

# Opportunities and Challenges of using Big Data to Evaluate Lung Cancer Screening in Diverse Healthcare Systems: The Lung Population-based Research to Optimize the Screening Process (PROSPR) Research Consortium

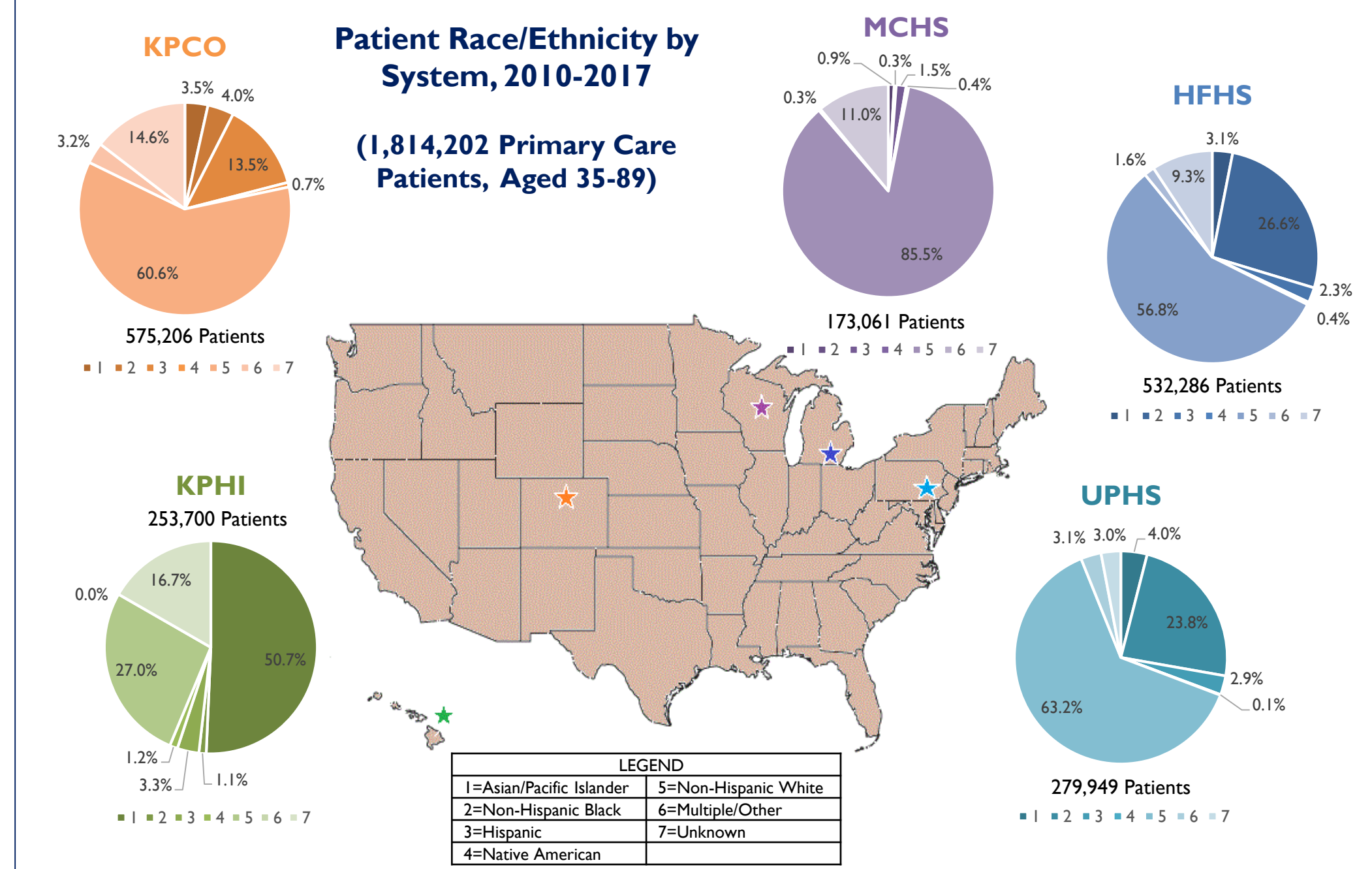
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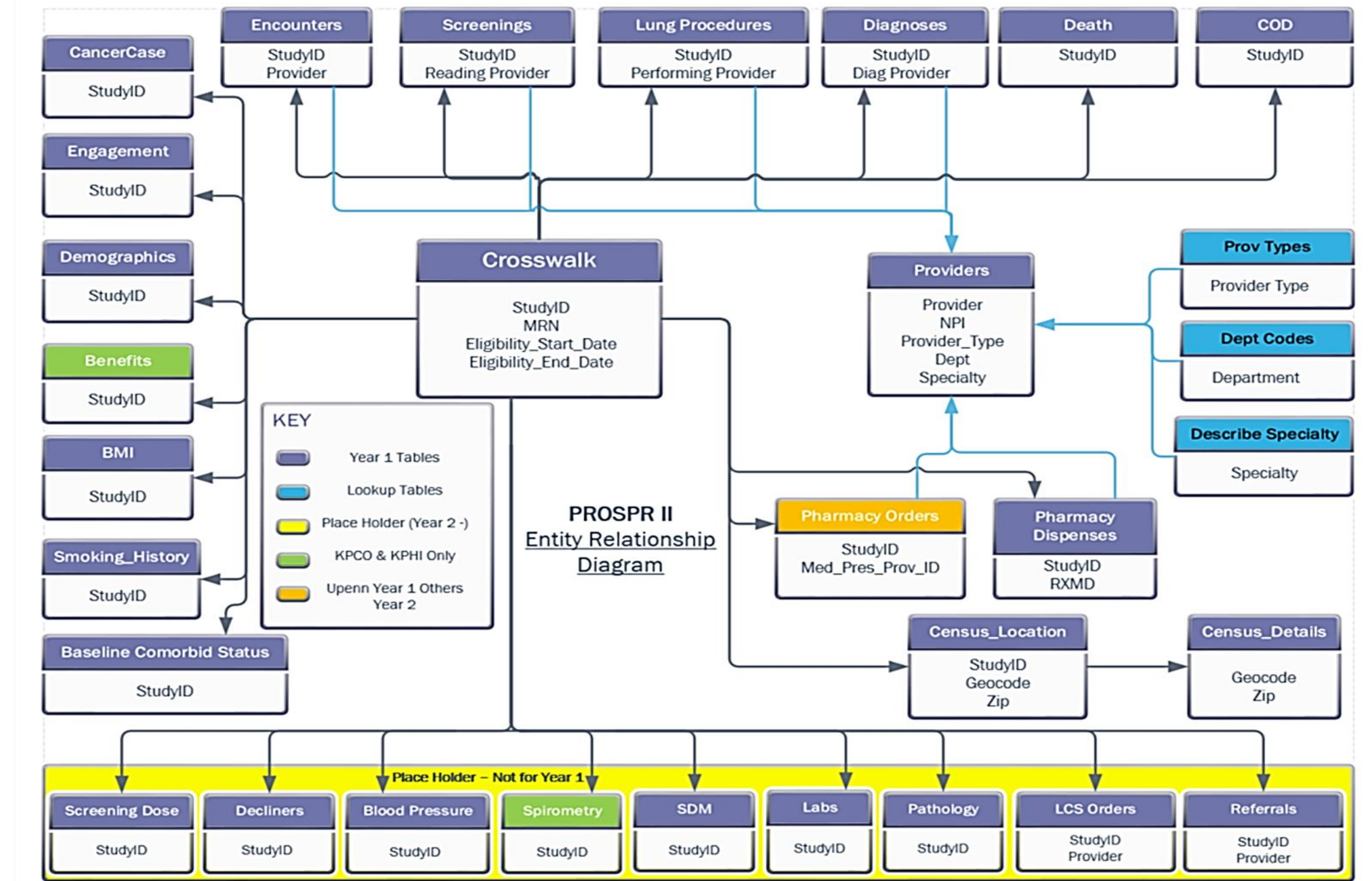
## Overview

