

A Role for Indicators in the Environmental Public Health Tracking Network

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Preview

- Why do people use indicators?
- How these reasons relate to the goals of the EPHTN
- Considerations in selecting data and developing indicators
- Ways we might move forward

Why do people use indicators?

- To turn data into something understandable and relevant to audiences
- To provide an interpretation of what numbers mean
- To provide information in simple form that is consistent with science (complex → simple)
- To look at trends in conditions of concern, including those for which relationships now known
- In integrated assessments spanning health and environment sectors

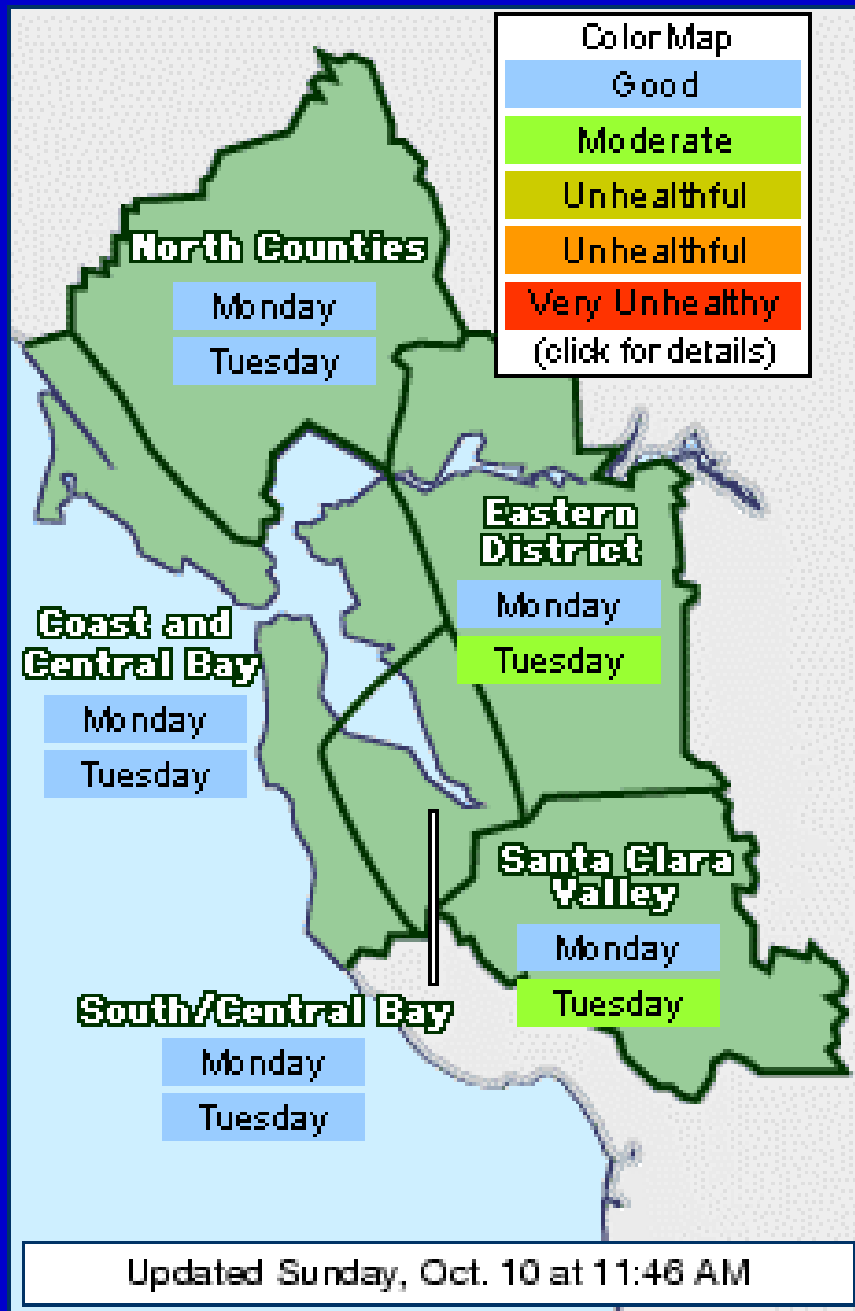
Why use indicators?

