Excerpt from

Neighborhoods and Health:

Building Evidence for Local Policy

By Kathryn L.S. Pettit, G. Thomas Kingsley, and Claudia J. Coulton
With Jessica Cigna

May 2003

SUBMITTED TO
The Office of the Assistant Secretary for Planning and Evaluation
U.S. Department of Health and Human Services

SUBMITTED BY
The Urban Institute
2100 M Street NW, Washington DC

Delivery Order 19, Contract No. HHS-100-99-0003.

Section 1

INTRODUCTION: THE PROJECT AND THE REPORT

This document is the final report of the Development and Use of Neighborhood Health Analysis project, which has been conducted by the Urban Institute (UI) under the sponsorship of the U.S. Department of Health and Human Services (HHS), Office of the Assistant Secretary for Planning and Evaluation (ASPE) through a contract that began in 2001.[1] The work period ran from September 2001 through April 2003.

The project was motivated by an issue of growing importance to health policy. It is increasingly recognized that variations in neighborhood conditions are critical to health outcomes and program options—in almost all urban areas, serious health problems are highly concentrated in a fairly small number of distressed neighborhoods—yet only a handful of U.S. cities now have data that allow them to analyze health problems constructively at the neighborhood level.

The research was designed to take advantage of an initiative that offers special advantages in at least beginning to address this issue: the National Neighborhood Indicators Partnership (NNIP). NNIP is a collaborative effort by the Urban Institute and local partners in 20 cities to further the development and use of neighborhood information systems in local policy making and community building.[2]

NNIP's local partners represent the majority of the local organizations in this country that have built advanced information systems with integrated and recurrently updated data on neighborhood conditions in their cities. Thus, NNIP is particularly well prepared to provide both (1) relevant data and analysis (comparable across sites) and (2) practical guidance on developing local data systems for health analysis and using them to improve programs and policies.

---

[1] Delivery Order No. 19, under Contract No. HHS-100-99-0003.

[2] The 20 NNIP partners are identified in annex A of this report. That annex also describes the purposes of NNIP, its activities and its accomplishments in more detail.

This section introduces the project. We begin by describing the project's purposes and overall structure. We then discuss in more depth our approach and methodology in the two major work components: cross-site analysis and site-specific analysis. Finally, we review the contents of the remainder of the report.

PURPOSES AND APPROACH

The project had two major purposes. The first was to ***contribute to expanding the range and usefulness of health indicators available at the neighborhood level in America's localities***. It is well recognized that such indicators could be extremely valuable in planning, implementing, and evaluating health programs. Yet most cities do not regularly produce any indicators of health conditions at the neighborhood level, and in those that do, the range of available information is quite limited (mostly variables that can be derived from vital statistics files). Under this project, a selected group of NNIP partners were to assemble new health related indicators and incorporate them into their data systems. With assistance from the UI, they were then to analyze variations in these indicators in relation to other variables, report on the implications of the analyses, and take steps to encourage practical use of the data in local health initiatives.

The second purpose was to ***gain greater understanding of the relationships between characteristics of neighborhoods and health outcomes***. Considerable theory supports the concept of neighborhood as an underlying cause or mediating mechanism in relation to a variety of health and social problems. This ecological research in some cities has shown that problems such as child maltreatment, low birth weight, and infant mortality are significantly clustered and correlated with such neighborhood variables as concentrated poverty, family instability, and residential turnover (Ellen, Mijanovich, and Dillman, 2001). However, these analyses have been limited as to the range of variables considered and the number of cities studied. In this research, the UI and the selected NNIP partners were to examine relationships between health indicators and a broader range of variables, including new tract-level data from the 2000 census. Special emphasis was to be given to the development of indicators pertaining to the health of children and youth, and to gaining understanding of disparities in health outcomes, considering race and other factors.

To accomplish these purposes, the first step was selecting five local NNIP partners (the maximum the budget would allow) to participate in the work. In October 2001, a request for proposals, based on the HHS accepted overall work plan for the project, was sent out to all 12 of the organizations that were partners in NNIP at that time. Proposals were received from 9 of the 12. The proposals were reviewed by a small panel of Urban Institute staff using a pre-established point system. Key factors for award included the extent and quality of the data

already maintained in their systems (in terms of potential contribution to the cross-site analysis) as well as the creativity and professionalism exhibited in their proposals to conduct the site-specific analysis. All nine proposals were responsive and met our basic standards, but the five selected came out highest in overall points.

