




# ENVIRONMENTAL **POLLUTION**



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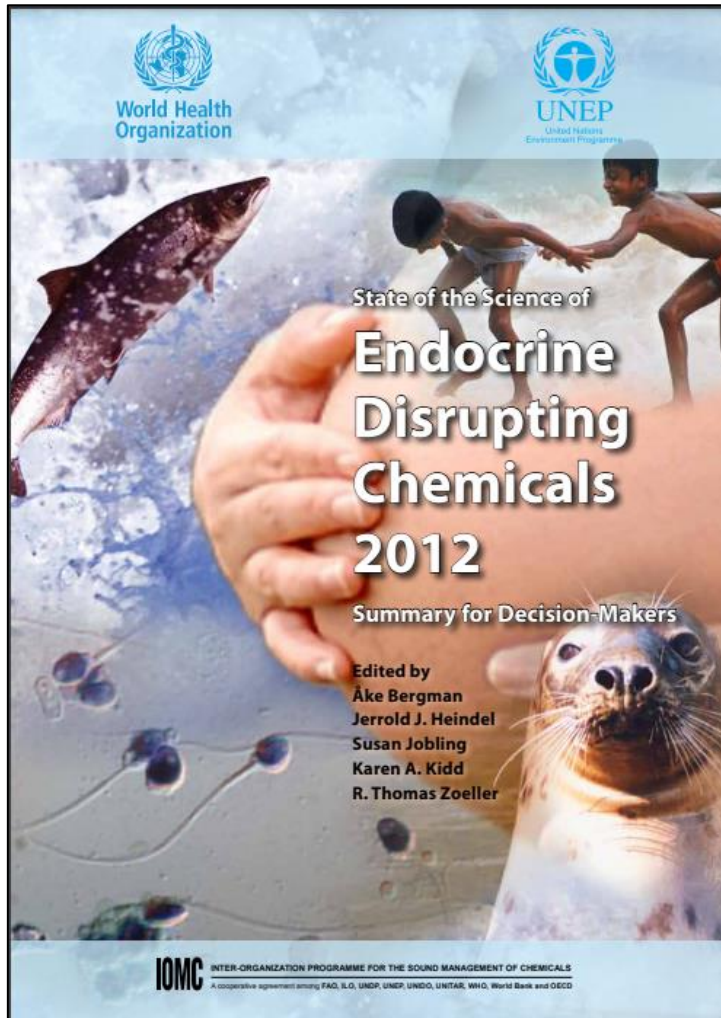


The air we breathe,  
the food we eat ...  
a toxic cocktail?

**The Centre for  
Environmental Health  
and Sustainability**

Leicester University

# THE EVIDENCE BEHIND ENVIRONMENTALLY INDUCED ILL-HEALTH

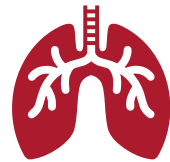


Developmental, reproductive, brain, immune, and other problems.

# THE AIR WE BREATHE, THE WATER WE DRINK, THE HOUSE WE LIVE IN...

Study estimates that disease caused by all forms of pollution was responsible for **268 million disability-adjusted life years in 2015.**

The Lancet



There appears to be **no lower limit** below which harmful effects do not occur.

Royal College of Physicians



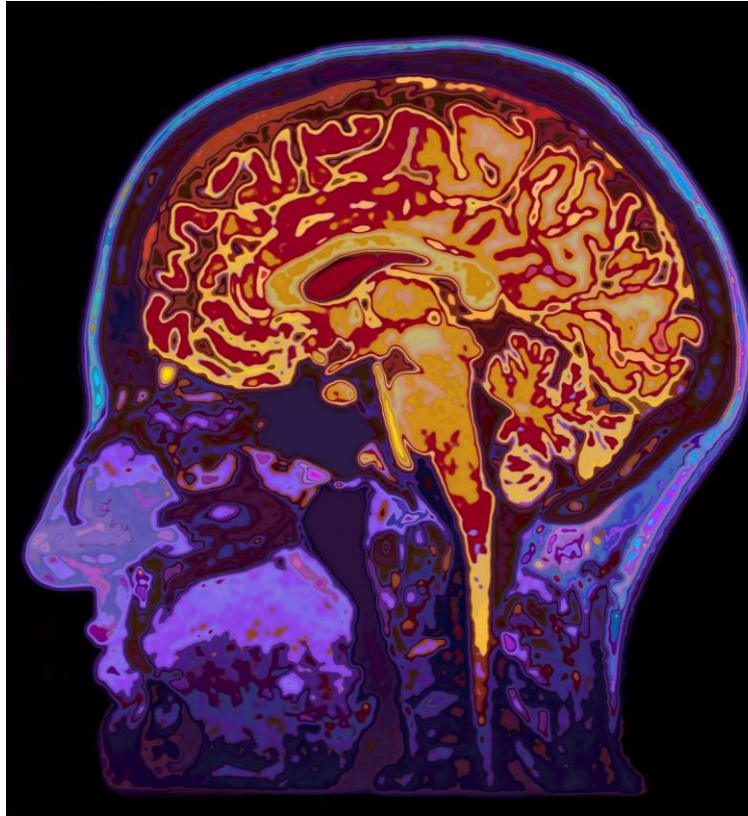
"...in 2012, **unhealthy environments** were responsible for 12.6 million deaths worldwide - 23% of total global mortality."