- Represent data in a form that is understandable to audience
 - The general public
 - Stakeholders
 - Policy makers

Ex: Air Quality Index

widely reported in news media in metro areas

AIR QUALITY INDEX



Why use indicators?

Present an agreed upon interpretation to data

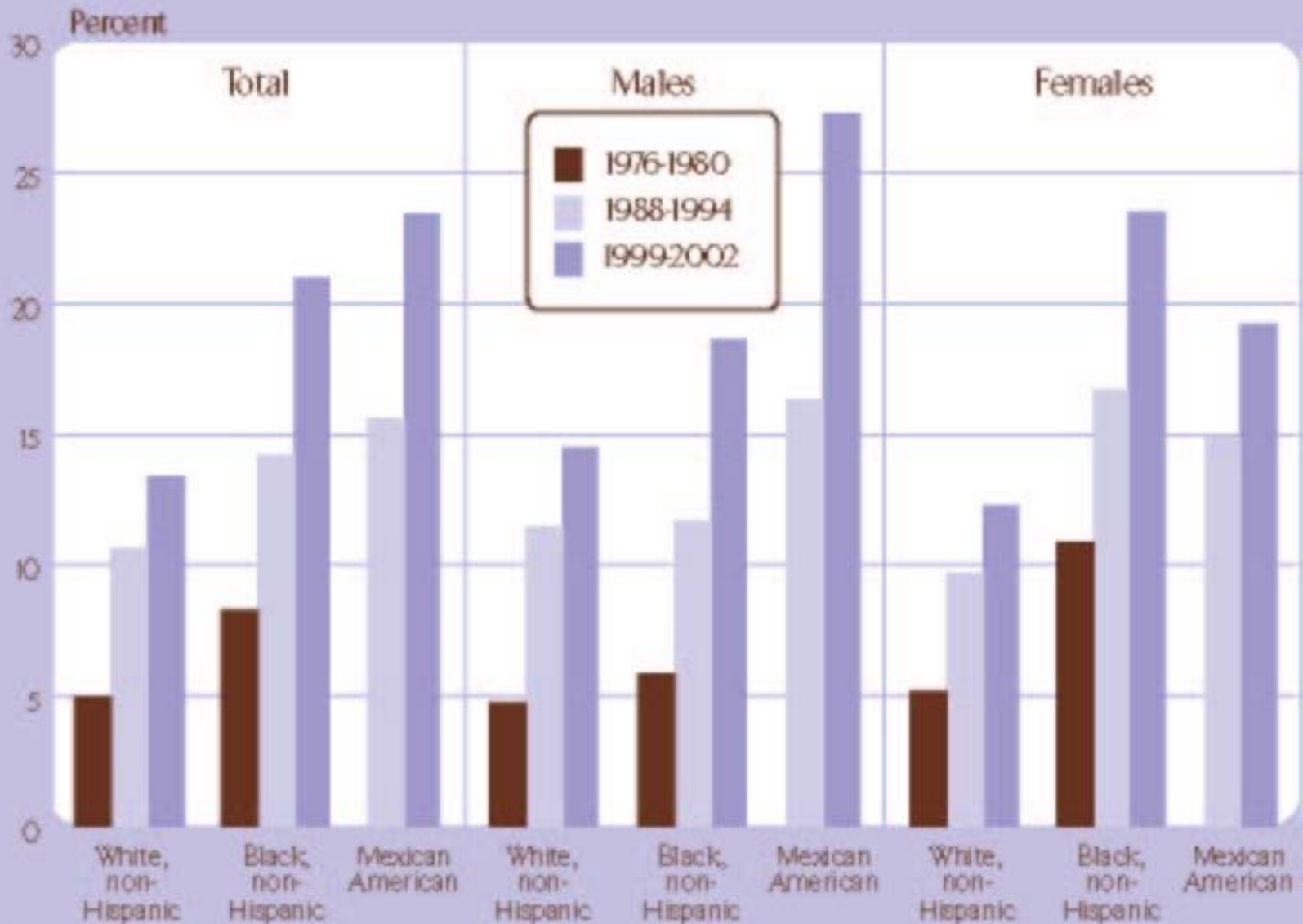
Requires consensus on what data "mean"

