Mass General Brigham

RSNA 2024
Building Intelligent Connections

Leveraging a Quality and Safety Continuous Process Improvement Framework to Address Disparities in Breast Cancer Screening

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RISE
RADIOLOGY INCLUSION & SYSTEMIC EQUITY

Disclosures: None

Background

Problem

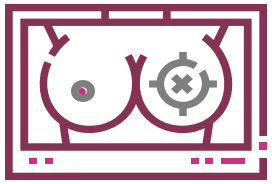
- ***Breast cancer disparities*** disproportionately impact racial and ethnic minorities.
- ***SDoH*** influences up to **80%** of clinical outcomes.[1]
- Early detection with ***screening mammography (SM) can bridge existing gaps***, but high missed appointments (**30-40%**) were seen at two sites serving racial/ethnic minority communities.

Impact

- ***Missed care opportunities*** (MCO), no-shows or same-day cancellations increase the risk of delayed breast cancer diagnoses that may lead to worse outcomes.
- ***MCOs also impact access*** by artificially decreasing capacity.

Leveraging Q&S

- To address the problem, a Q&S ***Continuous Process Improvement (CPI) framework*** was used.
- Ensures a ***systematic, equity-focused, and patient-centered*** approach.
- Allows ***pragmatic testing, refinement, and adjustment*** of interventions in real-time.



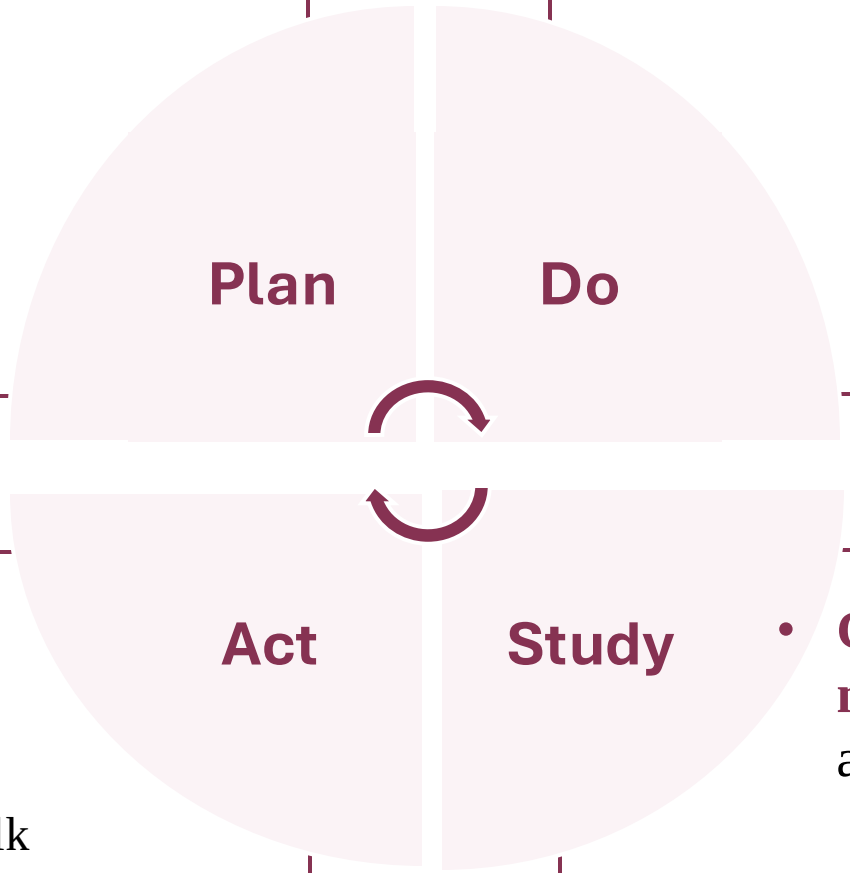
Aim: Use a Continuous Process Improvement Approach to reduce MCOs for SM at these two sites.

[1] Amornsiripanitch N, Jaramillo-Cardoso A, Dean K, Burns A, Goodman T, Moreno-Gobin J, Byrne SC, Neuman ML, Chikarmane S, Flores EJ, Leveraging Quality Improvement Frameworks to Reduce Barriers to Screening Mammography among Underserved Populations, Journal of the American College of Radiology (2022), doi: https://doi.org/10.1016/j.jacr.2022.08.008.

