



AMERICA'S TRANSITION TO A CLEAN TRANSPORTATION SYSTEM

David Ederer, PhD

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MOTOR VEHICLES, like the dragons of old, have a foul and fiery breath. From their tailpipes and crankcases these modern monsters spew forth a steady stream of pollutants, visible and invisible, odorous and odorless, into the atmosphere. These emissions are unquestionably obnoxious; whether and to what degree they are also noxious is under intensive study by the Public Health Service.

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Motor Vehicles, Air Pollution, and Public Health

RICHARD A. PRINDLE, M.D., M.P.H., and CHARLES D. YAFFE, M.S.

The following material is adapted from a statement before the Joint State Government Commission of the General Assembly of the Commonwealth of Pennsylvania, June 8, 1962. The statement was based on a three-part report, "Motor Vehicles, Air Pollution, and Health" (H. Doc. 489), submitted to the U.S. Congress in June 1962. Because of the particular interest of the commission, proportionately more emphasis was given to standards and controls in the statement. Copies of the report are available from the Congress and from the Division of Air Pollution, Public Health Service, Washington 25, D.C.

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Before 1955 the Service and other Federal agencies had conducted limited research activities on some aspects of air pollution. With the passage of Public Law 84-159 in 1955, further Federal activity was authorized, and research was centralized in the Public Health Service. Emissions from motor vehicles were investigated as a part of the total air pollution problem, and it was recognized early that these were important contributors, especially in certain areas of the United States. With the passage,

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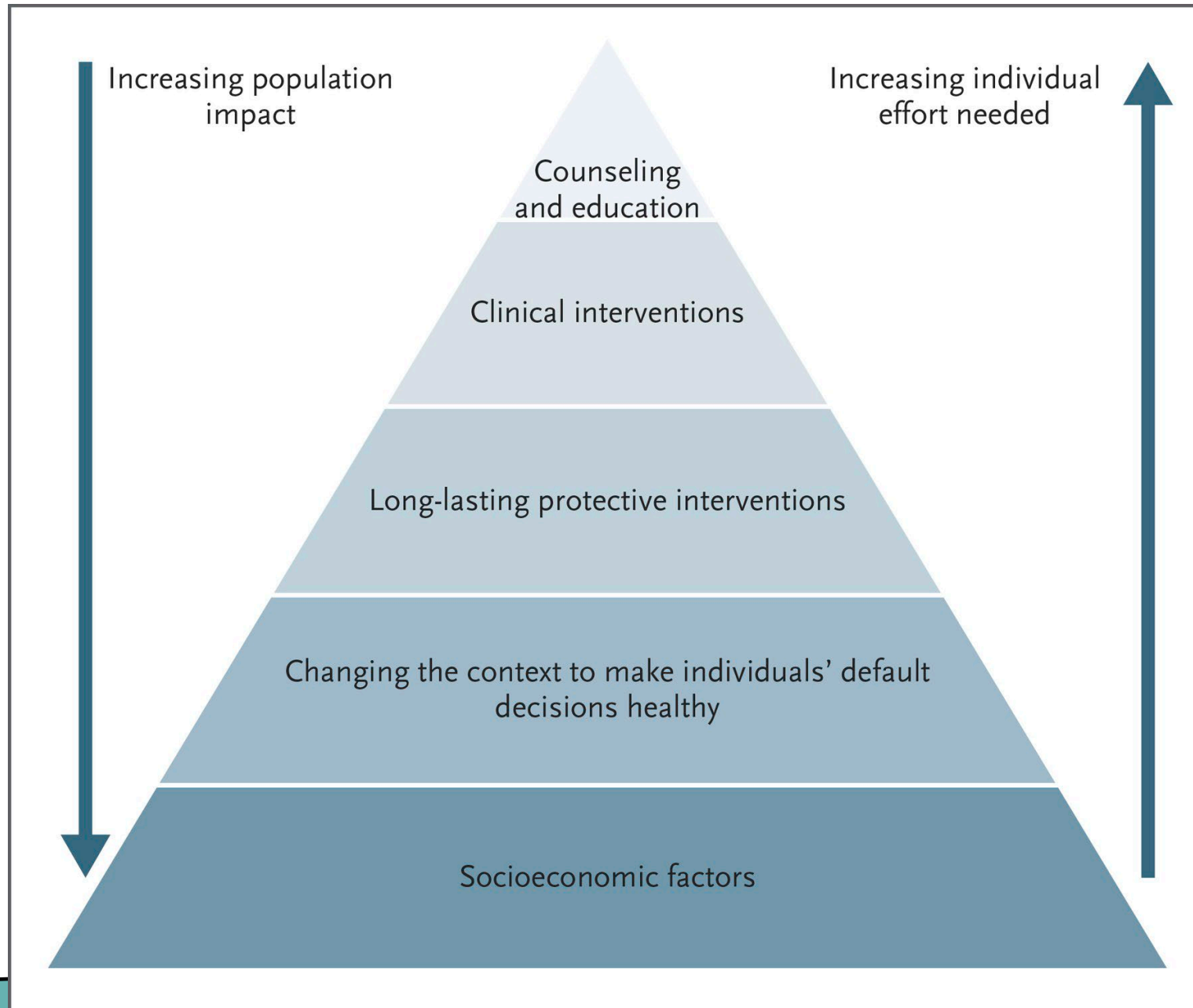
in 1960, of Public Law 86-493 (commonly called the Schenck Act, after its sponsor, Congressman Paul F. Schenck of Ohio), added impetus was given to the study of motor vehicle emissions. This act authorized and directed the Surgeon General of the Public Health Service to make a study and report to Congress, by June 1962, from the standpoint of the public health, on the discharge of substances into the atmosphere from the exhaust of motor vehicles.

