Orator of the PHOENIX

Phillip D. Levy, MD MPH, FACEP, FAHA, FACC
Professor of Emergency Medicine and Associate Vice President for Translational Science - Wayne State University
Director, Mobile Health Unit Program - Wayne Health

WAYNE STATE UNIVERSITY

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Relevant Disclosures

- NIH/NHLBI: R01 HL153607; R01 HL163377; R01 HL146059; R01 HL127215; T32 HL120822
- NIH/NIMHD: P50 MD017351 (ACHIEVE GREATER)
- AHA: RESTORE Health Equity Research Network (LEAP HTN); Collaboration for Equitable Health
- MDHHS: Mobile Health Unit; Michigan Mobile Health Corps; CDC 1815, 1816 and 1817 programs
- Ford Motor Company Fund
- Cielo Fund
- Michigan Health Endowment Fund
- Delta Dental

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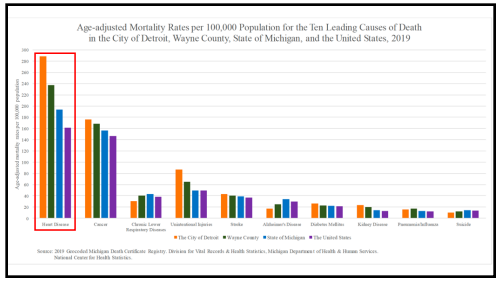

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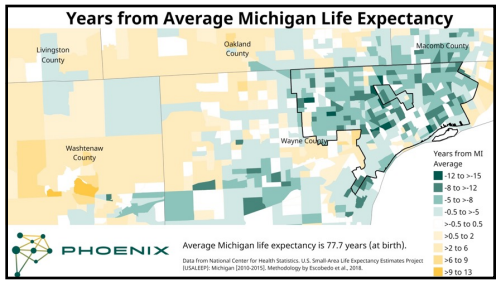

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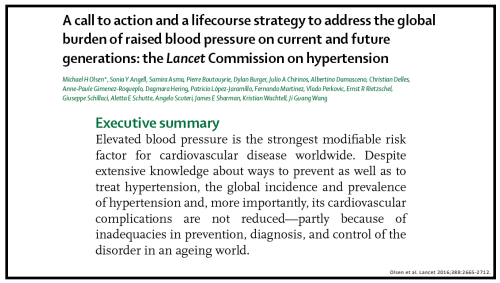

A call to action and a lifecourse strategy to address the global burden of raised blood pressure on current and future generations: the *Lancet* Commission on hypertension

Michael H Olsen*, Sonia Y Angell, Samira Asma, Pierre Boutouyrie, Dylan Burger, Julio A Chirinos, Albertino Damasceno, Christian Delles, Anne-Paule Gimenez-Roqueplo, Dagmara Hering, Patricio López-Jaramillo, Fernando Martinez, Vlado Perkovic, Ernst R Rietzschel, Giuseppe Schillaci, Aletta E Schutte, Angelo Scuteri, James E Sharman, Kristian Wachtell, Ji Guang Wang

Executive summary

Elevated blood pressure is the strongest modifiable risk factor for cardiovascular disease worldwide. Despite extensive knowledge about ways to prevent as well as to treat hypertension, the global incidence and prevalence of hypertension and, more importantly, its cardiovascular complications are not reduced—partly because of inadequacies in prevention, diagnosis, and control of the disorder in an ageing world.

Olsen et al. Lancet 2016; 388: 2665–2712

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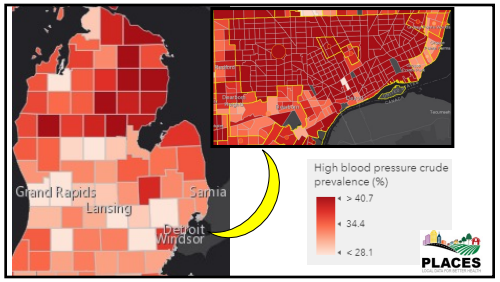
Grand Rapids
Lansing
Sarnia
Detroit
Windsor
High blood pressure crude prevalence (%)
> 40.7
34.4
< 28.1
PLACES

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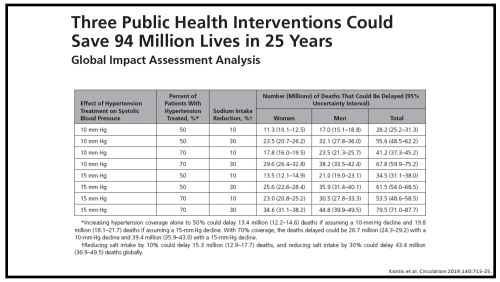
Three Public Health Interventions Could Save 94 Million Lives in 25 Years
Global Impact Assessment Analysis
Effect of Hypertension Treatment on Systolic Blood Pressure
Percent of Patients With Hypertension Treated, %*
Sodium Intake Reduction, %†
Number (Millions) of Deaths That Could Be Delayed (95% Uncertainty Interval)
Women
Men
Total
10 mm Hg 50 10 11.3 (10.1–12.5) 17.0 (15.1–18.8) 28.2 (25.2–31.3)
10 mm Hg 50 30 23.5 (20.7–26.2) 32.1 (27.8–36.0) 55.6 (48.5–62.2)
10 mm Hg 70 10 17.8 (16.0–19.5) 23.5 (21.3–25.7) 41.2 (37.3–45.2)
10 mm Hg 70 30 29.6 (26.4–32.8) 38.2 (33.5–42.4) 67.8 (59.9–75.2)
15 mm Hg 50 10 13.5 (12.1–14.9) 21.0 (19.0–23.1) 34.5 (31.1–38.0)
15 mm Hg 50 30 25.6 (22.6–28.4) 35.9 (31.6–40.1) 61.5 (54.0–68.5)
15 mm Hg 70 10 23.0 (20.8–25.2) 30.5 (27.8–33.3) 53.5 (48.6–58.5)
15 mm Hg 70 30 34.6 (31.1–38.2) 44.8 (39.9–49.5) 79.5 (71.0–87.7)
*Increasing hypertension coverage alone to 50% could delay 13.4 million (12.2–14.6) deaths if assuming a 10-mm Hg decline and 19.8 million (18.1–21.7) deaths if assuming a 15-mm Hg decline. With 70% coverage, the deaths delayed could be 26.7 million (24.3–29.2) with a 10-mm Hg decline and 39.4 million (35.9–43.0) with a 15-mm Hg decline.
†Reducing salt intake by 10% could delay 15.3 million (12.9–17.7) deaths, and reducing salt intake by 30% could delay 43.4 million (36.9–49.5) deaths globally.
Kontis et al. Circulation 2019;140:715-25

