



Patient Segmentation and Disparities Measurement

Bristol-Myers Squibb Foundation Grantee Summit
Andrea Tull, PhD

Agenda

Case study of analytic process for exploring disparities in quality measures

- Background on MGH & health equity work
- Challenges of working with administrative data
- Analytic approach to measuring and eliminating disparities
- Communicating results and engaging clinicians in improvement
- Ongoing measuring/monitoring

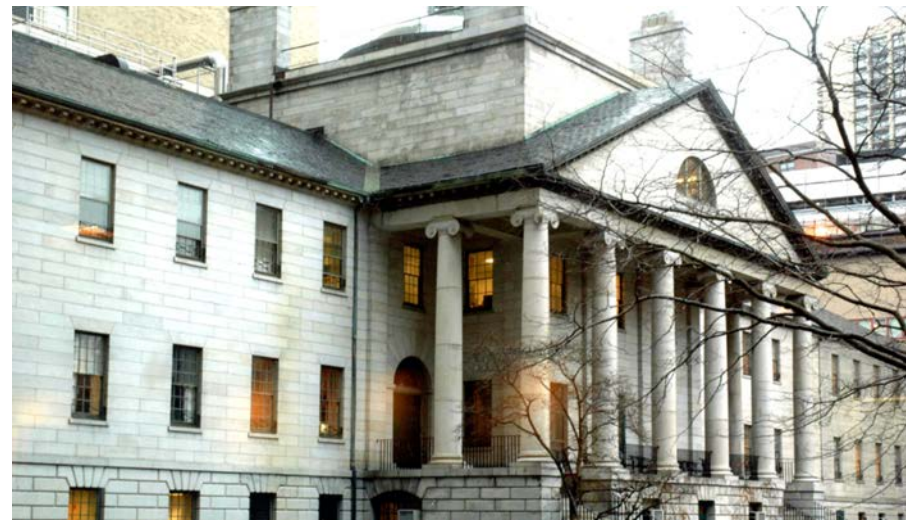


Background on MGH & Health Equity Work

Massachusetts General Hospital

Founded 1811

- Large, complex academic medical center
 - 48,000 inpatient admissions
 - 2M outpatient visits
 - 100,000 emergency room visits
- 1,046 licensed beds
- 25 satellite locations in metro-Boston
- ~30,000 employees - *largest private employer in Boston*
- \$900M in research funding



Mass General Lawrence Center for Quality & Safety

Overview of core competencies and goals

- Established in 2007
- Employs a multidisciplinary team of physicians, nurses, analysts, researchers, consultants and informatics professionals
- Serves as an institution-wide resource

Areas of Expertise

Clinical
Compliance

Patient Safety

Research &
Education

Quality
Management

Patient
Experience

Process
Improvement

Informatics

Analytics and
Reporting



**THE DISPARITIES
SOLUTIONS CENTER**

One Goal - High Quality Care for All

Background and Mission

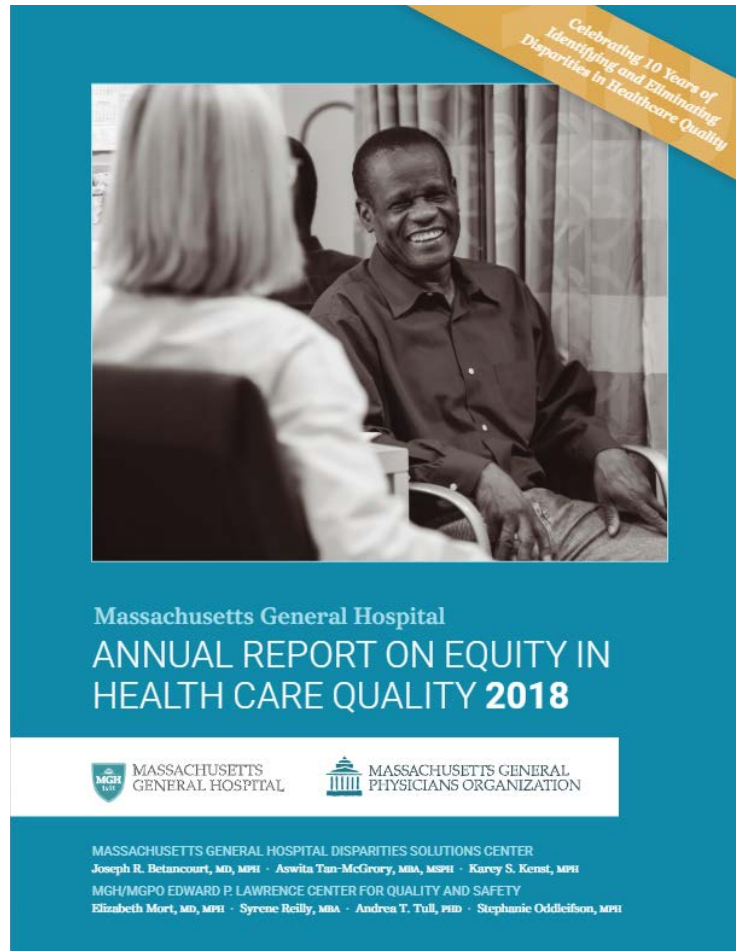
Established 2005

The Disparities Solutions Center is dedicated to developing and implementing strategies to improve quality, eliminate racial and ethnic disparities, and achieve equity in health care. We aim to serve as a local, regional, and national change agent by:

- Translating existing and ongoing research on strategies to eliminate disparities and achieve equity into policy and practice,
- Developing solutions to improve quality and address disparities,
- Providing education and leadership training to expand the community of skilled individuals dedicated to improving quality and achieving equity.

Annual Report on Equity In Health Care Quality

DSC/Lawrence Center collaboration since 2006



Disparities Solutions Center

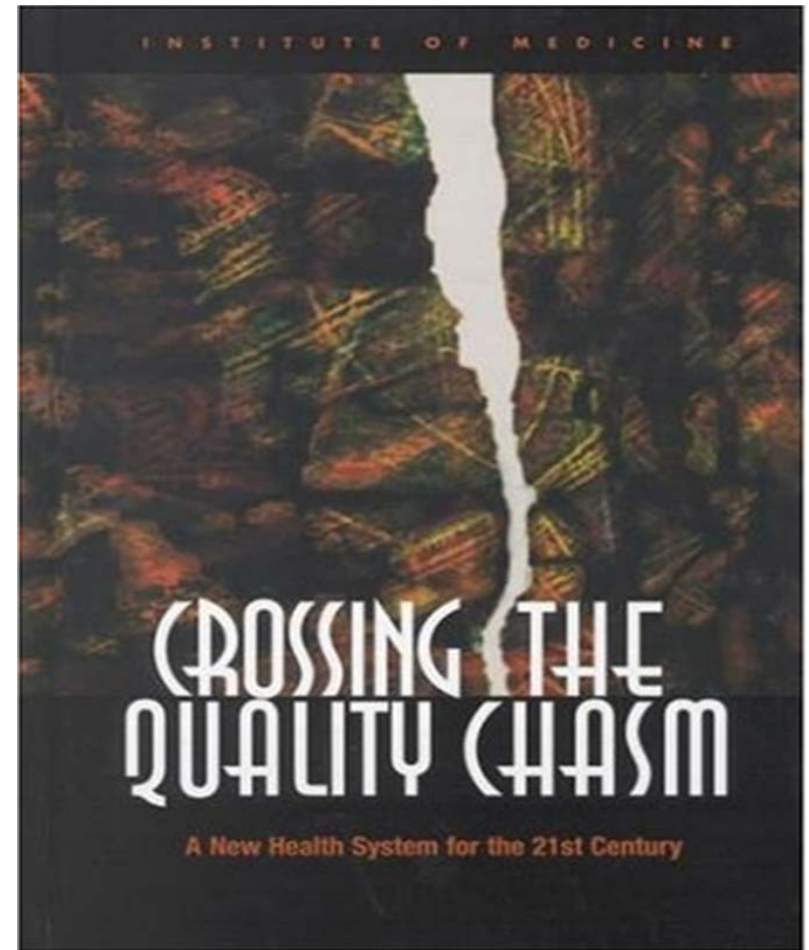
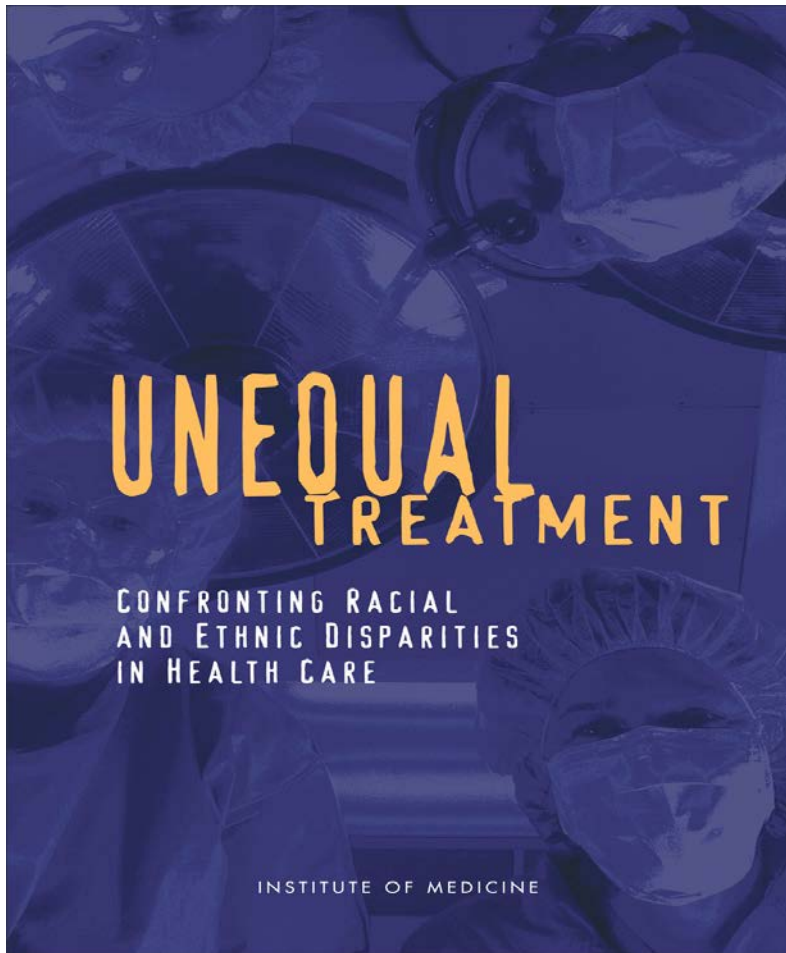
Joseph R. Betancourt, MD, MPS
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Edward P. Lawrence Center for Quality & Safety

