

Planning for Prevention: The Erie County Risk Indicator Database (RIDB): Key Indicators

Version 13.3
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Introduction

This documentation describes Version 13.3 of the Erie County Risk Indicator Database Key Indicators Subset developed by the Center for Health and Social Research in cooperation with Erie County Department of Mental Health and the CD Prevention and Treatment Providers. The validation analysis of the full Risk Indicator Database found almost every indicator to be valid, i.e. significantly related to relevant data that was gathered independent of the risk indicators. The data were gathered from a large (n=3,700), general population survey focused on alcohol, drugs, and related issues (Erie County Health Outcomes Survey conducted by the Center for Health and Social Research (2000)). A list of suggested indicators (or “Key” Indicators) was compiled based on the validation analysis, and these selected indicators have been revised with updated data.

The selected risk indicators contained in this database encompass many of the categories defined in the Hawkins and Catalano risk and protective factor program “Communities That Care”. The selected risk indicator database subset provides detailed population, social, economic, crime, health, and school information.

The indicator database has three main purposes: (1) to assist in needs assessment for the planning and geographic targeting of services, (2) to provide detailed information to service providers, which allows programs to be tailored to local needs, and (3) to serve as a resource for the development of funding applications.

Database Geography

The risk indicators are compiled at a level of geography suitable for analysis at the community scale: 5-digit ZIP Code tabulation areas (ZCTA). The ZIP Code tabulation areas are defined as in Census 2010 maps. This dataset is computed at three spatial scales, Erie County (including Buffalo) [ECIB], Erie County (excluding Buffalo) [ECEB], and City of Buffalo Only [COBO].

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Risk Indicators

The table below documents the risk indicators that were compiled for this project. These notes explain how to use the table.

- The Risk Indicators Description column lists descriptions of particular indicators variables (e.g., *Off premise alcohol sales establishments, per road mile*).
- Most indicator variables are essentially rates. The majority of them are expressed as a percent, e.g., percent of renter occupied housing units. When it is clear, the [Universe: ...] clause is omitted. In some cases, it may not be clear which denominator is provided, i.e. [Universe: ...]. For some indicators, such as those of disease and crime, the rate is per 10,000 population, rather than percent, while for others, such as those for alcohol availability, the rate is per 100 road miles. Unless otherwise noted, the population used to calculate these rate indicators is from the 2010-2014 American Community Survey.

The [Source/Native Geography] tag on the right side of the Risk Indicators column identifies the data source (see “Technical Notes”, “Data sources” on page 5 for the list of data sources) and the original geography level of the source data (“Z” for ZIP Code area, “O” for other – see footnotes in this case). For example, for *IV.A. Population Instability (Migration)*, the tag is [CEN/Z] meaning that this data comes from the Census and was originally available at 5-digit ZIP Code area geography levels.

<i>Risk Indicator Description</i> [Source/Native Geography]	<i>Variable Name</i>
Alcohol Sales Establishments [SLA/O] 2023 Off premise alcohol sales establishments, per 100 road miles [Universe: aggregate road miles per areal unit] 2023 Off premise alcohol sales establishments, per 10,000 population [Universe: total population]	alc_off_pr_rd alc_off_pr_pop
Population Instability (Migration) [CEN/Z] Percent of population 5 years and over that moved into current residence from another house in Erie County, 2019 - 2023 American Community Survey [Universe: population 5 years and over]	mov_county
Rental Residential Properties [CEN/Z] Percent population in renter occupied housing units, 2019 - 2023 American Community Survey [Universe: population in occupied housing units]	rent_pop
Extreme Economic Deprivation [CEN/Z] Composite Poverty Index (summation of standard deviation units of the following indicators, all data from 2019-2023 American Community Survey): <ul style="list-style-type: none"> • Percent families with income below poverty level [Universe: all families] • Percent families with female householder and no husband present, with income below poverty level and with related children under 18 years [Universe: all families] • Percent children under 18 years living below poverty level [Universe: population under age 18] • Percent aggregate income that is coming from assistance sources: social security, supplemental security income, public assistance [Universe: aggregate income from all sources] • Median household income 	z_pov
Gini Coefficient [CEN/Z] Index of income inequality, 2019-2023 American Community Survey [Universe: total population]	gini