Approach

- **Community-informed** identification of barriers through interviews & analytical tools:
  - Process maps
  - Pareto charts
  - Driver Diagram

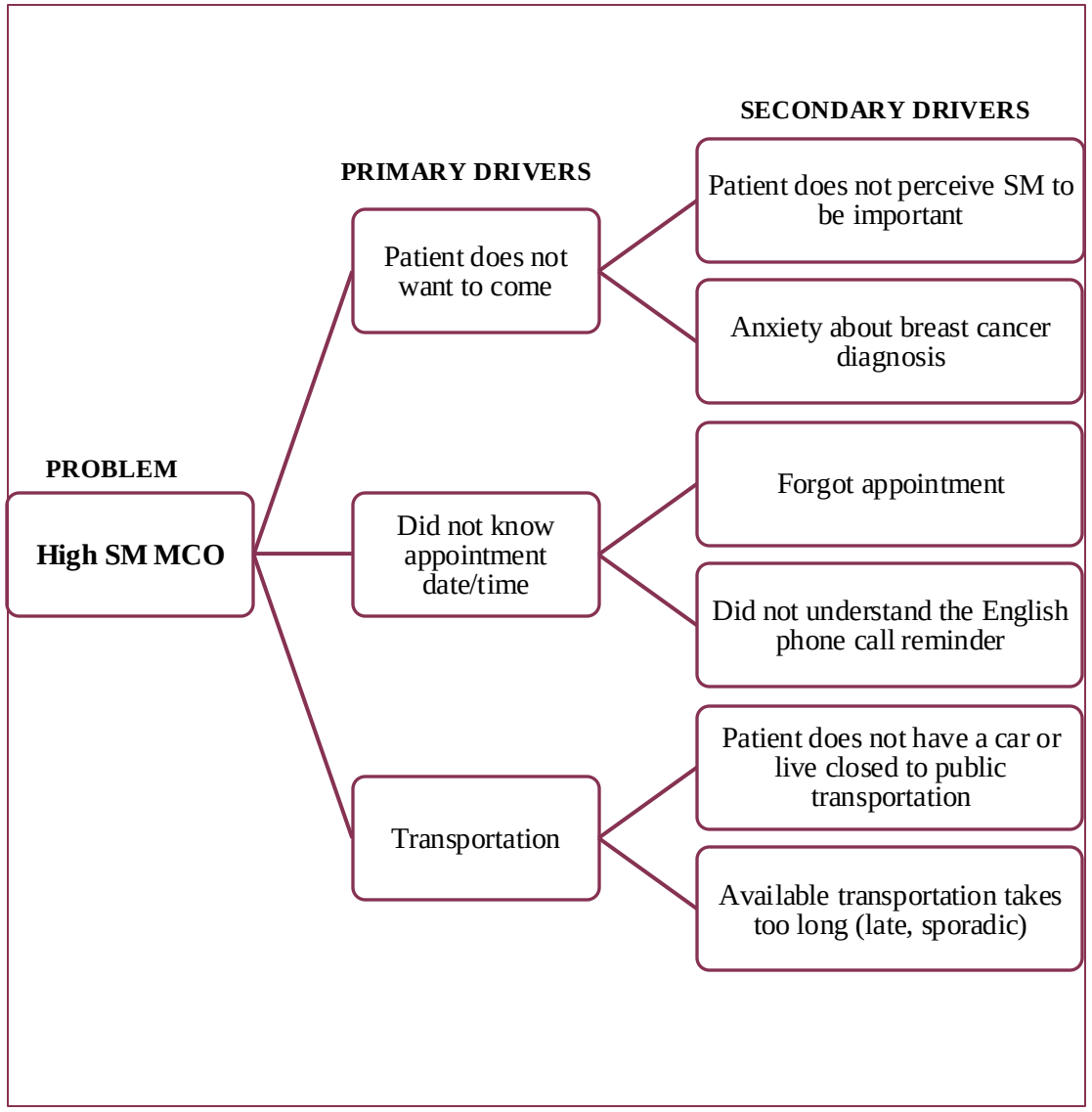
- **Developed & implemented tailored interventions**:
  - EHR cross-walk at sites
  - Culturally/linguistically diverse educational videos
  - Rideshare (Uber Health)
  - SMS reminder



