

The Public Health Disparities Geocoding Project Monograph

Geocoding and Monitoring US Socioeconomic Inequalities in Health: An introduction to using area-based socioeconomic measures

GENERATING ABSMs

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Generating ABSMs: concepts, methods, and measures

Generating area-based measures of socioeconomic position requires an explicit approach to understanding what socioeconomic inequality is and how to measure it, at multiple levels. In this section we briefly review our definitions of “social class” and “socioeconomic position,” and then delineate our approach to generating and appraising the validity and utility of our Project’s area-based socioeconomic measures (ABSMs).

Definitions: social class and socioeconomic position

Starting first with definitions, in the Public Health Disparities Geocoding Project we used the construct of “social class” to refer to social groups arising from interdependent economic relationships among people. [1-2](#) Stated simply, broad classes--like the working class, business owners, and their managerial class--exist in relationship to and co-define each other. One cannot, for example, be an employee if one does not have an employer and this distinction--between employee and employer--is not about whether one has more or less of a particular attribute, but concerns one’s relationship to work and to others through a society’s economic structure. Also at issue is an asymmetry of economic relations, whereby owners of resources (e.g., capital) gain economically from the labor or effort of employees.

Class, as such, is therefore logically and materially prior to its manifest expression in what can be referred to as socioeconomic position, an aggregate concept that includes both resource-based and prestige-based measures, as determined by both childhood and adult social class position. [1](#) Resource-based measures refer to material and social resources and assets, including income, wealth, and educational credentials; terms used to describe inadequate resources include “poverty” and “deprivation.” Prestige-based measures refer to individuals’ rank or status in a social hierarchy. The term “socioeconomic status” should accordingly be avoided both because it arbitrarily (if not intentionally) privileges “status” over material resources as a determinant of health and because it conflates pathways involving material resources with those involving psychosocial appraisals of relative status.

Measuring socioeconomic position: domains, levels, & lifecourse

Key domains of socioeconomic position relevant to understanding population health thus include: [1-2](#)

- (1) Occupational class, which can affect health both directly and indirectly, via occupational hazards and via wages or income, relevant to standard of living;
- (2) Educational attainment/credentials, usually reflective of childhood socioeconomic position and relevant to future economic prospects, and also relevant vis a vis knowledge & health literacy;

(3) Income & entitlements/subsidies, together affecting standard of living, noting that what “income” buys in a given society is related in part to what is provided by the social wage;

(4) Wealth, referring to accumulated assets, with important distinctions between what’s readily fungible or not (e.g., stocks vs equity in a home), plus also wealth’s converse, i.e., debt; and

(5) Relative social ranking, typically referring to “status” & “prestige.”

Second, each domain can be assessed at multiple levels, including: individual, household, and area or neighborhood, plus also regional, national and global. [1-5](#)

Likewise, relevant moments during the lifecourse for which one may want socioeconomic data include: in utero, infancy, childhood, plus early, middle, and late adulthood. [1-2](#)

From this vantage, we opted to create a variety of ABSMs, intended to capture diverse domains of SEP, for diverse outcomes that spanned the lifecourse, literally from birth until death.

Formulating the ABSMs from census data

As described more fully in our Project’s manuscripts, [6-9](#) we created 19 theoretically-justified ABSMs (11 single variable, 8 composite ABSMS), delineated in the [ABSM Creation Table](#). Two criteria central to formulating these ABSMS for socioeconomic position (SEP) were that they: (a) meaningfully summarized important aspects of the specified area’s socioeconomic conditions, and (b) employed socioeconomic data that could legitimately be compared over time and across regions. [1-9](#) Based on our a priori conceptual definitions of SEP and social class and US, UK, and other global evidence emphasizing detrimental effects of material deprivation on health, [10-14](#) we developed ABSMs for 6 domains of SEP: occupational class, income, poverty, wealth, education, and crowding, premised on the understanding that social class, as a social relationship, fundamentally drives the distribution of these manifest aspects of SEP. [1](#) Of note, one measure we included differs from the others: the Gini coefficient, which is a measure of within-area socioeconomic inequality rather than a measure of the average socioeconomic level of an area. [15](#) We included it because of concerns expressed about its uncritical use at the BG and CT level, given realities of economic segregation. [9,16](#)

Operationally, we generated each ABSM at each level of geography for each state. Among the composite variables, two were US analogues of the UK Townsend [4-5,17](#) and Carstairs [4-5,18](#) deprivation indices, one used the algorithm for the US Center for Disease Control and Prevention’s “Index of Local Economic Resources,” [19](#) and five were created exclusively for our study. To mirror the skewed population distribution of socioeconomic resources, “SEP1” and “SEP2” simultaneously combined categorical data on poverty, working class, and either wealth or high income. Finally, we produced an “SEP index” akin to the Townsend index, based on summation of standardized z scores of selected ABSM.