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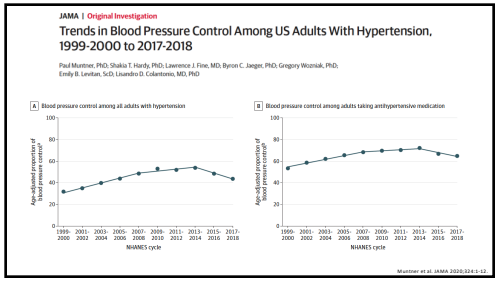
JAMA | Original Investigation
Trends in Blood Pressure Control Among US Adults With Hypertension, 1999-2000 to 2017-2018
Paul Muntner, PhD; Shakia T. Hardy, PhD; Lawrence J. Fine, MD; Byron C. Jaeger, PhD; Gregory Wozniak, PhD; Emily B. Levitan, ScD; Lisandro D. Colantonio, MD, PhD
A Blood pressure control among all adults with hypertension
B Blood pressure control among adults taking antihypertensive medication
Age-adjusted proportion of blood pressure controlled
NHANES cycle
1999-2000
2001-2002
2003-2004
2005-2006
2007-2008
2009-2010
2011-2012
2013-2014
2015-2016
2017-2018
Muntner et al. JAMA 2020;324:1-12

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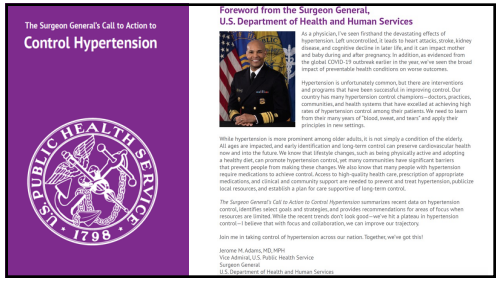
The Surgeon General's Call to Action to
Control Hypertension
PUBLIC HEALTH SERVICE
1798
Foreword from the Surgeon General, U.S. Department of Health and Human Services
As a physician, I've seen firsthand the devastating effects of hypertension. Left uncontrolled, it leads to heart attacks, stroke, kidney disease, and cognitive decline in later life, and it can impact mother and baby during and after pregnancy. In addition, as evidenced from the global COVID-19 outbreak earlier in the year, we've seen the broad impact of preventable health conditions on worse outcomes.
Hypertension is unfortunately common, but there are interventions and programs that have been successful in improving control. Our country has many hypertension control champions—doctors, practices, communities, and health systems that have excelled at achieving high rates of hypertension control among their patients. We need to learn from their many years of "blood, sweat, and tears" and apply their principles in new settings.
While hypertension is more prominent among older adults, it is not simply a condition of the elderly. All ages are impacted, and early identification and long-term control can preserve cardiovascular health now and into the future. We know that lifestyle changes, such as being physically active and adopting a healthy diet, can promote hypertension control, yet many communities have significant barriers that prevent people from making these changes. We also know that many people with hypertension require medications to achieve control. Access to high-quality health care, prescription of appropriate medications, and clinical and community support are needed to prevent and treat hypertension, publicize local resources, and establish a plan for care supportive of long-term control.
The Surgeon General's Call to Action to Control Hypertension summarizes recent data on hypertension control, identifies select goals and strategies, and provides recommendations for areas of focus when resources are limited. While the recent trends don't look good—we've hit a plateau in hypertension control—I believe that with focus and collaboration, we can improve our trajectory.
Join me in taking control of hypertension across our nation. Together, we've got this!
Jerome M. Adams, MD, MPH
Vice Admiral, U.S. Public Health Service
Surgeon General
U.S. Department of Health and Human Services

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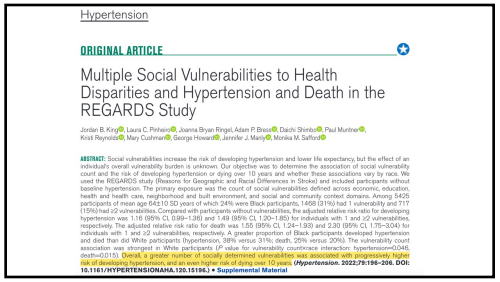
Hypertension
ORIGINAL ARTICLE
Multiple Social Vulnerabilities to Health Disparities and Hypertension and Death in the REGARDS Study
Jordan B. King, Laura C. Pinheiro, Joanna Bryan Ringel, Adam P. Bress, Daichi Shimbo, Paul Muntner, Kristi Reynolds, Mary Cushman, George Howard, Jennifer J. Manly, Monika M. Safford
ABSTRACT: Social vulnerabilities increase the risk of developing hypertension and lower life expectancy, but the effect of an individual's overall vulnerability burden is unknown. Our objective was to determine the association of social vulnerability count and the risk of developing hypertension or dying over 10 years and whether these associations vary by race. We used the REGARDS study (Reasons for Geographic and Racial Differences in Stroke) and included participants without baseline hypertension. The primary exposure was the count of social vulnerabilities defined across economic, education, health and health care, neighborhood and built environment, and social and community context domains. Among 5425 participants of mean age 64±10 SD years of which 24% were Black participants, 1408 (31%) had 1 vulnerability and 717 (15%) had ≥2 vulnerabilities. Compared with participants without vulnerabilities, the adjusted relative risk ratio for developing hypertension was 1.16 (95% CI, 0.99–1.36) and 1.49 (95% CI, 1.20–1.85) for individuals with 1 and ≥2 vulnerabilities, respectively. The adjusted relative risk ratio for death was 1.55 (95% CI, 1.24–1.93) and 2.30 (95% CI, 1.75–3.04) for individuals with 1 and ≥2 vulnerabilities, respectively. A greater proportion of Black participants developed hypertension and died than did White participants (hypertension, 38% versus 31%; death, 25% versus 20%). The vulnerability count association was strongest in White participants (P value for vulnerability count×race interaction: hypertension=0.046; death=0.015). Overall, a greater number of socially determined vulnerabilities was associated with progressively higher risk of developing hypertension, and an even higher risk of dying over 10 years. (Hypertension. 2022;79:196–206. DOI: 10.1161/HYPERTENSIONAHA.120.15196.) • Supplemental Material