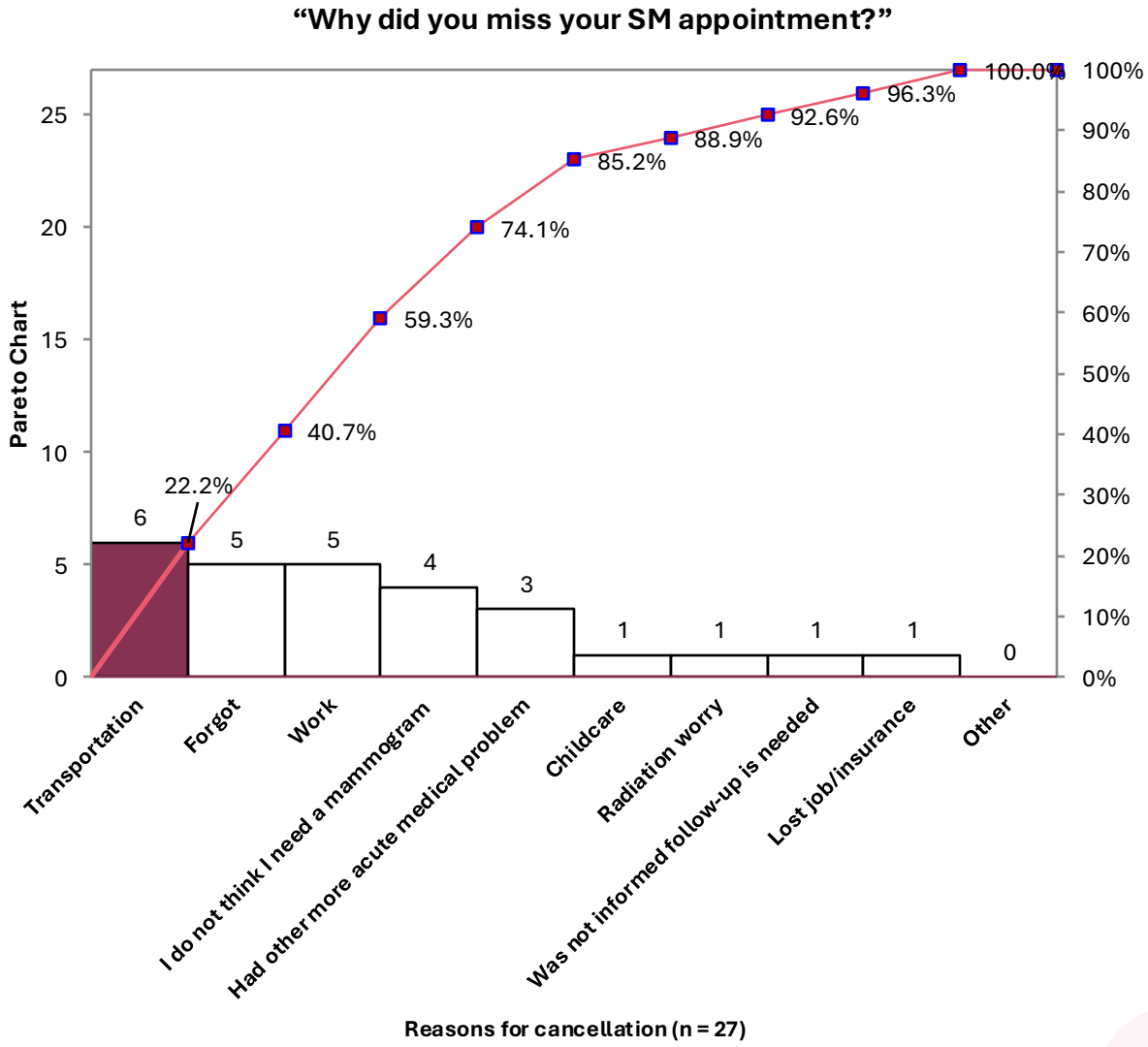
- **Refined interventions through phased PDSA cycles:**
  - **PDSA 1**: EHR cross-walk
  - **PDSA 2**: SMS reminders
  - **PDSA 3**: Educational videos + rideshare

- **Continuous data monitoring and analysis** to assess MCO rates:
  - SPC p-chart for appointment completion/cancellations
  - Patient demographics
  - Digital engagement

Identifying Barriers to SM: Driver Diagram & Pareto Chart



Driver diagram: Key factors contributing to MCO rates.



Pareto chart: Focus on high impact factors

PLAN DO ACT STUDY

Interventions

Multilingual SMS reminders sent 48 hrs prior to appointment (via Housecall Pro)

