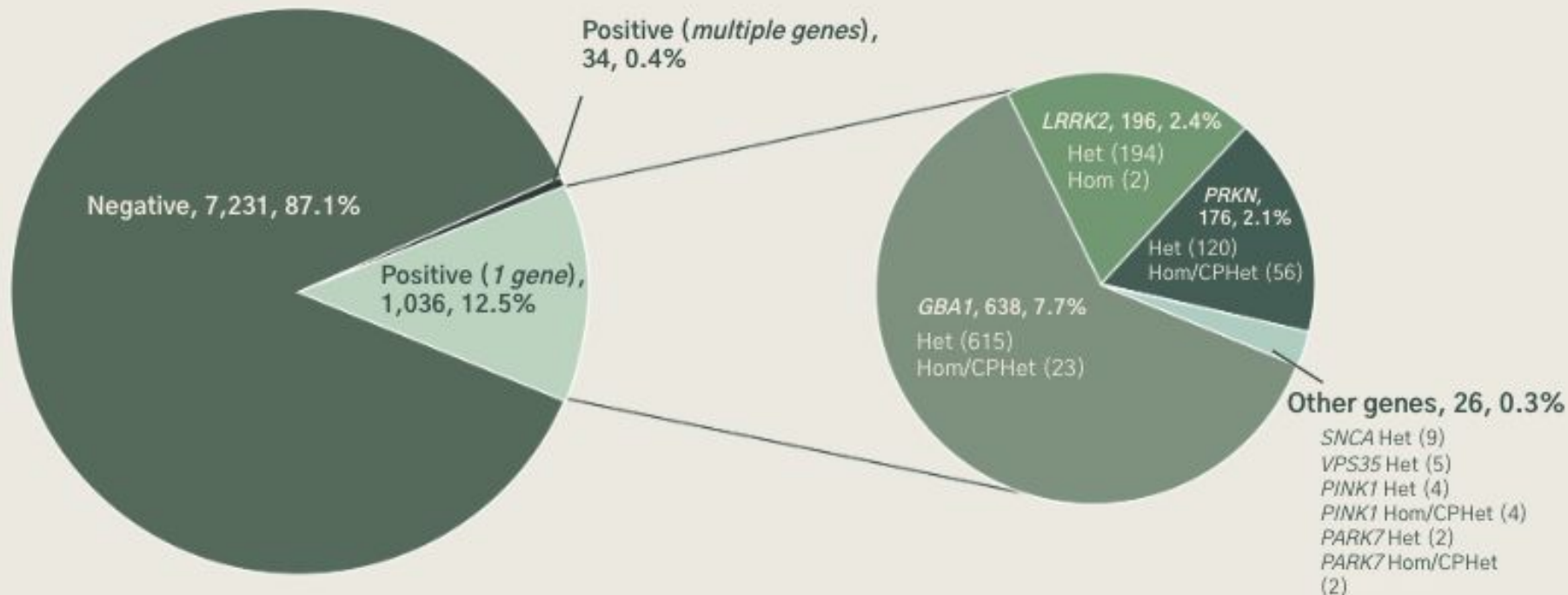


London Fog, 1847

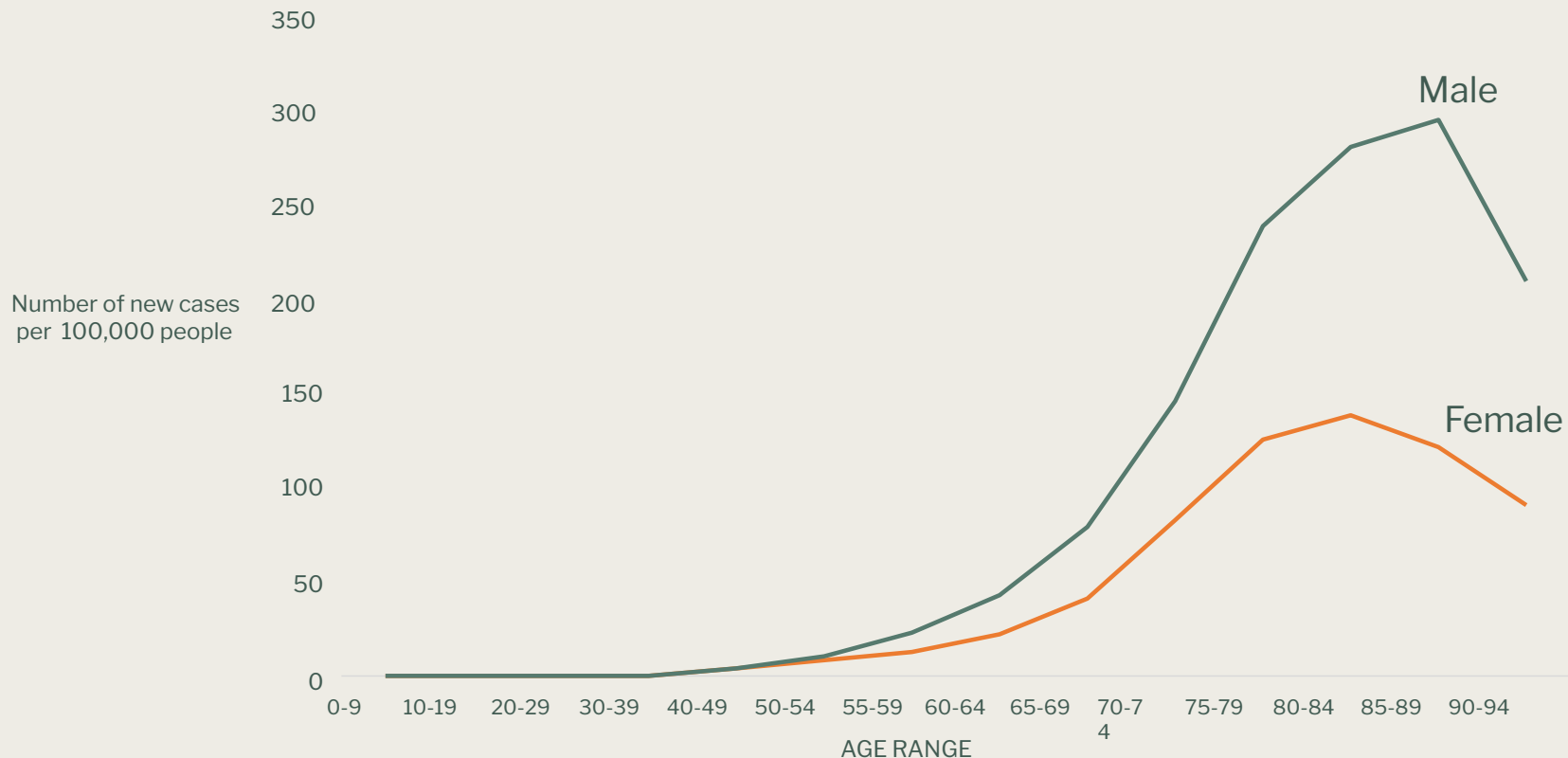
... but is now one of the