A Neighborhood’s Built Environment May Have Numerous Effects on Its Residents’ Health

Examining the interaction between social environment and the health of low-income populations in Oregon

SUMMARY

Although the Affordable Care Act is extending Medicaid coverage to more low-income adults in some states, better access to medical care may not guarantee better health because it does little to address the environmental factors that also affect health.

From November 2010 to February 2013, researchers from the Oregon Health Study assessed links between health and the use of health care among low-income residents of Portland and the characteristics of the neighborhoods where they live. They also plan to assess the role of the built environment in mediating the connection between health insurance and health care use and outcomes.

The Oregon Health Study was a randomized, controlled analysis of the effects of the Oregon Health Insurance Experiment, in which a 2008 state lottery offered enrollment in the state’s Medicaid program to a random portion of the state’s low-income adults. The researchers collected information on both those who were and were not selected in the Medicaid lottery to determine how extending Medicaid to low-income adults affects their health and well-being. The study was partially funded by the Robert Wood Johnson Foundation (RWJF).1 See Program Results Report on the study.

Researchers from the Office for Oregon Health Policy and Research, the Harvard School of Public Health, the nonprofit Providence Health & Services in Portland, Portland State University, and Columbia University collaborated on this project to augment the study with detailed information on neighborhood characteristics of those participating in the lottery.

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1 RWJF’s grants: ID# 64301 ($247,925, May 1, 2008 to February 28, 2011) and ID# 64964 ($2,498,965, November 15, 2008 to November 14, 2011)
**Key Findings**

The researchers’ preliminary findings include:

- A neighborhood’s built environment has a complex relationship with residents’ health. For example, the more grocery stores are in close proximity to where people live, the lower their blood pressures and body mass indexes tend to be.

- Low-income neighborhoods vary significantly in the physical and social characteristics that affect health. For example, the number of grocery stores in low-income neighborhoods ranged from 0 to more than 30.

- The relationship between a neighborhood’s racial and ethnic composition and its physical and social characteristics also varies widely. For example, Blacks and Hispanics are more likely to live in neighborhoods with certain positive and negative characteristics, while Whites are more likely to live in neighborhoods with other attributes.

**Funding**

RWJF provided a grant of $270,065 for this project. The Centers for Medicare & Medicaid Services provided matching funds.

**CONTEXT**

RWJF supported creation of the Oregon Health Research and Evaluation Collaborative, which initially provided an umbrella for the Oregon Health Study through the Foundation’s *State Coverage Initiatives*. The Foundation also provided several grants to support multiple components of the Oregon Health Study and its offshoots.²

For the *Oregon Health Study*, researchers used health records, personal interviews, and clinical screenings to develop health profiles of 6,387 low-income adults selected by the lottery, and 5,842 adults not selected. The team found that those who enrolled in Medicaid reaped a number of benefits, including greater access to health care, improved self-reported health, lower rates of depression, and more financial security.

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² Additional RWJF funding for testing the impact of the lottery included two grants described in footnote 1, page 1 of this report. For findings, see the Program Results Report at www.rwjf.org/en/research-publications/find-rwjf-research/2013/10/what-does-expanding-medicaid-do-for-low-income-adults-.html.
However, the research team also found that Medicaid did not seem to have a discernible impact on conditions such as high blood pressure, high cholesterol, and diabetes.³

That may reflect the fact that social and physical environments are key drivers of health, as shown by a growing body of research. According to one study, “Although access to care is a necessary component of population health, concerted policy action in income security, education, housing, nutrition/food security, and the environment is also critical in efforts to improve health among socially disadvantaged populations.”⁴

However, the United States invests only 5 percent of its health spending in community-based strategies for improving health.⁵ To develop a comprehensive approach to improving health, policy-makers need more information on the interaction among insurance coverage, the physical and social environment, and people’s health.

