Clinical quality and the Patient-centered Medical Home

Results from the national PACT evaluation

Karin ("Kari") Nelson, MD MSHS
Staff Physician, VA Puget Sound Health Care System
Associate Director, National PACT evaluation
Associate Professor, University of Washington
Seattle, WA

Overview

- Patient centered medical home (PCMH) model
- PCMH & clinical quality in non-VHA clinics
- VHA PACT national evaluation regarding PCMH model and clinical outcomes
  - Association of PACT implementation
  - Elements of PACT most associated with improved quality
  - Improvements in quality related to PACT implementation

Poll Question #1

What is your primary role in VA?

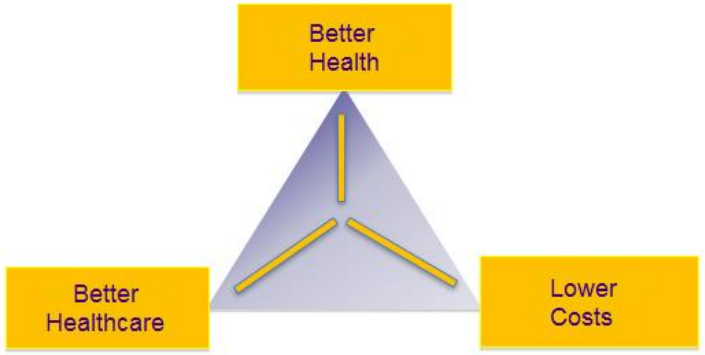
- student, trainee, or fellow
- clinician
- researcher
- administrator, manager or policy-maker
- other

Poll Question #2

- What if any is your involvement with PACT?
  - Provider (Physician, NP, PA)
  - RN Case Manager
  - Mental Health Provider (psychologist, psychiatrist)
  - Other staff
  - Not involved with PACT

The Patient Centered Medical Home (PCMH)

- Tackle the "Triple aim"
  - Restructure primary care practice
  - Improve chronic disease care
- PCMH elements
  - Team-based care
  - Enhance access to care
  - Coordinate care
  - Comprehensiveness
  - Systems approach to quality and safety
  - Sustained partnership with patients
- Most major health plans, FQHC and VHA have PCMH models



Jackson, *Annals of Internal Medicine*, 2013, 158 (3)
Bitton, *JGIM*, 2013; 25(6): 584

Prior Non-VA research on clinical outcomes

- FQHC clinics: better performance with PCMH recognition 9/16 measures
  - Asthma meds, diabetes control, pap testing, prenatal care, tobacco cessation
  - Example - diabetes A1c < 9%: 71.1 in PMCH certified clinic vs. 68.4% clinic without PCMH certification
- Pennsylvania Chronic care initiative: multi-payor with shared savings
  - PCMH practices had better control on 4 out of 6 process measures (e.g. testing for A1c: 92.1% in pilot vs. 83.9% control clinic)
- Recent meta-analysis on 11 initiatives noted only small benefits
  - 1.2% increase in cervical cancer screening; 1.4% increase in breast cancer screening
  - No differences in 4/6 quality measures (colorectal cancer screening, diabetes)

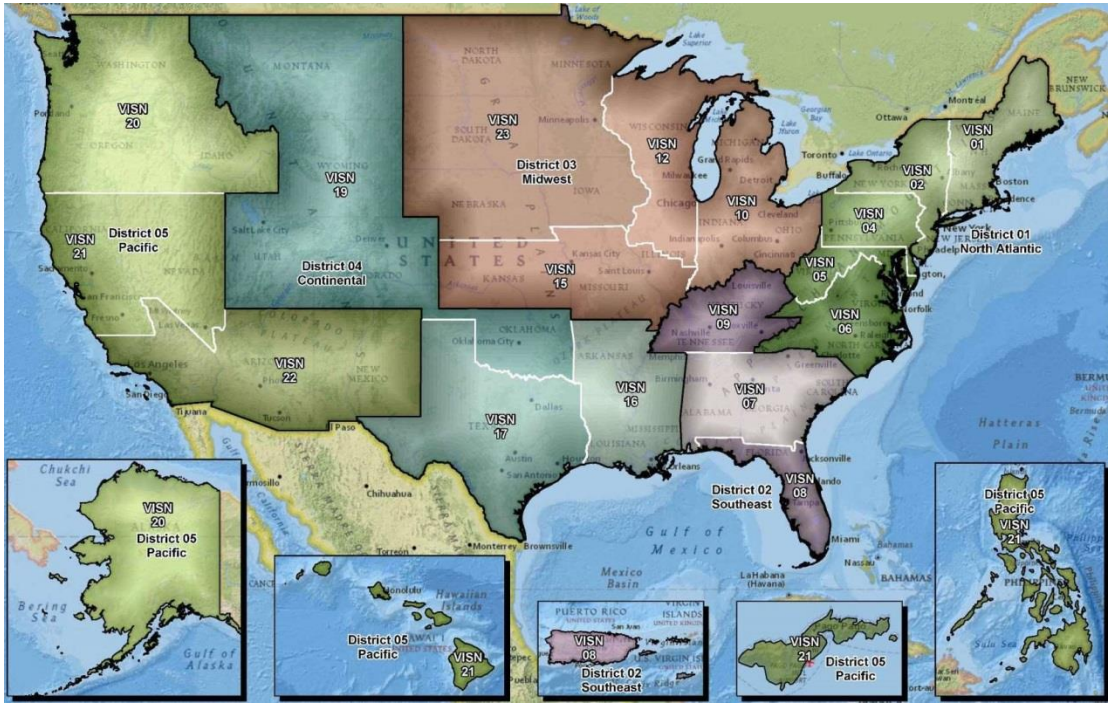
Friedberg, *JAMA IM, 2015*
Shi, *Health Services Research, 2016*
Sinaiko, *Health Affairs, 2017*

