

# **PACT Implementation and Provider Job Turnover**

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## **Poll Question**

What is your involvement with PACT?

- 1) I am a member of a PACT teamlet
- 2) I am researching or evaluating PACT
- 3) I am an administrator implementing PACT
- 4) I am involved with PACT in another capacity
- 5) I am unfamiliar with PACT

# Agenda

- 1) Previous PACT cyberseminars
- 2) Project motivation
- 3) Data definitions and descriptive statistics
- 4) PACT/PCP turnover association
- 5) Other factors associated with turnover
- 6) PACT/turnover association and PCP characteristics
- 7) Limitations/Conclusions
- 8) Questions

# Some Previous PACT Seminars

### **3/21/2012 Work Role Transformation during PACT Implementation: Successes and Challenges**

- Includes VISN 4 and VISN 23 surveys of PCPs and PACT team members
- Interviews with PCPs and RN Care Managers about PACT and role shifts

### **8/15/2012 Facilitating the Nursing Role Transformation in PACTs**

- Includes VISN 22 survey of PCPs and PACT team members

### **1/16/2013 PACT Implementation: Findings from primary care surveys**

- National PACT survey: Includes reported facilitators & barriers to patient-centered care
- VISN 4 survey: Includes barriers to quality improvements and survey of PCP experiences

### **2/20/2013 Provider and Staff Experience with PACT: Results and recommendations from national and regional primary care surveys**

- Elements of PACT and burnout: Includes national PACT survey and VISN 20 and VISN 22 surveys

### **6/19/2013 Building the Foundation for PACT in a Large VA Academic Medical Center: Access and Continuity for Part-time Providers**

- Includes VISN 11 interviews with PACT team members

## **Previous PACT Seminars: Some Conclusions**

- 1) Inadequate staffing is a frequently reported barrier to PACT implementation
- 2) PCPs report relatively high levels of burnout
- 3) Role shifts necessary for PACT team-based care are often difficult and stressful
- 4) Support for PACT with effective teamlet functioning and dedicated administration support

# Why study PCP turnover?

### PACT Implementation

- Organizational change and role shifts may influence PCP turnover, at least in the short-term
- Lower PCP turnover may help mitigate PACT staffing barriers

### PACT Principles

- Patient-provider continuity is directly impacted by PCP turnover

### Administration

- Provider and job characteristics may predict turnover
- Turnover leads to significant recruitment costs

### Methodology

- We use VA administrative data to study provider behavior
- Complements insights gained from surveys and interviews

# Hypotheses

- At the overall system level, PCP turnover may be related to organizational changes
  - We examined the association between PACT implementation and PCP turnover at the national level using an Interrupted Time Series analysis
- At the individual level, PCP turnover may be influenced by economic incentives
  - We adjusted the PACT/turnover association for individual and local economic factors

# Data Sources (2003-2012)

- **VA Corporate Data Warehouse (CDW)**
  - Identified VA PCPs ('03 to '12) from [PCMM].[PatientProviders] table
  - ProviderRole = "PC ASSIGNMENT", TeamPurpose = "PRIMARY CARE"
  - Used RelationshipStartDate & RelationshipEndDate to establish PCP's assigned patients during a given quarter
  - Providers with no assigned patients during a given quarter defined as not in VA primary care workforce in that quarter
- **VA Personnel and Accounting Integrated Data (PAID)**
  - Quarterly PCP/job covariates: FTE status, Start of VA employment, etc.
  - Used to indicate whether a PCP worked during a given quarter
  - <http://www.herc.research.va.gov/publications/guidebooks.asp>

# Data Sources (2003-2012)

- **Medicare Wage Index for VA facilities (from HERC)**
  - Used to inflation-adjust provider annual FTE salary rates
  - If VA PCP salary-growth exceeds(lags) Medicare wage index growth, VA providers may have lower(higher) incentive to leave VA primary care
- **Market area unemployment (not healthcare specific unemployment)**
  - Proxy for changes in providers' non-VA employment opportunities
  - 23 VISNs comprise 81 geographic market areas
  - [http://vaww.pssg.med.va.gov/PSSG/geo\\_access/FY2011\\_Geographic\\_Access\\_Report\\_Final\\_22MAR13.pdf](http://vaww.pssg.med.va.gov/PSSG/geo_access/FY2011_Geographic_Access_Report_Final_22MAR13.pdf)
  - Market area unemployment is an average of included county unemployment rates (weighted by Veteran population)

