



# **VISION FOR IMPROVING EVIDENCE GENERATION FOR INTEGRATED DIAGNOSTICS AND PRECISION ONCOLOGY**

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# DISCLOSURES

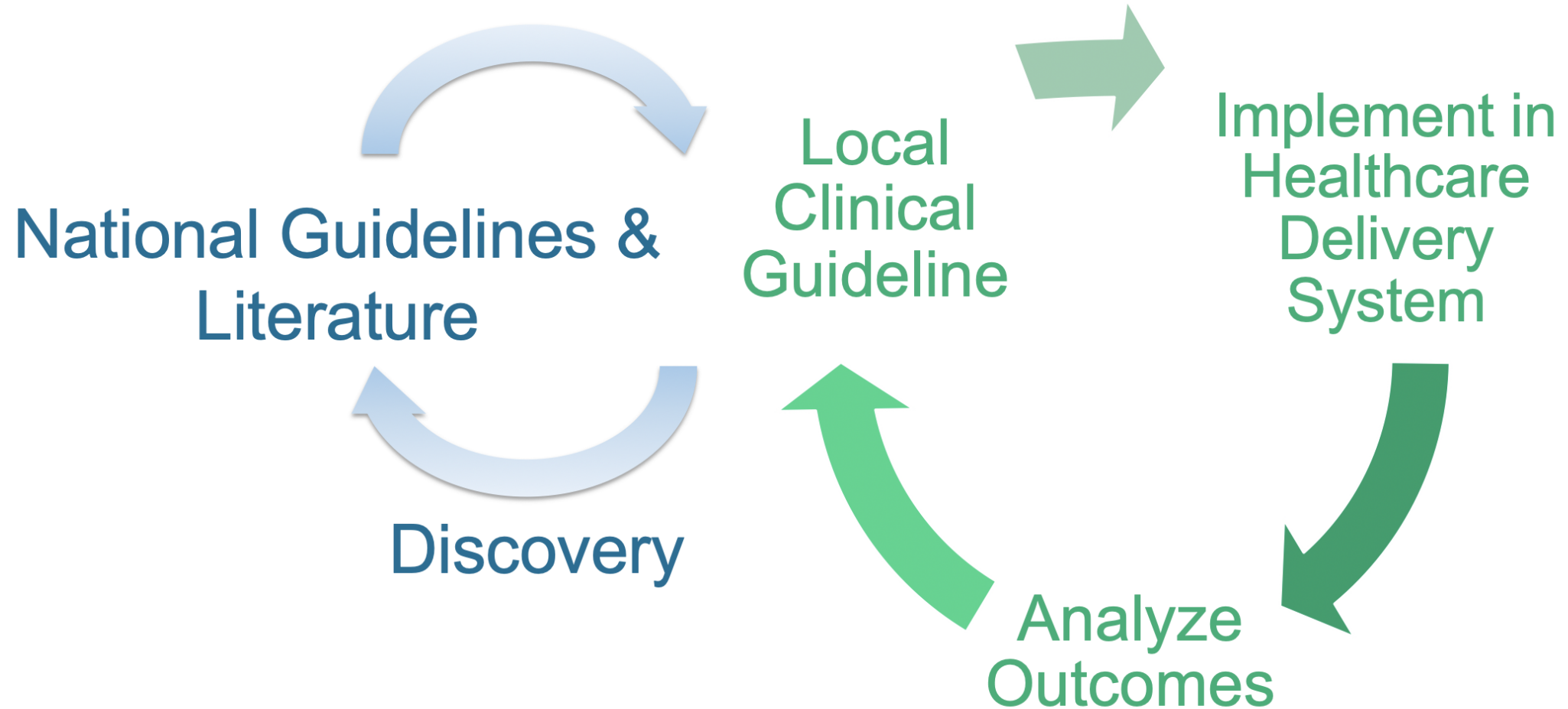
Employee: Foundation Medicine, Inc., Rush University

