Developing a Human Well-Being Index for the 77 Chicago Community Areas Using Principal Component Analysis

Abstract

This analysis attempts to establish a measure of well-being on the local level. Public health, environmental, and socio-economic data were normalized and aggregated using principal components analysis (PCA) to develop the HWBI for the 77 Chicago Community Areas (CCA). The HWBI map of the CCA's shows the spectrum of well-being in the city. Communities along the shore on the north-side of Chicago enjoy a high level of well-being while communities in the south-central and western-central areas of the city have the lowest levels of well-being. The community-scale HWBI gives local decision makers insight into the status of well-being in communities across the city. The HWBI is a sustainability metric that accounts for the present societal well-being. It can act as a social barometer to assess relative levels of well-being in each community.

Introduction

Previous studies on human well-being by the U.S. Environmental Protection Agency's (EPA) Office of Research and Development program, Sustainable and Healthy Communities, have developed a Human Well-Being Index (HWBI) on the county level in the United States using a statistical technique called Principal Component Analysis (PCA).). The county-level HWBI gave scores (on a relative scale from 0-100) to the 14 Chicago MSA counties based on the performance of the counties compared to a dataset which included 107 counties (all counties in the state of Illinois plus the surrounding Indiana and Wisconsin MSA counties). County-level analyses give a broad overview of relative well-being on a national and regional scale.

The results of the county-level HWBI showed Cook County, Illinois as having lower levels of well-being relative to most of the surrounding Chicago Metropolitan Statistical Area counties. Cook County is home to the central business district of Chicago, many tourist attractions, several world-leading universities, and research institutions. Meanwhile, there are parts of the city that have extremely high rates of poverty and violence. The county-level HWBI fails to identify the nuances of well-being within the city of Chicago. This community-level HWBI explores the difference between community areas' respective measures of well-being.

The HWBI is an objective measure of well-being. PCA is statistical procedure that uses orthogonal transformation of variables to convert a set of observations of possibly correlated variables into a set of values of linearly uncorrelated variables called principal components. PCA is used to establish weighting coefficients of the indicators of well-being, determining weights based on the amount of variance explained by each variable in the dataset. The variables used to calculate it are not self-reported. Instead, they are gathered from publicly available data. This method of measuring societal well-being is less cost intensive compared to measuring self-reported well-being.

Study Area

The Chicago Community Areas (CCAs) represent the units of analysis in this study of human well-being. The City of Chicago recognizes 77 divisions as official CCAs. The CCAs do not necessarily represent homogenous neighborhoods in the city. These areas are well-defined with public data available through the City of Chicago Data portal. The data available for these communities are tied to census data. The geographic representations serve as the basis for various urban planning initiatives and are useful in the context of planning for the Chicago Metropolitan Agency for Planning (CMAP). Many of the CCA's contain more than one neighborhood, but rater contain groups of neighborhoods (Chicago Historical Society).

Methods

Data

The data used to calculate the community-level HWBI come from a range of years, spanning a decade (2005-2015). The environmental data used in this analysis is from the US EPA's EJSCREEN dataset from 2015, the earliest year for which this granular environmental data was available. This data set contains block-level environmental data for traffic proximity and volume, proximity to major direct discharges to water, proximity to national priorities list sites, proximity to risk management plan facilities, proximity to treatment and disposal facilities, ozone level in the air, and particulate matter (PM2.5) concentration in the air.

The EPA publishes regulations and guidance for chemical accident prevention at risk management plan facilities as is required under section 112(r) of the Clean Air Act Amendments. Communities in proximity to these sites are at higher risk to the effects of a chemical accident. The variable proximity to treatment and disposal facilities represents a similar indicator of risk posed to communities from potential chemical accidents. The rest of the environmental indicators (traffic proximity and volume, ozone level, and particulate matter concentration) represent immediate environmental conditions related to air quality.

Health indicators include: life expectancy, breast cancer in females, cancer (all types) rate, childhood lead poisoning rate, colorectal cancer, diabetes, infant mortality rate, low birth weight, lung cancer, prenatal care beginning in the first trimester, preterm births, prostate cancer in males, stroke, suicide, and teen birth rate. This data was accessed from the Chicago Department of Public health. The data from this source was provided by the Illinois Department of Public Health. The time period of this data is from 2005-2011. Other indicators were taken from US Census Bureau tract data and aggregated to the community areas using processing tools in a geographic information systems (GIS) software. One other indicator was similarly processed from data on tree cover from a tree canopy dataset from the US Geological Survey (USGS). More details about this data can be found in the table listing indicators, data sources, and time periods in the appendix.

The block-level environmental data from USEPA's EJSCREEN tool was aggregated to the 77 community areas using GIS. The area weighted average of the block data represented the value for each environmental variable for each community area. Similar to how the environmental variables were determined, the tract-level census data for the socioeconomic variables was

aggregated to each community area. Tract level data was used since many of the socioeconomic variables were not available at a more granular level.

GIS was also used to calculate the percentage of community covered by tree canopy. The 2010 land cover data set was accessed from Chicago's Open Data Portal. The raster was converted to a polygon so that only the tree canopy features of the data could be separated out. The polygon was then clipped to the Chicago Communities polygon to get only the tree canopy covering the study area. A new field was created in the tree canopy polygon and the calculate geometry tool was used to determine the area (in m2). The tree canopy polygon was then joined with a shapefile of Chicago Communities based on spatial location and the tree canopy area was summed. This added the sum of the area of tree canopy for each community area to the Chicago Communities HWBI variables attribute table.

Metric Calculation

This version of the HWBI uses the same principal components analysis method outlined in the subsection describing the county-level HWBI. The primary difference between the two methods is the number of variables inputted, 40 instead of 34. As a result, 6 more principal components are generated. The same Kaiser Criterion method is used to determine the number of principal components to use. The cutoff point where the standard deviation equals one happens to be at the seventh principal component for this version as well.

Some of the eigenvectors' loadings in the county-level principal components analysis were set to zero to assign variables with the highest contribution to explained variance to each principal component. In this iteration of the HWBI, the loadings were not changed in any way except by making the loadings for variables which have a negative impact on well-being (e.g. PM2.5) negative and likewise for variables that are positive drivers of well-being (e.g. median income).

The five most significant variables in determining the human well-being index are percent of population 25 years and older with a bachelor's degree, per capita income, median housing value, death rate from lunch cancer, and the death rate for all causes of death. The five variables with the least weight in determining the human well-being index are heart disease death rate, crowded housing, proximity to traffic, proximity to risk management plan facilities, and tree canopy. There is a 97 percent difference in absolute weight values between the top-weighted variable (BACH) and the lowest-weighted variable (Heart_disease).