The World Health Organisation

# AN UNWELCOME TRIO



**Cancer**



**Brain disease**



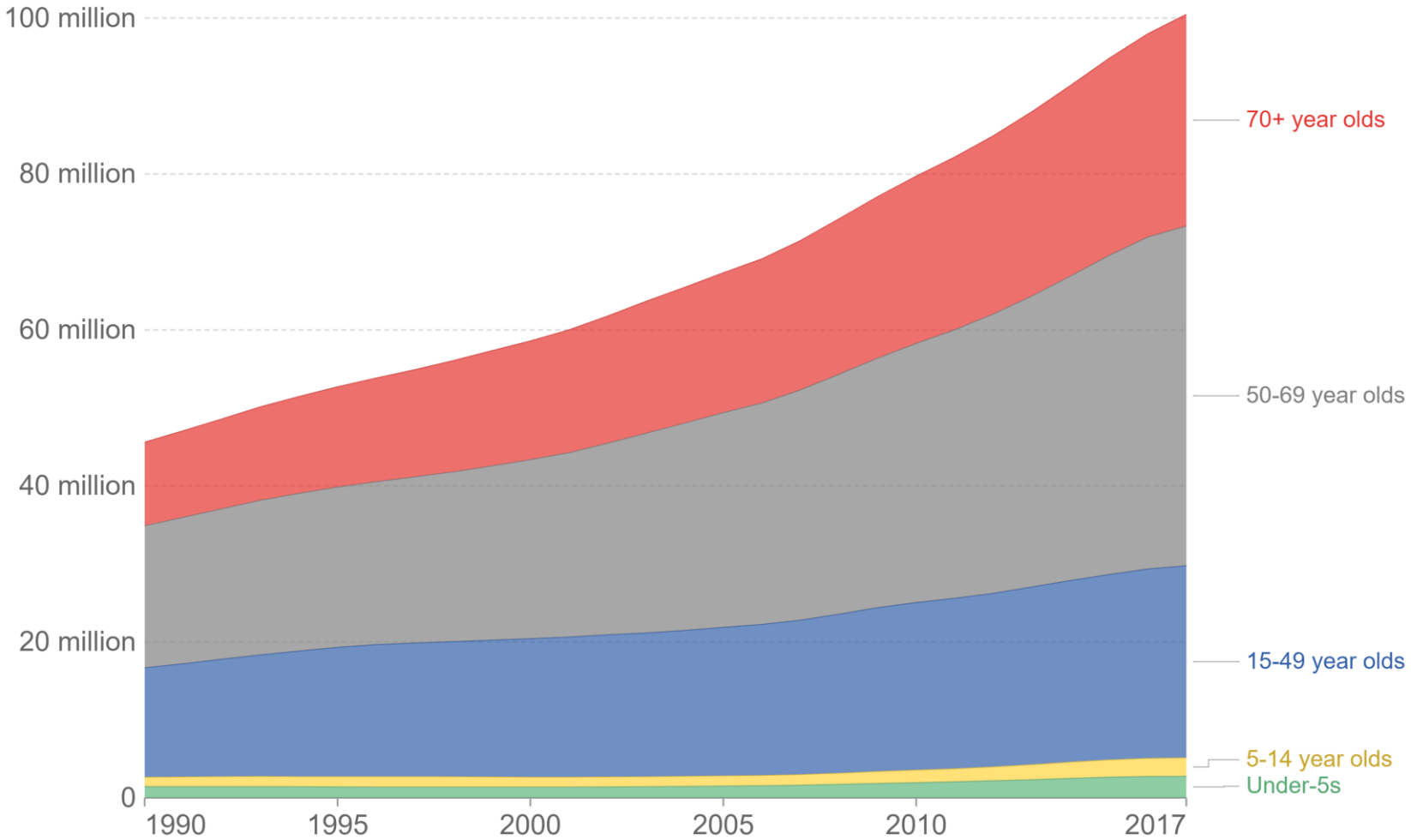
**Fertility**

## BUT THAT'S NOT ALL...



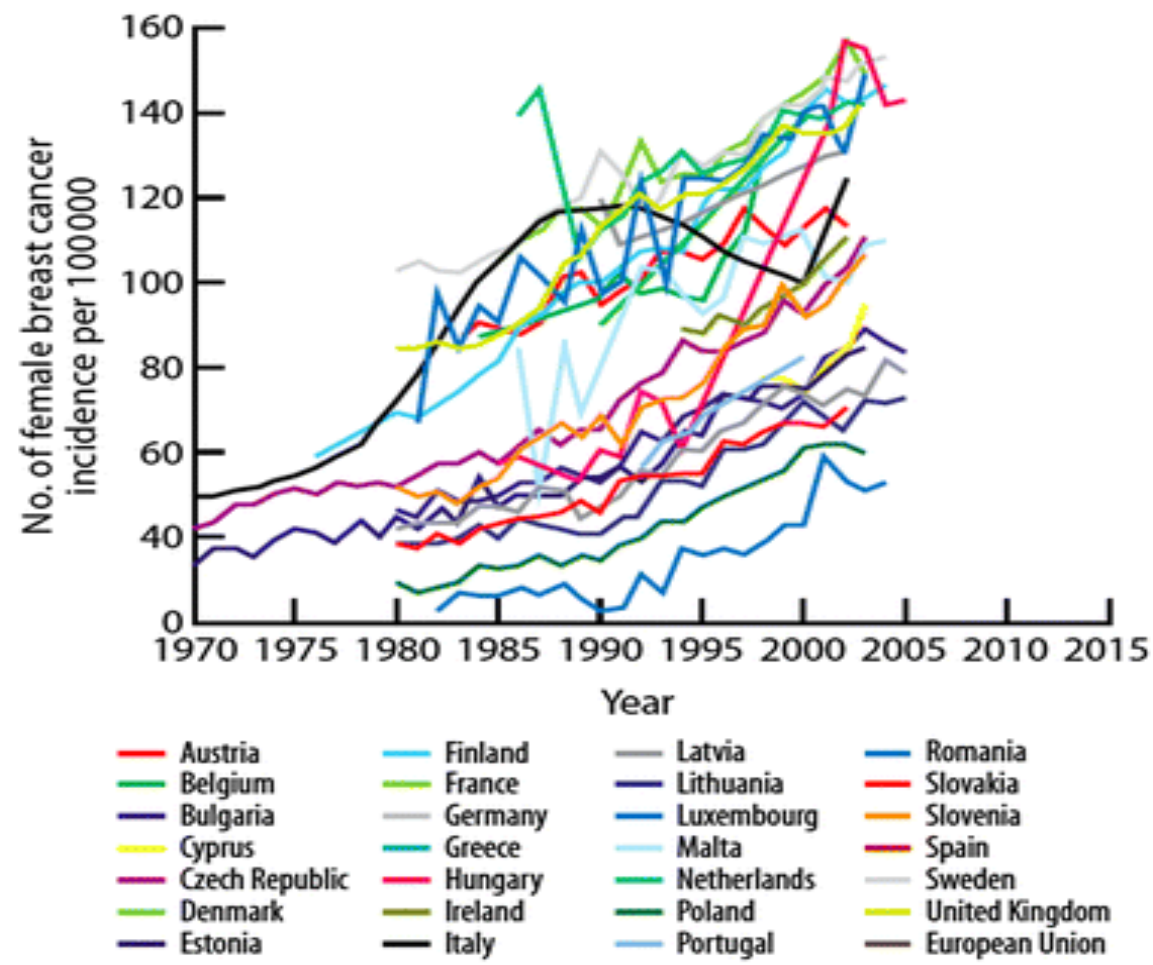
# Prevalence of cancer by age, World, 1990 to 2017