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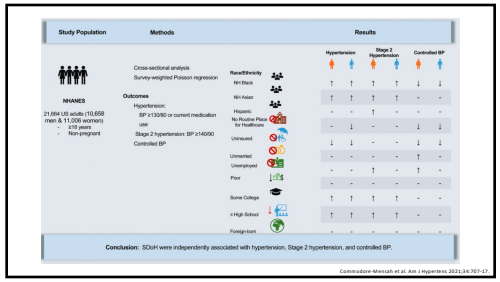
Study Population
Methods
Results
NHANES
21,694 US adults (10,658 men & 11,036 women)
≥18 years
Non-pregnant
Cross-sectional analysis
Survey-weighted Poisson regression
Outcomes
Hypertension:
BP ≥130/80 or current medication use
Stage 2 hypertension: BP ≥140/90
Controlled BP
Hypertension
Stage 2 Hypertension
Controlled BP
Race/Ethnicity
NH Black
NH Asian
Hispanic
No Routine Place For Healthcare
Uninsured
Unmarried
Unemployed
Poor
Some College
< High School
Foreign-born
Conclusion: SDoH were independently associated with hypertension, Stage 2 hypertension, and controlled BP.
Commodore-Mensah et al. Am J Hypertens 2021;34:707-17

12

Life expectancy by county, race, and ethnicity in the USA, 2000–19: a systematic analysis of health disparities

GBD US Health Disparities Collaborators*

Summary

Background There are large and persistent disparities in life expectancy among racial–ethnic groups in the USA, but the extent to which these patterns vary geographically on a local scale is not well understood. This analysis estimated life expectancy for five racial–ethnic groups, in 3108 US counties over 20 years, to describe spatial–temporal variations in life expectancy and disparities between racial–ethnic groups.

Methods We applied novel small-area estimation models to death registration data from the US National Vital Statistics System and population data from the US National Center for Health Statistics to estimate annual sex-specific and age-specific mortality rates stratified by county and racial–ethnic group (non-Latino and non-Hispanic White [White], non-Latino and non-Hispanic Black [Black], non-Latino and non-Hispanic American Indian or Alaska Native [AIAN], non-Latino and non-Hispanic Asian or Pacific Islander [API], and Latino or Hispanic [Latino]) from 2000 to 2019. We adjusted these mortality rates to correct for misreporting of race and ethnicity on death certificates and then constructed abridged life tables to estimate life expectancy at birth.

Findings Between 2000 and 2019, trends in life expectancy differed among racial–ethnic groups and among counties. Nationally, there was an increase in life expectancy for people who were Black (change 3·9 years [95% uncertainty interval 3·8 to 4·0]) life expectancy in 2019 75·3 years [75·2 to 75·4]), API (1·9 years [2·7 to 3·4]; 85·7 years [85·3 to 86·0]), Latino (2·7 years [2·6 to 2·8]; 82·2 years [82·0 to 82·5]), and White (1·7 years [1·6 to 1·7]; 78·9 years [78·8 to 79·0]), but remained the same for the AIAN population (0·0 years [–0·3 to 0·4]; 73·1 years [71·5 to 74·8]). At the national level, the negative difference in life expectancy for the Black population compared with the White population decreased during this period, whereas the negative difference for the AIAN population compared with the White population increased; in both cases, these patterns were widespread among counties. The positive difference in life expectancy for the API and Latino populations compared with the White population increased at the national level from 2000 to 2019; however, this difference declined in a sizeable minority of counties (623 [42·8%] of 3465 counties) for the Latino population and in most counties (481 [48·2%] of 616 counties) for the API population. For all racial–ethnic groups, improvements in life expectancy were more widespread across counties and larger from 2000 to 2010 than from 2010 to 2019.

Interpretation Disparities in life expectancy among racial–ethnic groups are widespread and enduring. Local-level data are crucial to address the root causes of poor health and early death among disadvantaged groups in the USA, eliminate health disparities, and increase longevity for all.

Funding National Institute on Minority Health and Health Disparities; National Heart, Lung, and Blood Institute; National Cancer Institute; National Institute on Aging; National Institute of Arthritis and Musculoskeletal and Skin Diseases; Office of Disease Prevention; and Office of Behavioral and Social Science Research, US National Institutes of Health.

Published Online June 30, 2022 https://doi.org/10.1016/S0140-6736(22)00876-5

See Online Comment https://doi.org/10.1016/S0140-6736(22)00934-5

*Collaborators are listed at the end of the article.