Adjunct Faculty: Vanderbilt University

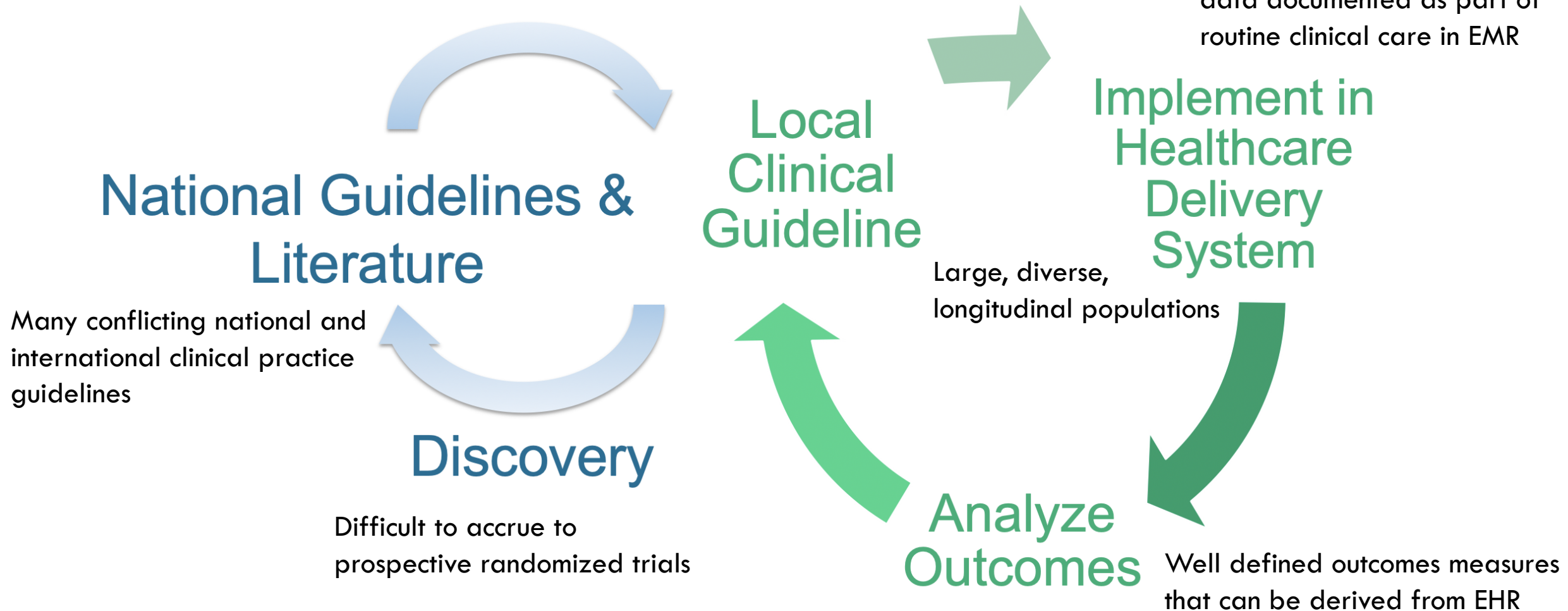
Equity Interest: Roche, GenomOncology, Personalis

