Invited Commentary

Invited Commentary: Repeated Measures, Selection Bias, and Effect Identification in Neighborhood Effect Studies

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Research on neighborhood effects faces enormous methodological challenges, with selection bias being near the top of the list. In this issue of the *Journal* (*Am J Epidemiol. 2014;180(8):776–784*), Professor Jokela addresses this issue with novel repeated measures data and models that decompose putative effects into those within and between persons. His contribution shows that within-person neighborhood effects are quite modest and that there is evidence of selection bias between persons. Like all research, the work rests on assumptions. Unfortunately, such assumptions are difficult to substantiate or validate in this context. A consequentialist epidemiologic perspective compels further innovation and a larger social epidemiologic imagination.

causal; counterfactual; dynamic; methodology

Professor Jokela’s new article (1) is a thoughtful and important contribution to the social epidemiologic literature addressing neighborhood effects. The research uses rich repeated-measures data, defensible neighborhood quality measures, reasonable health measures, and an interesting set of analyses aimed at illuminating the problem of social selection, which has vexed researchers for many years.

Jokela’s analyses are based on the idea that persons who move to different neighborhoods are exposed to new neighborhood environments, be they better or worse. Obviously there may be lateral moves, which is to say moves in which the new neighborhood environment is much like the original neighborhood environment. In fact, lateral moves are probably the norm. In any case, Jokela’s is a within-person design; persons serve as their own counterfactuals when exposed to different neighborhood environments. The large number of people analyzed serve as replicates and thus increase precision of between-person averages. The large number of people analyzed serve as replicates and thus increase precision of between-person averages. As usual, the questions are how different neighborhood environments impact health and to what extent better or worse health compels one to move to a better or worse neighborhood. To answer this, Jokela relies primarily on fixed-effect models of within-person change to decompose effect estimates into within-person and between-person associations.

In simplest terms, Jokela’s analyses suggest that people’s health influences their choice of neighborhood and that neighborhood correlations with health are likely due to between-person differences and related sorting by socioeconomic and health status, not necessarily neighborhood environment impact per se. In other words, Jokela’s work implies that many prior estimates are biased and that neighborhoods may have less impact on health than previously thought. One might quibble with his data, measures, or model, but the results appear as robust as almost any.

We should not be surprised by Jokela’s results. To the contrary, finding either a strong association of neighborhoods with health or no association of health with neighborhood selection in a within-person design would have been surprising. Here are some reasons why.

First, it seems that few people (to be more accurate, few families/households) make dramatic moves from one kind of neighborhood environment to another. Though no direct data are presented, I would be surprised to learn that many people moved to substantially more or less advantaged places in any given discrete move. Such moves often require an exogenous shock, like an unexpected infusion of resources from, say, an insurance settlement, or an unexpected illness without a sufficient safety net. Further, dramatic moves require imagination and a desire for a life-altering change (e.g., moving for new job). Ongoing research seems to show that it can be difficult for disadvantaged persons to imagine dramatic moves because they too often feel helpless in this regard and have too
few reference examples upon which to draw, to say nothing of
the many necessarily binding social relationships that are
costly to alter. As a result, most moves appear lateral or nearly
so. Accordingly, there is little “dose,” and we should not ex-
pect large within-person associations with health.

To clarify some of these issues, it seems worth suggesting
that researchers of neighborhood effects publish simple
transition proportion/probability tables, such as in Figure 1.
This simple cross-tabulation, with sample sizes of N in each
cell, holds a great deal of meaningful information. The off-
diagonal cells are of great interest, especially in the corners.
How do people end up in such cells? Is it through divorce,
a cancer diagnosis, or winning the lottery? What can be done to
facilitate upward moves or mitigate such downward moves?
Is there a linear dose-response relationship as we move off
the diagonal? When people do move to better places, what
becomes of those left behind?

Second, the persons in Jokela’s data who moved did so
more or less voluntarily. That is, they were presumably not
forced to move at gunpoint or by some other disturbing threat.
Obviously, getting sick or losing a job and having to relocate
is not desired, but the choice as to where to relocate remains at
least partially under a person’s control. Thus, subtle if not
latent characteristics or values of people who move help de-
terminate subsequent neighborhood environments. This is se-
lection within a person/household, and it may not be time
invariant. In fact, it is probably time and context dependent
and thus violates assumptions in Jokela’s model. Metaphor-
ically, the problem is akin to people choosing their own diets
to lose weight. If a repeated-measures study shows little impact
of such diets on the dieters who chose them, should we dis-
count the efficacy of such diets, or would it be better to know
the results of an experimental study that randomized people
to such diets?

Third, although it is a meaningful advance, the exposure
timeframe in Jokela’s data is just 10 years at maximum. Ex-
cept for rare cases of a move to an acutely toxic or idyllic
environment, it is hard to imagine that temporally short ex-
posures would have large influences on health measures. My
suspicion is that, save for the rare cases, neighborhood envi-
rnments have subtle impacts on most people’s outlook and
health, and these take a long time to accumulate. An environ-
mental change may be enjoyable or salubrious, but the corre-
spending difficulties of navigating a new area and social
context may mute gains. On the other hand, self-reported
health measures would probably be affected sooner rather
than later. Additionally, Jokela creatively examined neigh-
borhood satisfaction measures, which correlated as theory
predicts.

What does Jokela’s study mean for the problem of social
selection in neighborhood effects research? Among the pa-
per’s contribution is that, given assumptions about sufficient
change in neighborhood environment, control of time- and
context-dependent effects, and sufficient exposure times (to
name but a few variables), there is evidence to suggest that
people are moving to different neighborhoods because of
their health. In other words, the paper suggests selection
bias is important and probably undermines many previously
published parameter estimates. In fact, some might say that
bias is so extensive as to undermine the notion that neigh-
borhood contexts impact health more generally.

Yet, even though I appreciate Jokela’s findings, I remain
steadfast in believing that neighborhood contexts affect
health above and beyond the characteristics of any given per-
son. Imagine a newborn baby growing up with the same family
in either a good or bad neighborhood. It seems to be common
sense that exposure to the good neighborhood would be lead
to better health outcomes, all else being equal.

The trouble is one of effect identification, the teasing out or
disentangling of unbiased effects in a system of dynamic
feedback loops and dependent accumulative effects. As I
wrote 10 years ago (2), it is hard to imagine any observational
design-solving identification problems in neighborhood ef-
facts research. On the other hand, subsequent experimental
designs entailing exogenous relocation, such as Move to Op-
portunity, clearly reveal practical obstacles of perturbing the
social system’s equilibrium. Efforts to exogenously change
(i.e., improve) neighborhoods in some sort of community-
randomized trial have faced similar political, cultural, and fi-
nancial obstacles. However, such research difficulties do not
mean that the impact of neighborhoods on health is negligi-
ble. Rather, they mean that the research question is difficult
and that we may not ever get a precise unbiased estimate of
a neighborhood’s true impact. Some questions are just not
answerable (3).

What should be done? A consequentialist perspective (4)
compels us to redirect our collective energy and resources.
Perhaps it is time to address the impact of larger phenomena,
such as culture (5), religion, or the processed food industry;
or, going the other way, we may need study the impact of the
families/household or loving fathers on health. For those
wishing to stay focused on neighborhood effects, (experi-
mental) research into specific policy-relevant changes of
neighborhood environments would be most helpful. In any
case, it seems high time to expand the social epidemiologi-

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REFERENCES