Veterans Health Administration (VHA) Integrated Health Care System

> 5 million primary care patients

> 16 million primary care encounters annually

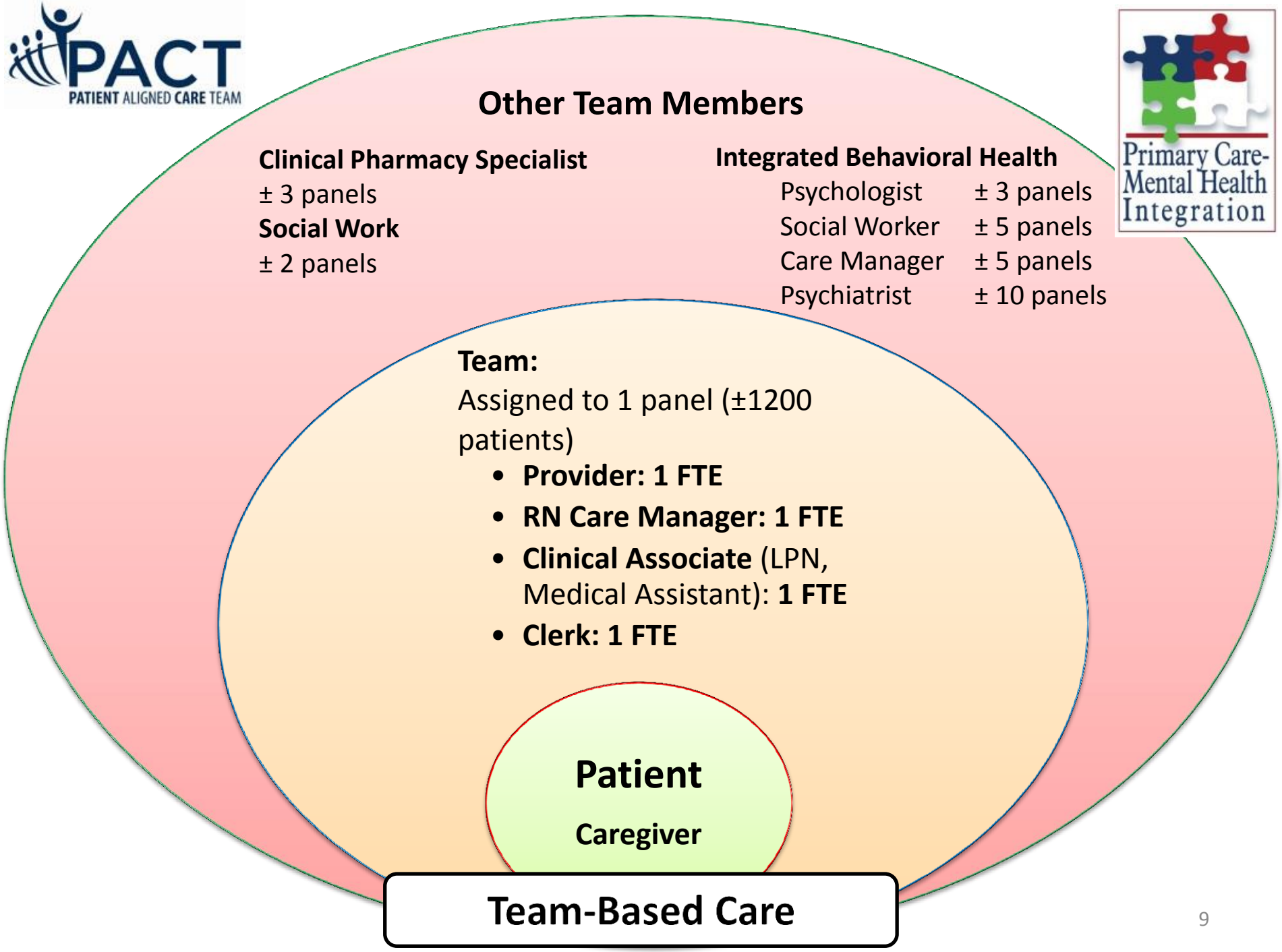
160 Medical centers, 802 community base outpatient clinics (CBOCs)



- Capitated payment system
- Regional networks
- Salaried medical staff

PCMH in VHA

- Patient Aligned Care Team (PACT) initiative: reorganization of VHA primary care practice into patient centered medical homes
- PACT national evaluation outcomes
  - Clinical outcomes
  - Staff experience
  - Cost and health care use
  - Patient satisfaction


Other Team Members
Clinical Pharmacy Specialist
± 3 panels
Social Work
± 2 panels
Integrated Behavioral Health
Psychologist ± 3 panels
Social Worker ± 5 panels
Care Manager ± 5 panels
Psychiatrist ± 10 panels
Team:
Assigned to 1 panel (±1200 patients)
Provider: 1 FTE
RN Care Manager: 1 FTE
Clinical Associate (LPN, Medical Assistant): 1 FTE
Clerk: 1 FTE
Patient
Caregiver
Team-Based Care

Challenges to measuring PACT Implementation

- Simultaneous rollout of national initiative across VHA
  - No control group
- No gold standard to measure PCMH
  - Widely used NCQA recognition not as relevant to VHA; emphasis on infrastructure and QI programs
- VHA already had in place many features of the medical home
  - ✓ Patient assigned to a primary care provider
  - ✓ Universal Electronic Medical Record
  - ✓ Performance & quality improvement system
  - ✓ Panel management tools, e.g. disease registries
  - ✓ National programs for care coordination
  - ✓ Integrated behavioral and mental health services

Development of the PACT Implementation Progress Index

- Goal
  - Utilizes existing patient, provider and administrative data
  - Reflects processes & attributes essential to effective primary care
- Describes variation in implementation across clinic sites
- Examines the relationship between Pi^2 and key associations: patient satisfaction, staff burnout, clinical quality, and health care use

PACT implementation progress index (Pi^2)

8 Domains	Source of Data	# of Items
Comprehensiveness	Patient surveys (Consumer Assessment of Health Plans=CAHPS-PCMH) n = 75,101	3
Self-management support		2
Patient-centered care & communication		6
Shared decision making		2
Access	Corporate Data Warehouse (CDW) n = >5.6 million & Patient surveys	11
Continuity		3
Coordination of care		8
Team-based care	Primary care personnel survey n = 5,404	18
Total		**53**

Nelson et al, *JAMA Internal Medicine*, 2014

PACT Implementation Progress Index (PI^2) Scores

- Clinic-level rankings generated for each domain
  - Sum of the standardized means for each variable
  - Variables were standardized using national means
- PI^2 score calculated for each clinic:

  PI^2 score = (# of domains in the top quartile) – (# of domains in the bottom quartile)

  Range from 8 to -8:

  High implementation: 5 to 8

  Low implementation: -7 to -5

Is PACT implementation associated with improved Clinical Quality?