Royalties: My Cancer Genome

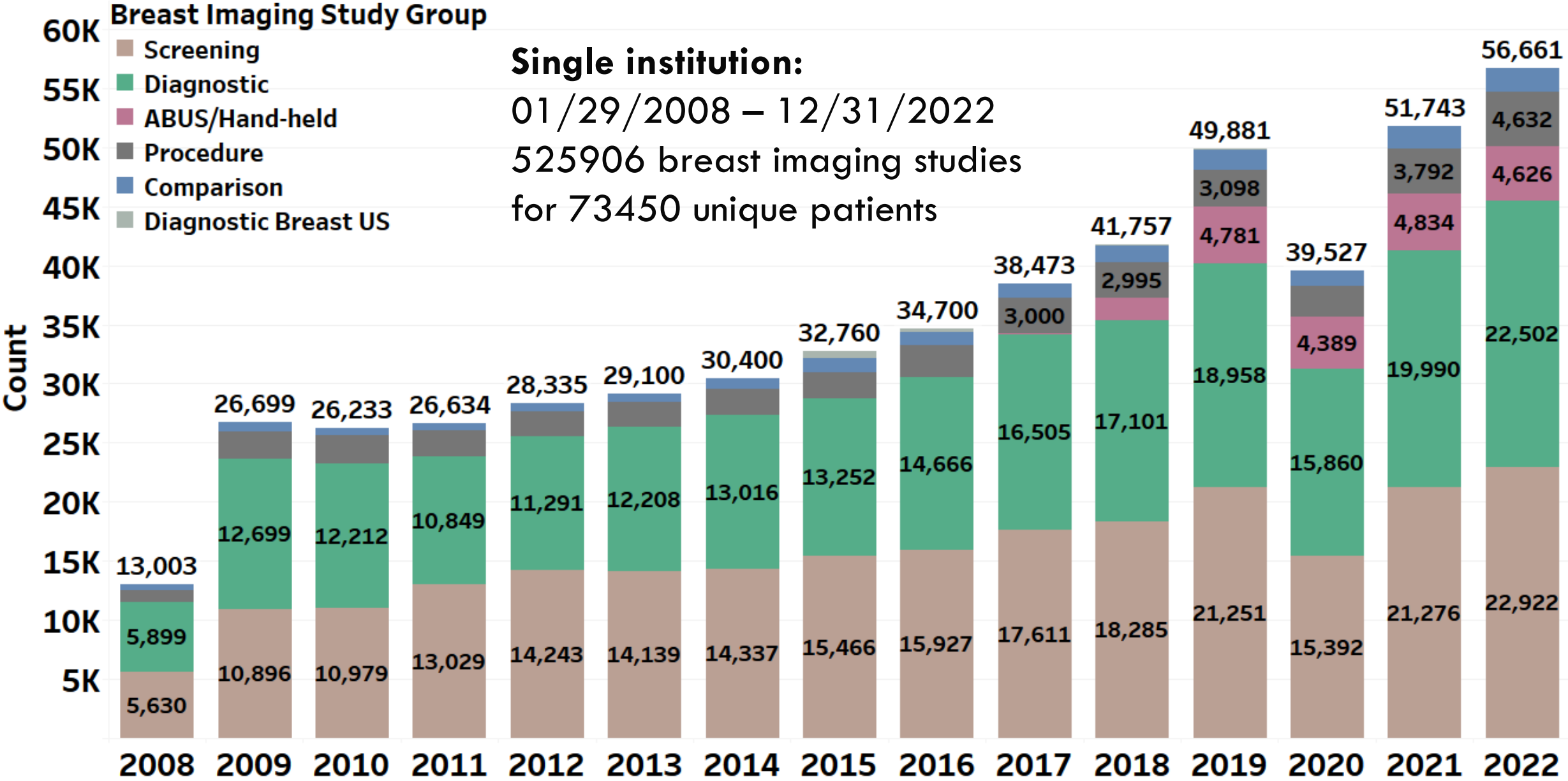
# LEVERAGING LEARNING HEALTHCARE SYSTEMS TO EVALUATE INTEGRATED