The selected partners were: the Center on Urban Poverty and Social Change, Case Western University (Cleveland); the Piton Foundation (Denver); the Polis Center of Purdue University at Indianapolis (Indianapolis); the Urban Strategies Council (Oakland); and the Providence Plan (Providence).[3] Project work was divided into two components:

- ***Site-specific analysis,*** which entailed assembling and analyzing *new* neighborhood level indicators pertaining to local health issues in each site and using the data to further local health improvement initiatives. In this component, the local partners took the lead in the work and the Urban Institute provided guidance to them and pulled together lessons learned from all of the sites for this report.

- ***Cross-site analysis,*** which entailed conducting research on the changing urban context in each of the five study sites, examining ecological relationships between metropolitan and neighborhood conditions and health outcomes in a comparable manner across sites, and developing a *neighborhood disparity index*. This work was done by Urban Institute staff, with data and guidance provided by the local partners along the way.

Urban Institute staff also took the lead in developing concluding sections covering the assessment of issues and the presentation of recommendations. In this work, however, they relied on interviews with local NNIP partners and other local leaders in public health in the five sites.

The Neighborhood Concept. Since the "neighborhood" is a central theme of this report, it is important to say what we mean by the term at the outset. A neighborhood is generally thought of as (1) a small residential area (size not exceeding the bounds of easy walking distance), where there is (2) considerable social interaction between neighbors, and probably (3) some degree of social homogeneity (as defined by class, ethnicity, or other social characteristics). Residents have common interests because they share the same physical space, and are likely to have other common interests as well. City planners most often adopt a neighborhood concept in planning new residential areas, thinking of it as an area with a radius

[3] The local partners that submitted proposals but were not selected were the Baltimore Neighborhood Indicators Alliance, the Florida Department of Children and Families in Miami, Nonprofit Center in Milwaukee, and DC Agenda in Washington, D.C.

of roughly one-quarter to one-half mile. Probably the most prominent explicit definition was by Clarence Perry in 1929 (Gallion, 1950). Perry saw a neighborhood as the area served by one elementary school (enrollment of 1,000 to 1,200 pupils), implying a total population in the range of 4,000 to 6,000.

Looking at an existing city, the task of defining a consistent set of neighborhood boundaries, satisfying to all people for all purposes, has proved to be impossible (Rossi, 1970). It is widely known that the extent of social cohesion and organization can vary widely across neighborhoods, and a number of studies (e.g., Lynch 1960) have shown that residents of the same area often see the boundaries of their neighborhood differently.

Nonetheless, there is wide agreement that the concept is important - that the neighborhood context can have important impacts on people's lives (Ellen and Turner, 1997). And, while recognizing that there can be no all-satisfying way to define boundaries, several acceptable approaches have been found to make the concept operational. First, community groups often come together to agree on boundary definitions of their own neighborhood for an improvement initiative. Second, many cities have adopted a set of "general purpose" neighborhood definitions that seem to work reasonably well for many purposes, even if individual communities sometimes develop alternatives (see further discussion in Kingsley, 1999).

Third, some cities and most national researchers rely on census tract boundaries as reasonable approximations of neighborhoods. Census tracts have an average population of around 4,000; thus they approximate the size of a neighborhood as traditionally defined. Also, in designing tracts initially, the Census Bureau has tried to be sensitive to what cities have regarded as important physical and socio-economic boundaries. Tracts cannot be expected to represent neighborhoods the way all local residents would define them, and tract analysis does not indicate patterns of intensity within tracts. The Oakland study described in section 5 provides an example of an alternative approach using isopleth maps. Even with these limitations, analysis of spatial patterns and trends using census tracts can be extremely valuable, and that is the approach we use in this report.

SITE-SPECIFIC ANALYSIS

In this component, the selected NNIP partners were asked to assemble and analyze *new* neighborhood level indicators pertaining to local health issues (data not already in the local information system they maintain), and to do so in a way that would contribute directly to local health improvement initiatives in their cities. They were asked to choose topics that were recognized as important in local policy deliberations.

This component, therefore, was to contribute to both of the project's major purposes. First, it would include analysis of ecological relationships utilizing the new health indicators the sites identified in relation to the other demographic and contextual data already assembled. Second, the experiences of the sites in conducting the work would provide lessons on (1) approaches and barriers to expanding the availability of health indicators at the neighborhood level and (2) the efficacy of various processes of applying such data in local policy-making and program implementation.

Research Questions

For the site-specific analysis, HHS specified the following research questions:

1. What ecological correlations emerge between the unique health, demographic, and contextual variables selected for study by each site?
2. Are census tract data useful for identifying contiguous or non-contiguous groups on the basis of health and demographic indicators?
3. What implications for policy and planning do these findings have?
4. As a result of site-specific analysis, are any actions planned such as specific public health initiatives, strategic plans, or metropolitan-wide policy changes?