## **Covariates From Data Sources (2003-2012)**

### **Position Covariates**

- End of quarter (EOQ) FTE salary
  - In 2003 dollars
  - Deflated using Sta5a Medicare wage index
- Tenure group=1 (vs. Tenure=0)
  - Reduction in Force priority
- Full-time (vs. Part-time)
  - Not hours worked in PC
- VAMC (vs. CBOC)

### **Provider Covariates**

- Gender
- Provider type (MD, NP, PA)
- Age (Under 45, 45 to 55, Over 55)
  - At EOQ
- VA experience
  - EOQ date – VA start date

### **Other Covariates**

- VA market area unemployment
- Sta3n dummy variables (Fixed effects)

# Longitudinal Sample Construction

- Observational period: FY2003-Q2 to FY2012-Q4, Quarterly frequency
- Assume PACT begins in April, 2010 (FY2010-Q3)



- Inclusion criteria: PCP has patients in [PCMM].[PatientProviders] during quarter
- Inclusion criteria: PCP has hours worked in PAID data during quarter (13,739 PCPs)



- Excluded residents identified in [CDWork].[Dim].[ProviderType]
- Excluded PCPs with Intermittent status in PAID data (1,765 PCPs)



- For PCPs in multiple facilities in same quarter (1,386 PCPs), included only longest-held
- Excluded PCPs with no covariate data (587 PCPs)

## Definition of Turnover Dependent Variable

- For each quarter, PCP is **“In Data”** if previous inclusion criteria are met
- Otherwise, PCP is **“Not In Data”**
- Turnover was defined by providers’ dropping out of longitudinal sample for **two or more consecutive quarters**
- Definition allows for leaves of absence (up to about 7 months of absence)
- Transfers between facilities (PCP to PCP) **are not considered turnover**
- Transfers within VA (PCP to Non-PCP) are considered turnover
- VA PCPs may turnover and later re-enter the sample
- Do not indicate reason for turnover

### Example of Dependent Variable

Quarter	PCP 1		PCP 2		PCP 3	
....	....		....		....	
FY06 Q2	In Data	0	In Data	0	In Data	0
FY06 Q3	In Data	0	In Data	0	In Data	0
FY06 Q4	In Data	0	In Data	1	Not In Data	
FY07 Q1	In Data	1	Not In Data		In Data	0
FY07 Q2	Not In Data		Not In Data		In Data	0
FY07 Q3	Not In Data		Not In Data		In Data	0
FY07 Q4	Not In Data		Not In Data		In Data	0
FY08 Q1	Not In Data		In Data	0	In Data	0
FY08 Q2	Not In Data		In Data	0	In Data	0
FY08 Q3	Not In Data		In Data	0	In Data	0
....	....		....		....	
	Turnover in FY07 Q1		Turnover in FY06 Q4 – Re-entry in FY08 Q1		No Turnover (Only 1 Qtr Absence)	

## Descriptive Statistics

	Pre-PACT FY03 Q2-FY10 Q2	Post-PACT FY10 Q3-FY12 Q2	P-Value* (Pre-Post difference)
<b>Quarterly Turnover Rate</b>			
All PCPs	3.06%	3.38%	P=0.001
MD (FT, Tenure group=1)	2.60%	3.14%	P<0.001
NP (FT, Tenure group=1)	3.33%	3.65%	P=0.160
PA (FT, Tenure group=1)	3.89%	3.87%	P=0.981
<b>Covariates</b>			
Female PCP - %(N)	50.9%	54.0%	P=0.001
MD Provider - %(N)	69.3%	69.7%	P=0.636
NP Provider - %(N)	20.8%	21.3%	P=0.528
PA Provider - %(N)	9.9%	9.1%	P=0.111