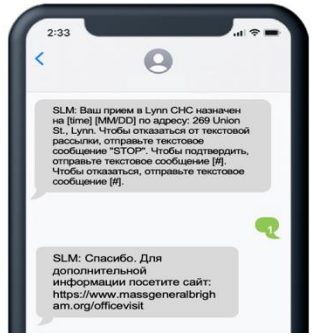
Spanish

Portuguese

Arabic

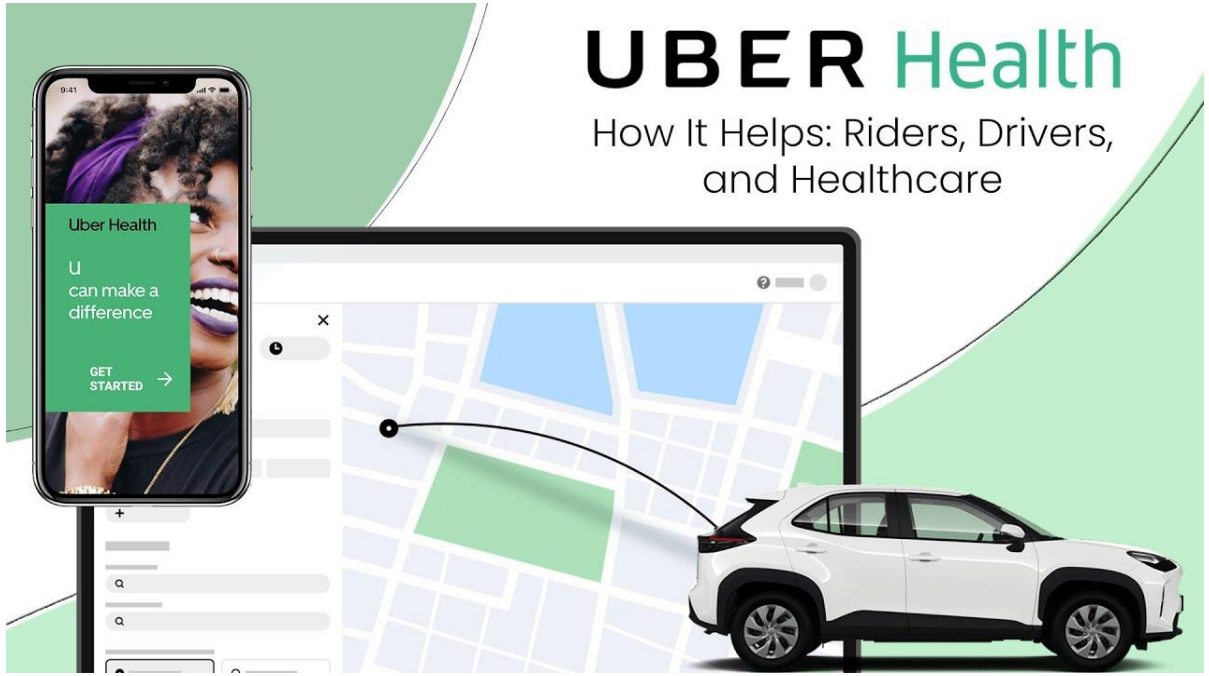
Haitian

Chinese

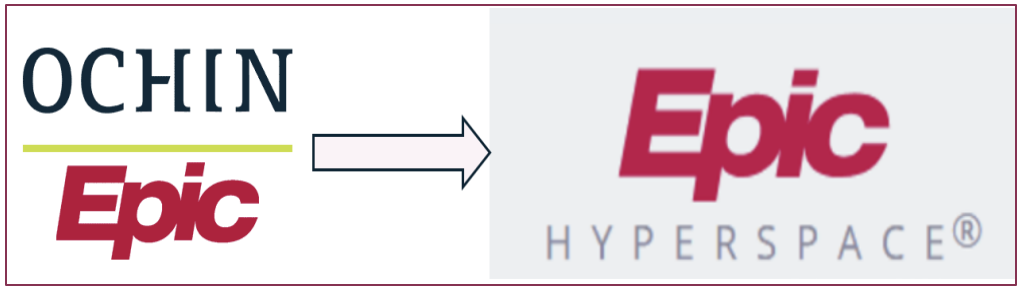


Russian

Rideshare transportation assistance through Uber Health (only DFCI)



Epic Ochin to Epic Hyperspace IT crosswalk

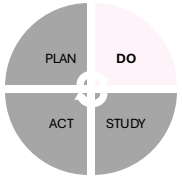


Multilingual 1-minute educational videos via email or PG (Xealth)