- Annual lung cancer screening (LCS) with low-dose computed tomography (LDCT) is recommended for high-risk adults that meet specific age, smoking, and health-status criteria, yet implementation and uptake has been suboptimal.
- In 2018, the National Cancer Institute (NCI) funded the large multisite consortium, *Population-based Research to Optimize the Screening Process (PROSPR)*, which aims to conduct multi-site, coordinated, transdisciplinary research to evaluate and improve cervical, colorectal, and lung cancer screening processes.
- In our Lung PROSPR Research Consortium, we aim to assess utilization and outcomes of LCS across five diverse healthcare systems and to identify key challenges and opportunities to optimize impact. Central to these efforts is understanding how variations in practice and context shape the cancer screening process and its outcomes.
- Here, we present the PROSPR lung cancer screening process model describing the interrelated steps needed to provide high-quality screening in community practice and introduce our diverse Lung PROSPR Consortium, including:
  - Henry Ford Health System (HFHS) in Michigan
  - Kaiser Permanente Colorado (KPCO) in Colorado
  - Kaiser Permanente Hawaii (KPHI) in Hawaii
  - Marshfield Clinic Health System (MCHS) in Wisconsin
  - University of Pennsylvania Health System (UPHS) in Pennsylvania
- Using a variety of methods and data sources, we aim to create a robust, harmonized data ecosystem across the five diverse healthcare systems to measure utilization and outcomes of LCS in routine care and identify patients eligible for LCS. The Lung Cancer Screening Population Data Model displays the complexity of our data and highlights some challenges of combining five different health systems into one common data model.
- The center utilizes fully-automated text mining to standardize capture of screening outcomes (determined by Lung-RADS scores) and is planning on expanding these methods to capture additional details from screening reports including nodule characteristics and incidental findings (Lung-RADS Extraction Process Diagram).

