

Preliminary Health Assessment South Portland Air Quality

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Environmental and Occupational Health Program

Maine Center for Disease Control and Prevention

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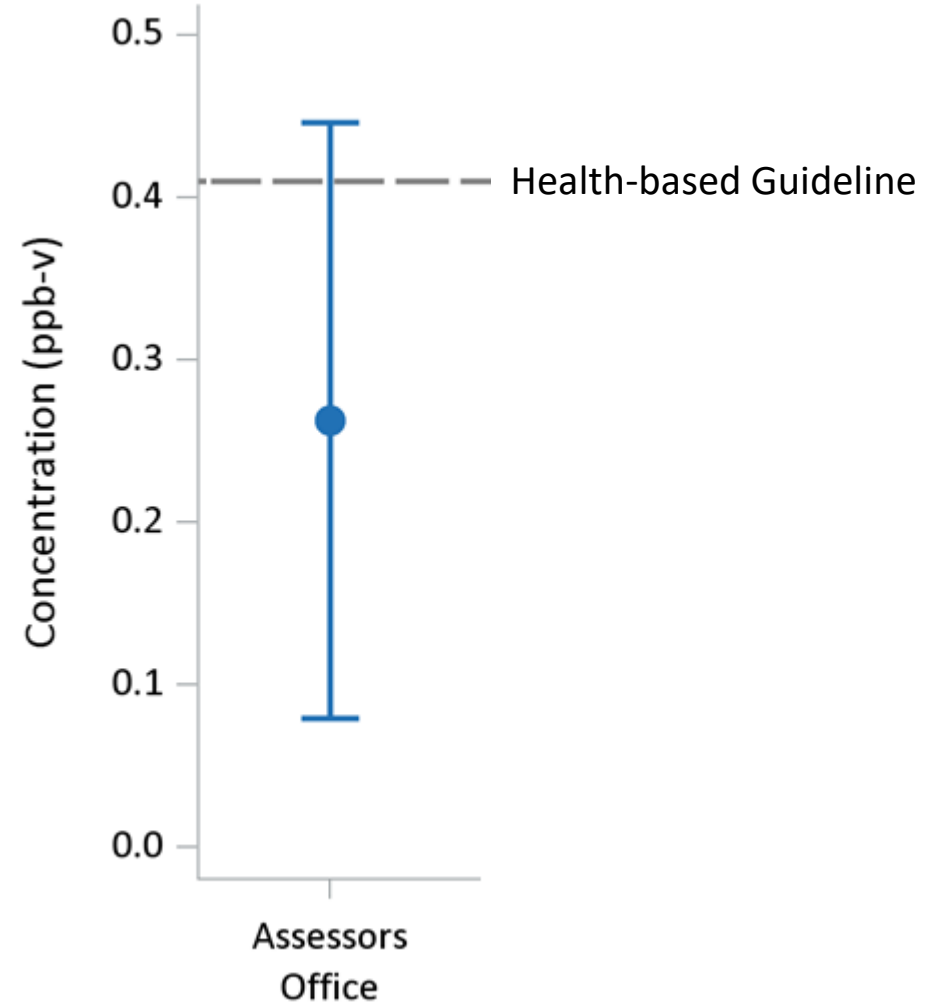
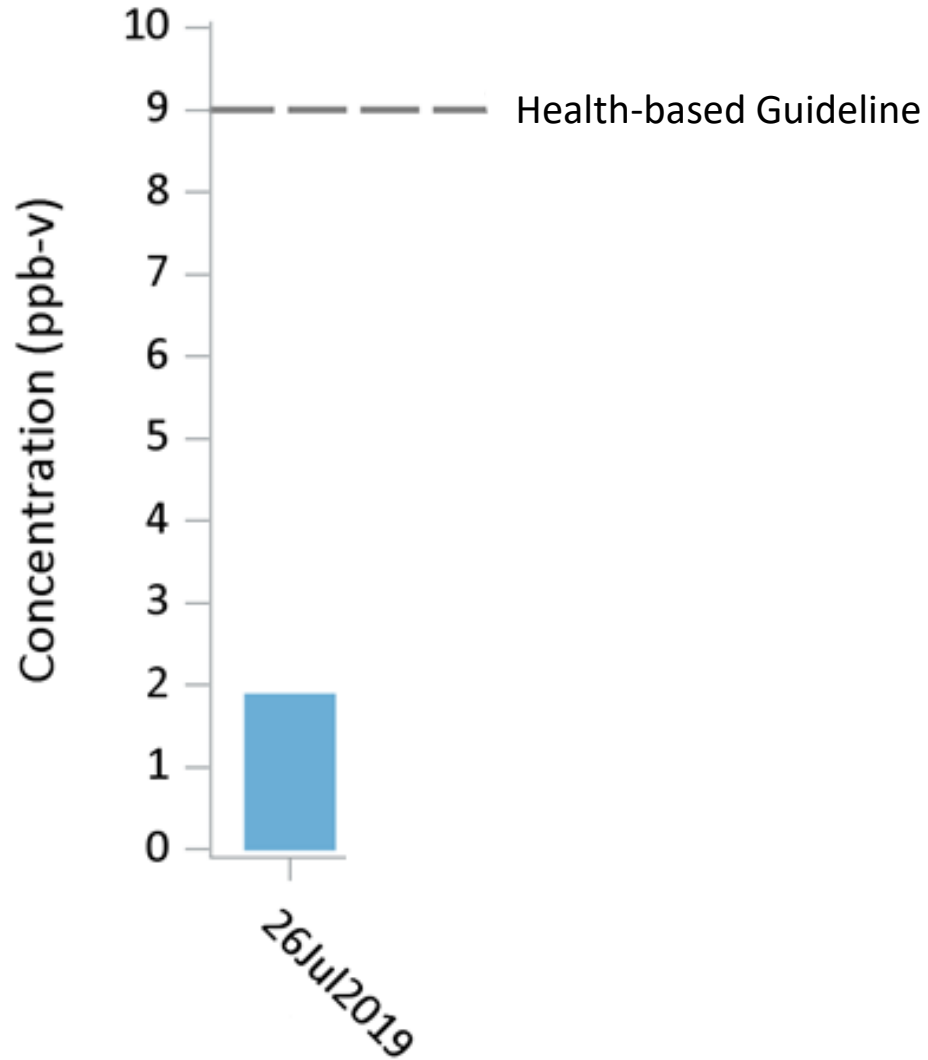
Road Map

- Provide background information
- Evaluation of “Grab sample” results
- Evaluation of 24-hour sample results
- Evaluation of air levels averaged over time
- Describe future evaluation of data on asthma-related emergency department visits

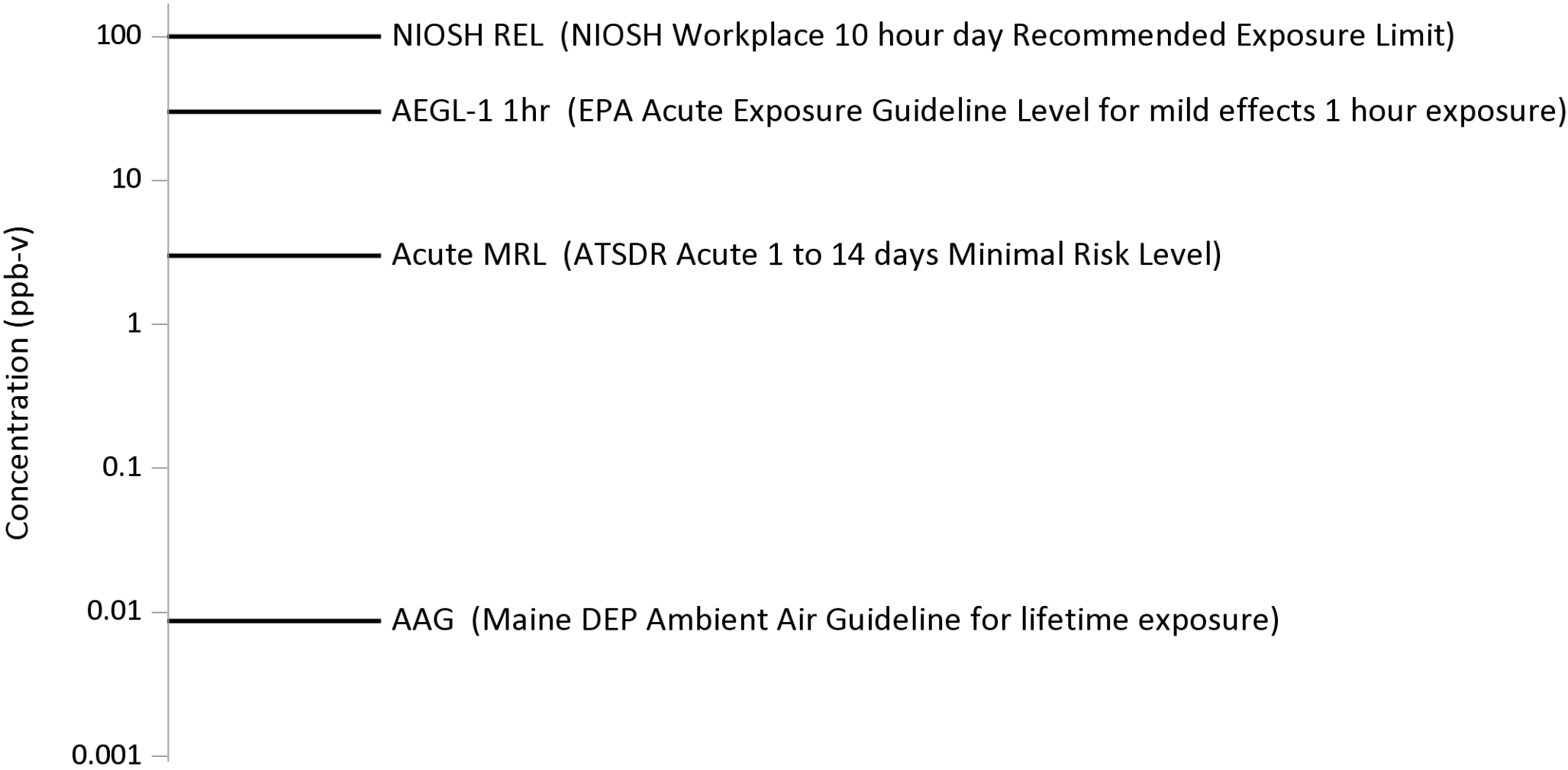


Some Background

Inspection of Air Quality Results and Comparison to Health-based Guidelines



Example: Health-based Exposure Guidelines for Acrolein

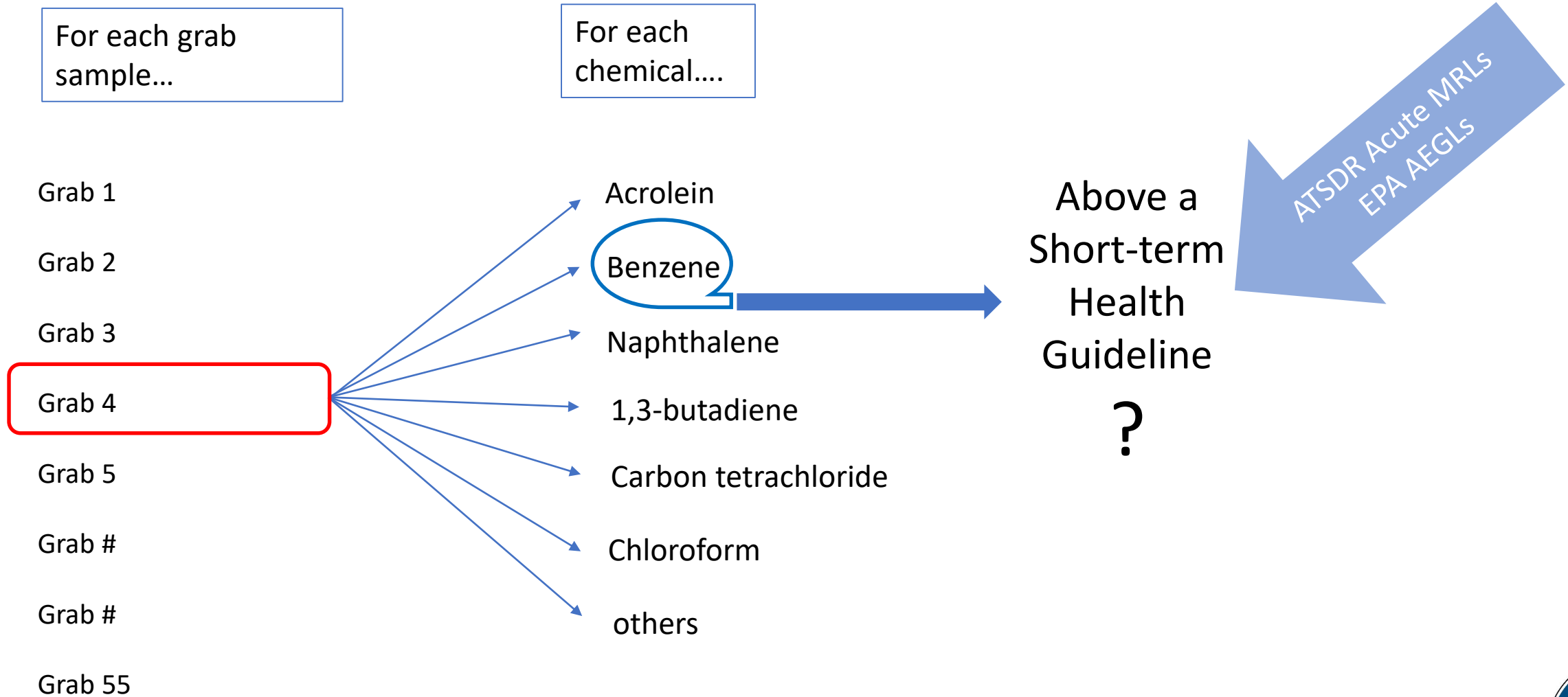


Focus Presentation on Three Chemicals

- Benzene, Naphthalene, Acrolein
- Three that come closest to exceeding health-based guidelines