<p>30 Day Binge Drinking Rates Among Adults [DH/Z] 2019-2021 average rate of binge drinking among adults ages 18+, per 10,000 population [Universe: total population]</p>	de_cirrhos
<p>Opioid Related Deaths [DH/Z] 2019-2021 average rate of opioid-related deaths among adults ages 18+, per 10,000 population [Universe: total population]</p>	de_trauma
<p>Divorce and Separation [CEN/Z] Percent of population 15 years and over who have never been married, 2019-2023 American Community Survey [Universe: population age 15 and over]</p>	nv_married
<p>Grade 8 English (ELA) performance [NYSED/O] 2021-2023 average rate of poor (levels 1-2) English performance [Universe: all students tested]</p>	g8_eng_112
<p>Juvenile Arrests [DCJS,BPD/Z,O] 2021-2023 average annual arrests for violent offenses (aggravated assault, forcible rape, murder, robbery) among juveniles, per 10,000 population [Universe: population under age 18]</p>	jar_viol
<p>Rate of Smoking Among Adults [DH/Z] 2019-2021 average rate of smoking among adults aged 18+, per 10,000 population [Universe: total population]</p>	gono_all
<p>OASAS Alcohol and Substance Abuse Admissions [DMH/Z] 2020-2022 average annual admissions of persons under 18 to treatment at the Office of Alcoholism and Substance Abuse (OASAS), per 10,000 population [Universe: population under age 18]</p>	oasas_u18
<p>Reported Crimes [DCJS,BPD/O] Index of criminal activity taken as the summation of standard deviation units of:</p> <ul style="list-style-type: none"> □ 2021-2023 average annual reported criminal mischief (vandalism, etc.) offenses, per 10,000 population [Universe: total population] □ 2021-2023 average annual reported violent offenses (aggravated assault, forcible rape, murder, robbery), per 10,000 population [Universe: total population] 	crm_crmis crm_viol crime_index
<p>Adolescent Pregnancies [DH/Z] 2018-2020 average annual pregnancies (births + abortions + spontaneous fetal deaths) by mother's age, per 1,000 population for the middle year of the three-year time period [Universe: female population ages 15-19]</p>	preg_15_19
<p>Neighborhood Index [CEN/Z] Composite neighborhood instability score taken as the summation of standard deviation units of the following indicators:</p> <ul style="list-style-type: none"> • Percent of population 5 years and over that moved into current residence from another house in Erie County, 2019-2023 American Community Survey [Universe: population in occupied housing units] • Percent of population 15 years and over who have never been married, 2019-2023 American Community Survey data [Universe: population age 15 and over] • Percent population in renter occupied housing units, 2019-2023 American Community Survey [Universe: population in occupied housing units] 	ngh_index

<p>Youth Index [DCJS,BPD/O]</p> <p>Taken as the summation of standard deviation units of the following indicators:</p> <ul style="list-style-type: none"> • 2019-2021 average annual arrests for violent offenses (aggravated assault, forcible rape, murder, robbery) among juveniles, per 10,000 population [Universe: population under age 18] • 2018-2020 average annual pregnancies (births + abortions + spontaneous fetal deaths) by mother's age, per 1,000 population for the middle year of the three-year time period [Universe: female population ages 15-19] • 2021-2023 average rate of poor (levels 1-2) English performance [Universe: all students tested] 	youth_index
<p>Aggregated Risk Index</p> <p>Taken as the summation of standard deviation units of all risk indicators.</p>	agg_risk