Correspondence to: Bin Zaman Gridgeo, Institute for Health Metrics and Evaluation, University of Washington, Seattle, WA 98121, USA bzaman@uw.edu

GBD US Health Disparities Collaborators 2022;400:25–38

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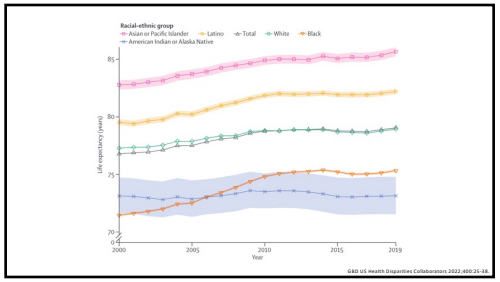

GBD US Health Disparities Collaborators 2022;400:25–38

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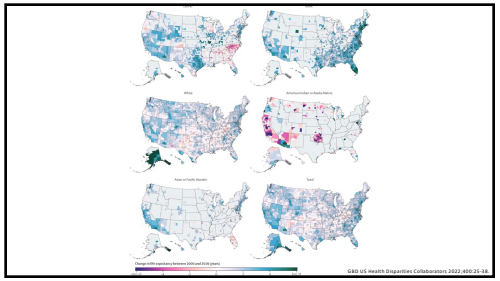

GBD US Health Disparities Collaborators 2022;400:25–38

15

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GBD US Health Disparities Collaborators 2022;400:25–38

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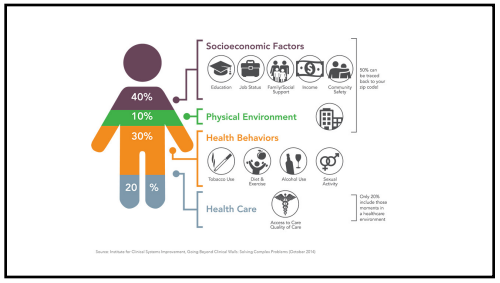

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Detroit is Among the Most Disadvantaged...

	Detroit	National Average
Children in poverty (%)	52.2	20.4
Income inequity score	-39.6	-1.1
Racial segregation score	40.3	10.9
Unemployment (%)	18.6	6.8
3rd Grade reading proficiency (%)	19.2	46.2
Violent Crime (per 100,000)	1900.4	436.1
Air pollution (PM2.5)	9.7	8.5
Housing w/ Lead Risk (%)	44.2	17.6
Limited access to healthy food (%)	48.3	63.9
Smoking (% adults)	28.9	16.7
Physical inactivity (%)	37.6	23.9
Obesity (%)	43.6	30.4

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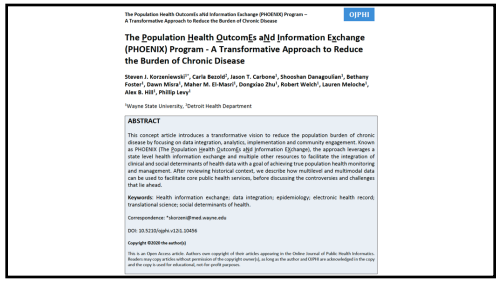

The Population Health OutcomEs aNd Information Exchange (PHOENIX) Program – A Transformative Approach to Reduce the Burden of Chronic Disease

OJPHI

The Population Health OutcomEs aNd Information Exchange (PHOENIX) Program - A Transformative Approach to Reduce the Burden of Chronic Disease

Steven J. Korzeniewski[1*], Carla Bezold[1], Jason T. Carbone[1], Shooshan Danagoulian[1], Bethany Foster[1], Dawn Misra[1], Maher M. El-Masri[2], Dongxiao Zhu[1], Robert Welch[1], Lauren Meloche[1], Alex B. Hill[1], Phillip Levy[1]

[1]Wayne State University, [2]Detroit Health Department

ABSTRACT

This concept article introduces a transformative vision to reduce the population burden of chronic disease by focusing on data integration, analytics, implementation and community engagement. Known as PHOENIX (The Population Health OutcomEs aNd Information Exchange), the approach leverages a state level health information exchange and multiple other resources to facilitate the integration of clinical and social determinants of health data with a goal of achieving true population health monitoring and management. After reviewing historical context, we describe how multilevel and multimodal data can be used to facilitate core public health services, before discussing the controversies and challenges that lie ahead.

Keywords: Health information exchange; data integration; epidemiology; electronic health record; translational science; social determinants of health.

Correspondence: *skorzen@med.wayne.edu

DOI: 10.5210/ojphi.v12i1.10456

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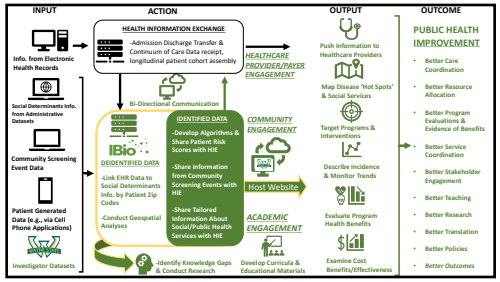

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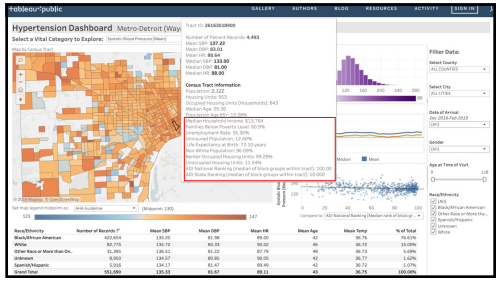

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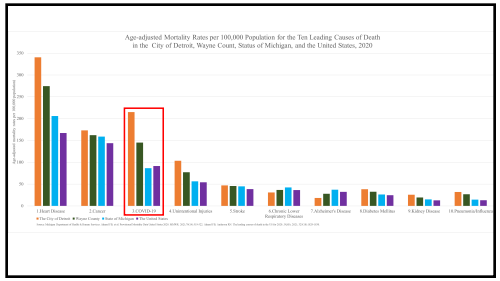

