Release Notes for Indicator Data for Cumulative Impact Analysis

UPDATED: January 30, 2025

> Data updated in this release: age, traffic proximity, diesel PM, ozone, PM2.5, cancer risk, coronary heart disease, COPD, premature mortality.

Location: MassDEP Cumulative Impact Analysis in Air Quality Permitting website (https://www.mass.gov/info-details/cumulative-impact-analysis-in-air-quality-permitting)

Contents: This file provides data for use in the assessment of existing community conditions section of the cumulative impact analysis (CIA) report required by 310 CMR 7.02(14)(c)4. Table 1. See MassDEP CIA guidance on its Cumulative Impact Analysis in Air Quality Permitting website for instructions on which data to use and how to present data in the CIA report.

Questions: Please contact MassDEP with any questions about the indicator data by emailing massdep.impact@mass.gov

File: Indicator data for cumulative impact analysis Jan 2025.xlsx

There are 4 tabs in this Microsoft Excel file.

1. Indicators by Block Group
2. Indicators by Tract
3. Block Group-Schools
4. Pediatric Asthma by School

MA statewide averages or rates for the indicators appear above the column headings.

Acronyms:

> MassDEP – Massachusetts Department of Environmental Protection
> MDPH – Massachusetts Department of Public Health
> EEA – Massachusetts Executive Office of Energy and Environmental Affairs
> EPA – United States Environmental Protection Agency
> ACS – American Community Survey from the U.S. Census Bureau
> µg/m3 – micrograms per cubic meter

Indicators by Block Group (EJ block groups only)

EJ Block Groups and Related Criteria

> Source: MassGIS Data: 2020 Environmental Justice Populations (https://www.mass.gov/info-details/massgis-data-2020-environmental-justice-populations)

> Data year: 2020 (November 2022 data release)

EEA designates EJ block groups and publishes them via MassGIS along with related data. The November 2022 release is based on the 2020 biennial Census population table and American Community Survey 2016-2020 5-year-estimate tables – see link above for more detailed data references.

From MassGIS metadata for the EJ data: Block groups are statistical divisions of census tracts and their boundaries are based on population numbers rather than geographic size, generally between 600 and 3,000 people. Therefore, block groups can vary greatly in size. Where block groups cover more than one town, most often in the western part of the state, the block group has been split along the town boundary **and the attributes, with the exception of TOWN_ID, Municipality and MUNI2, have been duplicated in each part of the block group.** These polygons are coded 'Y' in the *split_for_muni* field.

Traffic Proximity and Age

Source: EPA EJScreen data download (https://www.epa.gov/ejscreen/download-ejscreen-data)

Data years: 2020 for Age, 2020 for Traffic Proximity (Release of EJScreen 2.3, July 2024)

The July 2024 release updated all socioeconomic data to Census American Community Survey (ACS) 2018-2022 5-Year Estimates (ACS 2022). Percentiles for Age and Traffic Proximity fields are those calculated by EPA EJScreen and downloaded from the EJScreen website. MA averages are those given in EJScreen Community Reports. See EJScreen technical documentation for details: https://www.epa.gov/ejscreen/technical-information-and-data-downloads and https://www.epa.gov/ejscreen/ejscreen-change-log

Indicators by Tract

This tab provides indicator data by 2020 census tracts. Where data existed only for 2010 census tracts, MassDEP mapped the data into 2020 tracts using Census Tract Relationship Files provided by the U.S. Census website (https://www.census.gov/geographies/reference-files/time-series/geo/relationship-files.html#tract). Where multiple 2010 tracts contributed to a single 2020 tract, the indicator data from each of the contributing 2010 tracts was applied to the 2020 tract based on the percent of the 2020 tract area contributed by each of those 2010 tracts.

Diesel PM, PM$_{2.5}$ and Ozone

Source: EPA EJScreen data download (https://www.epa.gov/ejscreen/download-ejscreen-data). EJScreen is the Environmental Justice Screening and Mapping Tool available on EPA's website: https://www.epa.gov/ejscreen

Data years: 2020 for Diesel PM, PM$_{2.5}$ and ozone (EJScreen 2.3, July 2024)

Percentiles for PM$_{2.5}$ and ozone are those calculated by EPA EJScreen and downloaded from the EJScreen website. MA averages are those given in EJScreen standard reports. See EJScreen technical documentation for details: https://www.epa.gov/ejscreen/technical-information-and-data-downloads and https://www.epa.gov/ejscreen/ejscreen-change-log

The Diesel PM indicator is the estimated concentration of Diesel PM at the tract level provided by EJScreen expressed in units of micrograms per cubic meter ($\mu g/m^3$). Diesel PM was originally calculated in the 2020 AirToxScreen, but AirToxScreen only provides Diesel PM at the block group. EJScreen converts Diesel PM concentrations into percentiles and MassDEP provides these EJScreen percentiles in this update. MassDEP obtained the Diesel PM average for MA from EJScreen Community Reports.

Air Toxics Cancer Risk and Respiratory Hazard Index (HI)

Source: EPA AirToxScreen 2019 (Respiratory Hazard Index (HI)) and 2020 (Air Toxics Cancer Risk). AirToxScreen is the Air Toxics Screening Assessment available on EPA's website: https://www.epa.gov/AirToxScreen.

Data years: Respiratory HI 2019 (December 2022 release), Air Toxics Cancer Risk 2020 (May 2024 release)

MassDEP summed block values by pollutant for air toxics cancer risk and averaged to obtain tract values. MassDEP summed tract-level Respiratory HI by pollutant downloaded from the AirToxScreen website. MassDEP used the sum of the Entire State values by pollutant provided in the AirToxScreen data files for the MA statewide averages for cancer risk and HI. MassDEP calculated percentiles (percentile rank) for air toxics cancer risk and HI.