\*P-values determined from 1000 iterations of a block bootstrap process

## PACT Implementation and PCP Turnover

# Descriptive Statistics

	Pre-PACT FY03 Q2-FY10 Q2	Post-PACT FY10 Q3-FY12 Q2	P-Value* (Pre-Post difference)
<b>Covariates</b>			
PCP age under 45 - %(N)	29.7%	22.8%	P<0.001
PCP age 45-55 - %(N)	40.0%	35.3%	P<0.001
PCP age over 55 - %(N)	30.4%	41.9%	P<0.001
Years of experience	Mean=8.94	Mean=9.40	P=0.001
Salary index (Mean=1.0 in '03)	Mean=1.036	Mean=1.108	P<0.001
Tenure group=1 (vs. 0) - %(N)	88.6%	93.5%	P<0.001
Full-time salary (vs. PT) - %(N)	87.6%	88.9%	P=0.015

\*P-values determined from 1000 iterations of a block bootstrap process

## PACT Implementation and PCP Turnover

# Descriptive Statistics

	Pre-PACT FY03 Q2-FY10 Q2	Post-PACT FY10 Q3-FY12 Q2	P-Value* (Pre-Post difference)
<b>Covariates</b>			
VAMC (vs. CBOC) - %(N)	59.4%	52.9%	P<0.001
Market Unemployment rate	Mean=6.12	Mean=9.18	P<0.001
Provider-Quarter Observations	N=147,225	N=45,541	
Unique Providers	11,387		

\*P-values determined from 1000 iterations of a block bootstrap process

# Methodology: Interrupted Time Series

### Allow for secular trend in turnover rate: Upward/Downward/No Trend

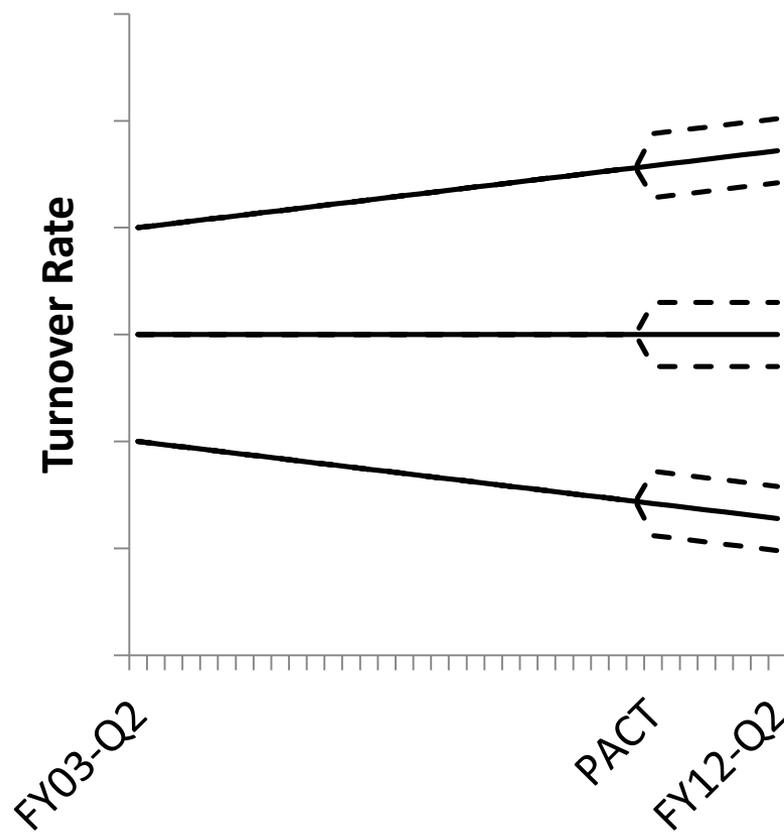
- Linear time trend explanatory variable

### Allow for change in turnover rate after PACT: Upward/Downward/No Change

- PACT Indicator explanatory variable
- = 0 prior to FY10-Q3 (April, 2010)
- = 1 on and after FY10 Q3