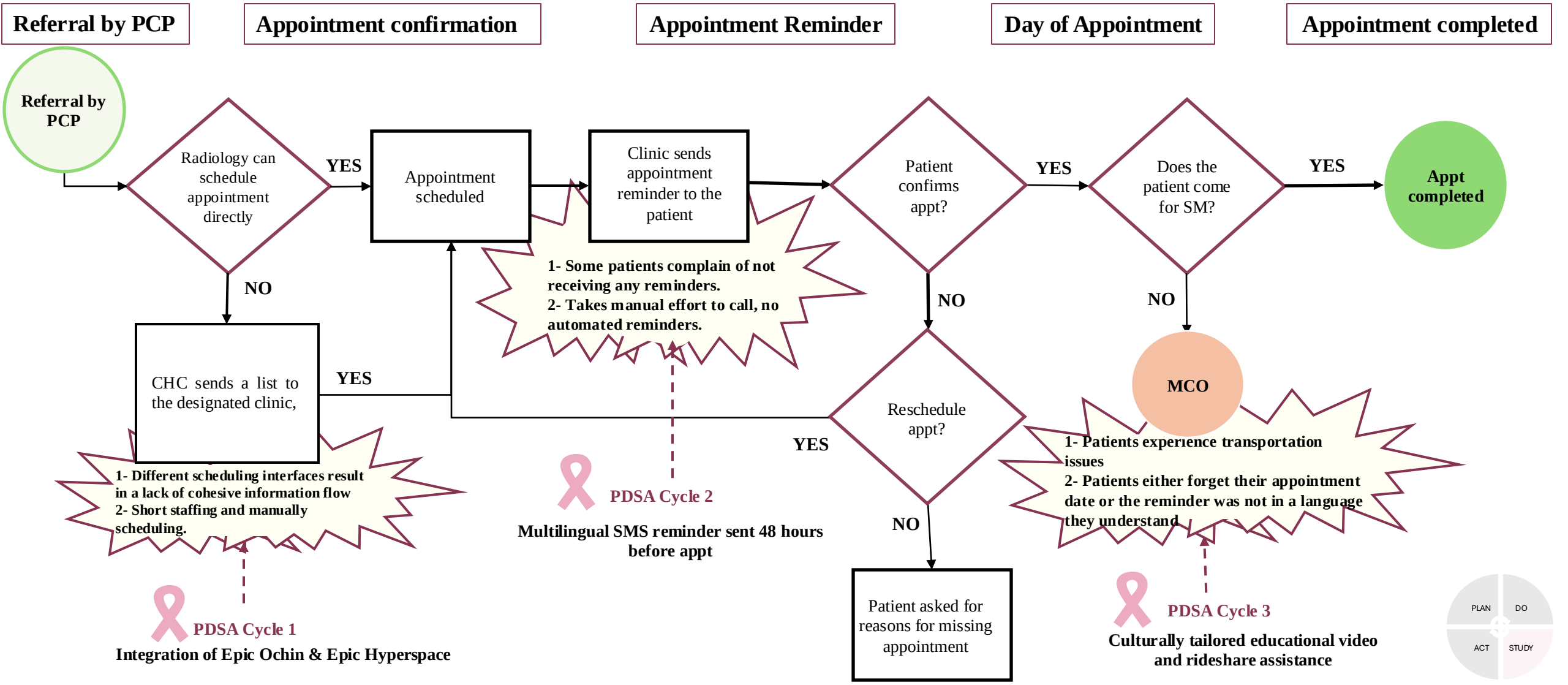
English

Spanish

Portuguese



Process Map – Mapping out our interventions



Data Collection and Evaluation

Data Metrics

- MCO rates, SMS Engagement, SM appointment status and Patient Demographics
- Educational video views
- Rideshare assistance data

Data Sources

- **Epic/EDW**: Patient demographics
  HouseCall Pro: SMS reminder engagement
- **Patient Gateway/Xealth**: Tracked video engagement (views, clicks)
- **Uber Health**: Monitored rideshare usage (single/round trips completed)