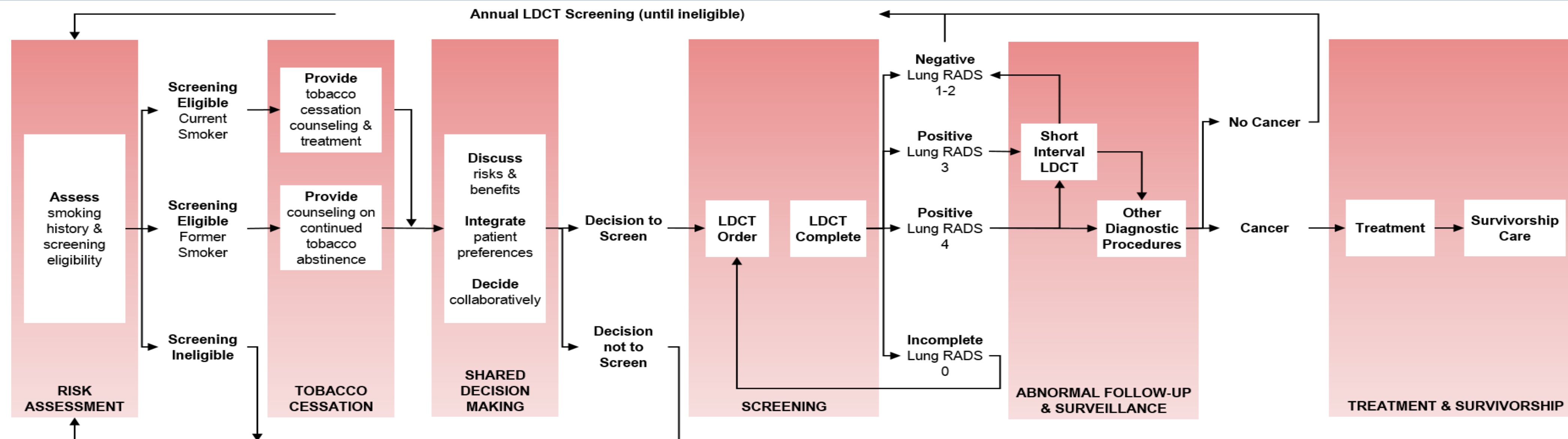
## Lung PROSPR Consortium: Five Diverse Healthcare Systems



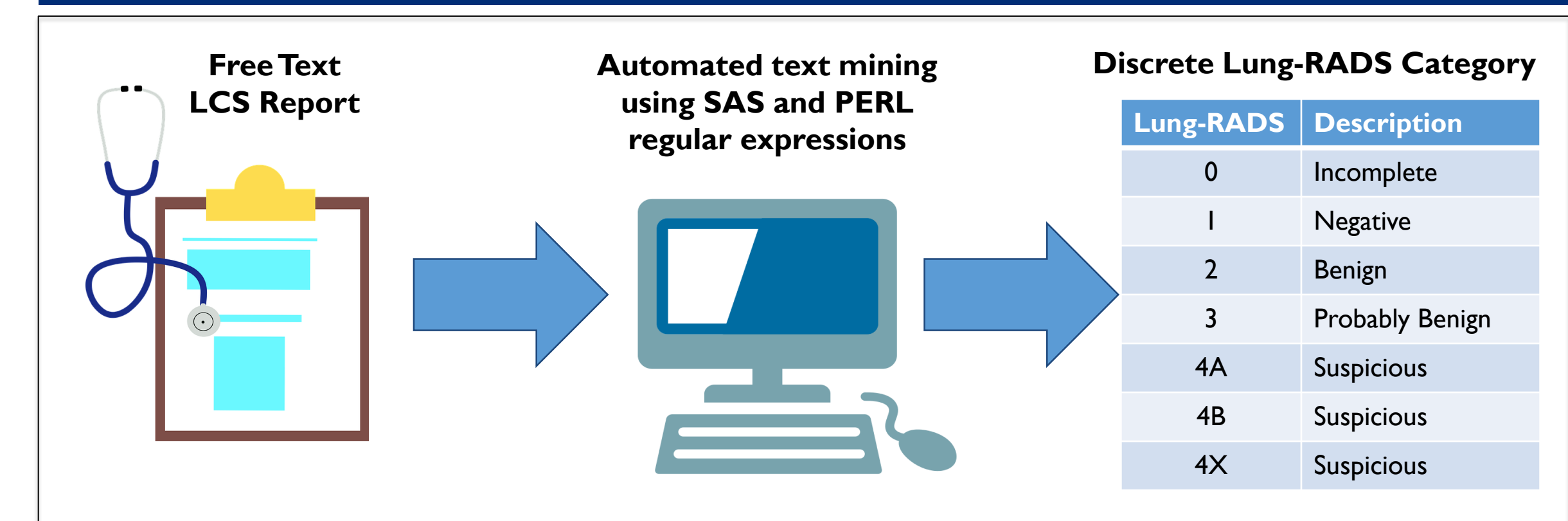
## Lung Cancer Screening: Population Data Model



## Lung Cancer Screening Process Model



## Lung-RADS Extraction Process



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