

# Leveraging Geospatial Data to Support an Implementation Science Approach to Address Lung Cancer Burden



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## Background

Lung cancer mortality in Philadelphia is 16% higher than the national rate, with some neighborhoods reaching double the average. Smoking, the leading cause of lung cancer, also reduces treatment success, making cessation vital for prevention and control.

Implementation Science (IS) promotes the use of proven health interventions in public health and clinical settings. It identifies strategies to integrate evidence-based practices, like smoking cessation, to improve population health. Using an IS framework, such as RE-AIM, ensures continual data collection and evaluation across key dimensions (Table, below).

## Methods

We developed geospatial versions of RE-AIM questions and applied a Geospatial IS approach using our smoking cessation program (TTP) as a case study. By integrating institutional data (TTP participation, community partners, facilities) with public data (lung cancer mortality, tobacco retailer density, smoking rates), we evaluate implementation and guide improvements.

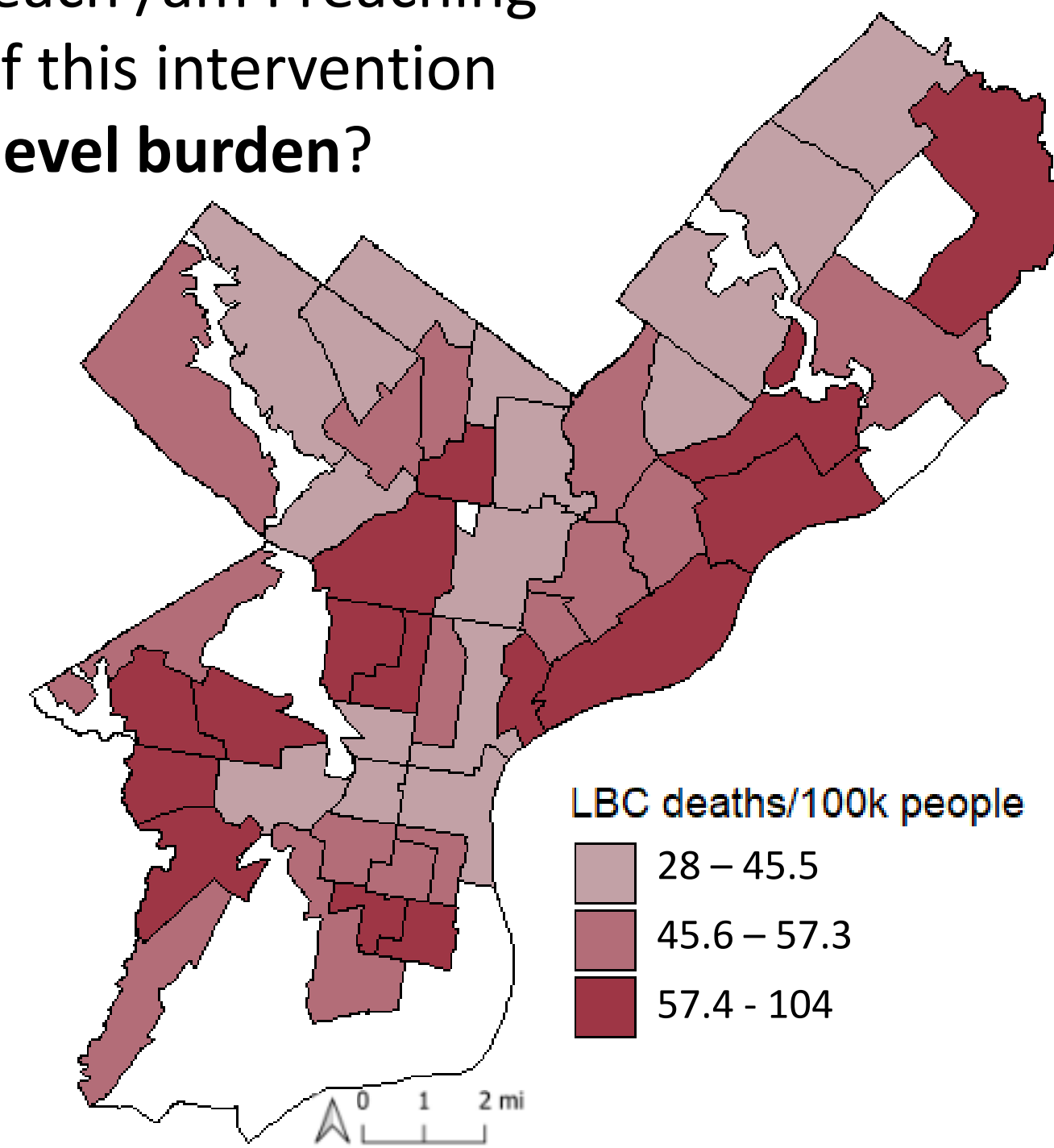
## Results

Maps were created for each geospatial IS prompt (Figure, right), enabling program leadership to: (1) identify high-priority Philadelphia neighborhoods based on lung cancer burden, (2) assess if TTP reaches these areas, (3) determine key community partners to support the program, (4) understand neighborhood context for participants, and (5) identify health facilities to sustain the program.

## Conclusion

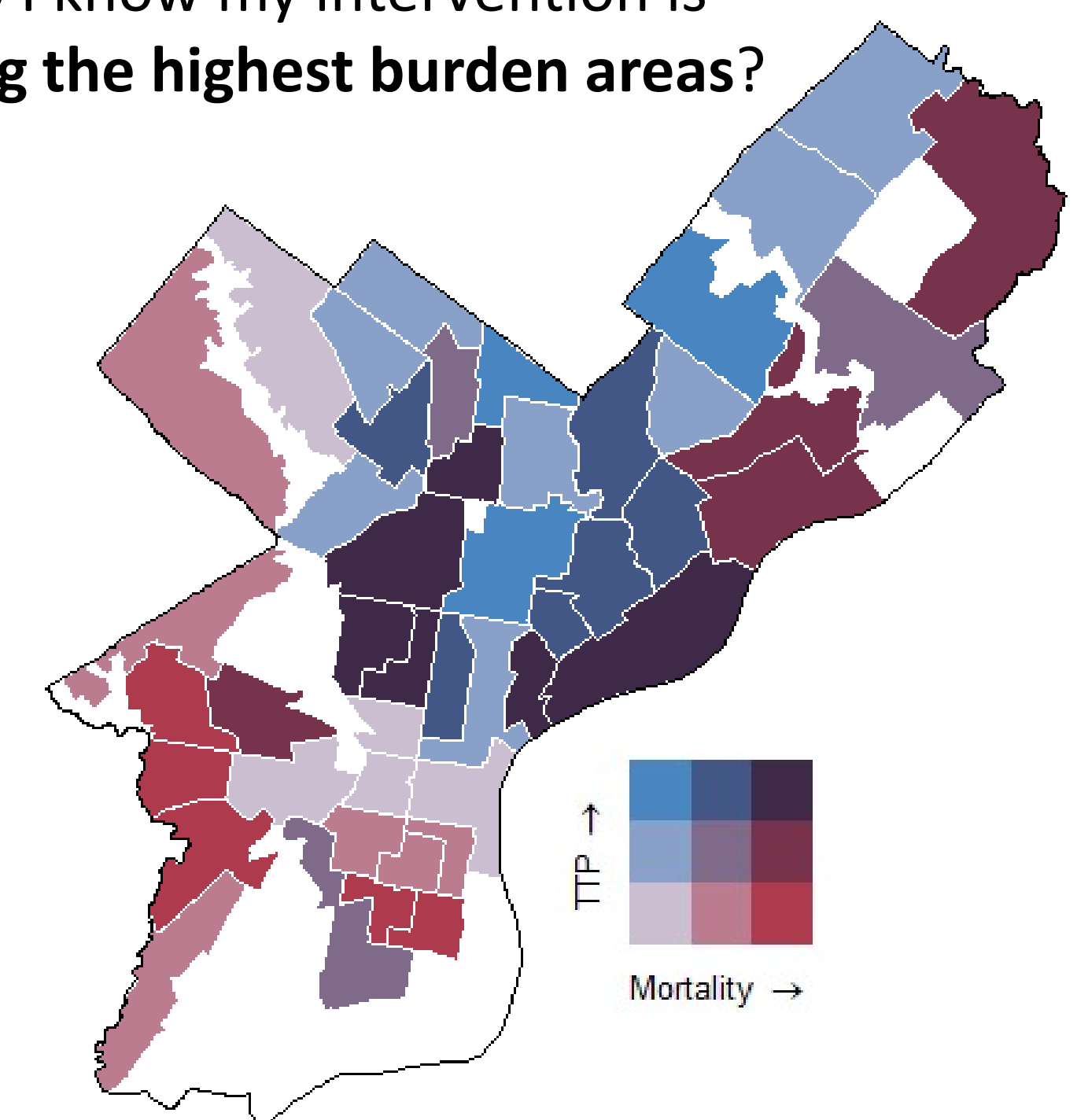
Our novel approach provides a framework for cancer centers to integrate behavioral, implementation, health disparities, and catchment area research. It also enhances the evaluation of clinical programs within the context of catchment area disparities.