Data Evaluation

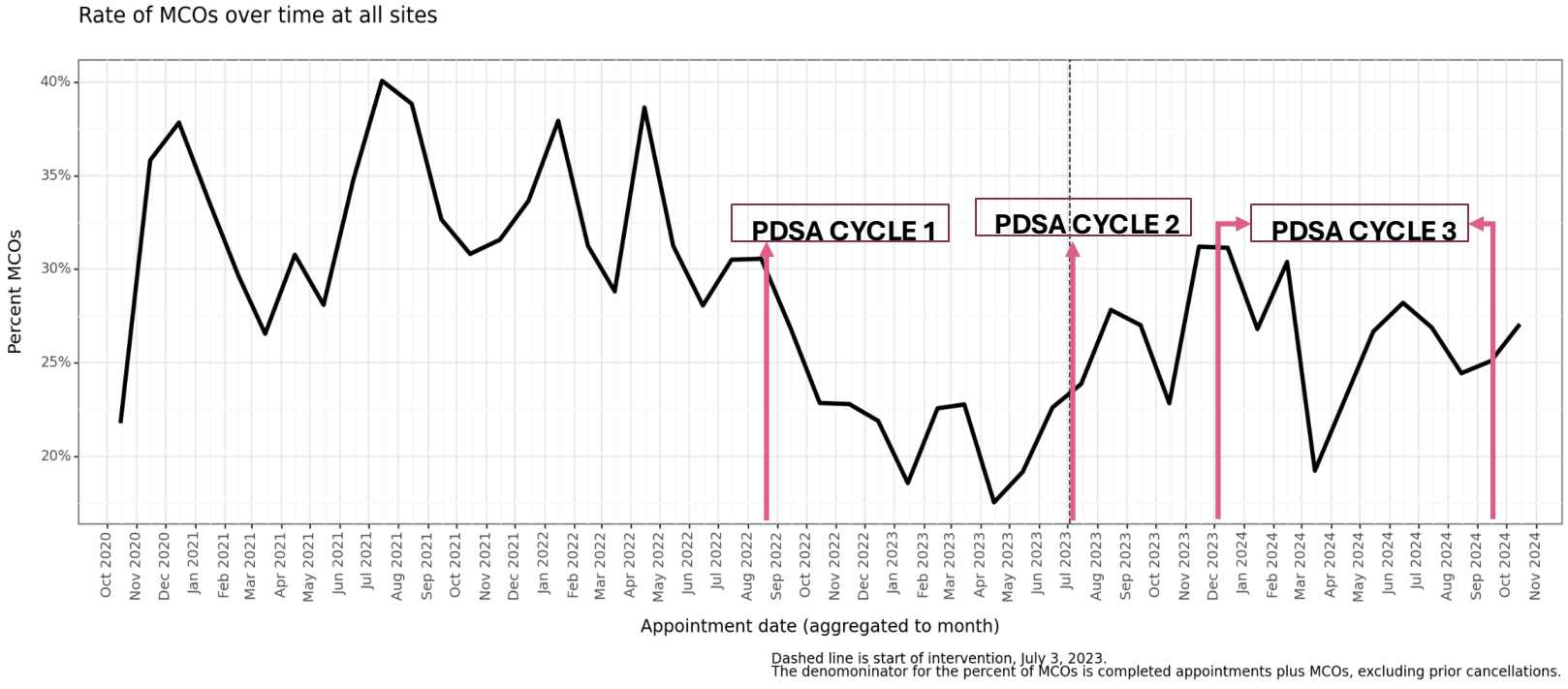
- **Primary Outcome**: MCO rates before and after each intervention
  Secondary Outcome: Factors associated with SMS engagement
- **Secondary Outcome:** Click through rate, views per patient
- **Secondary Outcome**: Cost per ride, number of rides/patients

Data Monitoring

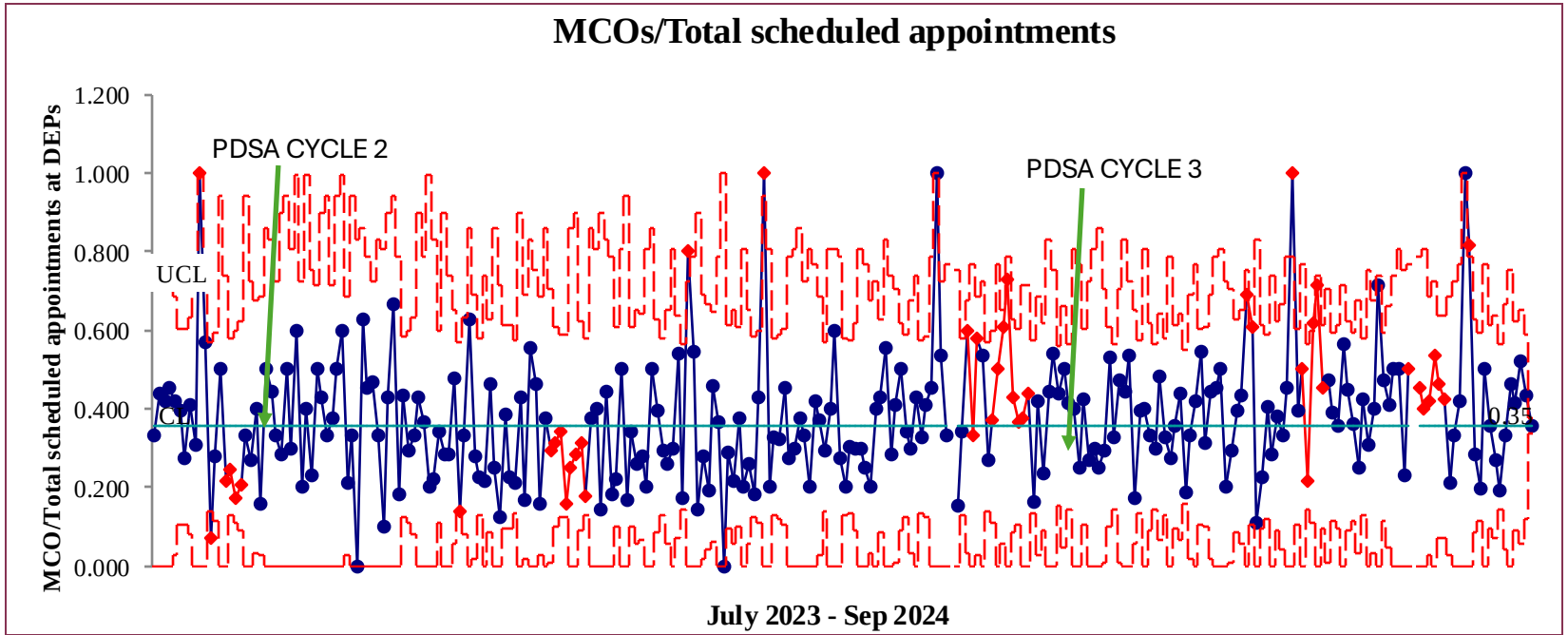
PDSA Cycle 1 2021-22

PDSA Cycle 2 (2022-23)

PDSA Cycle 3 (2023–24)



The average MCO rate is 2.5% points lower after implementing SMS reminders.