DIAGNOSTICS



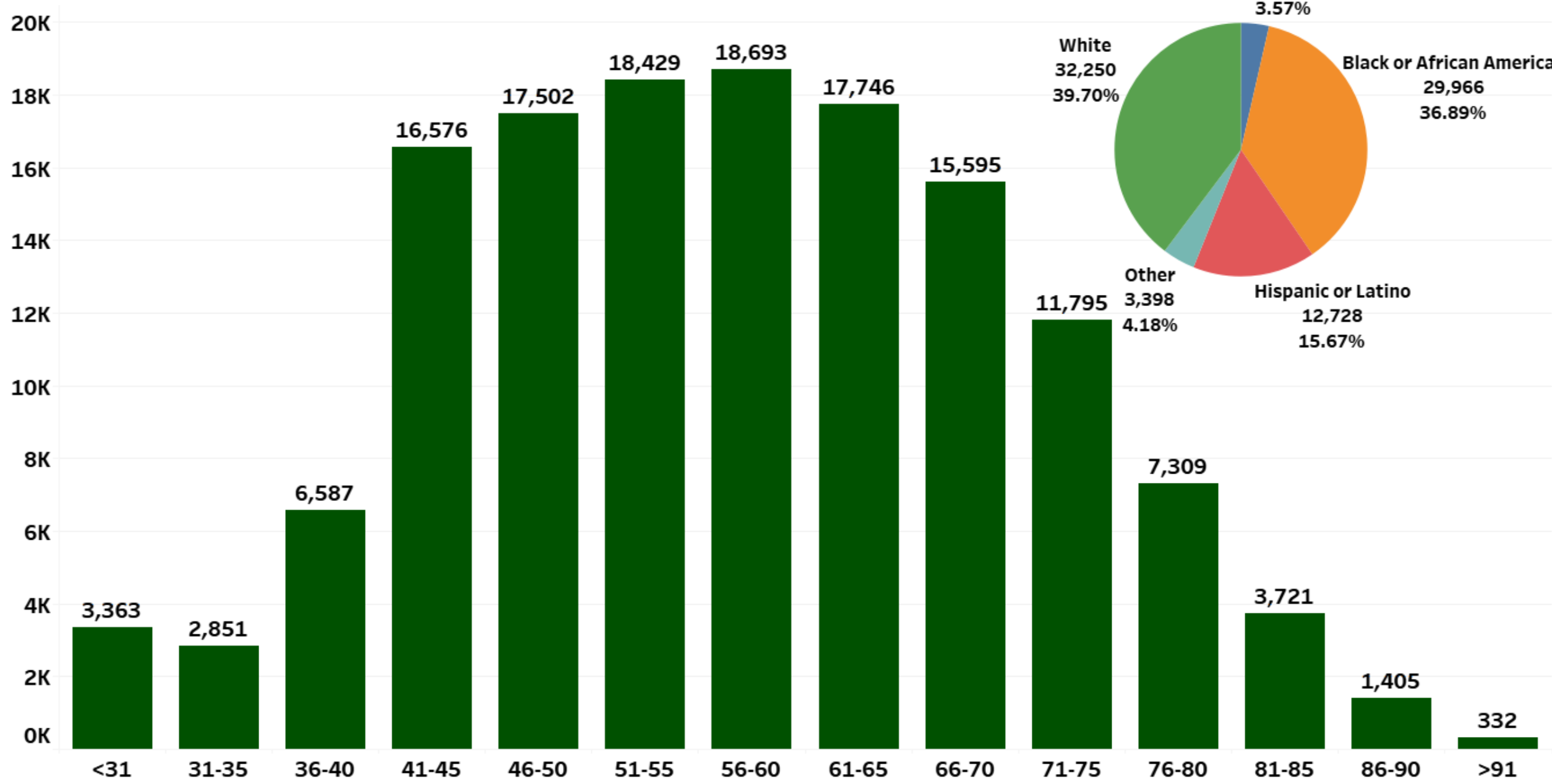
# ADDRESS CHALLENGES OF EVIDENCE GENERATION IN CANCER SCREENING?



