# Everett Community
# 2025 Environmental Justice Report

## Publication Information

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# Executive Summary

The Everett Community Report provides community information, demographic data, greenhouse gas emissions data, and information about criteria air pollutant levels (CAPs) and their health impacts. This document provides information about air quality and health impacts to those who live, work, and play in the Everett community.

For more information about the background and methodology of this document, please visit *2025 Environmental Justice Report: Overburdened Communities Highly Impacted by Air Pollution* (2025 EJ Report).

# Community Overview

The Everett community was identified as overburdened and highly impacted by air pollution because it met the statewide screening criteria based on the Washington Environmental Health Disparities map[1] ranking and the EJScreen demographic index.[2] This community also experiences elevated levels of short-term exposure to fine particulate matter ($PM_{2.5}$), based on nearby monitoring data and previous modeling. Community identification is described in more detail in the Overburdened Communities Highly Impacted by Air Pollution StoryMap.

**Land Area:** 16.5 sq. mi

**Population:** 87,620

**County:** Snohomish

**Municipal Government:** Everett City Council

**Ecology Region:** Northwest

**Local Clean Air Authority:** Puget Sound Clean Air Agency

**Local Health Jurisdiction:** Snohomish County Health Department

**Primary languages spoken:** English, Spanish, Vietnamese, Korean, Russian, Ukrainian

**Primary pollutant of concern:** Short-term $PM_{2.5}$

## Geographic characteristics

Everett is in Snohomish County, about 20 miles north of Seattle. It is the seventh-most populous city in Washington state. The identified community is bounded by Interstate 5 to the east, includes most of the city except its northwestern area, and extends from the Snohomish River in the north to Paine Field Airport in the south. Most of the Everett community is zoned for single- or multi-family residential housing; it also includes commercial mixed-use areas and part of the metropolitan center.

[1] Washington Environmental Health Disparities map https://doh.wa.gov/data-and-statistical-reports/washington-tracking-network-wtn/washington-environmental-health-disparities-map
[2] EJScreen demographic index https://www.epa.gov/ejscreen

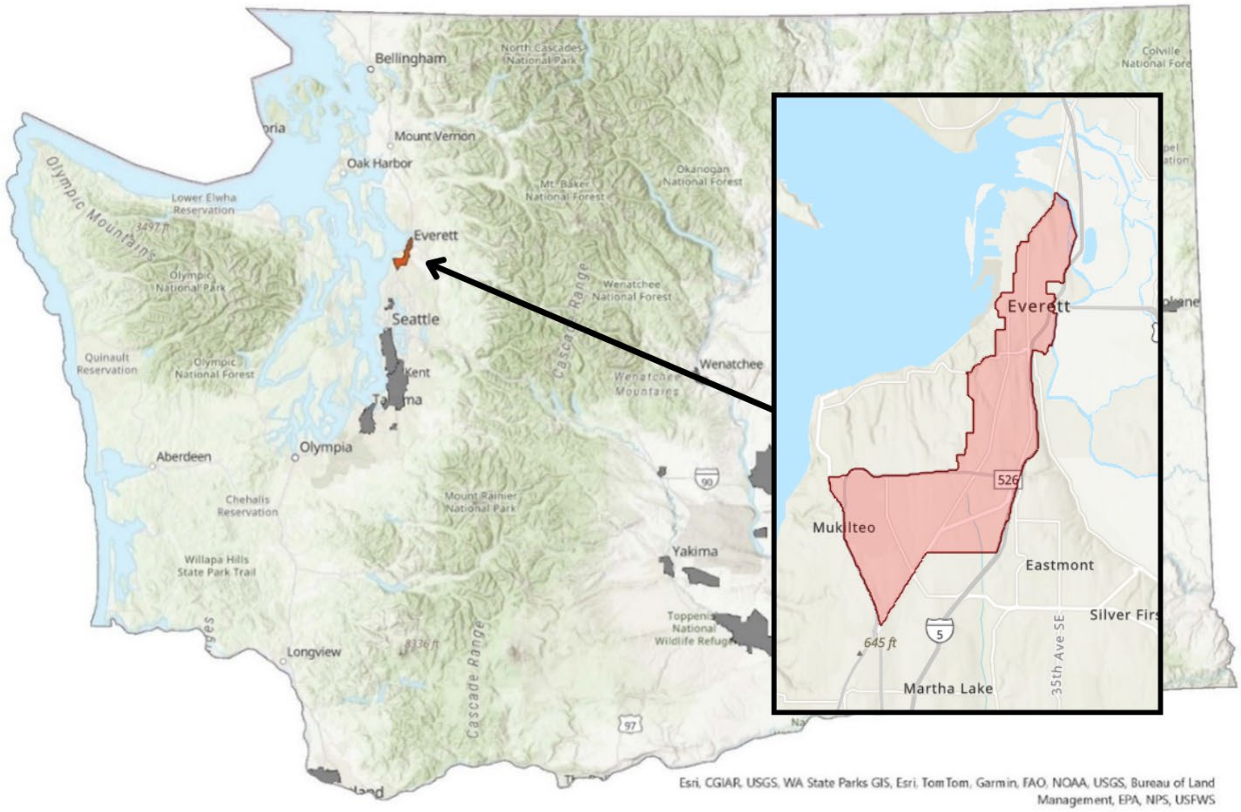


*Figure 1. Map of the 16 overburdened communities highly impacted by air pollution (gray) in Washington state, with Everett (red) highlighted.*

# Socioeconomic characteristics

Like many other parts of the greater Seattle region, Everett is ethnically diverse. A third of households in this community speak a language other than English at home. Over one-tenth of residents are Asian American, and about one-fifth are Hispanic. Nearly 1 in 10 workers in this community are employed in construction and extraction occupations, the highest share among the 16 identified communities.[3,4] The Everett community also experiences a slightly higher rate of asthma and lower life expectancy compared to the rest of Washington state, which may indicate increased vulnerability to the health impacts of air pollution.[5]

[3] American Community Survey Data https://www.census.gov/programs-surveys/acs/data.html
[4] WA Office of Financial Management, Estimates of April 1 population by age, sex, race and Hispanic origin https://ofm.wa.gov/data-research/population-demographics/forecasts-projections/age-sex-race-and-hispanic-origin/information/
[5] U.S. Centers for Disease Control and Prevention, PLACES Data Portal https://www.cdc.gov/places/tools/data-portal.html

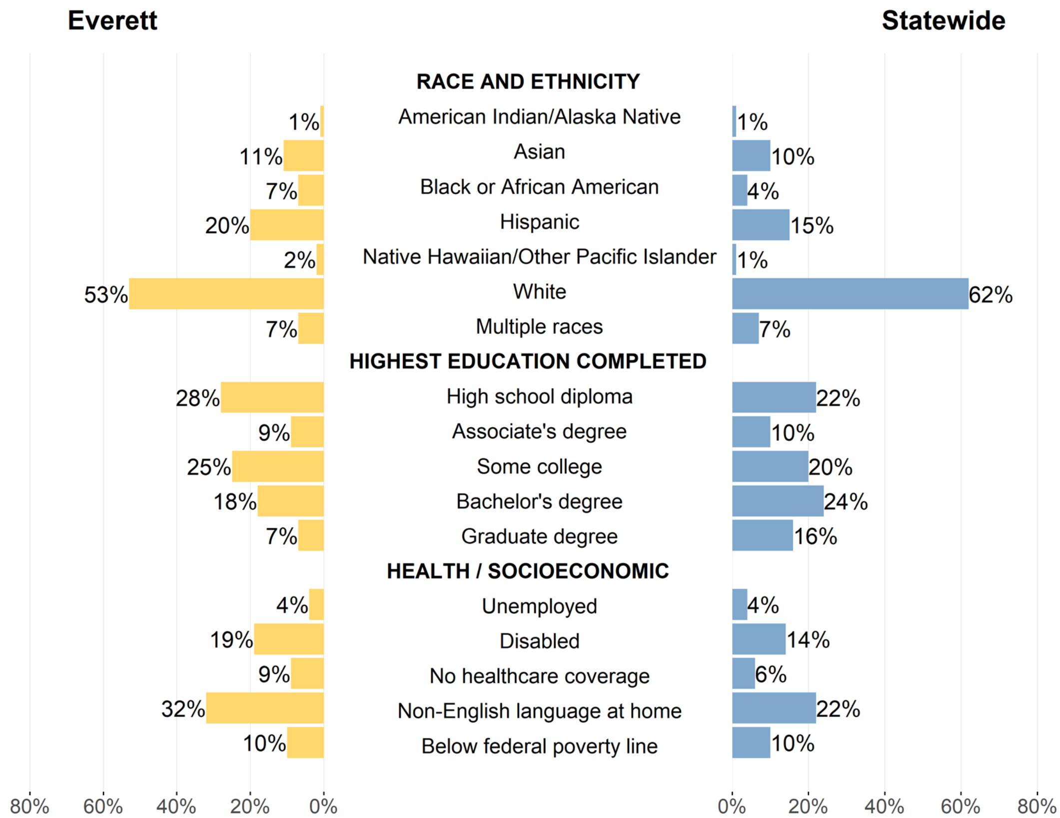


*Figure 2. Sociodemographic characteristics of the Everett community compared to statewide percentages, based on Washington State's 2024 estimated population of 8,035,700.*[6]

