Prescriber Level Variation in Potentially Inappropriate Medication Use in Medicare Part D Beneficiaries

Holly M. Holmes, MD, UT MD Anderson Cancer Center

James S. Goodwin, MD, UT Medical Branch, Galveston

(Channel 41)

INFORMATION NOT RELEASABLE TO THE PUBLIC UNLESS AUTHORIZED BY LAW:
This information has not been publicly disclosed and may be privileged and confidential. It is for internal government use only and must not be disseminated, distributed, or copied to persons not authorized to receive the information. Unauthorized disclosure may result in prosecution to the full extent of the law.

Disclosure

“Dr. Holmes and Dr. Goodwin declare no conflicts of interest or financial interests in any product or service mentioned in this presentation, including grants, employment, gifts, stock holdings, or honoraria.”

INFORMATION NOT RELEASABLE TO THE PUBLIC UNLESS AUTHORIZED BY LAW:
This information has not been publicly disclosed and may be privileged and confidential. It is for internal government use only and must not be disseminated, distributed, or copied to persons not authorized to receive the information. Unauthorized disclosure may result in prosecution to the full extent of the law.

Learning Objectives

1. Discriminate between different criteria for inappropriate medication use

2. Understand the strengths and limitations of administrative data in assessing provider quality

INFORMATION NOT RELEASABLE TO THE PUBLIC UNLESS AUTHORIZED BY LAW:
This information has not been publicly disclosed and may be privileged and confidential. It is for internal government use only and must not be disseminated, distributed, or copied to persons not authorized to receive the information. Unauthorized disclosure may result in prosecution to the full extent of the law.

Variation in Healthcare

- Wide variation in healthcare practices, at the provider and hospital level and by geographic region
  - Overuse, underuse, misuse, and error rates
- Even in cases of small variability, some situations are clinically meaningful enough to intervene to improve variation
- Some care may be low in variability but universally poor

AHRQ Pub. No. 02-P032. September 2002

Fung et al. Med Care 2010;48:140-8.

INFORMATION NOT RELEASABLE TO THE PUBLIC UNLESS AUTHORIZED BY LAW:
This information has not been publicly disclosed and may be privileged and confidential. It is for internal government use only and must not be disseminated, distributed, or copied to persons not authorized to receive the information. Unauthorized disclosure may result in prosecution to the full extent of the law.

Variation in Care at the Provider Level

- Rates of androgen deprivation therapy vary more by urologist's characteristics rather than patient or tumor characteristics, in >81,000 Medicare patients seeing >1700 urologists
  - Multilevel model for patient and urologist characteristics
  - OR 1.83 (95% CI 1.52-2.22) for androgen deprivation therapy for urologists with no academic affiliation compared to those with a major academic affiliation

Shahinian et al. JNCI 2006; 98: 839–845.
Shahinian et al. J Clin Oncol 25:5359-5365.

INFORMATION NOT RELEASABLE TO THE PUBLIC UNLESS AUTHORIZED BY LAW:
This information has not been publicly disclosed and may be privileged and confidential. It is for internal government use only and must not be disseminated, distributed, or copied to persons not authorized to receive the information. Unauthorized disclosure may result in prosecution to the full extent of the law.

Use of Part D Data to Assess Variation in Care

- Opportunity with Part D to have large numbers of patients and providers in addition to linkage with outpatient and inpatient data
- Need to assess quality of care with Part D: increased medication access >> increased use of inappropriate medications?
- Part D data provides an opportunity to explore provider-level variation using indicators of prescribing quality

Donohue et al. NEJM 366:530-8.
Sherman et al. Am J Manag Care. 2011 Nov;17(11):729-36.

INFORMATION NOT RELEASABLE TO THE PUBLIC UNLESS AUTHORIZED BY LAW:
This information has not been publicly disclosed and may be privileged and confidential. It is for internal government use only and must not be disseminated, distributed, or copied to persons not authorized to receive the information. Unauthorized disclosure may result in prosecution to the full extent of the law.

Definition: Inappropriate Medication Use

- Inappropriate medication, potentially inappropriate medication (PIM), potentially inappropriate prescribing (PIP)
- Medications that are high risk and low benefit
- Currently, PIMs, PIPs, etc. are only defined in older populations
- Associated with adverse drug events, drug interactions, adverse health outcomes, cost, healthcare utilization

INFORMATION NOT RELEASABLE TO THE PUBLIC UNLESS AUTHORIZED BY LAW:
This information has not been publicly disclosed and may be privileged and confidential. It is for internal government use only and must not be disseminated, distributed, or copied to persons not authorized to receive the information. Unauthorized disclosure may result in prosecution to the full extent of the law.

