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 2\textsuperscript{nd} and 3\textsuperscript{rd} 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