Can suggest need for action

Ex: Percentage of kids who are overweight (from children's health chart book)

FIGURE 6

Percentage of children ages 6 to 18 who are overweight, by gender, race, and Hispanic origin, selected years 1976-1980, 1988-1994, and 1999-2002

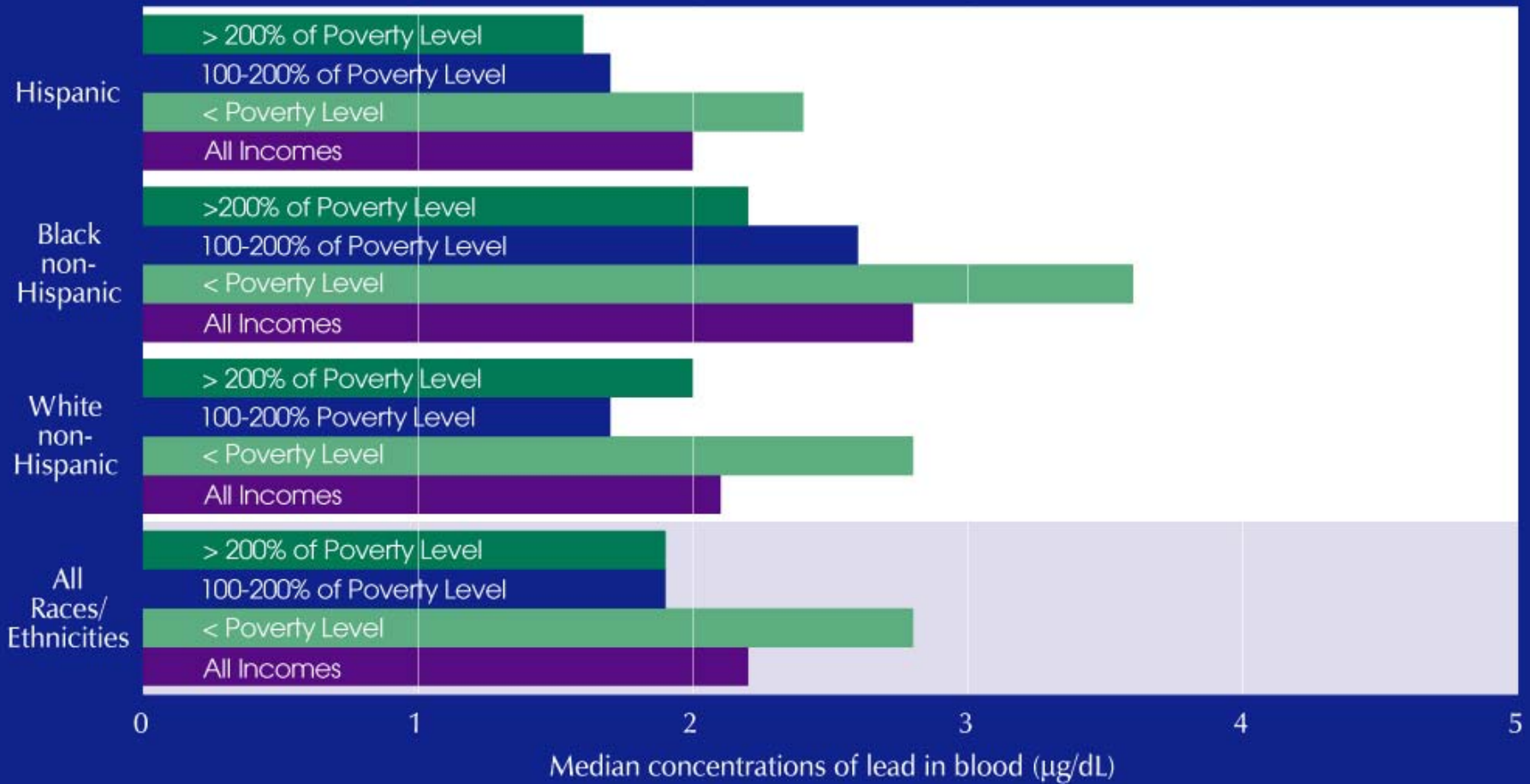


Why use indicators?