Criteria/Tools to Identify Inappropriate Medication Use

- Explicit criteria
  - Beers list
  - McLeod/Improving Prescribing in the Elderly (IPET) tool
  - STOPP/START criteria
- Implicit criteria and algorithms
  - Medication Appropriateness Index
  - Good Palliative-Geriatric Practice (GP-GP)
- Medications that cause adverse drug reactions (ADRs)

Fick et al. Arch Intern Med. 2003;163:2716-24.
Naugler CT et al. Can J Clin Pharmacol 2000;103-7.
Hanlon JT et al. J Clin Epidemiol 1992;45:1045-51.
Gallagher P et al. Int J Clin Pharamcol Ther 2008;46:72-83.
Garfinkel D et al. Arch Intern Med 2010;170:1648-54.

INFORMATION NOT RELEASABLE TO THE PUBLIC UNLESS AUTHORIZED BY LAW:
This information has not been publicly disclosed and may be privileged and confidential. It is for internal government use only and must not be disseminated, distributed, or copied to persons not authorized to receive the information. Unauthorized disclosure may result in prosecution to the full extent of the law.

Beers Criteria

- Developed by consensus using Delphi method in 1991, with updates in 1997, 2003, 2012
- 48 medications/drugs classes that are inappropriate, some at specified dosages or for unacceptable duration
- 20 drug and disease/condition combinations that should be avoided
- Beers list as a prescribing quality indicator – correlation with MAI scores

Fick DM et al. Arch Intern Med. 2003;163:2716-24.
Lund BC et al . Ann Pharmacother 2011;45:1363-70.

INFORMATION NOT RELEASABLE TO THE PUBLIC UNLESS AUTHORIZED BY LAW:
This information has not been publicly disclosed and may be privileged and confidential. It is for internal government use only and must not be disseminated, distributed, or copied to persons not authorized to receive the information. Unauthorized disclosure may result in prosecution to the full extent of the law.

Evidence that PIM Use is Associated with the Provider

- Beers drug use in >493,000 patients in 384 US hospitals
  - PIM use varied by specialty (cardiologists were higher)
  - Wide geographic variation in PIM use
  - Variation by hospital characteristics
- Variation in polypharmacy and Beers drugs across 589 nursing homes in Ontario
- PIM use ranged from 20 to 46% of patients across 71 general practices in Tayside, Scotland

Rothberg MB et al. J Hosp Med 2008;3:91-102.
Barnett K et al. BMJ Qual Saf 2011;20:275-81.
Bronskill SE et al. J Am Med Dir Assoc 2011 Aug 11. [Epub]

INFORMATION NOT RELEASABLE TO THE PUBLIC UNLESS AUTHORIZED BY LAW:
This information has not been publicly disclosed and may be privileged and confidential. It is for internal government use only and must not be disseminated, distributed, or copied to persons not authorized to receive the information. Unauthorized disclosure may result in prosecution to the full extent of the law.

Study Objectives

1. Investigate the utility of Medicare Part D data to describe provider-level variation in medication use

2. Evaluate the variation in PIM use in Medicare Part D beneficiaries at the provider level, controlling for patient characteristics associated with getting a PIM

INFORMATION NOT RELEASABLE TO THE PUBLIC UNLESS AUTHORIZED BY LAW:
This information has not been publicly disclosed and may be privileged and confidential. It is for internal government use only and must not be disseminated, distributed, or copied to persons not authorized to receive the information. Unauthorized disclosure may result in prosecution to the full extent of the law.

Design and Methods

- 100% Texas Medicare claims and Part D event files for 2007 and 2008
  - Enrollees 66 and older in 2008 with 12 months of A, B, and D, without HMO in 2008
  - Prescribers who were physicians, with 10 or more beneficiaries per prescriber
- PIMs defined according to Beers 2003 list
  - List of medications/drug classes only (did not include drug-disease combinations)
  - Unable to assess over-the-counter meds

INFORMATION NOT RELEASABLE TO THE PUBLIC UNLESS AUTHORIZED BY LAW:
This information has not been publicly disclosed and may be privileged and confidential. It is for internal government use only and must not be disseminated, distributed, or copied to persons not authorized to receive the information. Unauthorized disclosure may result in prosecution to the full extent of the law.