Methods:

- Cross sectional analysis of Pi^2 measure and clinical quality
- Non-parametric test of trend for differences in clinical quality by Pi^2
- Percentage of patients meeting each clinical quality indicators

Measure of clinical quality: External Peer Review Program (EPRP)

- Random selection among a clinic's patients who meet 'denominator' criteria from FY2012
- Manual abstraction of clinic records by an independent external contractor
- 48 quality indicators for chronic disease management and prevention

Example of EPRP quality indicators
High Clinical Quality at baseline (2012)

Chronic disease measures	% of patients meeting measure
CAD	
LDL level < 100	70.5%
LDL cholesterol measured	96.5%
Aspirin Prescription	92.9%
Diabetes	
LDL level < 100	70.1%
HbA1c < 9%	82.2%
BP < 160/100	96.0%
BP < 140/90	80.6%
Hypertension	
BP < 160/100	95.3%
BP < 140/90	78.5%

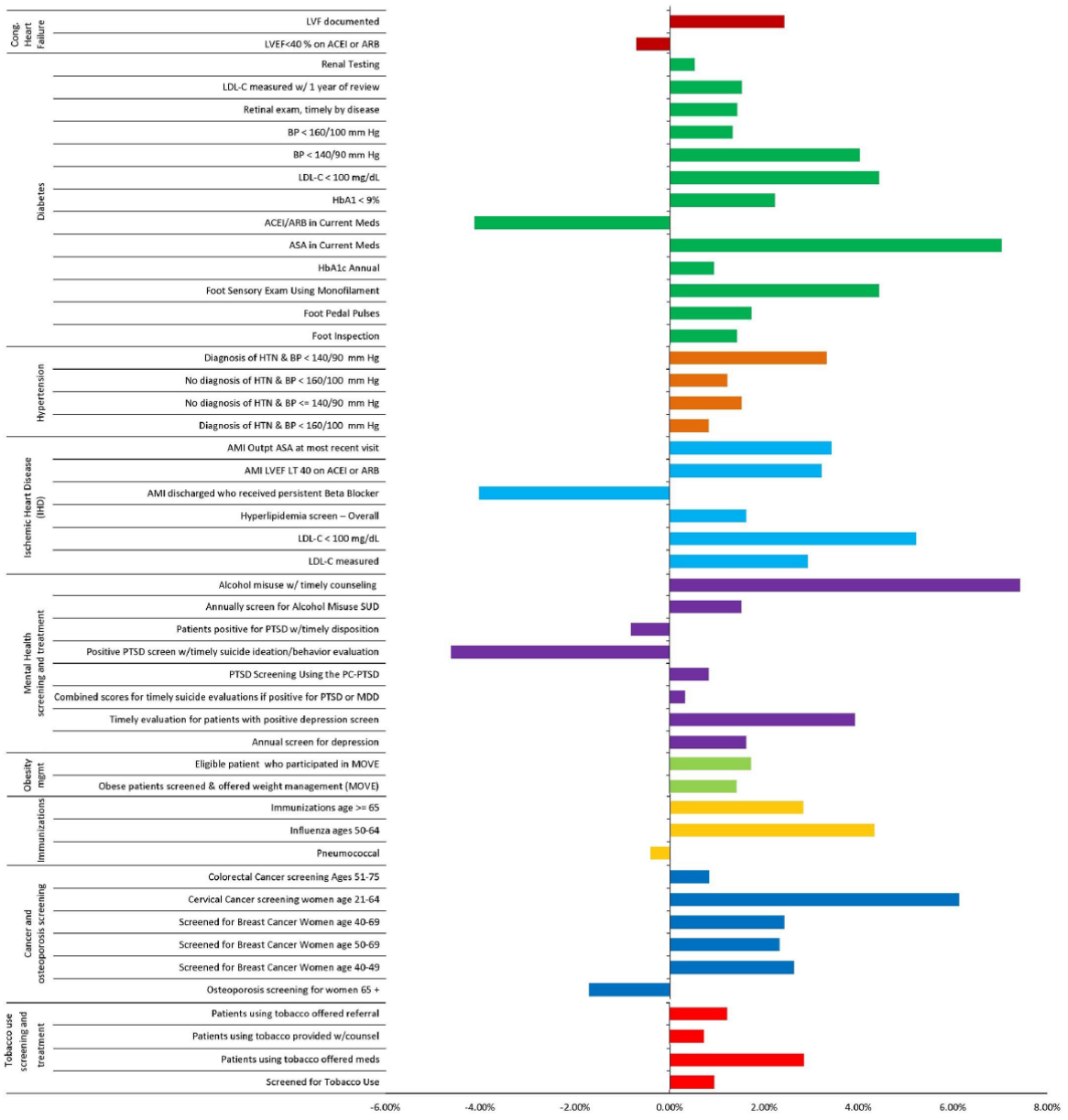
Prevention measures and screening	% of patients meeting measure
Annual screening for depression	96.6%
Breast cancer	84.3%
Cervical cancer	92.6%
Colon cancer	82.0%
Osteoporosis	62.0%
Tobacco use	99.4%
Obesity	95.1%
Vaccinations, pneumococcal	93.2%
Vaccinations, influenza	76.6%

Higher Implementation Sites had Higher Clinical Quality

48 clinical quality indicators

- Significantly higher ($p<0.05$) for 19/48 by high vs. low PI^2
- Random effects model: significant increase in average outcomes for facilities with higher PI^2 scores as compared to facilities with lower PI^2 scores ($p <0.001$).

Figure 1: Difference in the % of patients meeting quality criteria between high and low implementation sites



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Range of differences
1 to 6%