### Allow for seasonality in turnover

- Quarter-of-year indicator variable



# Methodology: Interrupted Time Series

### Allow for secular trend in turnover rate: Upward/Downward/No Trend

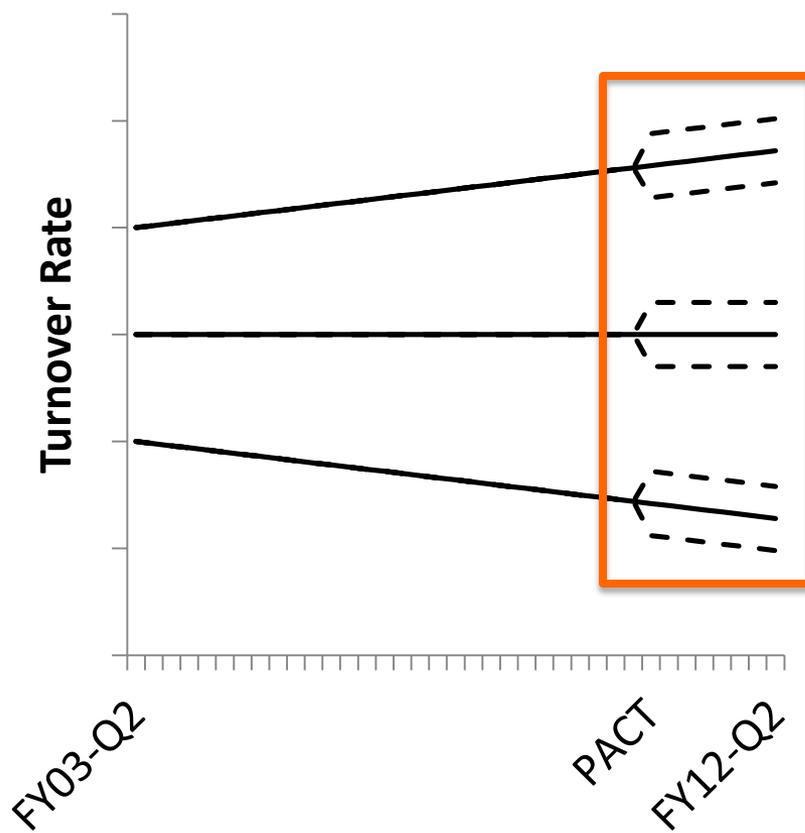
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## Logistic Regression: Statistical Notes

