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The miasma theory of disease went out of style in the 1850s. The discovery that bacteria, rather than vapors emanating from the soil at night, caused illness launched the modern public health profession. In the intervening 150 years, public health practitioners have focused on controlling disease through sanitary infrastructure and educational campaigns.

Despite these great strides, the geography of HIV illuminates the inconvenient truth that relationships between health and place persist. New York and New Jersey, which together are home to 9.3% of U.S. residents, were the site of 22.3% of AIDS cases recorded by the CDC through 2007. Not only do Oregon and Washington have a much smaller population (3.5% of U.S. residents), their burden of AIDS (1.8% of U.S. cases to date) is far lower (Henry J. Kaiser Family Foundation). If miasma isn’t behind these differences, what is?

Health and Place

Our health is affected by genes and behavior, and also by our physical and social living conditions. Unhealthy living conditions could include dilapidated housing, a lack of positive role models – and much more. The differences between places can be stark, as illustrated by a recent documentary on diabetes in Arizona. On the Tohono O’odham Indian reservation, up to 50% of residents are diabetic. In a nearby working class city, the rate is 11%; in the wealthy enclave of Scottsdale it is 5%. The tangle of cultural, social, and economic factors that make each place unique constitutes what sociologists Mark LaGory and Kevin Fitzpatrick term a “mosaic” of risk and protection. Poverty and lack of opportunity are some of the risks that destabilize reservation communities, while Scottsdale is ripe with protective features like recreational facilities and well-funded schools.

HIV is similarly connected to social patterns. An exhaustive study of New York City, Rod and Deborah Wallace’s book *A Plague on Your Houses* describes how systematic disinvestment in certain neighborhoods led to social instability that seeded HIV through the metropolitan area. This atlas considers how local place dynamics may affect the disease profile in and around Portland. This atlas asks how social conditions may influence the spatial distribution of the roughly 10,000 cases of HIV in the metroscape (Portland Area Global AIDS Coalition).

### Neighborhood Stability

To explore local conditions, we mapped Census 2000 data related to neighborhood stability. We selected three relevant variables: percentage of residents with incomes below the poverty line (figure 1), percentage of housing units occupied by renters (figure 2), and percentage of residents living in different housing unit five years prior (figure 3).

![Percentage of Block Group Residents with Income Below Poverty Level in 1999](source: U.S. Census, 2000)
We then mapped these Census data for all block groups in the Portland metropolitan area: Clackamas, Columbia, Multnomah, Washington, and Yamhill counties in Oregon; and Clark County, Washington. (Geographic units that roughly approximate neighborhoods, Census block groups contain 1,500 residents on average. The smaller a block group, the higher its population density.) In this atlas, we first explore the Census variables individually, then combine them into a Neighborhood Stability Index, and finally consider the relationship of the index to HIV cases.

Poverty is highest in urban areas, especially in the center of Portland (figure 1). While poverty is found throughout the metroscape, there are notable concentrations of high-poverty neighborhoods in the Downtown and Inner Northeast areas of Portland and in Gresham along Burnside Ave. Poverty can destabilize neighborhoods by limiting the capital available to support individual and collective undertakings. It also feeds informal economic activity, which can include drug and sex exchanges that put participants at risk for HIV. Might residents of these neighborhoods be especially vulnerable to HIV?

Another aspect of neighborhood stability is home ownership. In theory, homeowners want to assure return on investment by maintaining neighborhood quality. Those who live in their investment are doubly committed for the sake of their personal quality of life. In the metroscape, many of the most densely populated areas (the smallest block groups) have the highest proportion of renters (figure 2). This includes Central Portland and Vancouver, as well as the core of cities like Beaverton and Hillsboro in Washington County, and small cities like McMinnville and Newberg in Yamhill County. In the lower right-hand corner of the map, one large block group has a relatively high proportion of renters. We are not sure why this rural area, which is at the southern end of the
Molalla River and Colton School Districts, is so different from neighboring block groups. If these neighborhoods are indeed less stable, will residents be able to maintain social networks that foster healthy norms and mobilize resources to confront health problems? Does rental housing expose city neighborhoods to the “urban health penalty” said to disadvantage urbanites?

Housing tenure may not be the most important measure of neighborhood stability. Especially in places where renting is common, long-time renters may perform the functions usually associated with homeowners. So, we look next at the length of housing tenure (figure 3). Neighborhoods with highest proportion of long-term residents are in rural areas, outside cities’ Urban Growth Boundaries. Within Portland, areas of high transience include the Downtown Central Business District and the Inner East Side. Central neighborhoods like these are often popular with young people interested in cultural amenities. Downtown Portland is also home to the state’s largest university and a significant student population. These groups move often. Beaverton and Hillsboro in Washington County, which have experienced recent development and population influx, also have high turnover. In Clark County, similar patterns of housing tenure and flux can be found in Vancouver and Camas along the Columbia River, and further north in Battleground. Such changes in population may inhibit the formation of social networks, and the benefits people gain from drawing on this collective social capital. The various causes of transience, however, may have very different effects on neighborhood well-being. How might the health consequences of student neighborhoods, declining neighborhoods, and newly-developing neighborhoods vary?