**RWJF’s Interest in This Area**

In 2009, RWJF’s Commission to Build a Healthier America released recommendations on factors beyond medical care that influence health. The recommendations focused on the importance of safe streets and housing, as well as access to nutritious foods and opportunities for exercise. (The commission plans to issue further recommendations on early childhood development and healthy communities in early 2014.)

**THE PROJECT**

To assess the impact of neighborhood environments on the health of participants in the Oregon Health Study, the researchers first profiled the neighborhoods where the participants lived. For this work, the research team drew on the Active Neighborhood Checklist developed through Active Living Research, an RWJF national program (see

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To create the neighborhood profiles, six full-time auditors spent a year evaluating the attributes of more than 14,000 street segments in 196 census tracts in the Portland area. The auditors recorded the information on iPads running software designed for the study, with multiple auditors coding overlapping segments for reliability. The team combined this information with data from numerous sources using validated instruments to capture five key aspects of the social and built environment:

- **Socioeconomic status.** Researchers generated a “deprivation index score” for each neighborhood reflecting the degree of hardship faced by residents.\(^6\) The score accounted for characteristics such as the share of residents without a high school degree, and the share unemployed or receiving public assistance. The score also took into account the share of residents living in rental units, households headed by women with dependent children, and households with more than one person per room.

- **Nutrition and access to healthy food.** The team analyzed the number of grocery stores, fast food restaurants, and convenience stores in each neighborhood. The team also evaluated the distance from residents’ homes to the nearest full-service grocery store, the amount of time required to get to the nearest full-service grocery store using mass transit, the affordability of local grocery stores, and the relative density of fast food outlets.

- **Active living profile.** The research team assessed the walkability (including presence and condition of sidewalks and cross-walks), bike friendliness, and access to parks and other green spaces in each neighborhood.

- **Environmental quality.** Measures included the presence or lack of graffiti, litter, abandoned buildings; benches, fountains, and other amenities; public art; pedestrian-scale lighting; traffic noise; and tree cover.

- **Other Sources.** The team combined information from additional sources, including crime statistics to determine the relative safety of neighborhoods, city planning data including transit connectivity, area-level demographics, and business licensing data.

The researchers combined the resulting neighborhood profiles with information on participants’ health (including body mass index, blood pressure, and depression), individual demographic and socioeconomic information, and insurance coverage obtained through the Oregon Health Study.

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FINDINGS

In a report to RWJF and an interview for this report, the researchers reported these preliminary results from their ongoing analysis:

- **A neighborhood’s built environment may have numerous effects on residents’ health.** For example:
  
  - The more grocery stores in close proximity to where people live, the lower their blood pressure and body mass index tend to be.
  
  - Having more fast food outlets in the neighborhoods where people live is linked to higher body mass index.
  
  - People who live in more economically deprived neighborhoods are more likely to be depressed, and also more likely to be overweight.
  
  - People who live in neighborhoods with higher rates of violent crime are more likely to be overweight.

- **Contrary to common expectations, low-income neighborhoods vary significantly in their physical and social characteristics.** For example:
  
  - The median number of grocery stores in the low-income neighborhoods was around seven—but ranged from zero to more than 30.
  
  - The median number of crimes per thousand residents in these neighborhoods was around 70—but ranged from almost none to nearly 400.

  “Just because a neighborhood doesn’t have a park doesn’t mean it doesn’t have a grocery store,” observed project co-director Katherine Baicker, PhD, professor of health economics at Harvard School of Public Health. “There are all sorts of different combinations, and those factors vary within these neighborhoods … even though [the neighborhoods] are all by and large very low income.”

- **The relationship between a neighborhood’s racial and ethnic composition and its physical and social characteristics also varies widely.** For example:
  
  - Fewer than half of non-Hispanic Whites lived in neighborhoods with relatively high deprivation indexes—that is, with lower socioeconomic profiles and higher crime rates. Substantially more than half of Black and Hispanic participants lived in such neighborhoods.
  