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Racial and Ethnic Disparities in Health Care

Groundbreaking IOM reports



The Edward P. Lawrence
Center for Quality & Safety

 MASSACHUSETTS
GENERAL HOSPITAL

 MASSACHUSETTS GENERAL
PHYSICIANS ORGANIZATION

What are disparities?

Gaps in quality of health and health care due to differences in race, ethnicity, socioeconomic status, sexual orientation, gender identity, and/or ability

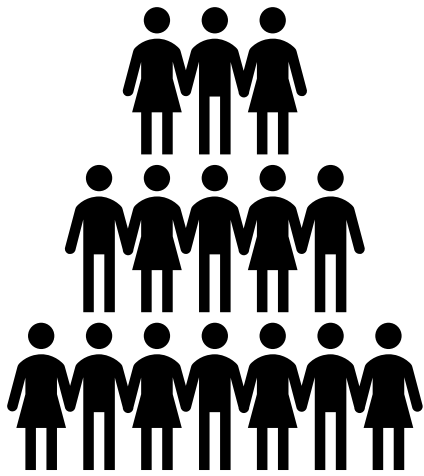
Examples of Racial & Ethnic Disparities in Health Care:

- African Americans and Latinos receiving less pain medication than Whites for long bone fractures in the Emergency Department and for cancer pain on the floors
- African Americans with end-stage renal disease being referred less to the transplant list than Whites
- African Americans being referred less than Whites for cardiac catheterization and bypass grafting

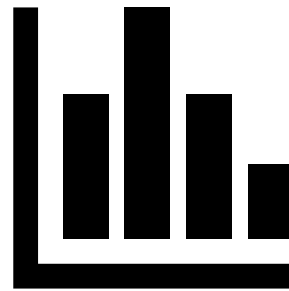
Goals of Annual Report on Equity in Health Care Quality

What are we trying to accomplish?

1. Seek out **evidence of unequal treatment** in the processes and outcomes of care
 - Stratification of quality measures by race, ethnicity and language
 - Other factors: gender, sexual orientation, age, payer/SES
2. Achieving **uniform high quality**
 - When disparities are identified, initiating improvement strategies to reach uniform high quality



- Solid analytic foundation
- Clinical partnership
- Leadership buy-in



**Required elements
for this work**

Working with Administrative Data

Data Collection: gaps in race/ethnicity data

Collection of REaL data

- Incomplete/inaccurate demographic data
 - Limitations of database structure
 - Unwillingness of patients to report
 - Training issues with registration staff collecting demographic information
- Changing perceptions about race/ethnicity

OMB Budget Categories

Race:

- American Indian or Alaska Native
- Asian
- Black or African American
- Native Hawaiian or Other Pacific Islander
- White

Ancestry.com
Online genealogy company



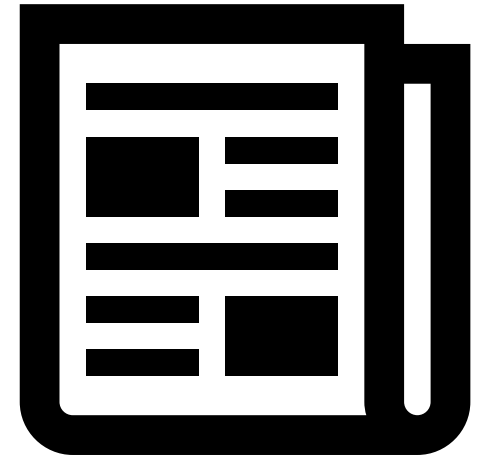
Ethnicity:

- Hispanic or Latino
- Not Hispanic or Latino



Data Collection: challenges with language

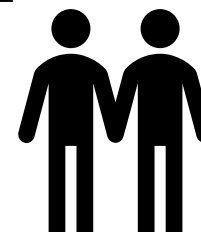
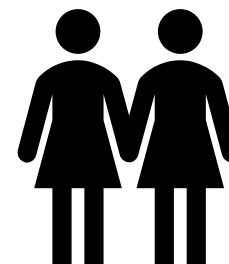
- Primary language
- Language spoken at home
- Preferred language
- Written vs. spoken language
- Is an interpreter needed?





Other demographic stratification variables

- Age
- Sex & Gender Identification
- Sexual Orientation
- Disability Status
- Veteran Status
- Zip code



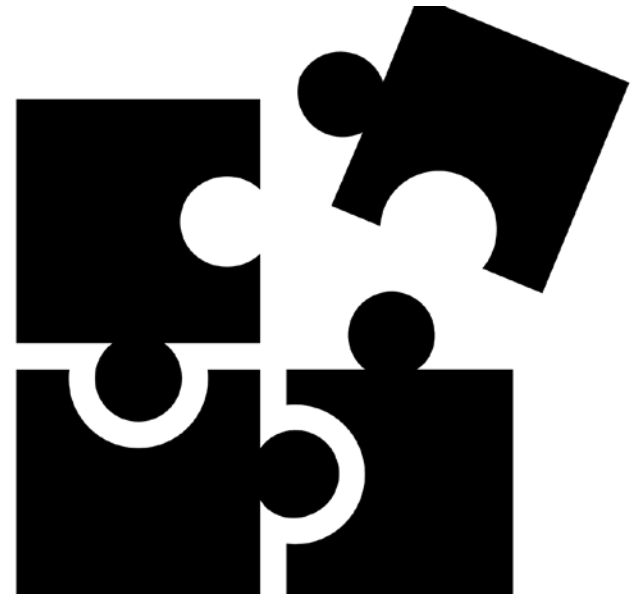
What we can't directly measure matters



Procurement/Data File Setup

Plan to spend 80% of your time here!

- Merging data from multiple sources
- Reconciling differences between datasets
- Exploring data for completeness, cleaning data



Challenges of Measuring Quality & Safety

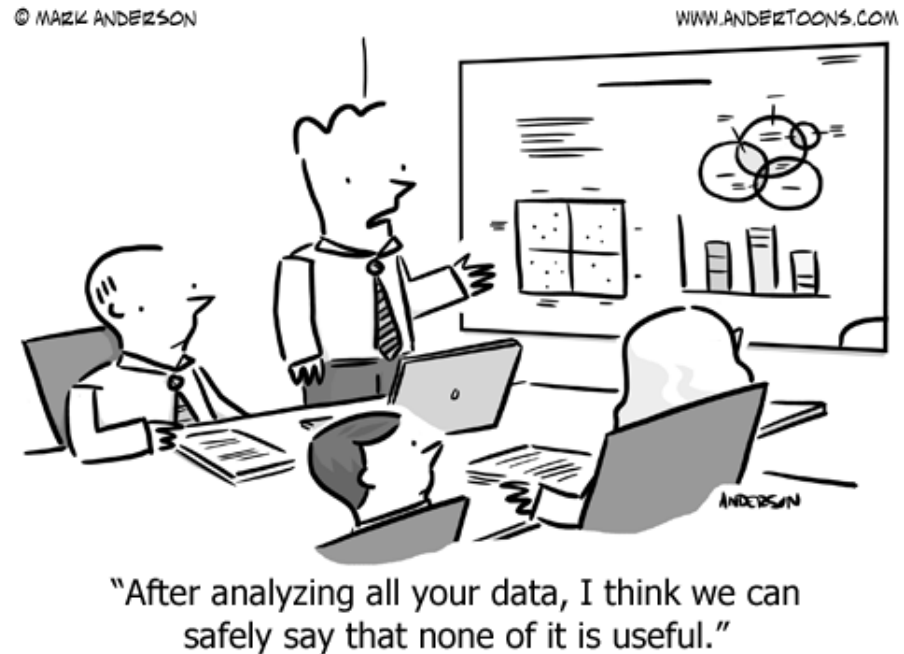


Leverage your “measure pantry”