Creating a Neighborhood Stability Index

After looking at individual variables, we used statistical techniques to create a measure of relative neighborhood stability that incorporated them all.
Neighborhood Stability Index and HIV Cases in the Portland Region

Figure 4

Neighborhood Stability Index (U.S. Census, 2000)

Number of HIV Cases per Block Group 2002-2007

- Most stable
- Very stable
- Somewhat stable
- Somewhat unstable
- Very unstable
- Most unstable

Sources: Public Health Division, Oregon Dept. of Human Services; U.S. Census 2000
Number of HIV Cases per Block Group 2002-2007

<table>
<thead>
<tr>
<th>Neighborhood Stability Index (U.S. Census, 2000)</th>
<th>Number of HIV Cases per Block Group 2002-2007</th>
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<tbody>
<tr>
<td>Most stable</td>
<td>1 - 2</td>
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<tr>
<td>Very stable</td>
<td>3 - 6</td>
</tr>
<tr>
<td>Somewhat stable</td>
<td>7 - 14</td>
</tr>
<tr>
<td>Somewhat unstable</td>
<td>15 - 23</td>
</tr>
</tbody>
</table>

Sources: Public Health Division, Oregon Dept. of Human Services; U.S. Census 2000

Figure 5
For each block group, we computed a score expressing the neighborhood’s stability relative to other block groups in its county (figure 4). We call this the Neighborhood Stability Index. While each county has the full range of Neighborhood Stability Index scores, like neighborhoods cluster together. Some of the most stable areas include historically desirable neighborhoods like the Southwest Hills. Low-stability clusters include Downtown Portland and Old Town/Chinatown, which are known for single-room-occupancy hotels and street people with high social service needs. Large highways travel through many low-stability areas. For example, most of the block groups along Interstate 5 have low stability scores. This is particularly notable in North Portland: could the instability be a long-term consequence of disruption by highway development and disinvestment in the historically Black Albina corridor? Or are these neighborhoods unpopular because of the noise, traffic, and air pollution that characterize life near highways? And how might the recent gentrification of the area be altering these dynamics?

**Neighborhood Stability and HIV**

Our final maps combine the Neighborhood Stability Index with HIV case data. By summing the number of cases reported in each block group from 2002-2007, we computed a rough measure of neighborhood HIV incidence (figure 5). Clark County, Washington incidence data are not included in these maps because they were not available from Washington State. Officials did not routinely collect address data for HIV cases until 2006 and do not publish the small number of cases recorded in order to protect the confidentiality of county residents. As in other areas of the U.S., HIV cases in the metroscape concentrate in the most urbanized areas.

A closer look at the heart of the metroscape reveals a correlation between the Neighborhood Stability Index and HIV incidence (Map 6). Prestigious neighborhoods like Eastmoreland, Beaumont-Wilshire, and Laurelhurst are highly stable and have low HIV incidence. Downtown and Central East Side neighborhoods are relatively unstable and have the highest HIV incidence. This correlation is statistically significant for the five Oregon counties included in the maps. But through what pathways does neighborhood stability affect HIV incidence? In high-stability neighborhoods, do strong social institutions help educate people about HIV and stem its transmission? Or do neighborhoods’ reputations for exclusivity discourage people at risk of HIV from living there? For low-stability neighborhoods, do the strain of poverty and anonymity of transience create a laissez-faire culture that tolerates or encourages high-risk activities? Or are these neighborhoods refuges for the down-and-out, embracing people with social and health challenges? Or is the embrace less than warm, with disenfranchised neighborhoods saddling the burden of people and facilities that are distasteful to more stable and politically powerful neighborhoods? Whichever is the case, the neighborhoods have disproportionate disease burdens.

If HIV concentrates in certain places, how can understandings of place be used to quell its devastating effects? “Meeting people where they’re at” has long been a mantra of public health outreach workers, but the scope of public health practice may also extend to changing these places. In addition to red ribbons and behavior change campaigns, how might public health interventions confront poverty and other destabilizing conditions? Could economic tactics like advocating for a family wage and responsible expansion of home ownership the health consequences of place? How might strengthening local institutions and fostering successful public spaces build social relationships that stem the spread of disease? While the novelty of a place-based approach to public health is invigorating, it also has its risks. Some of the less stable neighborhoods are already known for their travails; could targeting them reinforce bad reputations or stigmatize place or people? As always, public health practitioners have their work cut out for them.

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