Production of Emissions

The nature and volume of exhaust emissions discharged by a motor vehicle at any time depend on how it is being driven. In evaluating emissions, four basic driving maneuvers must be considered: (a) cruising, uniform speed; (b) acceleration, increasing speed; (c) deceleration, decreasing speed; and (d) idling, standing still with motor running.

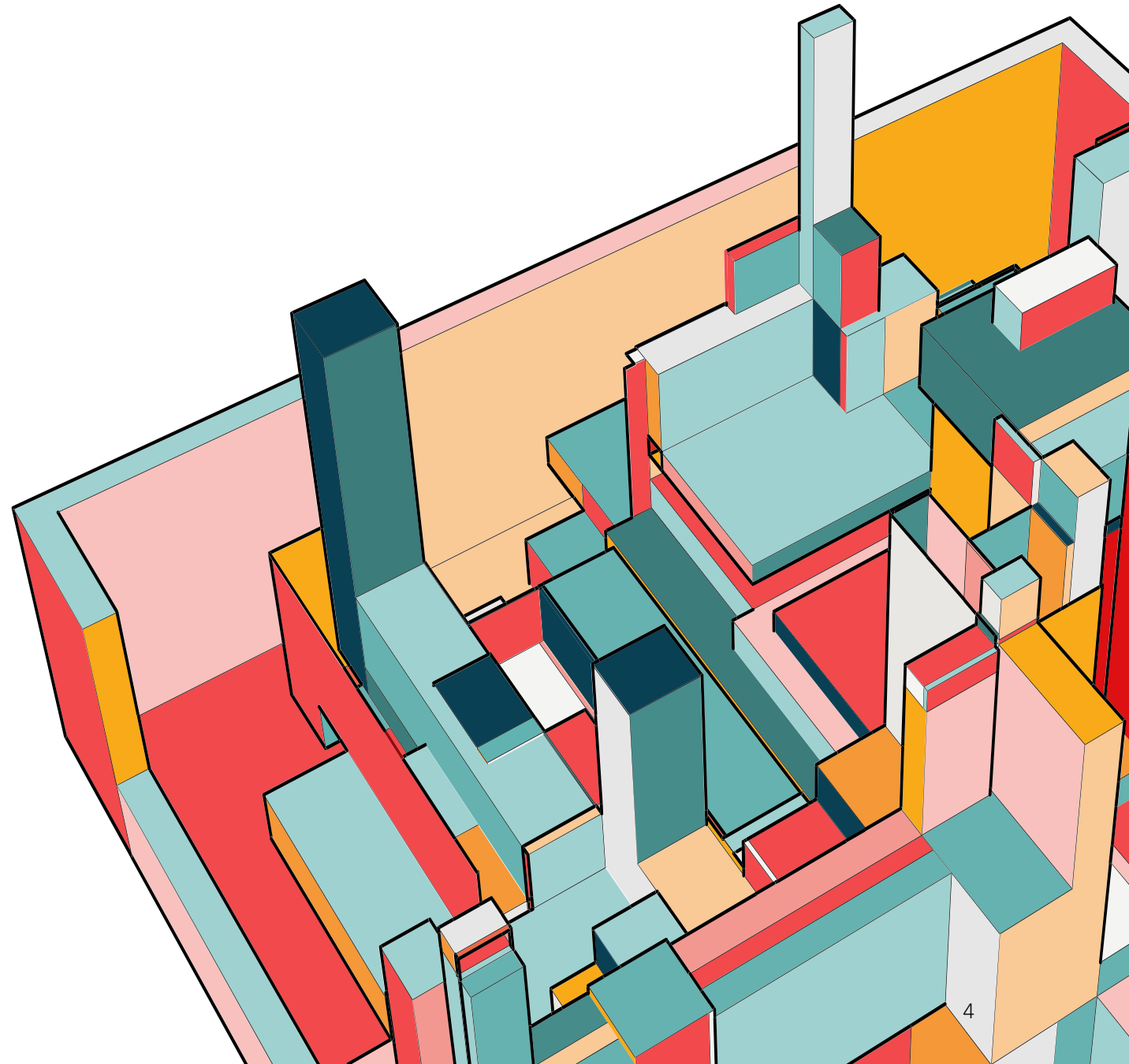
The typical U.S. automobile has a four-stroke Otto cycle gasoline engine with four, six, or eight cylinders. Pistons move up and down in these cylinders and transmit their motion by connecting rods to the crankshaft and thence through the transmission to the wheels. A gasoline-air mixture is drawn by a vacuum from the carburetor into each cylinder, where it is compressed and then ignited by an electric spark from the spark plug. The burning gases expand and produce pressures which force the pistons down, driving the crankshaft.

The conflicting requirements for easy starting, fuel economy, power, and the various performance characteristics which the public demands necessitate compromises in the design and the adjustment of the engine. The nature



PUBLIC HEALTH SURVEILLANCE

“Ongoing, systematic collection, analysis, interpretation, and dissemination of data regarding a health-related event for use in public health action to reduce morbidity and mortality and to improve health”