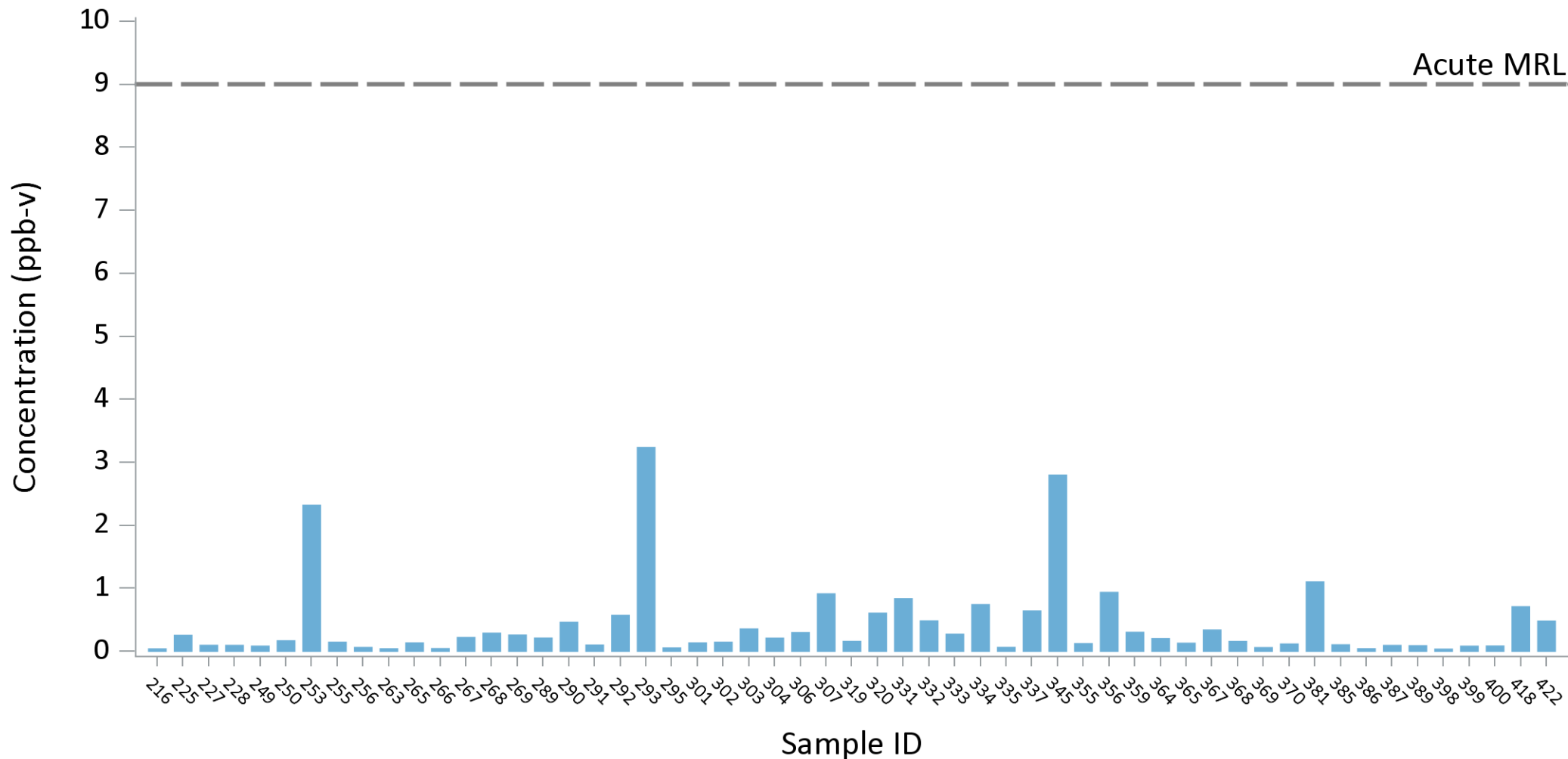


How we assess short-term exposure to chemicals in outside air:

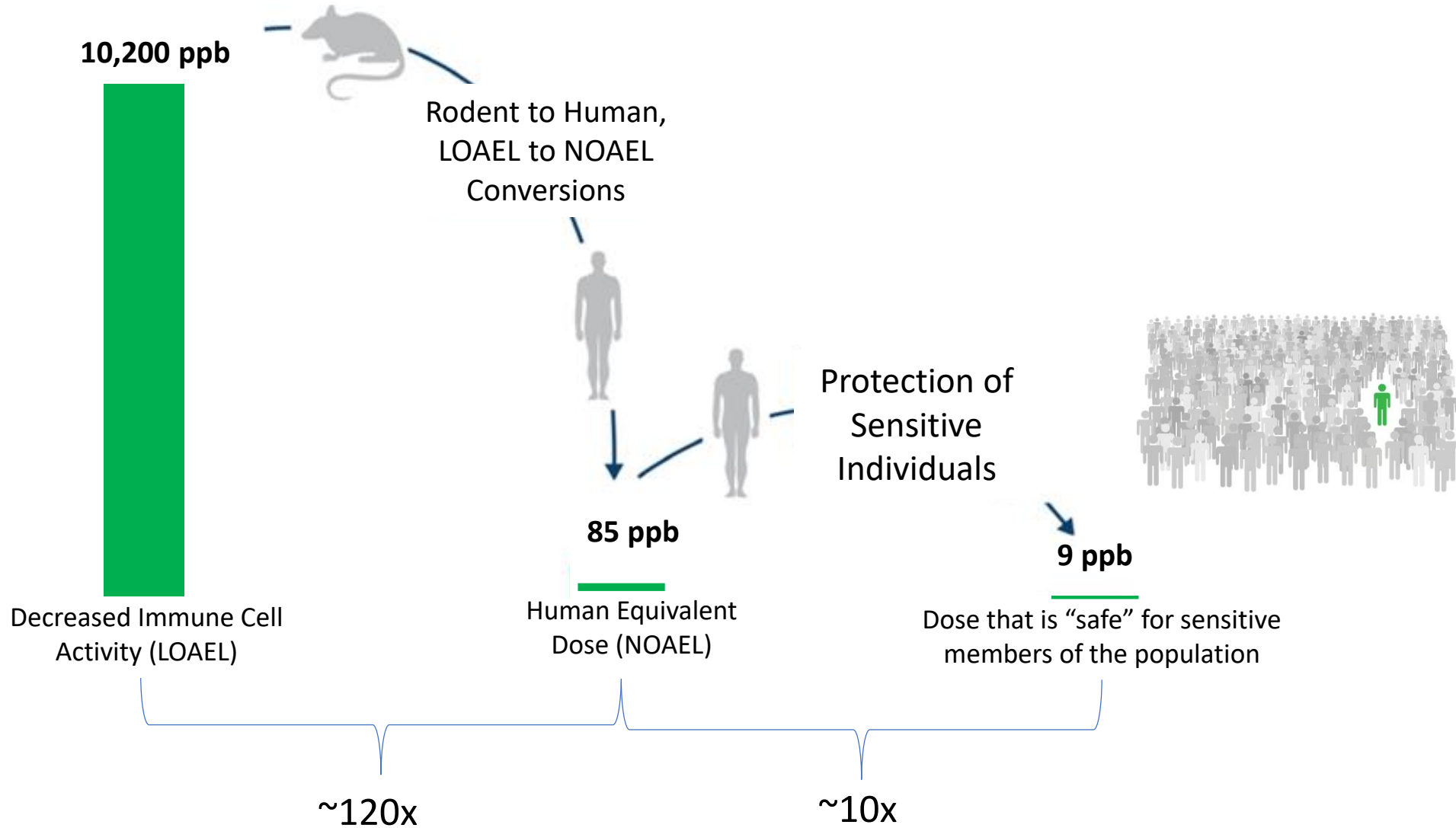


EXAMPLE - Benzene

Comparison of grab sample results for Benzene to an acute health guideline

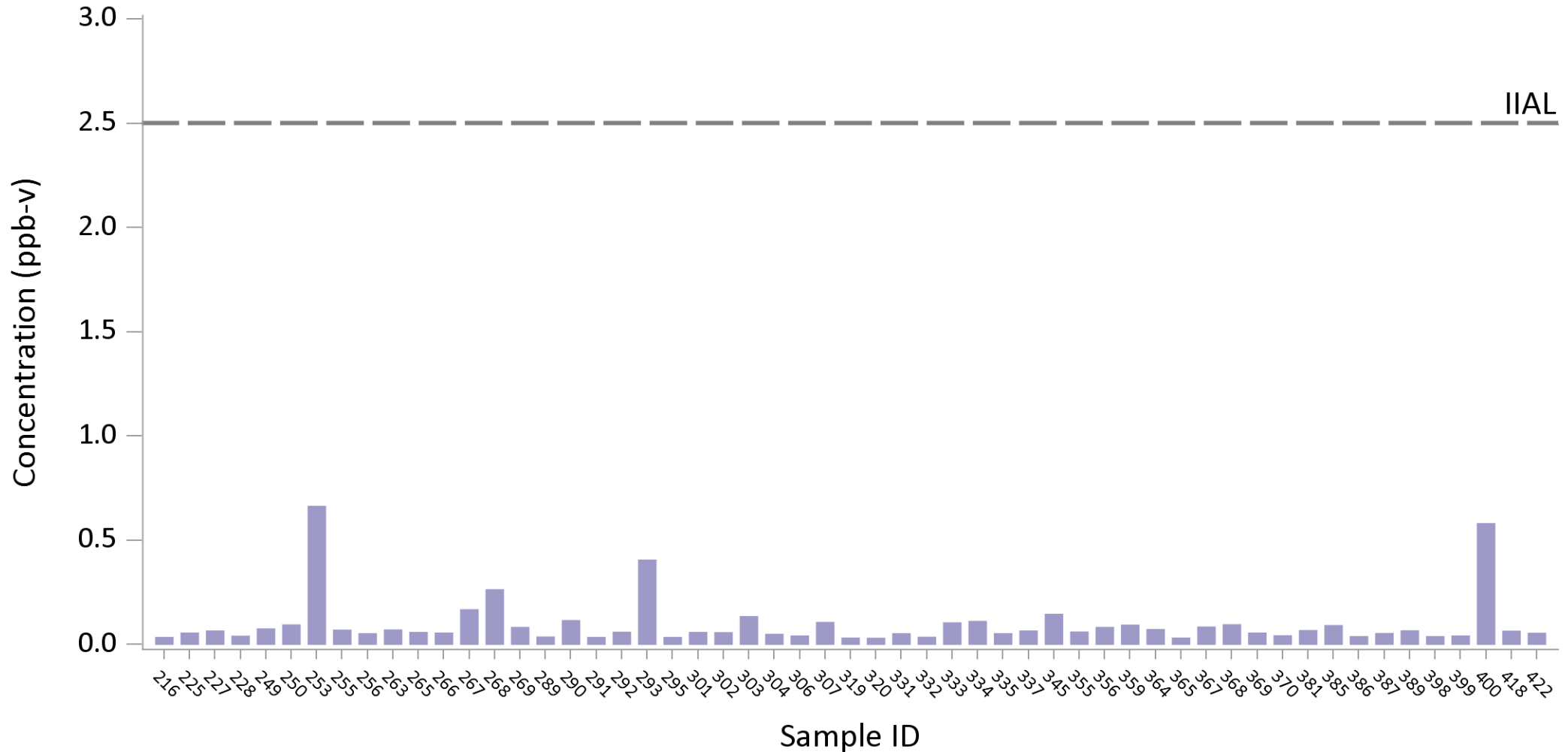


ATSDR's Derivation of an Acute Toxicity Value for Benzene

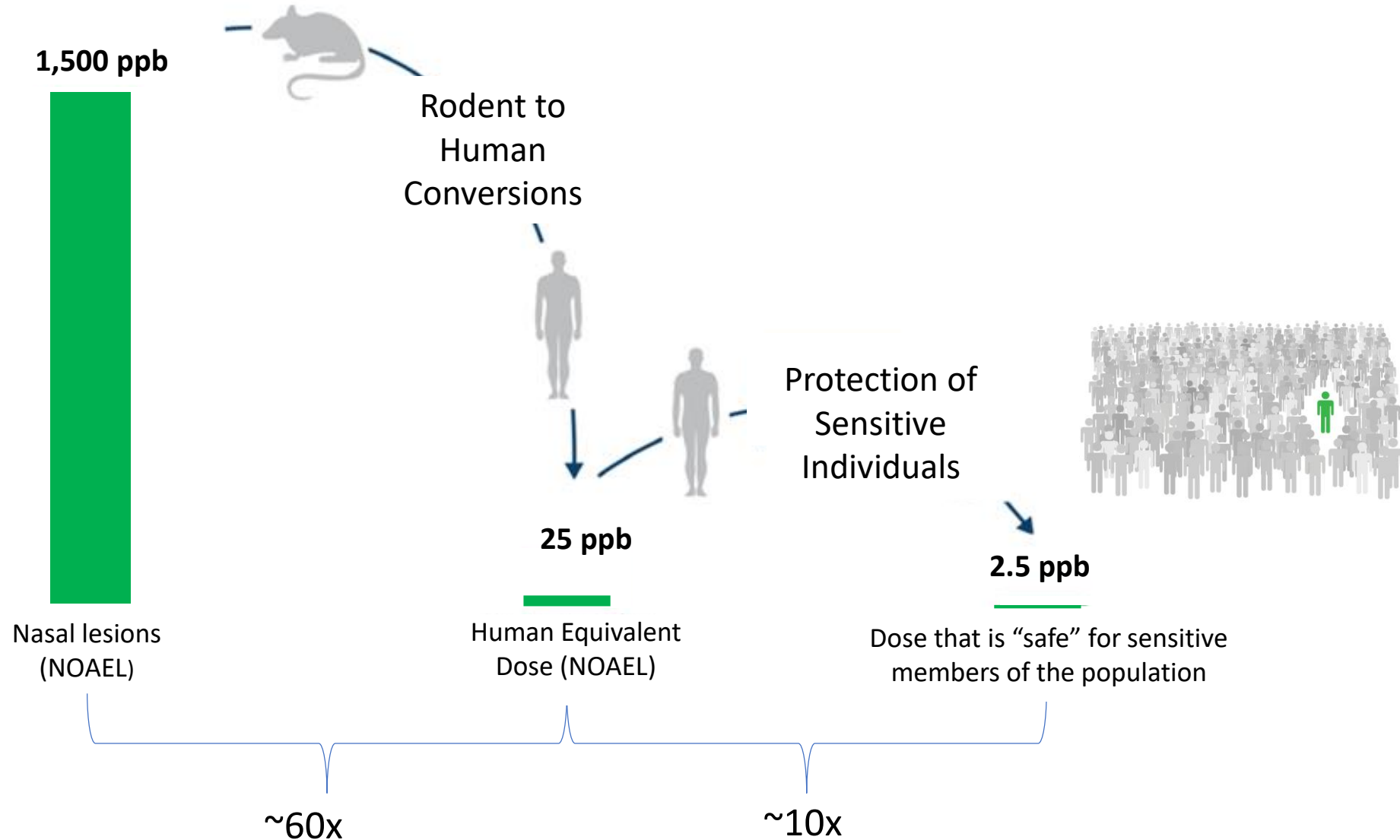


EXAMPLE - Naphthalene

Comparison of grab sample results for Naphthalene to an acute health guideline

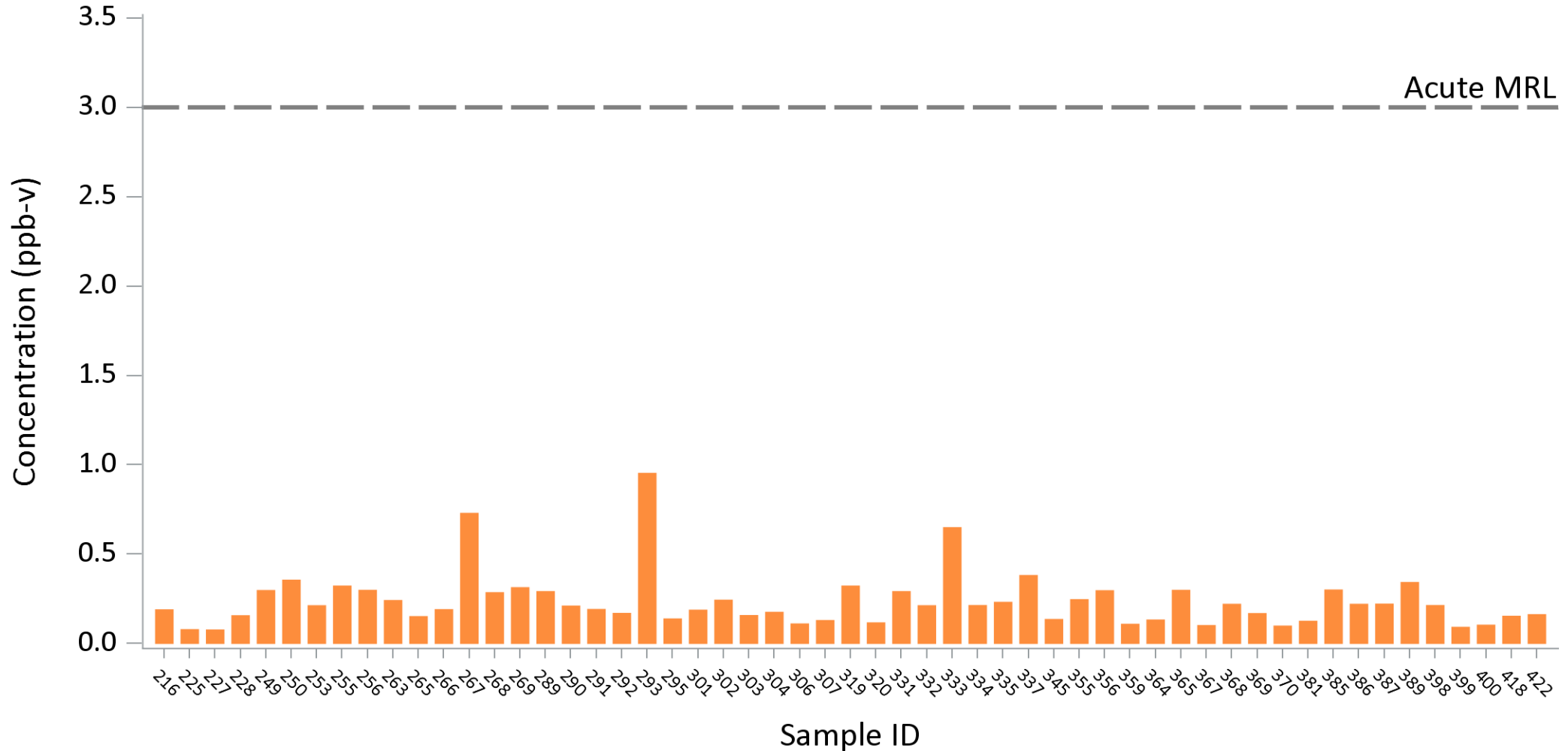