Design and Methods

Data Elements

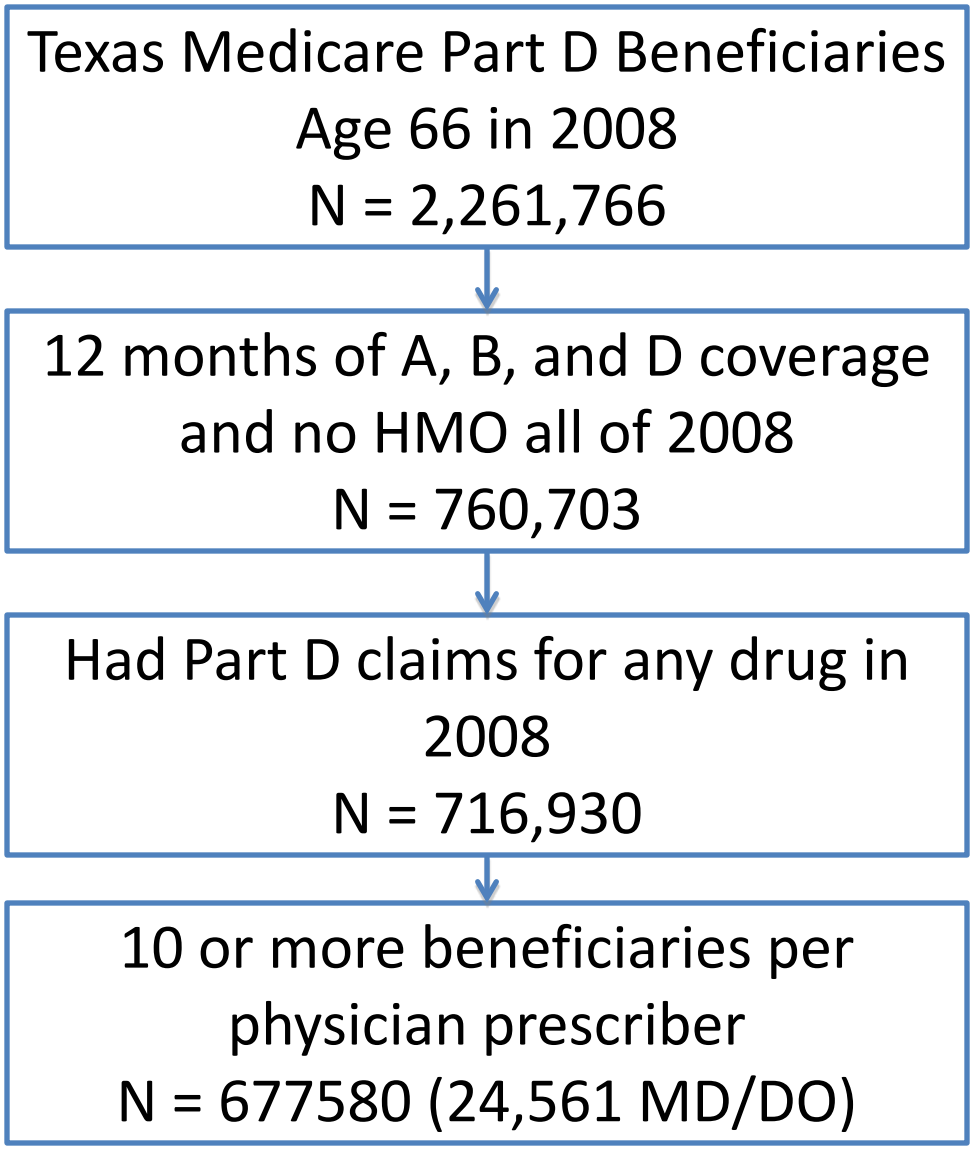
Variables		Data Source
Patient	Age, sex, race/ethnicity, state buy-in	PDE denominator
	Comorbidities (Elixhauser's Index)	2007 carrier file and MEDPAR
	Hospitalization in 2007	MEDPAR
	PIM in 2008 according to Beers list	PDE files
Prescriber	Credentials, specialty	PDE Prescriber Characteristics File

Analysis Plan

- Patient and provider characteristics associated with PIM use by patients
  - Bivariate
  - Multivariable model for patient factors
  - Multilevel model for prescriber, controlling for patient level