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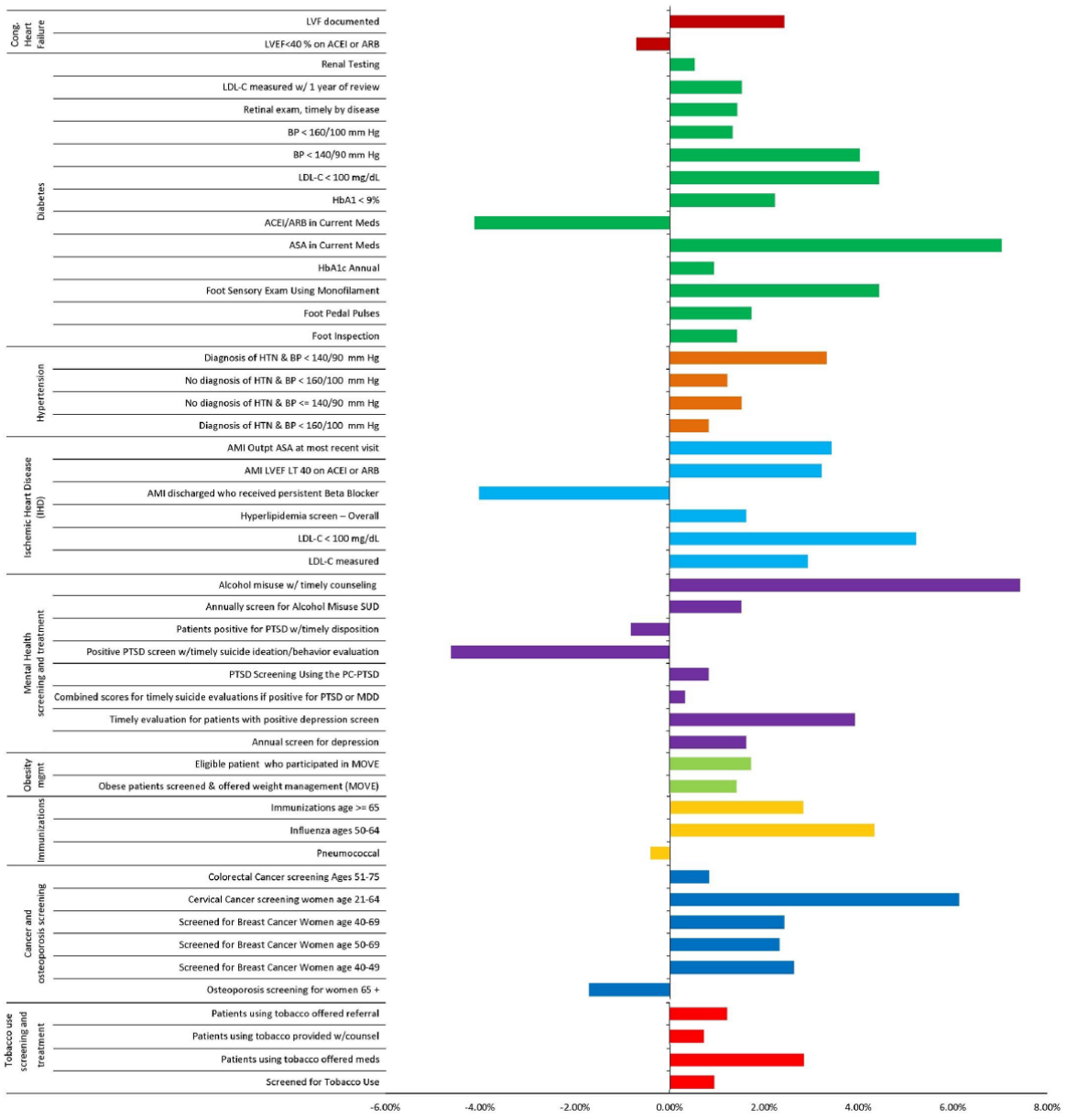


Implementation of PACT associated with higher clinical quality – example indicators

19/48 indicators significantly higher at sites with higher scores

Patient cohort		Pi² Score High				Low
Diabetes	**n**	**5 to 8**	**2 to 4**	**-1 to 1**	**-4 to -2**	**-7 to -5**
Aspirin in current meds	49,811	81.1%	79.3%	79.3%	74.4%	74.1%
Hypertension						
Diagnosis of HTN & BP < 140/90 mm Hg	107,033	80.2%	79.4%	79.1%	77.9%	76.9%
Prevention and Screening						
Alcohol misuse w/ timely counseling	8,957	86.8%	79.4%	80.7%	78.4%	79.4%
Cervical cancer screening women age 21-64	29,302	92.8%	91.8%	91.6%	91.6%	86.7%

Nelson KM, et al. *JAMA Intern Med.* 2014 Aug;174(8):1350-8

Which elements of the model were the most important for clinical quality

- Study Goal: To assess the association between elements of the PCMH model and clinical quality
- To estimate an overall population health benefit, if results from high performing clinics were achieved at all VHA primary care clinics

Nelson K, et al. *JAMA Intern Med.* Published online May 01, 2017.

Methods

- Patient-level observational study of 422,125 veterans who received VHA primary care from 2012 – 2014
  - AND had chart abstracted by an independent, external contractor for the External Peer Review Program (EPRP)
  - ~10% sample of the overall primary care population

Measures – PACT implementation

- Each clinic received a standardized domain score (mean of 0) for each of the 8 Pi^2 domains
- Categorized into quartiles
- For individual domains, clinics received
  - - 1if domain score in lowest quartile
  - +1if domain score in highest quartile
  - 0 all others
- Used scores from FY2012