Maine Derivation of an Acute Toxicity Value for Naphthalene

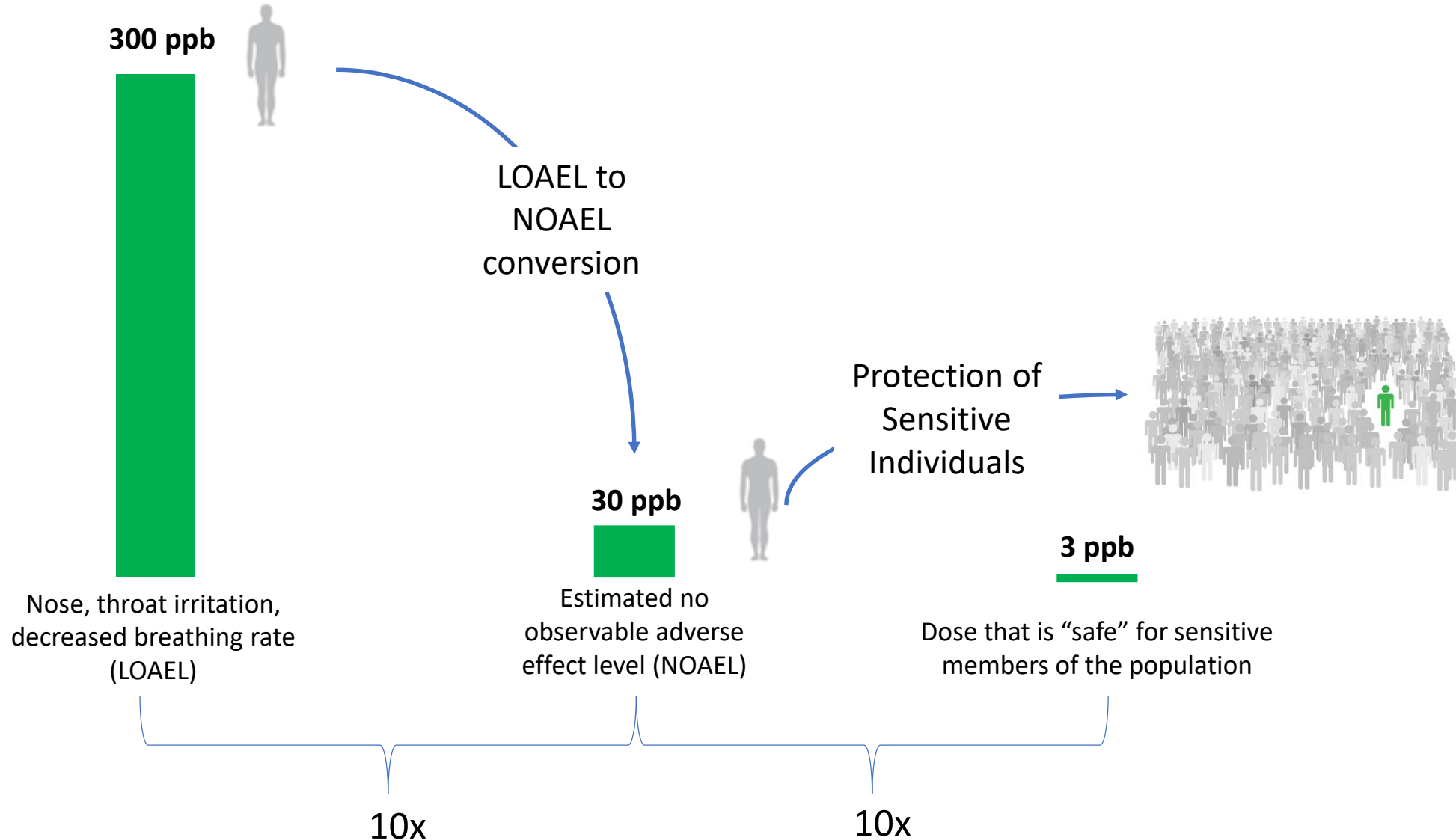


EXAMPLE - Acrolein

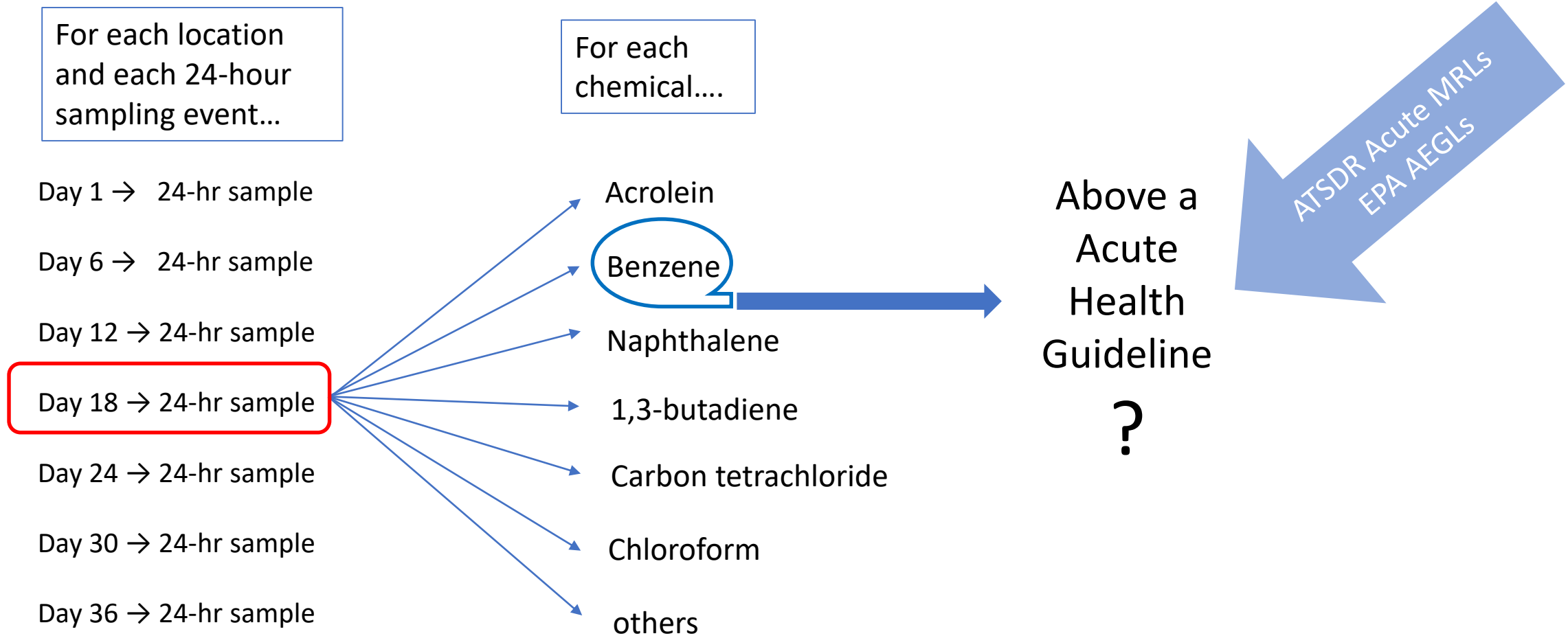
Comparison of grab sample results for Acrolein to an acute health guideline



ATSDR's Derivation of an Acute Toxicity Value for Acrolein

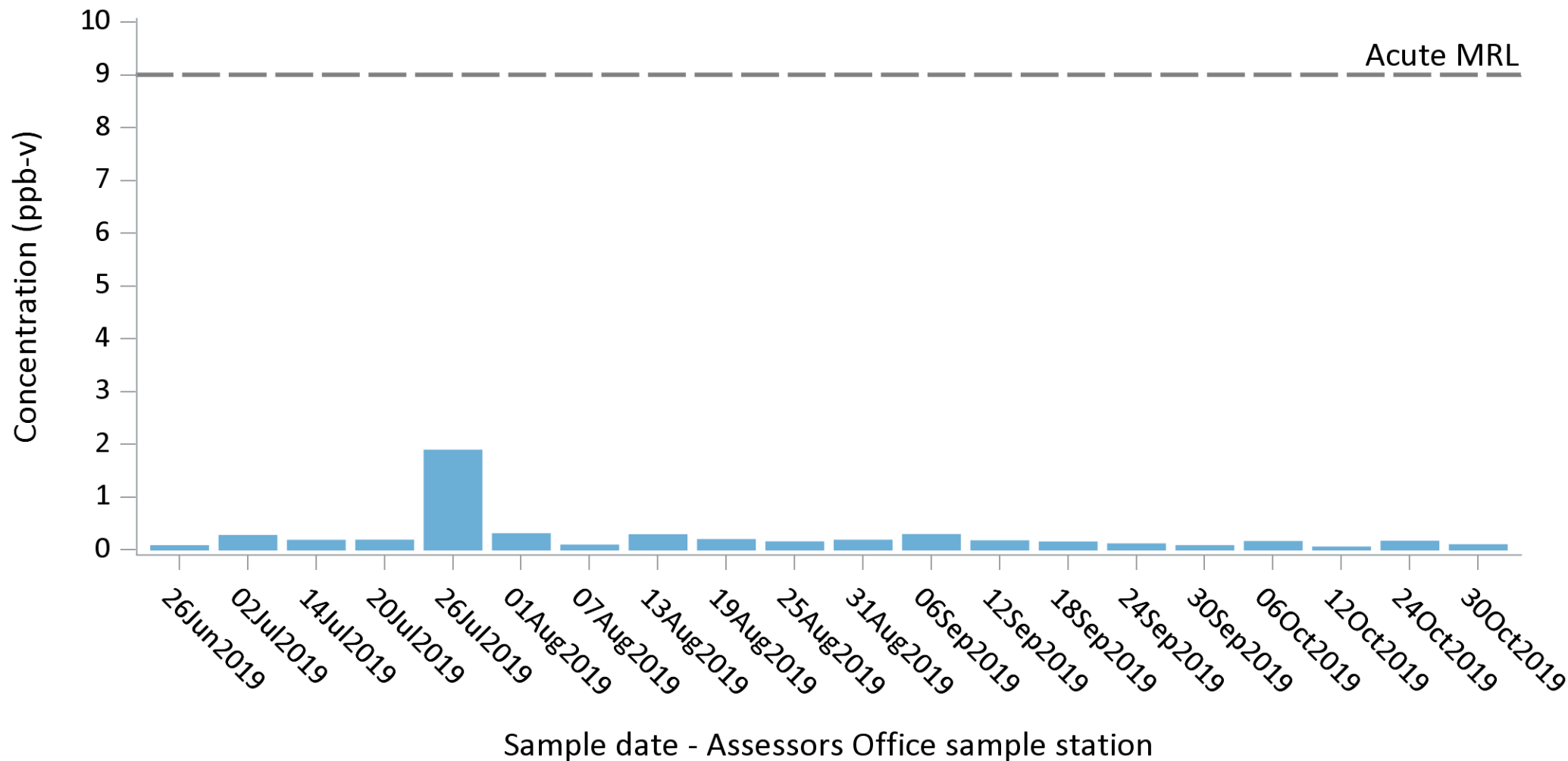


How we assess short-term exposure to chemicals in outside air:



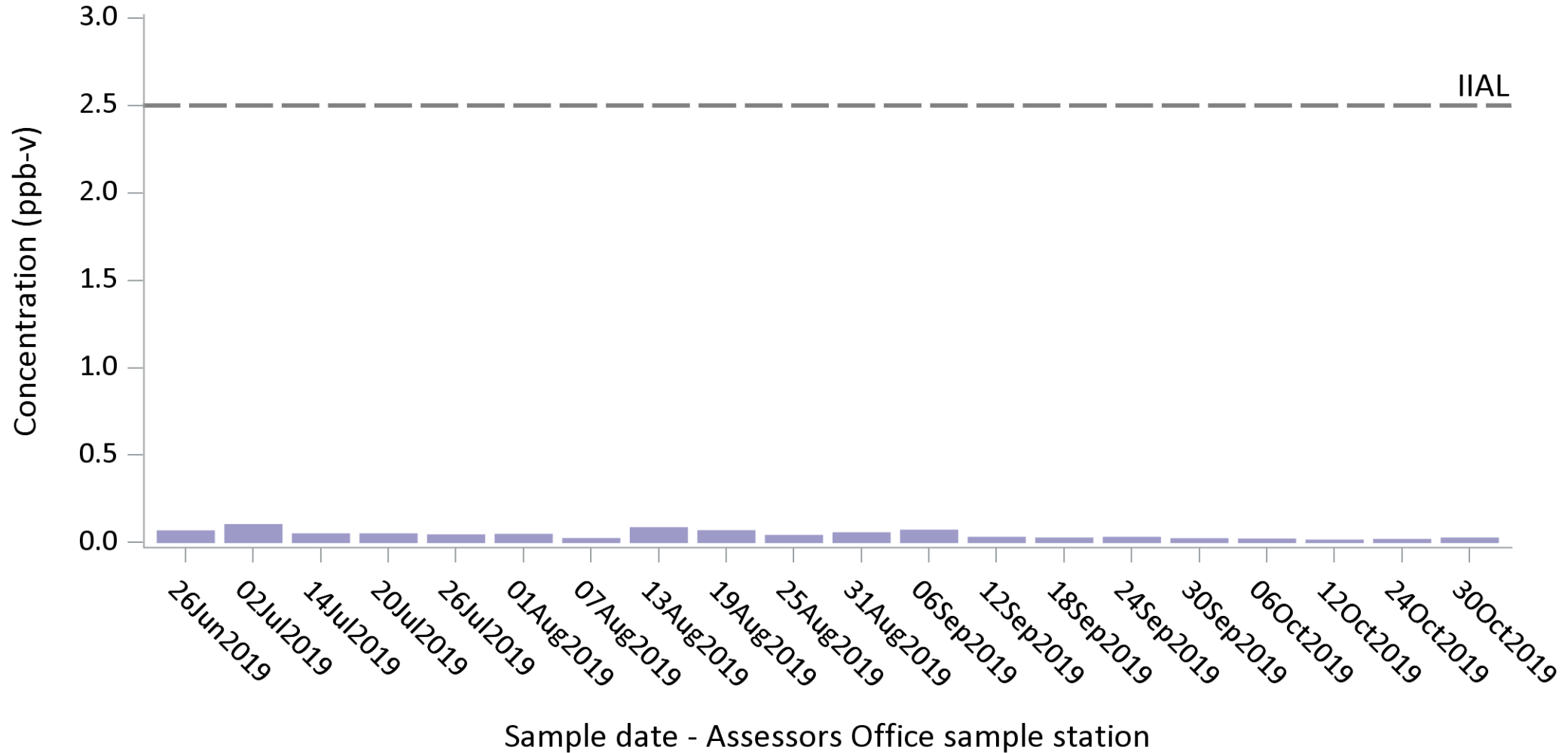
EXAMPLE - Benzene

Comparison of 24-hour sampling results for Benzene to an acute health guideline



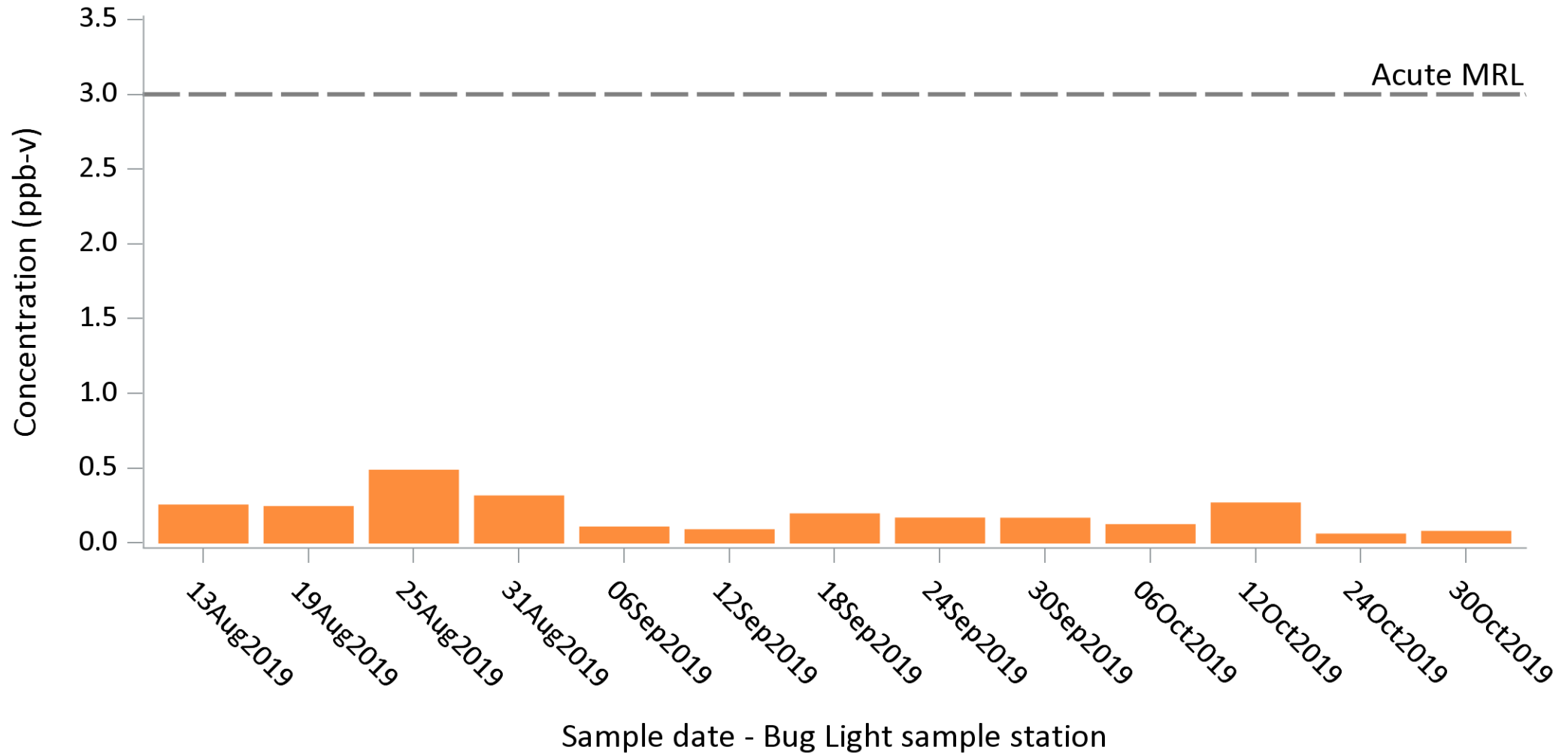
EXAMPLE - Naphthalene

Comparison of 24-hour sampling results for Naphthalene to an acute health guideline



EXAMPLE - Acrolein

Comparison of 24-hour sampling results for Acrolein to an acute health guideline



How we assess long-term exposure to chemicals in outside air:

For each location and for each 24-hour sampling event and each specific chemical result...

Compute the average air level

Day 1 → 24-hr sample → Benzene

Day 6 → 24-hr sample → Benzene

Day 12 → 24-hr sample → Benzene

Day 18 → 24-hr sample → Benzene

Day 24 → 24-hr sample → Benzene

Day 30 → 24-hr sample → Benzene

Day 36 → 24-hr sample → Benzene

Average Benzene Concentration in air

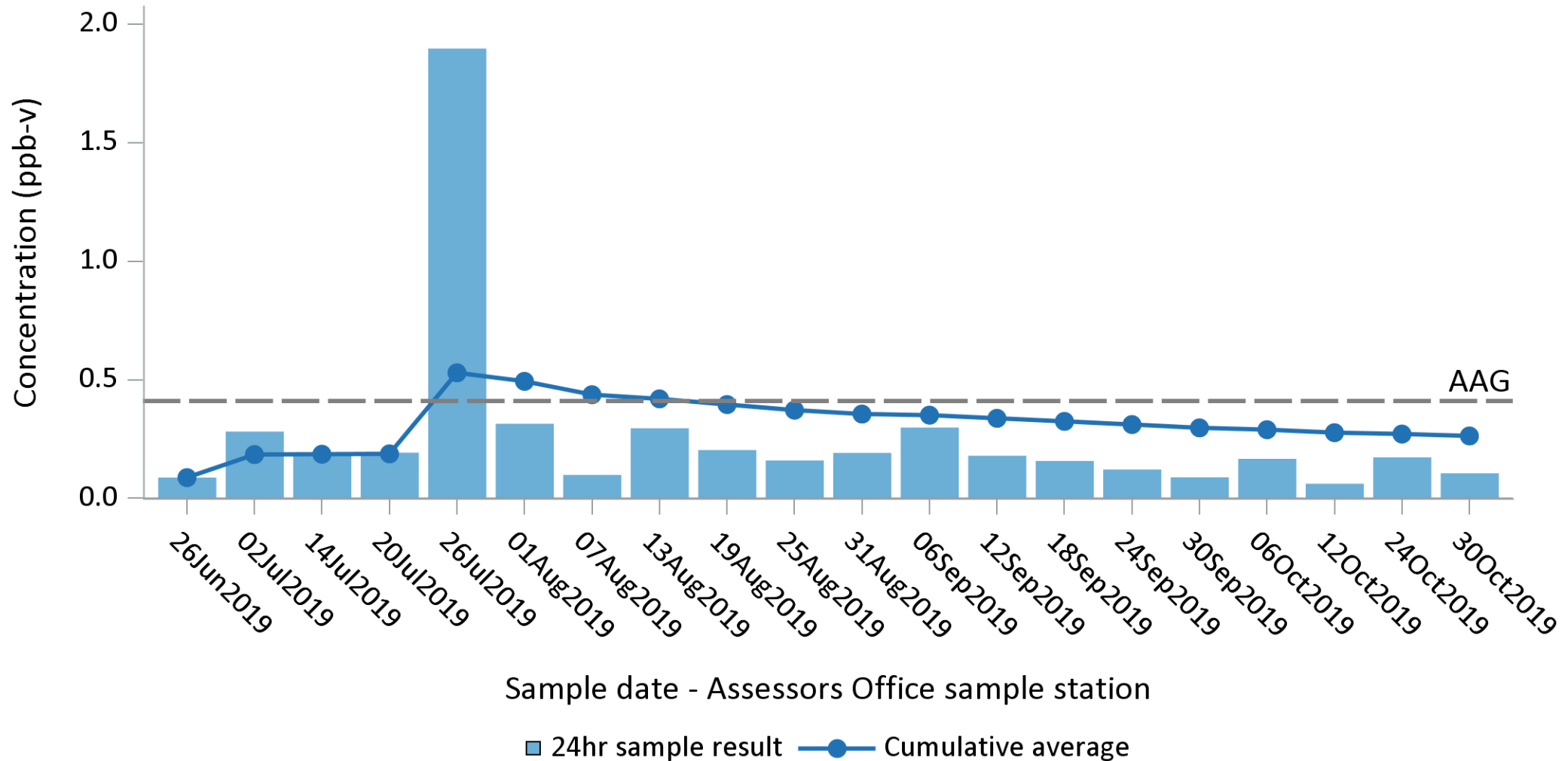
Above a Chronic Health Guideline ?

Maine AAGs (EPA)
ATSDR Chronic MRLs



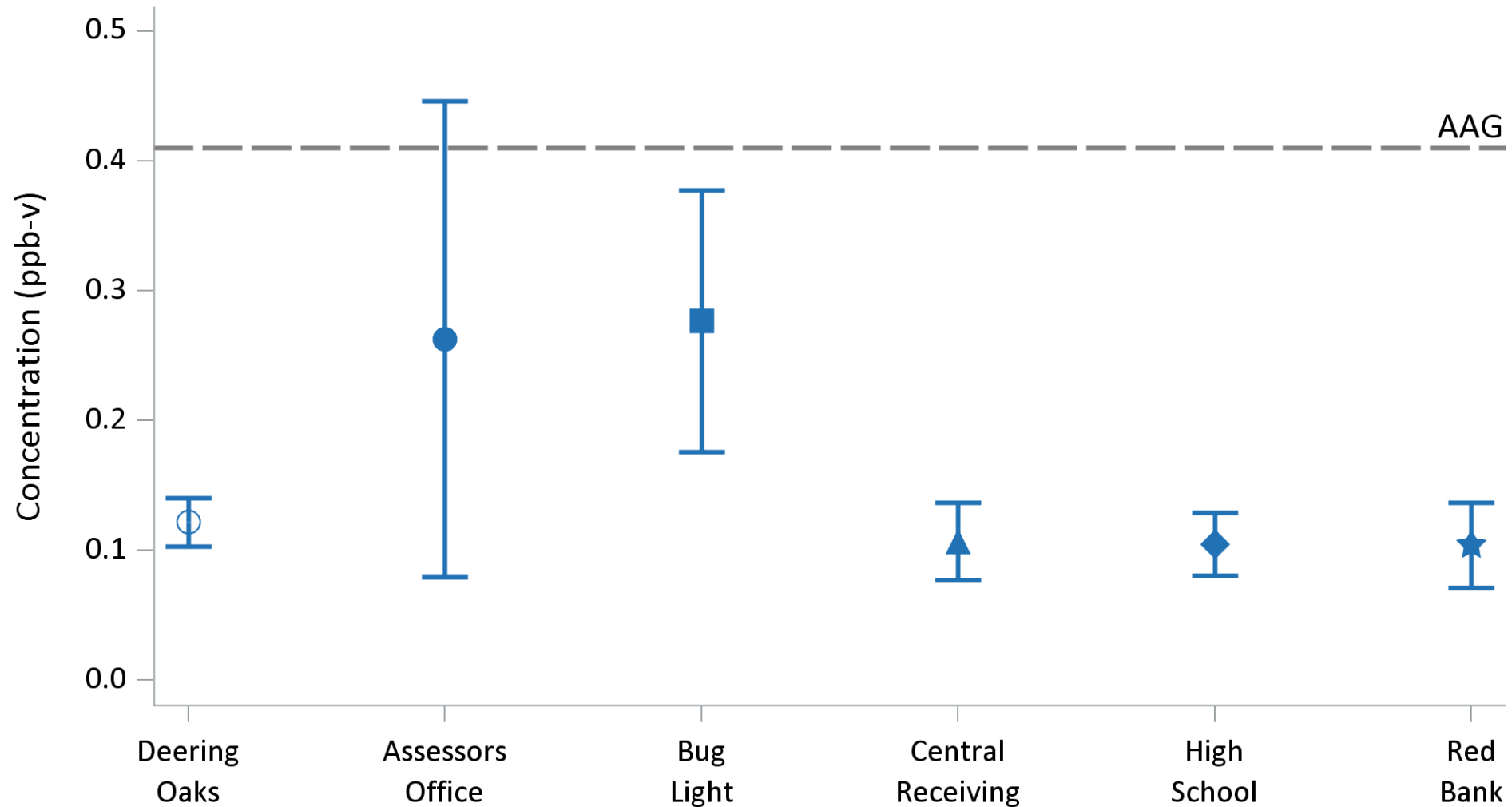
EXAMPLE - Benzene

Averaging of 24-hour sampling results for Benzene and comparison to a chronic health guideline