fastest growing brain diseases



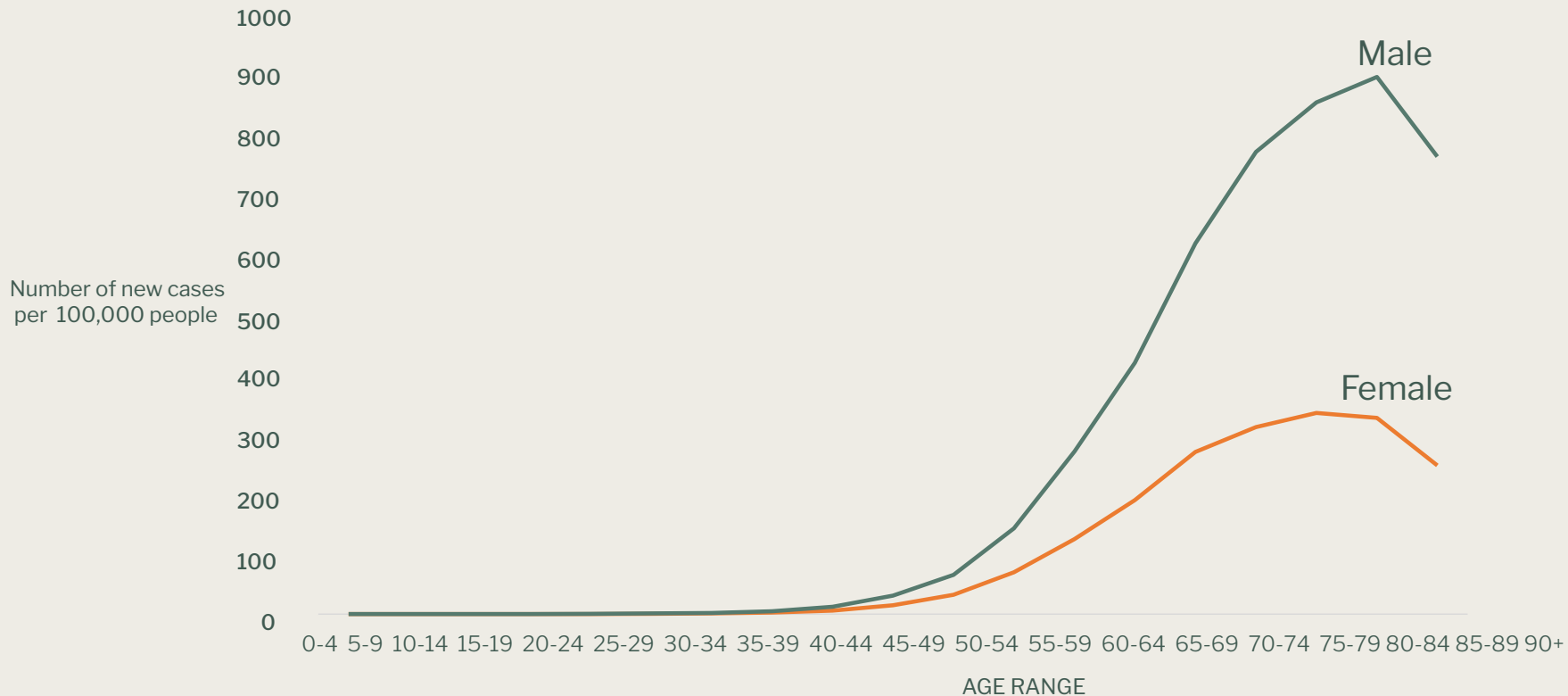
Genetic contributions to Parkinson's are limited