Study Topics

In their proposals, the five sites specified the topics they would examine. In their selection of a topic, the sites were asked to try to meet two implied requirements simultaneously. First, they needed a health-related topic pertaining to children or youth (if possible) that was already recognized as important in policy discussions in the community. Second, they needed a topic that offered a reasonable prospect for them to acquire and analyze new data in the time available and one in which their analyses would take community understanding of the issue to a new level.

We recognized at the outset that there would be limits to what we could accomplish in this component given our schedule. It might prove impossible, for example, for some sites to overcome bureaucratic barriers to data assembly, or to do an adequate job of data editing, in the time available. Similarly, policy change processes started-off by the partners' new studies could not be expected to have an impact on health outcomes in the limited time remaining in the contract period. Nonetheless, it was judged that valuable insights could be gained from a serious critical examination of these experiences, even if partial. The selected topics were as follows:

- ***Cleveland*** developed neighborhood indicators of child access to primary care using eligibility, claims, and encounter data from Ohio's Medicaid data system. Cleveland's analysis sought to clarify relationships between neighborhood conditions and children's access to primary care (as indicated by use of emergency services for non-emergency conditions and regularly-scheduled well-child doctor's visits).
- ***Denver*** explored new datasets focused on (1) the relationship between the spatial pattern of environmental hazards and other conditions and the locations of Denver's poorer neighborhoods (where children represent a much higher than average share of the population) and (2) violence as a public health issue for children using data files on violent crime, violence-related school suspensions and expulsions, and child abuse and neglect.
- ***Indianapolis*** used spatial analysis to study the relationship between community conditions and obesity in children in Marion County from 1998 to 2000. The contextual variables they used came from three broad areas including socioeconomic conditions, proximity to exercise opportunities, and social barriers to physical activity.
- ***Oakland*** focused on the relationship between neighborhood conditions and the incidence of tuberculosis. Staff sought in particular to examine fresh approaches to analyzing the data, applying new techniques developed in the fields of Geographic Information Systems (GIS) and spatial statistics.
- ***Providence*** undertook analysis to determine the extent of residential mobility of young children and the impact of mobility on delivery of child health care services. In particular, Providence looked at measures of continuity of care (from immunization data files) timely blood lead screenings, and consistent care with a primary provider.

CROSS-SITE ANALYSIS

This component was designed as our main contributor to the project's first purpose. As noted, the project's central activity was examining ecological relationships between various neighborhood conditions and health outcomes in a comparable manner across the five study sites. Data for the analysis included statistics from the 1990 and 2000 censuses as well as comparably defined health and context variables drawn from the information systems maintained by our selected NNIP partners. The research employed charts, quantitative analysis of relationships (bi-variate and multi-variate), and selective mapping to illustrate some of these relationships.

The work began with a context analysis; a broader examination of conditions and trends in the study sites in the 1990s at the neighborhood, city, and metropolitan levels. It also

included the use of data from all five sites to develop a *neighborhood health disparity index* that can be applied in policy analysis in other cities.

Research Questions

HHS posed four major research questions for the cross-site analysis:

1. What are the similarities and differences across the selected NNIP sites with regard to the ecological correlations among the selected health, demographic, and contextual variables in the 1990s?
2. How have ecological correlations among selected health, demographic, and contextual variables changed in the 1990s, and what contextual variables might account for these changes?
3. Are the 2000 census tract data useful for identifying contiguous or noncontiguous groupings based on their health and demographic characteristics in each NNIP site?[4]
4. What implications do the ecological analyses have for community approaches to problem solving in the health area?

Data Assembly

To implement the research, we began by formulating a series of working hypotheses to be tested, building off the rapidly evolving literature in this field (see the References section). Consistent with those hypotheses, we attempted to do the work to best take advantage of U.S. Census data and the data sets maintained by the five selected partner organizations. Specifically, analysis relied on the following types of variables at the neighborhood level:

1. Health variables derived from vital records maintained by the five NNIP partners. Examples include teen birth rates, percentage of births with early prenatal care, rate of low-birth weight babies, and age-adjusted death rates.
2. Demographic variables derived from the 1990 and 2000 censuses, such as age structure, race/ethnicity, poverty rate, number of households by type, and adults by level of education completed.

[4] U.S. Census tracts are locally-determined geographic units, ranging in size from 2,500 to 8,000 persons. Tracts are meant to approximate “neighborhoods” by capturing a group of residents with similar population characteristics, economic status, and living conditions. Tracts can be used by themselves as units of analysis, or as the building blocks to create larger neighborhood areas.

3. Contextual variables referring to the economic, physical, and social environment of the neighborhood (derived from the census and partners' systems), including crime rates and rates of welfare recipiency.