HWBI scores were calculated in the same way as the county-level HWBI by summing the weighted principal components scores for each community. The weighting of each principal component is determined by the proportion of the variance explained by the component. The weighting factors were calculated by dividing the square of the standard deviation of each of the first seven principal components by the sum of the squares of those components. The weighting factors for each principal component are shown in the treemap below. The absolute weight of

each HWBI variable can be found by multiplying the loadings matrix by the principal components weights matrix.
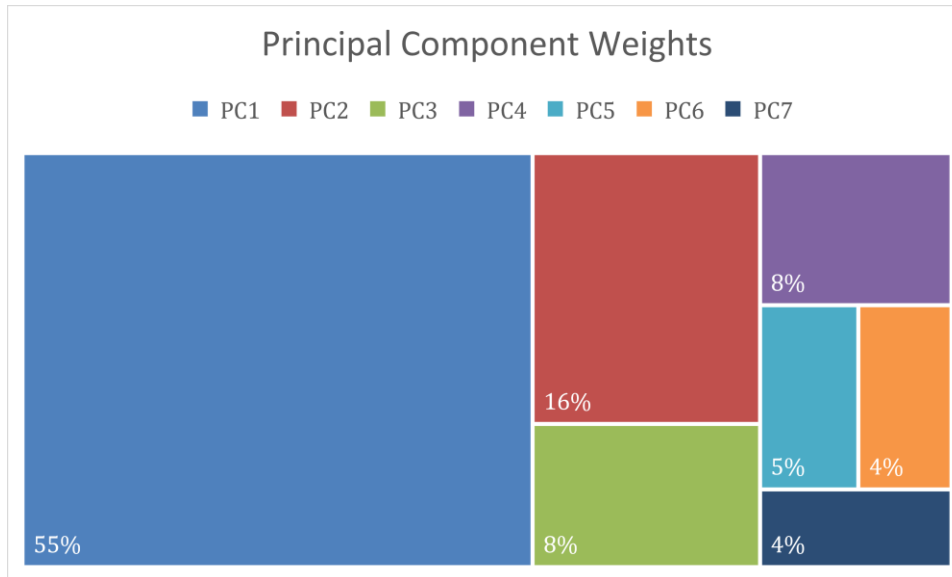

Results

The map displaying the result of the HWBI percentile for each community demonstrates how high levels of well-being are concentrated along the northeast part of the city located along the coast of Lake Michigan, near the central business district of Chicago. Meanwhile, two separate clusters of neighborhoods on the south-central and west sides of the city represent the communities with the lowest levels of well-being in the city. Lake View resulted in the highest scored community and West Garfield Park had the lowest score.

Lake View (also spelled Lakeview) is one of Chicago's most popular neighborhoods. It is well-connected to public to two 'L' lines with several different stops. The neighborhood is home to arts and culture venues in the form of live music, theater, dance, comedy, and sports. Lake view has one of the highest rates of bachelor's degree attainment, a high population of young professionals (low rate of dependency – 16.5), and one of the highest levels of income (median income - $81,511, per capita income – $58,227). Having a well-educated, high-income, and largely working-age population makes this community perform better on other indicators by default.

West Garfield park is one of Chicago's most violent neighborhoods. In the time span used for this study (2005-2009) the homicide rate was 40 per 100,000 (age adjusted). The city rate for that time period was 15.1 and for the U.S. in 2007 it was 6.1 per 100,000 (age adjusted). The issue of violence since the time period of our study has only worsened: the neighborhood had a rate of

83.13 homicides per 100,000 from 2013 to 2015, the highest rate of all community areas. West Garfield park was an outlier (absolute value of z-score greater than 2) for the following variables: average commute time, breast cancer in females, cancer, death (all causes), diabetes, infant mortality rate, life expectancy, preterm births, percent of population receiving Supplemental Nutrition Assistance Program (SNAP) benefits, stroke, and teen birth rate.

Chicago Communitiy Areas Human Well-being Index
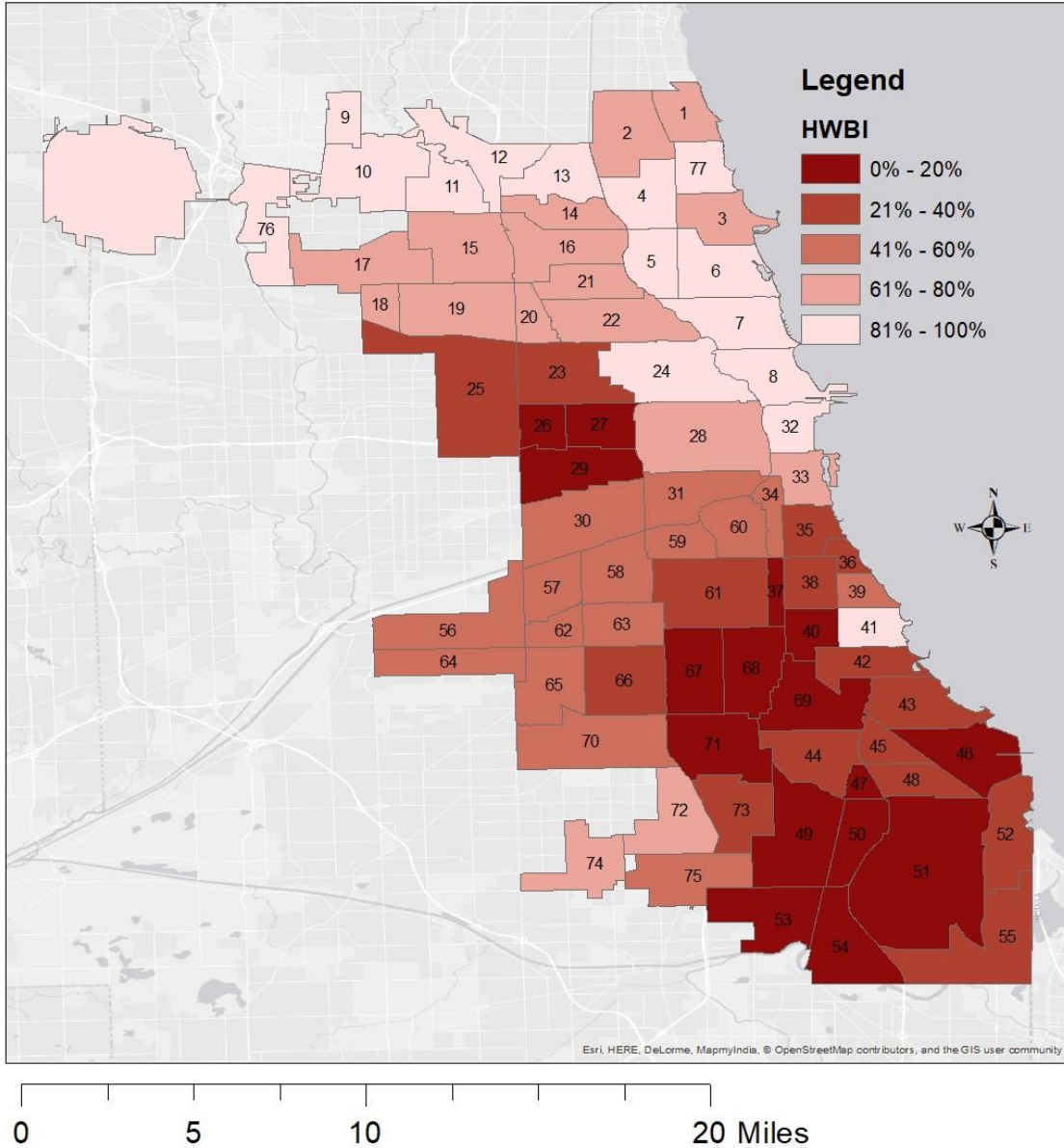
Community Area IDs are Numbered