Longevity is a prerequisite for Parkinson's disease



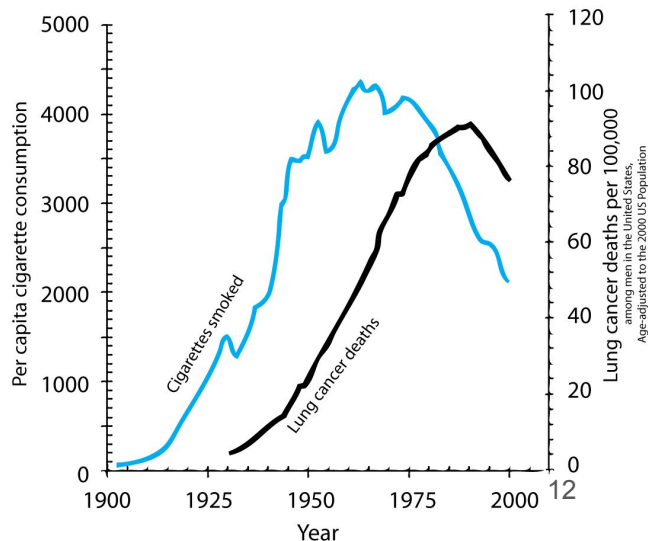
... and lung cancer



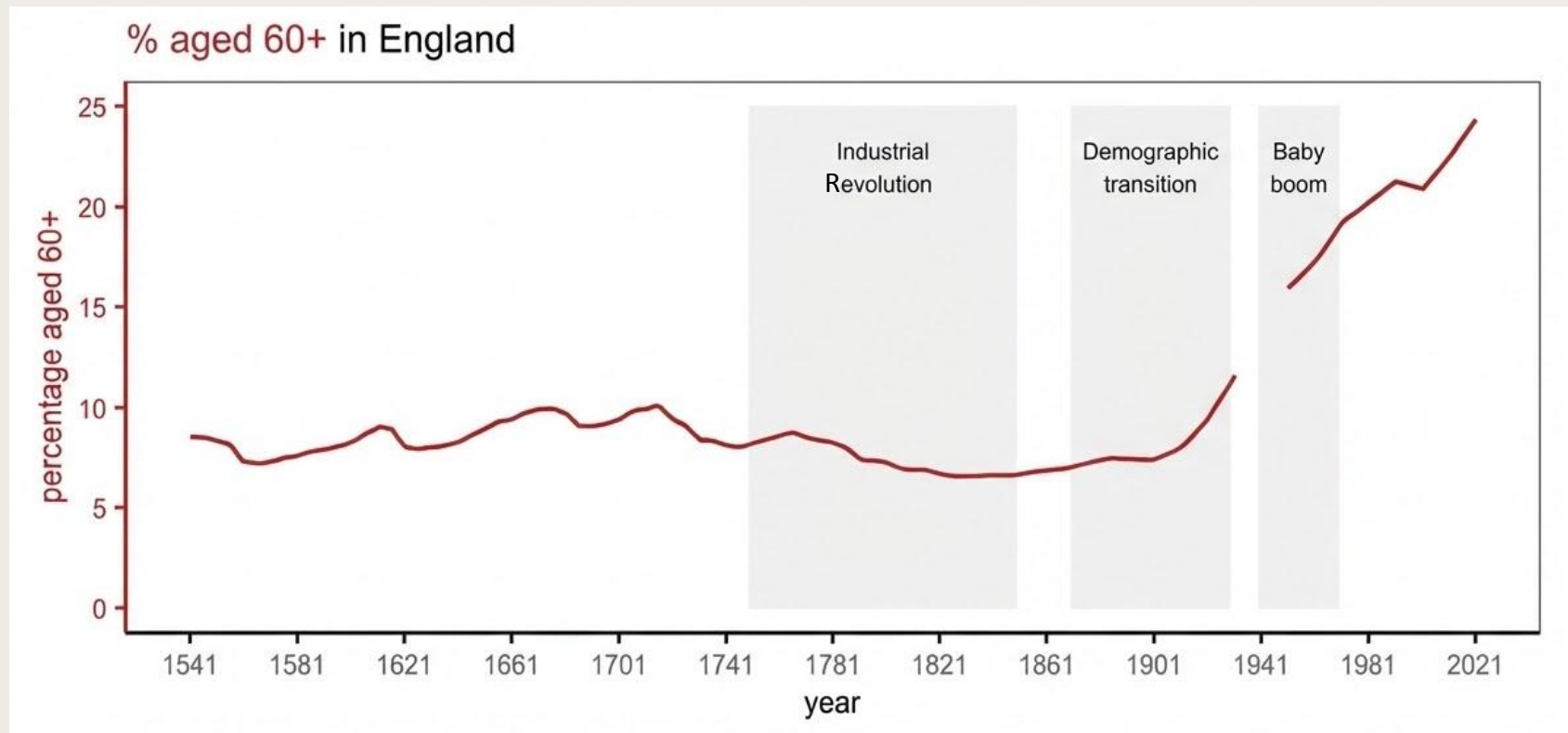
Most lung cancer is clearly man-made



Before the advent of cigarettes, “doctors took special notice when confronted with a case, thinking it a **once-in-a-lifetime oddity**”



Seniors aren't a new phenomenon



Source: Source: 1541–1871 from Wrigley et al. The Population History of England 1541–1871, CUP 1981, p.528–9; 1871–2021 from census data (Office for National Statistics). Accessed from: <https://www.campop.geog.cam.ac.uk/blog/2024/10/10/how-scarce-were-the-elderly/#:~:text=Baptisms%20and%20burials%20recorded%20in,time%20series%20of%20such%20length>. Accessed on: 2/17/2026

Three environmental toxicants may be fueling its rise

Certain pesticides



- Paraquat is associated with 150% increased risk of PD
- Prenatal chlorpyrifos exposure is associated with reduced IQ, brain abnormalities, and childhood tremors

Trichloroethylene (TCE) and perchlorethylene (PCE)



- TCE is associated with 500% increased risk of PD
- 1 in 12 UK workers may have been exposed to TCE
- PCE is still widely used in dry cleaning

Air pollution



- Sixth leading preventable cause of death
- 40% breathe in unhealthy air in the U.S.

Sources: Tanner C et al. Environmental Health Perspectives. 2011;119:866-72, Pesticide U.S. Geological Survey. Available at: https://water.usgs.gov/nawqa/pnsp/usage/maps/show_map.php?year=2018&map=PARAQUAT&hilo=H, Our World in Data available at: <https://ourworldindata.org/pesticides> ; Goldman S et al. Ann Neuroy 2012;71:776-84; JPD 2023;13(2):203-218, Kravchenko J et al. Enviro Health Research 202116(7):e0253253, Our World in Data available at: <https://ourworldindata.org/outdoor-air-pollution#outdoor-air-pollution-is-one-of-the-leading-risk-factors-for-premature-death> ; American Lung Association available at: <https://www.lung.org/research/sota/key-findings>