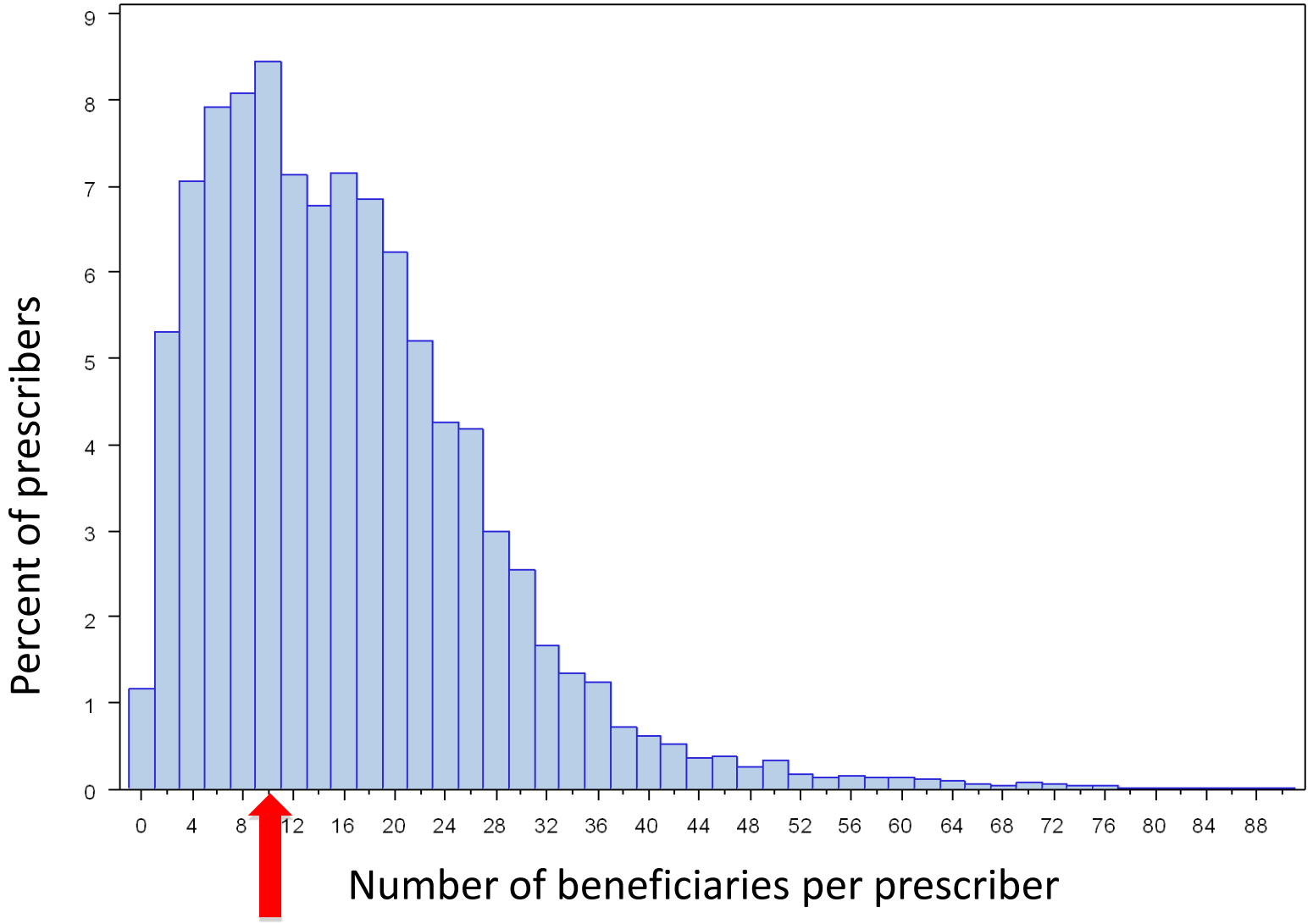
INFORMATION NOT RELEASABLE TO THE PUBLIC UNLESS AUTHORIZED BY LAW:
This information has not been publicly disclosed and may be privileged and confidential. It is for internal government use only and must not be disseminated, distributed, or copied to persons not authorized to receive the information. Unauthorized disclosure may result in prosecution to the full extent of the law.

Results: Study Flow Chart



INFORMATION NOT RELEASABLE TO THE PUBLIC UNLESS AUTHORIZED BY LAW:
This information has not been publicly disclosed and may be privileged and confidential. It is for internal government use only and must not be disseminated, distributed, or copied to persons not authorized to receive the information. Unauthorized disclosure may result in prosecution to the full extent of the law.

Results: Number of Beneficiaries Per Prescriber



INFORMATION NOT RELEASABLE TO THE PUBLIC UNLESS AUTHORIZED BY LAW:
This information has not been publicly disclosed and may be privileged and confidential. It is for internal government use only and must not be disseminated, distributed, or copied to persons not authorized to receive the information. Unauthorized disclosure may result in prosecution to the full extent of the law.

Results: Prevalence of PIM Use

- Overall, 216,364 (31.9%) of 677,580 Texas Part D beneficiaries who filled prescriptions received a PIM in 2008

- 85% of the 24,561 prescribers prescribed at least 1 PIM

INFORMATION NOT RELEASABLE TO THE PUBLIC UNLESS AUTHORIZED BY LAW:
This information has not been publicly disclosed and may be privileged and confidential. It is for internal government use only and must not be disseminated, distributed, or copied to persons not authorized to receive the information. Unauthorized disclosure may result in prosecution to the full extent of the law.

Table 1: Characteristics of 677,580 Beneficiaries

Characteristic	Category	Number	% Getting a PIM
Age	66-69	157,530	29.6
	70-74	171,984	30.9
	75-79	142,225	32.7
	80-84	107,999	33.8
	85+	97,842	34.4
Sex	Female	441,657	35.0
	Male	235,923	26.2
Race/Ethnicity	White	465,680	32.2
	Black	52,611	34.2
	Hispanic	139,223	31.3
	Asian	16,797	22.9
	Other	3,269	28.3

PIM – potentially inappropriate medication

- PIM use increased with increasing age, and differed between sexes and categories of race/ethnicity

INFORMATION NOT RELEASABLE TO THE PUBLIC UNLESS AUTHORIZED BY LAW:
This information has not been publicly disclosed and may be privileged and confidential. It is for internal government use only and must not be disseminated, distributed, or copied to persons not authorized to receive the information. Unauthorized disclosure may result in prosecution to the full extent of the law.

