

# Medication Adherence in Chronically Ill Veterans: Copayments, Other Potential Barriers, and Health System Factors to Potentially Mitigate Cost Burdens

**John E. Zeber, PhD MHA**

Co-director, Health Outcomes Core

Center for Applied Health Research

*Scott & White Healthcare* (Temple, TX)

Investigator, *Department of Veterans Affairs*

Associate Professor, *Texas A&M Health*

*Science Center College of Medicine,*

Departments of Medicine & Psychiatry

# Medication Adherence in Schizophrenia: Impact of Copayments



VA Center for Practice  
Management & Outcomes Research  
Health Services Research & Development



University of Michigan  
Department of Psychiatry

Zeber JE, Grazier KL, Valenstein M, Blow FC, Lantz PM (2007), *American Journal of Managed Care*, 13(6):335-46

# Introduction

- 40-50% of patients with serious mental illness (SMI) are poorly adherent
- Severe ramifications & costs (symptom exacerbation, ↑ risk of ER, re-admissions, treatment \$\$)
- Widespread issue: Medicaid, managed care, Medicare, VA, other health systems
- Intriguing measurement or definition issues



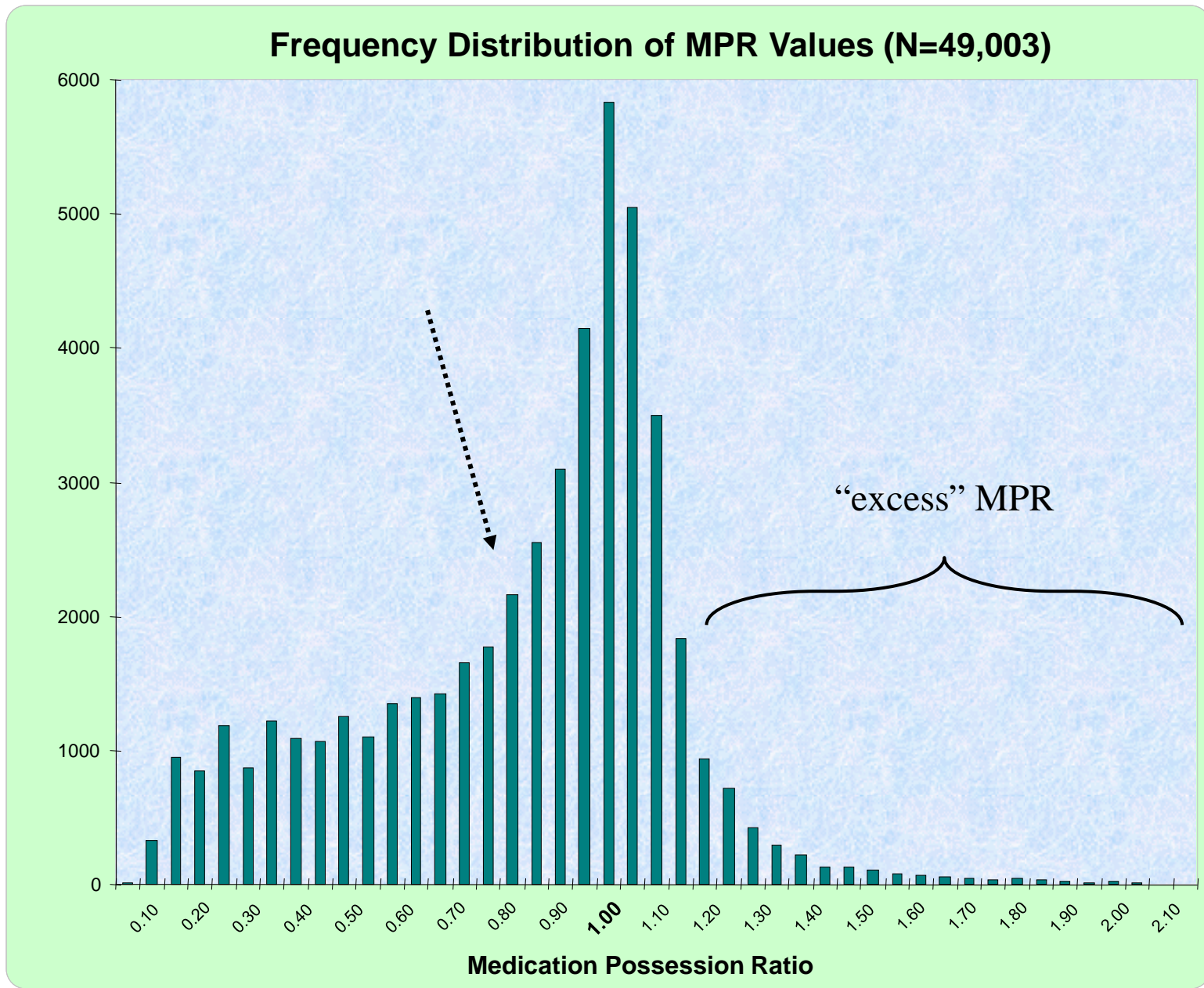


Figure 1: from Valenstein et al., *Schizophrenia Bulletin* (2004), 30(2): 255-64