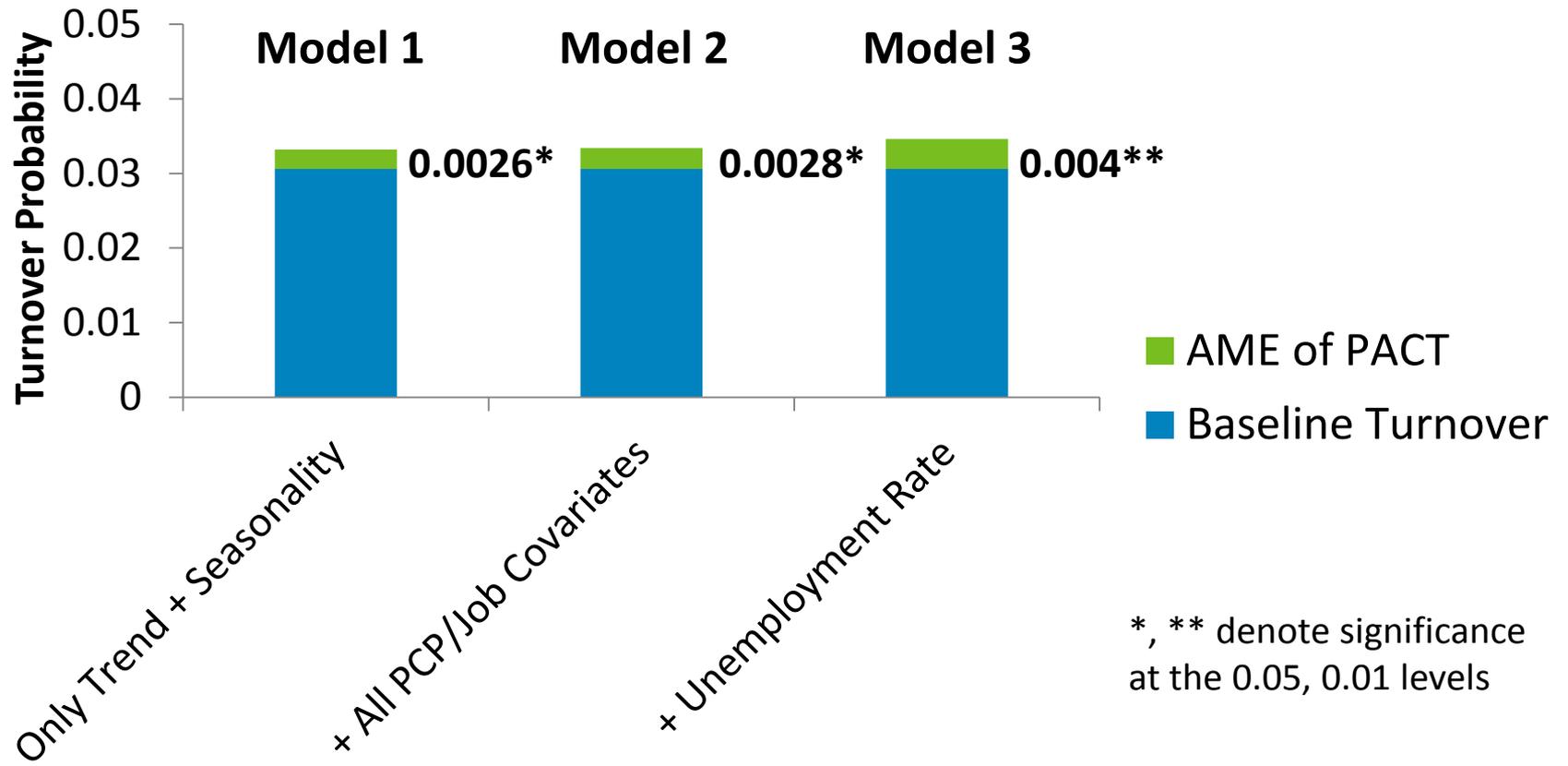
- Modeled the quarterly probability of PCP turnover using logistic regression
- Robust standard errors account for clustering at the PCP level (repeated observations)
- Sta3n dummy variables included in the model – fixed effects (500+ observations for all but 6 Stations)