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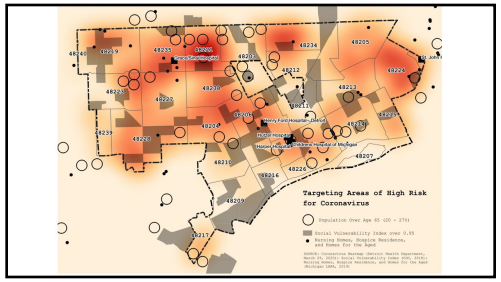

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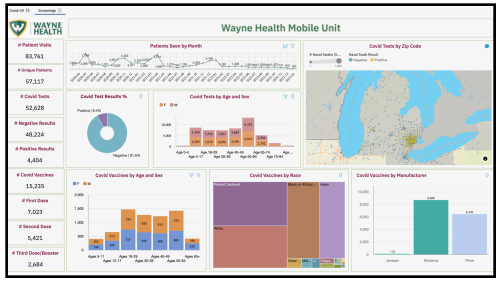

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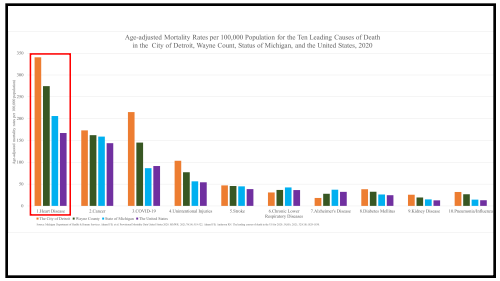

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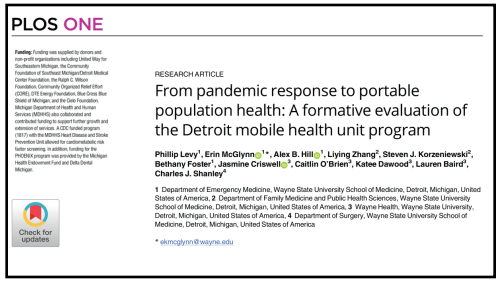

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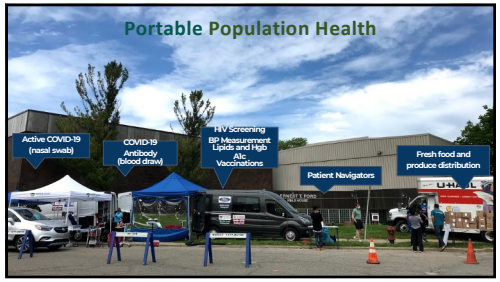

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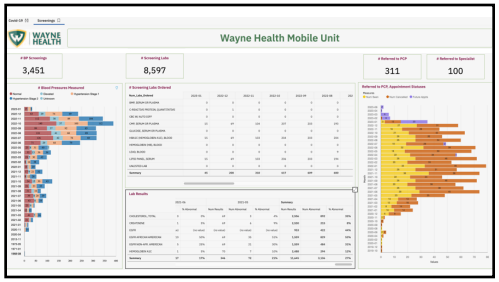

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Circulation: Cardiovascular Quality and Outcomes

CARDIOVASCULAR PERSPECTIVE

Cardiometabolic Risk Factor Control During Times of Crises and Beyond

Robert D. Brook, MD
Philip Levy, MD, MPH
Sanjay Rajagopalan, MD

The world is currently suffering through one the greatest crises of the last century. The coronavirus disease 2019 (COVID-19) pandemic is taking an enormous toll on public health and stretching medical resources in an unprecedented fashion. Our priorities are rightly focusing on meeting this existential threat. Nonetheless, we wish to call to attention that during major catastrophes the health consequences of chronic diseases, in particular cardiometabolic risk factors (CMRFs), continue unabated. In fact, new and serious problems arise part-and-parcel with the catastrophe and conspire to hamper our already imperfect ability to control CMRFs.[1,2] Our objective is to raise awareness that we need to anticipate (and not just be reactive to) the possible coming of a second crisis we term disastrous CMRFs. This refers to the worsening of CMRFs and their control rates during and following a major disaster.[1,2] Health care providers, in particular cardiologists, need to recognize the potential for this serious problem as it could promote a burgeoning of cardiovascular morbidity and mortality if not addressed. The COVID-19 pandemic should also serve as a wake-up call to the antiquated flaws in our healthcare model that collude to undermine the successful management of CMRFs in general.[3] This current crisis can be a catalyst for optimizing practices and creating critical new capacities that will be beneficial moving forward and serve as a bulwark against future crises.

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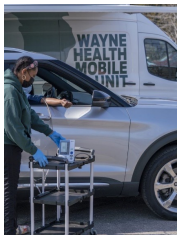
RESEARCH LETTER

Utilizing Mobile Health Units for Mass Hypertension Screening in Socially Vulnerable Communities Across Detroit

Robert D. Brook, Katee Dawood, Bethany Foster, Randi M. Foust, Catherine Gaughan, Paul Kurian, Brian Reed, Andrea L. Jones, Barbara Vernon, Phillip D. Levy



Nearly half of all adults in the United States have hypertension, defined as a blood pressure (BP) ≥130/80 mm Hg. However, both the prevalence (50%) and control rates (18%) are worse in Black patients.[1] Numerous social determinants of health in socially vulnerable populations further exacerbate these disparities while reducing hypertension awareness and access to health care.[2] Few places exemplify this crisis like the city of Detroit (78% Black race) where hypertension rates are the highest in Michigan (>50%) and a professional shortage area (primary care physician shortage area).[3] As such, the public health importance of large-scale screening efforts to identify the enormous number of individuals with hypertension cannot be overstated.[4] We have adopted the Bringular mobile unit to...