Toxic pesticides are still used on golf courses

Original Investigation | Neurology

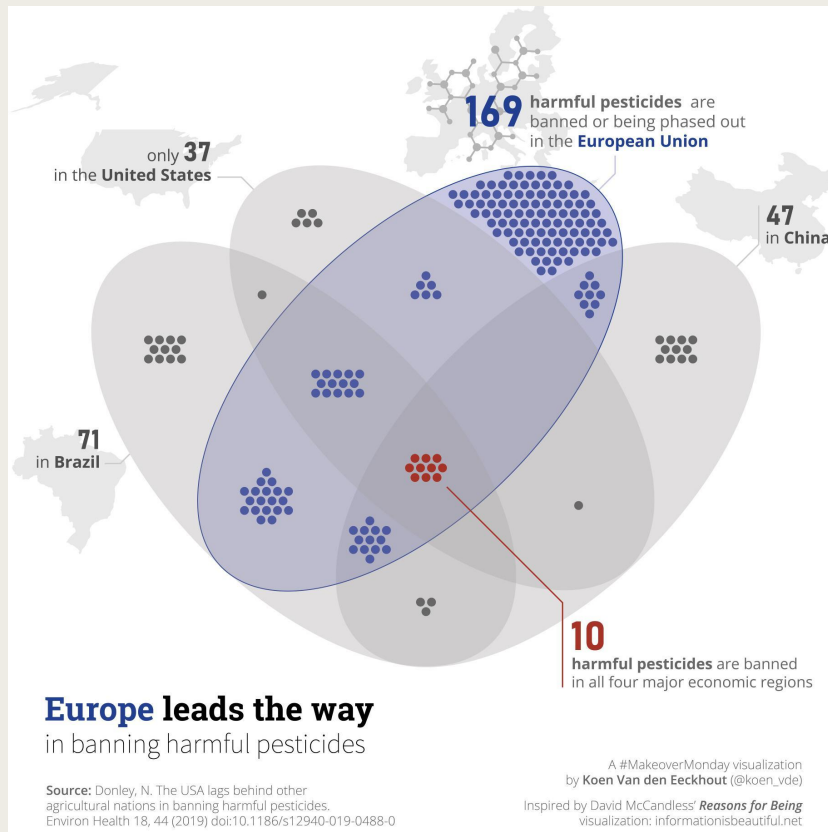
Proximity to Golf Courses and Risk of Parkinson Disease

- Living within 1 mile of a golf course associated with 126% increased odds of developing PD in the US
- Pesticide use on American golf courses is ~5x what is used on farms
- Pesticides like 2,4-D, a component of Agent Orange, are still used on golf courses in the UK today
- These pesticides damage dopamine-producing nerve cells in the lab



Source: Krzyzanowski B et al JAMA Network Open 2025(5):e259198, USGS data, pesticide use available at: https://www.usgs.gov/publications/water-quality-pesticide-occurrence-and-effects-irrigation-reclaimed-water-golf-courses%23%3Atext%3DSamples%2520from%2520wastewater%2520treatment%2520plants.and%2520fenamiphos%2520sulfoxide%252C%2520and%2520diuron&sa=D&source=editors&ust=1771346156334616&usg=AOvVaw0gaUCPBttOrDMC7Gv_OQKy and Attorney General of New York, New York State, Office of the Attorney General Environmental Protection Bureau Original Printing: July 1991 Revised: Feb. 1994, Dec. 1995 available at: <https://www.beyondpesticides.org/assets/media/documents/documents/toxic-fairways-1995.pdf>

The EU and UK have banned some of the most dangerous pesticides, including paraquat