Selected Indicators Matched with Hawkins and Catalano Categories

<i>Hawkins and Catalano Category</i>	<i>Matching Indicators</i>
I. Availability of Drugs	alc_off_pr_rd alc_off_pr_pop
II. Availability of Firearms	N/A
III. Community Laws and Norms Favorable to Drug Use, Firearms and Crime	alc_off_pr_rd alc_off_pr_pop pngh_index
IV. Transition and Mobility	mov_count yrent_pop ngh_index
V. Low Neighborhood Attachment and Community Disorganization	mov_count yrent_pop crm_crmis ngh_index
VI. Extreme Economic Deprivation	z_pov Gini ngh_inde
VII. Family History of Problem Behavior	de_cirrhos de_trauma
VIII. Family Management Problems	youth_index
IX. Family Conflict	nv_married ngh_index
X. Early and Persistent Antisocial Behavior	youth_index
XI. Lack of Commitment to School	g8_eng_112 youth_index
XII. Alienation and Rebelliousness	oasas_u18 youth_index
XIII. Academic Failure Beginning in Late Elementary School	g8_eng_112 youth_index
XIV. Early Initiation of Problem Behavior	jar_viol preg_15_19 oasas_u18
XV. Friends Who Engage in Problem Behavior	de_trauma gono_all preg_15_19 oasas_u18
XVI. Substance Abuse	oasas_u18 crime_index
XVII. Delinquency	de_trauma jar_viol crime_inde
XVIII. Favorable Paternal Attitudes and Involvement in Problem Behavior	de_trauma crm_crmis crime_index
XIX. Teen Pregnancy	preg_15_19 youth_index

INTERPRETING RISK

1. The small table at the top details the population characteristics of the selected zip
 - The raw values for “Population” and “Population under 18” are given
 - The proportion of the total zip code population under age 18 is listed in parentheses, after the raw value of “Population under 18”
2. The primary output table contains columns for the Hawkins and Catalano Categories and
 - The value column shows the raw value for the indicator as outlined by its
 - Note that the Composite Crime, Neighborhood, and Youth Problem Behavior Indices only show quartile values and do not show raw values. (See the Technical Documentation for more details.)
 - The Quartile column identifies where the value for this indicator for the inputted zip
 - 1 = the bottom 25% of values for the indicator - the lowest level of risk
 - 2 = 25% - 50% of values for the indicator - lower than average risk
 - 3 = 50% - 75% of values for the indicator - higher than average risk
 - 4 = the top 25% of values for the indicator - the highest level of risk
 - Indicators that have quartile values of 3 or 4 show an elevated level of risk for the specified zip code, and are recommended for use in Needs Assessments
 - Indicators in the 4th quartile are specifically identified by an asterisk
3. Once you have generated a report, you can simply copy and paste it into a word processing program
4. The Maps of Indicators documents available for download from this website contains quartile-based maps of these key indicators for use as supporting documentation in Needs
 - The Maps of Indicators supplement the Risk Analysis by providing a visual display for each indicator showing how the selected zip code compares to the rest of the county

Technical

1. Data sources. Risk indicators were compiled using data from several sources. Below is the list of data sources and abbreviations identifying them in the table of risk indicators:
 - (a) Federal and state sources:

U.S. Census Bureau American Community Survey	CEN
New York State Education Department	NYSED
New York State Department of Criminal Justice Services	DCJS
New York State Liquor Authority	SLA
 - (b) Erie County and local sources:

City of Buffalo Police Department	BPD
Erie County Department of Health	DH
Erie County Department of Mental	DMH
2. Missing data values. Even when an indicator is available, not every ZIP Code record will have an associated value; for some the value will be missing. Common reasons for missing data are data availability and small populations (see below).
3. Small populations. Since all indicators are essentially ratios of the form cases/population (expressed as percent or per 10,000), it is important to avoid unreliable indicator values due to small populations. For this reason, an arbitrary threshold of population greater than 100 was set. If the total population for a particular ZIP Code area is less than 100, then most population-based (i.e. with population in denominator) indicators will be missing for this record.
 - ❖ Some data are suppressed by the data source due to small numbers and the potential to violate confidentiality. If the subset of the population used to calculate a particular indicator (e.g. population under 18 for OASAS alcohol and substance abuse admissions) is less than 100, this data has also been suppressed.
4. Imputation of indicators. Sometimes the source data for calculation of the indicators were available at a spatial level other than ZIP Code area. In these cases, risk indicators were first calculated at the available level, and then imputed (transferred) to the ZIP Code level.