## Health characteristics

According to 2022 CDC health survey data,[7] Everett has slightly elevated prevalences of chronic health conditions among individuals ages 18 years and older relative to the statewide population, including asthma (11.8% vs. 11.4%), COPD (5.9% vs. 5.7%), and diabetes (10.9% vs. 9.6%). Everett also has a lower prevalence of cardiovascular disease (5.5% vs. 5.7%). These prevalences are not necessarily attributable to air pollution. Community and statewide prevalences that have overlapping 95% confidence intervals, as shown in Figure 3, might not be statistically significant.

[6] WA Office of Financial Management, Nov 2024 Data Tables, Population by age and sex https://ofm.wa.gov/wp-content/uploads/sites/default/files/public/dataresearch/pop/stfc/stfc_2024.xlsx
[7] U.S. Centers for Disease Control and Prevention, PLACES Data Portal https://www.cdc.gov/places/tools/data-portal.html

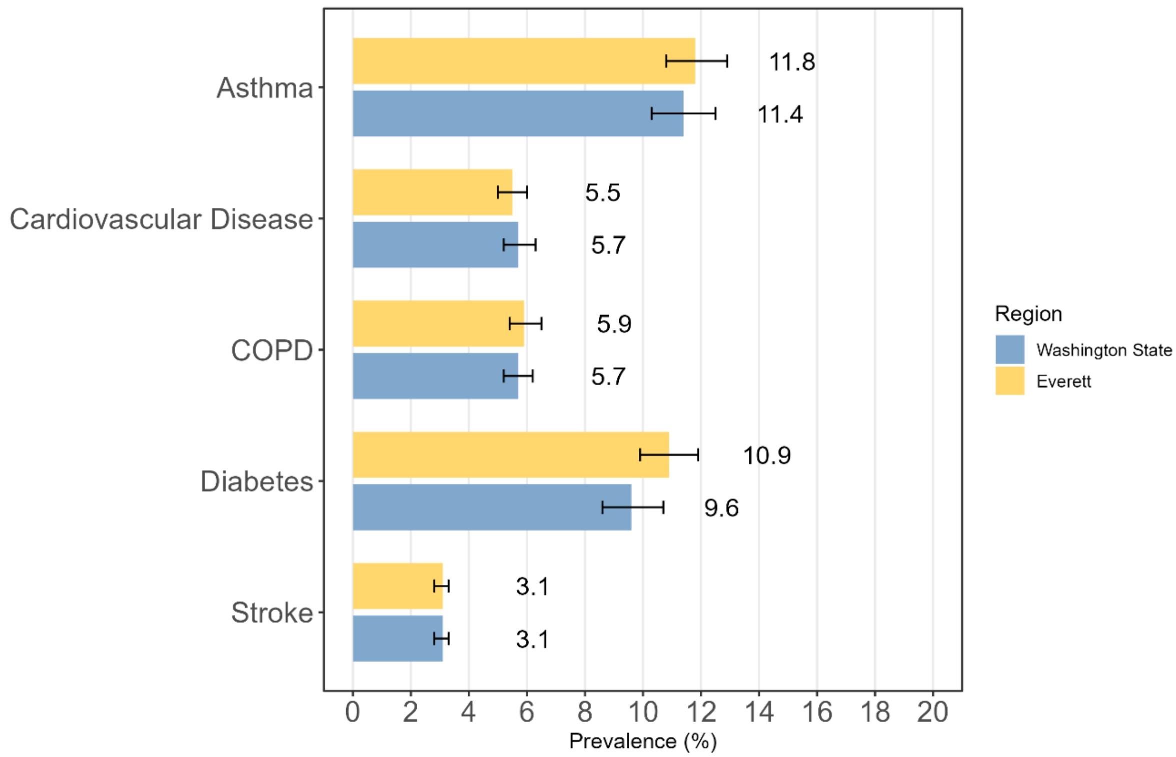


*Figure* 3. *Prevalence of chronic health conditions among people ages 18 years and older in Everett census tracts compared with Washington State.*

Data come from CDC PLACES, 2024 release, which uses 2022 survey data.[5] Yellow and blue bars indicate the estimated prevalence of each condition. Black lines indicate the 95% confidence interval.

# Air Monitoring

Between 2024 and 2025, Ecology's Northwest Regional Office (NWRO) installed a regulatory $PM_{2.5}$ and $PM_{10}$ monitor at the Everett-Beverly Park Rd monitoring site, and two $PM_{2.5}$ sensors (SensWA) in the Everett community using Climate Commitment Act (CCA) funding. The $PM_{10}$ monitor was added to assess particulate matter pollution from the Mountain Loop Mine's Everett aggregate facility, following public concerns about its proximity to a nearby school. The Mountain Loop Mine in Granite Falls halted operations for several months in 2024 due to permitting issues.

The two $PM_{2.5}$ sensors were installed in late 2024 and early 2025, and data from these sensors will be included in the next biennial EJ Report. This report includes only partial-year data from the Everett-Beverly Park Rd monitoring site. No other criteria air pollutants are currently monitored in this community.