# Logistic Regression: Average Marginal Effects

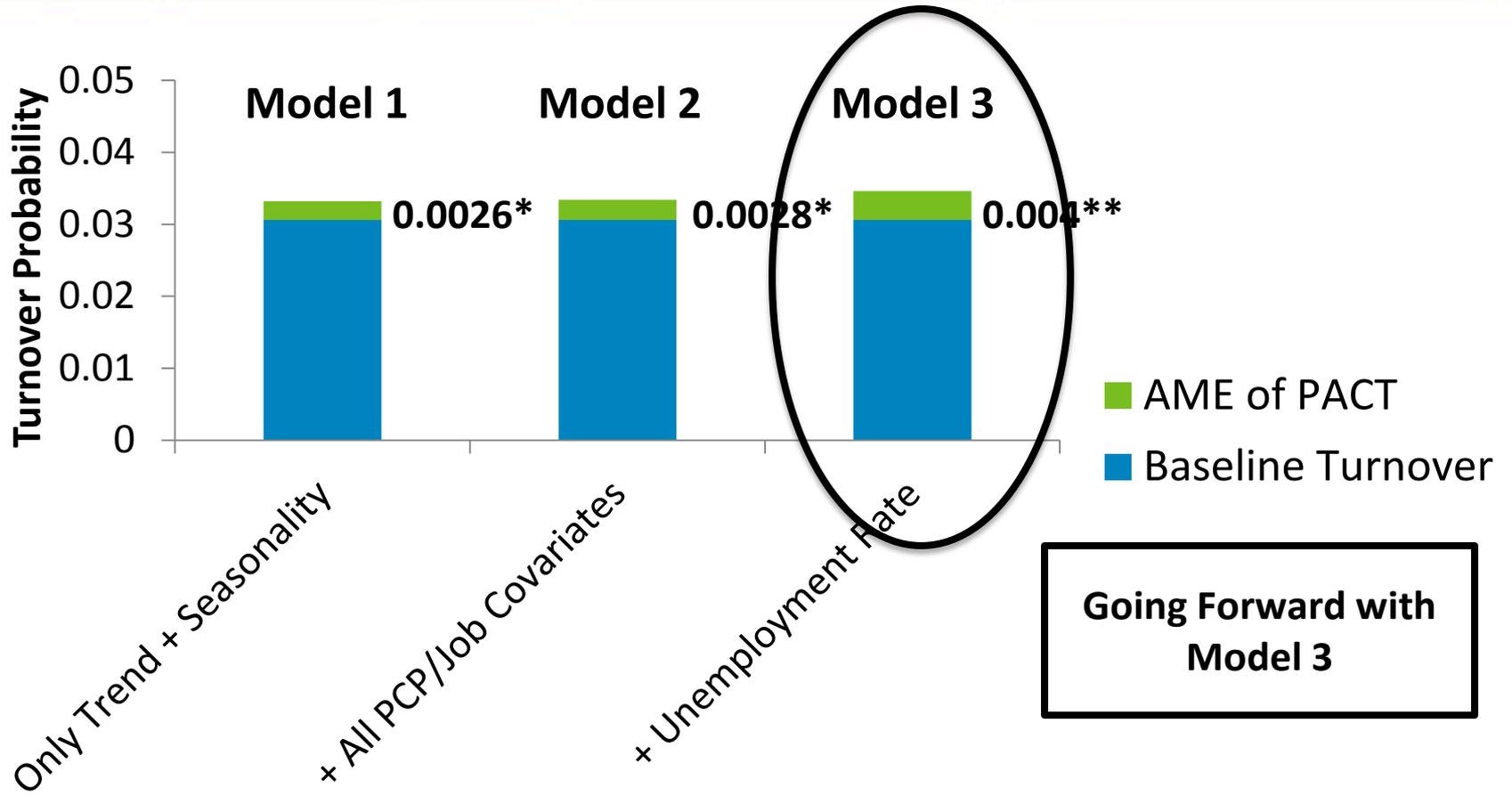
- Average Marginal Effects (AME) were calculated to estimate the association between explanatory variables and PCP turnover
  - “Effect” is misleading – cannot be interpreted as causal effect
  - AMEs reflect the change in turnover probability associated with a one unit change in an explanatory variable
- $\text{Prob}_{\text{NP}}=0.05 - \text{Prob}_{\text{MD}}=0.045$   
→  $\text{AME}_{\text{NP}}=0.005$

AME	X% increase in risk of turnover (Assume 3% baseline turnover)
0.002	6.67%
0.004	13.33%
0.006	20.0%
0.008	26.67%

# Association between PACT and Turnover



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## Association between PACT and Turnover

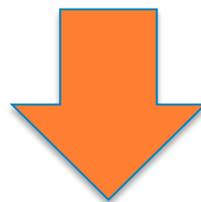
**Broad economic conditions may influence conclusions drawn from policy evaluations**