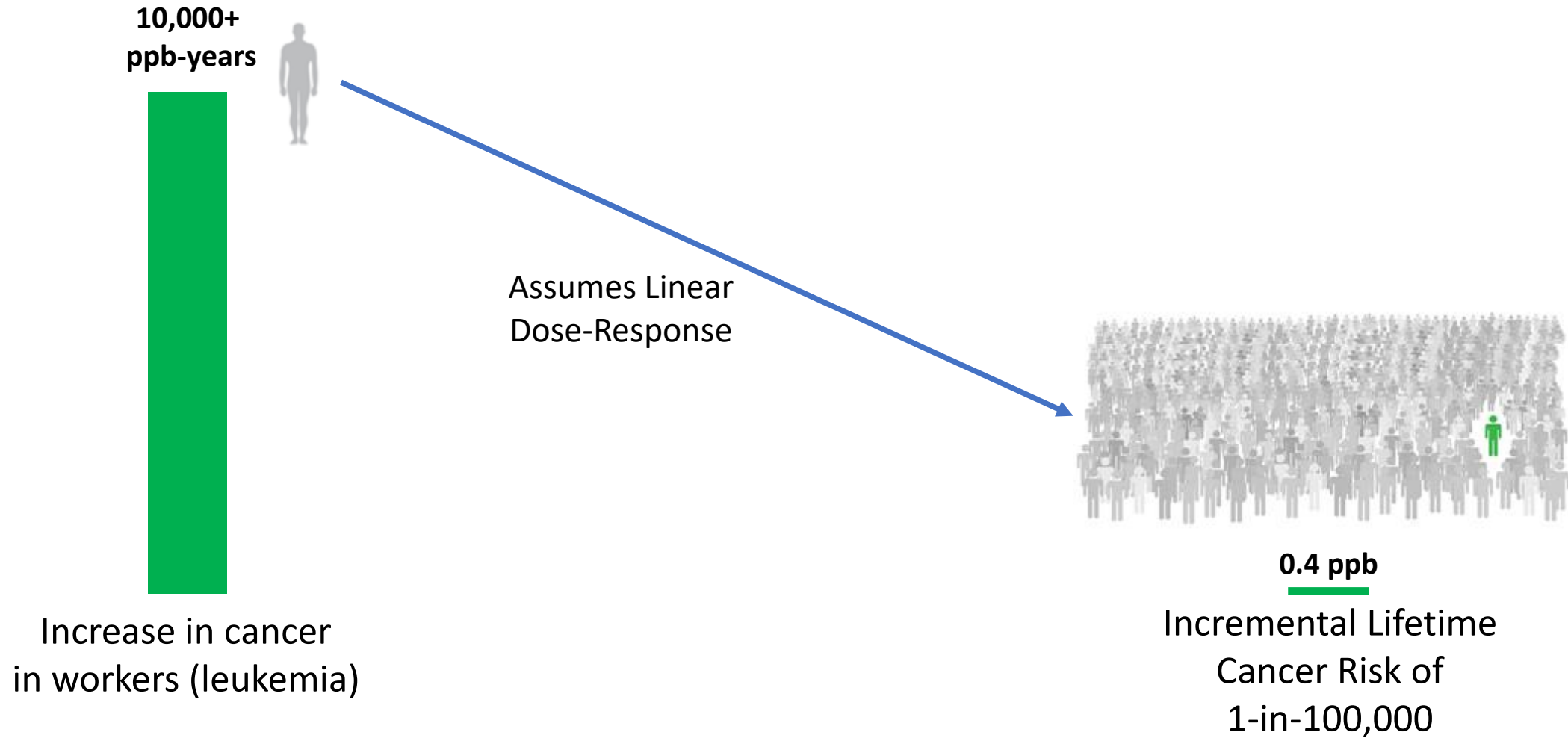


EXAMPLE - Benzene

Comparison of average 24-hour sampling results for Benzene across sampling locations with 95% confidence interval on the mean

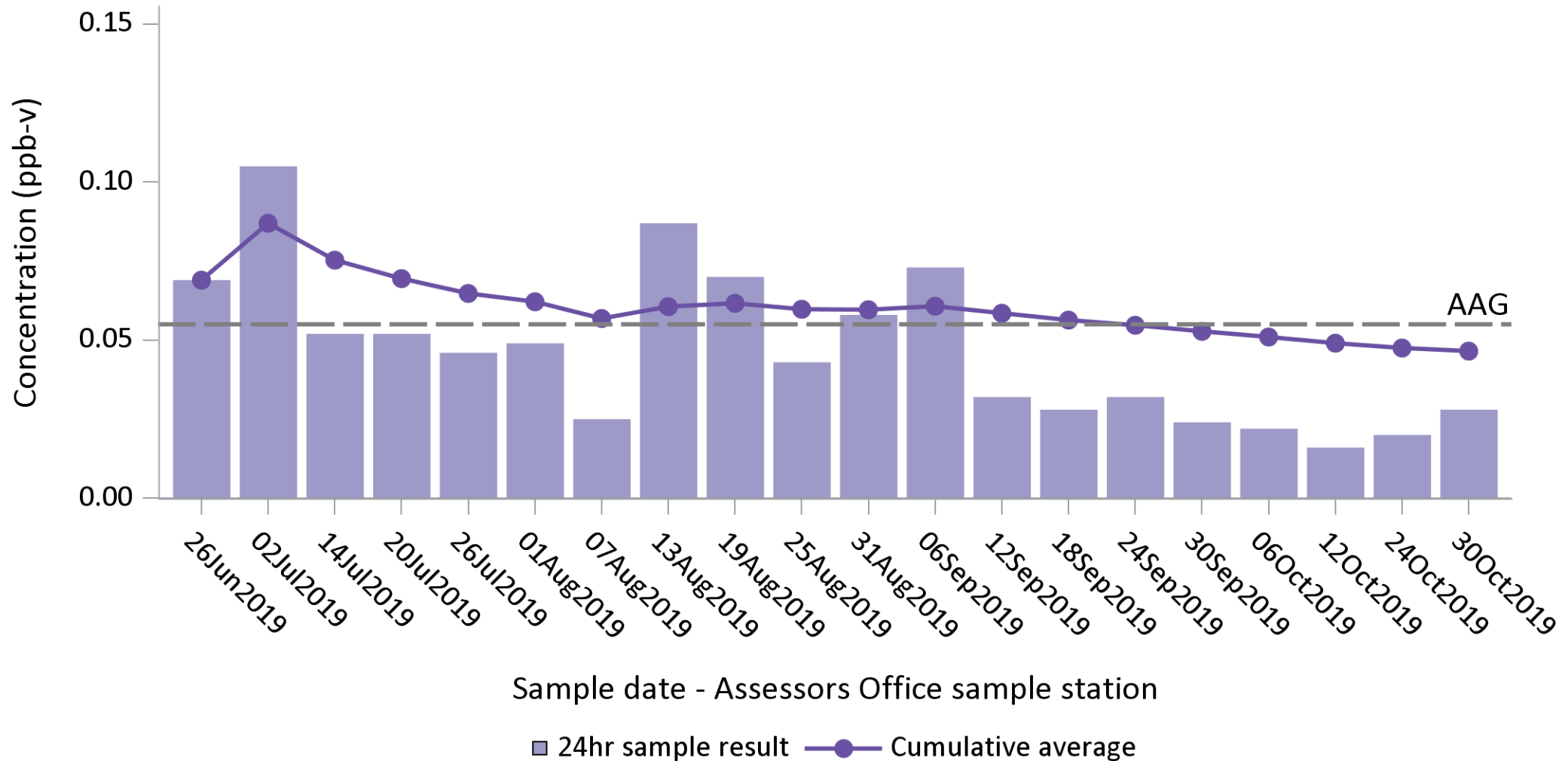


EPA's Derivation of an Chronic Toxicity Value for Benzene (AAG)



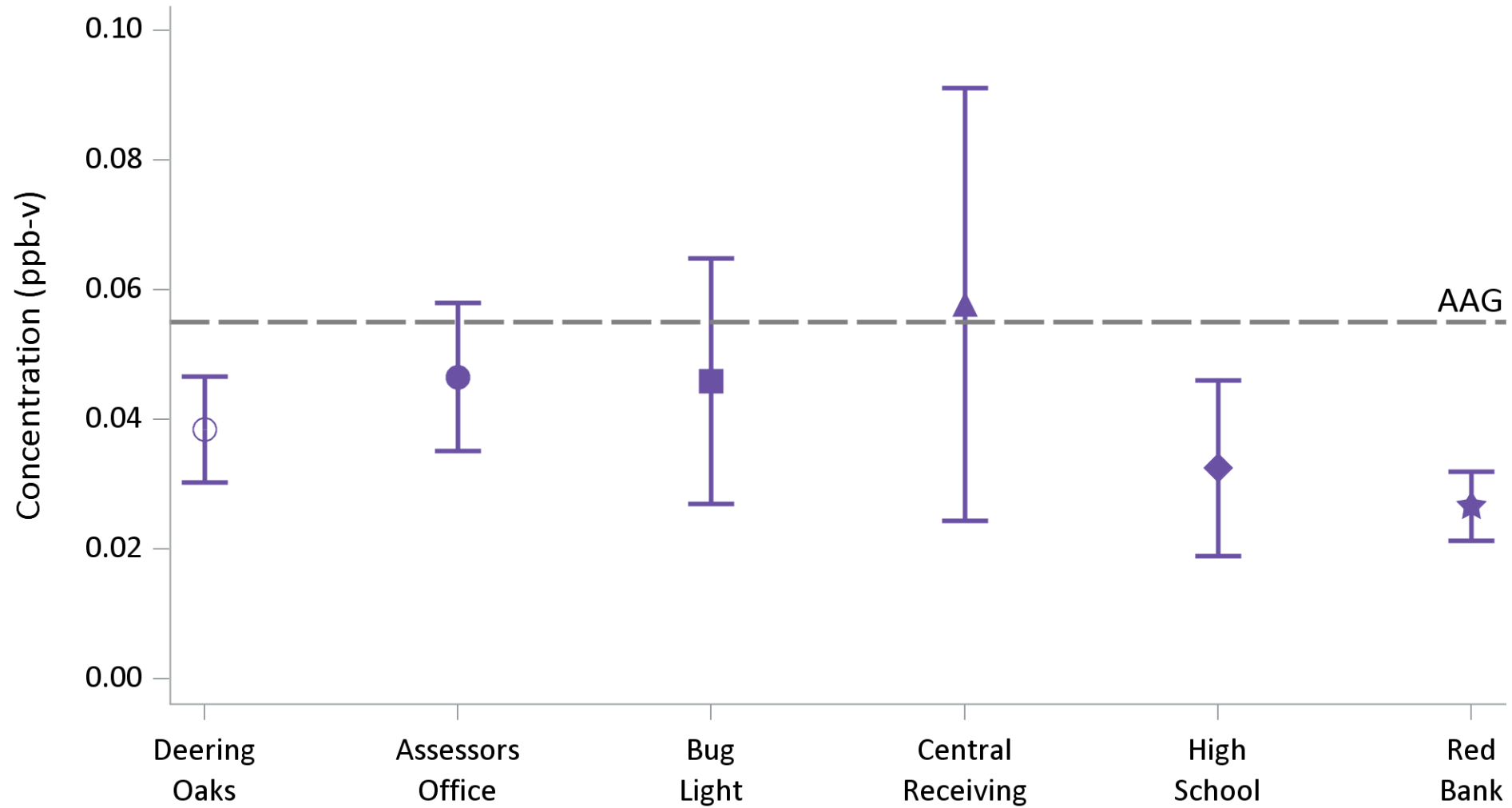
EXAMPLE - Naphthalene

Averaging of 24-hour sampling results for Naphthalene and comparison to a chronic health guideline



EXAMPLE - Naphthalene

Comparison of average 24-hour sampling results for Naphthalene across sampling locations with 95% confidence interval on the mean



California's Derivation of an Chronic Toxicity Value for Naphthalene (AAG)

