



BAY AREA  
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**AGENDA: 4**

# **Fine Particulate Matter Local Risk Methodology Update**

**Advisory Council Meeting  
September 12, 2022**

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# Overview



- Recap
- Provide updates responsive to Council feedback
  - Link implementation to risk framework
  - Focus on exposure window and adjustment factors
- Next Steps

# Recap



February

Regulatory toolbox  
Broadly scoped whitepaper

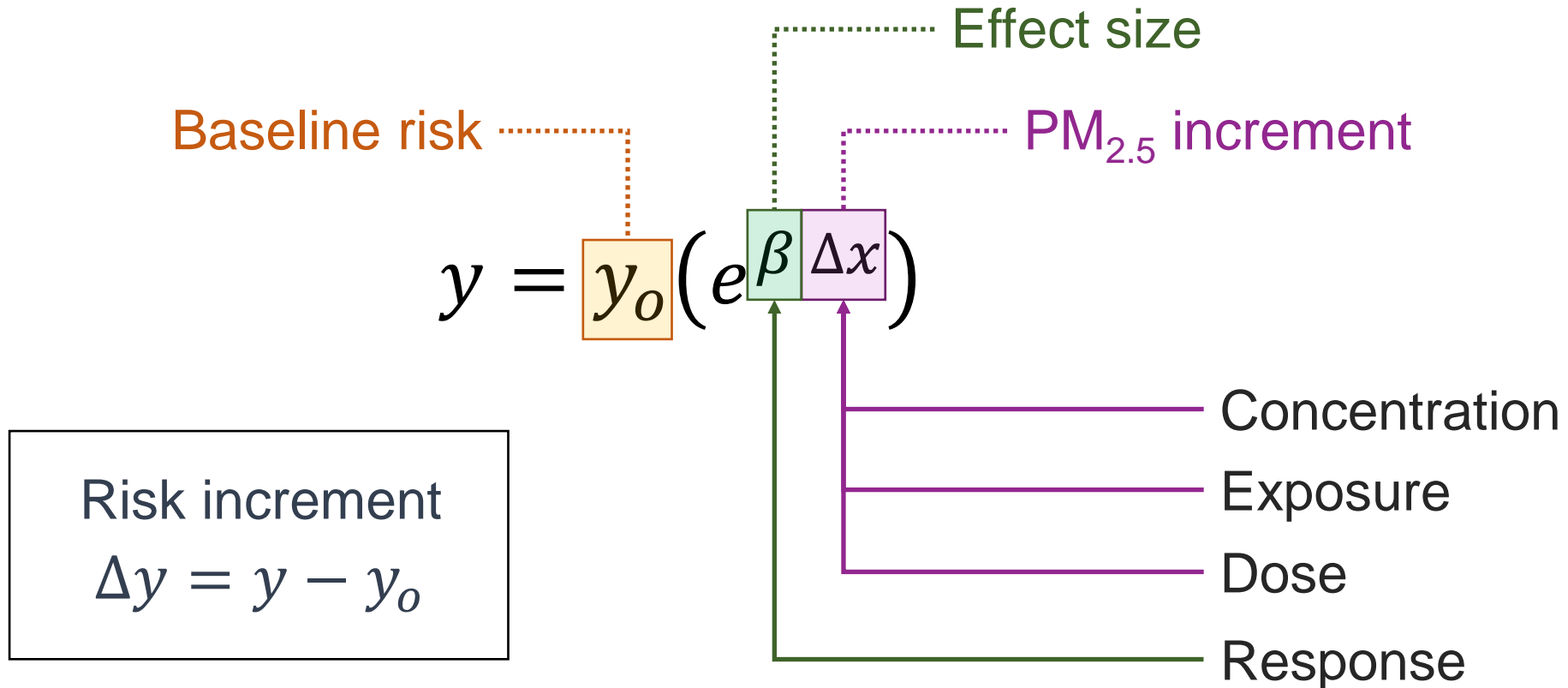
April

Gaps in the regulatory framework  
*Q: simplicity vs complexity*

July

Focus on **maximal risk**  
Extend to multi-year exposure  
Expand to include asthma  
*Q: sensitive individuals*