Hyde Park (ID number 41, HWBI percentage 85.5) is an exception of the trend of lower levels of well-being on the south side of the city. Hyde Park contains the University of Chicago and a museum district which attracts a highly educated and more skilled workforce.

The radar chart below dives deeper into the results of the principal components analysis, comparing the 40 weighted and normalized variables between the highest and lowest-scoring communities. Similar comparisons can be performed in Excel with the interactive data visualization tool accompanying this report.

Highest and Lowest HWBI Communities Comparison
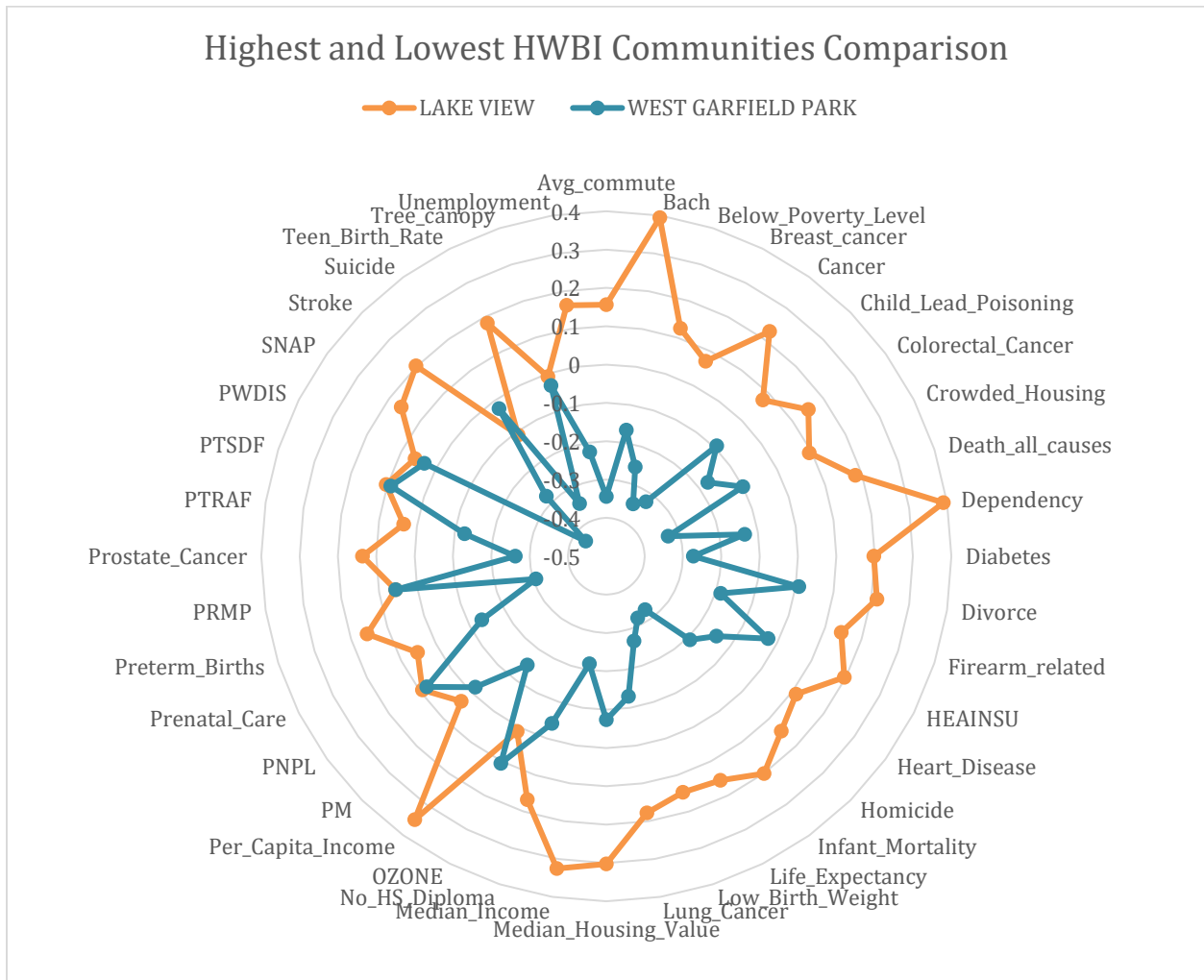
Discussion

The percentile scores given to each community are relative scores based on the performance of each of the 77 community areas. Actual levels of well-being may be similar for communities that differ by 10 or 20 percentage points. The ranking produced by the HWBI was compared to ratings provided by Niche.com, a website that allows the public to research U.S. colleges,

schools, neighborhoods, and companies. The website gives neighborhoods a report card and takes user reviews that rank a neighborhood on a scale of 1-5. This comparison is a proxy to the ideal comparison of surveying using random sampling in each of the 77 communities to assess residents' subjective levels of well-being. The report card rating provided by the site is objective in that it considers.

Wealth appears to be a strong driver in the differences between the level of well-being in communities. Wealthier communities can afford better healthcare, better education, and better housing options. There is a medium correlation (R = 0.41) between the health variables and the environmental variables in the HWBI. There is a stronger correlation between wealth and environmental variables (R= 0.49). There is an even stronger relationship (R=0.76) between wealth and health indicators. To determine these coefficients of correlation between domains of the HWBI, variables in the category of health, wealth, and environmental for taken in three sets of pairs (environmental and health, health and wealth, and environmental and wealth).