10,000 to 60,000
ppb



Increase in
nasal tumors



Assumes Linear
Dose-Response



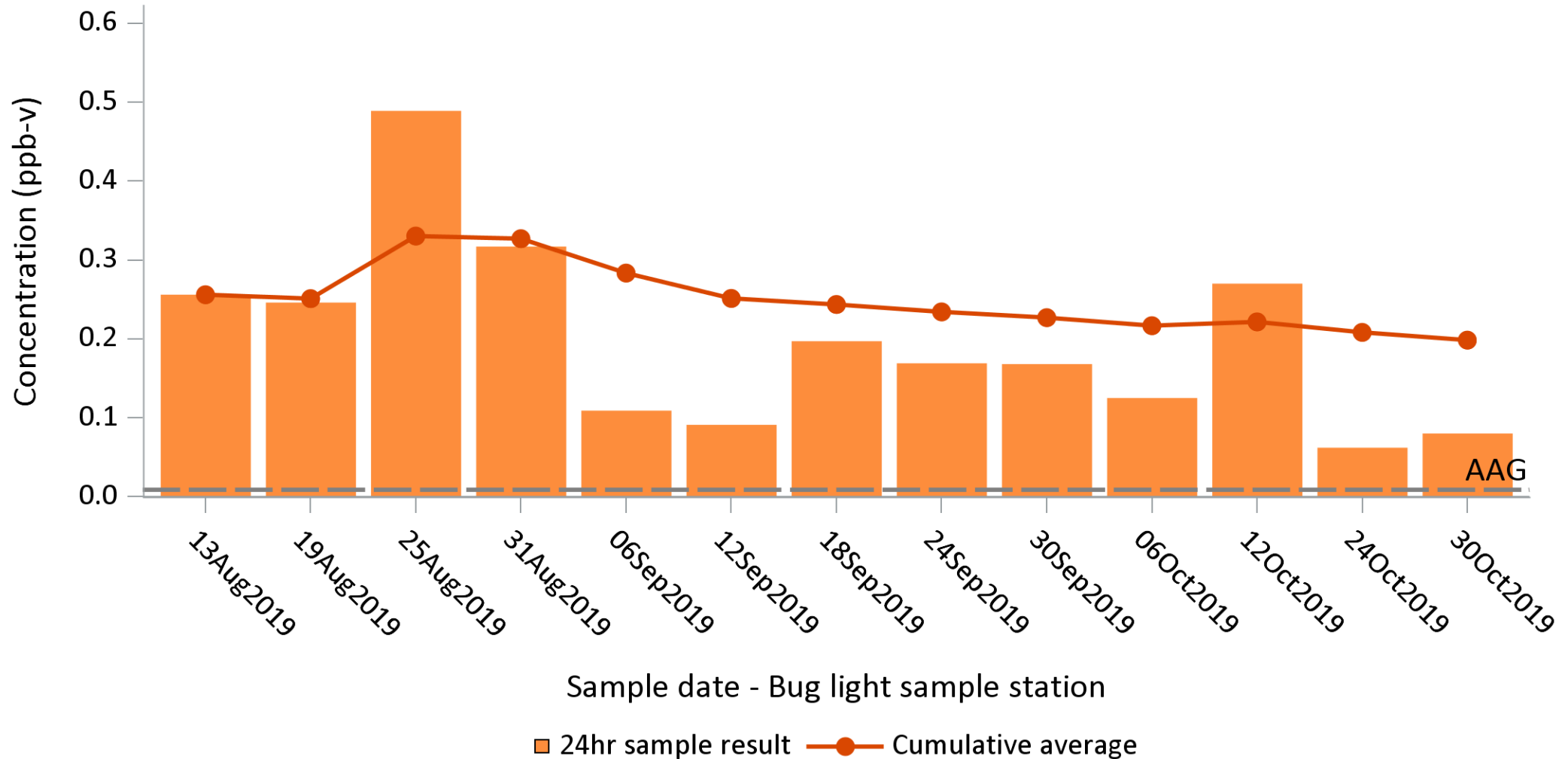
0.06 ppb

Incremental Lifetime
Cancer Risk of
1-in-100,000



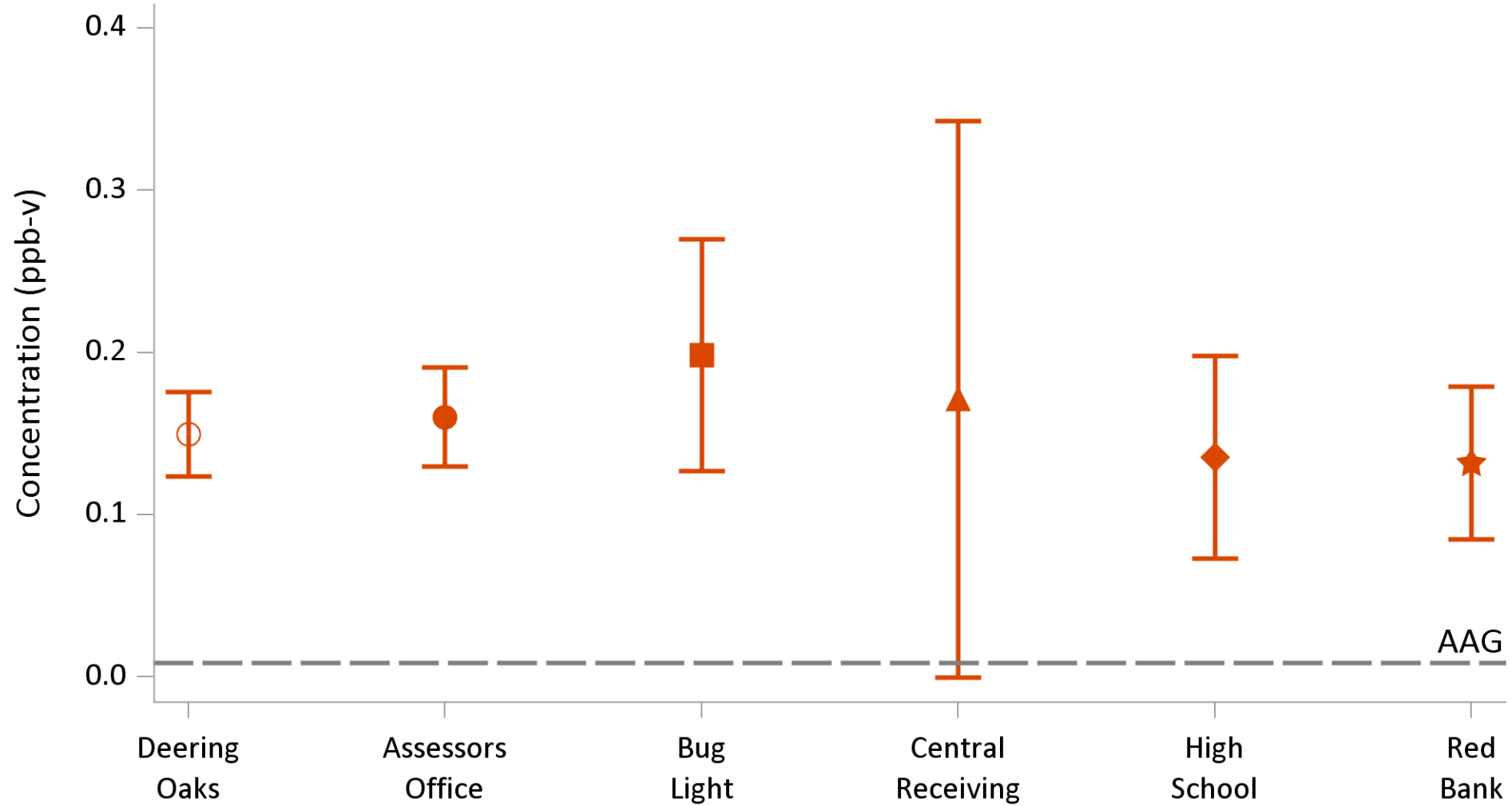
EXAMPLE - Acrolein

Averaging of 24-hour sampling results for Acrolein and comparison to a chronic health guideline

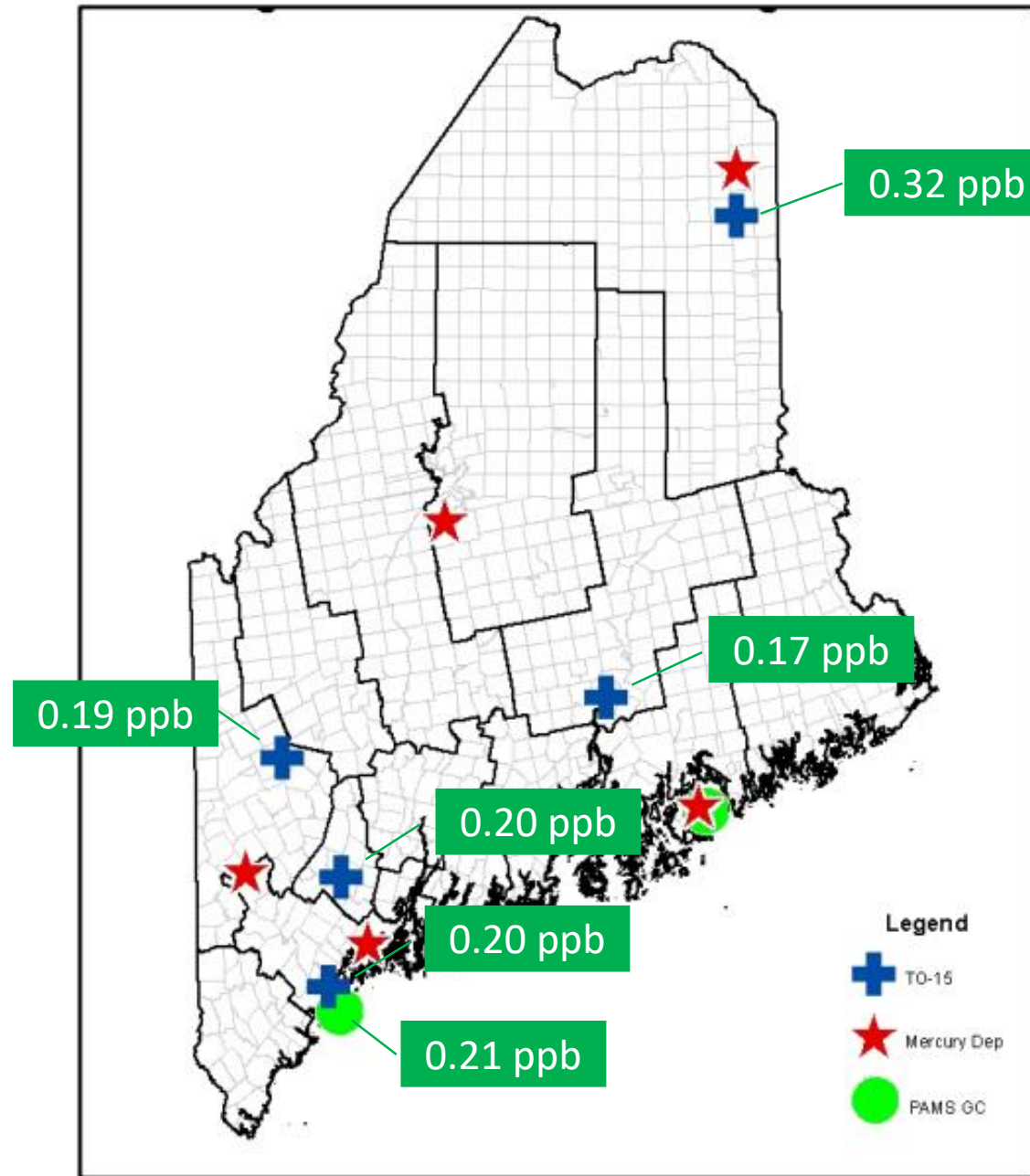


EXAMPLE - Acrolein

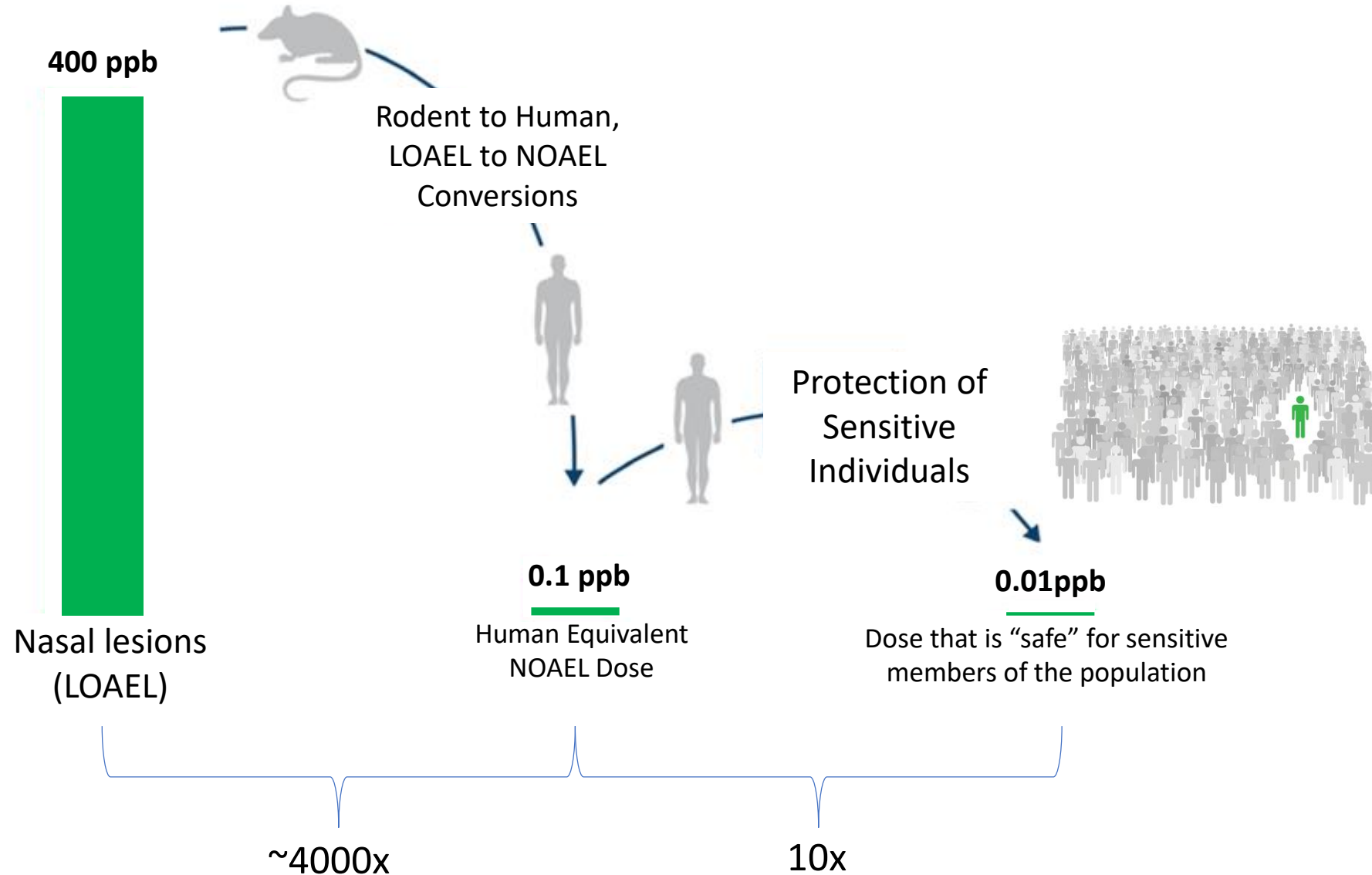
Comparison of average 24-hour sampling results for Acrolein across sampling locations with 95% confidence interval on the mean