1. **Where** do I reach /am I reaching those in need of this intervention based on **area-level burden**?



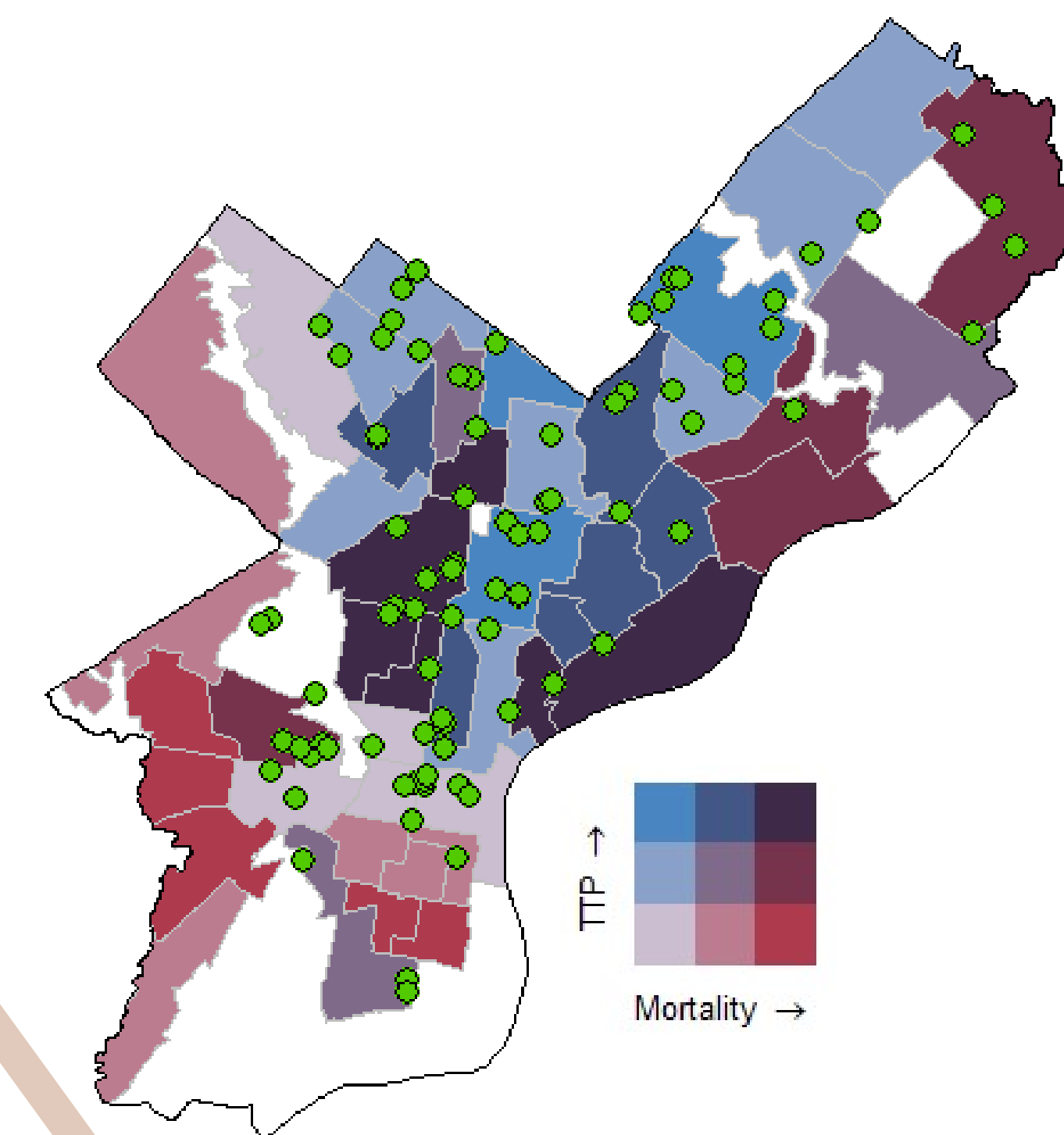
**Lung Cancer Mortality by Neighborhood**