Conclusion

High levels of well-being in Chicago are concentrated near the "gold coast" on the north side of the city. The lowest levels of well-being are concentrated in communities on the south and west side of the city. Communities with higher levels of wealth tend to perform better on almost all indicators compared to communities with lower levels of wealth. The exception to this trend can be seen in the performance of more affluent communities on environmental variables. The Loop and Near South Side community areas rank in the top quintile of aggregated wealth variables while ranking in the bottom quintile for environmental variables. Health and wealth indicators are more strongly correlated than the health-environmental and wealth-environmental relationships between variables.

This community-level HWBI serves as a local assessment of quality of life on the sub-county level within the urban center of Cook County, Illinois. Local stakeholders can use this tool as a decision-making aid in addressing local needs. On a higher level, the HBWI scores can highlight communities that need the most aid and programs to improve quality of life. Analyzing the relative scoring on HWBI indicators of lower-scoring communities compared to higher scoring communities allows stakeholders to pinpoint areas of improvement for the community.

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Death all causes source - https://data.cityofchicago.org/Health-Human-Services/Public-Health-Statistics-Selected-underlying-cause/j6cj-r444

27 Public health indicators: https://data.cityofchicago.org/Health-Human-Services/Public-Health-Statistics-Selected-public-health-in/iqnk-2tcu

Appendix

HWBI Variables

Variable	Variable name	Source	Time Period	Link

Average Commute Time	Avg_commute	Aggregated from US Census Bureau tract data	2006 - 2010	https://factfinder.census.gov
Percent of individuals 25 or older with a bachelor's degree or higher	Bach	Aggregated from US Census Bureau tract data		
Percent of households that have divorced	Divorce	Aggregated from US Census Bureau tract data		
Median housing value (2010 USD)	Median_Housing_Value	Aggregated from US Census Bureau tract data		
Median income (2010 USD)	Median_Income	Aggregated from US Census Bureau tract data		
Percent of population without health insurance	Health_insurance	Aggregated from US Census Bureau tract data		https://factfinder.census.gov
Percent of population receiving Supplemental Nutrition Assistance Program benefits	SNAP		2012	
Percent of community area covered by tree canopy	Tree_canopy	Calculated using USGS tree data (30m resolution - raster Calculations performed in ArcGIS)	2010	https://www.mrlc.gov/
Life Expectancy (years)	Life_Expectancy	Chicago Data Portal	2010	

Percent of population living below poverty level	Below_Poverty_Level			
Breast cancer in females (per 100,000 females, age adjusted)	Breast_cancer_in_females			
Cancer (all sites) (per 100,000 persons, age adjusted)	Cancer	Chicago Department of Public Health	2007 - 2011	https://data.cityofchicago.org/Health-Human-Services/Public-Health-Statistics-Selected-public-health-in/iqnk-2tcu
Childhood lead poisening per 100	Childhood_Lead_Poisoning			
Coleorectal cancer (per 100,000 persons, age adjusted)	Colorectal_Cancer			
Percent of occupied housing units	Crowded_Housing			
Dependency (Percent of persons aged less than 16 or more than 64 years)	Dependency			
Death all causes	Death_all_causes			
Diabetes-related mortality (per 100,000 persons, age adjusted)	Diabetes			
Firearm-related (per 100,000	Firearm_related			

persons, age adjusted)					
Death from heart disease (per 100,000 persons, age adjusted)	Heart_Disease_death_rate				
Homicide (per 100,000 persons, age adjusted)	Homicide				
Infant mortality rate (per 1000 live births)	Infant_Mortality_Rate				
Low birth weight (percent of live births)	Low_Birth_Weight				
Lung Cancer (per 100,000 persons, age adjusted)	Lung_Cancer				
Percent of persons aged 25 years and older without a high school diploma	No_High_School_Diploma				
Per capita income (2010 USD)	Per_Capita_Income				
Prenatal care beginning in first trimester (percent of females delivering a live birth)	Prenatal_Care_Beginning_in _First_Trimester				
Preterm births (percent of live births)	Preterm_Births				
Prostate cancer in males (per 100,000 persons, age adjusted)	Prostate_Cancer_in_Males				
Stroke (per 100,000 persons, age adjusted)	Stroke				
Suicide (per 100,000 persons, age adjusted)	Suicide				
Teen birth rate (per 1000 females aged 15-19)	Teen_Birth_Rate				

Percent of persons in labor force aged 16 years and older unemployed	Unemployment				
Traffic proximity and volume	PTRAF	USEPA EJSCREEN			
Proximity to major direct dischargers to water	PWDIS				
Proximity to National Priorities List (NPL) sites	PNPL				
Proximity to Risk Management Plan (RMP) facilities	PRMP				
Proximity to Treatment Storage and Disposal (TSDF) facilities	PTSDF				
Ozone level in air	OZONE			https://www.epa.gov/ejscreen	
PM2.5 level in air	PM25		2015		

Variable Loadings

Variable	Comp.1	Comp.2	Comp.3	Comp.4	Comp.5	Comp.6	Comp.7
Avg_commute	-0.2033	-0.0596	-0.1334	-0.0238	-0.0861	-0.0133	-0.00236
Bach	0.1639	0.2183	0.2306	0.0701	0.0089	0.0545	0.179346
Below_Poverty_Level	-0.1764	-0.0927	-0.1684	-0.0351	-0.0655	-0.0412	-0.3446
Breast_cancer_in_females	-0.1006	-0.1383	-0.0191	-0.0683	-0.3818	-0.0408	-0.29402
Cancer	-0.2034	-0.1409	-0.0094	-0.0229	-0.0262	-0.2203	-0.11483
Childhood_Lead_Poisoning	-0.1458	-0.0101	-0.0531	-0.1017	-0.3441	-0.2936	-0.21869
Colorectal_Cancer	-0.1673	-0.1710	-0.0499	-0.0291	-0.0690	-0.1346	-0.00747
Crowded_Housing	-0.0366	-0.3979	-0.0018	-0.0615	-0.0129	-0.0220	-0.05837
Death_all_causes	-0.2170	-0.0830	-0.0895	-0.0702	-0.0559	-0.0949	-0.0103
Dependency	-0.1667	-0.0849	-0.2816	-0.0819	-0.0709	-0.1143	-0.08154
Diabetes	-0.1957	-0.0196	-0.0377	-0.0704	-0.0190	-0.0855	-0.08065
Divorce	-0.1502	-0.2437	-0.0313	-0.0978	-0.0437	-0.1587	-0.08475
Firearm_related	-0.2075	-0.0696	-0.0287	-0.0418	-0.1278	-0.0539	-0.0132
HEAINSU	-0.0723	-0.3848	-0.0062	-0.0847	-0.0137	-0.0510	-0.04715
Heart_Disease_death_rate	-0.0240	-0.0873	-0.2312	-0.0140	-0.4130	-0.2400	-0.08273
Homicide	-0.2176	-0.0527	-0.0378	-0.0502	-0.1257	-0.0634	-0.02531
Infant_Mortality_Rate	-0.1976	-0.0796	-0.0921	-0.0402	-0.0270	-0.0134	-0.12028
Life_Expectancy	0.2193	0.0583	0.0840	0.1149	0.0357	0.0175	0.008166
Low_Birth_Weight	-0.1909	-0.0992	-0.1213	-0.0285	-0.1504	-0.0831	-0.20079
Lung_Cancer	-0.1861	-0.1495	-0.0146	-0.0759	-0.1586	-0.1920	-0.12934