Our World  
in Data



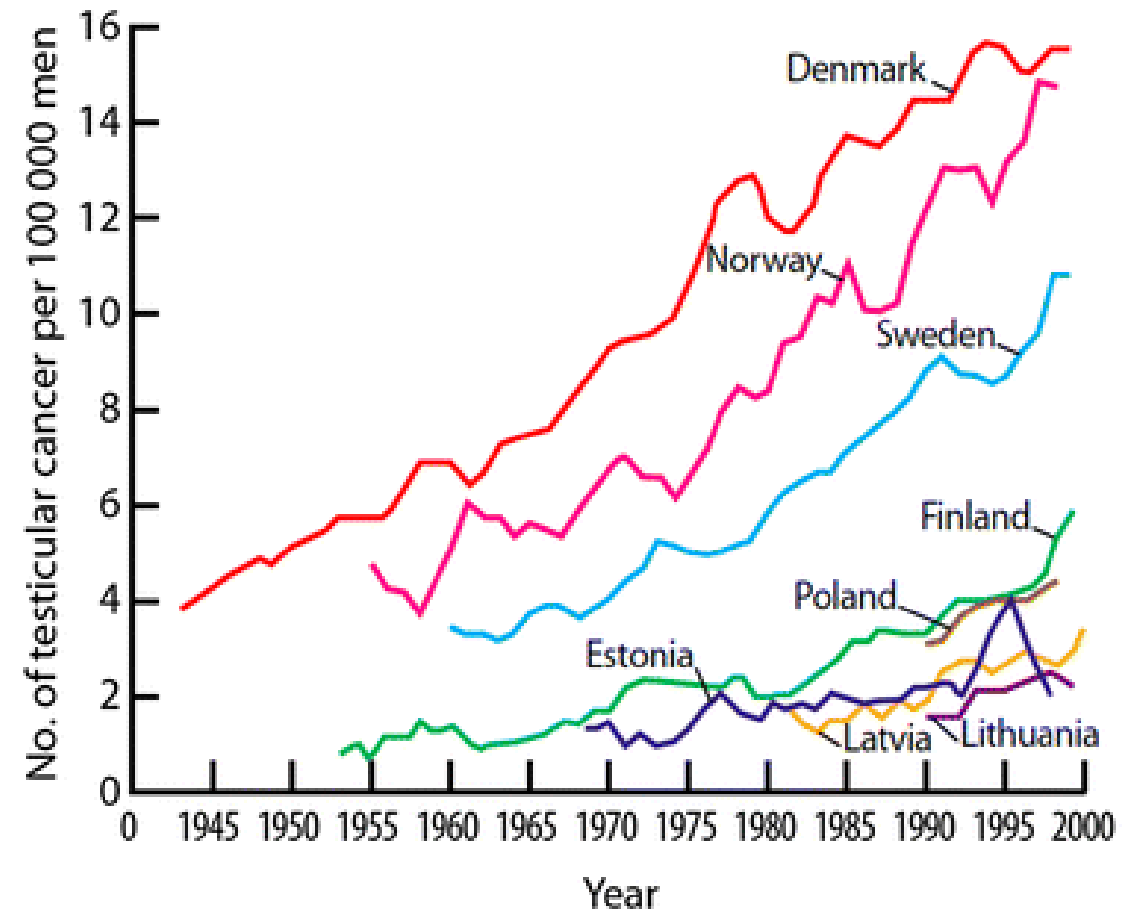
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# BREAST CANCER



Source: Female breast cancer incidence across Europe (data from <http://data.euro.who.int/hfad/>).