# Risk Framework



# Baseline Risk



- **Exposure window** is key parameter
  - Consistent with HRA principles and guidelines
  - Asthma rates higher for children; mortality rates higher for seniors

Receptor Type	Mortality	Asthma	
Residential	55–84	0–17	30-year, ends at median survival
Worker	40–64		ends at adulthood
Student	–	5–13	25-year, ends at retirement
Daycare	–	0–5	K-8 school

$$y_0(e^{\beta \Delta x})$$

# Concentration



- Source-specific, based on modeling
  - Simulate contributions to annual-average ambient PM<sub>2.5</sub> on a grid
  - Match receptor types (previous slide) to grid locations
  - Identify maximum impacts
- Why is modeled ambient PM<sub>2.5</sub> concentration the link?
  - Follows convention and guidance for toxics assessments
  - Outdoor PM<sub>2.5</sub> is the independent variable in epi studies

$$y_o(e^{\beta \Delta x})$$

# Exposure



- Incremental average exposure intensity
  - If emissions and receptor are 100% co-present, then equal to the incremental concentration
  - If the schedules of the source and receptor differ, then less
- Follow existing HRA guidance

$$y_o(e^{\beta \Delta x})$$

# Dose



- **Breathing rates** are linked to exposure window
- Health-protective estimates
  - **95<sup>th</sup> %ile moderate 8-hr** for workplace, school, daycare receptors
  - **95<sup>th</sup> %ile daily** for residential
- Use ratios to adjust PM<sub>2.5</sub> increment ( $\Delta x$ )
  - Denominators = mean daily rates (implicit in epi studies)
  - No separate variable for dose

$$y_o(e^{\beta \Delta x})$$





# Summary



$$y = y_0 (e^{\beta \Delta x})$$

## BASELINE RATE $y_0$

- Asthma higher for children; mortality higher for seniors

## EFFECT SIZE $\beta$

- Adjust RR by 3x
- To cover known and unknown variation

## PM<sub>2.5</sub> INCREMENT $\Delta x$

- Modeled outdoor (max)
- Source & receptor schedules
- 95<sup>th</sup> %ile breathing rates by age and activity level

*linked to selection of exposure window*

# Net Adjustments



*adjustments to relative risk*

*adjustments to breathing rate*

		$\beta$	$\Delta x$	<b>Combined</b>
Mortality	Residential	3.0	1.6	<b>5x</b>
	Worker	3.0	3.7	<b>11x</b>
Asthma	Daycare	2.9	4.2	<b>12x</b>
	Student	2.9	3.5	<b>10x</b>
	Residential	2.9	1.6	<b>5x</b>

*Ratios of final results (with vs without adjustments) for a +0.1 ug/m<sup>3</sup> incremental concentration, evaluated over the relevant exposure windows.*

$$y = y_o (e^{\beta \Delta x})$$

# Status and Next Steps



<b>September</b>	External reviewer feedback on current draft
October	Release v1.0 for public review & comment
November	Present v1.0 to Advisory Council
December	Present v1.0 to Stationary Source & Climate Impacts Committee
Early 2023	Transition to considering applications

# Thank You



Questions and comments welcome



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**AGENDA: 5**

# Source Prioritization Framework

**Advisory Council Meeting  
September 12, 2022**

**Elizabeth Yura  
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# Outline

- Why prioritize rule making efforts
- What is prioritization framework
- How modeling informs prioritization
- Work in larger context
- Prioritization implications and input needed
- Next steps



# Why set priorities?

## Problem

- Lack of clarity on board and community priorities
- Lack of transparency on which rules go first
- Reasons for rule delays are unclear
- Long and uncertain timelines

## Result

- Rules often start and stop as priorities shift
- Community and board frustrated with lack of progress on rule making
- Community and board lose confidence in staff to fulfil agency mission