Median_Housing_Value	0.1922	0.0734	0.2465	0.0750	0.0325	0.0419	0.196848
Median_Income	0.1929	0.1685	0.0107	0.0137	0.0977	0.0536	0.044771
No_High_School_Diploma	-0.0731	-0.4067	-0.0130	-0.0273	-0.0273	-0.0188	-0.00968
OZONE	-0.1212	-0.0956	-0.0606	-0.2894	-0.1890	-0.3183	-0.13785
Per_Capita_Income	0.1605	0.2335	0.1711	0.1729	0.0194	0.0534	0.041391
PM	-0.0889	-0.0973	-0.3001	-0.3791	-0.1701	-0.0880	-0.13167
PNPL	-0.1143	-0.0830	-0.3804	-0.2914	-0.0712	-0.1427	-0.09059
Prenatal_Care	0.1362	0.0329	0.1362	0.0053	0.1666	0.3340	0.335633
Preterm_Births	-0.1888	-0.1318	-0.0195	-0.0347	-0.1602	-0.1216	-0.1709
PRMP	-0.0047	-0.1606	-0.1085	-0.3923	-0.1836	-0.1493	-0.38293
Prostate_Cancer_in_Males	-0.1936	-0.1004	-0.1060	-0.0263	-0.0315	-0.1034	-0.05863
PTRAF	-0.0564	-0.0099	-0.2372	-0.2830	-0.0835	-0.3468	-0.00857
PTSDF	-0.1221	-0.1059	-0.3809	-0.2680	-0.0835	-0.1176	-0.05003
PWDIS	-0.0393	-0.1292	-0.2386	-0.3404	-0.1278	-0.1597	-0.38905
SNAP	-0.1766	-0.0808	-0.1393	-0.0023	-0.1569	-0.1305	-0.19185
Stroke	-0.1876	-0.0358	-0.0071	-0.0030	-0.2674	-0.0904	-0.15049
Suicide	-0.0827	-0.0896	-0.0861	-0.0074	-0.3609	-0.4347	-0.04745
Teen_Birth_Rate	-0.1944	-0.1444	-0.1007	-0.0909	-0.0169	-0.0566	-0.03455
Tree_canopy	0.043122	0.189185	0.215281	0.364458	0.084321	0.025497	0.019778
Unemployment	-0.20814	-0.02128	-0.08205	-0.01689	-0.1477	-0.00254	-0.00074

Overall Variable Weights

Variable	Weight	Absolute Weight
Bach	0.1596	0.1596
Per_Capita_Income	0.1580	0.1580
Median_Housing_Value	0.1548	0.1548
Lung_Cancer	-0.1542	0.1542
Death_all_causes	-0.1526	0.1526
Cancer	-0.1523	0.1523
Low_Birth_Weight	-0.1517	0.1517
Teen_Birth_Rate	-0.1499	0.1499
Preterm_Births	-0.1486	0.1486
Life_Expectancy	0.1483	0.1483
PTSDFwa	-0.1477	0.1477
Below_Poverty_Level	-0.1469	0.1469
Dependency	-0.1468	0.1468
Homicide	-0.1447	0.1447
Divorce	-0.1440	0.1440
Median_Income	0.1436	0.1436
PNPL	-0.1435	0.1435
SNAP	-0.1425	0.1425
Prostate_Cancer_in_Males	-0.1417	0.1417
Firearm_related	-0.1396	0.1396
Avg_commute	-0.1390	0.1390
Infant_Mortality_Rate	-0.1386	0.1386
OZONE	-0.1373	0.1373
PM	-0.1355	0.1355
Colorectal_Cancer	-0.1352	0.1352
Unemployment	-0.1330	0.1330
Stroke	-0.1321	0.1321
Childhood_Lead_Poisoning	-0.1317	0.1317

Prenatal_Care_Beginning_in_First_Trimester	0.1278	0.1278
Diabetes	-0.1270	0.1270
PWDIS	-0.1165	0.1165
Breast_cancer_in_females	-0.1154	0.1154
HEAINSU	-0.1130	0.1130
No_High_School_Diploma	-0.1109	0.1109
Suicide	-0.1059	0.1059
Tree_canopy	0.1056	0.1056
PRMP	-0.0973	0.0973
PTRAF	-0.0938	0.0938
Crowded_Housing	-0.0925	0.0925
Heart_Disease_death_rate	-0.0811	0.0811

Chicago CCA's HWBI Scores and Rankings

Rank	ID Number	Community	HWBI	Percentile
1	6	LAKE VIEW	6.037125	100.00%
2	7	LINCOLN PARK	5.635964	98.60%
3	12	FOREST GLEN	5.226822	97.30%
4	76	OHARE	5.015427	96.00%
5	32	LOOP	4.925367	94.70%
6	5	NORTH CENTER	4.854047	93.40%
7	8	NEAR NORTH SIDE	4.717164	92.10%
8	9	EDISON PARK	4.464869	90.70%
9	10	NORWOOD PARK	4.29949	89.40%
10	13	NORTH PARK	4.153322	88.10%
11	4	LINCOLN SQUARE	4.006053	86.80%
12	41	HYDE PARK	3.533645	85.50%
13	11	JEFFERSON PARK	3.383486	84.20%
14	77	EDGEWATER	3.240455	82.80%
15	24	WEST TOWN	2.964891	81.50%
16	15	PORTAGE PARK	2.947741	80.20%
17	22	LOGAN SQUARE	2.920365	78.90%
18	74	MOUNT GREENWOOD	2.823995	77.60%
19	17	DUNNING	2.772259	76.30%
20	2	WEST RIDGE	2.662595	75.00%
21	21	AVONDALE	2.583477	73.60%
22	3	UPTOWN	2.382546	72.30%
23	14	ALBANY PARK	2.35515	71.00%
24	16	IRVING PARK	2.304813	69.70%
25	18	MONTCLARE	2.059574	68.40%
26	72	BEVERLY	1.937467	67.10%
27	19	BELMONT CRAGIN	1.673777	65.70%