Four imputation schemes were utilized in calculating the risk indicators:

- (a) From school districts to ZIP Code areas. This scheme was used to transfer data collected for school districts (e.g. performance on English tests) to ZIP Code areas and calculate corresponding risk indicators.
- (b) From police departments' areas of responsibility to ZIP Code areas. Crime statistics obtained from New York State Department of Criminal Justice Services (DCJS) are tabulated by law enforcement agencies in Erie County. Areas served by each law enforcement agency (usually a town or an incorporated place) were delineated and data were interpolated to ZIP Code areas for ease of use and for compatibility with crime data from Buffalo Police Department (see below).

- (c) Data from the Buffalo PD for 2004 and beyond are incident-based (inclusive of all known crimes) and do not use the UCR coding system. Address-level records for crimes reported to DCJS by the Buffalo PD were geocoded and aggregated to compute their proportional shares per ZIP Code for each crime category. These proportions were in turn used to interpolate the 2010-2013 DCJS crime counts to provide better spatial detail of crime within Buffalo; this method is more appropriate and reflective of actual crime patterns when compared to simple population or areal interpolation.

As an example of how this spatial interpolation works, consider interpolating school data from school districts to ZIP Code areas. Specifically, let's calculate the risk variable `g8_eng_112` (low grade 8 English exam scores as percentage of tested students) for ZIP Code area 14001.

- ❖ We start by allocating low score counts (e.g. numbers of cases of students with low scores) from each school district to ZIP Code areas, proportionately to the percent of population of each school district which lives in a specific ZIP Code area (as determined by spatial overlay operation in a GIS). For example, the population living inside the boundaries of Akron Central School District is distributed in the following way: 90.0% of the population lives in ZIP Code area 14001, 4.6% in 14004, 3.5% in 14032, and 1.9% in 14013. Hence, the total number of low-scoring students for the Akron district, 80, is split up between these ZIP Code areas as follows: 72.00 for ZIP Code area 14001, 3.68 for 14004, 2.80 for 14032, and 1.52 for 14013.
- ❖ Next, we sum up allocated counts for each ZIP Code area. ZIP Code 14001 receives counts from three school districts: Akron (90.0% of Akron's total count of suspensions), Alden (5.0% of its count), and Clarence (14.9% of its count). The total suspension count for ZIP Code area 14001 is then:

$$g8_eng_112_{14001} = g8_eng_112_{Akron} * 0.900 + g8_eng_112_{Alden} * 0.050 + g8_eng_112_{Clarence} * 0.149$$

- ❖ Repeating the above procedure for the total students tested in ZIP Code area 14001, we can now compute the risk indicator variable `suspension` (low grade 8 English performance as % of tested students) for this ZIP Code area.

Note: Due to the lack of community-based schools in the City of Buffalo, the risk variable `g8_eng_112` (low grade 8 English exam scores as percentage of tested students) has been omitted from City of Buffalo only quartile rankings.

5. Decimal places. Values of risk indicators were rounded to two decimal
6. New York State Liquor Authority data. Data provided by the SLA was initially edited to remove locations that are not reflective of typical alcohol consumption patterns (e.g. concessions at the First Niagara Center where patrons must first gain entrance to the arena) as well as additional liquor licenses for singular locations (e.g. Soho Bar at 64 Chippewa Street in Buffalo has three on-premise licenses to accommodate the three separate bars located on the two levels of the single location). These data were then geocoded and aggregated to determine the counts of locations per ZIP Code which were then standardized by dividing by both 100 road miles and 10,000 population to reflect road network and population densities.
7. Adolescent Pregnancy Rate. Due to changes in policies at the Department of Health, disclosure of the adolescent pregnancy rates is limited to ages 15-19, rather than ages 10-19 as used in some previous versions of the database.

8. Gini Coefficient. A measure of statistical dispersion capturing inequality in a frequency distribution, in this case of household income. In this measure, 0 represents perfect equality, while 100 represents perfect inequality. Income inequality as measured by the Gini Coefficient is a risk indicator for mental health problems, particularly among adolescents.
9. The database includes five index variables: Composite Poverty, Youth, Neighborhood, Crime, and Aggregated Risk. To capture the information contained in several of the indicators, composite indices were constructed by converting indicators (detailed above in the Risk Indicator Description Table) into standard deviation units (z scores) and then summing their scores.