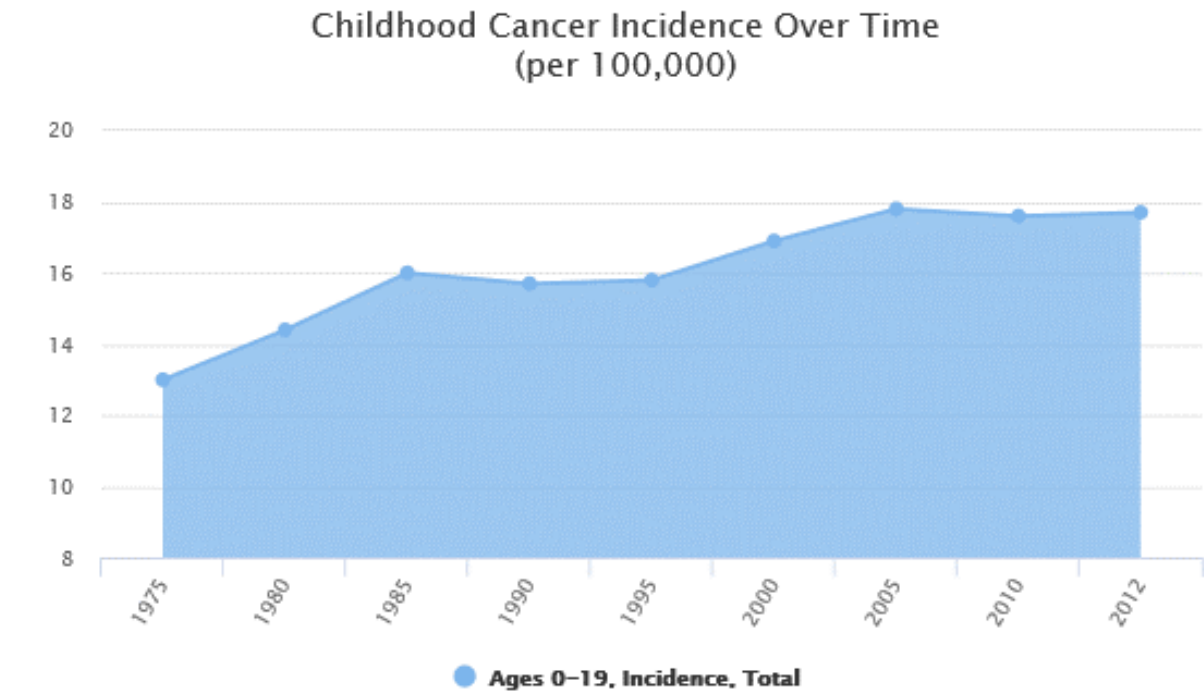
# TESTICULAR CANCER



Source: Testicular cancer rates across northern Europe (from Richiardi et al, 2004; used with permission of the author).

# INCIDENCE RATES OVER TIME

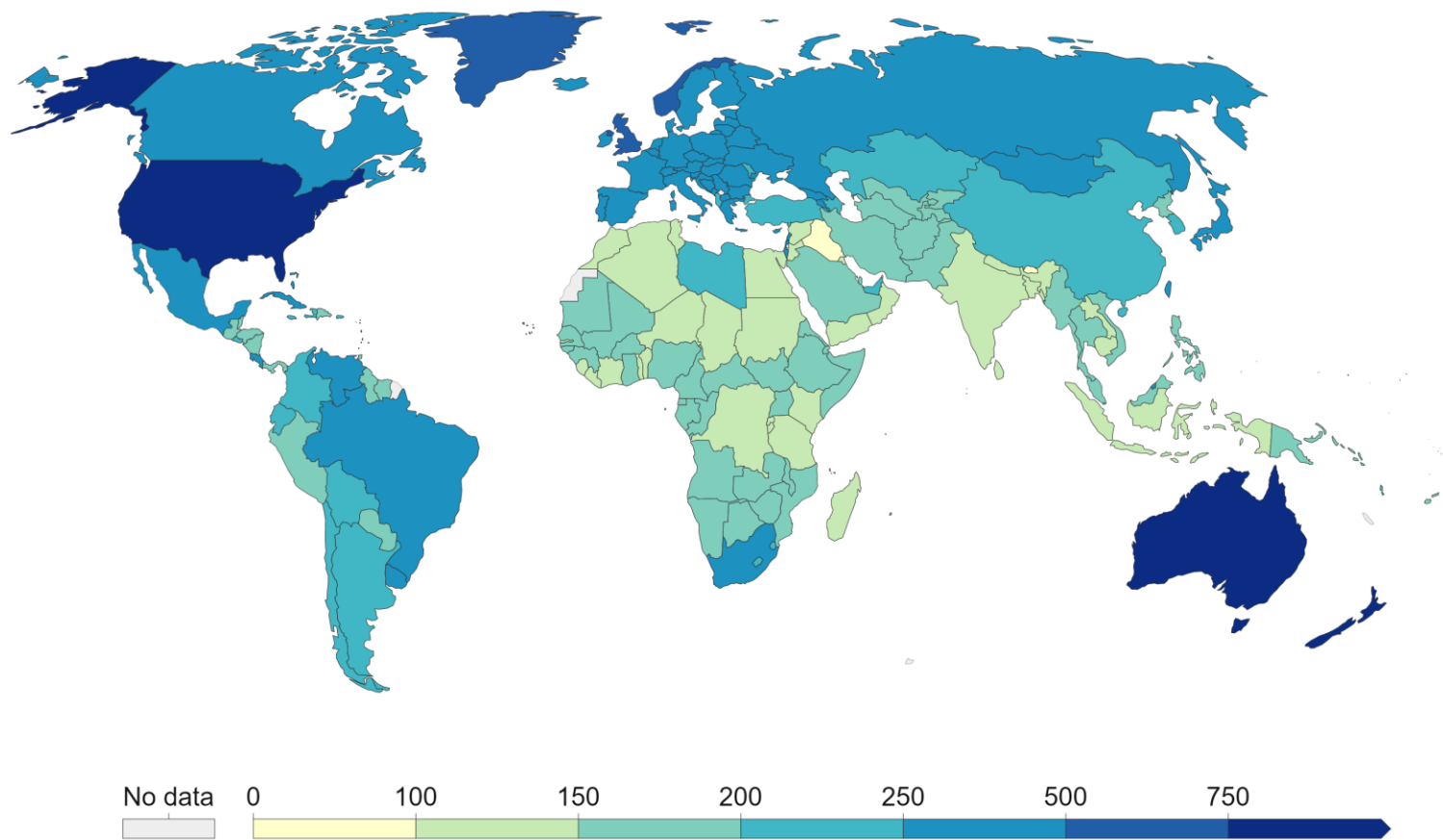
Even as the cure rate continues to improve, the incidence of childhood cancer has been steadily increasing over the last few decades, from about 13 children per 100,000 in 1975 to over 17 children per 100,000 since 2005.