28		33	NEAR SOUTH SIDE	1.625642	64.40%
29		20	HERMOSA	1.576594	63.10%
30		1	ROGERS PARK	1.492175	61.80%
31		28	NEAR WEST SIDE	1.261813	60.50%
32		64	CLEARING	1.137807	59.20%
33		31	LOWER WEST SIDE	1.033823	57.80%
34		39	KENWOOD	1.009963	56.50%
35		65	WEST LAWN	0.953123	55.20%
36		59	MCKINLEY PARK	0.912942	53.90%
37		60	BRIDGEPORT	0.752838	52.60%
38		70	ASHBURN	0.582469	51.30%
39		34	ARMOUR SQUARE	0.552703	50.00%
40		62	WEST ELSDON	0.486863	48.60%
41		56	GARFIELD RIDGE	0.377933	47.30%
42		30	SOUTH LAWNDALE	0.36816	46.00%
43		58	BRIGHTON PARK	0.120536	44.70%
44		57	ARCHER HEIGHTS	0.053969	43.40%
45		75	MORGAN PARK	-0.28632	42.10%
46		63	GAGE PARK	-0.49177	40.70%
47		36	OAKLAND	-1.04077	39.40%
48		66	CHICAGO LAWN	-1.10418	38.10%
49		52	EAST SIDE	-1.35468	36.80%
50		55	HEGEWISCH	-1.43393	35.50%
51		48	CALUMET HEIGHTS	-1.72821	34.20%
52		23	HUMBOLDT PARK	-2.01576	32.80%
53		45	AVALON PARK	-2.17062	31.50%
54		38	GRAND BOULEVARD	-2.52472	30.20%
55		35	DOUGLAS	-2.60884	28.90%
56		42	WOODLAWN	-2.76589	27.60%
57		44	CHATHAM	-2.9516	26.30%
58		25	AUSTIN	-2.97795	25.00%
59		61	NEW CITY	-3.00464	23.60%
60		73	WASHINGTON HEIGHTS	-3.12343	22.30%
61		43	SOUTH SHORE	-3.1725	21.00%
62		71	AUBURN GRESHAM	-3.3288	19.70%
63		46	SOUTH CHICAGO	-3.51286	18.40%
64		49	ROSELAND	-4.0231	17.10%
65		27	EAST GARFIELD PARK	-4.02684	15.70%
66		51	SOUTH DEERING	-4.15914	14.40%

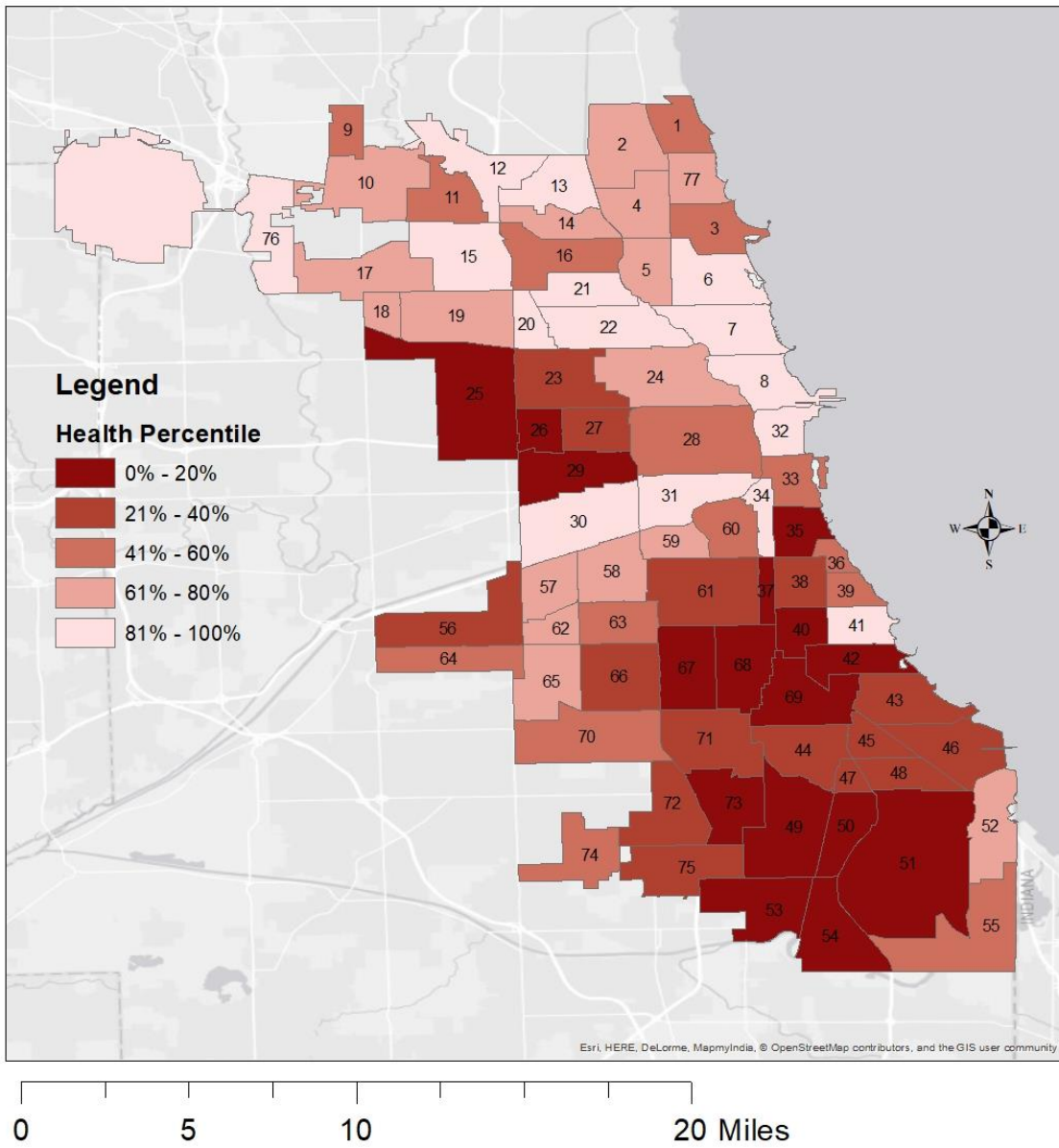| 67		47	BURNSIDE	-4.30946	13.10%
68		29	NORTH LAWNDALE	-4.35493	11.80%
69		53	WEST PULLMAN	-4.54213	10.50%
70		69	GREATER GRAND CROSSING	-4.55222	9.20%
71		50	PULLMAN	-4.60115	7.80%
72		40	WASHINGTON PARK	-4.6585	6.50%
73		68	ENGLEWOOD	-5.38042	5.20%
74		37	FULLER PARK	-5.71152	3.90%
75		67	WEST ENGLEWOOD	-5.83141	2.60%
76		54	RIVERDALE	-6.00263	1.30%
77		26	WEST GARFIELD PARK	-6.43031	0.00%