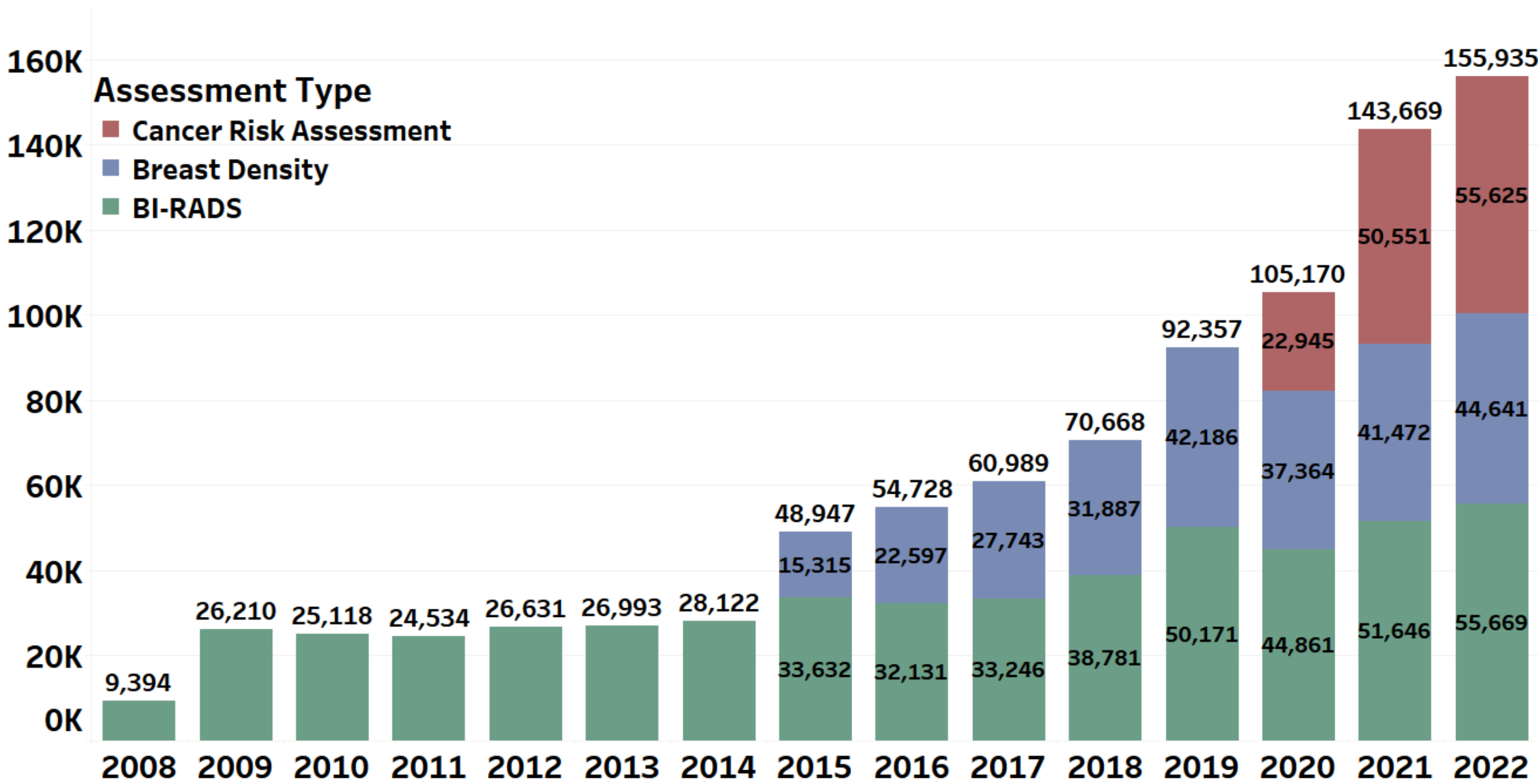
# LARGE LONGITUDINAL PATIENT POPULATION



# DIVERSE POPULATION ACROSS AGE AND RACE



# INCREASING DIVERSITY OF STRUCTURED DATA ELEMENTS



# REFERENCE IMPLEMENTATION FOR A BREAST CANCER RISK MANAGEMENT LEARNING SYSTEM

- Risk assessment guidelines
- Risk based supplemental screening guidelines
- Risk management guidelines

Local  
Clinical  
Guideline



Implement in  
Healthcare  
Delivery  
System

- Risk assessment questionnaire and calculation
- Risk reporting and follow-up recommendations in mammogram reports
- Navigator for high-risk patients
- High-risk breast clinic including genetic results documentation
- Referral workflows

- Uptake of guidelines
- Automated calculation of **cancer detection rates** for supplemental screening and risk group sub-analysis

Analyze  
Outcomes





# DIAGNOSTIC AND CLINICAL SYSTEMS INTEGRATIONS

## Clinical Systems

Provider Order  
Entry  
(Order Sets)