Source: Surveillance, Epidemiology, and End Results (SEER) Program ([seer.cancer.gov](http://seer.cancer.gov)) SEER 9 areas, 1975-2012, Age 0-19.

# CANCER INCIDENCE, 2017

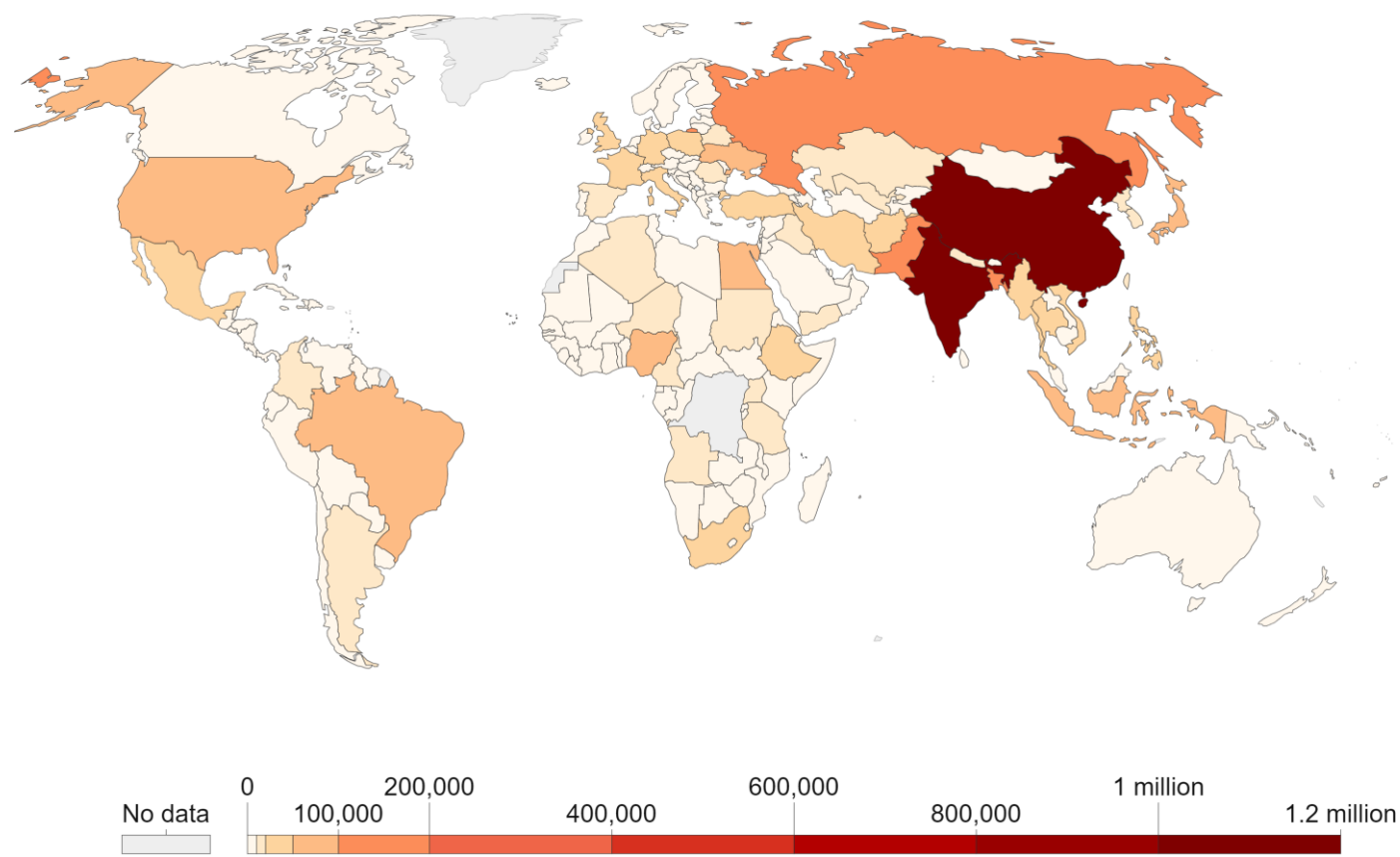
New cases of any type of cancer (i.e incidence) measured as the number of new cases per 100,000 people. This has been age-standardised, assuming a constant age structure of the population for comparisons between countries and over time.



Source: Institute for Health Metrics and Evaluation (IHME)

# DEATHS FROM AMBIENT PARTICULATE AIR POLLUTION

Absolute number of deaths from ambient particulate air pollution, 2015.  
Absolute number of deaths per year attributed to ambient (outdoor) particulate matter (PM2.5) air pollution.