2018 HAPs Data – Acrolein Annual Averages

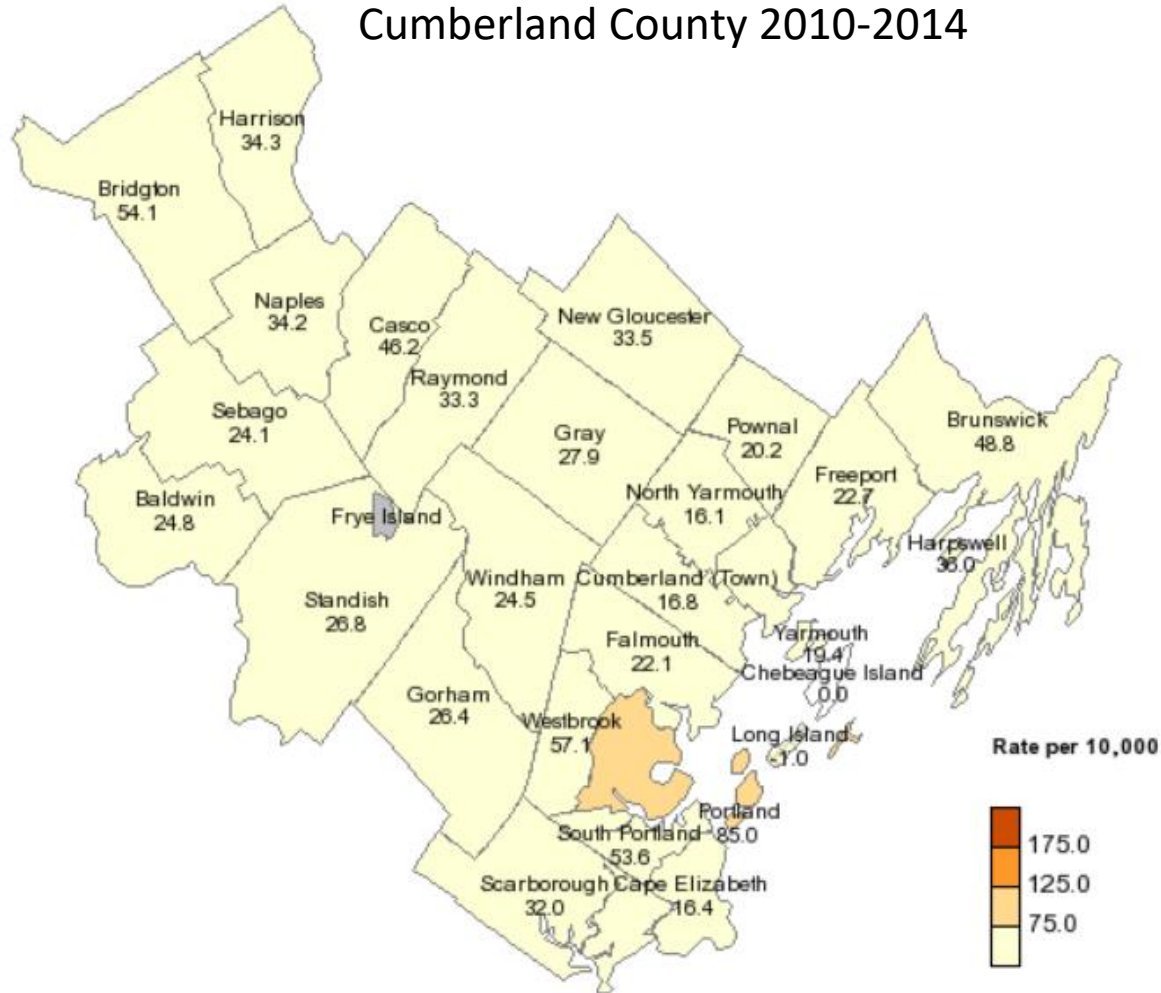


EPA's Derivation of a Chronic Toxicity Value for Acrolein

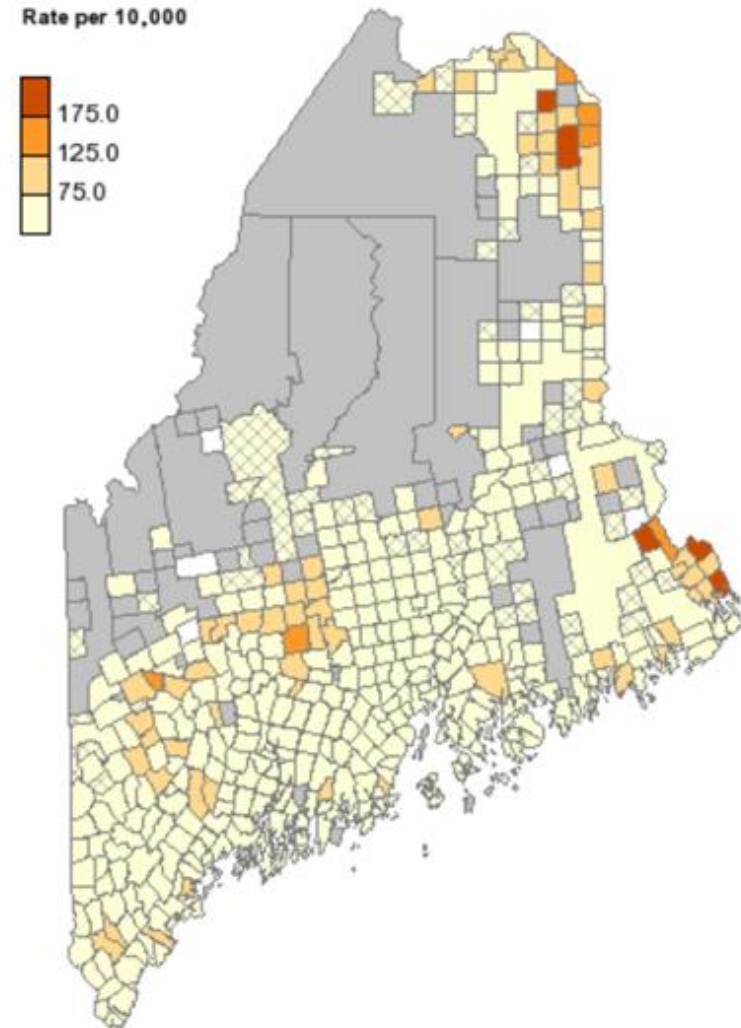


Evaluate Health Outcomes - Asthma

Rates of Emergency Department Visits by Town
Cumberland County 2010-2014



Rates of Emergency Department Visits by Town
Statewide 2010-2014



Potential Cluster Analysis

Example – Childhood Lead Poisoning

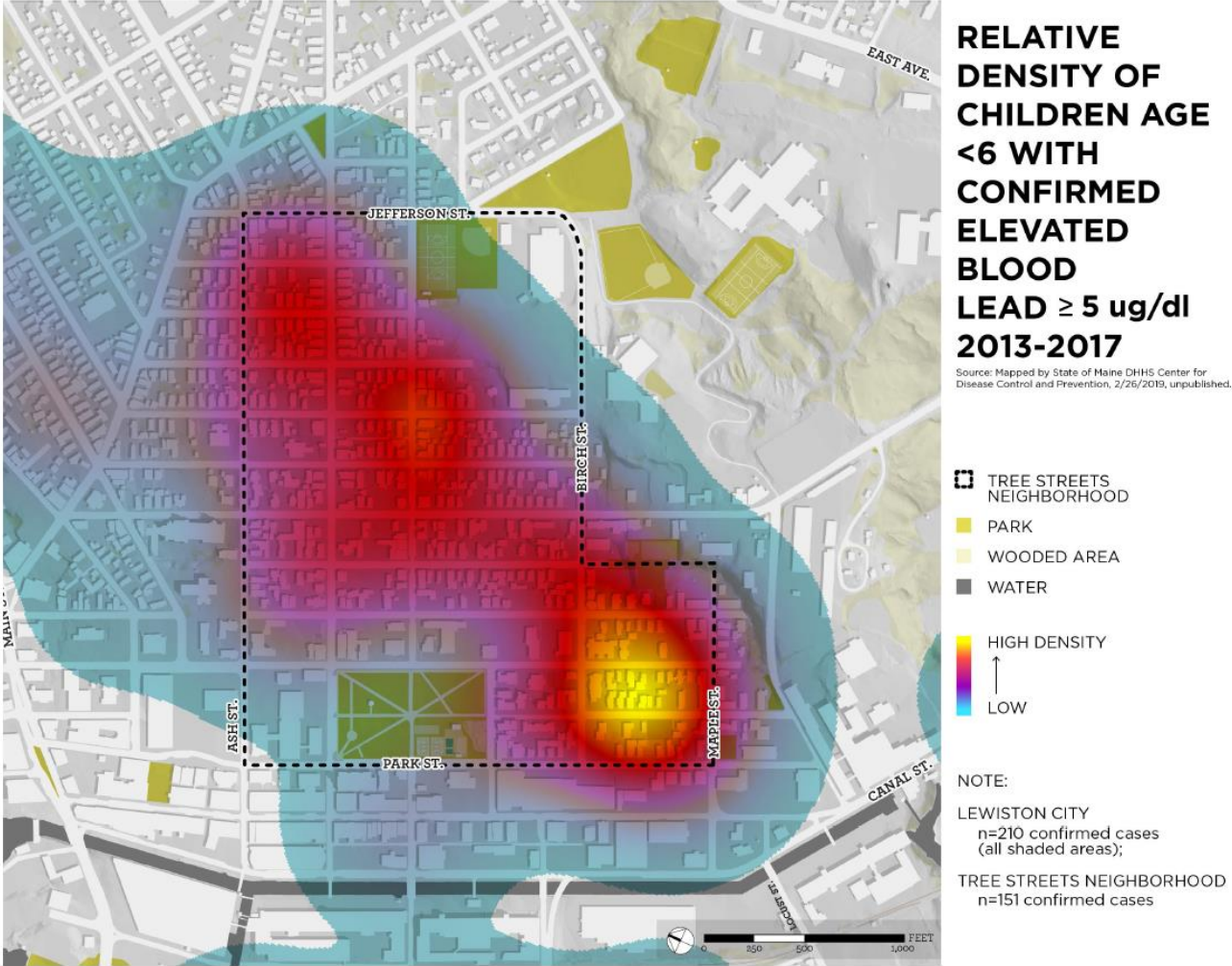


Figure 21. Map of the relative density of confirmed childhood lead poisoning cases in the Tree Streets Neighborhood



Next Steps for Maine CDC

- Continue to monitor 24-hour sampling results in partnership with DEP
- Continue to track cumulative averages for each location in partnership with DEP
- Obtain and evaluate data on asthma ED visits for Portland / South Portland
- Periodically report back to South Portland community



Questions?

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