



The Public Health Disparities Geocoding Project Monograph

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

Table 1A: Population and Race/Ethnicity specific denominator data from 1990 Census variables

Variable	Conceptual definition	Operational definition	STF 3 Table ²⁴	table coordinates ²⁴
Denominator data				
population	total population	persons	P1	P0010001
proportion "Hispanic"	self-reported "Hispanic" origin by "race"	proportion whites who identify as Hispanic	P12	$P0120006 / (P0120001 + P0120006) = \Pi w$
		proportion Blacks who identify as Hispanic	P12	$P0120007 / (P0120002 + P0120007) = \Pi b$
		proportion of Native Americans who identify as Hispanic	P12	$P0120008 / (P0120003 + P0120008) = \Pi n$
		proportion Asian and Pacific Islanders who identify as Hispanic	P12	$P0120009 / (P0120004 + P0120009) = \Pi a$
		proportion of other race/ethnicity who identify as Hispanic	P12	$P0120010 / (P0120005 + P0120010) = \Pi o$
"race" x "sex" x age (note 1)	self-reported "race/ethnicity"	White women	P14	(P014B001, ..., P014B031)
		Black women		(P014D001, ..., P014D031)
		Native American women		(P014F001, ..., P014F031)
		Asian and Pacific Islander women		(P014H001, ..., P014H031)
		other race/ethnicity women		(P014J001, ..., P014J031)
		White men		(P014A001, ..., P014A031)
		Black men		(P014C001, ..., P014C031)
		Native American men		(P014E001, ..., P014E031)
		Asian and Pacific Islander men		(P014G001, ..., P014G031)
		other race/ethnicity men		(P014I001, ..., P014I031)
"race" x "hispanic" x "sex" x age (note 1)	imputed Hispanic ethnicity by self-reported race/ethnicity	Hispanic White women	P14 (note 2)	$\Pi w * (P014B001, \dots, P014B031)$
		Hispanic Black women		$\Pi b * (P014D001, \dots, P014D031)$
		Hispanic Native American women		$\Pi n * (P014F001, \dots, P014F031)$
		Hispanic Asian and Pacific Islander women		$\Pi a * (P014H001, \dots, P014H031)$
		Hispanic other race/ethnicity women		$\Pi o * (P014J001, \dots, P014J031)$
		Hispanic White men		$\Pi w * (P014A001, \dots, P014A031)$
		Hispanic Black men		$\Pi b * (P014C001, \dots, P014C031)$
		Hispanic Native American men		$\Pi n * (P014E001, \dots, P014E031)$
		Hispanic Asian and Pacific Islander men		$\Pi a * (P014G001, \dots, P014G031)$
		Hispanic other race/ethnicity men		$\Pi o * (P014I001, \dots, P014I031)$



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Table 1B : Single Variable Area Based Socioeconomic Measures (ABSM) from 1990 Census variables

