

Collaborative on Health and the Environment

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What Chronic Disease Epidemiologists Do: observational studies

- Establish (population) samples of people
- Sort into exposure groups
- Compute extent of current or future disease or other conditions by level of exposure
- Sort out what factors are “confounded” with exposure

Metabolic Syndrome

- A constellation of related metabolic abnormalities (body fatness, blood fat handling, insulin, glucose)
- Almost all type 2 diabetics have it
- Many with MetSyn eventually get diabetes
- Lots of them eventually get cardiovascular disease
- Causes: Poor diet quality, eating too much, sedentariness, being fat, unlucky genetics, ongoing low grade inflammation and oxidative stress

Diabetes and Persistent Organic Pollutants

- National Health and Nutrition Examination Surveys (NHANES, 1999-2002)
- 2016 adults, 217 had diabetes
- 6 POPs detected by CDC in at least 80% of the sample (>5ml of blood per person)
- Each related to increasing diabetes occurrence
- Summing the 6, only 2 diabetics were found in the bottom quarter
- Compared to the bottom quarter of scores, those in the 2nd and 3rd quarters had 15 times the risk and those in the top quarter had 38 times the risk of diabetes

Metabolic Syndrome in nondiabetics in NHANES

- 721 aged at least 20, 19 pollutants detectable in at least 60% of people
- Organochlorine pesticides: 5 times the risk of having MetSyn in the top quarter as in the lowest quarter
- Other pollutants showed lesser risk

Mode of Delivery

- These pollutants do not metabolize easily or quickly
- Even though they were mostly banned in the 1970s, they are still in food
- Other similar compounds are in refrigerators, computers, flame retardants, waste dump sites

Possible Mechanism of Action

- These chemicals disrupt endocrine function
- They have sometimes powerful effects at very low doses, dampen response at somewhat higher doses, and can be lethal at sufficiently high dose