Social Determinants of Health

Concepts and Methods Relevant to Air Pollution

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2020-05-13
‘A Terrible Price’: The Deadly Racial Disparities of Covid-19 in America

For the Zulu club, a black social organization in New Orleans, Mardi Gras was a joy. The coronavirus made it a tragedy.
Disproportionate racial impact of COVID-19 on deaths

Pandemic exposure reveals underlying inequalities in social conditions.

“We have long known that emissions coming from these facilities are very dangerous to the health of people who live nearby, and it is black people who live the closest. So I’m getting tired of being told our Covid death rates are only because we’re obese or have diabetes or are eating badly, without any regard to the systematic harm pollution has caused us.”

-Beverly Wright
Deep South Center for Environmental Justice

"The conditions in the social and physical environment where people live, work, attend school, play and pray have an outsize influence on health outcomes."

"Those in the public-health field call these conditions social determinants of health".

What are Social Determinants of Health?
The social determinants of health are the conditions in which people are born, grow, live, work and age.

- Availability of resources (e.g., safe housing and local food markets)
- Access to educational, economic, and job opportunities
- Access to health care services
- Quality of education and job training
- Availability of community-based resources in support of community living and opportunities for recreational and leisure-time activities
- Transportation options
- Public safety
- Social support
- Social norms and attitudes (e.g., discrimination, racism, and distrust of government)
- Exposure to crime, violence, and social disorder
- Socioeconomic conditions (e.g., concentrated poverty)
- Residential segregation
- Language/Literacy
- Access to mass media and emerging technologies
- Culture

Sources: WHO Commission on Social Determinants of Health (2008); https://www.healthypeople.gov/2020/topics-objectives/topic/social-determinants-of-health
Concepts
Medical care matters, but not much.

Death rates per 1000

- **Measles**: Vaccine
- **Scarlet Fever**: Penicillin
- **Tuberculosis**: Isoniazid
- **Typhoid**: Chloramphenicol

McKinlay & McKinlay (1977); McKeown (1979)
The UK Black Report (1981) cemented the idea of **persistent** health inequalities.

Universal health insurance did not reduce inequalities.

**More ambitious interventions needed** in education, housing and social welfare, in addition to improved clinical care.

Black et al. (1980)
Mechanisms may change, but social inequalities continue to reproduce health inequalities.

Link and Phelan (1995)
Risk factors are insufficient

"The social class difference was partly explained by known coronary risk factors: men in the lower grades smoked more and exercised less, they were shorter and more overweight, and they had higher blood pressures and lower levels of glucose tolerance.

Most of the difference, however, remains unexplained. It seems that there are major risk factors yet to be identified"

-Rose and Marmot, 1981
Interventions need to be social

"...the primary determinants of disease are mainly economic and social, and therefore its remedies must also be economic and social."

- Geoffrey Rose

Figure 1: Rates of homicide in Chicago and England and Wales by age and sex of perpetrator

Rose (1992, p.129); Marmot (1998)
"Social injustice is killing people on a grand scale."

Closing the gap in a generation
Health equity through action on the social determinants of health

CSDOH (2008)
Conceptual model of SDOH (will redraw for legibility)

- Explicit links between social exposures
- Differential exposure and susceptibility
- Key leverage points for policy intervention

Diderichsen et al. (2001)
Early evidence of disproportionate impact of environmental hazards
Persistent racial and socioeconomic inequalities in exposure

"...findings raise serious questions about the ability of current policies and institutions to adequately protect people of color and the poor from toxic threats."

Individual vs. population determinants

Apte (2018)
Important heterogeneity

Most find that risks are more concentrated among disadvantaged social groups.

Plea for better methods

O’Neill (2003); Benmarhnia (2014); Hajat (2015); Appleton (2016); Fairburn (2019)
Methodological Issues
1. Clarity about the study goal

Descriptive aims
require attention to relevant units and measures.
Measures of the "social" are context dependent.

Need to fit for purpose.

What is the relevant risk for a particular pollutant?

Source: Galobardes (2004)
Social position isn't static

"Status" takes place in the context of an overarching structure.

Source: https://www.hamiltonproject.org/charts/annual_earnings_of_teachers_and_non-teachers
Context also matters for impacts

Higher income downtown core more exposed to $NO_2$

Crouse et al. (2009)
1. Clarity about the study goal

Descriptive aims
require attention to relevant units and measures.

Interventions
need all of the above plus causal evidence.

Causal inference is hard.
Causal models have implications for analysis.

Ritz (2018)
Integrating multiple causes to explain inequalities.

the individual contribution of PM2.5 is comparable in magnitude to any single individual- or neighborhood-level factor.
2. Multi-level, multi-causal

Incorporating social determinants means incorporating the
2. Which "social" exposures matter?
Social hierarchies affect the conditions into which people are born, grow, live, work, and age.

Greater attention to social determinants will enrich explanations and improve science and policy.
Thank you!

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