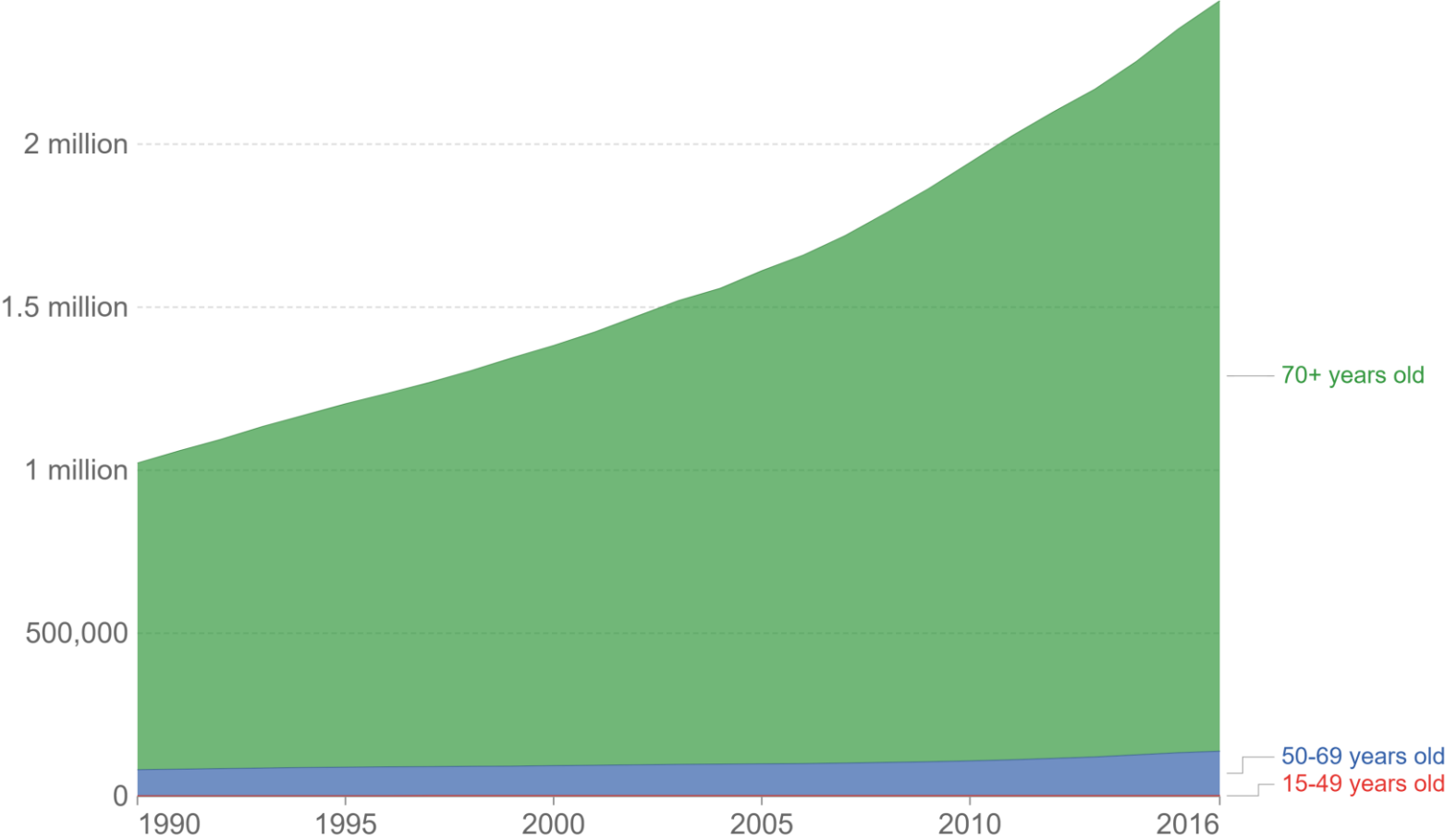


Source: State of Global Air

OurWorldInData.org/air-pollution/ • CC BY

# DEATHS FROM DEMENTIA-RELATED DISEASES

Deaths from dementia-related diseases, by age, World, 1990 to 2016.  
Annual number of deaths from Alzheimer’s and other dementia diseases.