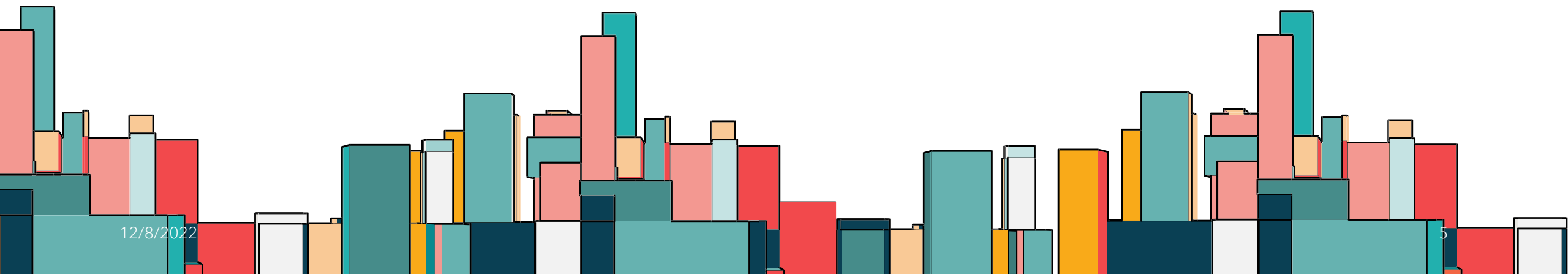
PUBLIC HEALTH DATA SOURCES

Incidence and prevalence

Risk factors

Modelled outcomes

Indices and aggregations

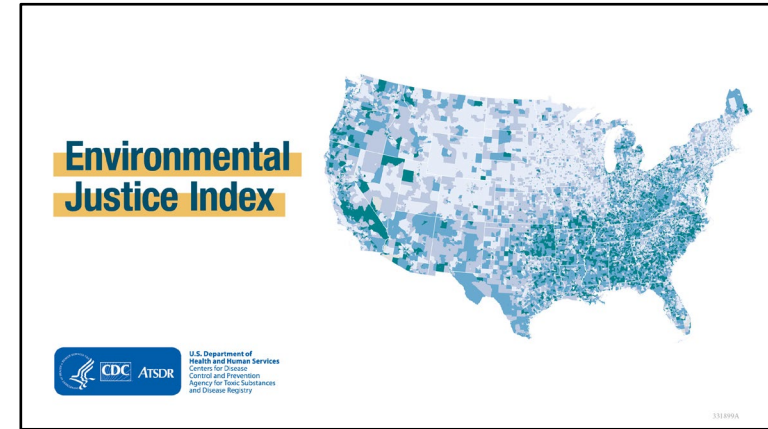




Modelled small area estimates
Primarily chronic disease
outcomes



Aggregated data from federal
agencies, states, local
governments



Census-tract metric to assess
environmental justice

PLACES

The 29 measures include:

- 4 health risk behaviors
- 13 health outcomes
- 3 health status measures
- 9 prevention practices

PLACES: Local Data for Better Health

Home Data Portal

[CDC](#) > [Division of Population Health](#) > [PLACES](#)