Lastly, our a priori criteria for evaluating the ABSMs pertained to: (1) external validity (did it detect the expected socioeconomic gradients for each outcome, i.e., positive, negative, or none at all?), (2) robustness (did the ABSM do so across multiple outcomes, as well as within diverse population groups?), (3) completeness (was the ABSM relatively unaffected by missing data?), and (4) user-friendliness (was it easy to understand and use?). [7-9,22](#) Based on these criteria, and the key findings we summarize in the introduction to this monograph, in the case example developed for this monograph, we focus solely on the census tract poverty ABSM.

Example:

Creating a single variable ABSM - % of persons below poverty

This section will describe how to create a single variable ABSM from census data, using the example of "percent of persons below poverty." As indicated in the [ABSM creation table](#), the data for creating this variable for 1990 is available from census table P117, available from the summary tape file 3 (STF3). P117 gives population counts of persons above and below poverty, stratified by age. As an example, the table below shows the counts for table P117 for all of Massachusetts.

**P117. Poverty Status in
1989 by Age [24]
Universe: Persons for
whom poverty status is determined**

Income in 1989 above poverty level:

Under 5 years	P1170001	346803
5 years	P1170002	67131
6 to 11 years	P1170003	376888
12 to 17 years	P1170004	366353
18 to 24 years	P1170005	520219
25 to 34 years	P1170006	1007694
35 to 44 years	P1170007	859171
45 to 54 years	P1170008	574743
55 to 59 years	P1170009	237919
60 to 64 years	P1170010	241233
65 to 74 years	P1170011	421973
75 years and over	P1170012	272949

Income in 1989 below poverty level:

Under 5 years	P1170013	58986
5 years	P1170014	11649
6 to 11 years	P1170015	60386
12 to 17 years	P1170016	45200
18 to 24 years	P1170017	78749
25 to 34 years	P1170018	83304
35 to 44 years	P1170019	49958
45 to 54 years	P1170020	27960
55 to 59 years	P1170021	13489
60 to 64 years	P1170022	17335
65 to 74 years	P1170023	33139
75 years and over	P1170024	39184

To calculate the proportion of persons below poverty for this region, we sum all categories P1170001 to P1170024 to get the denominator, and sum categories P1170013 to P1170024 to get the numerator, and then simply divide this numerator by the denominator:

$$(P1170001 + \dots + P1170012) / (P1170001 + \dots + P1170024)$$

Creating a composite ABSM – Townsend Index

Creating a composite ABSM is similar in principle to creating a single variable ABSM, but requires a few extra steps. The Townsend ABSM consists of four components, percent crowding, percent unemployment, percent of individuals who do not own cars, and percent renters. The ABSM creation table (pam – can you add this as a link) indicates where these four variables can be found as tables in the 1990 STF3 census data.

After obtaining the data from the census tables, the first step in creating the Townsend Index is to transform each area's value for each component factor j into a standardized Z score. The Z score for area i is calculated as

$$Z_{ij} = (X_{ij} - m_j) / s_j$$

Where X_{ij} is the value of component variable j for area i where m_j is the mean of component j across all areas and s_j is the standard deviation of the component variable j over all areas.



The second step to create this index is to sum the Z score values from each of the four components of the index.

Shoe Leather Research

It's one thing to see output, however, it's another to have a sense of its relevance to the real world. So, to see whether our measures made any sense, we randomly selected several addresses in Boston and took a look at them, writing down our impressions of the neighborhood- and then compared this to how the area would be characterized by our ABSMs.

This economically depressed area in Boston's Chinatown, turned out to be characterized as a highly working class, poor, low income area with high unemployment and few expensive homes.

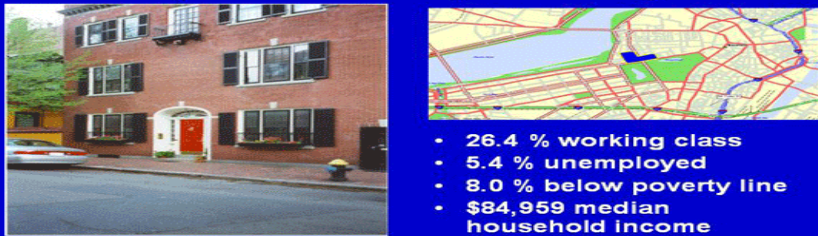
Tyler Street

- 86.4 % working class
- 15.6 % unemployed
- 26.5 % below poverty line
- \$18,607 median household income
- 5.1 % owner-occupied homes valued >\$300,000

This one house in Beacon Hill looked like it was -- and turned out to be -- in a fairly affluent area: over 75% professionals, low poverty, high income, low unemployment, and lots of expensive homes.

Mount Vernon St
(this is one home, not an apartment building)



- 26.4 % working class
- 5.4 % unemployed
- 8.0 % below poverty line
- \$84,959 median household income
- 40.2 % owner-occupied homes valued >\$300,000

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