Occupational Class				
Working class ^{1,27}	Nonsupervisory employees	Percent of persons employed in predominantly working class occupations, (i.e., as non-supervisory employees, operationalized as percent of persons employed in the following 8 of 13 census-based occupational groups: Administrative support; Sales; Private household service; Other service (except protective); Precision production, craft, repair; Machine operators, assemblers, inspectors; Transportation and material moving; Handlers, equipment cleaners, laborers.) out of the employed civilian population 16 years and over (note 3)	P78	numerator: (P0780004 + P0780005 + P0780006 + P0780008 + P0780010 + P0780011 + P0780012 + P0780013) denominator: (P0780001 + ... + P0780013)
Unemployment ²⁷	Unemployed persons actively seeking employment	Percent of persons age 16 and older in the labor force who are unemployed (and actively seeking work)	P71	numerator: (P0710003 + P0710007 + P0710011 + P0710015 + P0710019 + P0710023 + P0710027 + P0710031 + P0710035 + P0710039) denominator: (P0710002 + P0710003 + P0710006 + P0710007 + P0710010 + P0710011 + P0710014 + P0710015 + P0710018 + P0710019 + P0710022 + P0710023 + P0710026 + P0710027 + P0710030 + P0710031 + P0710034 + P0710035 + P0710038 + P0710039)
Income				
median household income ²⁷	Income of households where half of households have income below this level and half have income above it	Median household income in year prior to the decennial census (for U.S. in 1989 = \$30,056)	P80A	P80A001
low income ²⁷	relative measure of poverty, set at half the national median income (European Union definition of poverty)	Percent of households with income < 50% of the US median household income (i.e., < \$15,000 in 1989)	P80	numerator: (P0800001 + ... + P0800004) denominator: (P0800001 + ... + P0800025)
high income ²⁷	Income at least 5 times higher than the median income	Percent of households with incomes >= 400% of the US median household income (i.e., >= \$150,000 for 1989)	P80	numerator: P0800025 denominator: (P0800001 + ... + P0800025)
gini coefficient ^{9,15,16,28}	Measure of how unequally income is distributed	A measure of income inequality, regarding the share of income distribution across the population, calculated using the standard algorithm employed by the US Bureau of Census to extrapolate the lower and upper ends of the income distribution	P80 P81 P80A	income: (P0800001 + ... + P0800004) aggregate household income: (P0810001 + P0810002) median household income: P80A001
Poverty				
below poverty ^{23, 27}	persons or households whose household income is below the threshold to cover basic needs	Percent of persons below federally-defined poverty line, a threshold that varies by size and age composition of the household, and on average equaled \$12,674 for a family of 4 in 1989. The original US poverty line was set in 1963 in relation to food and subsequently has been updated annually in relation to the Consumer Price Index. (note 4)	P117	numerator: (P1170013 + ... + P1170024) denominator: (P1170001 + ... + P1170024)
Wealth				
expensive homes ²⁷		Percent of owner-occupied homes worth >= \$300,000 in 1989 (400% of the median value of owned homes)	H61	numerator: (H0610018 + ... + H0610020) denominator: (H0610001 + ... + H0610020)
Education				
Less than high school ²⁷	adults with low educational attainment	Percent of persons, age 25 and older, with less than a 12th grade education (including individuals with 12 grades but no diploma)	P57	numerator: (P0570001 + P0570002) denominator: (P0570001 + ... + P0570007)
College ²⁷	Adults with high educational attainment	Percent of persons, age 25 and older, with at least 4 years of college (individuals with a Bachelor's degree or more education)	P57	numerator: (P0570006 + P0570007) denominator: (P0570001 + ... + P0570007)
Crowding				
Crowding ¹	at household level, more people than rooms	% households with >= 1 person per room (note 5)	H69	numerator: (H0690002 + H0690003 + H0690005 + H0690006 + H0690008 + H0690009 + H0690011 + H0690012) denominator: (H0690001 + ... + H0690012)



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Table 1C - Composite Area Based Socioeconomic Measures (ABSM) from 1990 Census variables

Townsend Index ^{4,5,17}	Contextual (area-based) measure of economic deprivation	UK deprivation measure consisting of a standardized z score combining data on percent crowding, percent unemployment, percent no car ownership, and percent renters	H37	no car: numerator: (H0370001 + H0370007) denominator: (H0370001 + ... + H0370012)
			H69	crowding: numerator: (H0690002 + H0690003 + H0690005 + H0690006 + H0690008 + H0690009 + H0690011 + H0690012) denominator: (H0690001 + ... + H0690012)
			H8, H4	renters: numerator: (H0080002) * (H0040001) denominator: (H0080001+H0080002) * (H0040001+H0040002)
			P71	unemployment: numerator: (P0710003 + P0710007 + P0710011 + P0710015 + P0710019 + P0710023 + P0710027 + P0710031+ P0710035 + P0710039) denominator: (P0710002 + P0710003 + P0710006 + P0710007 + P0710010 + P0710011 + P0710014 + P0710015 + P0710018 + P0710019 + P0710022 + P0710023 + P0710026 + P0710027 + P0710030 + P0710031 + P0710034 + P0710035 + P0710038 + P0710039)
Carstairs index ^{4,5,18}	contextual (area-based) measure of economic deprivation	UK deprivation measure consisting of a standardized z score combining data on percent crowding, percent male unemployment, percent no car ownership, and percent low social class (US census categories for: transportation and material moving; handlers, equipment cleaners, and laborers; household service).	H37	no car: numerator: (H0370001 + H0370007) denominator: (H0370001 + ... + H0370012)
			H69	crowding: numerator: (H0690002 + H0690003 + H0690005 + H0690006 + H0690008 + H0690009 + H0690011 + H0690012) denominator: (H0690001 + ... + H0690012)
			P71	male unemployment: numerator: (P0710003 + P0710011 + P0710019 + P0710027 + P0710035) denominator: (P0710002 + P0710003 + P0710010 + P0710011 + P0710018 + P0710019 + P0710026 + P0710027 + P0710034 + P0710035)
			P78	low social class: numerator: (P0780004 + ... + P0780006 + P0780008 + P0780010 + ... + P0780013) denominator: (P0780001 + ... + P0780013)
Index of Local Economic Resources ¹⁹	geopolitical (county-based) measure of economic resources	A "summary index" based on: "white collar employment, unemployment rate, and median family income, developed for use at the county level"	P78	white collar employment: numerator: (P0780001 + P0780002) denominator: (P0780001 + ... + P0780013)
			P71	unemployment: numerator: (P0710003 + P0710007 + P0710011 + P0710015 + P0710019 + P0710023 + P0710027 + P0710031+ P0710035 + P0710039) denominator: (P0710002 + P0710003 + P0710006 + P0710007 + P0710010 + P0710011 + P0710014 + P0710015 + P0710018 + P0710019 + P0710022 + P0710023 + P0710026 + P0710027 + P0710030 + P0710031 + P0710034 + P0710035 + P0710038 + P0710039)
			P107A	median family income: (P107A001)