Compare Counties

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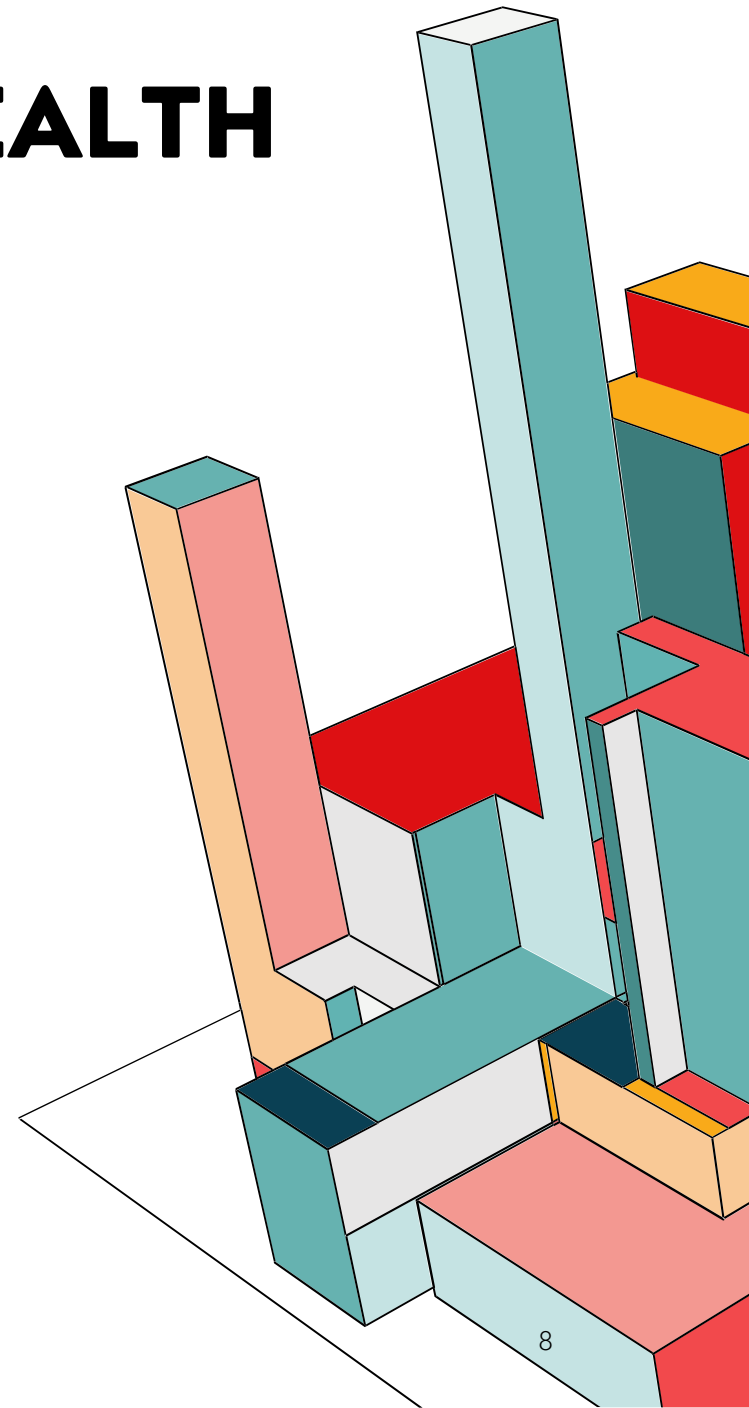
Category [Expand All](#) [Collapse All](#)

[Health Outcomes](#)

Measure	Data Type	United States 2019 Population Estimate: 328,239,523	Cobb, GA 2019 Population Estimate: 760,141 edit remove	DeKalb, GA 2019 Population Estimate: 759,297 edit remove	Fulton, GA 2019 Population Estimate: 1,063,937 edit remove
Arthritis among adults aged >=18 years - 2019 view definition	Crude prevalence % (95% CI)	25.1 (24.8 - 25.3)	20.3 (19.5 - 21.2)	21.7 (20.9 - 22.7)	20.2 (19.5 - 21.0)
	Age-adjusted prevalence % (95% CI)	22.3 (22.1 - 22.6)	20.1 (19.3 - 20.9)	21.6 (20.7 - 22.5)	20.9 (20.1 - 21.7)
Current asthma among adults aged >=18 years - 2019 view definition	Crude prevalence % (95% CI)	8.9 (8.8 - 9.1)	8.5 (8.2 - 8.9)	9.1 (8.7 - 9.6)	8.5 (8.2 - 9.0)
	Age-adjusted prevalence % (95% CI)	8.9 (8.7 - 9.1)	8.4 (8.1 - 8.8)	9.1 (8.6 - 9.5)	8.5 (8.1 - 8.9)