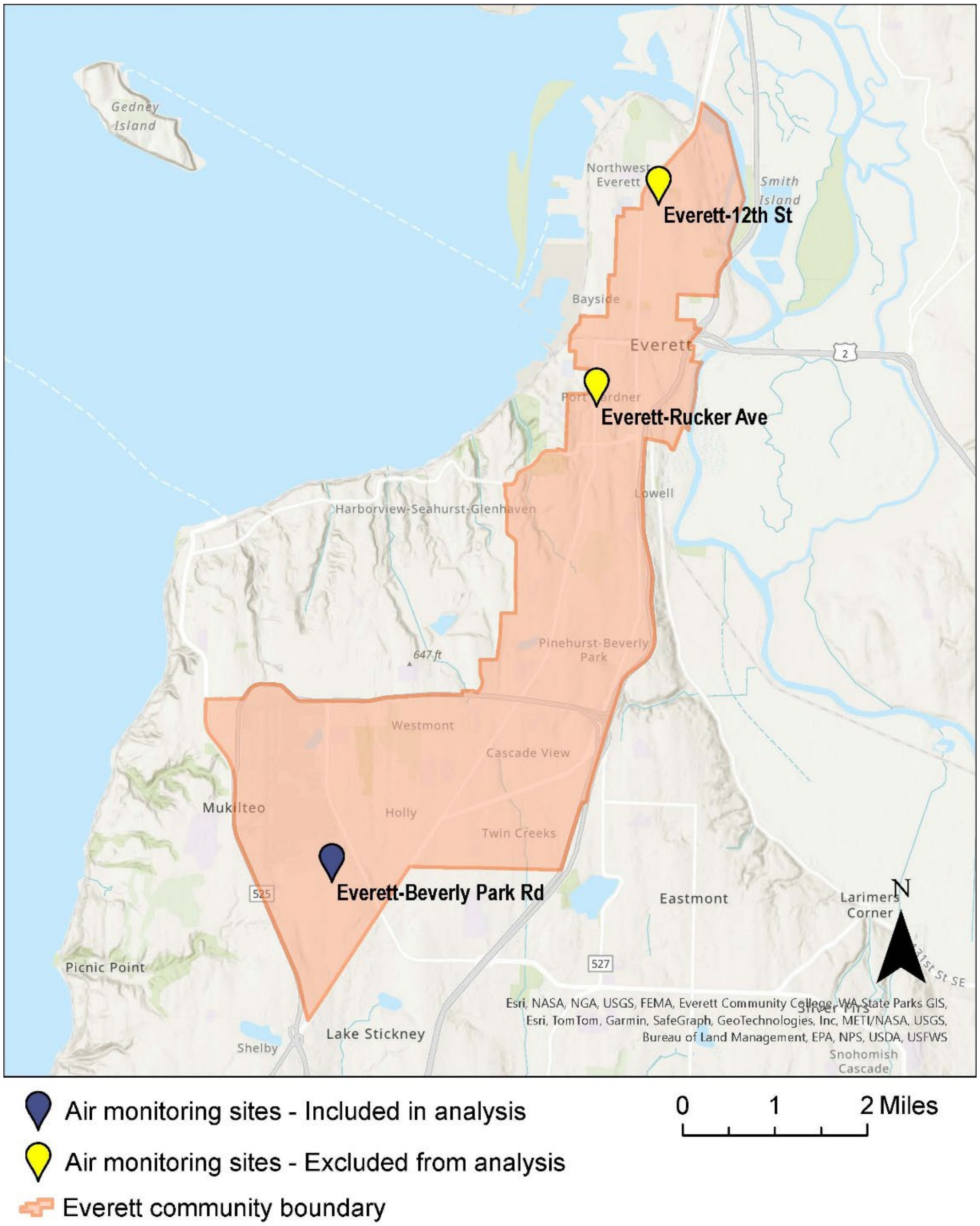


*Figure 4. Map of Everett air monitoring sites.*

*Table 1. Everett criteria air pollutant monitors*.

| Monitoring Site | Type | Site Owner | Pollutants Monitored |
|---|---|---|---|
| Everett-Beverly Park Rd | Regulatory [1] | Ecology-NWRO | $PM_{2.5}$, $PM_{10}$ |

[1] Installed as part of Climate Commitment Act implementation

# Criteria Air Pollution

This report summarizes criteria air pollution (CAPs) concentrations in the Everett community from 2024. CAPs concentrations for $PM_{2.5}$ are calculated using data from the Washington Ambient Air Monitoring Network and reported according to the Environmental Protection Agency's (EPA) methodology. More information can be found in the background and methods sections of the 2025 EJ Report.

Table 2 includes 24-hour $PM_{2.5}$ ($98^{th}$ percentile) summary statistics. $PM_{2.5}$ concentrations are measured over 24-hour periods in micrograms per cubic meter ($\mu g/m^3$). The EPA establishes national ambient air quality standards (NAAQS), which define the maximum allowable levels (thresholds) for each criteria pollutant. The NAAQS threshold for 24-hour $PM_{2.5}$ ($98^{th}$ percentile) is 35 $\mu g/m^3$. The design value for 24-hour $PM_{2.5}$ ($98^{th}$ percentile) is a statistic that describes the air quality of a location relative to the NAAQS over a three-year period and is used to describe short-term fine particulate exposure.

This report includes a partial-year of data from the newly installed Everett-Beverly Park Rd monitoring site. Using the available 2024 data, the 24-hour $PM_{2.5}$ concentration was below the NAAQS. Future publications of the biennial EJ Report will include additional years of $PM_{2.5}$ data as it becomes available.

*Table 2.* ***24-hour $PM_{2.5}$ (98th percentile) summary statistics, 2024.*** *Units are in µg/m³. Brackets [ ] exclude wildfire days when 24-hour average $PM_{2.5}$ concentration exceeded 35.4 µg/m³. 24-hour $PM_{2.5}$ (98th percentile) NAAQS is 35 µg/m³.*

| Monitoring Site | 2022 24-hour 98th Percentile | 2023 24-hour 98th Percentile | 2024 24-hour 98th Percentile | 2024 Design Value |
|---|---|---|---|---|
| Everett-Beverly Park Rd | DNC | DNC | *13.9* *[13.9]* | * |

*Italics* indicate incomplete annual data, DNC = data not collected, NAAQS = national ambient air quality standards, PM = particulate matter, µg/m³ = micrograms per cubic meter, * = incomplete data for 3-year design value

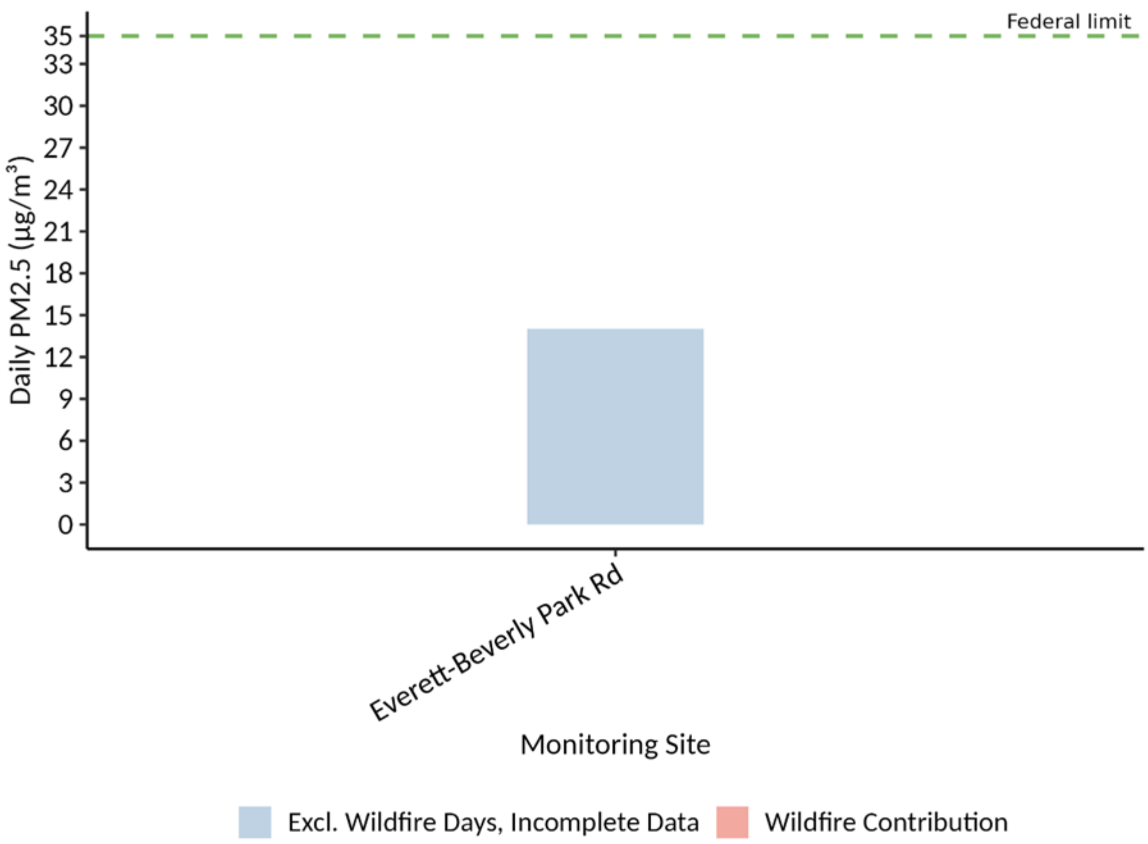


Figure 5. ***24-hour $PM_{2.5}$ (98th percentile) summary statistics, 2024.*** *Annual summary statistics calculated with and without days elevated from wildfire smoke. Light blue bars include average of available data from 2024. Dashed line is the federal limit (NAAQS) for 24-hr $PM_{2.5}$.*

Table 3 includes annual mean $PM_{2.5}$ concentrations for 2024. The annual $PM_{2.5}$ design value is a three-year average of annual mean concentrations used to describe long-term exposure; however, we did not have three-years of data available. Using available data from 2024, the annual mean $PM_{2.5}$ concentration remained below the NAAQS threshold of 9.0 µg/m³. We will include more complete annual $PM_{2.5}$ datasets as additional years of monitoring data become available.

*Table 3.* ***Annual mean $PM_{2.5}$ concentrations, 2024****. Units are in µg/m³. Brackets [ ] exclude wildfire days when the average $PM_{2.5}$ concentration exceeded 15.0 µg/m³. Annual $PM_{2.5}$ NAAQS is 9.0 µg/m³.*

| Monitoring Site | 2022 | 2023 | 2024 | 2024 Design Value |
|---|---|---|---|---|
| Everett-Beverly Park Rd | DNC | DNC | *4.30* *[4.30]* | * |

*Italics* indicate incomplete annual data, DNC = data not collected, NAAQS = national ambient air quality standards, PM = particulate matter, µg/m³ = micrograms per cubic meter, * = incomplete data for 3-year design value

For $PM_{10}$, 24-hour concentrations should not exceed 150 µg/m³ more than once per year on average over a three-year period. Based on available data, Table 4 shows that there were no $PM_{10}$ exceedances in 2024.