Context Analysis

Background information on urban trends is needed to facilitate understanding of the context for the ecological analyses that are the centerpiece of this research. Whereas conditions in America's inner-city neighborhoods generally worsened in the 1980s, census and other data suggest a much more diverse range of trends and outcomes in the 1990s. Accordingly, the first step in our cross-site analysis was to examine general patterns of social, economic, and physical change in that decade in the five NNIP cities and compare their experiences with those in the 100 largest metropolitan areas. Measures are presented in categories related to our study hypotheses (see below).

Ecological Analysis

The literature of the field suggests that neighborhood level health outcomes are influenced by a variety of types of conditions. Our review of the literature led to the development of the specific hypotheses to be tested in this research. The hypotheses fall into five categories defined by types of independent variables involved. These include four defined by neighborhood level measures: (1) socioeconomic conditions; (2) physical stressors; (3) social stressors; and (4) social networks. Hypotheses are primarily defined with respect to ecological relationships at a point in time, but some address changes in those relationships over time. The dependent variables (health indicators) fall into two categories (1) maternal and infant health, and (2) mortality.

The data are used to examine the hypothesized relationships in four ways. First, we present uniform tables, maps and graphics of basic health conditions and trends for all sites. Second, we present bi-variate correlation analysis to express the relationships between all indicators in our hypotheses (health, demographic, and context) that we have constructed by neighborhood in each city.

Third, we have conducted multiple regression analysis to examine relationships of various measures to health outcomes. We do not have the unit-record data on characteristics of individuals and families to perform the sorts of multi-level regressions that could explain influences on change in outcomes more completely. However, regressions with tract-level variables across five different cities offer lessons about concentration that should be valuable for policy.

As implied by the research questions noted earlier, these analyses examine the relationships within sites and then consider similarities and differences in the findings across sites (i.e. the extent to which levels and changes in health conditions found in one city hold up in similar types of neighborhoods in other cities). We also examine how these relationships have changed over time during the 1990s in the five cities.

In this work, we deal explicitly with what is often termed the "rare events" issue. Even when one has complete annual data for a neighborhood (say at the census tract level) over several years, the numbers of health-relevant events (specific types of births, deaths, and incidences of health problems) may be so small that they are subject to random variation (i.e., they may not exhibit a reliable trend). This issue is normally dealt with by aggregating years and/or neighborhoods. In this work, we assess how varying approaches to aggregation affect results.

Disparity Index

We believe there is a need for one or more "neighborhood health disparity indexes." In an Annex to the report, we review relevant concepts, present alternative index formulations, show how index values vary across our five cities and over time.

ISSUES AND RECOMMENDATIONS

Our final aim was to draw on the results of our studies (and other sources to a limited extent) to offer guidance for the future of the field. We do this both with respect to technical aspects (potential for the development and use of neighborhood level data in health research) and, less extensively, policy development.

The first task was to explore the potentials for expanding the scope and extent of health-relevant data that is available at the neighborhood level in America's communities. To do this, we both review the experiences of the NNIP partners in this study and scan prior literature on the range of possible data sources available. We examine the problems the partners faced in expanding their data sets in these areas, how they tried to address these problems, and broader steps that might be taken (by governments at different levels and other institutions, as well as NNIP-type intermediaries) to substantially expand the local availability of data of this type.

Finally, we consider contributions to local policy making. The most important source for this is the evidence in Part 1 on what has happened to this point in response to the site-specific studies in each city, and what discussions with NNIP partners and other local leaders suggest may happen in follow-up activities regarding these issues in the future. We draw on these

descriptions and other experiences (in NNIP sites and elsewhere) in suggesting lessons for the effective use of neighborhood level data in health policy and program design.

ORGANIZATION OF THIS REPORT

The organization of the remainder of this report parallels the discussion of the work above. The report has three parts:

Part 1 – Site-Specific Analysis

Part 1 offers summaries of each of the five site-specific studies: Cleveland (section 2), Denver (section 3), Indianapolis (section 4), Oakland (section 5), and Providence (section 6).

Part 2– Cross-Site Analysis

Because of the complexity involved, this part opens with a more detailed discussion of approach and methodology that also includes a discussion of data sources (section 7). We then present the results of the context analysis (section 8) and a straightforward description of trends in health conditions in the five sites (section 9). Section 10 presents our ecological research (bivariate correlations and multivariate regression analysis) and spatial mapping.

Part 3 – Issues and Recommendations

This part (section 11) incorporates our broader assessments of issues and presentation of recommendations on the expansion and improvement of neighborhood-level data and the application of such data in policy development.

The report has a list of References and several Annexes: (A) a description of the National Neighborhood Indicators Partnership (NNIP); (B) a description of the analysis supporting the development of a neighborhood disparity index; and (C) a compilation of supporting tables.