Third Party ranking of Chicago Community Areas from Niche.com

Community Area ID	Neighborhood	User Rating	Number of user reviews	Niche.com Grade	HWBI Percentile
6	LAKE VIEW	0.74	110	A+	100%
7	LINCOLN PARK	0.86	67	A+	99%
32	LOOP	0.74	54	A+	95%
5	NORTH CENTER	0.82	31	A+	93%
8	NEAR NORTH SIDE	0.76	32	A+	92%
41	HYDE PARK	0.8	88	A+	86%
72	BEVERLY	0.78	49	A+	67%
33	NEAR SOUTH SIDE	0.76	9	A+	64%
28	NEAR WEST SIDE	0.92	8	A+	61%
12	FOREST GLEN	0.8	39	A	97%
9	EDISON PARK	0.96	20	A	91%
4	LINCOLN SQUARE	0.78	59	A	87%
77	EDGEWATER	0.74	140	A	83%
24	WEST TOWN	0.76	24	A	82%
3	UPTOWN	0.76	73	A	72%
10	NORWOOD PARK	0.78	55	A-	89%
13	NORTH PARK	0.72	37	A-	88%
22	LOGAN SQUARE	0.8	79	A-	79%
74	MOUNT GREENWOOD	0.72	43	A-	78%

2	WEST RIDGE	0.7	92	A-	75%
39	KENWOOD	0.74	13	A-	57%
76	OHARE	0.64	4	B	96%
15	PORTAGE PARK	0.7	151	B	80%
17	DUNNING	0.84	29	B	76%
21	AVONDALE	0.68	82	B	74%
64	CLEARING	0.68	44	B	59%
70	ASHBURN	0.68	143	B	51%
56	GARFIELD RIDGE	0.68	78	B	47%
75	MORGAN PARK	0.72	23	B	42%
35	DOUGLAS	0.7	37	B	29%
11	JEFFERSON PARK	0.74	80	B+	84%
14	ALBANY PARK	0.7	114	B+	71%
16	IRVING PARK	0.7	106	B+	70%
18	MONTCLARE	0.78	14	B-	68%
1	ROGERS PARK	0.74	142	B+	62%
31	LOWER WEST SIDE	0.66	54	B-	58%
59	MCKINLEY PARK	0.66	38	B-	54%
60	BRIDGEPORT	0.74	60	B-	53%
34	ARMOUR SQUARE	NA	0	B-	50%
55	HEGEWISCH	0.6	31	B-	36%
37	FULLER PARK	0.54	3	B-	4%
19	BELMONT CRAGIN	0.68	151	C	66%
20	HERMOSA	0.6	543	C	63%
30	SOUTH LAWNDALE	0.66	87	C	46%
58	BRIGHTON PARK	0.64	141	C	45%
57	ARCHER HEIGHTS	0.64	17	C	43%
36	OAKLAND	0.6	45	C	39%
66	CHICAGO LAWN	0.56	104	C	38%
45	AVALON PARK	0.54	31	C	32%
38	GRAND BOULEVARD	0.58	58	C	30%
44	CHATHAM	0.64	22	C	26%
73	WASHINGTON HEIGHTS	0.62	58	C	22%
51	SOUTH DEERING	0.62	26	C	14%
53	WEST PULLMAN	0.62	37	C	11%

65	WEST LAWN	0.66	97	C+	55%
62	WEST ELSDON	0.64	50	C+	49%
63	GAGE PARK	0.62	60	C-	41%
52	EAST SIDE	0.66	51	C+	37%
48	CALUMET HEIGHTS	0.68	14	C+	34%
23	HUMBOLDT PARK	0.62	71	C+	33%
42	WOODLAWN	0.52	24	C+	28%
25	AUSTIN	0.52	95	C-	25%
61	NEW CITY	0.54	84	C-	24%
43	SOUTH SHORE	0.62	45	C-	21%
71	AUBURN GRESHAM	0.54	99	C-	20%
46	SOUTH CHICAGO	0.6	34	C-	18%
49	ROSELAND	0.62	62	C-	17%
47	BURNSIDE	0.58	12	C-	13%
29	NORTH LAWNDALE	0.5	38	C-	12%
69	GREATER GRAND CROSSING	0.48	31	C-	9%
50	PULLMAN	0.64	15	C+	8%
40	WASHINGTON PARK	0.46	17	C-	7%
54	RIVERDALE	0.56	48	C-	1%
68	ENGLEWOOD	0.5	105	D+	5%
67	WEST ENGLEWOOD	0.5	105	D+	3%
27	EAST GARFIELD PARK	0.46	18	D	16%
26	WEST GARFIELD PARK	0.46	18	D	0%