*Table 3.* ***Annual exceedances of $PM_{10}$* (µg/m³), 2024*.***

| Monitoring Site | Pollutant | 2022 | 2023 | 2024 | NAAQS Level | Form |
|---|---|---|---|---|---|---|
| Everett-Beverly Park Rd | $PM_{10}$ | DNC | DNC | *0* | 1 (µg/m³) | # of annual exceedances >150 µg/m³, averaged over 3 years |

*Italics* indicate incomplete annual data, DNC = data not collected, µg/m³ = micrograms per cubic meter

# Health Impacts of Criteria Air Pollution

We estimated the number and rate of deaths and morbidities associated with $PM_{2.5}$ and $O_3$ concentrations by age range and using health effect estimates from peer-reviewed studies (Appendix A, Table 2 in the 2025 EJ Report).  All estimates are rounded to the nearest whole number. We present ranges of deaths or morbidities where multiple studies assessed that health outcome.

## $PM_{2.5}$

We estimated 20 deaths by any cause (29 deaths per 100,000 population, Table A1) related to yearly $PM_{2.5}$ exposure. Among older adults, which is a smaller portion of the population, we estimated 11 total deaths (89 deaths per 100,000 population) each year associated with annual $PM_{2.5}$ exposure (Table A2).

Among different racial and ethnic groups (Figure 6), we estimated most $PM_{2.5}$-related deaths by any cause per year to be among non-Hispanic White people (16 deaths among 18–84-year-olds). However, when accounting for the ages of people in each racial and ethnic group[8], the annual age-adjusted mortality rate was highest among Hispanic people (46 deaths per 100,000 population) and non-Hispanic Black people (50 deaths per 100,000 population).

Figure 6 is based on the study by Pope et al. (2019),[9] where AIAN refers to American Indian and Alaska Native; NH to non-Hispanic; and NHOPI to Native Hawaiian and Other Pacific Islander. The bars indicate the 95% confidence interval (CI) for each rate.

[8] Age-adjusted mortality rates represent the mortality rate if the age distribution in that race category matched the age distribution of the total Washington State population. This allows for better comparability given that different race groups can have different age distributions and the risk of death is higher in older age groups. We see higher age-adjusted rates for race categories other than the non-Hispanic White group given that these groups are generally younger in overburdened communities compared to the statewide age distribution; when we standardize these groups to the state age distribution (which has a higher proportion of older people) the estimated mortality rates are higher. More information about our age-adjustment methods can be found in the 2025 EJ Report.

[9] Pope, C.A., 3rd, Lefler, J.S., Ezzati, M., Higbee, J.D., Marshall, J.D., Kim, S.Y., Bechle, M., Gilliat, K.S., Vernon, S.E., Robinson, A.L., & Burnett, R.T. (2019). Mortality Risk and Fine Particulate Air Pollution in a Large, Representative Cohort of U.S. Adults. *Environmental Health Perspectives*, 127(7), 77007.

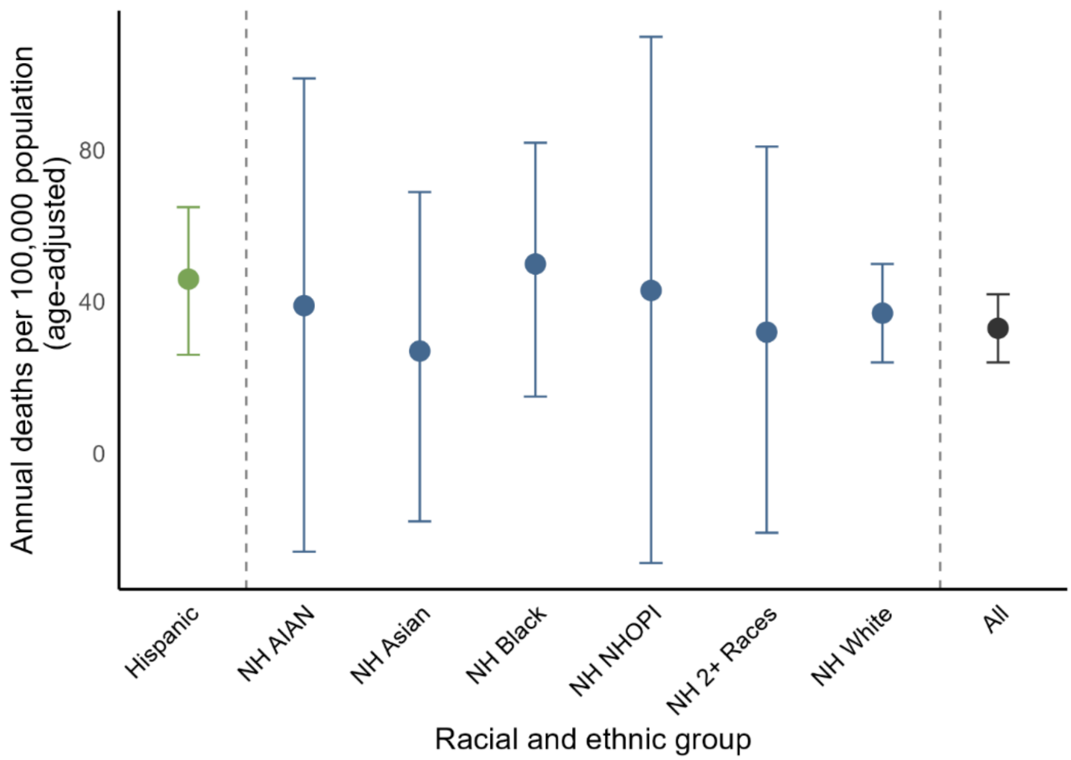


*Figure 6. Age-adjusted annual death rates associated with long-term $PM_{2.5}$ exposure among ages 18-84 by racial and ethnic group in Everett.*

When assessing specific causes of death related to yearly $PM_{2.5}$ concentrations (Table A3), we estimated 6 deaths due to cardiovascular disease (8 deaths per 100,000 population), 6 to 9 deaths due to ischemic heart disease (10 to 17 deaths per 100,000 population), and 1 to 2 deaths per year due to lung cancer (2 to 3 deaths per 100,000 population) among adults.

Regarding non-fatal health outcomes (Table A3), an estimated 8 hospital admissions (11 visits per 100,000 population) for acute non-fatal myocardial infarction were associated with yearly $PM_{2.5}$ concentrations among adults. Additionally, 6 lung cancer diagnoses per year were associated with annual $PM_{2.5}$ exposure among all people (11 diagnoses per 100,000 population).

Daily $PM_{2.5}$ exposure (Table A4) was associated with <1 death by any cause (<1 per 100,000 population) among all people and 1 death by any cause (8 per 100,000 population) among older adults ages 65 to 99. For non-fatal conditions, daily $PM_{2.5}$ was associated with 1 to 2 acute non-fatal myocardial infarction admissions (2 per 100,000 population) among all adults, 8 respiratory admissions (59 per 100,000 population) among older adults ages 65 to 99, 5 asthma hospital admissions (7 per 100,000 population) among people ages 0 to 64. Additionally, 19 to

36 asthma-related emergency department (ED) visits (21 to 40 per 100,000 population) among all people and 14 asthma-related ED visits (69 per 100,000 population) among youths ages 0 to 17 years were associated with daily $PM_{2.5}$ exposure.

## Ozone

We estimated that $O_3$ exposure during the warm season (Table A5) was associated with 2 seasonal deaths by any cause among older adults ages 65 to 99 (12 deaths per 100,000 population). Daily $O_3$ exposure was associated with 1 death by any cause (1 per 100,000 population), 29 asthma-related ED visits (32 per 100,000 population) among all people, and 10 respiratory hospital admissions (81 per 100,000 population) among older adults ages 65–99.

# Greenhouse Gas Emissions

Greenhouse gas emissions data for the Everett overburdened community highly impacted by air pollution include: 1) Emissions from greenhouse gas reporting entities per RCW 70A.65[10] and WAC 173-441,[11] -446;[12] and 2) Mobile source emissions.[13]

We did not collect information or model greenhouse gas emissions from other sources at this time. The greenhouse gas information provided in this report aligns with the Climate Commitment Act's (CCA) requirements. For further information on methods and statewide results, refer to the 2025 EJ Report.