Present data in a more simple form

Ex: Blood lead levels by race/ethnicity
and income

Median concentrations of lead in blood of children ages 1-5, by race/ethnicity and family income, 1999-2000



SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Health and Nutrition Examination Survey

Why use indicators?

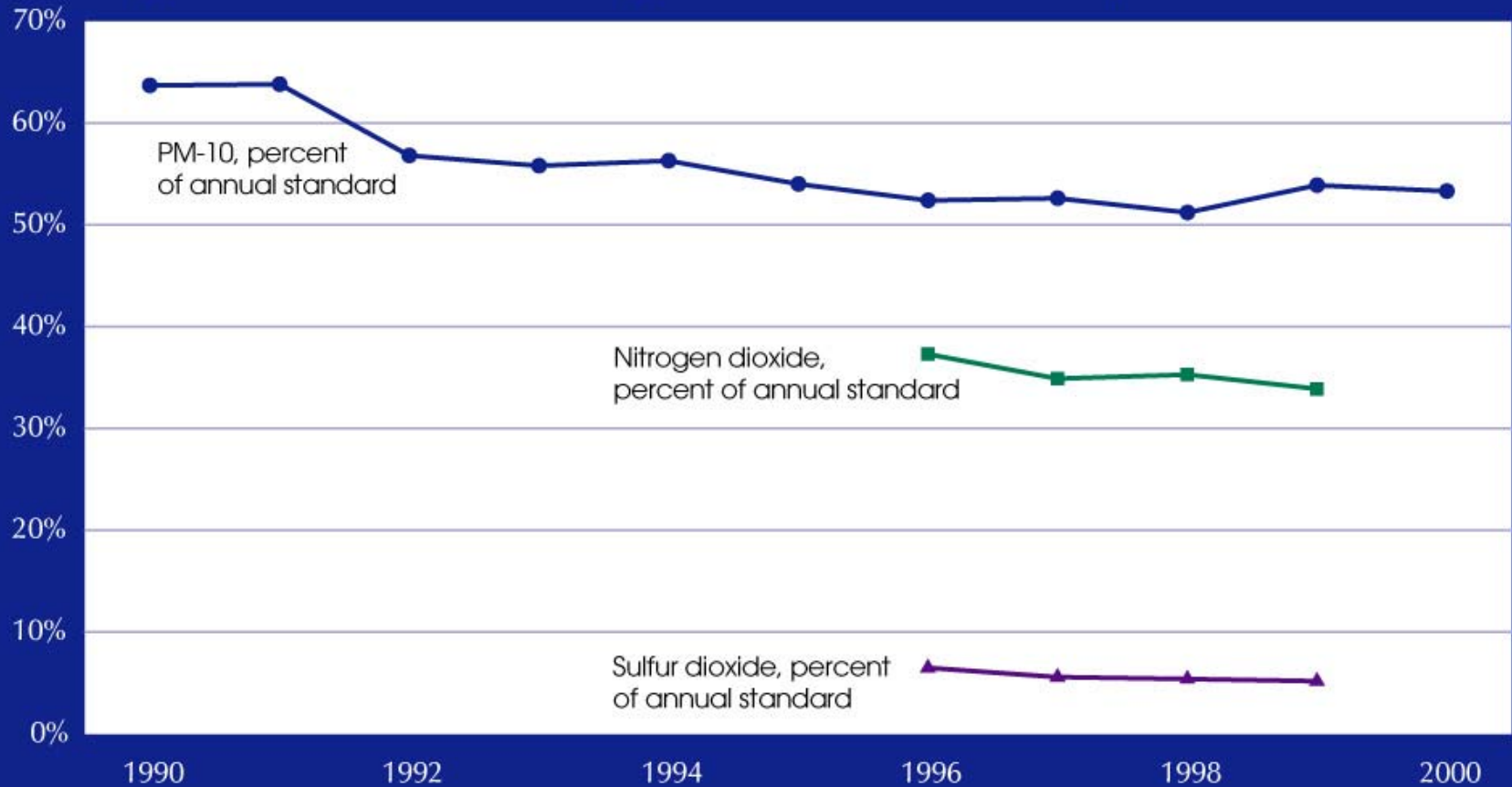
➤ Keep an eye on trends in conditions of concern