Given the large population serviced (while also ensuring resiliency of the program during cold weather and COVID surges), only a single BP measurement was obtained at the screening for high BP (defined as ≥130/80 mm Hg) beginning in November 2020. Those driving to a site (≈90%) rested inside their parked car for 15 minutes before their measured using an Omron 907XL monitor following a guideline-consistent protocol—up to an average of triplicate upper arm readings (1-minute intervals) using a correct cuff size with the arm supported at heart level (floor armrest) and feet resting on the floor. A Hawaii Tri-Ethnic pad was used. Patients had seated rest periods of 5 minutes before readings and no caffeine, tobacco, exercise, nonprescription cold medicines, or nonprescription herbal supplements within 30 minutes of readings when relevant.

All patients are provided follow-up care in the Wayne Health system per individual needs. Wayne Health Information Technology and Hypertension Portal, a collected but not publicly available, for the entire cohort. Individuals with a

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Categories	Number (%)	BP* (mm Hg)
All patients	3,039	126.9 ± 23.1 / 76.8 ± 14.7
Normal BP Systolic BP <120 and diastolic BP <80 mm Hg	1136 (37%)	105.5 ± 9.28 / 65.0 ± 8.34
High BP Categories**		
Elevated BP Systolic BP 120-129 and diastolic BP <80 mm Hg	306 (10%)	124.2 ± 2.8 / 70.1 ± 6.44
Hypertension categories*** Systolic BP ≥130 and/or diastolic BP ≥80 mm Hg	1597 (53%)	142.7 ± 19.39 / 86.4 ± 12.43
Stage I Systolic BP 130-139 and/or diastolic BP 80-89 mm Hg	629 (21%)	127.7 ± 8.73 / 80.3 ± 6.84
Stage II Systolic BP ≥140 and/or diastolic BP ≥90 mm Hg	968 (32%)	152.4 ± 18.15 / 90.4 ± 13.6

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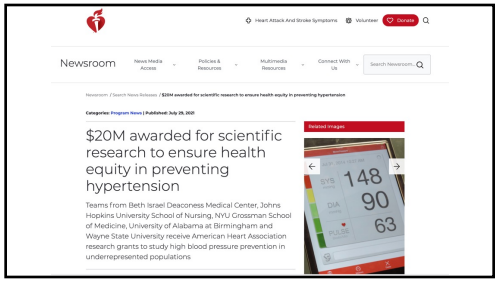

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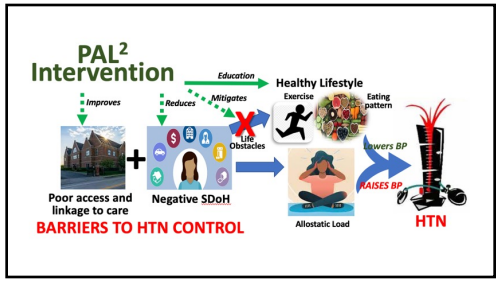

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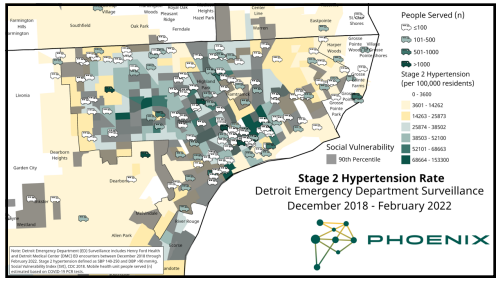

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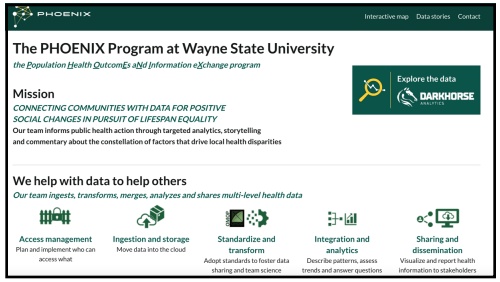

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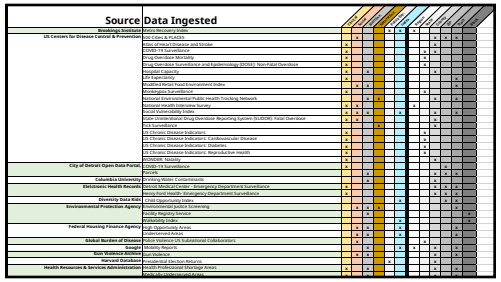

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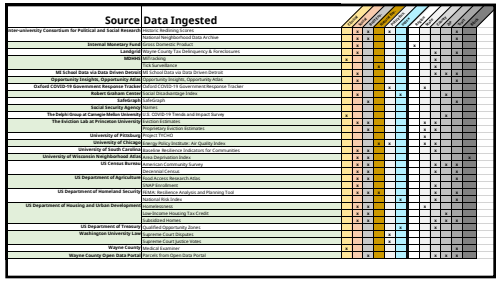

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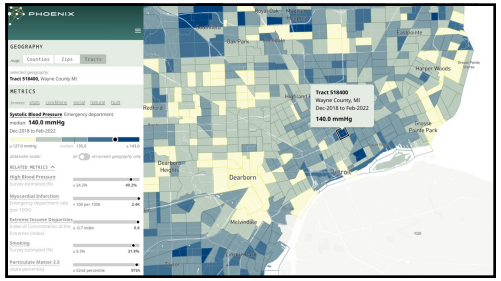

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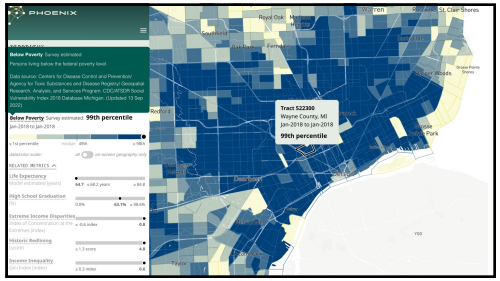