## Facilities

Washington State requires certain businesses that emit more than 10,000 metric tons of carbon dioxide equivalents (MT $CO_2e$) to report to the Washington Greenhouse Gas Reporting Program.[14] Businesses that emit over 25,000 MT $CO_2e$ are also subject to the Cap-and-Invest Program (covered sources). Each reporting facility is required to follow a compliance plan.

In the Everett community, one facility (Figure 7; Table 4) within the community boundary reported their emissions in 2022 and 2023. The total reported emissions from this facility were 69,711 MT $CO_2e$ in 2022 and 66,124 MT $CO_2e$ in 2023, a 5.1% year-to-year decrease. Some

[10] Greenhouse Gas Emissions – Cap-and-Invest Program https://app.leg.wa.gov/RCW/default.aspx?cite=70A.65
[11] Reporting of Emissions of Greenhouse Gases https://app.leg.wa.gov/WAC/default.aspx?cite=173-441
[12] Climate Commitment Act – Program Rule https://app.leg.wa.gov/WAC/default.aspx?cite=173-446
[13] Environmental Justice Review https://app.leg.wa.gov/RCW/default.aspx?cite=70A.65.020
[14] Mandatory greenhouse gas reports https://ecology.wa.gov/air-climate/reducing-greenhouse-gas-emissions/tracking-greenhouse-gases/mandatory-greenhouse-gas-reports

facilities in communities report biogenic carbon (biogenic $CO_2$)[15] emissions, which are expected to be partially recaptured as part of the natural carbon cycle. For reporting purposes, biogenic $CO_2$ is subtracted from total metric tons of $CO_2e$, even though it has the same atmospheric warming effect as non-biogenic $CO_2$. There were no facilities that reported biogenic $CO_2$ in Everett. Since 2020, total reported greenhouse gas emissions from facilities within and near OBCs have decreased by 20.3%, and by 6.3% after subtracting biogenic $CO_2$ emissions. Some year-to-year fluctuations in emissions from individual facilities are expected.

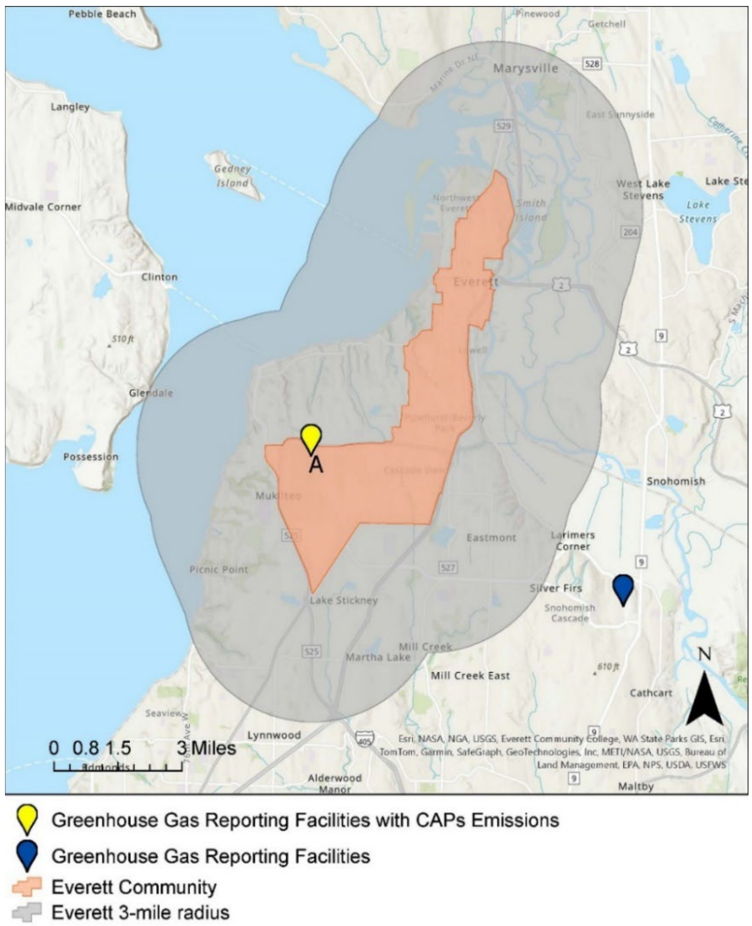


*Figure 7. Reporting facilities as of 2023 that are in or near the Everett community boundary. Facility letters correspond with Table 4.*

[15] Biogenic carbon refers to greenhouse gases released from the combustion, decomposition, or processing of materials derived from biological sources – such as wood, paper, biomass fuels, agriculture residues, food waste, or biogas. Under the Washington Greenhouse Gas Reporting Program, these emissions are reported separately from fossil-derived emissions because they result from carbon that circulates within the short-term natural carbon cycle rather than long-term carbon stores. Biogenic $CO_2$ acts the same way in the atmosphere as non-biogenic $CO_2$. Anthropogenic processes that include these emissions reduce a facility's environmental impact.

The emissions in Table 4 are in MT $CO_2e$. Each greenhouse gas uses a conversion factor known as its Global Warming Potential (GWP), in this case AR4 GWP[16], to convert emissions into $CO_2e$. A GWP describes how much heat a greenhouse gas traps in the atmosphere relative to carbon dioxide over a specific time horizon (20, 100, or 500 years). AR4 GWPs are published in the 2007 Intergovernmental Panel on Climate Change (IPCC).[17] The Greenhouse Gas Reporting Program uses AR4 GWPs mainly for regulatory stability, consistency, and alignment with other federal programs.

*Table 4. Facility emissions in or nearby[18] the Everett community. Biogenic $CO_2$ is in brackets [ ].*

| | Facility Name/City | Facility Sector | Within Community Boundary | CCA-Covered Facility[19] | Source of CAPs[20] | 2022 Emissions ($MTCO_2e$) | 2023 Emissions ($MTCO_2e$) |
|---|---|---|---|---|---|---|---|
| **A** | Boeing Commercial Airplanes - Everett | Manufacturing | Yes | Yes | Yes | 69,711 [0] | 66,124 [0] |

[16] Reporting of Emissions of Greenhouse Gases https://app.leg.wa.gov/WAC/default.aspx?cite=173-441
[17] Intergovernmental Panel on Climate Change https://www.ipcc.ch/
[18] "Nearby" refers to facilities within a three-mile radius of the community boundary that were included in this analysis.
[19] Large emitters of greenhouse gases, specifically those emitting 25,000 or more MT $CO_2e$ annually in Washington State that are part of the Cap-and-Invest program established by the Climate Commitment Act.
[20] Major sources of criteria air pollutants are designated in the Air Operating Permit program. A major source is any stationary source that has the actual or potential to emit ≥100 tons per year for any air pollutant. Many sources emit far below the threshold. More information can be found at https://ecology.wa.gov/regulations-permits/permits-certifications/air-quality-permits/air-operating-permit

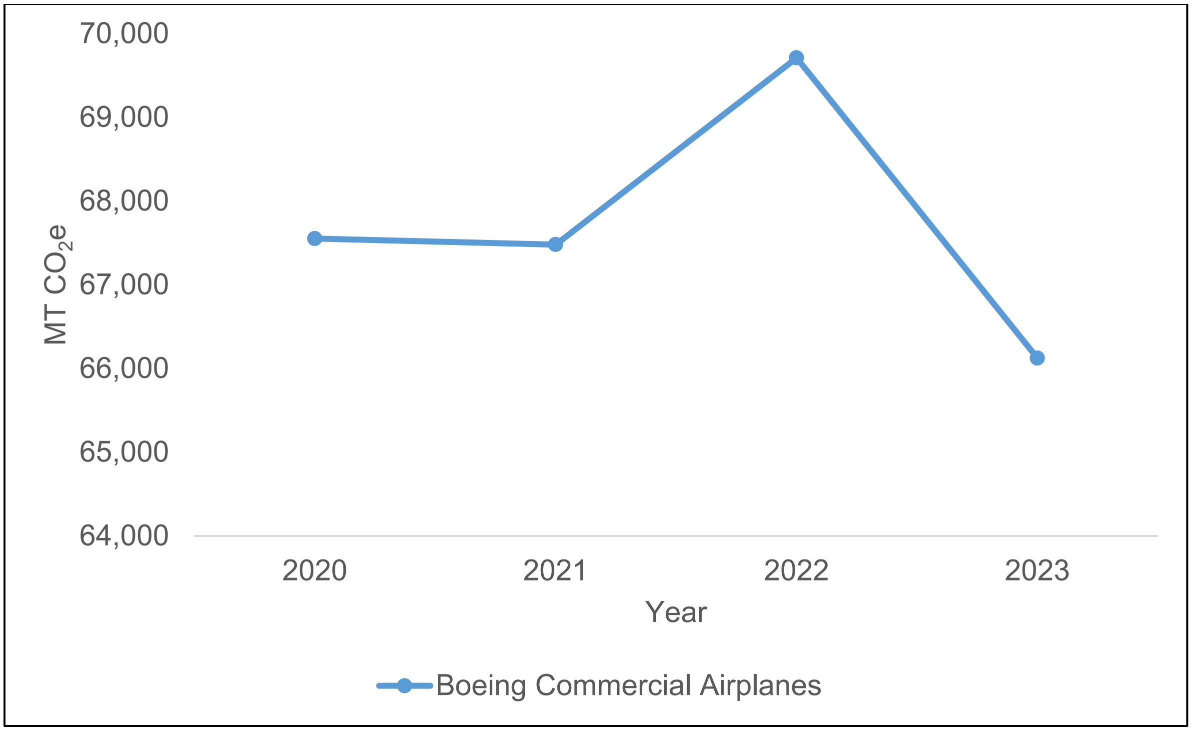


*Figure 8. Greenhouse gas reporting facilities and their emissions from 2020-2023*.