Chicago Communitiy Areas Aggregated Health Variables

Legend

Health Percentile

- 0% - 20%
- 21% - 40%
- 41% - 60%
- 61% - 80%
- 81% - 100%

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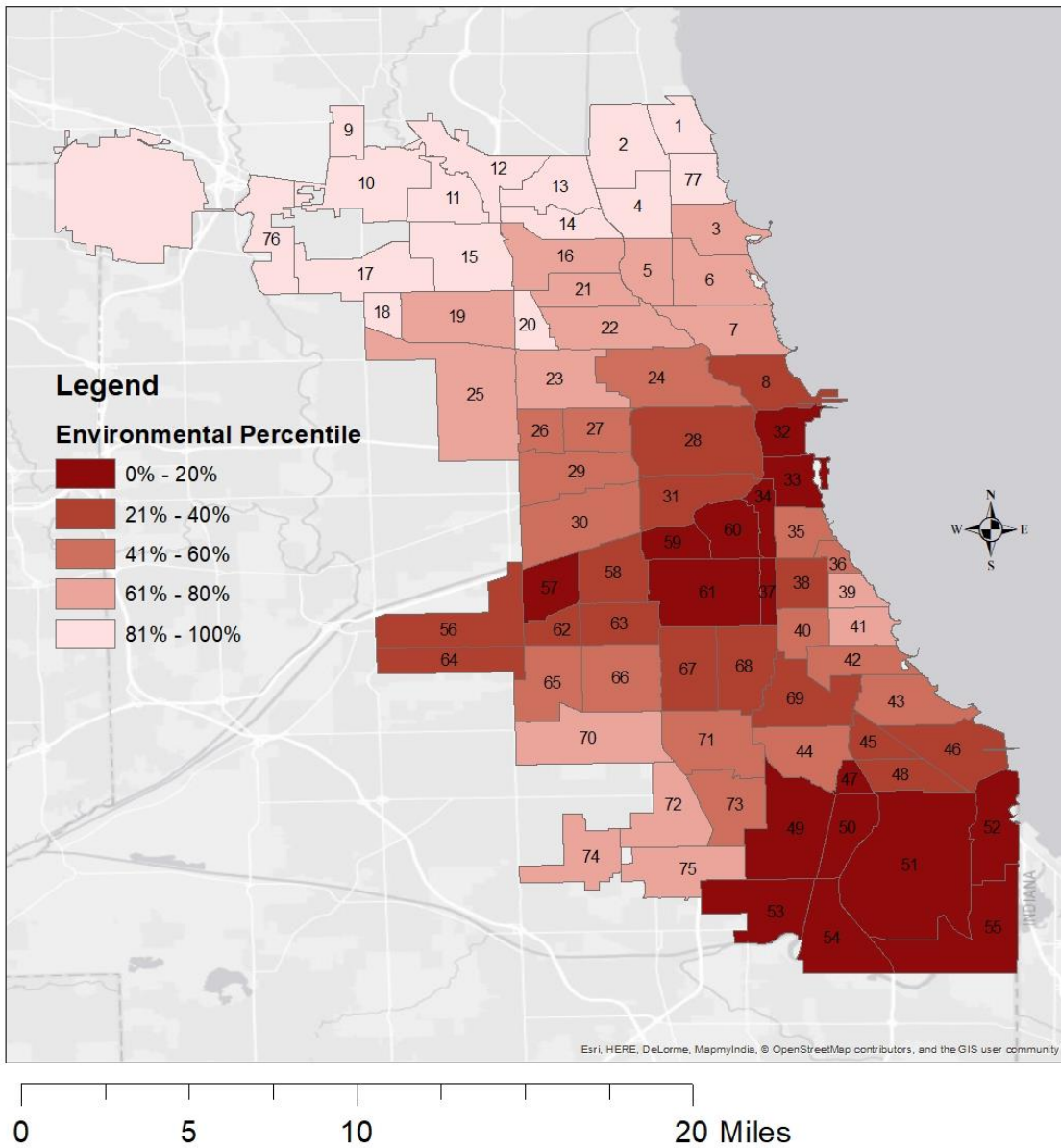
| 0 | 5 | 10 | 20 Miles |

Community Area IDs are Numbered

Chicago Communitiy Areas Aggregated Wealth Variables

Community Area IDs are Numbered
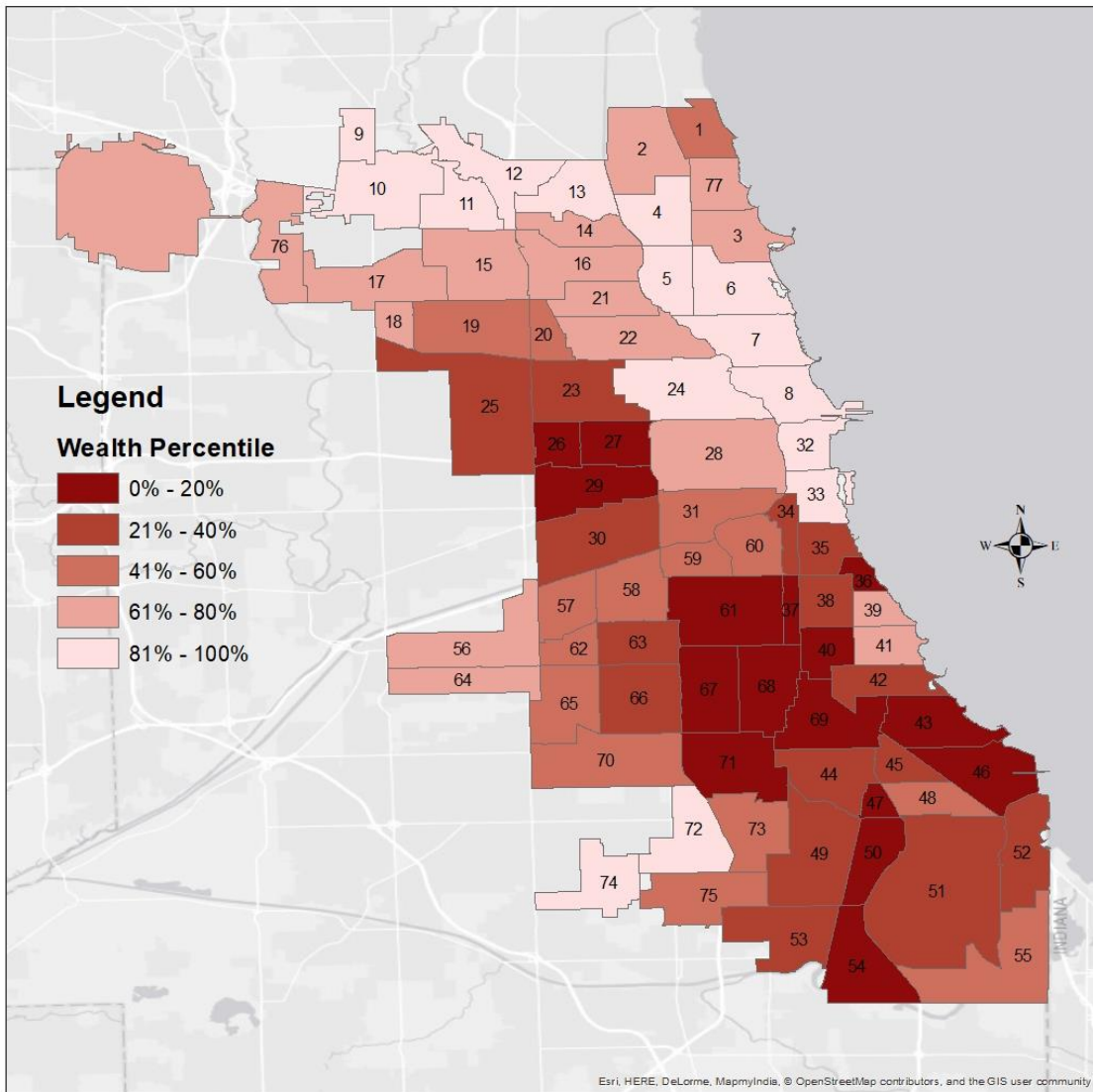
Chicago Communitiy Areas Aggregated Environmental Variables

Legend

Environmental Percentile

- ■ 0% - 20%
- ■ 21% - 40%
- ■ 41% - 60%
- ■ 61% - 80%
- ■ 81% - 100%

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0   5   10   20 Miles

Community Area IDs are Numbered