... but still exports them to the United States

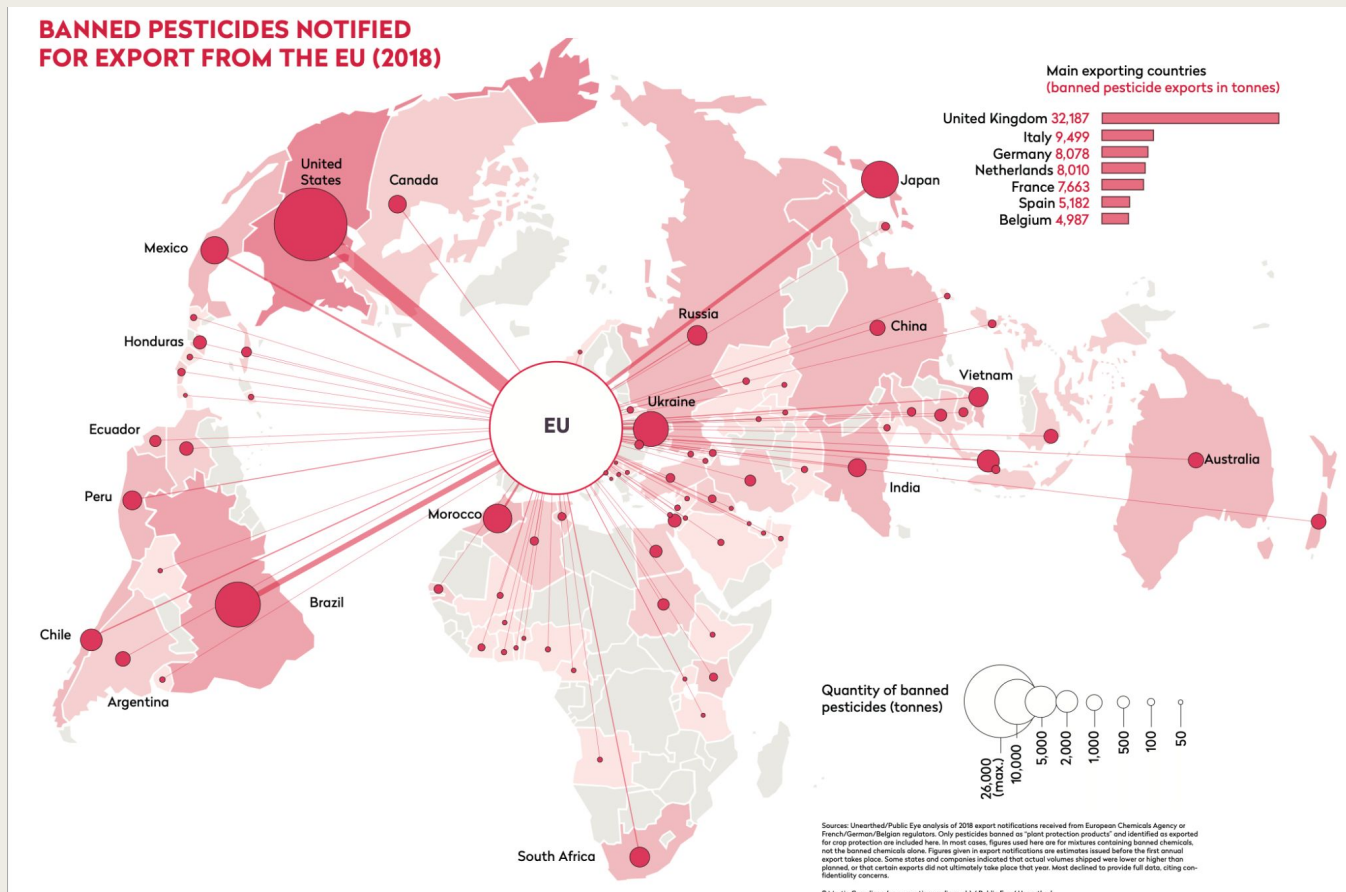


UNCERTAIN HARVEST

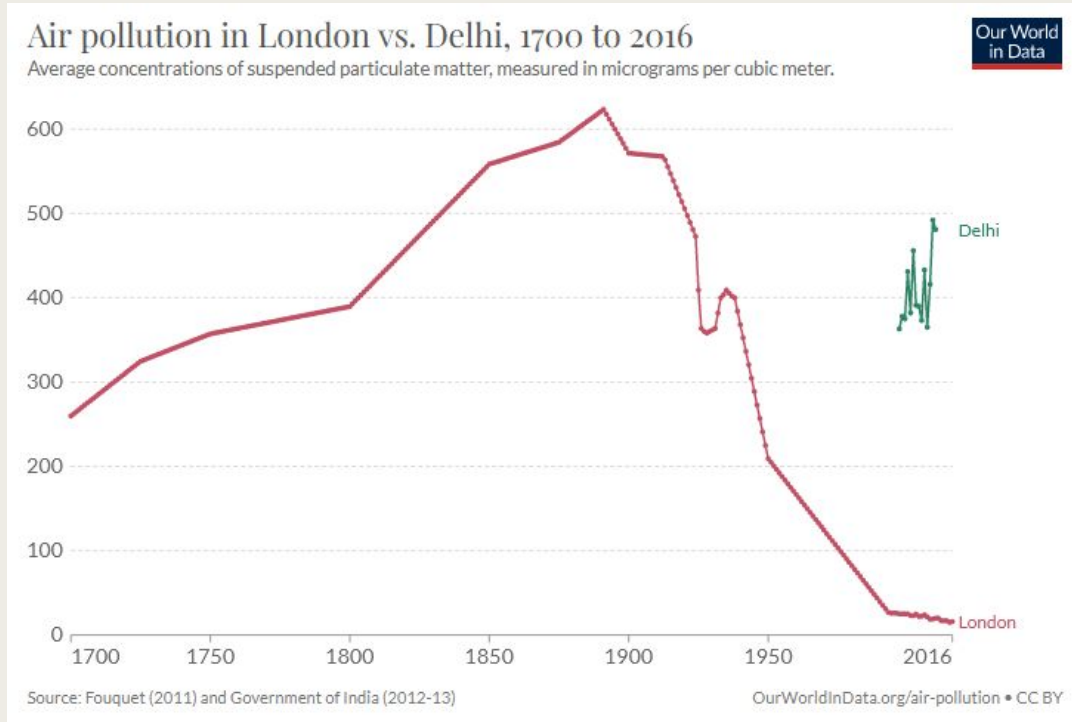
***This Pesticide Is Prohibited in Britain.
Why Is It Still Being Exported?***

Paraquat, one of many pesticides that can't be used in Europe but is sold in the United States and elsewhere, has been linked to Parkinson's disease in a growing body of research.