- Start with “off the shelf” measures
- Tread carefully with measure development

Common challenges with Q&S measurement

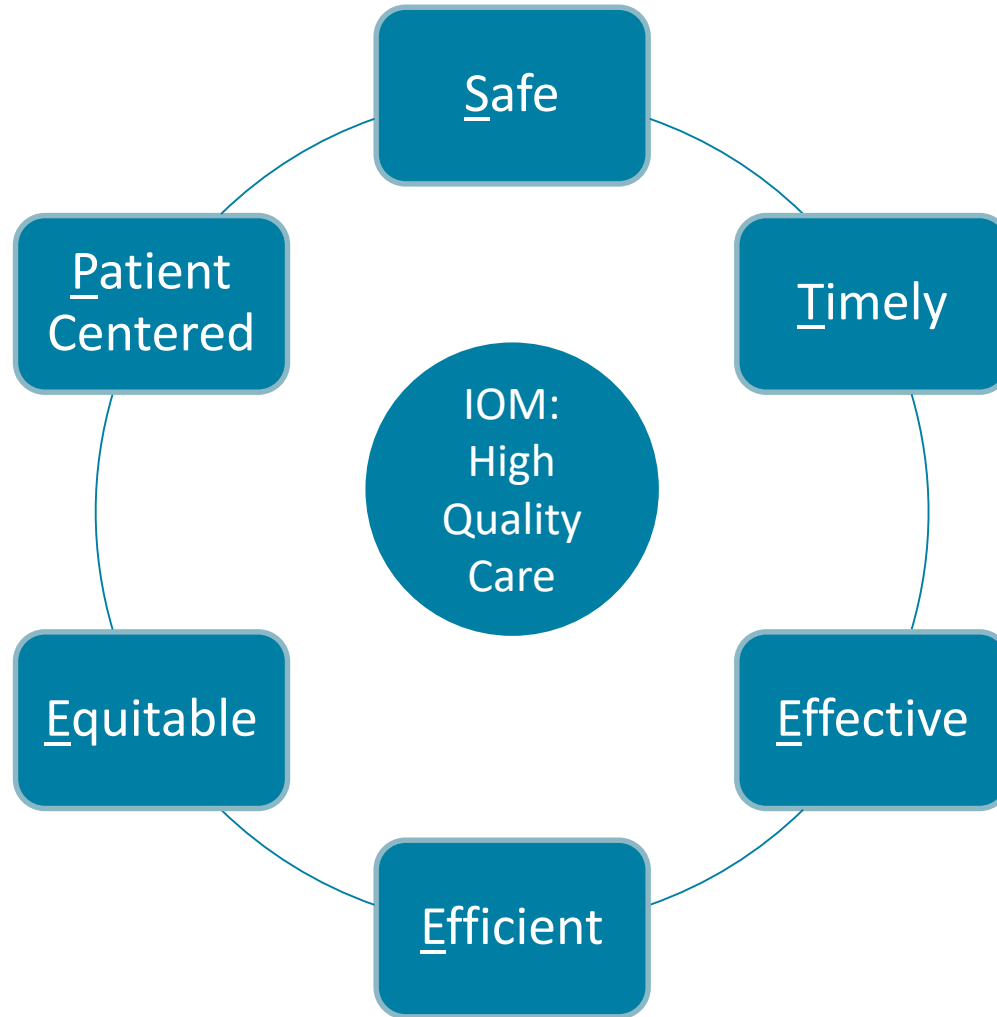
- Data lag
 - Patient experience, readmission, registry outcomes
- Small N/rare events
 - Safety events, patient safety indicators, hospital acquired conditions
- Rapidly changing measures
 - Measures being added or retired



Where to begin?

- Step 1: have a framework

National Academy of Medicine
STEEEP Framework

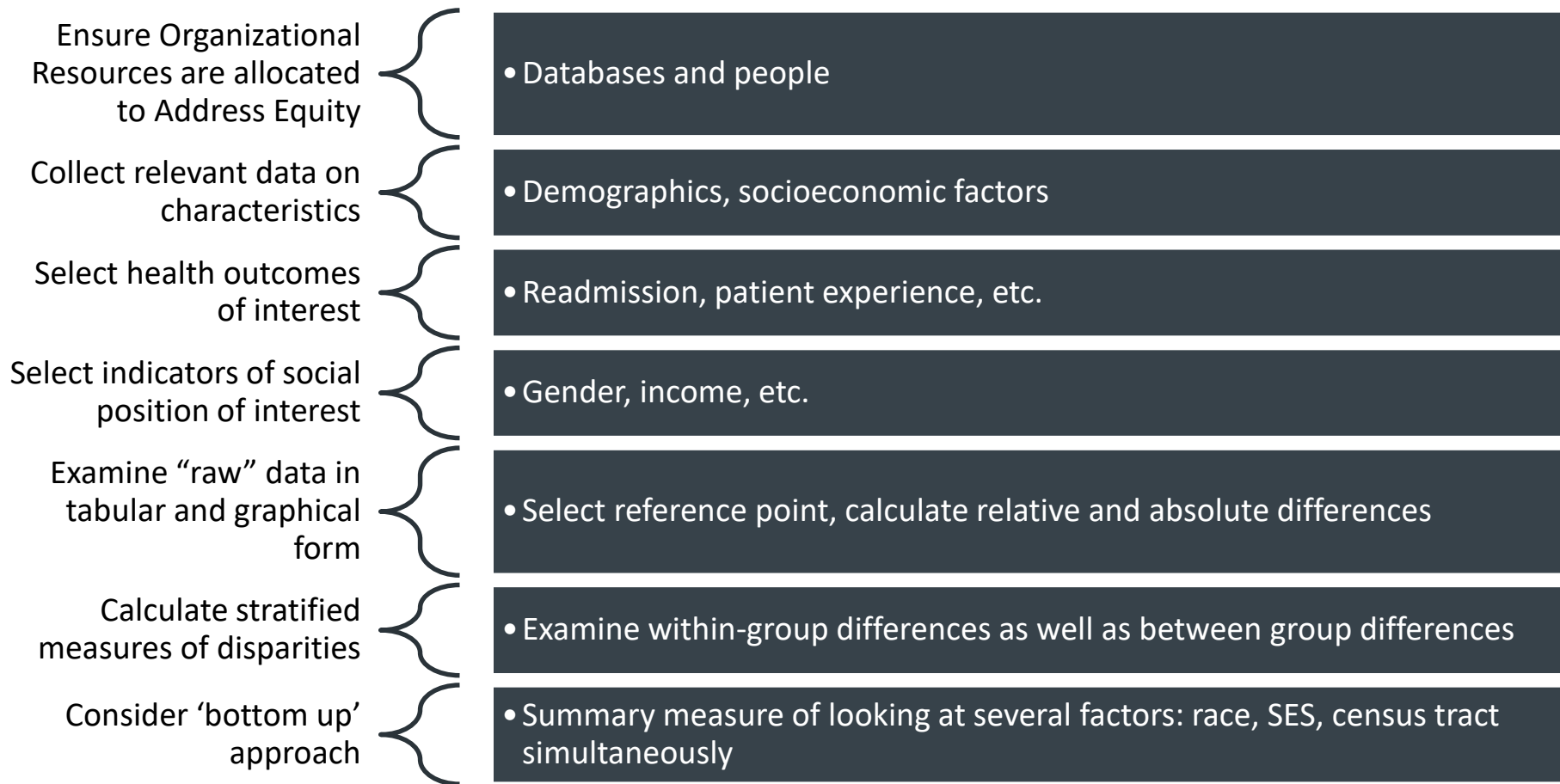


Additional lenses for assessing measures

- Look for **evidence of disparities in the literature**
- Select measures with **ample sample size** that are suited for stratification
- Choose measures where you can **mobilize for improvement**
 - Eliminating disparities is a lever to achieve **uniform high quality**
 - Remember: you have a **fiduciary responsibility** to improve any disparities you find