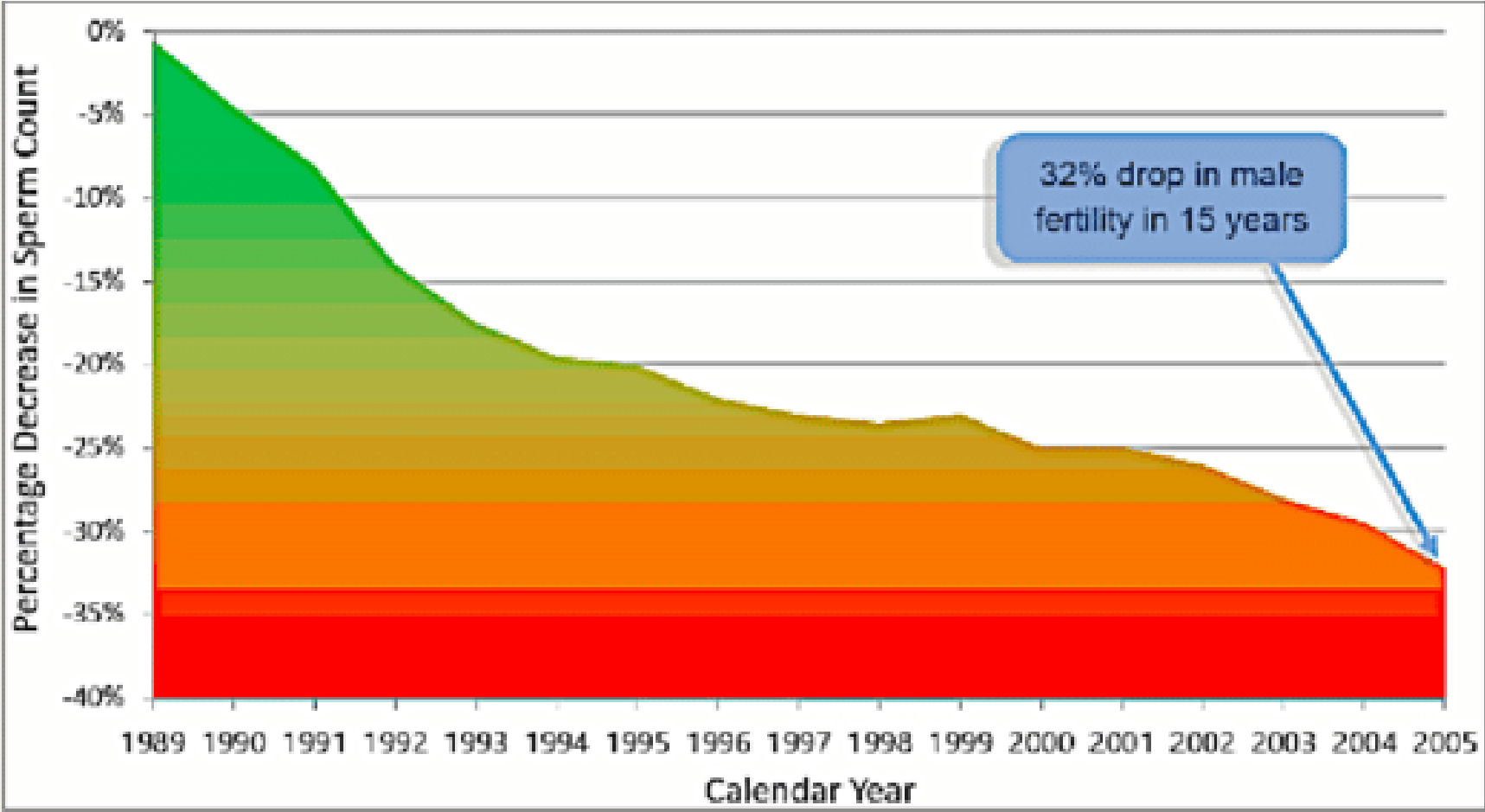
Source: IHME, Global Burden of Disease (GBD)

# FERTILITY | A Frankenstein future?

- Bisphenol A
- Phthalates
- Pesticides
- Dioxins/Furans
- Polychlorobiphenyls(PCBs)
- Brominated flame retardants (PBDE)
- Perfluorinated compounds
- Heavy metals
- **Have all been found in almost 100% of pregnant women - Royal Society of Medicine**

# SPERM COUNT AND INFERTILITY

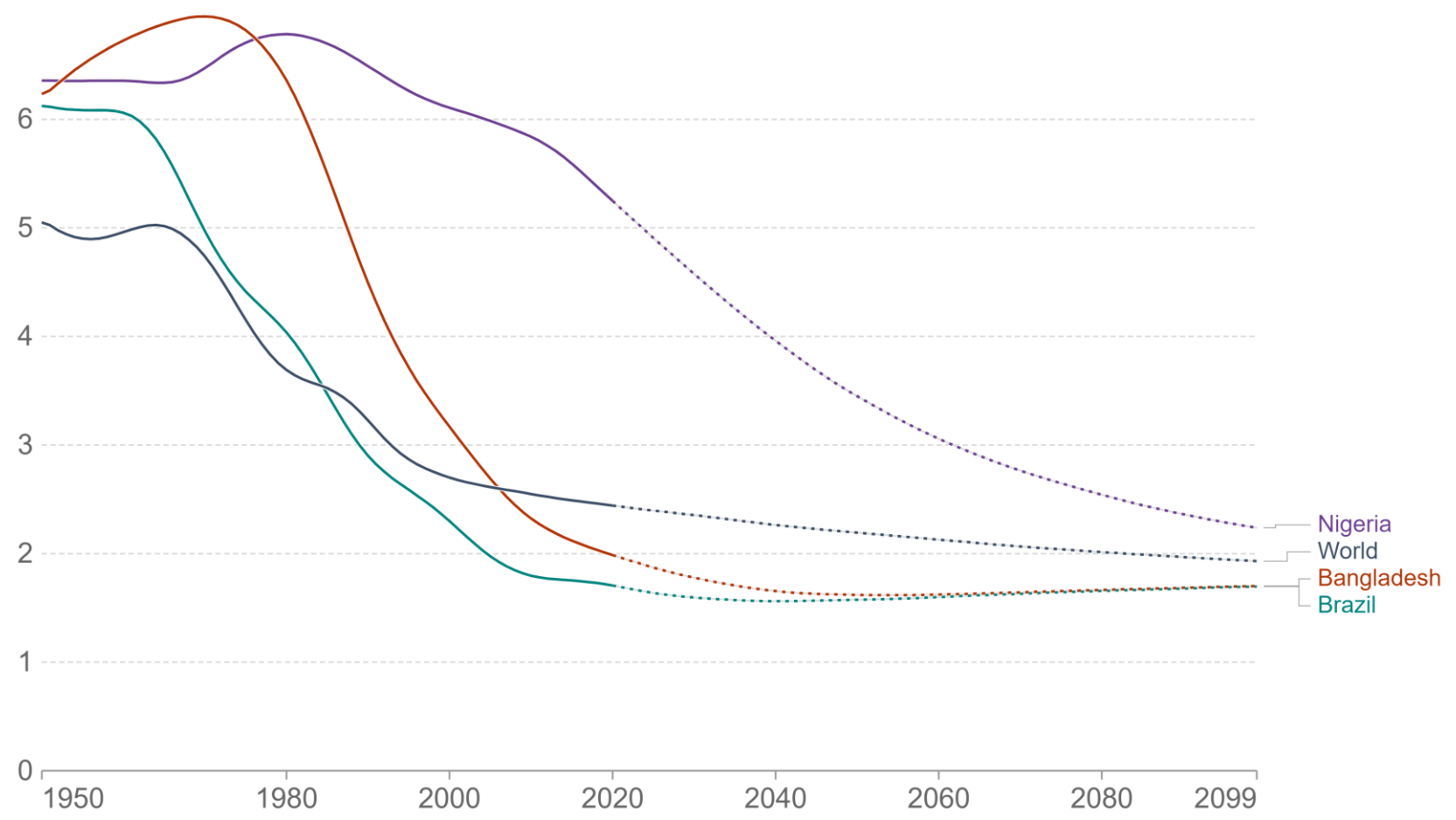
Percentage decrease in 35 year old male sperm counts 1989 – 2005.