# Adherence and Rate of Psychiatric Admission

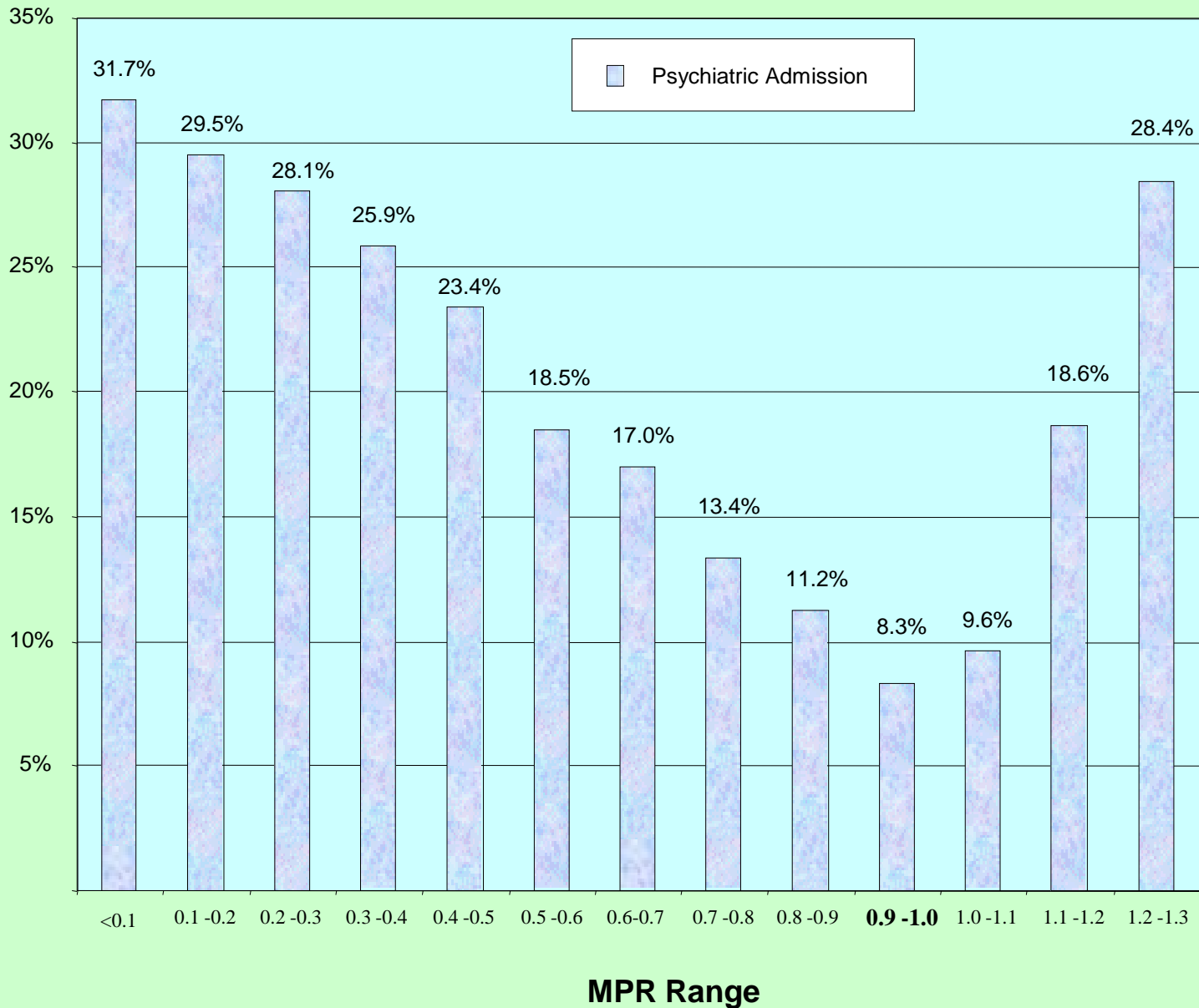


Figure 2: from Valenstein et al., Medical Care (2002), 40(8):630-9

# Study Background

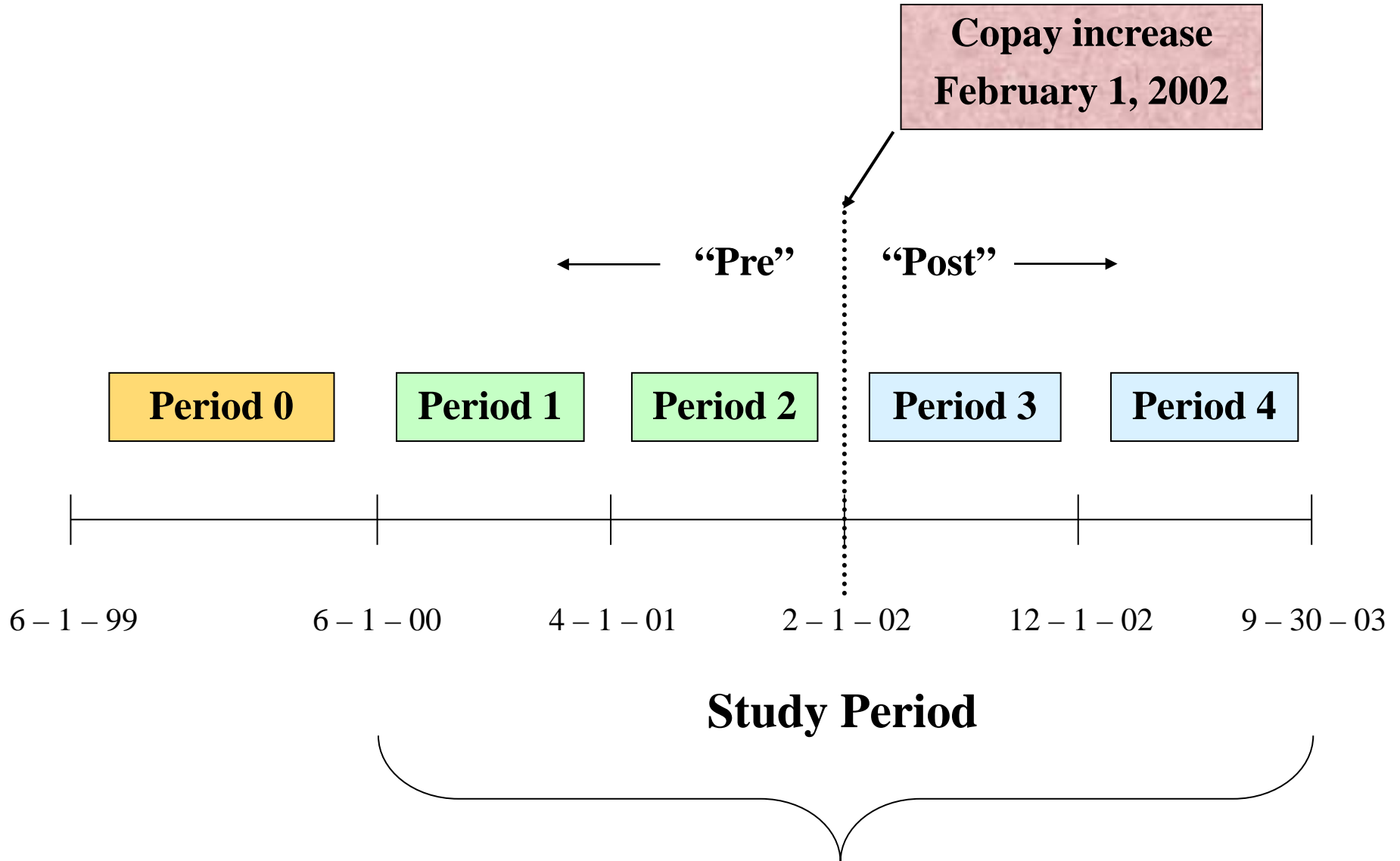
- Rising pharmacy costs (national & VA)
- Medication restriction due to cost
- Numerous other risk factors (aside from cost)
- Variety of medication copayment plans
- 17-second history of VA copayments
  - \$2 in 1990 → \$7 in 2002 (now \$8 or \$9)

# Effect of Copayments on Utilization

*(hint: mostly negative)*

- Health Services Utilization (outpatient, hospital, ER)
  - RAND, Group Health (psychiatric), others
- Pharmacy Utilization (many studies – few targeting mental health: see Soumerai et al.)
  - reduced utilization
  - differential effects of copays / cost-sharing
    - ◆ ethnicity, elderly, sicker patients, lower SES

# Study Design & Exclusions





# Data Source & Study Groups

- Administrative DX of schizophrenia ( $T^0$ ) per the National Psychosis Registry (SMITREC)
- Patient groups
  - Groups 1 & 2 = “**Copay**” (non-service connected 0-49%)
  - vs
  - Group 3 = “**Exempt**” ( $SC \geq 50\%$ )
- Multivariable longitudinal random effects models