Table 1 (cont'd): Characteristics of 677,580 Beneficiaries

Characteristic		Number	% Getting a PIM
State Buy-in in 2008	YES	206,113	35.0
	NO	471,467	30.6
Hospitalization in 2007		143,741	41.5
Comorbidities	Heart Failure	108,703	42.5
	Uncomplicated DM	213,993	35.9
	Complicated DM	81,271	40.3
	Hypertension	523,380	34.2
	Pulmonary Disease	150,589	38.5
	PVD	133,021	39.7
	Depression	70,283	42.4
	Cancer	72,654	32.7
	Psychoses	43,211	40.1
	Neurologic Disorder	91,586	37.7
Total Number of Medication Claims (SD)		39.2 (+/- 32.0)	52.2 (+/- 35.9)

PIM – potentially inappropriate medication
DM – Diabetes mellitus
PVD – peripheral vascular disease

INFORMATION NOT RELEASABLE TO THE PUBLIC UNLESS AUTHORIZED BY LAW:
This information has not been publicly disclosed and may be privileged and confidential. It is for internal government use only and must not be disseminated, distributed, or copied to persons not authorized to receive the information. Unauthorized disclosure may result in prosecution to the full extent of the law.

Table 2: PIM Use According to Number of Prescribers

Number of Unique Prescribers	Number of Beneficiaries	% of Beneficiaries Getting a PIM
1	182,884	19.2
2	178,487	26.6
3	130,779	34.1
4+	185,430	48.1

- 73% of beneficiaries had >1 prescriber for all prescriptions
- PIM use increased considerably with increased numbers of unique prescribers

INFORMATION NOT RELEASABLE TO THE PUBLIC UNLESS AUTHORIZED BY LAW:
This information has not been publicly disclosed and may be privileged and confidential. It is for internal government use only and must not be disseminated, distributed, or copied to persons not authorized to receive the information. Unauthorized disclosure may result in prosecution to the full extent of the law.

Table 3: Prescriber Characteristics and PIM Use

Characteristic of Prescriber		Number of Prescriptions	% of Beneficiaries Getting PIMs
Credentials	MD	1,753,953	14.4
	DO	133,790	18.5
Specialty	Gen. Internal Medicine	355,262	19.0
	Family Medicine	438,185	19.3
	General Practice	20,730	19.7
	Internal Medicine Specialty	364,597	8.0
	Geriatrics	30,767	18.7
	Gynecology	27,021	11.4

- 14.4% of all beneficiaries who got a prescription from an MD got a PIM from that MD

INFORMATION NOT RELEASABLE TO THE PUBLIC UNLESS AUTHORIZED BY LAW:
This information has not been publicly disclosed and may be privileged and confidential. It is for internal government use only and must not be disseminated, distributed, or copied to persons not authorized to receive the information. Unauthorized disclosure may result in prosecution to the full extent of the law.

10 Most Commonly Prescribed PIMs

PIM Name	Number of Beneficiaries
Propoxyphene	83,415
Nitrofurantoin	37,908
Clonidine	28,496
Cyclobenzaprine	27,893
Amitriptyline	19,390
Doxazosin	11,941
Amiodarone	10,906
Dicyclomine	9753
Carisoprodol	8475
Methocarbamol	7958

INFORMATION NOT RELEASABLE TO THE PUBLIC UNLESS AUTHORIZED BY LAW:
This information has not been publicly disclosed and may be privileged and confidential. It is for internal government use only and must not be disseminated, distributed, or copied to persons not authorized to receive the information. Unauthorized disclosure may result in prosecution to the full extent of the law.

Table 5: Multivariable Model for Odds of PIM Use

Characteristic		Odds Ratio	95% CI
Age	66-69	1.0	Ref
	70-74	1.0	0.98-1.01
	75-79	0.99	0.97-1.01
	80-84	0.98	0.96-1.00
	85+	0.97	0.95-0.99
Gender	Female	1.37	1.35-1.38
	Male	1.0	Ref
State Buy-in	Yes	1.11	1.09-1.12
	No	1.0	Ref
Race/Ethnicity	White	1.0	Ref
	Black	1.04	1.02-1.07
	Hispanic	0.94	0.92-0.95
	Asian	0.74	0.71-0.77
	Other	0.92	0.85-1.00

INFORMATION NOT RELEASABLE TO THE PUBLIC UNLESS AUTHORIZED BY LAW:
This information has not been publicly disclosed and may be privileged and confidential. It is for internal government use only and must not be disseminated, distributed, or copied to persons not authorized to receive the information. Unauthorized disclosure may result in prosecution to the full extent of the law.