## Mobile sources

In the Everett community, greenhouse gas emissions from mobile sources increased by 21% from 2020 to 2021 (Table 5), but have decreased by 5.4% between 2019 to 2021.[21] Mobile sources consist of on-road and non-road emissions. The drop in emissions in 2020 was largely due to a decrease in vehicle traffic that was attributed to the COVID-19 pandemic.[22,23]

Similar to Table 4, the results in Table 5 use AR5 GWPs to convert greenhouse gas emissions into $CO_2$e. In 2013-2014, the IPCC published AR5 GWPs and AR6 GWPs in 2021-2022. The Washington Greenhouse Gas Emissions Inventory[24] uses AR5 GWPs in mobile source emission estimates, as the inventory models for greenhouse gas accounting are revised as science improves.

[21] Improving Air Quality in Overburdened Communities Highly Impacted by Air Pollution 2023 Report https://apps.ecology.wa.gov/publications/SummaryPages/2302115.html
[22] Washington State Greenhouse Gas Emissions Inventory: 1990-2021, Jan 2025 https://apps.ecology.wa.gov/publications/SummaryPages/2414077.html
[23] Reducing Greenhouse Gas Emissions from the Transportation Sector through Climate Planning, Dec 2024 https://www.epa.gov/system/files/documents/2024-12/420f24042.pdf
[24] Washington State Greenhouse Gas Emissions Inventory: 1990-2021, Jan 2025 https://apps.ecology.wa.gov/publications/SummaryPages/2414077.html

*Table 5. Greenhouse gas emissions from mobile sources per capita from 2020-2021.*

| Population | 2020 Emissions (MT $CO_2e$) | 2020 Per Capita MT $CO_2e$ | 2021 Emissions (MT $CO_2e$) | 2021 Per Capita MT $CO_2e$ |
|---|---|---|---|---|
| 83,973 | 295,112 | 3.5 | 356,998 | 4.3 |

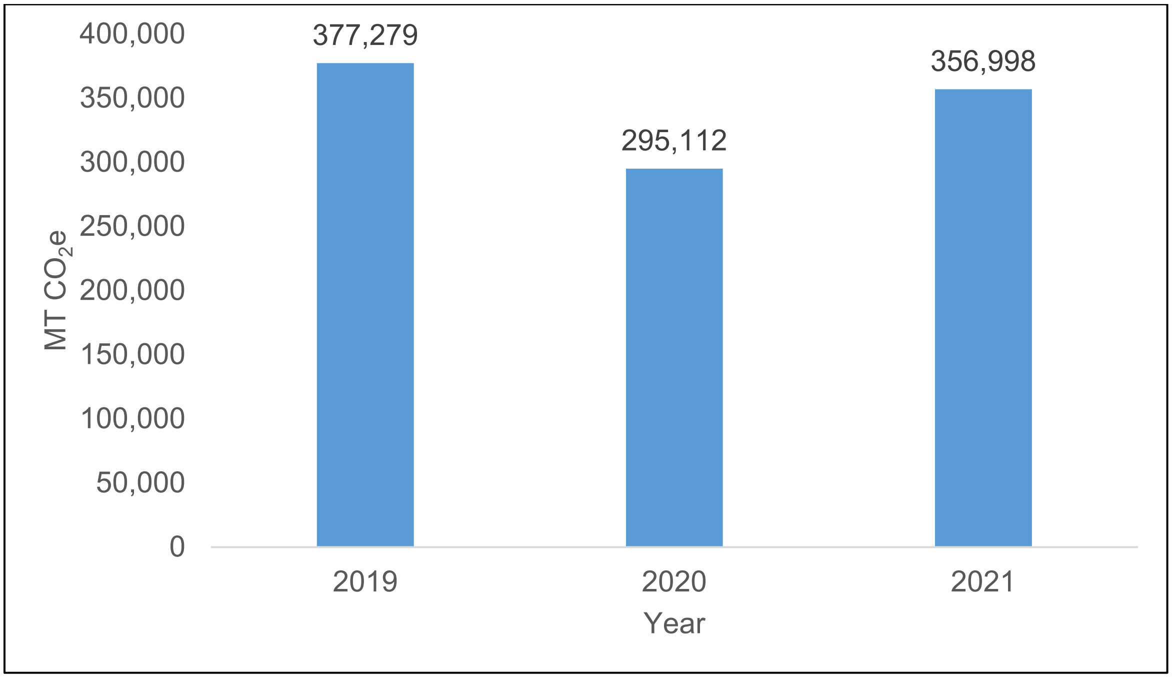


*Figure 9. Annual greenhouse gas emissions from mobile sources in the Everett community, 2019-2021.*

## Community Resources

These resources provide more information about air quality and health in the Everett community:

- Snohomish County Health Department: Community Health Reports[25]
- Snohomish County Health Department 2022 Community Health Assessment[26]

[25] https://www.snohd.org/307/Community-Health-Reports
[26] https://www.snohd.org/DocumentCenter/View/12307/2022-Snohomish-County-Community-Health-Assessment?bidId=

- Providence Swedish North Puget Sound 2024 Community Health Needs Assessment[27]
- Zero-emission and electric vehicles mapping tool | WSDOT[28]
- Home | Washington Climate Action[29]

[27] https://www.swedish.org/-/media/project/psjh/providence/socal/files/about/community-benefit/pdfs/2024-edmonds-chna.pdf
[28] https://wsdot.wa.gov/business-wsdot/grants/zero-emission-vehicle-grants/zero-emission-and-electric-vehicles-mapping-tool
[29] https://climate.wa.gov/

# Appendix A. Supplemental Health Impacts Tables

*Table A1. Estimated annual deaths by any cause related to yearly $PM_{2.5}$ exposure among 18–84 year-olds in Everett by racial and ethnic group, 2022–2023 (based on effect estimates in study by Pope, et al., 2019[9]).*

| Racial and Ethnic Group | Population (18-84-year-olds) | Estimated Annual Deaths [95% CI] | Estimated annual deaths per 100,000 population [95% CI] | Estimated age-adjusted annual deaths per 100,000 population [95% CI] |
|---|---|---|---|---|
| All | 69,728 | 20 [15 to 26] | 29 [21 to 37] | 33 [24 to 42] |
| Hispanic | 10,851 | 2 [1 to 3] | 22 [13 to 32] | 46 [26 to 65] |
| Non-Hispanic AIAN | 670 | <1 [range <1] | 26 [-17 to 65] | 39 [-26 to 99] |
| Non-Hispanic Asian | 7,864 | 2 [-1 to 5] | 23 [-16 to 59] | 27 [-18 to 69] |
| Non-Hispanic Black | 4,428 | 1 [0 to 2] | 32 [10 to 53] | 50 [15 to 82] |
| Non-Hispanic NHOPI | 926 | <1 [range <1] | 16 [-11 to 42] | 43 [-29 to 110] |
| Non-Hispanic 2+ races | 4,176 | 1 [-1 to 2] | 19 [-13 to 49] | 32 [-21 to 81] |
| Non-Hispanic White | 40,813 | 16 [10 to 22] | 40 [26 to 53] | 37 [24 to 50] |

AIAN: American Indian and Alaska Native; CI: confidence interval; NHOPI: Native Hawaiian and Other Pacific Islander.