Useful when conditions represent a possible concern

Ex:

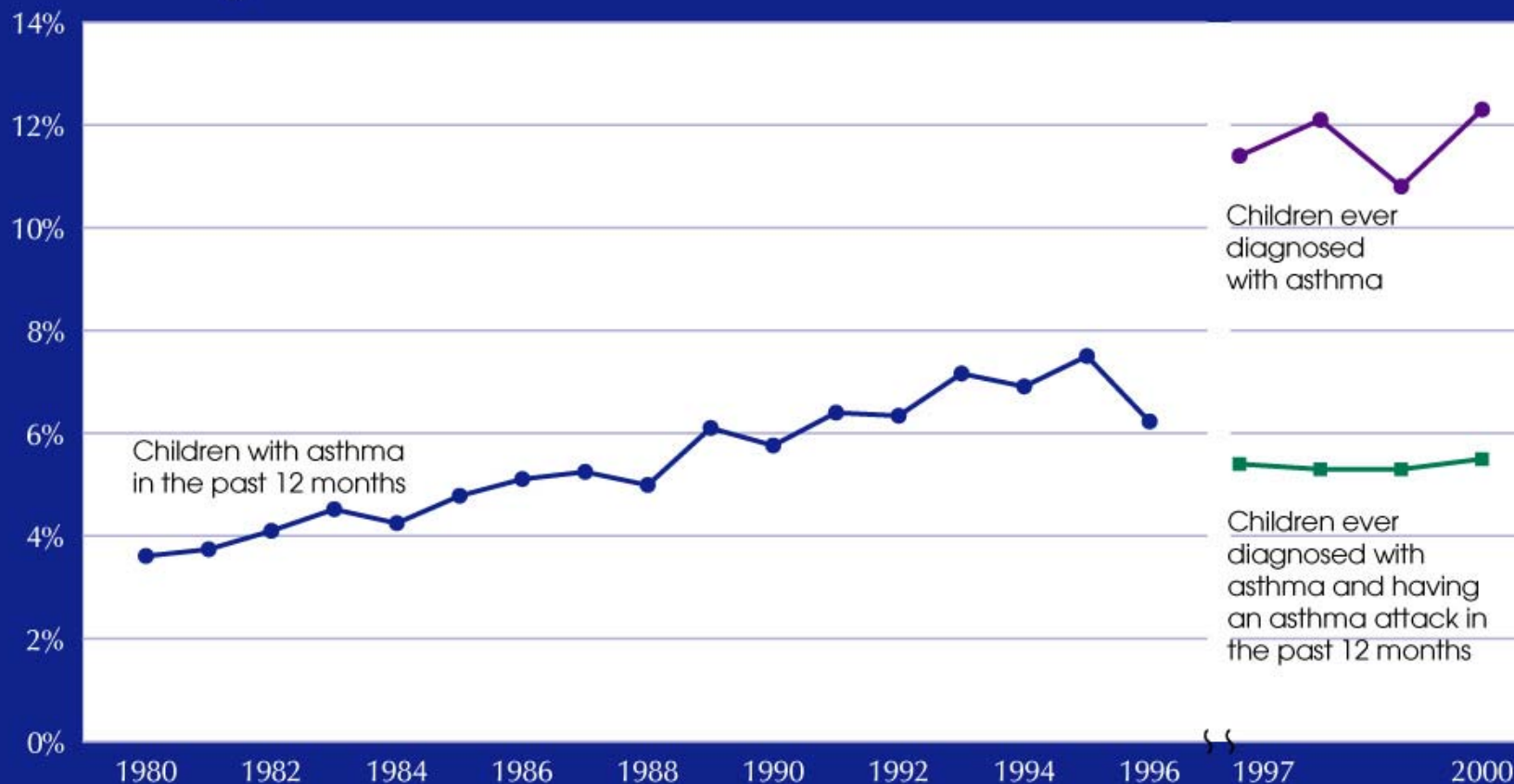
- environmental conditions
- body burdens
- disease rates

Long-term trends in annual average concentrations of criteria pollutants



SOURCE: U.S. Environmental Protection Agency, Office of Air and Radiation, Aerometric Information Retrieval System

Percentage of children with asthma



SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey

Note: The survey questions for asthma changed in 1997; data before 1997 cannot be directly compared to data in 1997 and later.