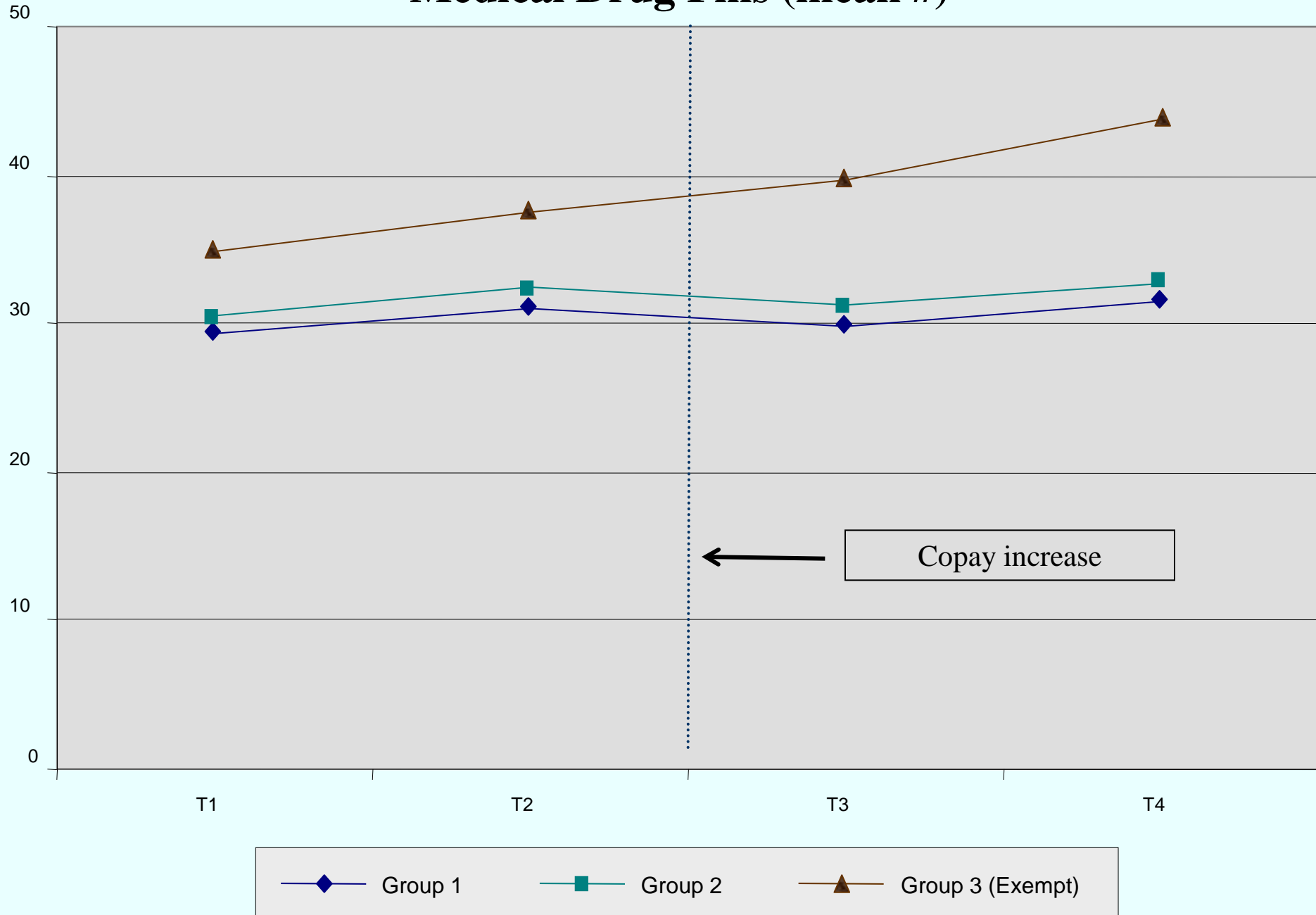
# Primary Outcomes

- Pharmacy utilization (30-day fills)
  - total, medical, psychiatric
- Health Services Utilization
  - total psychiatric days & total outpatient visits
- Costs from VA perspective
  - total pharmacy

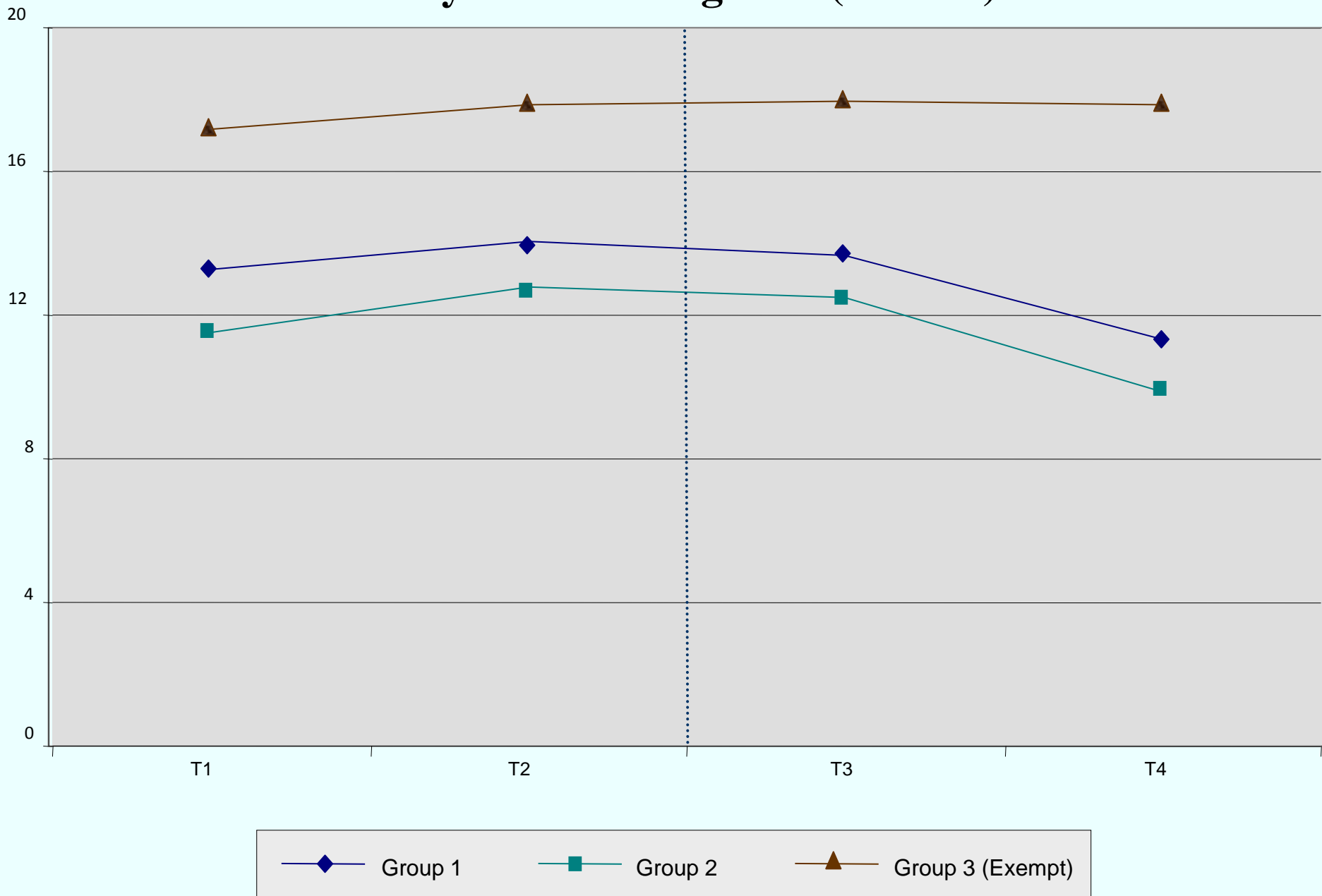
# Results: Descriptive Statistics

- final sample = **80,668** ~ 50% “Exempt”
- overall means:
  - age = 52.8; women = 5.3%; minority = 36.8%; # of comorbidities = 1.97
- bivariate analysis: (baseline)
  - Groups 1 & 2 healthier, ↓utilization, less VA tenure
  - Group 2 somewhat distinct from non-SC Group