Race categories only include people who identify as non-Hispanic to reflect the race categories used in the study by Pope, et al.

Population is the average of the 2022 and 2023 Washington State Office of Financial Management estimates for the census tracts that comprise this overburdened community.

The age-adjusted rate indicates the expected rate if the age distribution in this overburdened community matched that of Washington State.

*Table A2. Estimated annual deaths by any cause related to yearly $PM_{2.5}$ exposure among 65–99-year-olds in Everett by racial and ethnic group, 2022–2023 (based on effect estimates in study by Di, et al., 2017[30]).*

| Racial and Ethnic Group | Population (65-99-year-olds) | Estimated Annual Deaths [95% CI] | Estimated annual deaths per 100,000 population [95% CI] | Estimated age-adjusted annual deaths per 100,000 population [95% CI] |
|---|---|---|---|---|
| All | 12,688 | 11 [11 to 12] | 89 [86 to 91] | 90 [87 to 92] |
| Hispanic | 692 | 1 [1 to 1] | 101 [87 to 114] | 109 [95 to 124] |
| AIAN | 121 | <1 [range <1] | 75 [46 to 103] | 84 [52 to 116] |
| Asian | 1,277 | 1 [1 to 1] | 78 [61 to 93] | 84 [66 to 101] |
| Black | 423 | 1 [1 to 1] | 174 [167 to 180] | 184 [177 to 191] |
| NHOPI | 80 | <1 [range <1] | 82 [50 to 112] | 89 [54 to 122] |
| 2+ races | 497 | <1 [0 to 1] | 82 [50 to 112] | 87 [53 to 119] |
| White | 10,292 | 7 [7 to 7] | 68 [66 to 71] | 68 [65 to 70] |

AIAN: American Indian and Alaska Native; CI: confidence interval; NHOPI: Native Hawaiian and Other Pacific Islander.

Race categories include people who identify as Hispanic and non-Hispanic to reflect the race categories used in the study by Di, et al.

Population is the average of the 2022 and 2023 Washington State Office of Financial Management estimates for the census tracts that comprise this overburdened community.

The age-adjusted rate indicates the expected rate if the age distribution in this overburdened community matched that of Washington State.

[30] Di, Q., Wang Y., Zanobetti, A., Wang, Y., Koutrakis, P., Choirat, C., Dominici, F., Schwartz, J.D. 2017. Air Pollution and Mortality in the Medicare Population. *The New England Journal of Medicine*, 376(26), pp. 2513-2522.

*Table A3. Annual mortality and morbidity associated with yearly $PM_{2.5}$ exposure (yearly 24-hour average concentrations) in Everett, 2022-2023. Brackets [] include 95% confidence interval.*

| Health Outcome | Age Group | Source of Risk Estimate | Population | Estimated Annual Number [95% CI] | Estimated annual rate per 100,000 population [95% CI] |
|---|---|---|---|---|---|
| Deaths – Any cause | 65 to 99 | Di et al., 2017[31] | 12,688 | 11 [11 to 12] | 89 [86 to 91] |
| Deaths – Any cause | 18 to 84 | Pope et al., 2019[32] | 69,728 | 20 [15 to 26] | 29 [21 to 37] |
| Deaths – Cardiovascular disease | 18 to 99 | Alexeeff et al., 2023[33] | 70,957 | 6 [2 to 9] | 8 [3 to 13] |
| Deaths – Ischemic heart disease | 30 to 99 | Jerrett et al., 2017[34] | 55,218 | 6 [5 to 8] | 11 [8 to 14] |
| Deaths – Ischemic heart disease | 30 to 99 | Krewski et al., 2009[35] | 55,218 | 9 [8 to 11] | 17 [14 to 20] |
| Deaths – Ischemic heart disease | 30 to 99 | Pope et al., 2019[36] | 55,218 | 6 [4 to 7] | 10 [8 to 13] |
| Deaths – Lung Cancer | 30 to 99 | Krewski, et al., 2009[37] | 55,218 | 2 [1 to 3] | 3 [1 to 5] |

[31] Di, Q., Wang Y., Zanobetti, A., Wang, Y., Koutrakis, P., Choirat, C., Dominici, F., Schwartz, J.D. 2017. Air Pollution and Mortality in the Medicare Population. *The New England Journal of Medicine*, 376(26), pp. 2513-2522.

[32] Pope, C.A., 3rd, Lefler, J.S., Ezzati, M., Higbee, J.D., Marshall, J.D., Kim, S.Y., Bechle, M., Gilliat, K.S., Vernon, S.E., Robinson, A.L., & Burnett, R.T. (2019). Mortality Risk and Fine Particulate Air Pollution in a Large, Representative Cohort of U.S. Adults. *Environmental Health Perspectives*, 127(7), 77007.

[33] Alexeeff SED, K.Van Den Eeden, S.Schwartz, J.Liao, N. S.Sidney, S. Association of Long-term Exposure to Particulate Air Pollution with Cardiovascular Events in California. *JAMA Network Open*. 2023;6(2):e230561.

[34] Jerrett, 2017. Comparing the Health Effects of Ambient Particulate Matter Estimated Using Ground-Based Versus Remote Sensing Exposure Estimates. *Environmental Health Perspectives*. 2017 Apr;125(4):552-559. doi: 10.1289/EHP575. Epub 2016 Sep 9.

[35] Krewski D, Jerrett M, Burnett R, et al. 2009. Extended Follow-Up and Spatial analysis of the American Cancer Society Linking Particulate Air Pollution and Mortality. Health Effects Institute, Cambridge MA

[36] Pope, C.A., 3rd, Lefler, J.S., Ezzati, M., Higbee, J.D., Marshall, J.D., Kim, S.Y., Bechle, M., Gilliat, K.S., Vernon, S.E., Robinson, A.L., & Burnett, R.T. (2019). Mortality Risk and Fine Particulate Air Pollution in a Large, Representative Cohort of U.S. Adults. *Environmental Health Perspectives*, 127(7), 77007.

[37] Krewski D, Jerrett M, Burnett R, et al. 2009. Extended Follow-Up and Spatial analysis of the American Cancer Society Linking Particulate Air Pollution and Mortality. Health Effects Institute, Cambridge MA

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|---|---|---|---|---|---|
| Deaths – Lung Cancer | 30 to 99 | Turner et al., 2016[38] | 55,218 | 1 [0 to 2] | 2 [1 to 3] |
| Hospital Admissions – Acute Non-Fatal Myocardial Infarction | 18 to 99 | Alexeeff, et al., 2023[39] | 70,957 | 8 [5 to 11] | 11 [6 to 16] |
| Lung Cancer Diagnoses | 30 to 99 | Gharibvand et al., 2016[40] | 55,218 | 6 [2 to 10] | 11 [3 to 17] |

CI: confidence interval. CIs are inversely proportional to population sizes reflecting higher uncertainty when estimating effects with smaller numbers of people. CIs that include 0 indicate that it is plausible that no deaths are associated with $PM_{2.5}$ in this group in this community.

Population is the average of the 2022 and 2023 Washington State Office of Financial Management estimates for the census tracts that comprise this overburdened community.

The age-adjusted rate indicates the expected rate if the age distribution in this overburdened community matched that of Washington State.

Health outcomes were selected based on the availability of effect estimates for that outcome relevant to the Washington population in the scientific literature. Where multiple effect estimates exist, we listed the model results separately for each. See the 2025 EJ Report for more information.

*Table A4. Annual mortality and morbidity associated with daily $PM_{2.5}$ exposure (daily 24-hour average concentrations) in Everett, 2022-2023. Brackets [ ] include 95% confidence interval.*

| Health Outcome | Age Group | Source of Risk Estimate | Population | Estimated Annual Number [95% CI] | Estimated annual rate per 100,000 population [95% CI] |
|---|---|---|---|---|---|

[38] Turner, M.C., Jerrett, M., Pope, C.A., III, Krewski, D., Gapstur, S.M., Diver, W.R., Beckerman, B.S., Marshall, J.D., Su, J., Crouse, D.L., & Burnett, R.T. (2016). Long-term ozone exposure and mortality in a large prospective study. *American Journal of Respiratory Critical Care Medicine* 193(10): 1134-1142.

[39] Alexeeff SED, K.Van Den Eeden, S.Schwartz, J.Liao, N. S.Sidney, S. Association of Long-term Exposure to Particulate Air Pollution with Cardiovascular Events in California. *JAMA Network Open*. 2023;6(2):e230561.