Source: Rolland, Le Moal, Wagner, Royère, and De Mouzon (2013)

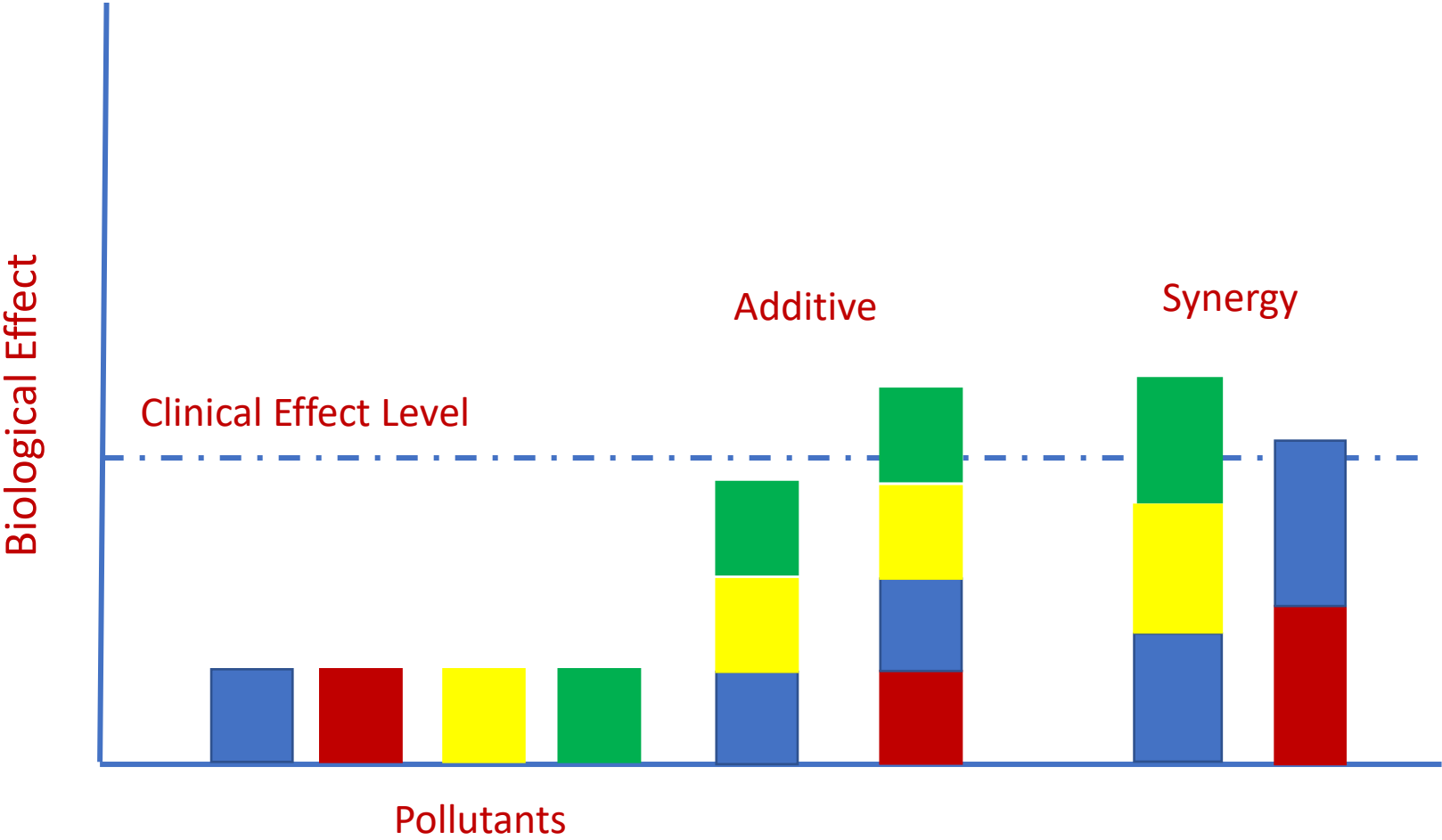
# TOTAL FERTILITY RATE 1950-2099

Average number of live births per woman, if the woman were to experience the exact current age-specific fertility rates, and to survive till the end of her reproductive life.



Source: UN Population Division (2019 Revision)

# ENVIRONMENTAL MEDICINE CUMULATIVE LOAD



## CONCLUSION SO FAR

- Incidence of major disease is increasing – cancer, cardiovascular, inflammation, obesity, fertility.
- Increasing evidence that environmental pollutants affect human health.
- It is suspected that your susceptibility to environmentally induced illness is personal to you.
- The effects of individual pollutants are increased when in combination.

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