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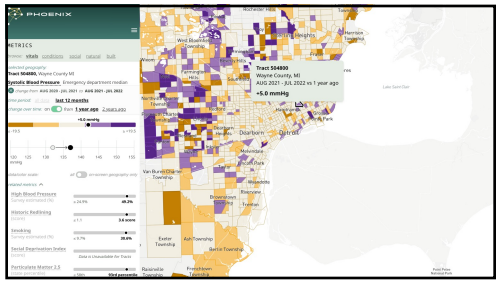

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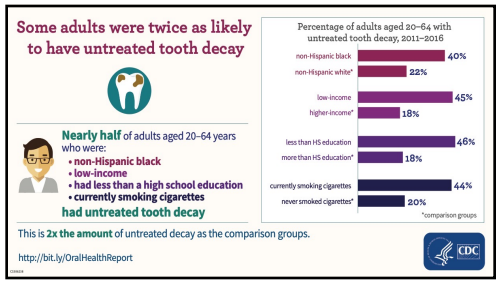

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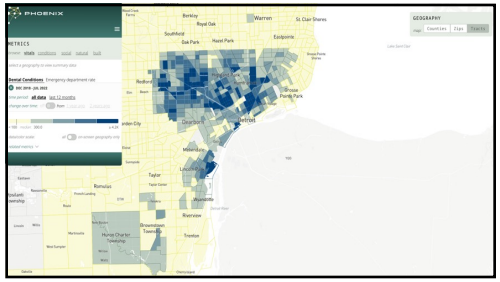

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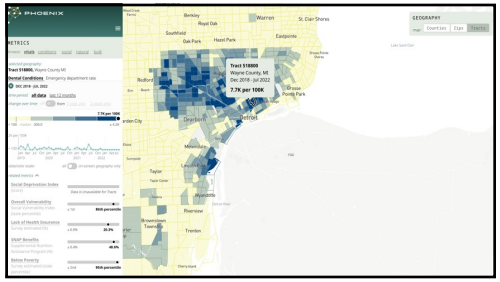

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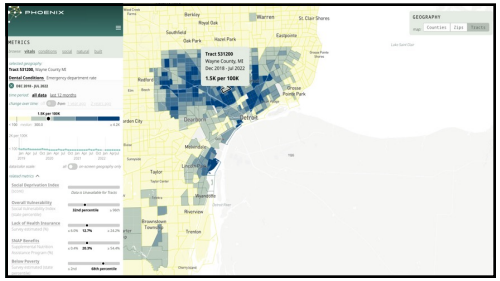

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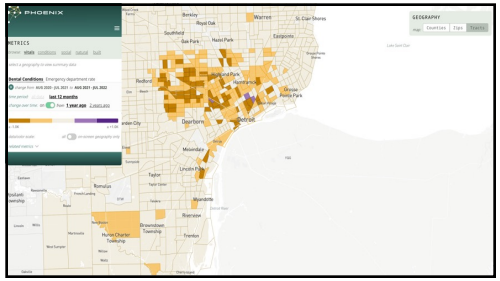

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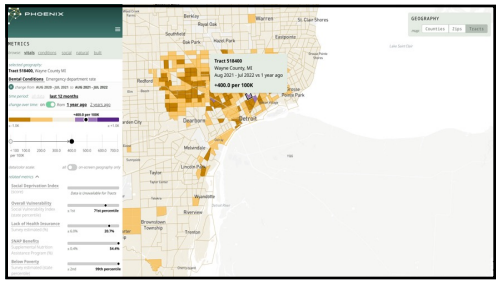

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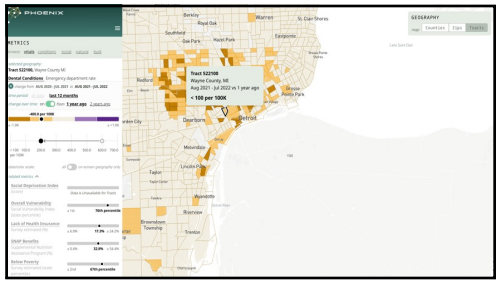

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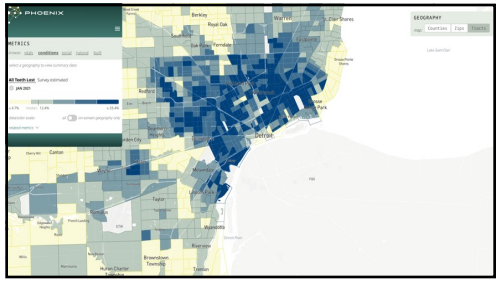

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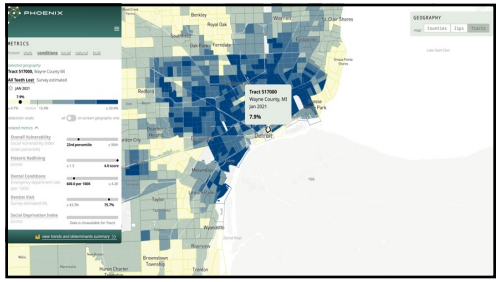

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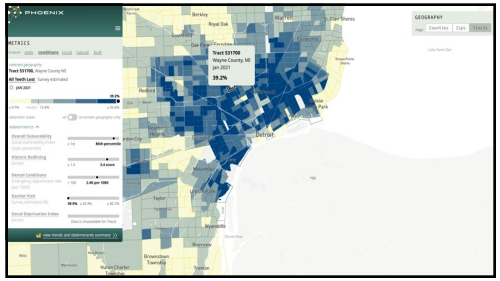

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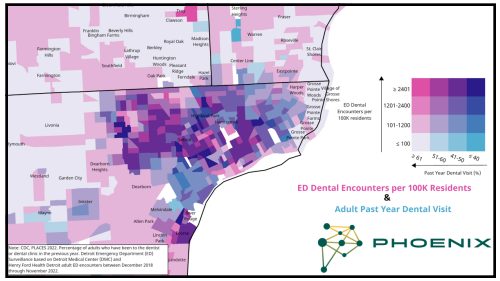