IHI framework for measuring disparities

From IHI white paper: Achieving Health Equity



Analytic Approach to Equity Work

Analyzing disparities is like being a detective

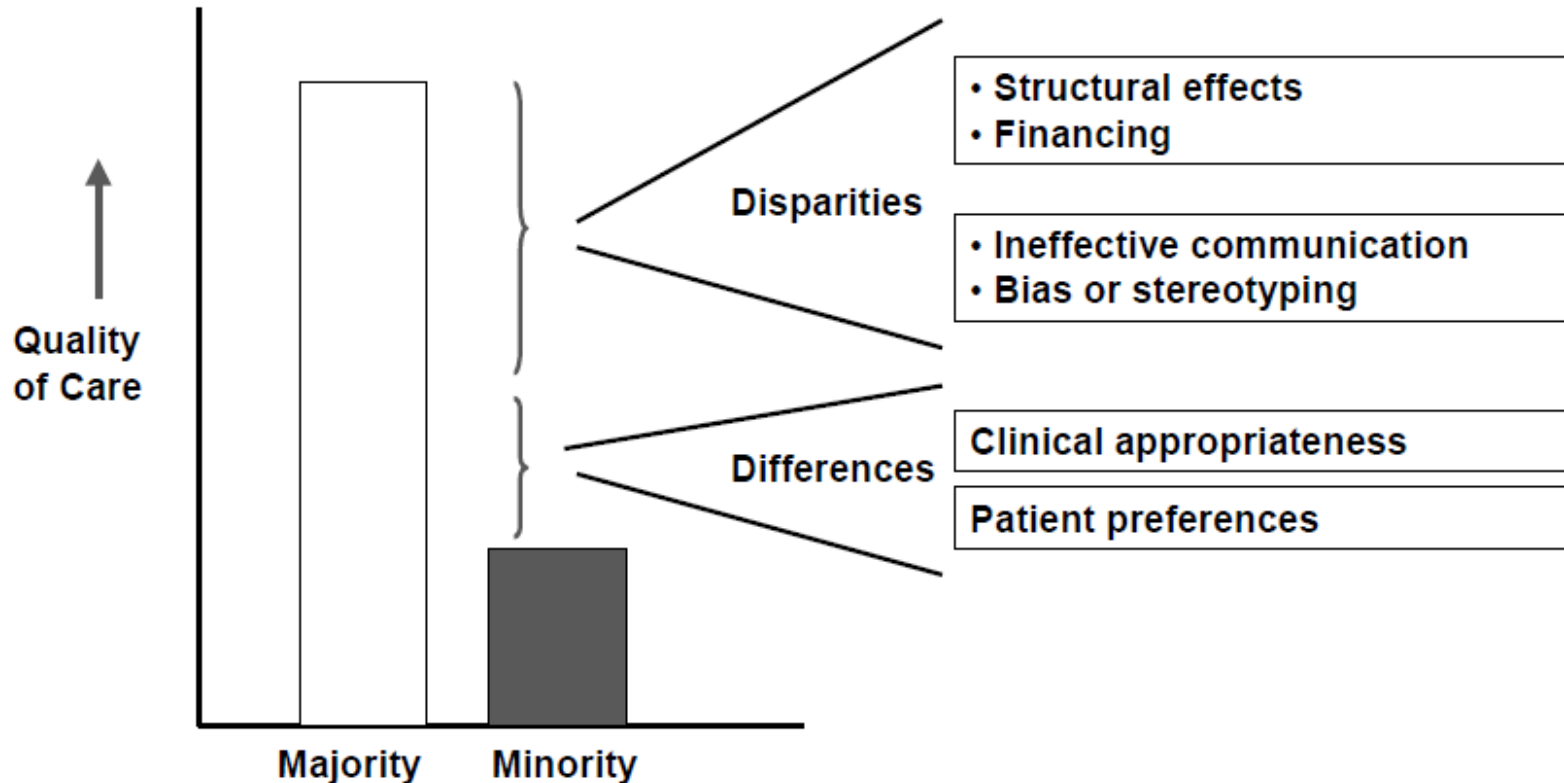
First step is to seek out disparities

- Crosstab performance by demographic characteristic of interest
- Is it statistically significant?
- Is it clinically significant?
- Is it a true disparity?



Conceptualizing Health Care Disparities

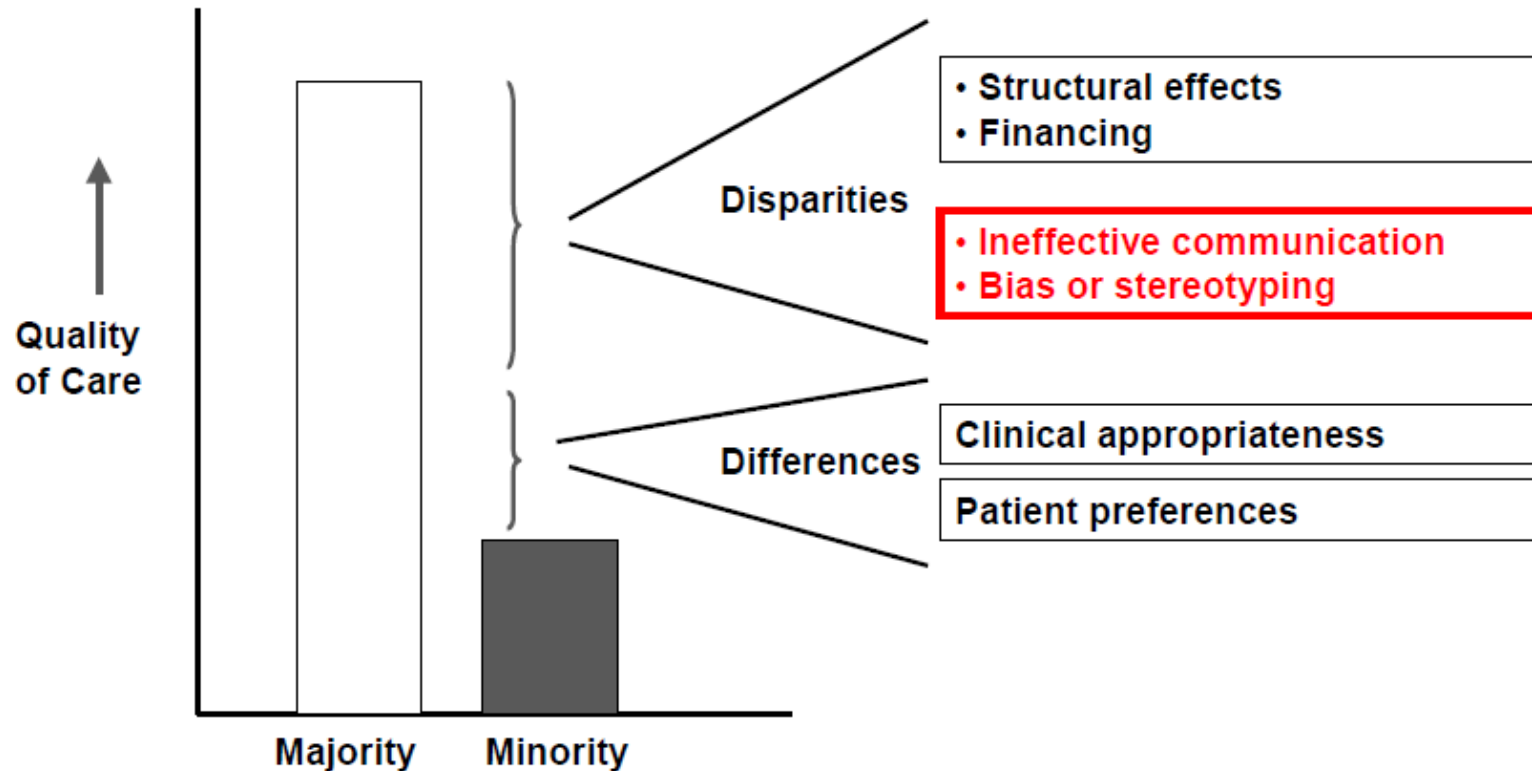
Difference vs. disparity; adopted from IOM Unequal Treatment, 2001



Adapted from IOM, Unequal Treatment 2001

Conceptualizing Health Care Disparities

Difference vs. disparity; adopted from IOM Unequal Treatment, 2001



Adapted from IOM, Unequal Treatment 2001

Exercise: How would you interpret these findings?

Assume these are statistically and clinically significant differences

Breast Cancer Screening		
White	Black	Hispanic
94%	80%	83%

HIV Screening		
White	Black	Hispanic
51%	85%	81%

- What follow up questions would you ask?
- What additional data do you need? Where would you look?
- How would you characterize these findings?

Think about all the tools in your toolbox

More data analysis isn't always the answer

- Literature review
- Chart review
- Patient interviews/focus groups
- Leverage patient advisory committees
- Surveys



Stratification only tells you there is a potential problem...it doesn't tell you how to fix it!