Table 5 (cont'd): Multivariable Model for Odds of PIM Use

Characteristic	Odds Ratio	95% CI
Hospitalization in 2007	1.11	1.10-1.13
Heart Failure	0.98	0.96-0.99
Uncomplicated DM	0.92	0.91-0.94
Complicated DM	0.96	0.94-0.98
Hypertension	0.93	0.92-0.95
Pulmonary Disease	1.03	1.02-1.05
PVD	1.05	1.03-1.06
Depression	1.08	1.06-1.10
Cancer	0.97	0.95-0.99
Psychoses	0.84	0.82-0.86
Neurologic Disorder	0.85	0.84-0.87

- Adjusted for other patient factors, sex and hospitalization were still significant, and most comorbidities were not statistically or clinically significant predictors of getting a PIM

INFORMATION NOT RELEASABLE TO THE PUBLIC UNLESS AUTHORIZED BY LAW:
This information has not been publicly disclosed and may be privileged and confidential. It is for internal government use only and must not be disseminated, distributed, or copied to persons not authorized to receive the information. Unauthorized disclosure may result in prosecution to the full extent of the law.

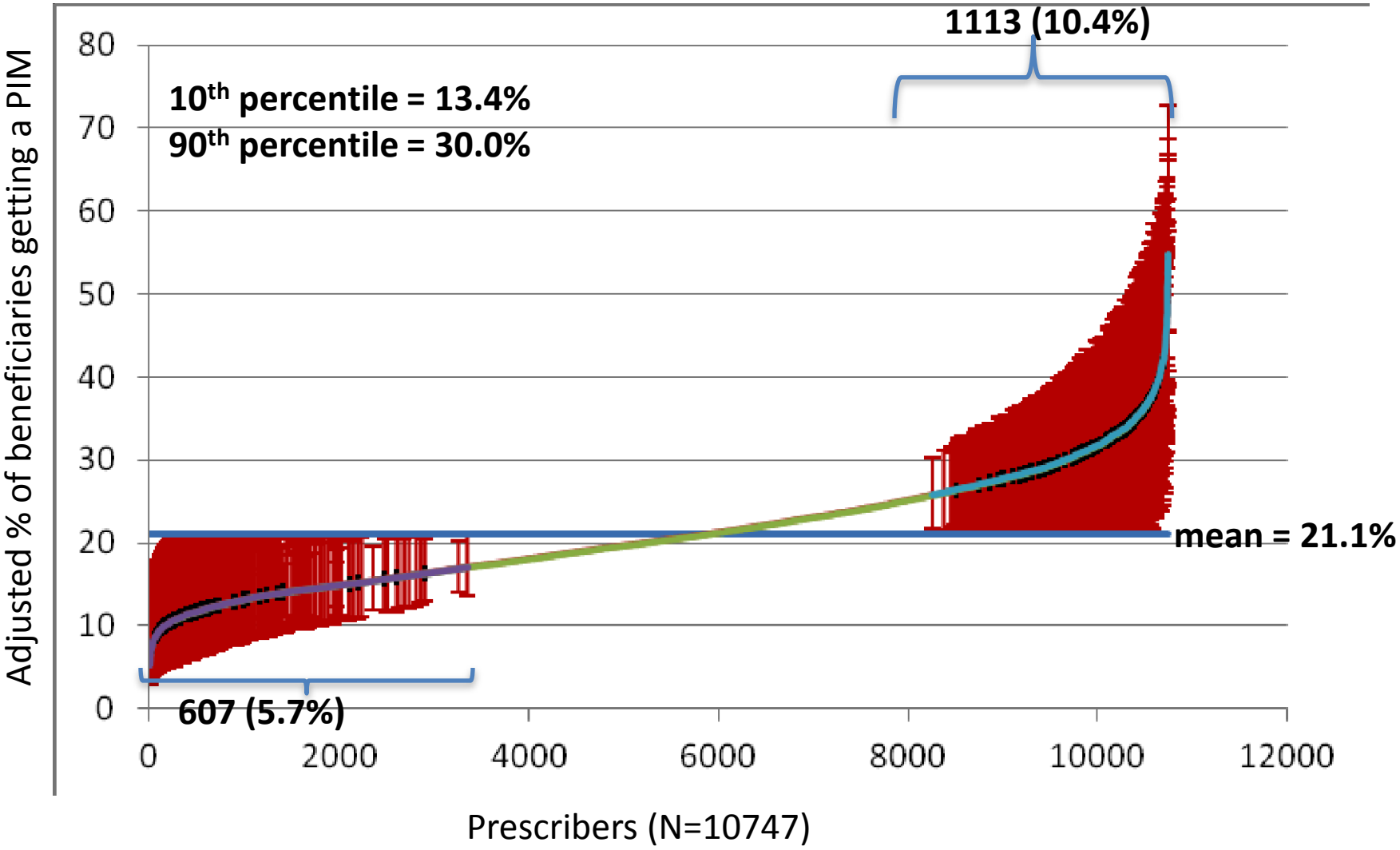
Table 5 (cont'd): Multivariable Model for Odds of PIM Use