Used in Integrated Assessments

Efforts to integrate information from multiple sectors to influence policy

- Span health and environment
- Integrate data systems -> interoperability
- Accessible to public
- Similar attributes found in PACEH and WHO approaches

Knowledge base to define determinants

- Use all evidence of links between environmental factors and health
- Not limited to data linkages as input, but can use these
- Determinants become focus of measurement/surveillance or indicators
 - What we know or suspect
 - Can address different levels of knowledge

Indicators --

- Can measure the determinants that you know or suspect to be related to health or disease
 - Also determinants of "hazard" or exposure
- Can also measure things that contribute to these determinants
 - (e. g., surrogates or interventions)
- Can be "integrated" or not, depending on what you think you need to know

Goals of EPHTN

- Improve understanding of **relationships** between environmental factors and health
- Track **determinants** of health that are environmentally mediated
 - "hazards" and "exposures"
- Track **diseases** that are environmentally mediated
- Make **links** between "hazards," "exposures," outcomes
- Develop **information to support policy action** -
- **Reduce disease burden or risk**

Needs and goals are similar

- Explain what we know or suspect about relationships between environmental factors and health
- Take data and turn it into results that can be used by the public and policy audiences
- Target data collection toward findings that are actionable (surveillance)

To date: emphasis on linking data

- Relationships between “health” and “environment” explained through data linkage
 - Highly technical and data intensive
- Can use indicators to answer broader range of questions, sooner (where data exist)

What indicators could do now

- Present available data in understandable way
- Simplify "data smog" for policy audiences
- Present agreed upon interpretation
- Keep track of conditions of concern and provide benchmarks (PACEH)

Some issues in defining indicators

- Terminology and topics
- Different amounts of knowledge and certainty about relationships
- Metrics matter (and can give different results)
- Addressing “many to many” relationships

1. Terminology and topics

- We use different words
 - Questions to answer (ROE) =
 - Topic areas (ACE) =
 - Indicator (CSTE) =
 - Priority conditions (CDC)

Need to (and can) deal with

- Topics or subject
- Data sources
- Metrics

What to include (first)

- Some convergence in overall topic areas or subjects
- Less convergence on how measurements can be used to answer questions
- Even less convergence on metrics to use (i. e) how to calculate

Need to sort this all out

Categories	Pew	CDC RfA	CSTE	America's Children Environ	Cal Enviro Health Indicators	EPA Report on the Environment
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Agents by Media

Outdoor Air contaminant	Air contaminants, including toluene and fine particles (tier 1); Air quality (p. 15)	Air contaminants, outdoor	Criteria pollutants (ozone, particulate matter, SO ₂ , NO ₂ , lead, CO); Hazardous or toxic substances	Criteria air pollutants; hazardous air pollutants	Ozone	Criteria pollutants, Air toxics (benzene, 1,3- butadiene, lead, perchloroethylene)
Indoor Air contaminant		Air contaminants, indoor	Tobacco smoke; Hazardous or toxic substances	Environmental tobacco smoke	Environmental tobacco smoke	Environmental tobacco smoke, Radon
Ambient water contaminant	Water quality (p. 15)		Contaminants in ambient water		Pesticides, metals, sediment, nutrients or low dissolved oxygen, bacteria and pathogens, trash or debris (p. 35)	Mercury, pesticides, dioxin, lead, PCB's, PBT's
Drinking water contaminant	Drinking water contaminants, including pathogens (tier 1)		Monitored contaminants in systems; source water contamination	Regulated drinking water contaminants; lead	MTBE, perchlorate, NDMA and other regulated contaminants	
Crops				Organophosphate residues		
Food			Pesticides, toxic contaminants on food; contaminants in shellfish and sport and commercial fish	Organophosphate pesticides residues; mercury in noncommercial fish		Mercury and PCB in fish tissue; contaminants in freshwater fish