Some examples from Mass General AREHQ

Methods for analyzing and displaying data on disparities

- Readmissions analysis (bivariate and multivariate)
- Patient Experience Care Transitions (deeper descriptive analysis and surveys, interpreter services interventions)
- GBS Prophylaxis (chart review and clinician interventions)
- Future directions: mapping of clinical process of care measures

Stratification Approach and Process

Example 1: analysis of MGH readmissions by race and language

Phase 1 Analysis:

- Comparison of readmission rates by race and language to test for disparities

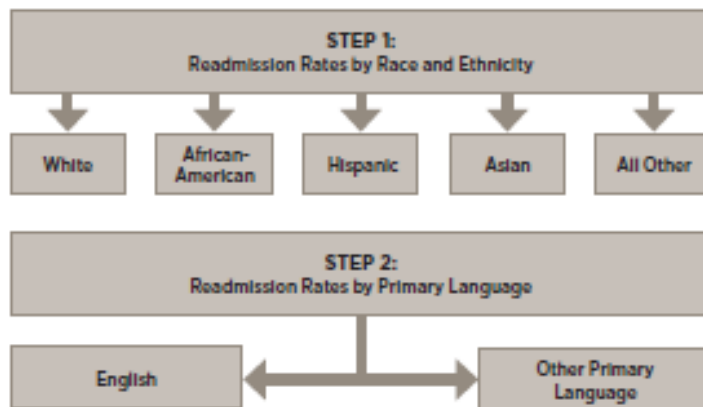
Phase 2 Analysis:

- Multivariate model building to test if race/ethnicity are independent predictors of readmission

Phase 3 Analysis:

- Further stratification by condition & procedure
- Continued monitoring

Data Analysis Process



Phase 1: Descriptive Evaluation of Readmission Rate

Crosstab by Race/Ethnicity and Language

- Did not see higher readmission rates among African American, Hispanic, Asian or patients of 'Other' races

White	African American	Hispanic	Asian	Other
12.6%	12.8%	10.8%	10.0%	8.9%

- Did not see higher readmission rates by primary language overall

English as Primary Language	Other Primary Language
12.8%	11.4%

Phase 1: Further Bivariate Stratification

Additional sociodemographic factors, stratified by language

Readmission Rates by Primary Language: October 2012–September 2014*

Readmission Rates	Primary Language			
	English		Other	
	N	%	N	%
Total				
All Patients	126,759	12.3%	12,807	11.4%
Gender				
Male	62,026	13.3%	5,435	13.7%
Female	64,733	11.2%	7,372	9.6%
Age				
Age 0–17	6,160	8.9%	1,248	7.5%
Age 18–64	72,411	11.4%	7,224	9.2%
Age 65+	48,188	13.9%	4,335	16.1%
Race				
White	105,514	12.6%	3,207	13.1%
Black	6,862	13.0%	870	11.0%
Hispanic	4,471	10.4%	5,147	11.1%
Asian	3,657	8.7%	1,518	13.2%
Other/Unknown	6,255	9.1%	2,065	8.3%
Primary Payer				
Commercial (HMO)	17,102	9.9%	604	7.3%
Commercial (PPO)	25,433	9.4%	918	6.4%
Medicaid	15,551	13.4%	5,173	9.6%
Medicare	53,012	14.9%	3,754	15.9%
Other	15,661	9.5%	2358	10.9%
Discharge Status				
Home/Self	69,866	9.7%	7,512	8.3%
Home Health Service	32,858	15.4%	3,159	15.3%
Skilled Nursing Facility	23,883	15.5%	2,121	16.4%
Other/Unknown	152	7.9%	15	6.7%

* Comparison of LEP rate to English speaking rate is statistically significant at $P < 0.05$ using CHI Square test. Scores for LEP patients that exhibit a statistically significant difference are in **bold italics**.

- Further stratification of readmission rates by sociodemographic factors such as age, gender, and other factors revealed the following patterns of interest:
- Readmission rates were higher for patients with other primary language age 65 or older compared with their English-speaking counterparts (16.1% vs. 13.9%).
- Asian patients with other primary language had a readmission rate of 13.2%, compared with 8.7% for Asians with English as their primary language.

So...now what???

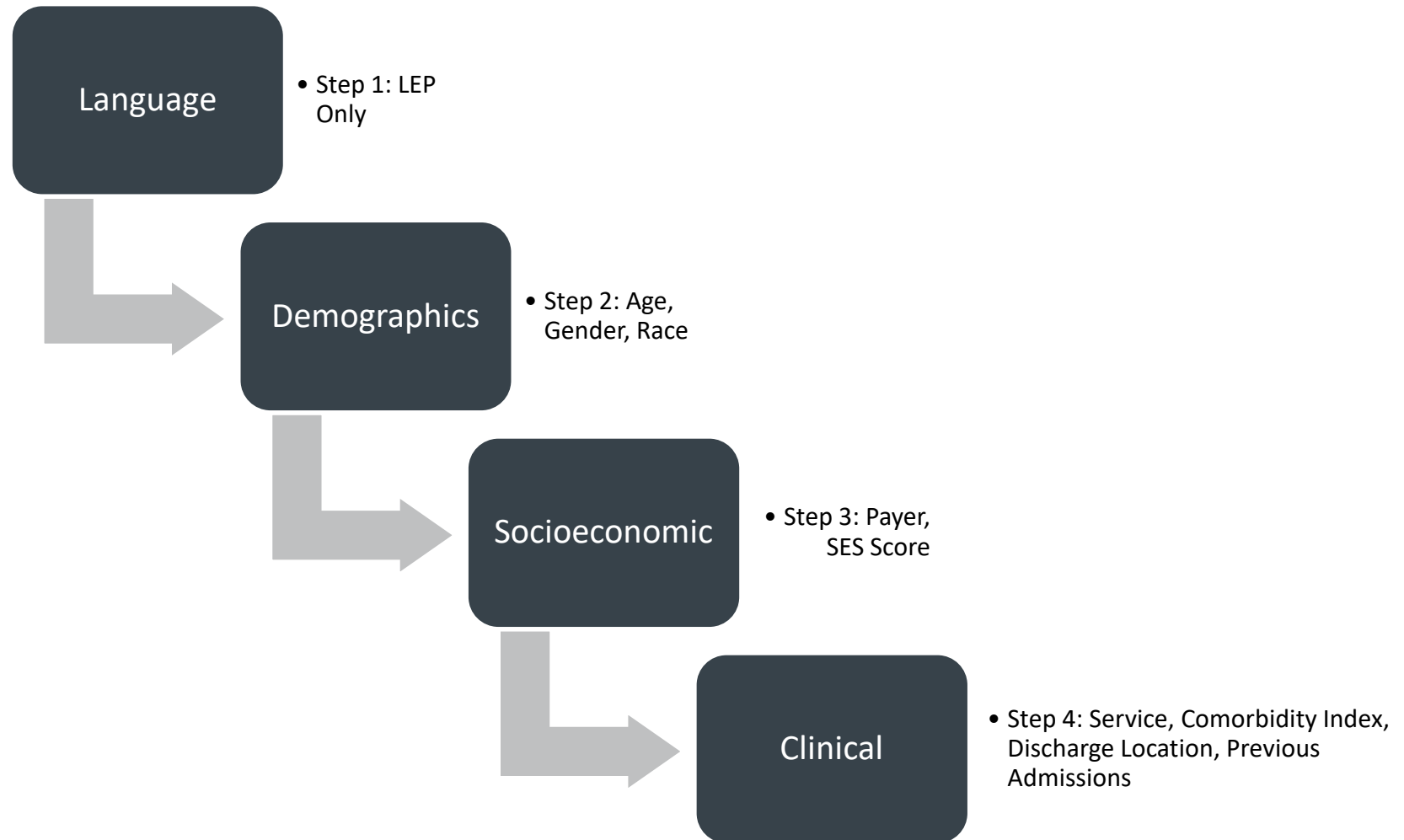
Unexpected results in bivariate analysis led to more questions

- What about SES?
- What about clinical factors?
- How do all of these patient characteristics interact to influence readmission?