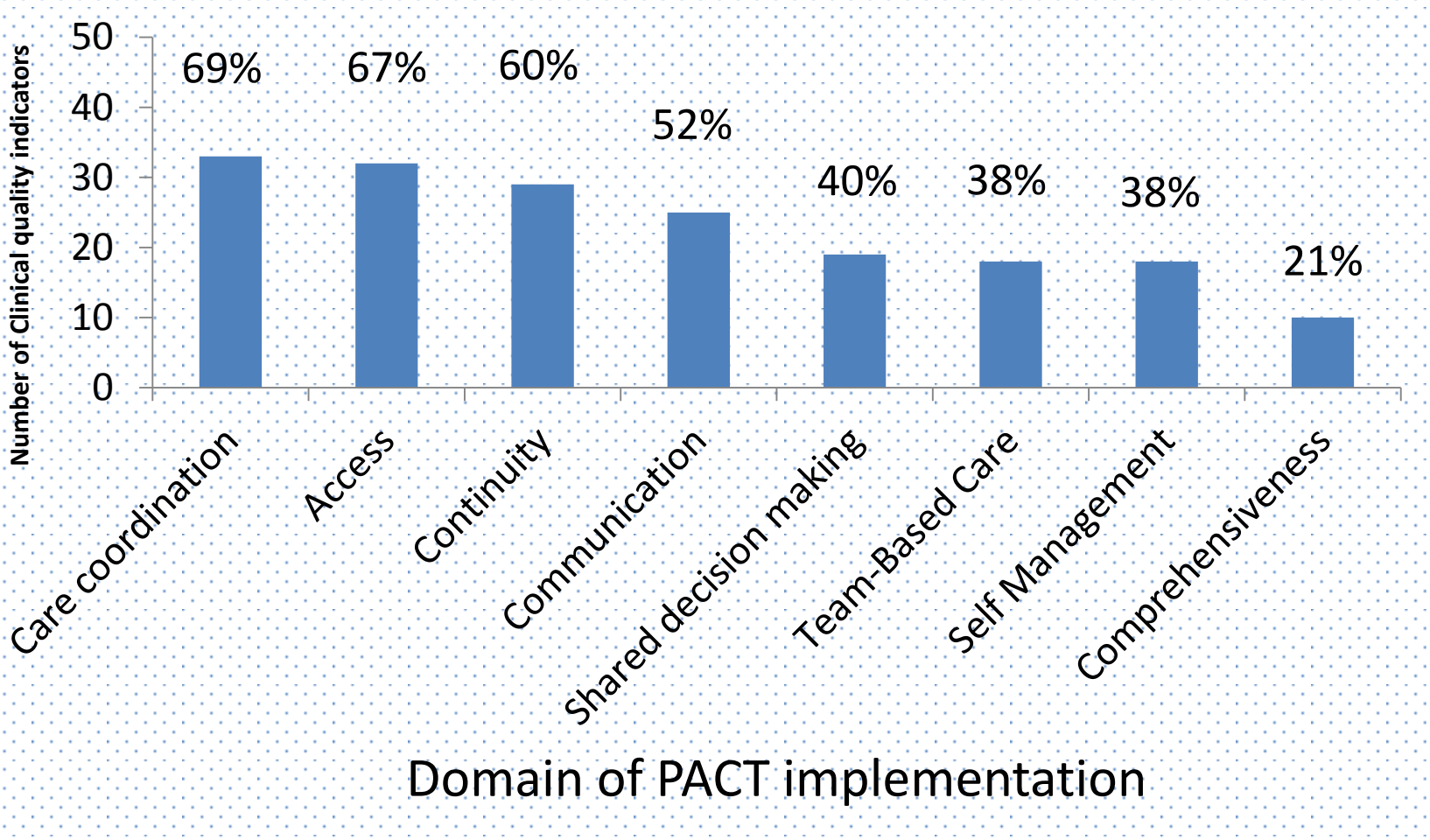
Statistical analysis

- Modeled the association between quartile of each Pi^2 component and the 48 clinical quality indicators using Generalized Estimating Equations (GEE) for binary outcomes
  - accounting for within-patient correlation across quality measures and adjusting for multiple comparisons.
- Calculated average marginal effects to report differences in probability of meeting clinical quality between the highest and lowest quartile Pi^2 component scores

Methods

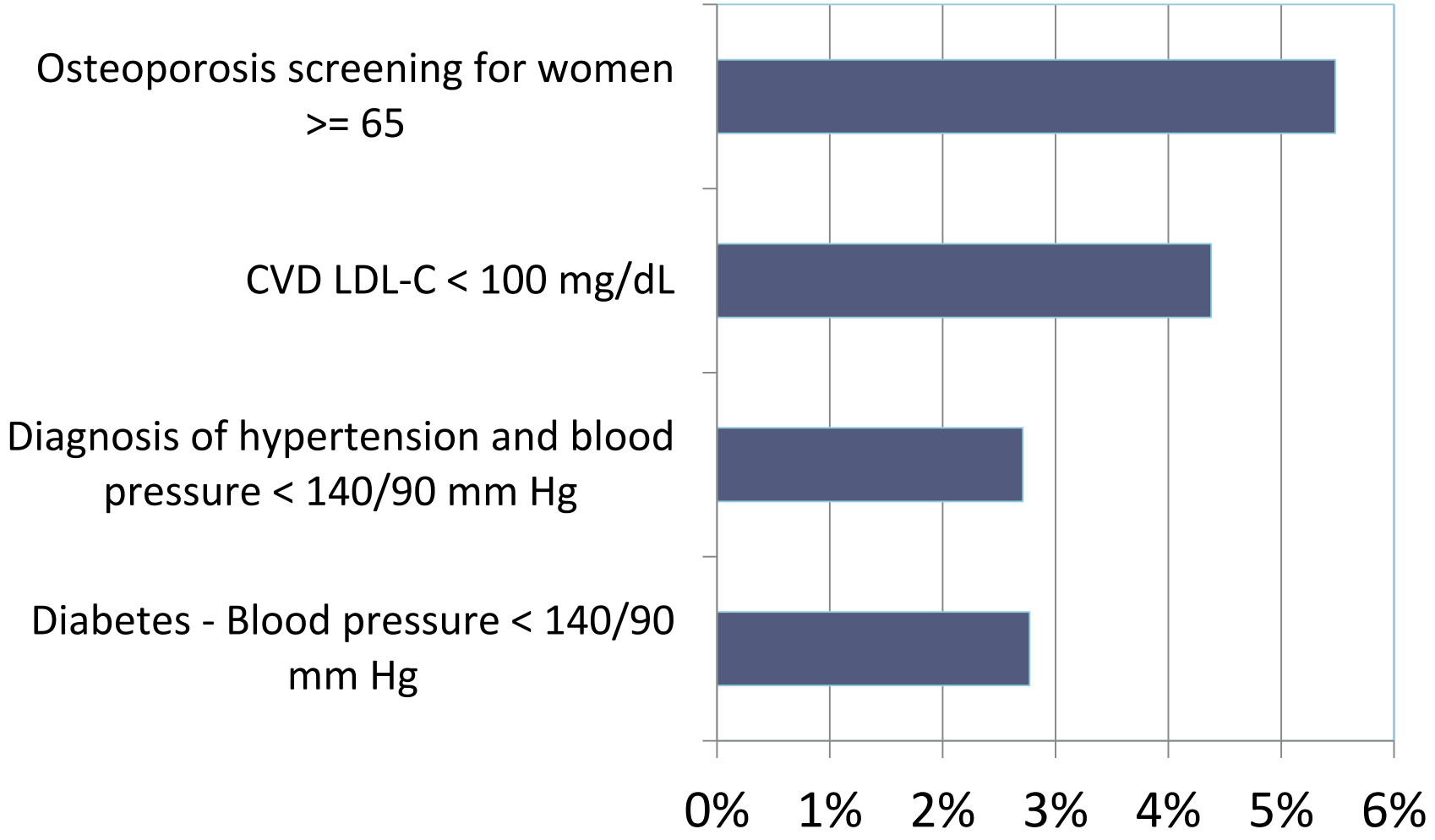
- Calculated the number additional measures expected to have met quality criteria had the low- and middle-scoring clinics performed similarly to clinics in the highest domain scores
  - Used differences in probability of between low and middle Pi^2 clinic compared to high scoring clinics
  - Generated population estimates for each EPRP measure for the VHA primary care population in 2014

% of 48 quality indicators associated with significantly better performance in highest quartile clinics compared to lowest quartile clinics, n= 909 clinics