Number of Unique Prescribers	Odds Ratio	95% CI
1	1.0	Ref
2	1.42	1.40-1.44
3	1.90	1.87-1.94
4+	2.92	2.87-2.96

- Increasing number of unique prescribers remained a strong independent predictor of PIM use in the multivariable model for patient factors

INFORMATION NOT RELEASABLE TO THE PUBLIC UNLESS AUTHORIZED BY LAW:
This information has not been publicly disclosed and may be privileged and confidential. It is for internal government use only and must not be disseminated, distributed, or copied to persons not authorized to receive the information. Unauthorized disclosure may result in prosecution to the full extent of the law.

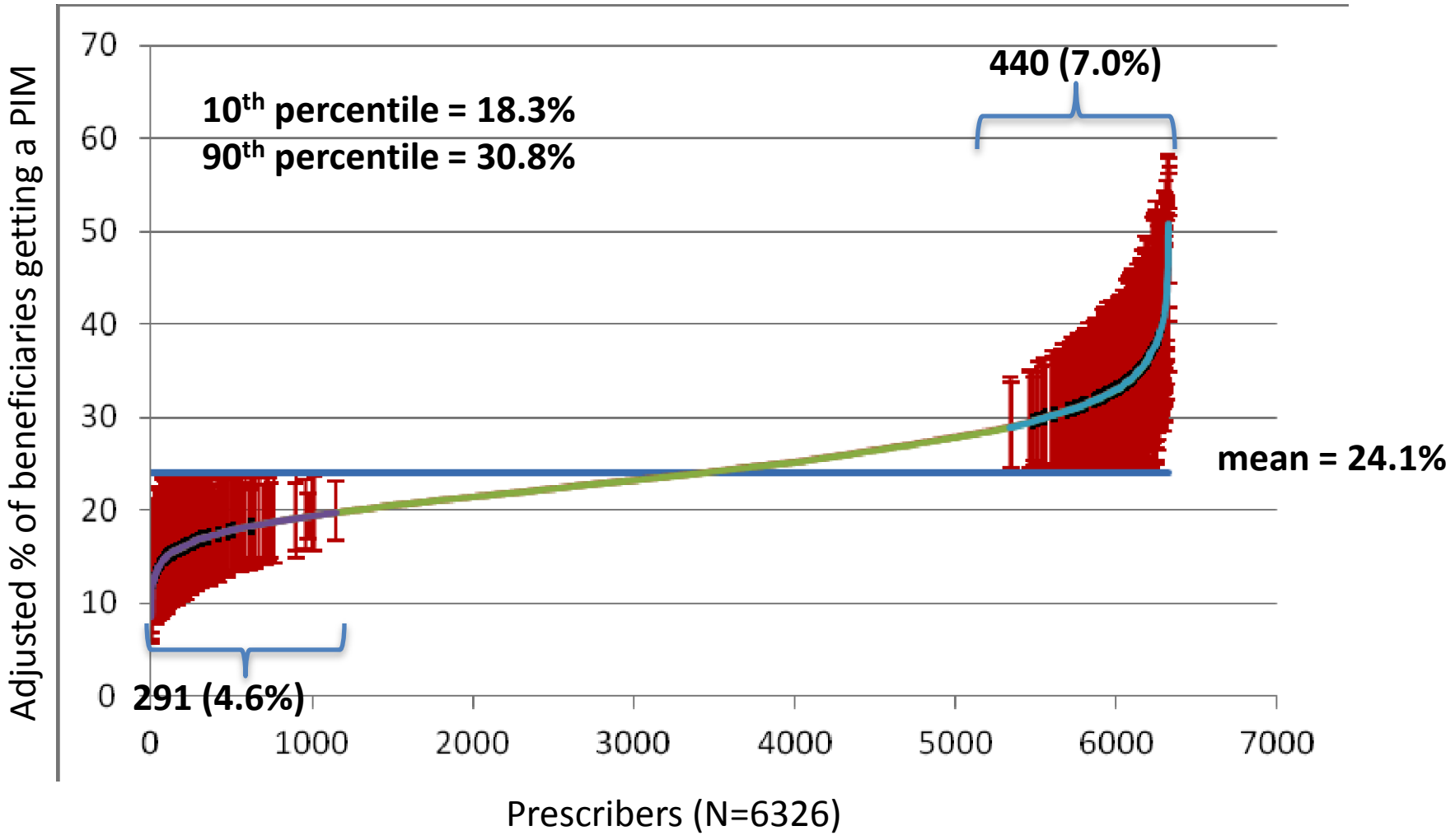
Results: Adjusted % of Beneficiaries on PIMs Across All Prescribers



INFORMATION NOT RELEASABLE TO THE PUBLIC UNLESS AUTHORIZED BY LAW:
This information has not been publicly disclosed and may be privileged and confidential. It is for internal government use only and must not be disseminated, distributed, or copied to persons not authorized to receive the information. Unauthorized disclosure may result in prosecution to the full extent of the law.