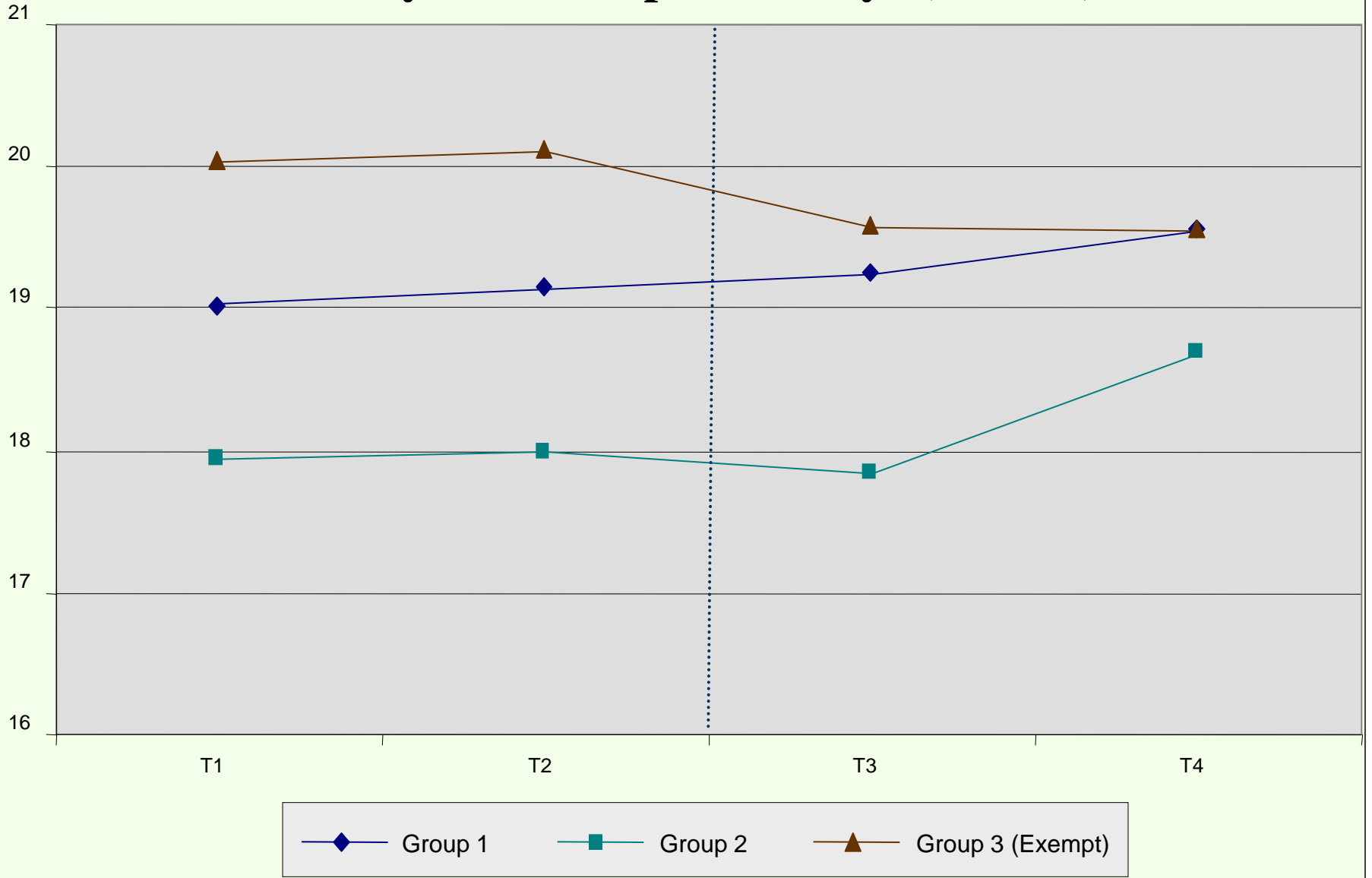
# Medical Drug Fills (mean #)



# Psychiatric Drug Fills (mean #)

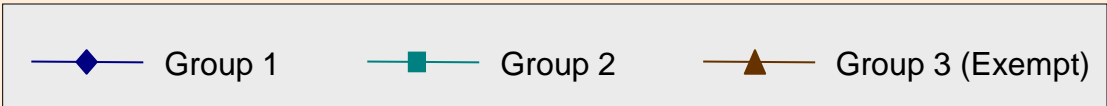
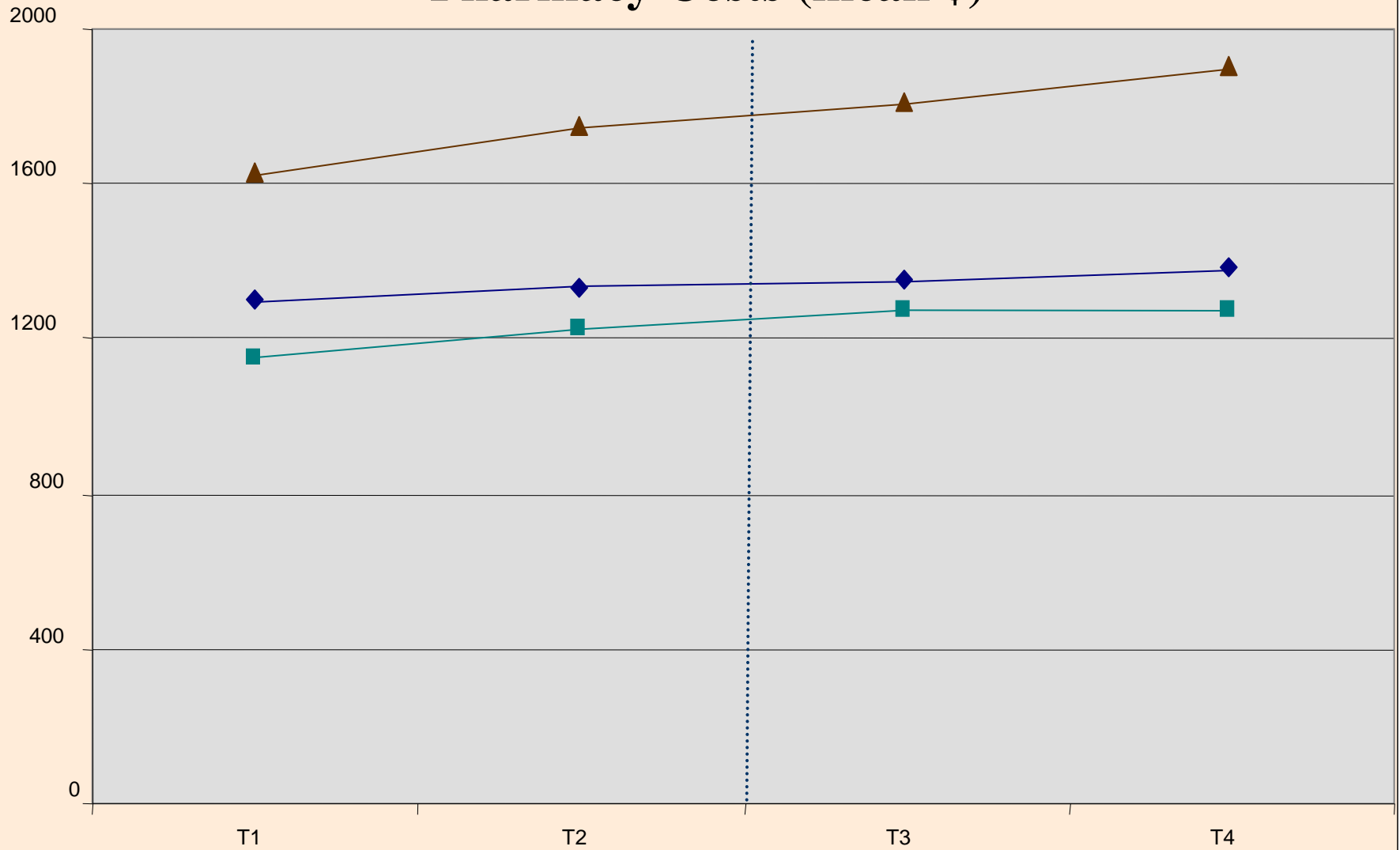