... and around the world



The rise of air pollution coincides with the first description of Parkinson's



Great Smog of London, 1952

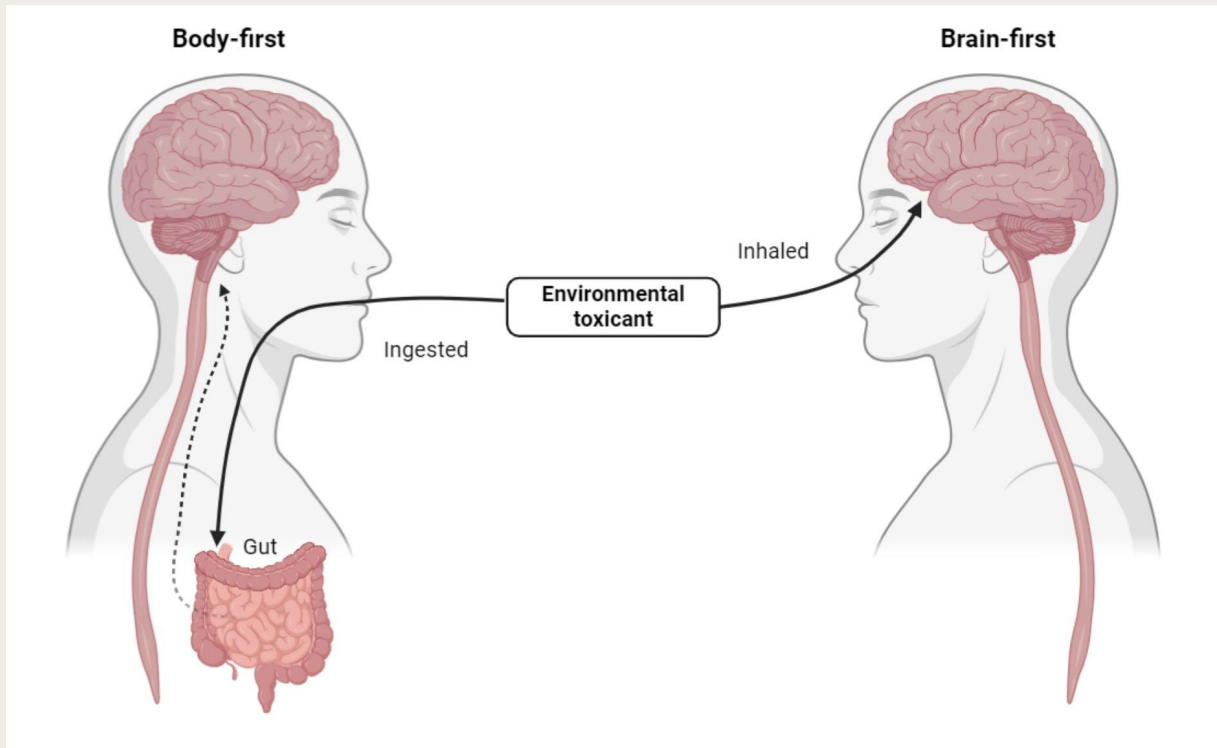


Delhi, India, 2016

Sources: <https://www.britannica.com/event/Great-Smog-of-London>;

<https://www.ndtv.com/delhi-news/delhi-haze-similar-to-1952-london-smog-data-says-some-parameters-close-1622045>

Ingested or inhaled chemicals may contribute to Parkinson's disease beginning in the gut or the nose