2. Knowledge + certainty vary

Relationships between environmental factors and health fall on continuum:

- Well established (lead and cognitive deficits) to
- Not established but of concern (autism)

What to measure may vary depending on this

May be more valuable to track upstream determinants instead and act upon these results

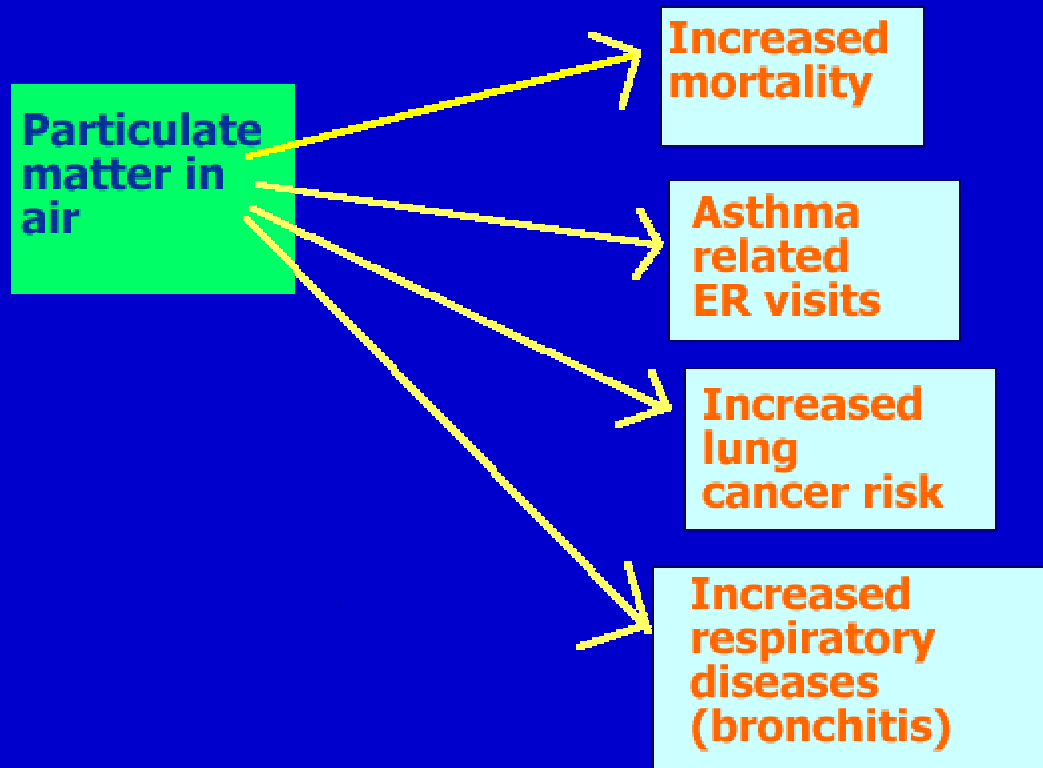
3. Need to think about metrics

- Choices to be made about what is the most honest and informative way to represent data
 - Different metrics do not necessarily track
- Need metrics that correspond to what you know about causes of risks and disease
- Not the same as enforcement ones