Nelson, et al, *JAMA Internal Medicine*, 2017

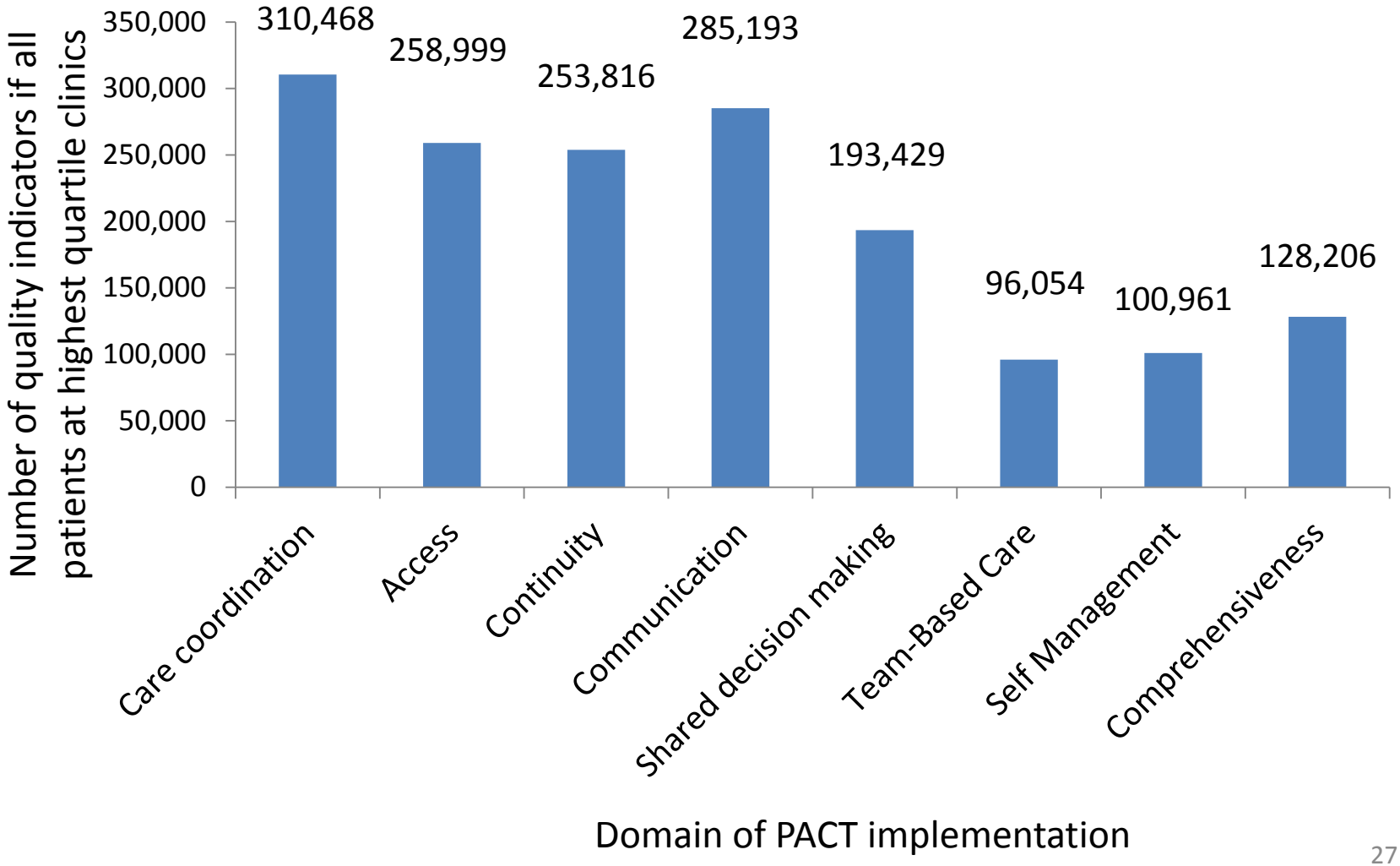
Difference in percentage meeting EPRP criteria between sites with high vs. low continuity clinics



Clinical Quality indicators with population estimates

	% of patients meeting measure	Population with chart abstracted	Estimate population of primary care patients
Chronic disease management			
Diabetes - HbA1c < 9%	82.2%	48,685	996,531
Hypertension - BP < 160/100	95.3%	112,429	2,528,286
Screening			
Depression	96.6%	109,628	4,613,649
Colon cancer	82.0%	115,048	3,127,987

Population estimates for additional clinical quality indicators met if all patients cared for a high performing facilities, n= 909 clinics



Conclusions

- All components of the PCMH model contributed to better performance on clinical quality indicators
- Those with the greatest association were care coordination, access, continuity and communication
- Significant number of quality indicators could have been met if adoption of PACT at all clinics was similar to high-quartile clinics

Improvements in quality related to PACT

Did VHA primary care clinics with more extensive PACT implementation have more improvement in chronic disease quality measures?

Rosland AM, et al. Manuscript under review

Methods

- Clinic-level longitudinal analysis
- All primary care clinics with complete data (N=808)
- Linear regression models of change from 2009 (Pre-PACT) to 2013 (PACT) for individual clinical quality measures
- Main predictor - Extent of PACT implementation

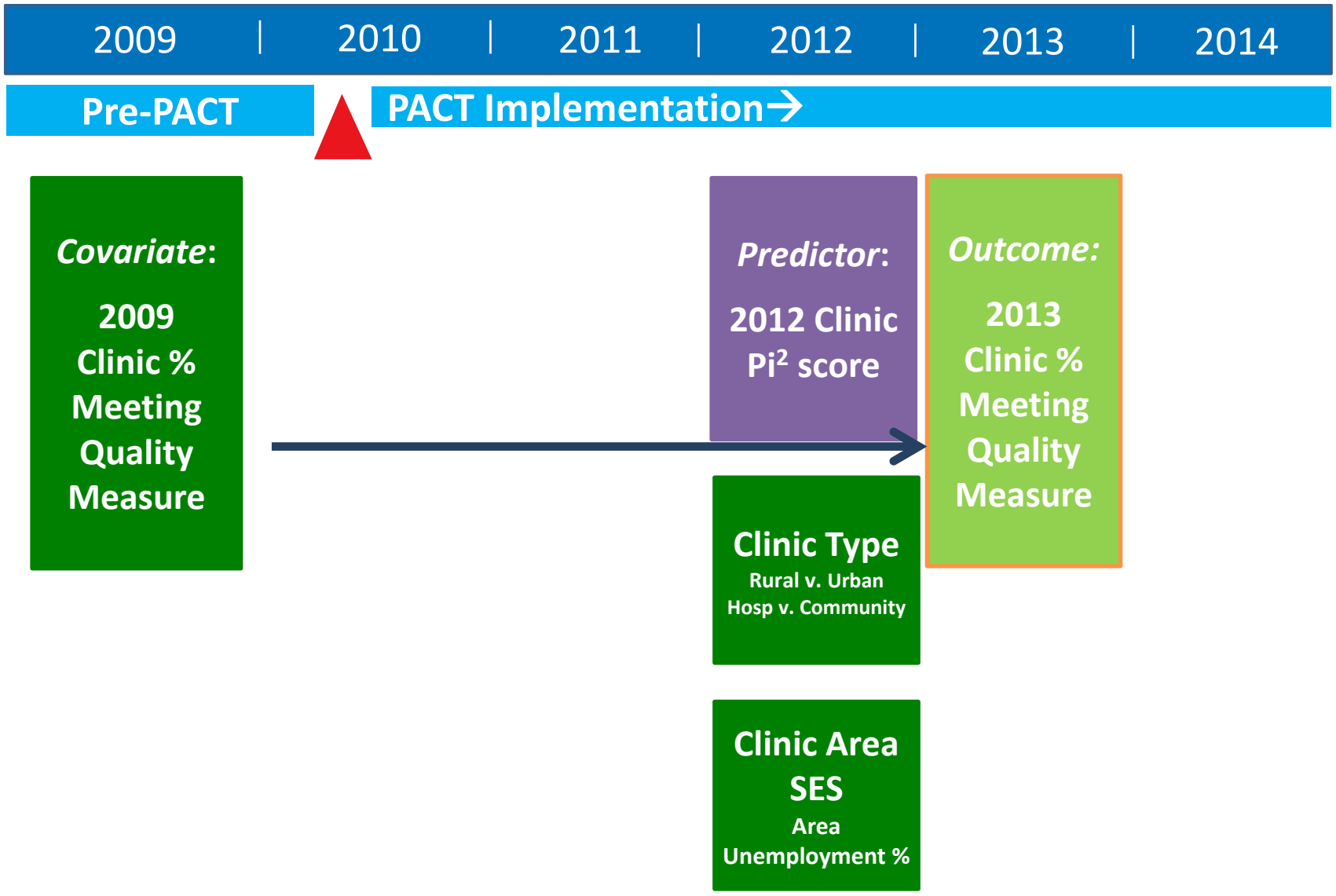
EPRP Quality Measure Selection for Study