NATIONAL ENVIRONMENTAL HEALTH TRACKING NETWORK

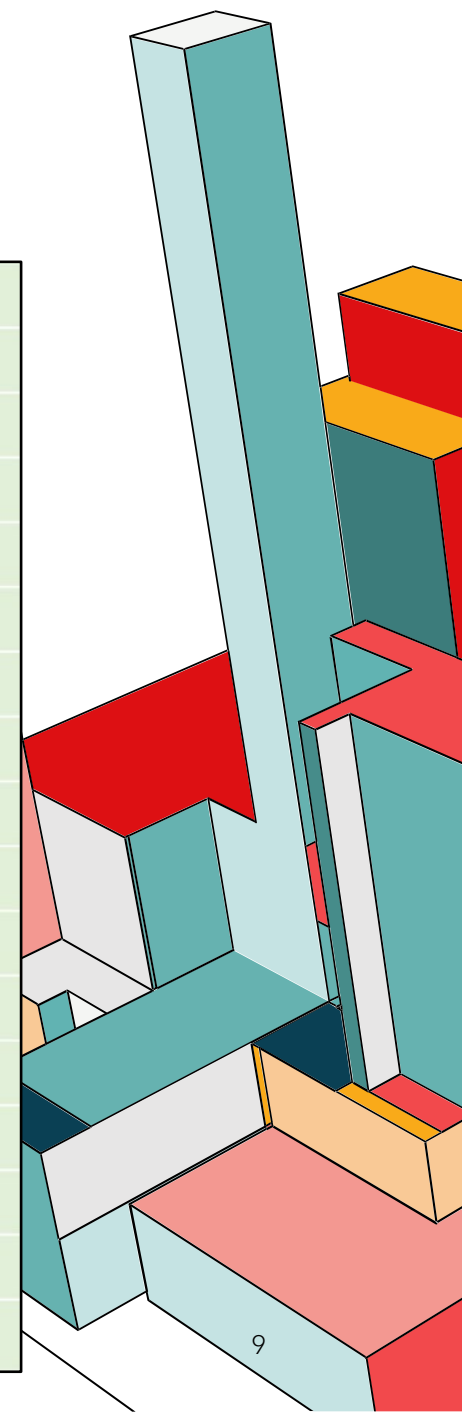
- 29 different topics
 - Asthma
 - Children's Environmental Health
 - Climate change
 - Community Characteristics
 - Outdoor air quality



ENVIRONMENTAL JUSTICE INDEX

- Social vulnerability
- Environmental burden
- Health vulnerability

Air Pollution	Ozone
	PM2.5
	Diesel Particulate Matter
	Air Toxics Cancer Risk
Potentially Hazardous & Toxic Sites	National Priority List Sites
	Toxic Release Inventory Sites
	Treatment, Storage, and Disposal Sites
	Risk Management Plan Sites
	Coal Mines
	Lead Mines
Built Environment	Recreational Parks
	Houses Built Pre-1980
	Walkability
Transportation Infrastructure	High-Volume Roads
	Railways
	Airports
Water Pollution	Impaired Surface Water



THANK YOU

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The preceding presentation represented the opinions of the author, and not necessarily their employers

Overall Environmental Justice Rank	Social Vulnerability	Racial/ Ethnic Minority Status	Minority Status
		Socioeconomic Status	Poverty
			No High School Diploma
			Unemployment
			Housing Tenure
			Housing Burdened Lower-Income Households
			Lack of Health Insurance
			Lack of Broadband Access
		Household Characteristics	Age 65 and Older
			Age 17 and Younger
	Civilian with a Disability		
	Housing Type	Speaks English "Less than Well"	
		Group Quarters	
	Environmental Burden	Air Pollution	Mobile Homes
			Ozone
			PM2.5
			Diesel Particulate Matter
		Potentially Hazardous & Toxic Sites	Air Toxics Cancer Risk
			National Priority List Sites
			Toxic Release Inventory Sites
Treatment, Storage, and Disposal Sites			
Risk Management Plan Sites			
Coal Mines			
Built Environment		Lead Mines	
		Recreational Parks	
		Houses Built Pre-1980	
Transportation Infrastructure	Walkability		
	High-Volume Roads		
	Railways		
Health Vulnerability	Pre-existing Chronic Disease Burden	Airports	
		Water Pollution	
		Impaired Surface Water	
		Asthma*	
		Cancer*	
		High Blood Pressure*	
		Diabetes*	
		Poor Mental Health*	