# Prioritization Framework

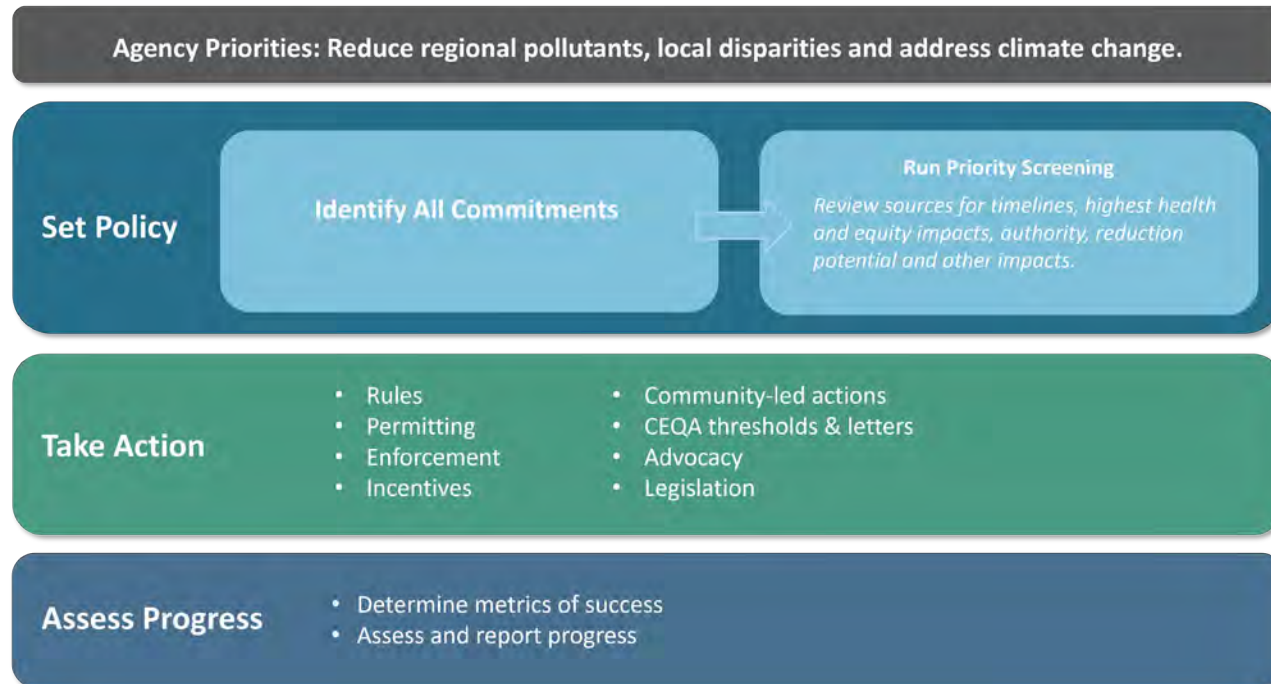
- **Purpose:** Align work efforts to board and community priorities.
- Focus on commitments, as a first screen.
- Perform **priority screening** to guide what commitment gets done first.

## Prioritization Factors

Commitments	<ul style="list-style-type: none"><li>• Legal or prior commitments, such as in a community emission reduction plan.</li></ul>
Health & Equity 	<ul style="list-style-type: none"><li>• Magnitude of emissions and/or exposure, relative potency of pollutant, distribution of exposure.</li></ul>
Authority	<ul style="list-style-type: none"><li>• Statutory authority or purview to regulate emissions and/or source.</li></ul>
Reduction Potential	<ul style="list-style-type: none"><li>• Availability and feasibility of controls, and/or performance levels.</li></ul>
Other Impacts 	<ul style="list-style-type: none"><li>• Economic, socioeconomic, other environmental, and equity impacts.</li></ul>

 Modeling Informs

# The Larger Context



- **Ideal:** propose *emission reduction strategies* that align with priorities.
- Set policy via prioritization framework
- Priorities determine which sources go first
- Possible strategies: new rules, rule amendments, incentives, increased enforcement, etc.

# Implications & Questions

Magnitude of existing commitments means new, non-committed rules would not be taken up for next few years.

Sources or strategies with primarily climate impact will likely be low priority, unless significant co-benefits.

Role of rules in climate efforts remain uncertain.

Considering implications, are factors the right ones?

# Next Steps

- Review prioritization framework with Community Advisory Council
- Review health and equity modeling data for sources.
- Run sources through entire prioritization process
- Identify and evaluate emission reduction strategies