- Outpatient quality of care in chronic diseases directly impacted by primary care
- Clinical process and outcome measures
- Available and measured in same form from 2009 to 2013

→**15 Clinical Quality Measures Selected**

→**Coronary Artery Disease, Diabetes, Hypertension**

Analysis


2009
2010
2011
2012
2013
2014
Pre-PACT
PACT Implementation→
Covariate:
2009 Clinic % Meeting Quality Measure
Predictor:
2012 Clinic Pi² score
Outcome:
2013 Clinic % Meeting Quality Measure
Clinic Type
Rural v. Urban
Hosp v. Community
Clinic Area SES
Area Unemployment %

Results: Clinical Process Quality Measures

Measure – Clinical Group	Mean 2009 Clinic Score	Adjusted Difference in 2013 Quality Highest Pi^2 vs. Lowest Pi^2 categories
LDL cholesterol measured - CAD	95%	**+2.4%***
Aspirin Prescription - CAD	92%	**+3.9%*@**
Aspirin Prescription - Diabetes	75%	+0.9%
HbA1c measured annually - Diabetes	98%	**+0.8%***
ACE-inhibitor /ARB prescription - Diabetes	79%	**-3.0%***
Foot Exam - Diabetes	92%	+1.4%
Retinal Exam - Diabetes	88%	-0.05%
Renal Function Testing - Diabetes	95%	-0.8%

*P value <0.05

@P <0.05 for 4th Pi^2 category (-4 to -2) vs. 1st (+5 to +8)

All others for 5th Pi^2 category (-5 to -8) vs. 1st

Results: Clinical Outcome Quality Measures

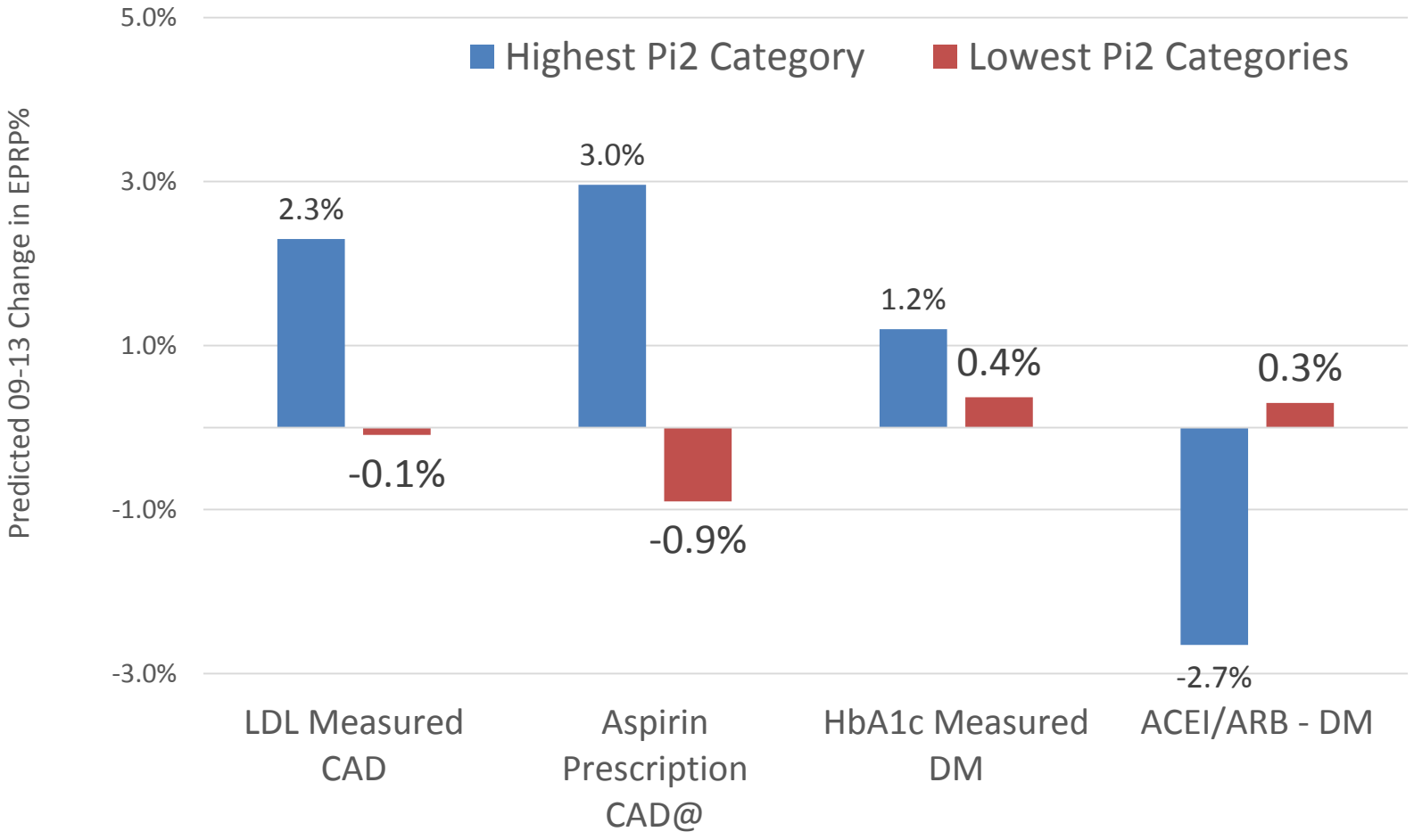
Measure – Clinical Group	Mean 2009 Clinic Score	Adjusted Difference in 2013 Quality Highest Pi^2 vs. Lowest Pi^2 categories
LDL level < 100 – CAD	67%	**+5.4%***
LDL level < 100 – Diabetes	70%	**+3.8%***
HbA1c < 9% - Diabetes	85%	+0.8%
Blood Pressure < 160/100 - Diabetes	96%	**+1.4%***
Blood Pressure < 140/90 - Diabetes	80%	+1.9%
Blood Pressure < 160/100 - Hypertension	95%	**+1.9%***
Blood Pressure < 140/90 - Hypertension	78%	**+2.6%*@**