**Elevated unemployment roughly coincident with PACT**



**Suppose a small increase in turnover observed after PACT**

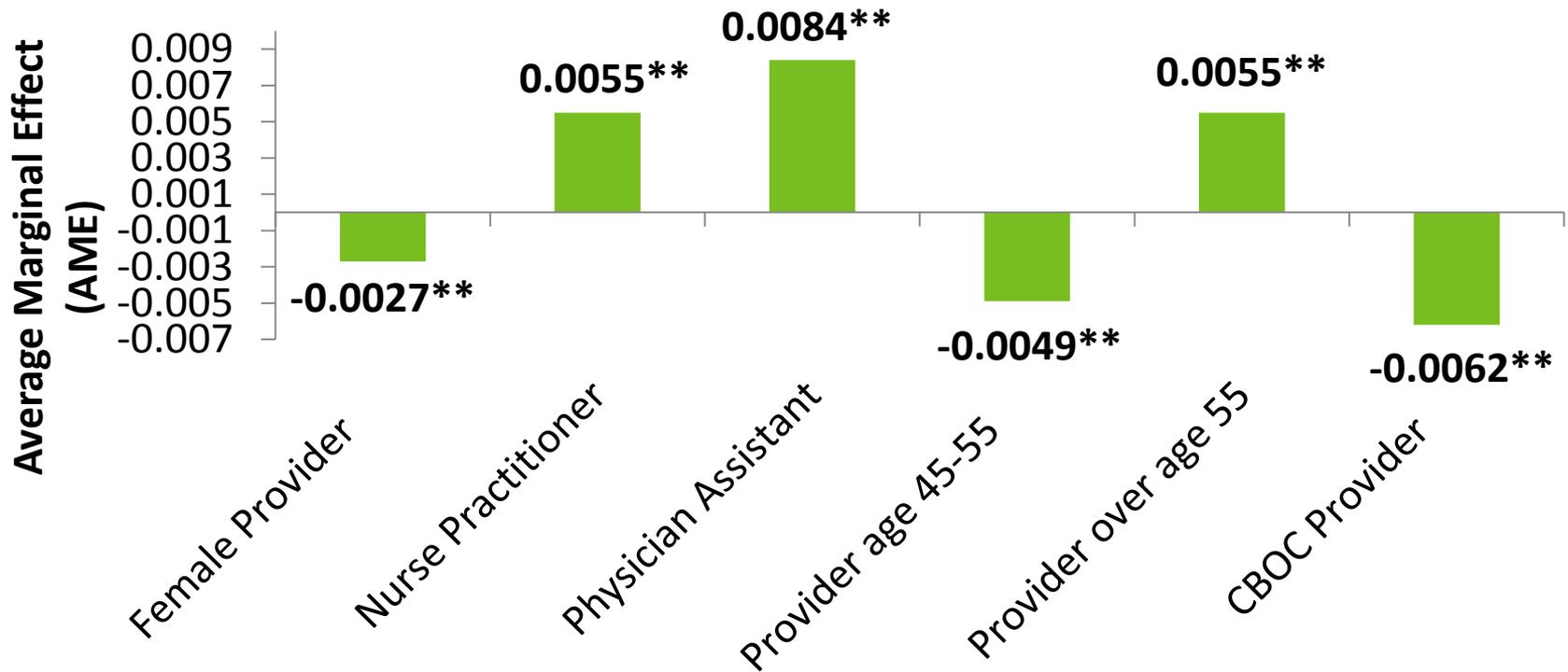


**Historical unemployment-turnover relationship predicts reduction in turnover**



**Greater estimated association between PACT and turnover**

# Factors associated with baseline PCP Turnover



\*, \*\* denote significance at the 0.05, 0.01 levels

## Other Covariates

Covariate	Average Marginal Effect (AME)	Standard Error
Linear time trend	0.0002**	(<0.0001)
VA experience (in Quarters)	-0.0001**	(<0.0001)
Salary (\$1000s of '03 dollars)	-0.0001*	(<0.0001)
Unemployment Rate	-0.0011**	(0.0003)
Tenure group=0 (vs. Tenure group=1)	0.0108**	(0.0014)
Part-time employee (vs. Full-time)	0.0073**	(0.0014)
FY-Q2 (Jan-Mar) (vs. Q1)	-0.0035**	(0.0012)
FY-Q3 (Apr-Jun) (vs. Q1)	-0.001	(0.0012)
FY-Q4 (Jul-Sep) (vs. Q1)	0.0062**	(0.0011)

\*, \*\* denote significance at 0.05, 0.01 levels

## PACT/Turnover Association and PCP Characteristics

- Included interaction term between PACT indicator and PCP characteristics
- Distinct PACT/turnover association for each PCP group

PCP Group	AME of PACT	95% Confidence Interval	Significant Difference
Male PCP	0.0061	(0.0024 , 0.0098)	<b>No</b>
Female PCP	0.0024	(-0.0009 , 0.0057)	

MD PCP	0.0048	(0.0017 , 0.0079)	<b>No</b>
NP PCP	0.0030	(-0.0021 , 0.0081)	
PA PCP	0.0014	(-0.0057 , 0.0085)	