# Psychiatric Inpatient Days (mean #) \*



\* among those patients with *any* admission

# Pharmacy Costs (mean \$)



# Discussion

- Hypotheses & Interpretation of Results
- Theoretical Context
  - Adherence / Utilization: Role of Health Beliefs
  - Equity Issues & VA mission
- VA cost savings, generalizability, limitations
- Copayment increase: “Success”?
  - cost-effectiveness vs. mission vs. philosophy
  - other cost-sharing options?
- Veterans as vulnerable population
  - unique patients with schizophrenia
  - other complex medical or psychiatric conditions



# Ethnicity, Copayments, and Differential Cost-Related Burdens



Zeber JE, Copeland LA, Miller AL, Kilbourne AM, Velligan DI. [abstract presented at 2008 ISPOR meeting, Toronto]

# Study Summary

- Sub-analysis and enhanced study design approach (4 ethnic groups, 22 time periods)
- Findings: all groups restricted psychotropics as before (16-22%)
- However, African-Americans and Hispanics experienced far greater ramifications (e.g., IP days, ER visits)
- Summary: differential burden of medication cost, equity issues

# A Cost-Benefit Analysis of Changing Pharmacy Benefit Policy

Zeber JE, Leykum L, Valenstein M,  
Copeland LA, Miller AL. [abstract to be  
presented at the 2009 HSRD meeting and  
2011 Mental Health Economic Policy  
meeting, Venice, Italy]

# Introduction & Objective

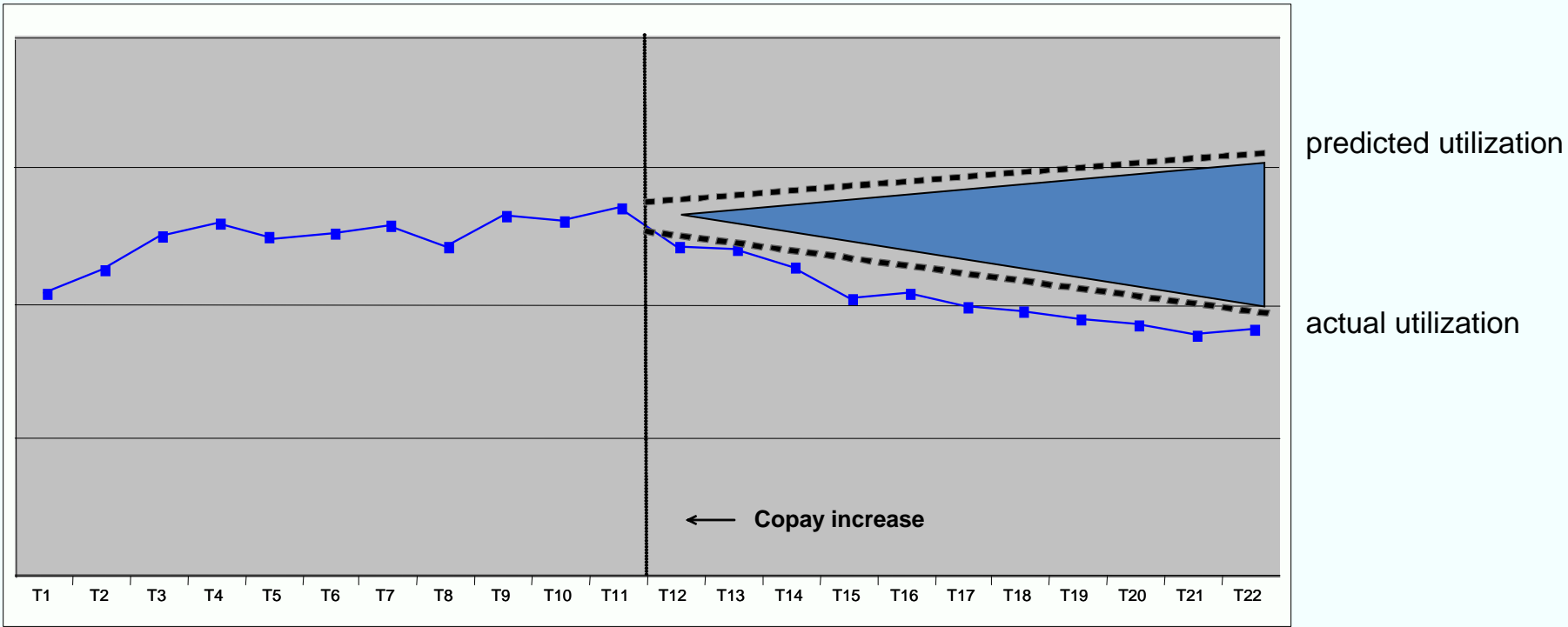
- little work done in mental health
  - increasing HSR&D research into the adverse effect of medication copayments
    - Wang, 2011; Maciejewsky, 2010; Doshi, 2009; Stroup, 2007
- \* From the VA's perspective, what are the cost-offset policy implications of ↑ copayments, balancing additional copayment revenue with extra treatment costs?**

# Methods

- all Copayment veterans with SCH in FY99 (N=33,431)
- Apr 1999 – Sept 2005 with 22 quarterly time points
- pharmacy fills, psychiatric IP and total ER utilization, along with **total costs**

additional copayment revenue  
+  
cost-related ↓ psychotropic fills

vs. ↑ Inpatient and ER costs



## ■ Analysis:

- Microsoft Office™ statistical package & sophisticated program coding: + (“plus”, etc.), -, /, ... Σ
- primary analysis focused on POST-policy utilization & costs
  - \$\$ adjusted to 1999 medical CPI

■ Sensitivity: ER \$\$ estimation, Δs attributable to policy ↑

# Results

## ■ **Cost-offset calculation:**

|                                        |                        |
|----------------------------------------|------------------------|
| ➤ additional copay revenue:            | + \$15.62 million      |
| ➤ reduced psychotropic pharmacy costs: | + \$ 2.94 million      |
| ➤ higher IP costs:                     | - \$18.85 million      |
| ➤ higher ER costs:                     | - \$1.83 million       |
| ➤ <b>TOTAL:</b>                        | <hr/> - \$2.12 million |

**~\$771,000 annualized loss**

# Discussion

- 2002 benefit  $\Delta$  = clinical & budgetary implications
- Current study reflects only 0.6% of all VA patients
- Study period does not include 2006 → or future copayment increases
  - Other economic or resource costs?
- Concerns about “silo mentality” in cost savings



# Medication Adherence, Ethnicity, and Multiple Psychosocial & Financial Barriers in Veterans with Bipolar Disorder

subtitle: “*A young(ish) researcher’s slow but inexorable journey towards self-realization*”

Zeber JE, Miller AL, Copeland LA, McCarthy JF, Zivin K, Valenstein M, Greenwald D, Kilbourne AM. *Administration & Policy in Mental Health / Mental Health Services Research* (2011).