*P value <0.05

@P <0.05 for 4th Pi^2 category (-4 to -2) vs. 1st (+5 to +8)

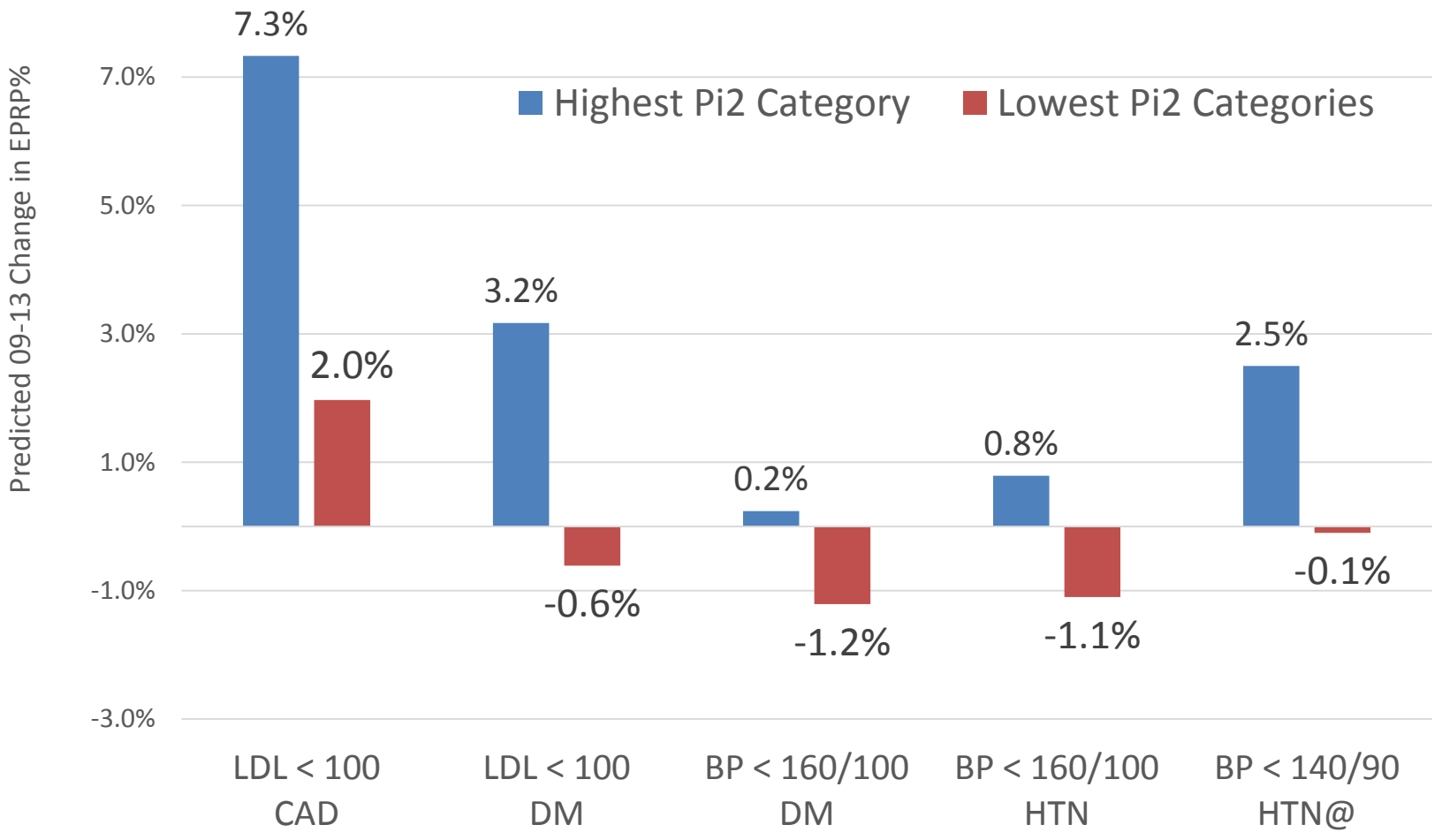
All others for 5th Pi^2 category (-5 to -8) vs. 1st

Model-Based Predicted 2009-2013 Change in Statistically Significant Process Measures



@Low Pi2 Category (-2 to -4). All others Pi2 (-5 to -8).

Model-Based Predicted 2009-2013 Change in Statistically Significant Outcome Measures



@Low Pi2 Category (-2 to -4). All others Pi2 (-5 to -8).

Conclusions

- Clinics with PACT most extensively in place by 2012 had significantly larger improvements in more than half of the chronic disease quality measures examined than clinics with least PACT
  - Both clinical processes and outcomes
  - Among high and low starting

- PCMH-aligned changes in care delivery across all patients could realize downstream improvements in chronic disease quality measures

Limitations for all analyses

- Observational studies
  - no control group
  - association can not imply causality
- Do not have comparable measure of PACT implementation prior to 2012
- Performance in clinical quality measures does not always reflect actual quality of care
- Several domains scores rely on self-report from patients and providers

Conclusions

- Evidence that PCMH can improve clinical quality is mixed
- Effective implementation of the PACT model in VHA associated with small differences in clinical quality
- Clinics with more effective implementation of PACT had larger improvements in chronic disease care measures
- Domains of the model associated with the biggest differences: care coordination, access, continuity and communication
  - ✓ When applied to large populations of patients in the VHA, there were a significant number of care processes completed in higher performing clinics

Acknowledgements

PACT National Evaluation Team

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Resources

Published articles

Nelson KM, et al. Implementation of the patient-centered medical home in the Veterans Health Administration…*JAMA Intern Med.* 2014 Aug;174(8):1350-8

http://jamanetwork.com/journals/jamainternalmedicine/fullarticle/1881931

Nelson KM, et al, Clinical quality and the patient-centered medical home. *JAMA Internal Medicine, online May, 2017*

http://jamanetwork.com/journals/jamainternalmedicine/fullarticle/2623525

Patient care services website about PACT

https://www.patientcare.va.gov/primarycare/PACT.asp

QUESTIONS OR COMMENTS?

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KARIN.NELSON@VA.GOV

THANKS!