- Next step: multivariate analysis

Phase II: Multivariate Model Building

Built model in a stepwise fashion to see impact of each group of characteristics



Regression Model Results

Multivariate analysis suggests race, language not significant independent predictors of readmission

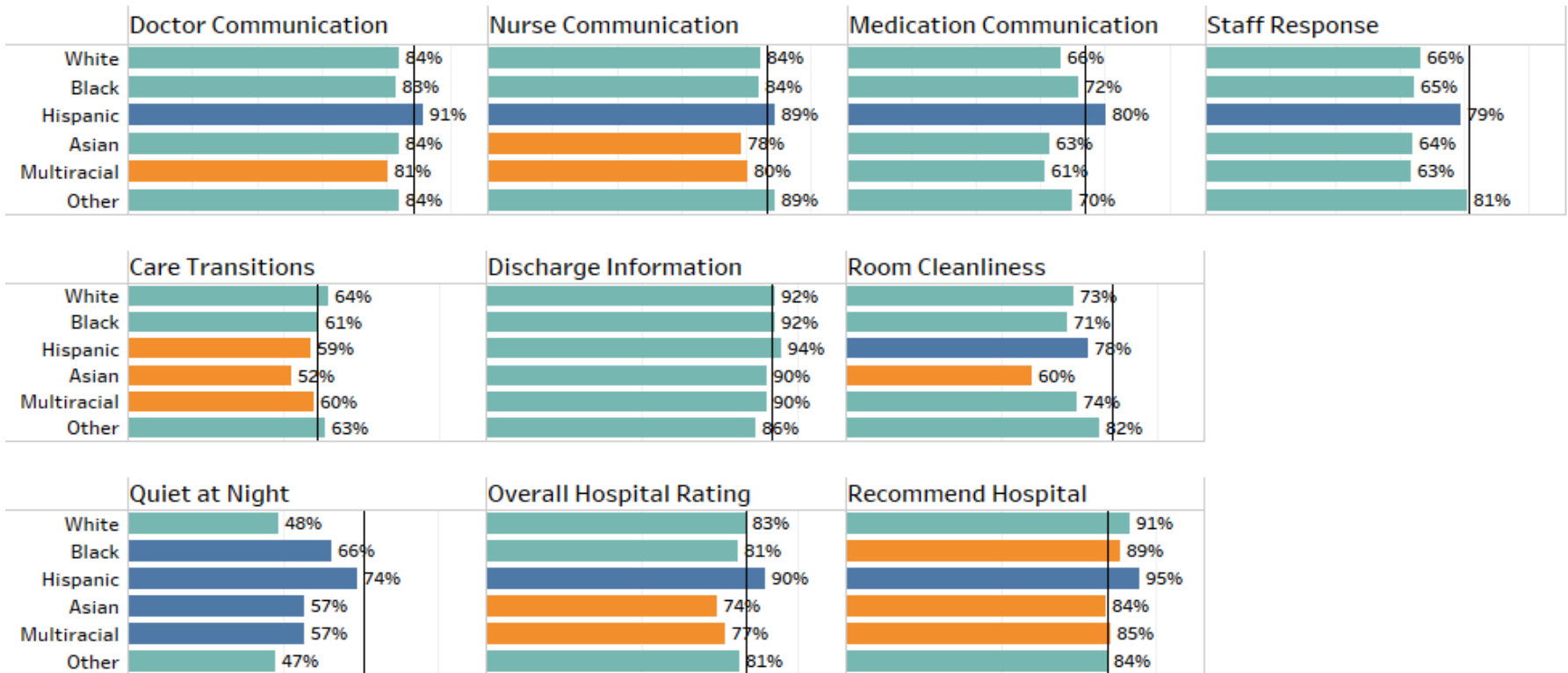
- Language not significant predictor
- Race not significant predictor
- Other factors predicting higher likelihood of readmissions include:
 - N admission days prior year (OR 1.227)
 - Medicaid (OR 1.066)
 - Comorbidities (OR 1.128)
 - Discharged home with home health care (OR 1.442)
 - Other discharge location (OR 1.247)

Characteristic	Odds Ratio	Odds of Readmission
Limited English Proficiency	1.015	
Female	.905***	Lower
Age	.998**	Lower
Asian & Pacific Islander (vs. white)	1.025	
Black (vs. white)	.965	
Hispanic (vs. white)	.938	
Other (vs. white)	.780	
Commercial Payer (vs. Medicare)	.964	
Medicaid (vs. Medicare)	1.066***	Higher
Other Payer (vs. Medicare)	.904	Lower
Socioeconomic Status Score	.992	
Number Admission Prior 365 Days	1.227***	Higher
Elixhauser Comorbidity Index	1.128***	Higher
Neurology Service (vs. Medicine)	.757	
OB/GYN Service (vs. Medicine)	.343***	Lower
Other Service (vs. Medicine)	.887**	Lower
Psychiatry Service (vs. Medicine)	.619	
Surgery Service (vs. Medicine)	.723	
Urology Service (vs. Medicine)	.785**	Lower
Home Health Care (vs. Home)	1.442***	Higher
Skilled Nursing Facility or Hospital (vs. Home)	.848**	Lower
Other Discharge Location (vs. Home)	1.247**	Higher

Example 2: Racial Disparities in Patient Experience

- Lower ratings among certain minorities in MD/Nurse Communication, Care Transitions, Room Cleanliness, Overall Rating & Recommend.

HCAHPS Adult Patient Experience Composites, by Race: CY2015-2017

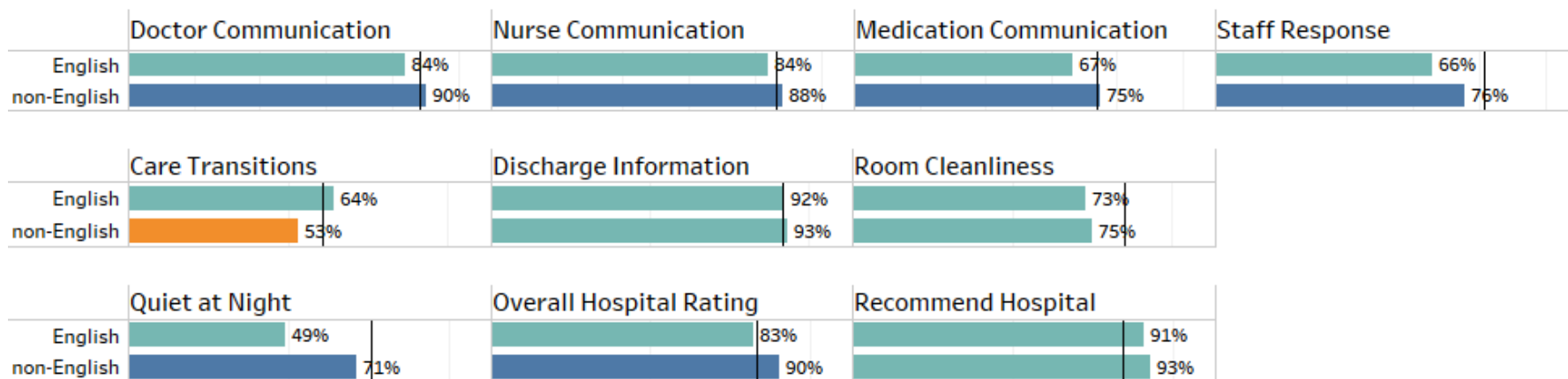


■ No significant difference from referent population
■ Significantly worse than referent population
■ Significantly better than referent population
 | CMS national 90th percentile

Language Disparities in Patient Experience

- Non-English speakers report lower ratings on HCAHPS Care Transitions

HCAHPS Adult Patient Experience Composites, by Language: CY2015-2017



■ No significant difference from referent population
■ Significantly worse than referent population
■ Significantly better than referent population
 | CMS national 90th percentile

Question level disparities: Asian/non-English

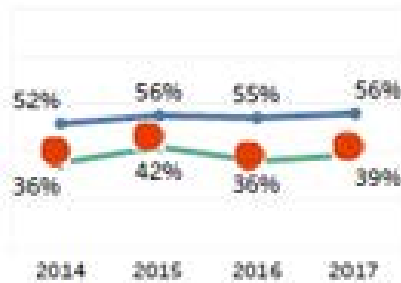
HCAHPS Composite: Care Transitions, White vs. Asian, 2014-2017

Care Transitions

White
Asian



Q: Patient/Family Preferences Taken into Account at Discharge



Q: Patient Had Good Understanding of Responsibilities for Managing Health at Discharge



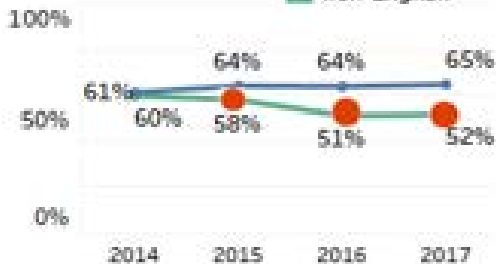
Q: Patient Understood Purpose of Taking Each Medication at Discharge



HCAHPS Composite: Care Transitions, by Language, 2014-2017

Care Transitions

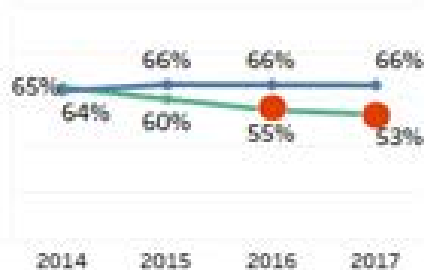
English
non-English



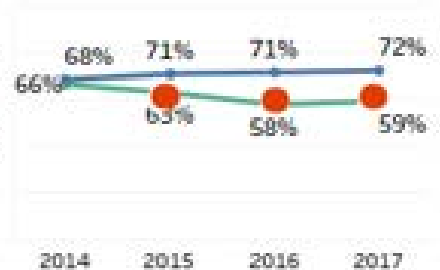
Q: Patient/Family Preferences Taken into Account at Discharge