Risk Assessment  
Calculators

High Risk Clinic  
Documentation

Cancer Staging  
Documentation

## Diagnostic Systems

Radiology  
Documentation

Structured  
Genetics Results  
Documentation

Patient outreach  
documentation

Pathology  
Outcomes  
Documentation

Worklist  
Management

## Analytics Systems

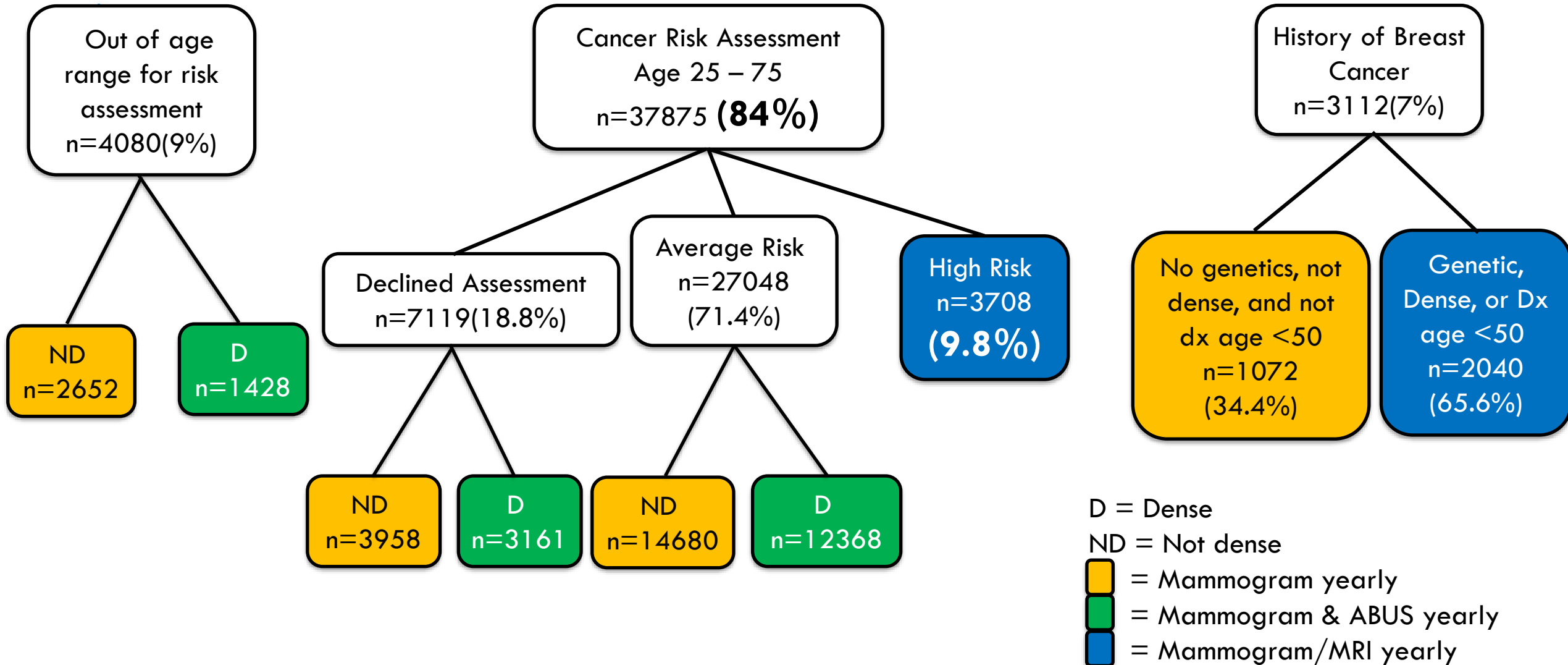
Analytics  
Dashboards

Quality  
Measures  
Analytics

Population  
Analytics

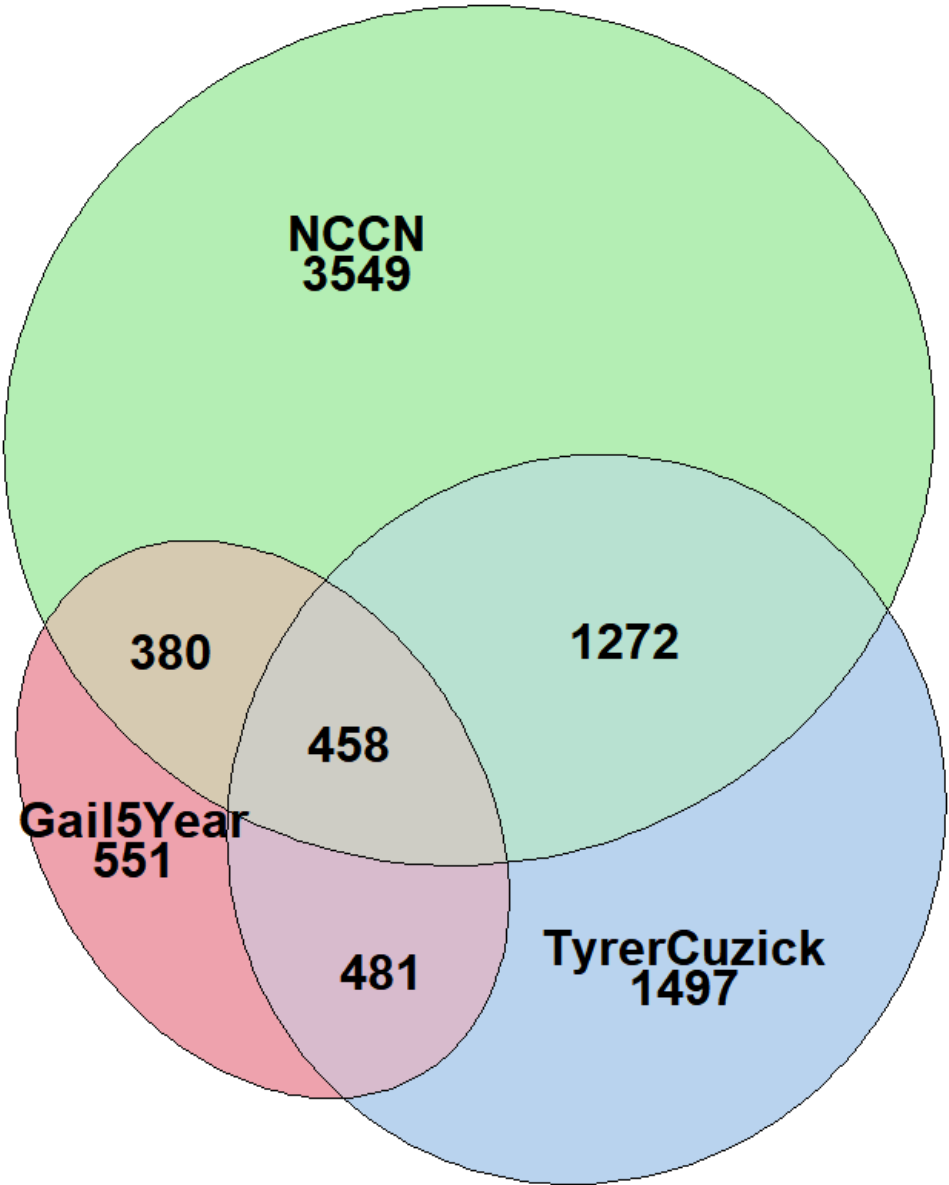
# 50% ELIGIBLE FOR SUPPLEMENTAL SCREENING

(22544 OUT OF 45067 PATIENTS BETWEEN 7/20/2020 - 12/31/2022)



# MANAGEMENT OF HIGH-RISK PATIENT POPULATION

8188 High-risk patients between 07/20/2020 and 12/31/2022



**Recommend referral to genetic counseling**  
(n=5659, 12%)

**Recommend supplemental screening with MRI** (n=3708, 8%)

**Recommend referral to high-risk clinic for consideration of risk reducing endocrine therapy**  
(n=1870, 4%)

# SUMMARY

- Regulation of documentation standards improves dissemination of best practices
- Integrated diagnostics evaluation can be enabled by learning systems implemented in healthcare delivery system
- Our reference implementation of such a system demonstrates the feasibility of this approach for evidence dissemination and evidence generation for cancer screening
- There is still a lot of work to be done, but we have reached the moment when technology and innovation make this approach possible