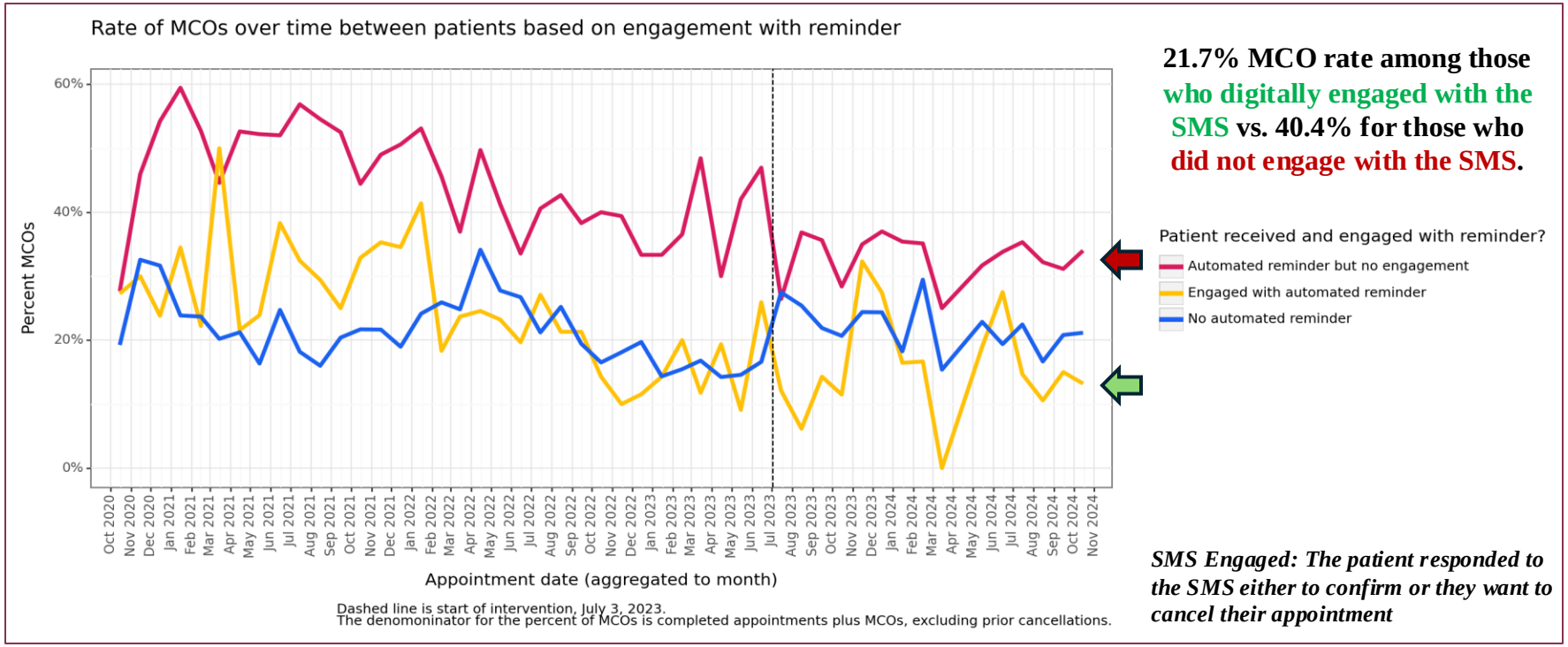
SPC p-chart showing the proportion of MCOs over total scheduled appointments

Results:

Logistic regression analyses showed:

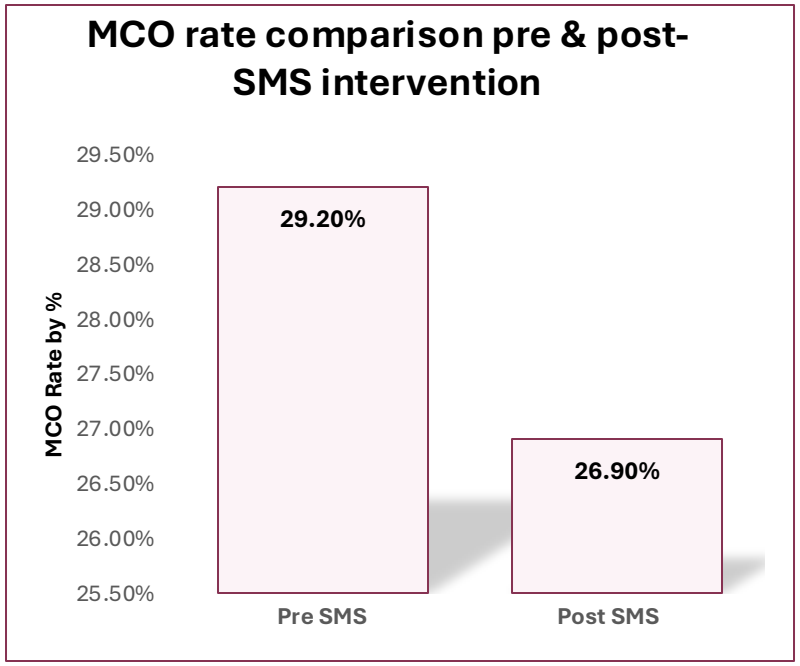
- **Factors associated with MCOs:**
  - Higher likelihood among patients: Not married (OR=1.09), not completed their E-check in (OR=2.84).
  - Less likelihood among patients: Part-time (OR = 0.85) or unknown employment (OR = 0.81), need an interpreter (OR = 0.75), Medicare (OR = 0.76), graduated college (OR = 0.85).

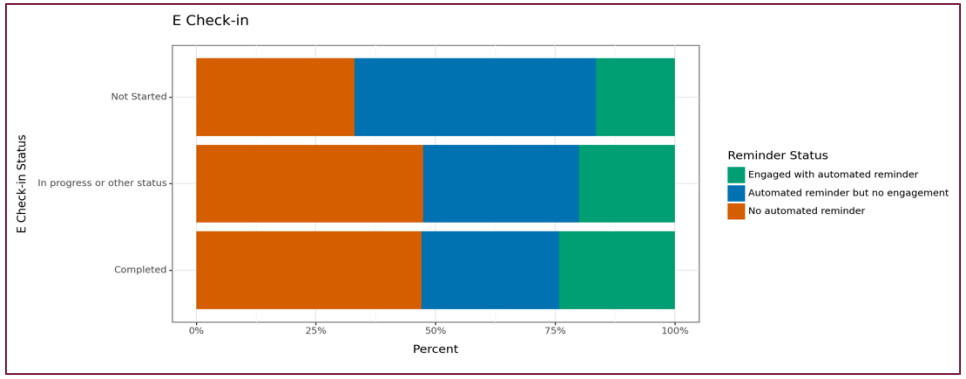
- **Factors associated with SMS engagement:**
  - Higher likelihood among patients: Higher education (OR = 1.68), older patients (OR = 1.01).
  - Less likelihood among patients: Not started e-check in (OR = 0.56), Non-Hispanic (OR = 0.76), not English primary language (0.67), higher number of no-shows/MCOs (OR = 0.94).

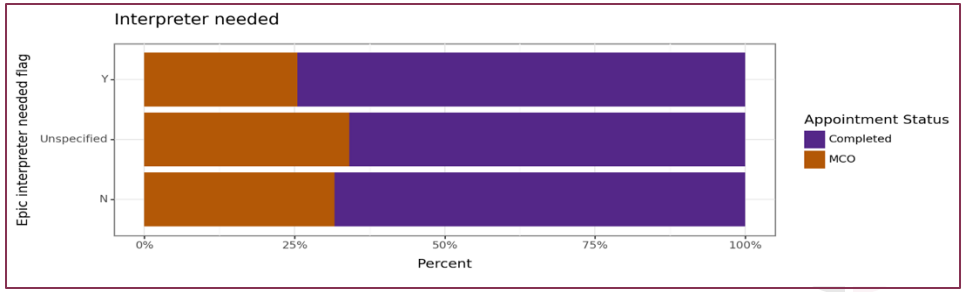


21.7% MCO rate among those who digitally engaged with the SMS vs. 40.4% for those who did not engage with the SMS.

SMS Engaged: The patient responded to the SMS either to confirm or they want to cancel their appointment







Discussion & Future Steps

Impact: Multilevel intervention implemented using a Continuous Process Improvement (CPI) approach reduced SM MCOs.

Beyond the numbers: Culturally tailored, patient-centerd solutions empower patients to actively take control of their health.

Scalability: The QS-CPI framework allows continuous pragmatic refinement and adjustment scaling to meet our patient needs and expand with relatively low impact with operations.

Thank you for your time!

Questions? pdhar@mgh.harvard.edu