# Introduction

- Patients face multiple barriers to adherence, yet the cumulative effect and interaction often not examined
- **Psychosocial factors:** personal, environmental, & cultural context
- Burden of **financial barriers:** income, copayments
- Involves complex interactions across diverse population
- Certain individuals experience inequitable burdens of these barriers: elderly, multiple conditions, minorities

# Psychosocial Barriers

- Diverse matrix of health beliefs, TX preferences & care-seeking, social or environmental support, perceptions
- Fortunately many interventions have proven successful:
  - cognitive behavioral therapy (low insight)
  - blister-paks (M Valenstein)
  - cognitive adaptive training (environmental instability)
  - family sessions or motivational therapy
  - patient-centered care / CCM
  - health benefit policies

- **Our prior work with this dataset & population:**
  - **Therapeutic alliance** <sup>1-3</sup>
  - **Medication Beliefs** <sup>4</sup>
  - **Access to care** <sup>5-6</sup>
  - **Complementary and Alternative Medicine (CAM)** <sup>7</sup>
- **Objective: Explore panoply of potential barriers, reconcile TX preferences, provider goals, → design tailored interventions**

<sup>1</sup> - Zeber JE et al. (2008), *Jour Affec Disord*; <sup>2</sup> - Perron BE et al. (2009), *JNMD*; <sup>3</sup> - Ilgen MA et al. (2009), *Jour Affec Disord*; <sup>4</sup> - Copeland LA et al. (2008), *JNMD*; <sup>5</sup> - McCarthy JF et al. (2010), *Psych Serv*; <sup>6</sup> - Zeber JE et al. (2009), *AJPH*; <sup>7</sup> - Kilbourne AM, et al. (2007), *Psychopharm Bull*

# Methods

- All variables and survey data from CIVIC-MD study (PI – Kilbourne)
- Large population-based study examining quality of care provided to veterans with bipolar disorder (N=435)
- Self-reported measures of medication adherence and perceived barriers
- Primary outcome: two definitions of adherence
  - **Morisky** scale – intrapersonal barriers (2+ = non-adherence)
  - **No Missed Days**, in past 4

# Adherence Barriers

## ■ Financial

- Income (<\$20,000)
- Ever restricted treatment due to cost
- Medication copayment (service connection <50%)

## ■ Psychosocial

- Difficulty accessing a mental health specialist
- Poor therapeutic alliance (HCCQ  $\leq 25$ )
- Low medication insight (med-perspective  $\leq 7$ )
- Binge drinking
- Live alone
- Travel 50+ miles to VA care

\* Side effects? sadly not available ...

[Zeber JE et al. (2010), *Ann Pharmacother*]

# Analysis

- Bivariate analysis examined association between the 9 barriers → adherence; 5 selected for final models
- Logistic regression predicted poor adherence
- Covariates = ethnicity, age, some college, homeless, any affective symptoms
- two separate models
  - 1) adherence = total # of barriers + covariates
  - 2) adherence = barrier<sup>1</sup> + ...barrier<sup>5</sup> + covariates

# Descriptive & Bivariate Results

## ■ Non-adherence rates:

- Morisky = 46%; No missed days = 27%
- mean # of barriers = **2.8**; 20% experienced >4

## ■ Specific barriers (“yes”):

- low income = 58%; forego TX = 13%; copay = 59%
- **access to specialist = 18%; poor alliance = 18%; low medication insight = 14%; binge drinking = 22%;**  
live alone = 35%; **>50+ to TX = 16%**

## ■ Ethnic differences: low income, access to MH specialist, binge drinking



# Multivariable Models

## ■ Model #1:

- OR=1.29 per Morisky barrier
- key covariates: affective symptoms (1.95), other race (2.25)

## ■ Model #2:

- insight (2.41), binge (1.95), specialist access (1.73)
- covariates = affective symptoms (1.76)

## ■ Ethnicity \* barrier interaction models

# Discussion

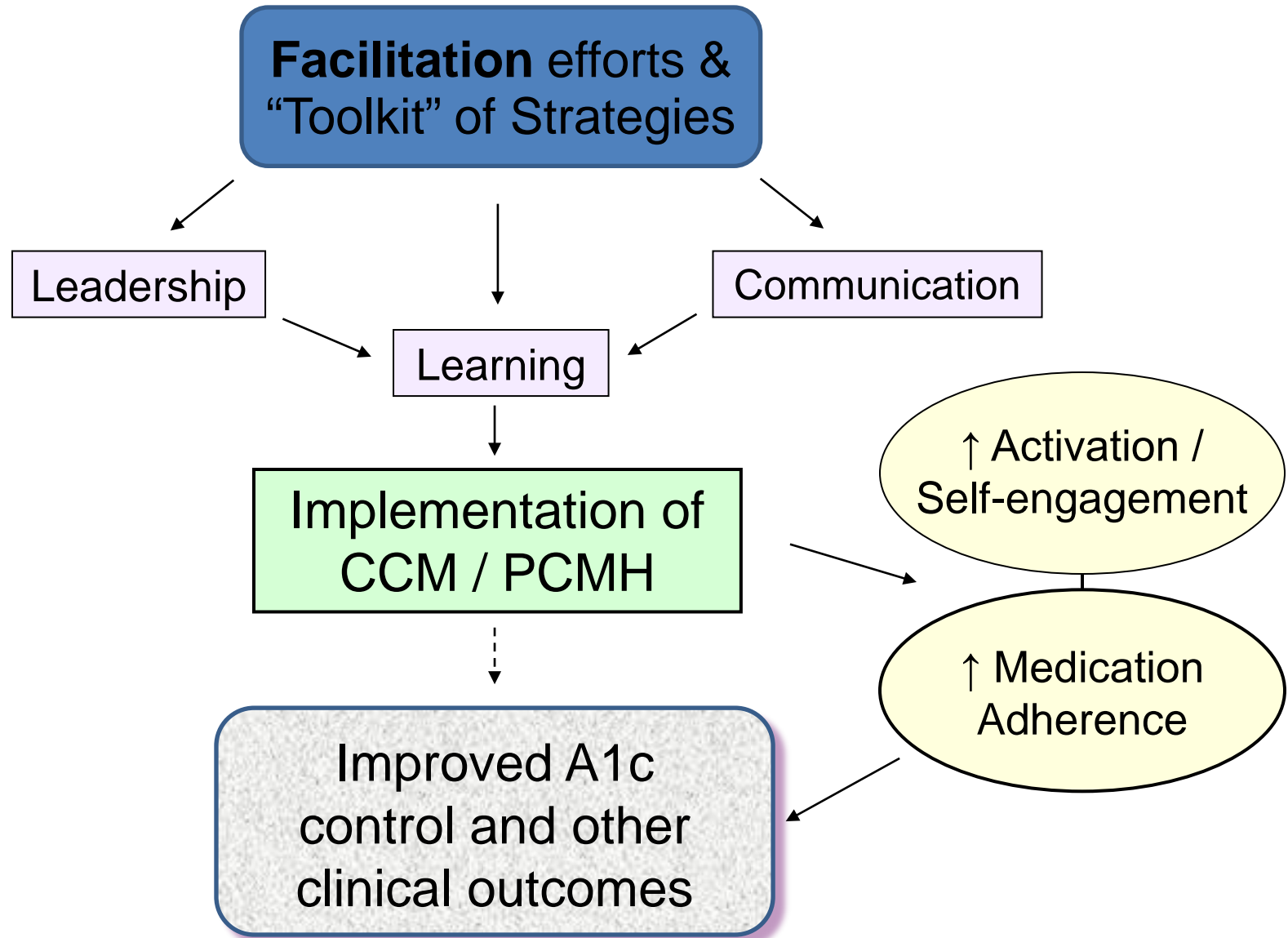
- Patients experience numerous barriers, with # and type associated with medication adherence problems
- Significant barriers include insight, substance abuse, and access, but also affective disorder symptoms
- Ethnic differences were observed here - more work needed to understand importance & interaction effects
- Financial barriers (e.g., copayments) not as significant
- Results support designing tailored interventions to improve adherence, recognizing patient-level burdens