[40] Gharibvand, L., Shavlik, D., Ghamsary, M., Beeson, W.L., Soret, S., Knutsen, R., & Knutsen, S.F. (2016). The association between ambient fine particulate air pollution and lung cancer incidence: results from the AHSMOG-2 study. *Environmental Health Perspectives* 125 (3): 378?384

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|---|---|---|---|---|---|
| Deaths – Any cause | 0 to 99 | Ito et al., 2013[41] | 90,583 | <1 [0 to 1] | <1 [0 to 1] |
| Deaths – Any cause | 65 to 99 | Zanobetti et al., 2014[42] | 12,688 | 1 [1 to 1] | 8 [5 to 11] |
| Deaths – Cardiovascular disease | 0 to 99 | Liu et al., 2022[43] | 90,583 | 1 [0 to 1] | 1 [0 to 1] |
| Deaths – Respiratory | 0 to 99 | Liu et al., 2022[44] | 90,583 | 1 [0 to 2] | 1 [0 to 2] |
| Hospital Admissions – Acute Non-Fatal Myocardial Infarction | 18 to 99 | Sullivan et al., 2005[45] | 70,957 | 1 [-2 to 5] | 2 [-3 to 6] |
| Hospital Admissions – Acute Non-Fatal Myocardial Infarction | 18 to 99 | Zanobetti et al., 2009[46] | 70,957 | 2 [1 to 2] | 2 [1 to 3] |
| Hospital Admissions – All Respiratory | 65 to 99 | Zanobetti et al., 2009[47] | 12,688 | 8 [4 to 11] | 59 [34 to 84] |

[41] Ito, K., Ross, Z., Zhou, J., Nádas, A., Lippmann, M. and Thurston, G.D., 2013. NPACT Study 3. Time-series analysis of mortality, hospitalizations, and ambient $PM_{2.5}$ and its components. National Particle Component Toxicity (NPACT) Initiative. https://www.healtheffects.org/publication/national-particle-component-toxicity-npact-initiative-integrated-epidemiologic-and

[42] Zanobetti, A., Dominici, F., Wang, Y. and Schwartz, J.D., 2014. A national case-crossover analysis of the short-term effect of $PM_{2.5}$ on hospitalizations and mortality in subjects with diabetes and neurological disorders. *Environmental Health*, 13(1), p.38.

[43] Liu, R.A., Wei, Y., Qiu, X., Kosheleva, A. and Schwartz, J.D., 2022. Short term exposure to air pollution and mortality in the US: a double negative control analysis. *Environmental Health*, 21(1), p.81.

[44] Liu, R.A., Wei, Y., Qiu, X., Kosheleva, A. and Schwartz, J.D., 2022. Short term exposure to air pollution and mortality in the US: a double negative control analysis. *Environmental Health*, 21(1), p.81.

[45] Sullivan, J., L. Sheppard, A. Schreuder, N. Ishikawa, D. Siscovick and J. Kaufman. 2005. Relation between short-term fine-particulate matter exposure and onset of myocardial infarction. Epidemiology. Vol. 16 (1): 41-8.

[46] Zanobetti, A., Franklin, M., Koutrakis, P. and Schwartz, J., 2009. Fine particulate air pollution and its components in association with cause-specific emergency admissions. *Environmental Health*, 8(1), p.58.

[47] Zanobetti, A., Franklin, M., Koutrakis, P. and Schwartz, J., 2009. Fine particulate air pollution and its components in association with cause-specific emergency admissions. *Environmental Health*, 8(1), p.58.

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|---|---|---|---|---|---|
| Hospital Admissions – Asthma | 0 to 64 | Sheppard et al., 2003[48] | 77,895 | 5 [2 to 9] | 7 [3 to 11] |
| ED Visits – Asthma | 0 to 99 | Mar et al., 2010[49] | 90,583 | 36 [9 to 62] | 40 [10 to 68] |
| ED Visits – Asthma | 0 to 99 | Slaughter, J. C., et al., 2005[50] | 90,583 | 19 [-16 to 52] | 21 [-18 to 58] |
| ED Visits – Asthma | 0 to 17 | Norris, G., et al., 1999[51] | 19,626 | 14 [7 to 20] | 69 [35 to 101] |

ED: emergency department; CI: confidence interval. CIs are inversely proportional to population sizes reflecting higher uncertainty when estimating effects with smaller numbers of people. CIs that include 0 indicate that it is plausible that no deaths are associated with $PM_{2.5}$ in this group in this community.

Population is the average of the 2022 and 2023 Washington State Office of Financial Management estimates for the census tracts that comprise this overburdened community.

The age-adjusted rate indicates the expected rate if the age distribution in this overburdened community matched that of Washington State.

Health outcomes were selected based on the availability of effect estimates for that outcome relevant to the Washington population in the scientific literature. Where multiple effect estimates exist, we listed the model results separately for each. See the 2025 EJ Report for more information.

*Table A5. Annual mortality and morbidity associated with seasonal and daily $O_3$ exposure (seasonal and daily 8-hour maximum concentrations) in Everett, 2022-2023. Brackets [ ] include 95% confidence interval.*

[48] Sheppard, L. Ambient Air Pollution and Nonelderly Asthma Hospital Admissions in Seattle, Washington, 1987-1994. In: Revised Analyses of Time-Series Studies of Air Pollution and Health. 2003, Health Effects Institute: Boston, MA. p. 227-230.
[49] Mar, T. F., J. Q. Koenig and J. Primomo. 2010. Associations between asthma emergency visits and particulate matter sources, including diesel emissions from stationary generators in Tacoma, Washington. *Inhalation Toxicology*. Vol. 22 (6): 445-8.
[50] Slaughter, J. C., E. Kim, L. Sheppard, J. H. Sullivan, T. V. Larson and C. Claiborn. 2005. Association between particulate matter and emergency room visits, hospital admissions and mortality in Spokane, Washington. *Journal of Exposure Analysis and Environmental Epidemiology*. Vol. 15
[51] Norris, G., et al. An association between fine particles and asthma emergency department visits for children in Seattle. *Environmental Health Perspectives*, 1999. 107(6): p. 489-93.

| Health Outcome | Age Group | Source of Risk Estimate | Population | Estimated Annual Number [95% CI] | Estimated annual rate per 100,000 population [95% CI] |
|---|---|---|---|---|---|
| Deaths – Any cause (Seasonal) | 65 to 99 | Di, et al. 2017[52] | 12,688 | 2 [1 to 2] | 12 [8 to 16] |
| Deaths – Any cause (Daily) | 0 to 99 | Zanobetti and Schwartz, 2008[53] | 90,583 | 1 [0 to 1] | 1 [0 to 1] |
| ED Visits – Asthma (Daily) | 0 to 99 | Mar and Koenig, 2009[54] | 90,583 | 29 [7 to 49] | 32 [8 to 54] |
| Hospital Admissions – All Respiratory (Daily) | 65 to 99 | Schwartz, 1995[55] | 12,688 | 10 [3 to 17] | 81 [23 to 134] |

ED: emergency department; CI: confidence interval. CIs are inversely proportional to population sizes reflecting higher uncertainty when estimating effects with smaller numbers of people. CIs that include 0 indicate that it is plausible that no deaths are associated with $O_3$ in this group in this community.

Population is the average of the 2022 and 2023 Washington State Office of Financial Management estimates for the census tracts that comprise this overburdened community.

Age-adjusted rate indicates the expected rate if the age distribution in this overburdened community matched that of Washington State.

Health outcomes were selected based on the availability of effect estimates for that outcome relevant to the Washington population in the scientific literature. Where multiple effect estimates exist, we listed the model results separately for each. See the 2025 EJ Report for more information.

[52] Di, Q., Wang Y., Zanobetti, A., Wang, Y., Koutrakis, P., Choirat, C., Dominici, F., Schwartz, J.D. 2017. Air Pollution and Mortality in the Medicare Population. *The New England Journal of Medicine*, 376(26), pp. 2513-2522.
[53] Zanobetti, A. and Schwartz, J., 2008. Mortality displacement in the association of ozone with mortality: an analysis of 48 cities in the United States. *American Journal of Respiratory and Critical Care Medicine*, 177(2), pp.184-189.
[54] Mar, T.F. and Koenig, J.Q. (2009). Relationship between visits to emergency departments for asthma and ozone exposure in greater Seattle, Washington. *Annals of Allergy, Asthma & Immunology*, 103, 474-479.
[55] Schwartz, J., 1995. Short term fluctuations in air pollution and hospital admissions of the elderly for respiratory disease. *Thorax*, 50(5), pp.531-538.