Pre-Mature Mortality (PMR)

Source: Massachusetts DPH (MDPH) Registry of Vital Records and Statistics (RVRS) Death Records

Data years: 2018-2022

MDPH provided an age-adjusted premature mortality rate (PMR per 100,000) by tract. MDPH calculated the statewide PMR (292.5 per 100,000) and MassDEP calculated the percent of state rate and percentile (percentile rank) from the tract values. Premature mortality tracks unfulfilled life expectancy and is based on deaths prior to age 75 (premature). PMR includes unintentional injuries such as motor vehicle-related deaths, poisonings, falls, fires, and drownings that were not intended to occur. Deaths are for all age groups. For more information on PMR and Leading Causes of Death please see the Death Data via the Registry of Vital Records and Statistics.

Impervious Surface

Source: EEA/MassDEP GIS based on MassGIS Data: 2016 Land Cover/Land Use (https://www.mass.gov/info-details/massgis-data-2016-land-coverland-use)

Data years: 2016 (for the underlying land cover/land use data)

Areas of ocean were removed from the original data by MassDEP GIS – the indicator value is percent impervious within tracts not including coastal embayments/rivers and open ocean. MassDEP calculated the MA average and percentiles (percentile rank) from the percent impervious surface by tract determined by EEA/MassDEP GIS.

Coronary Heart Disease and COPD (chronic obstructive pulmonary disease)

Source: CDC Places database available on the U.S. Centers for Disease Control and Prevention's website: http://www.cdc.gov/places

Data years: 2022 (August 2024 release)

The indicator table includes CDC Places crude prevalence based on the Behavioral Risk Factor Surveillance System (BRFSS) 2022 data and the American Community Survey (ACS) 2018–2022. MA state rates are from the BRFSS Prevalence & Trends Data at the BRFSS Prevalence Data & Data Analysis Tools site (https://www.cdc.gov/brfss/data_tools.htm). MassDEP calculated the percentiles (percentile rank).

Low Birth Weight (LBW)

Source: MDPH datasets (similar data available through the MDPH Environmental Justice Tool available on MDPH's website: https://matracking.ehs.state.ma.us/Environmental-Data/ej-vulnerable-health/environmental-justice.html)

Data years: LBW 2011-2015

Low Birth Weight Rate Definition: 5-Year annual average low birth weight (less than 2,500 grams) per 100 full-term births. Null values indicate that the data are suppressed to protect privacy, which occurs when the case count is between 1 and 4 with total live births less than 1,200. MDPH applied suppression based on the combined total for all years of data (2011-2015). Values of 0 can be interpreted as 0 instances of LBW. MDPH calculated the MA state rate (2.17%) for LBW.

Elevated Blood Lead Levels (BLL)

Source: MDPH dataset (similar data available through the MDPH Environmental Justice Tool available on MDPH's website: https://matracking.ehs.state.ma.us/Environmental-Data/ej-vulnerable-health/environmental-justice.html)

Data years: BLL 2017-2021

Childhood Blood Lead Levels Definition: 5-year average prevalence of elevated (≥5 µg/dL estimated confirmed) childhood blood lead levels (ages 9-47 months). Visit the MA EPHT glossary page for more information about the estimated confirmed measure (https://matracking.ehs.state.ma.us/Glossary/index.html). A null BLL value indicates the case count or prevalence is suppressed by MDPH. Values are suppressed to protect privacy when the number of children screened or case count is between 1 and 5 and the population or total screened is less than 1,200. MDPH applied suppression based on the combined total for all years of data. Values of 0 can be interpreted as 0 instances of elevated BLL.

MDPH calculated the tract rates and MassDEP calculated the MA state rate (18.40 per 1000, or 1.8%) for elevated BLL.

Pediatric Asthma by School

Source: Massachusetts Department of Public Health/Bureau of Environmental Health (MDPH/BEH)

Data: Average prevalence (% of enrollment) for each school for 3 school years: 2014-2015, 2015-2016, 2016-2017

Prevalence in schools is defined as the percentage of enrolled students reported by school nurses to have asthma during a school year. Schools are public, charter, and private. School-based asthma data are reported annually by school nurses through the DPH Pediatric Asthma and Diabetes Survey for students in grades K-8 who have ever been diagnosed with asthma. MDPH calculated the school rates for asthma prevalence (November 2022). The statewide rate is the average of the statewide prevalence reported by the MDPH Massachusetts Environmental Public Health Tracking (MEPHT) system.

From the MEPHT notes on pediatric asthma data: Prevalence was not calculated (NC) for schools missing enrollment data (no data - ND) for any of the three years. "NS" indicates that data were suppressed to protect privacy. Suppression is applied for any school with a total case count between 1 and 5 and a total enrollment < 1200. Suppression was applied based on the combined total for all years of data (2014-2016). NA indicates insufficient school enrollment data available to calculate prevalence. NA for both student case count and student enrollment

may indicate the school location is no longer in use, or prevalence could not be calculated due to a data collection issue.

MassDEP removed 1 outlier from the dataset – Green River school in Greenfield – because it had a prevalence greater than its enrollment.

MassDEP GIS identified schools in or within ½ mile of each EJ block group – that list is in tab *Block Group-Schools*. Because more than one school can be within ½ mile and the ½ mile around each EJ block group can overlap, there may be multiple records for each school as it may be near multiple block groups.