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Table 1C - Composite Area Based Socioeconomic Measures (ABSM) from 1990 Census variables (cont'd)

SEP1	cumulative contextual (area-based) measure of socioeconomic position based on three domains: occupational class, economic deprivation (poverty), and assets (invested wealth, in housing stock)	A composite categorical variable based on percent < poverty, working class, and expensive homes	P117	poverty: numerator: (P1170013 + ... + P1170024) denominator: (P1170001 + ... + P1170024)
			P78	working class: numerator: (P0780004 + P0780005 + P0780006 + P0780008 + P0780010 + P0780011 + P0780012 + P0780013) denominator: (P0780001 + ... + P0780013)
			H61	expensive homes: numerator: (H0610018 + ... + H0610020) denominator: (H0610001 + ... + H0610020)
SEP2	cumulative contextual (area-based) measure of socioeconomic position based on three domains: occupational class, economic deprivation (poverty), and fungible wealth (high income)	A composite categorical variable based on percent < poverty, working class, and high incomes	P117	poverty: numerator: (P1170013 + ... + P1170024) denominator: (P1170001 + ... + P1170024)
			P78	working class: numerator: (P0780004 + P0780005 + P0780006 + P0780008 + P0780010 + P0780011 + P0780012 + P0780013) denominator: (P0780001 + ... + P0780013)
			P80	high incomes: numerator: P0800025 denominator: (P0800001 + ... + P0800025)
SEP index	contextual (area-based) measure of socioeconomic position	A summary deprivation measure consisting of a standardized z score combining data on percent working class, unemployed, < poverty < high school, expensive homes, and median household income (note 6)	P78	working class: numerator: (P0780004 + P0780005 + P0780006 + P0780008 + P0780010 + P0780011 + P0780012 + P0780013) denominator: (P0780001 + ... + P0780013)
			P70	unemployment: numerator: (P0700003 + P0700007) denominator: (P0700001 + P0700008)
			P117	poverty: numerator: (P1170013 + ... + P1170024) denominator: (P1170001 + ... + P1170024)
			P57	less than high school: numerator: (P0570001 + P0570002) denominator: (P0570001 + ... + P0570007)
			H61	expensive homes: numerator: (H0610018 + ... + H0610020) denominator: (H0610001 + ... + H0610020)
P107A	median family income: (P107A001)			

note 1: We use here the census term of "sex" even though this data is more accurately defined as gender.

note 2: Each of the 31 P014 counts is multiplied by the proportion Hispanic (and proportion non-Hispanic)

note 3: This operational definition applies to the occupational categories used in the Census 1990. The occupational classification system used in the Census 2000 "consists of 509 specific occupational categories for employed people arranged in 23 major occupational groups."

note 4: An explanation of the US Census Bureau definition of poverty is available at <http://www.census.gov/hhes/poverty/povdef.html>

An explanation of the history of the US poverty line is available at <http://www.census.gov/hhes/poverty/povmeas/papers/orshansky.html>

note 5: For the Census 1990 this data was derived from a measure of tenure by plumbing facilities by persons per room.

note 6: Selection of measures included in this index was informed by a factor analysis performed on the following factors (working class, unemployed, below poverty, no car, expensive homes, less than high school, greater than or equal to 4 years of college, household crowding, median household income, households with only 1 room, households with no kitchen, households with no private plumbing, households with no telephone, home ownership, and aggregate income from interest, dividend or net rental income.