# Medication Adherence in Patients with Chronic Illnesses: The Role of Provider and Organizational Factors

# Project(s) Summary

- **Chronic Care Model → A1c / CAD risk (Parchman – PI)**  
NIH / NIDDK Grants #R34 DK067300 and R18 DK075692
- **Pilot study (5 clinics) and larger project (40 clinics)**
- **Goal: facilitate delivery of diabetes care to improve intermediate clinical outcomes**
- **Education efforts directly targeting outcomes often less successful**
- **However, elements of the Chronic Care Model (CCM) offers potential benefits**

# ABCs: a conceptual model



# ABCs Pilot Study (n=157, 5 clinics)

- **Risk of Coronary Artery Disease in Type 2 Diabetes and the Delivery of Care Consistent With the Chronic Care Model in Primary Care Settings**

Parchman ML, JE Zeber, Romero R, Pugh JA  
(2007), *Medical Care*, 45(12):1129-34

- **Participatory Decision Making, Patient Activation, Medication Adherence, and Intermediate Clinical Outcomes in Type 2 Diabetes**

Parchman ML, Zeber JE, Palmer R (2010),  
*Annals of Family Medicine*, 8(5):410-7

# Therapeutic Alliance and Adherence

- Participatory Decision Making, Therapeutic Alliance, Perceived Drug Costs & Clinical Outcomes in Diabetes

Objective: Examine association between dimensions of the therapeutic alliance, perceived drug costs, and medication adherence

Zeber JE et al. [abstract presented at 2009 HSR&D meeting]

- **Measures:**

- patient engagement / self-activation (Lorig); physician level of patient-centered care (Kaplan); cost-related medication restrictions (Piette)

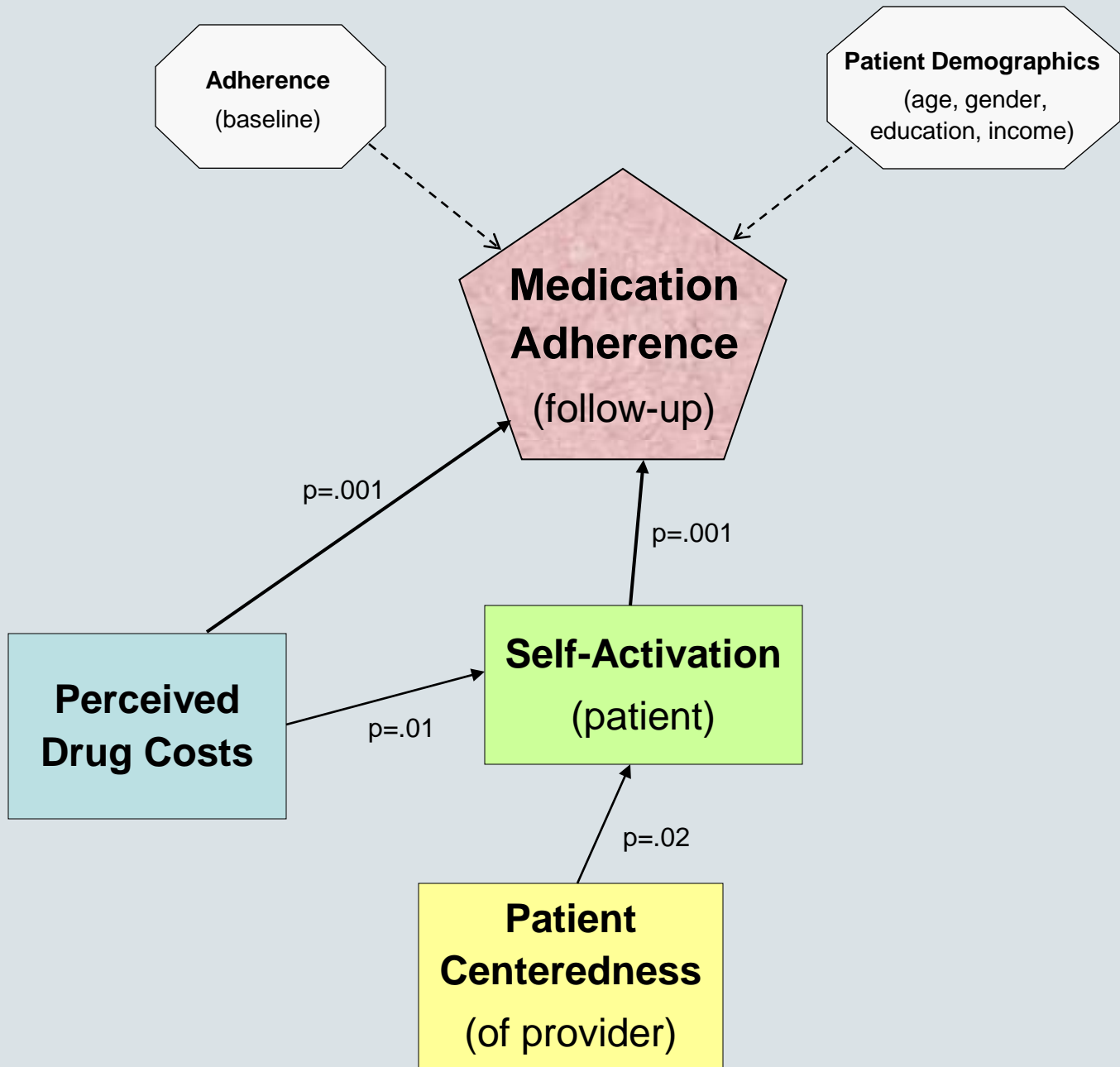
- **Main Outcome / Analysis: medication adherence (Morisky) with structural equation model**

- **Results:**

- SEM model: direct inverse relationship between **cost burden** → **adherence**; **patient-centeredness** associated with **self-activation**, which then positively influenced medication adherence; **self-activation** mediated **cost** issues

- **Efforts to improve the therapeutic alliance can improve adherence & clinical outcomes**





# ABCs Full Study (n=2400, 40 clinics)

## ■ Numerous projects, including a couple on adherence

“Impact of the chronic care model on medication adherence when patients perceive cost as a barrier”

Mackey K, Parchman MP, Leykum LK, Lanham HJ, Noel PH, Zeber JE.  
in press, *Primary Care Diabetes*