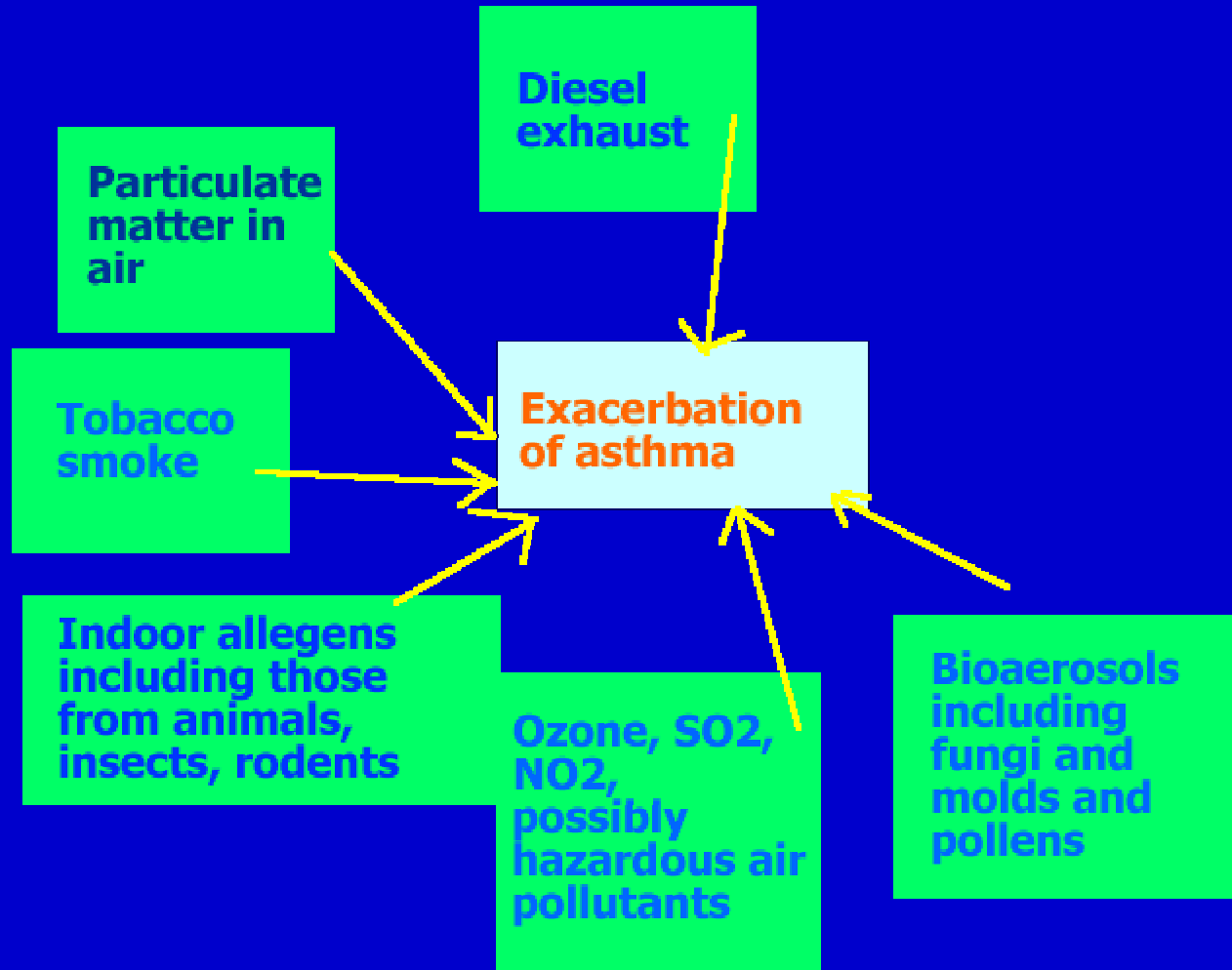
4. Relationships are “MEME”

- Many exposures <-> many effects
- Complex in both directions
- Conceptual approaches beginning to address this internationally but not yet in US

One “hazard,” multiple outcomes



One outcome, multiple causes



Contribution to EPHTN

- Provide source of early success and tangible results for program
- Start to measure determinants and outcomes we know are important in consistent way
- Useful to key audiences
- Help to define data uses and limits

Some possible steps

- Define what we think is important
- Consider data sources,
- Discuss how best to represent results, agree on metrics
- Identify data gaps for and useful surrogates
- Provide "health and environment" perspective to other forums

Conclusion

- Indicators
 - Contribute to policy relevance of data generated by EPHTN
 - Reflect systems approach to identify and track environmental determinants of health (not all of which have to be linked)
- Tracking as surveillance
 - What is tracked (and linked) should be relevant to action to improve public health