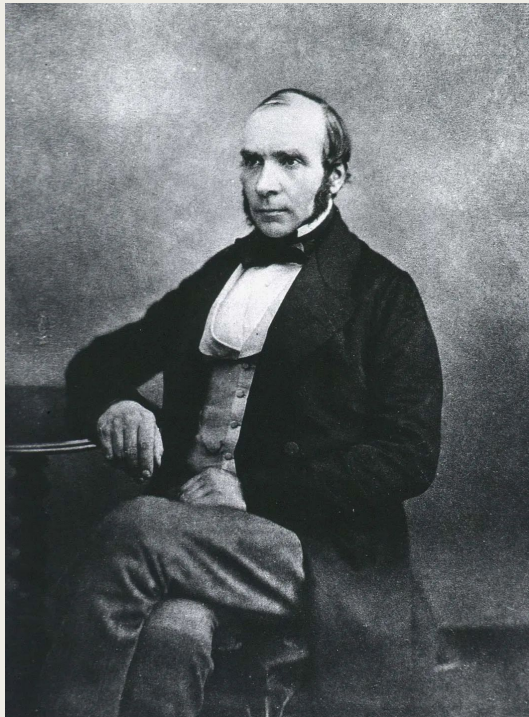
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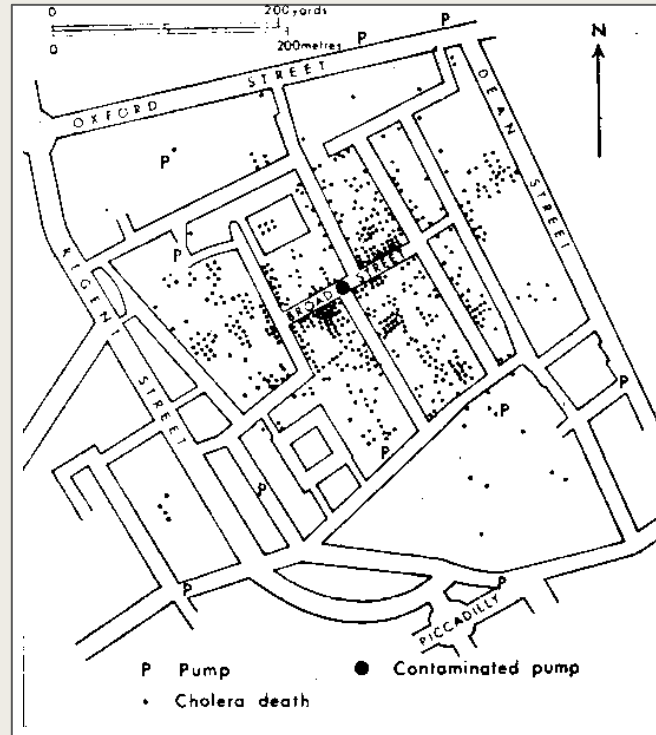
Parkinson's disease

Conclusion

When we learn why, we can prevent infectious diseases

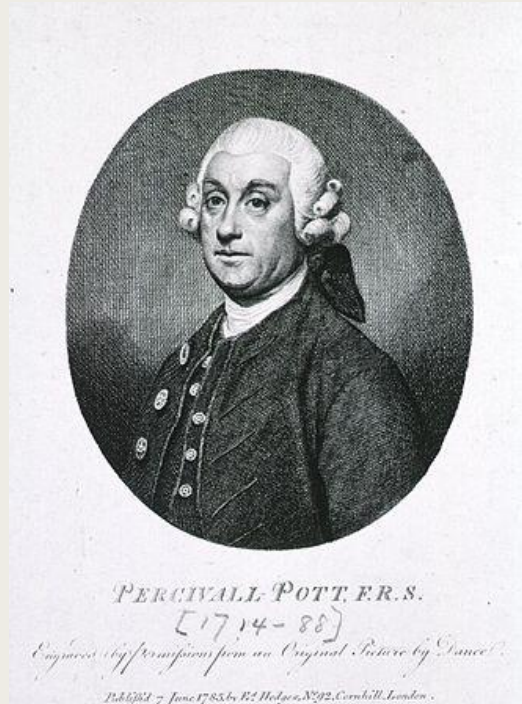


John Snow, “the father of epidemiology”



Broad Street pump map, 1854

... and cancer



Chimney sweeps, 1800s

We can now prevent brain diseases

Neurological Conditions Are Leading Cause of Disability Worldwide

1. Own the challenge
2. Find the likely causes
 - Ask about early childhood exposures, teenage jobs, current occupation, and residences
3. Measure toxicants
 - Urine: heavy metals, TCE & PCE, air pollutants like Polycyclic aromatic hydrocarbons
 - Blood: pesticides such as organochlorines, and heavy metals
 - Hair: pesticides such as chlorpyrifos, and atrazine

... and have a responsibility to do so

“Medicine is a social science and politics is nothing else but medicine on a large scale. Medicine as a social science, as the science of human beings, has the obligation to point out problems and to attempt their theoretical solution; the politician, the practical anthropologist, must find the means for their actual solution.”

– Rudolf Virchow