2. How do I know my intervention is addressing the highest burden areas?



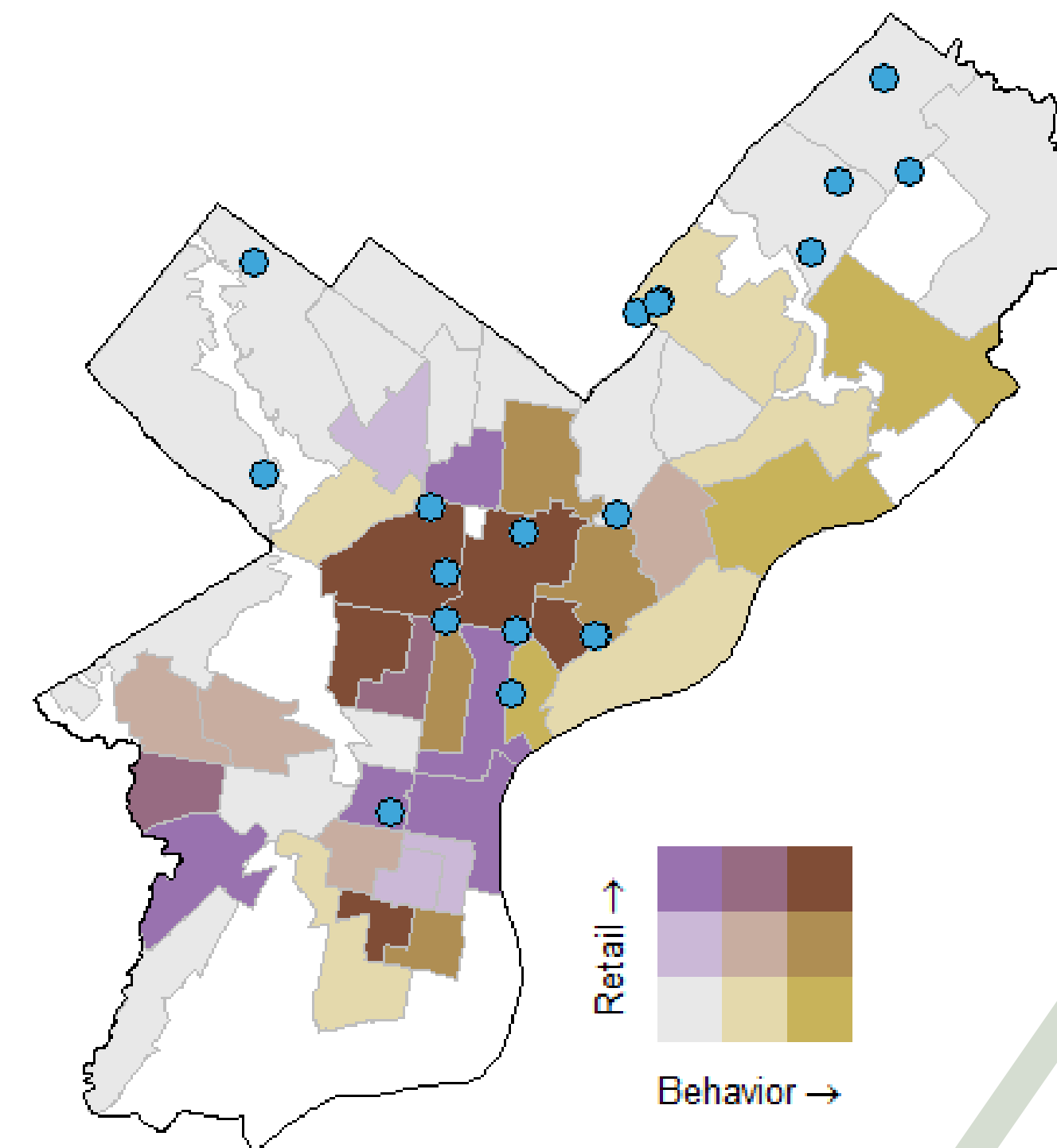
**Lung Cancer Mortality & TTP Participation**