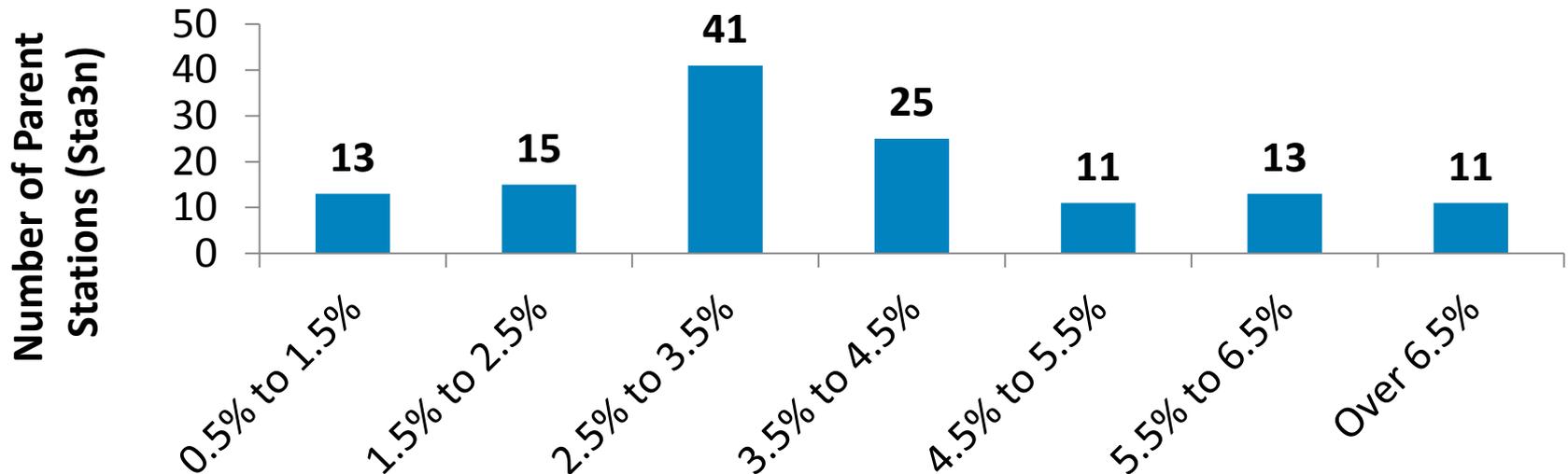
# **PACT/Turnover Association and PCP Characteristics**

<b>PCP Group</b>	<b>AME of PACT</b>	<b>95% Confidence Interval</b>	<b>Significant Difference</b>
Age under 45	-0.0008	(-0.0049 , 0.0033)	<b>45-55 AME &gt; Under 45 AME</b> <b>Over 55 AME &gt; Under 45 AME</b>
Age 45-55	0.0046	(0.0011 , 0.0081)	
Age over 55	0.0069	(0.0026 , 0.0112)	

5 yrs VA experience	0.0019	(-0.0012 , 0.0050)	<b>20 Years AME &gt; 5 Years AME</b>
10 yrs VA experience	0.0051	(0.0022 , 0.0080)	
15 yrs VA experience	0.0080	(0.0047 , 0.0113)	
20 yrs VA experience	0.0106	(0.0065 , 0.0147)	

# Post-PACT PCP Turnover: Sta3n-level Variation

## Distribution of Post-PACT Turnover at Sta3n-level (CBOCs rolled up to Sta3n-level)



Average Quarterly PCP Turnover Rate (FY10-Q3 to FY12-Q2)

# Limitations

- No control group of VA facilities since PACT is a system-wide initiative
  - Analysis does account for pre-existing turnover trend back to '03
- Measure of turnover is imperfect (inferred from sample dropout)
- Does not account for turnover reason (resignation, retirement, etc.)
- Healthcare specific unemployment would be a better proxy for PCP employment opportunities than overall unemployment rate

# Conclusions

- At the national level, PACT was associated with a small but statistically significant increase in PCP turnover
  - Model prediction: Suppose 7,000 VA PCPs \* 0.004 PACT AME \* 8 Post-PACT quarters → Implies 224 additional PCPs leaving VA primary care
- PACT/turnover association was significantly greater for older and more experienced providers
- PCP characteristics were significant predictors of baseline turnover (e.g., higher baseline turnover for NPs and PAs compared to MDs)
- Variation in Post-PACT PCP turnover rate at the Sta3n-level

# Questions?

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