  - Non-Hispanic Blacks were more likely to live in neighborhoods with good walkability scores, and were also more likely to live close to grocery stores.

Overall, “some neighborhoods are positive in certain areas and negative in others, making it difficult to simply classify them as ‘good’ or ‘bad’ places to live,” according to the research team. “Our data will help us tease out which factors are
most important” in mediating links between health and insurance coverage—the next step in the researchers’ analysis.

**SIGNIFICANCE OF THE PROJECT**

Even as the research team works to complete its analysis, its early findings are influencing policy and practice in Oregon. For example, the team is:

- Working with Metro, the regional planning agency; TriMet, the regional transit authority; and the Portland Bureau of Transportation to consider the physical and social determinants of health in choosing and designing infrastructure projects.

- Applying with the Portland Bureau of Transportation for funding to improve walkability and other health-related attributes of neighborhoods. Methods for collecting and analyzing data created for this project will serve as cornerstones for both planning and evaluation.

- Working with the Oregon Health Authority to integrate data on the social determinants of health—and the methods for gathering that information—into the state’s health reform efforts. These focus on spurring providers to form coordinated care organizations, which receive one payment for providing all care that meets quality standards to each enrollee, and better disease management and health outcomes.

- Partnering with HealthShare—a coordinated care organization for nearly all Medicaid beneficiaries in the Portland area—to combine neighborhood profiles with information on the health care needs of enrollees and their use of care. HealthShare will tap the analysis to target health intervention projects in Portland.

- Working with a nonprofit in north Portland to use data on the environmental determinants of health to build community gardens and expand green spaces in a low-income neighborhood.

**LESSONS LEARNED**

1. **Neighborhood characteristics are complex and hard to categorize.** The research team spent months building a reliable system for creating the neighborhood profiles, according to Bill J. Wright, PhD, project co-director and associate director of the Center for Outcomes Research and Education at Providence Health & Services. For example, when a sidewalk turns into a footpath, should auditors record that the sidewalk ends? What if a construction site interrupts the sidewalk?

   After developing a consistent approach to coding neighborhoods, the team then had to build and refine the iPad application that integrated the information with GIS data, so auditors could pinpoint exactly where they were standing. “It was all boots on the ground—trying to get a coding system that will capture the complexity of real
neighborhoods,” Wright notes. “You're trying to balance the need to systematize the coding with still being true to the spirit of what you're trying to collect.”

2. **Give data analysts a voice in data collection.** The analysts participated in teams that decided what information the auditors would collect, and in what forms. For example, in determining ease of access to public parks, the analysts needed to know not only their location but also that of park entrances, compared with where residents live. Similarly, the number of miles low-income residents must travel to get to a grocery store proved less important than how long the journey takes on public transportation.

   “Thinking about how you’re going to use the data as you’re figuring out how you’re going to collect it ensures that you’ll end up with usable data,” says Baicker. And “having the analysts and the data collectors part of the same team—rather than farming out data collection—makes it more likely that you’ll get the information you really need.”

**AFTERWARD**

Having collected these rich new data, the researchers are now pursuing the second half of the project: analyzing the interplay between insurance coverage, neighborhood characteristics, and residents’ health and use of health services. The team plans to write several journal articles and policy briefs on its findings, such as on links among physical and social environments; health behaviors such as diet and exercise; and hospitalization rates and reliance on emergency departments.

The researchers have also received a grant from RWJF to assess the impact on health and health care use of Oregon’s expanded efforts to encourage people to enroll in Medicaid.7

The team plans to make its data collection methods available to other researchers.

In addition, RWJF made a grant to Providence Health & Services8 to examine whether access to insurance positively impacts adult health outcomes for individuals who experienced childhood trauma. For findings, see the Program Results Report.

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7 Grant ID#70592 ($249,055, January 15, 2013 to January 14, 2016)  
8 Grant ID# 69666 ($269,532, January 1, 2012 to January 14, 2013)