3. How do I develop organizational support from partners located in high-burden areas to help deliver my intervention?

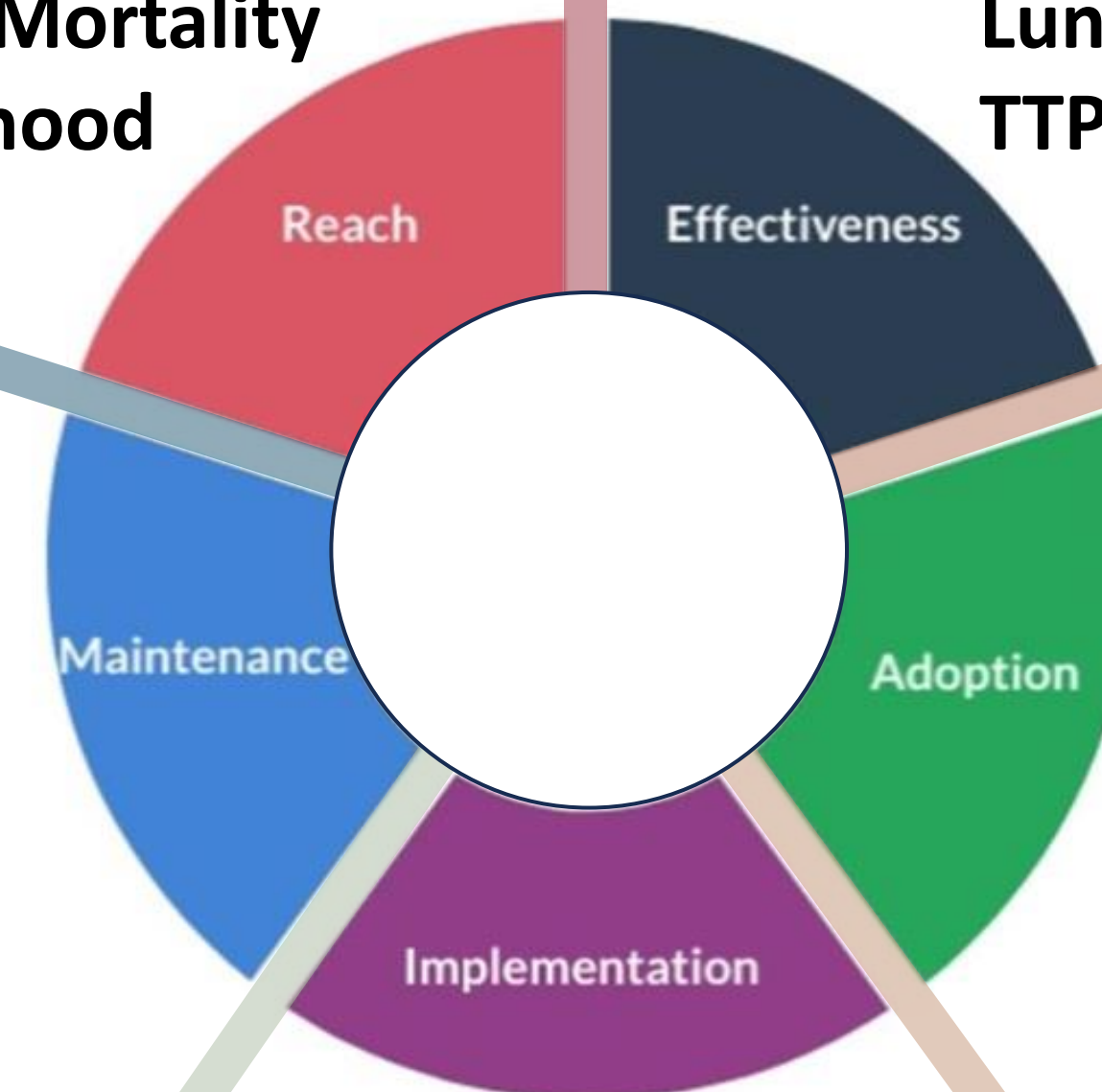


**Community Partners by Lung Cancer Mortality & TTP Participation**

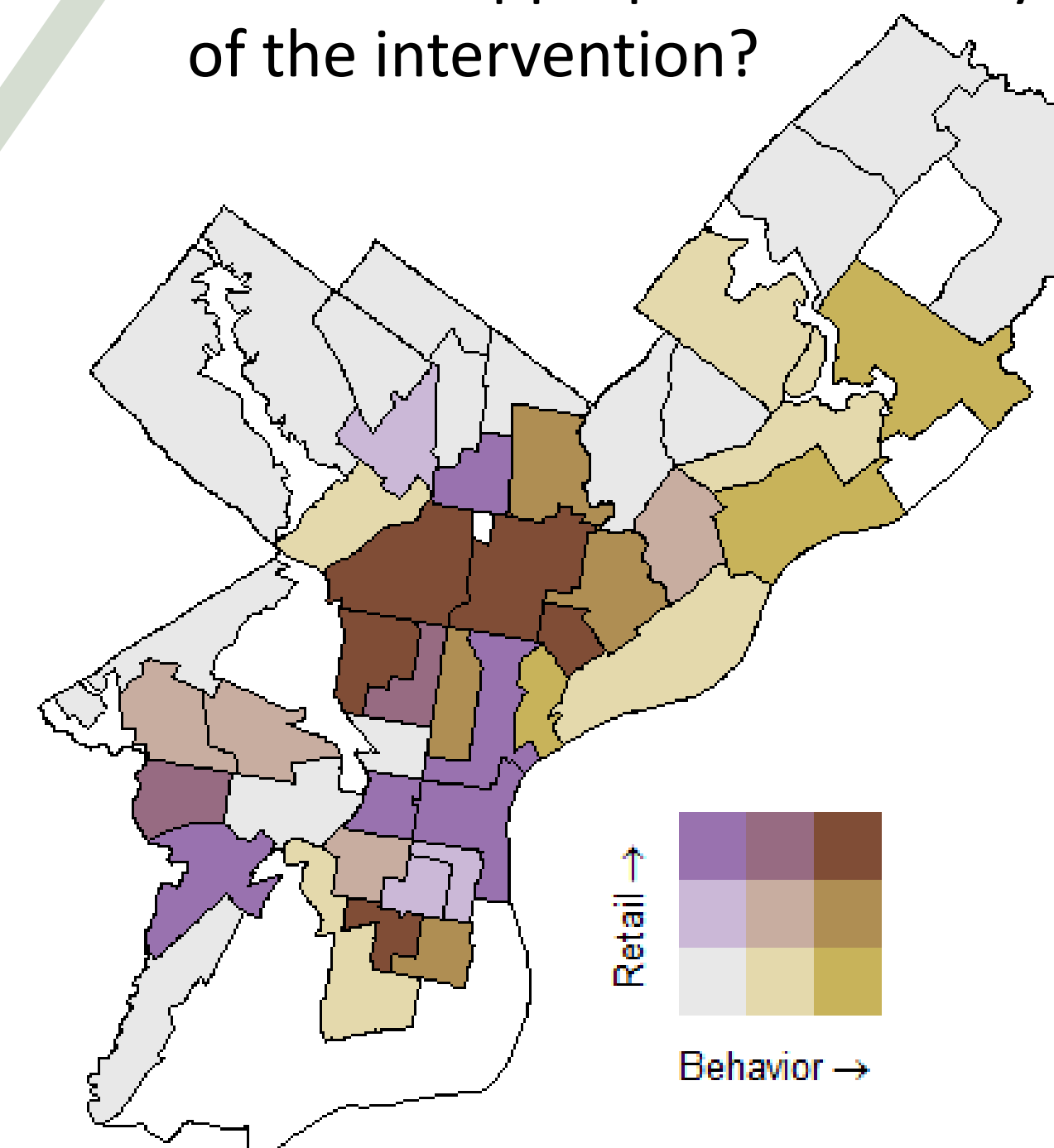
5. **Where** do I incorporate the intervention so it is delivered over the long term?



**Temple Health Hospitals, Multi-Specialty Centers, & Community Offices**



4. How do I consider geographic context to ensure appropriate delivery of the intervention?



**Tobacco Prevalence: Smoking Behavior & Tobacco Retailer Density**

Dimension	Original RE-AIM Question
Reach	How do I reach/Am I reaching those who need the intervention?
Effectiveness	How do I know my intervention is working?
Adoption	How do I develop organizational support to deliver my intervention?
Implementation	How do I ensure the intervention is delivered properly?
Maintenance	How do I incorporate the intervention so it is delivered over the long term?