Q: Patient Had Good Understanding of Responsibilities for Managing Health at Discharge



Q: Patient Understood Purpose of Taking Each Medication at Discharge



What we know from the literature

- National data reveal disparities in patient satisfaction among Asian patients.
 - HCAHPS survey assessments reveal that compared to African Americans, Hispanics, American Indian/Alaskan Native, and whites, Asians report the lowest levels of satisfaction with nurse communication, doctor communication, staff responsiveness, pain management, cleanliness, and quietness.⁴
- **Factors contributing to lower satisfaction among Asian patients:**
 - Perception that doctor did not listen to them, spend time with them or involve them in decision making¹
 - Lower level of trust²
 - Differences in communication styles^{1,7}
 - Not feeling respected by physician⁸
 - Provider bias against Asians⁷
 - Patient – physician linguistic discordance⁷
 - Lack of insurance⁷
 - Impact of “model minority” stereotype on physician perception^{1,9}

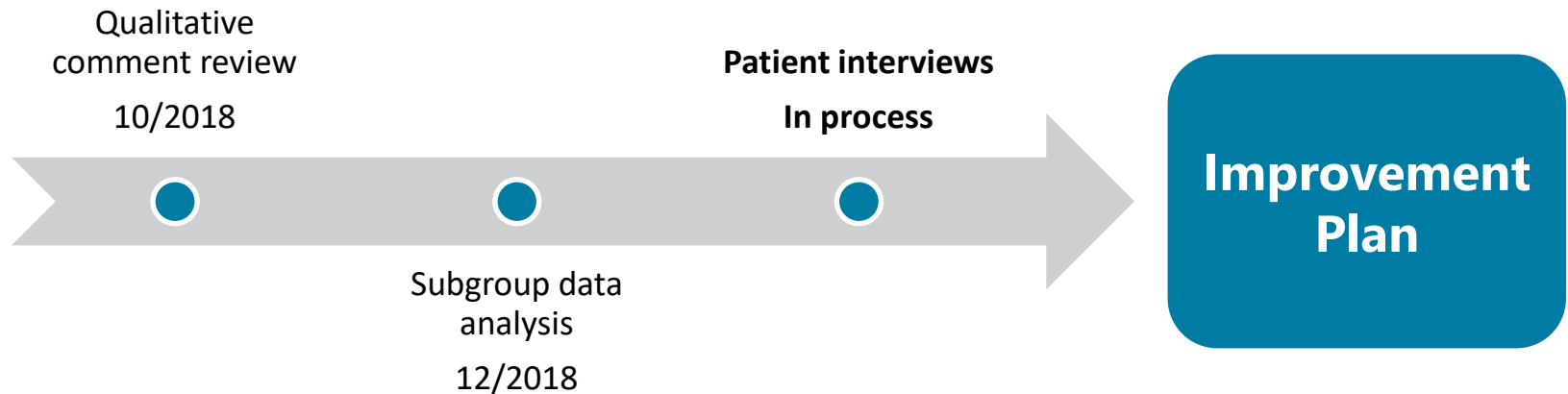
Survey Comment Analysis

Of 655 comments, about 5% addressed care coordination or communication

- Themes from care coordination comments include:
 - Concerns about the frequency and quality of the communication between physicians and nurses.
 - Concerns about the number of providers on the care team, and patients reporting difficulty understanding the roles of each member of the care team.
 - Patients feeling overwhelmed and confused, not understanding what was happening and why.
- Themes from communication comments include:
 - Desire for more information from the care team about what was happening, when and why.
 - Concerns that providers were not listening to the patient, understanding the patient's concerns and providing enough information to help the patient understand.
 - Concern that test results were not communicated promptly.

Care Transitions Disparities Interventions

- FY19 Quality & Safety Goal on Equity
 - Goal 1, “Lead in quality of care & patient experience,” will include a sub-goal to reduce disparities in patients’ experience of discharge
 - Discussion underway with the Patient Experience Council to socialize findings and identify opportunities for improvement
 - Creation of new, multidisciplinary **Equity in Care Transitions Working Group**

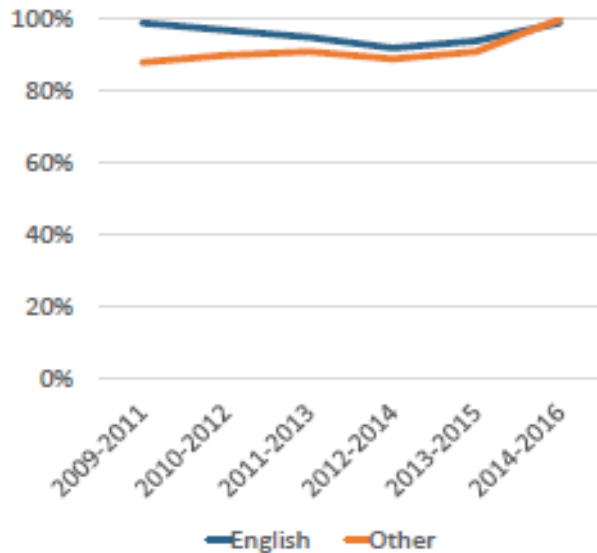


Process of Care Measures: GBS Prophylaxis

Clinical Process of Care Measures: Group B Strep (GBS) Disparity

GBS is a bacterium that can cause life-threatening infections in newborns. Stratification by language suggested a disparity among patients with limited English proficiency in 2009-2012.

Intrapartum Antibiotic Prophylaxis for GBS



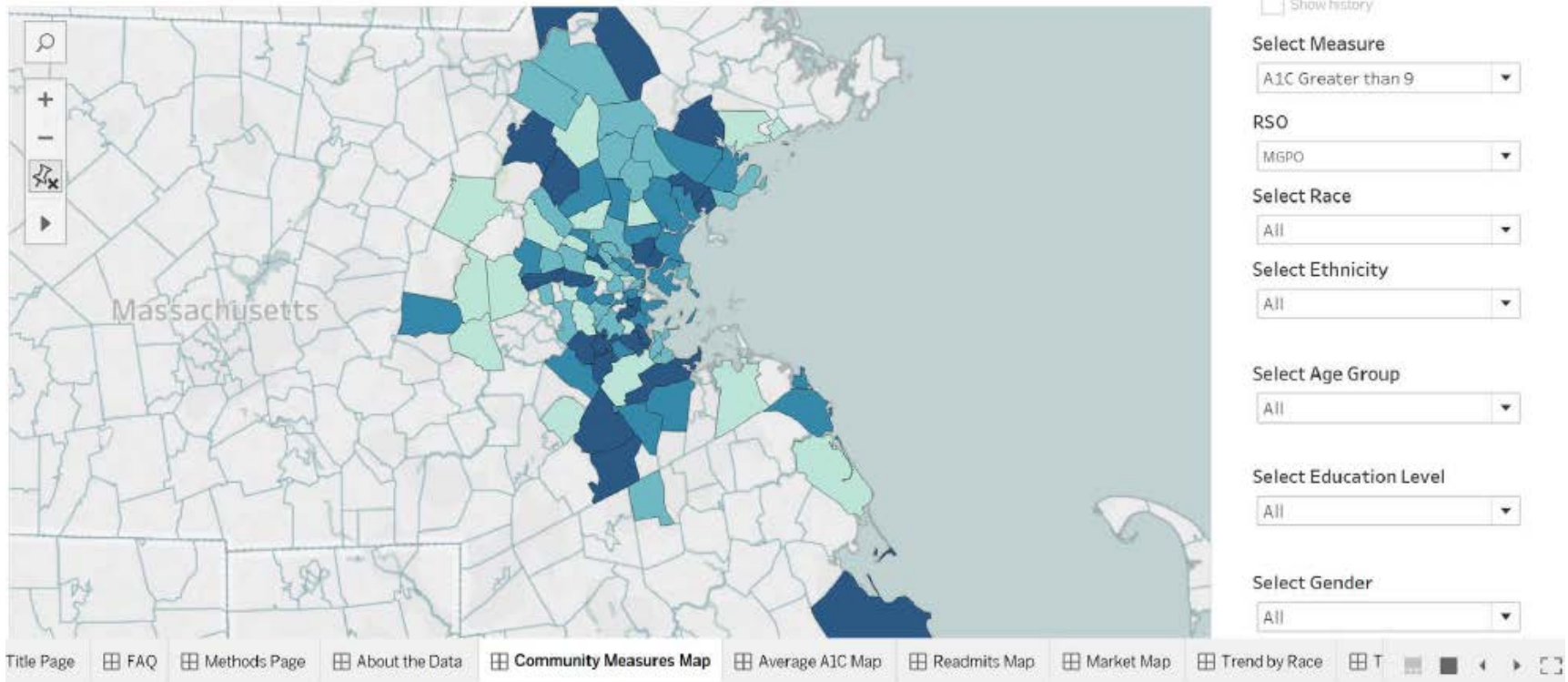
- Chart review of missed opportunities
- Intervention within health centers: educating clinicians and patients