- 40 clinics, n = 1,823 with a chronic health condition
- nested random effects models
- patient perceptions of chronic care delivery associated with cost-related adherence problems
- patients with intermediate adherence benefitted most from ↑ CCM

# Cost-Related Medication Adherence and Patients' Experience with the Chronic Care Model

“The communication and coordination of scattered fragments of knowledge is perhaps the basic problem of any society.” - Thomas Sowell

Zeber JE et al. [abstract presented at 2010 Academy Health meeting; manuscript in preparation]

# Objectives / Methods

## **Aims:**

- 1) Examine association between patients' experience of the CCM and reported cost-related adherence burden

**ABCs project:** Foster CCM / PCMH implementation in small community clinics and ↓ risk factors for diabetes complications

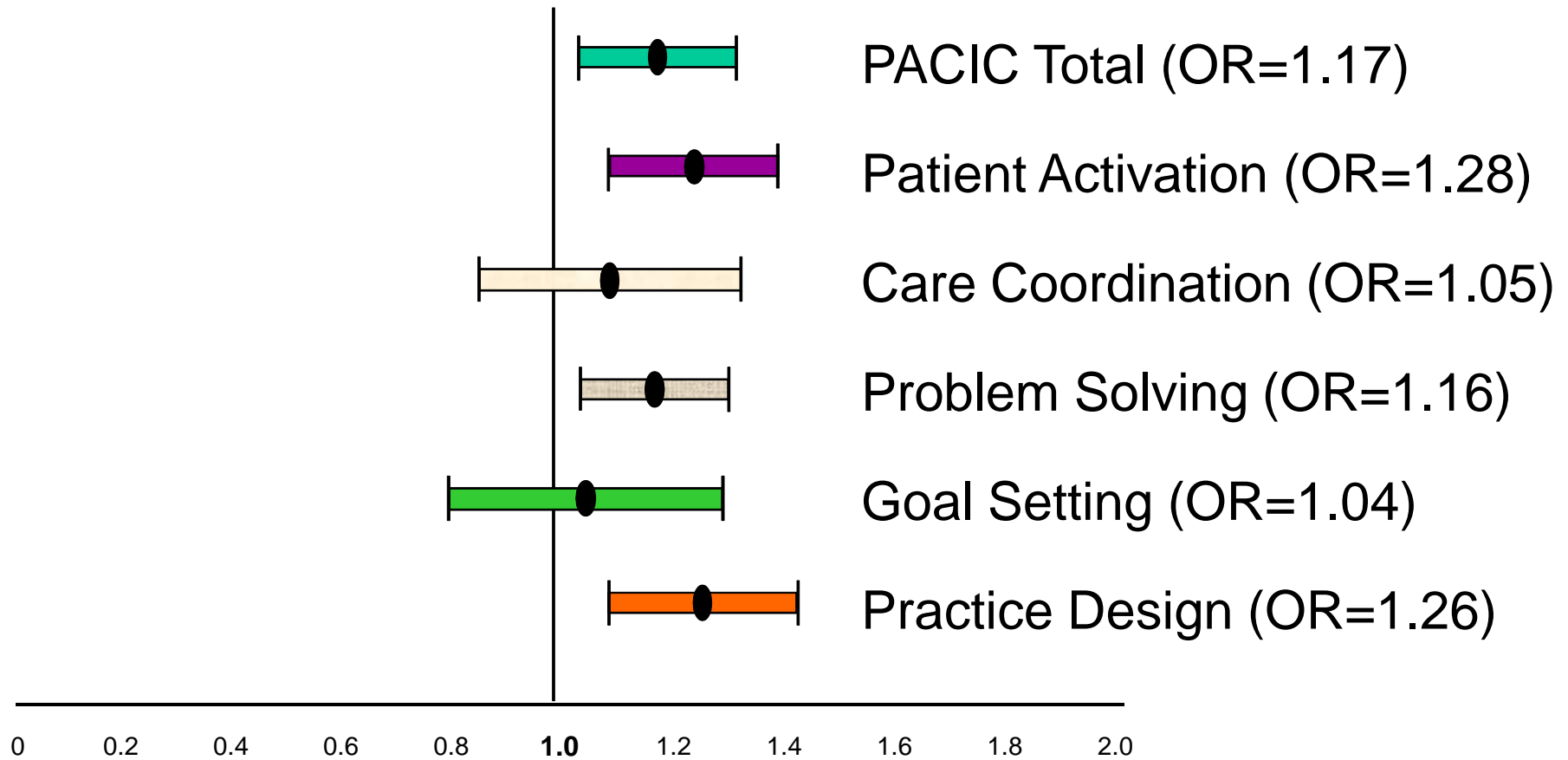
**A** = A1c      **B** = Blood pressure      **C** = Cholesterol

- **Population Studied:** Patients with chronic medical illness at 40 primary care offices in South Texas
- Initial intervention group (20) and delayed control group (20)
- Complex study: observations, facilitation sessions, provider and staff interviews, patient surveys, chart reviews, dissemination
- For this study, we utilized patient survey data only (n=60 per clinic)
- **Measures & Analysis:**
  - **Cost-related adherence burden (CRAB)** was measured with a 5-item scale, higher scores reflect more medication restrictions
  - **Patient Assessment of Chronic Illness Care (PACIC)** - 20-item instrument assessing perceptions of primary care treatment; higher values = care more consistent with CCM
  - Random effects models controlled patient nesting, demographics

# Results

- To date, 1368 patients completed baseline surveys
- Patient characteristics: age = 50.1 years; 65% women, ~50% Hispanic; overall self-reported health status good
- poor adherence = 45% and ~30% with cost-related problems
- CRAB mean = **1.50** (*sd* 0.8), total PACIC mean = **3.02** (*sd* 1.2)
- Multivariable models
  - CRAB was inversely associated with total PACIC score (OR = 1.17)
- also, higher subscales scores for:
  - patient activation (OR = 1.28), problem solving (OR = 1.16), and practice design (OR = 1.26)

# Figure 1: Multivariable Model Predicting No CRAB



Odds Ratio (OR) – per point change in PACIC score

\* models controlled for age, gender, ethnicity, and education

# Discussion

- Patients experiencing care more consistent with the CCM had lower cost-related burden
- Being actively involved in clinical decisions and provided information about their care → added benefits
- \*\* Efforts to develop highly activated, involved patients can help mitigate ramifications of financial pressures
- Community providers should better recognize and discuss medication cost burdens while focusing efforts in accordance with chronic care treatment delivery



# Other Thoughts and Next Directions

- adherence interventions are often not cost effective

[Elliott RA, Barber N, Horne R. (2005) Ann Pharmacother 39 (3), 508–515]

- however, room for optimism and CCM efforts fit nicely into VA patient-centered goals (PACT)

- Next steps:

- HSRD 2012 meeting abstract (adherence instability)
- sub-group analysis re: CCM effects
- merit grant of modern technologies (cell phones)
- data from Learn & Relate study (J Pugh – PI)
- potential use of HMORN data for cross-system analysis

# Contact Information

**John E Zeber, PhD**  
(254) 215-9877

[jzeber@swmail.sw.org](mailto:jzeber@swmail.sw.org)  
[john.zeber@va.gov](mailto:john.zeber@va.gov)



**CENTER FOR  
APPLIED HEALTH RESEARCH**



SCOTT & WHITE  
Healthcare



Department of  
Veterans Affairs



TEXAS A&M  
HEALTH SCIENCE CENTER