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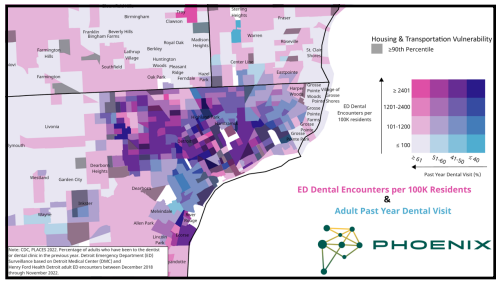

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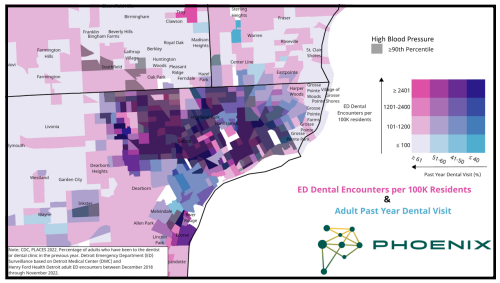

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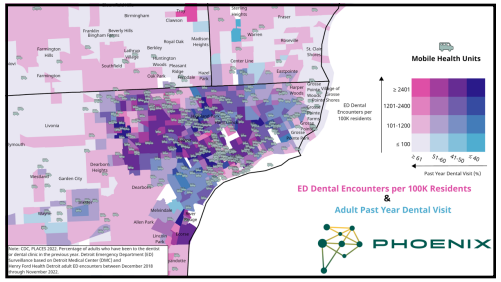

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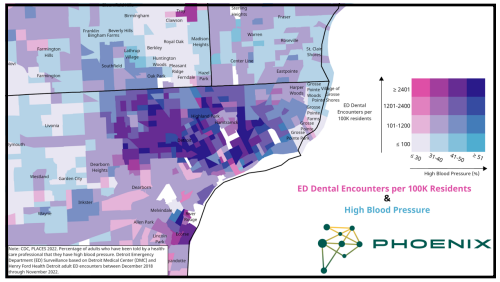

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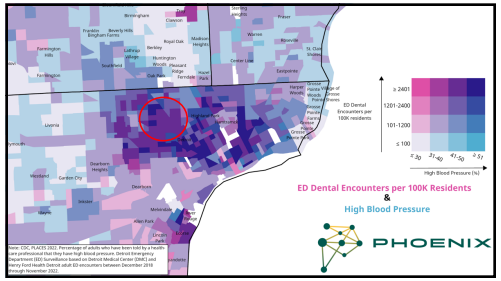

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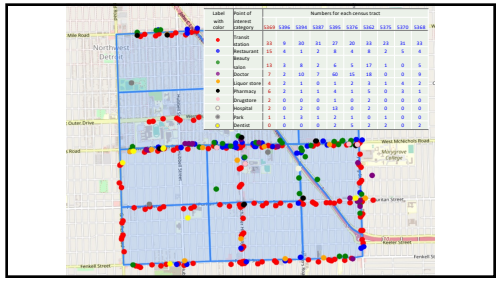

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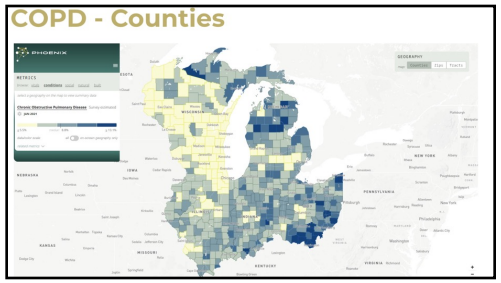

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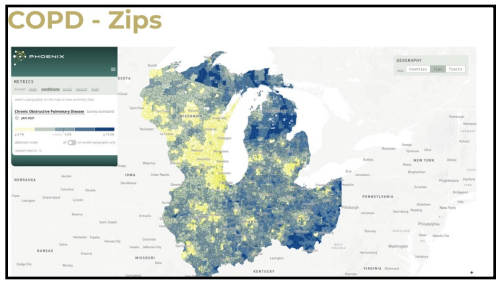

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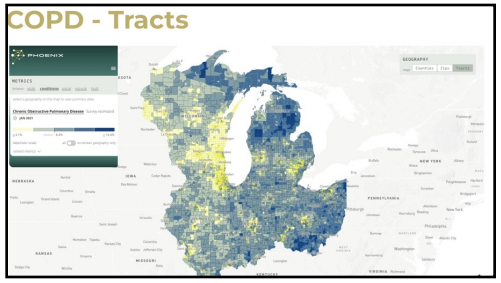
COPD - Tracts

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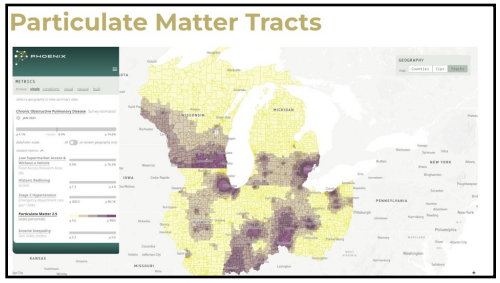
Particulate Matter Tracts

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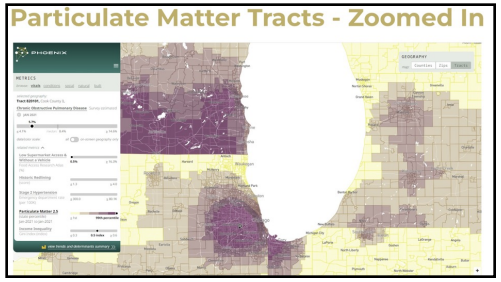
Particulate Matter Tracts - Zoomed In

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plevy@med.wayne.edu

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