New approaches to displaying data

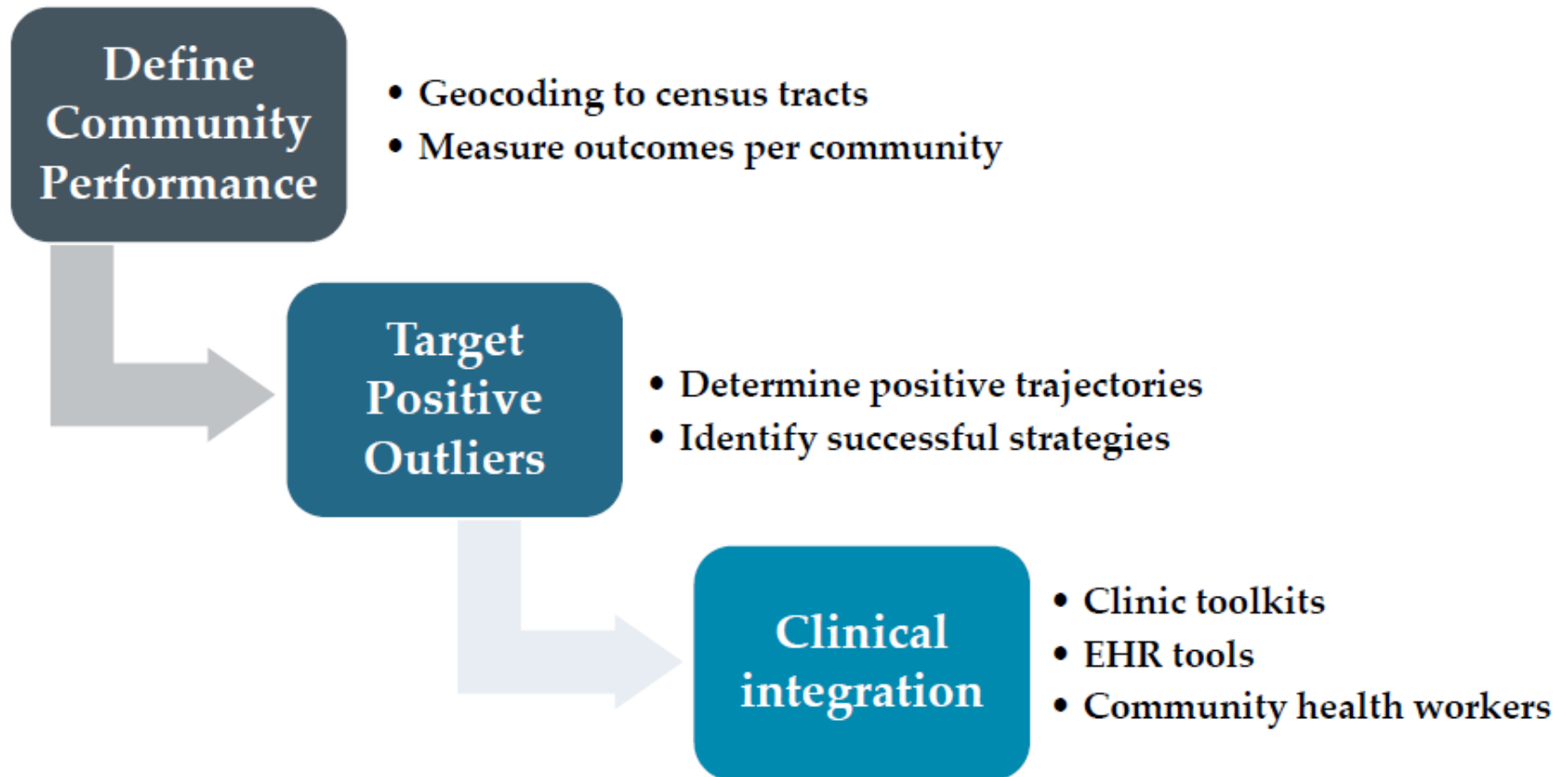
Focus on geocoding/mapping

Partners HealthCare Community Quality Measures

Map showing Snapshot Date of 12/1/2018 for A1C Greater than 9. Color shading is based on rank among zip codes. Zip codes must have a denominator of greater than 30 to be included on the map. Lighter shades represent better performance.



Three step process for community-oriented intervention



Sequist TD, Taveras EM. NEJM 2014

Communicating Results and Leading Improvement

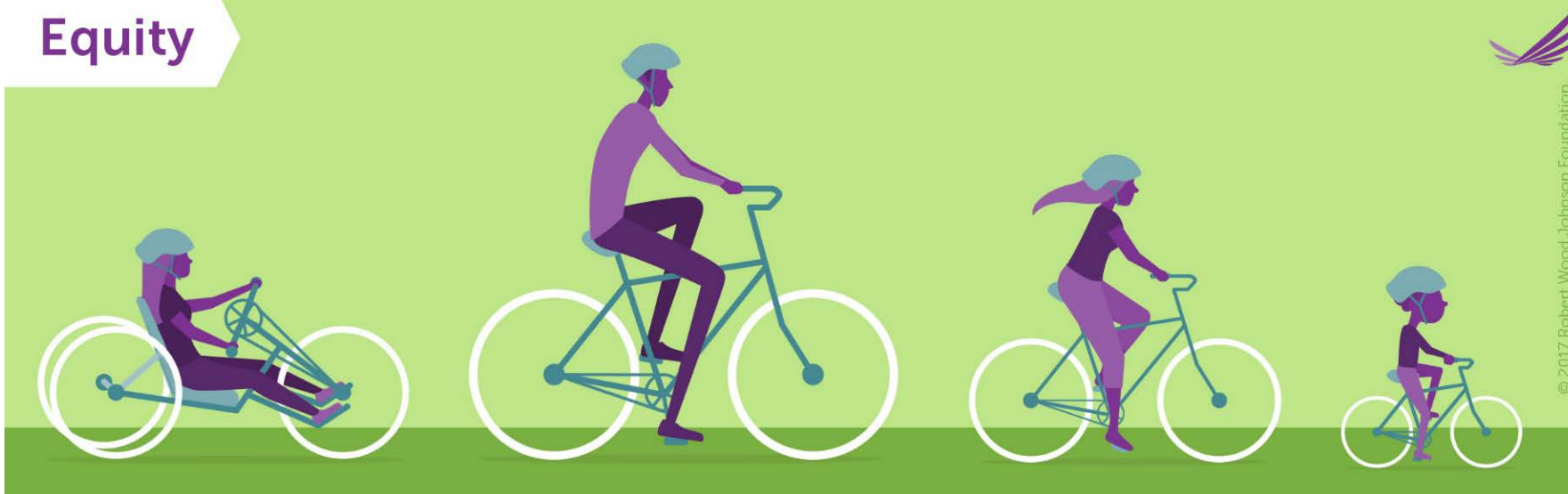
Equity is not equality

Robert Wood Johnson Foundation

Equality



Equity



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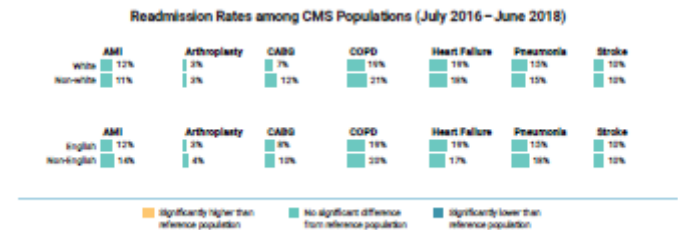
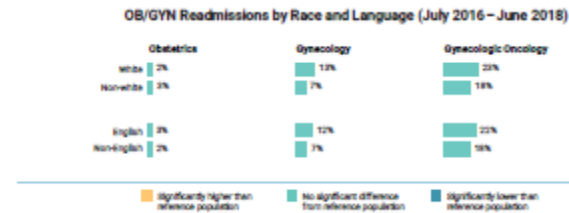
What happens when we find a disparity?

Moving from measurement to improvement

- Be ready to mobilize for any measure you analyze
 - Multidisciplinary teams to drive improvement
 - Clinician engagement is a must
- Further analysis will likely be necessary: it is a process
- Interventions are not always obvious
- Multiple interventions are sometimes needed
- Leadership buy-in is key to getting resources for improvement

Continued monitoring is key

- Evaluate progress toward eliminating disparities
- Ensure new disparities do not emerge



Closing Reflections

Replicating this approach in your organization

1. Exploring disparities is an ongoing process.
2. Leverage existing measures, start simple and go slowly.
 - Simple crosstabs reveal many opportunities!
3. Anticipate challenges with administrative data.
4. Find a champion- clinical and/or executive leader.
5. Commit to monitoring, even if you don't see a disparity the first time around.

Questions?

For more information:

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