Results: Adjusted % of Beneficiaries on PIMs Across Prescribers

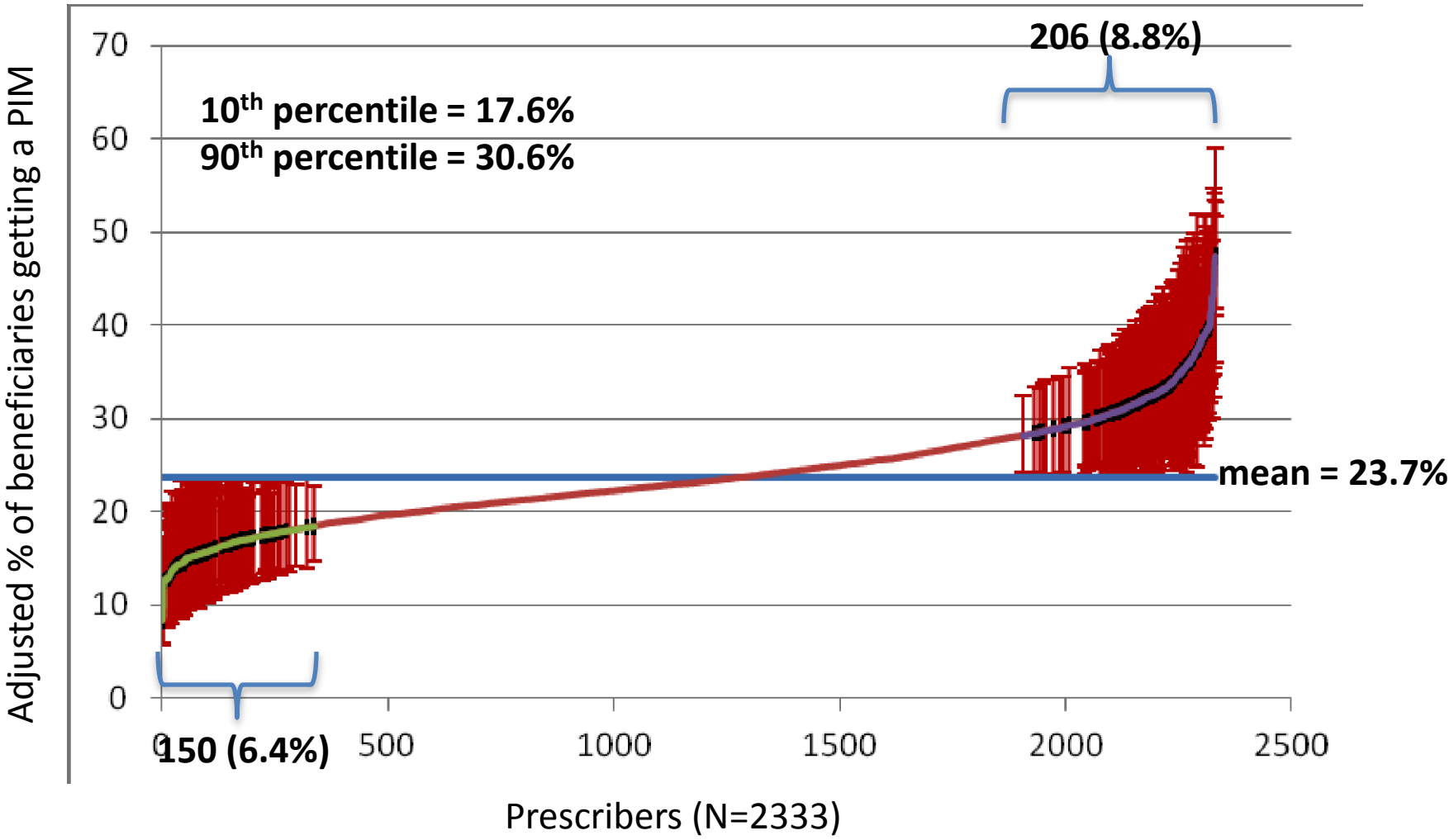
- Generalists (Family Med, Internal Med, General Practice)



INFORMATION NOT RELEASABLE TO THE PUBLIC UNLESS AUTHORIZED BY LAW:
This information has not been publicly disclosed and may be privileged and confidential. It is for internal government use only and must not be disseminated, distributed, or copied to persons not authorized to receive the information. Unauthorized disclosure may result in prosecution to the full extent of the law.

Results: Adjusted % of Beneficiaries on PIMs Across Prescribers

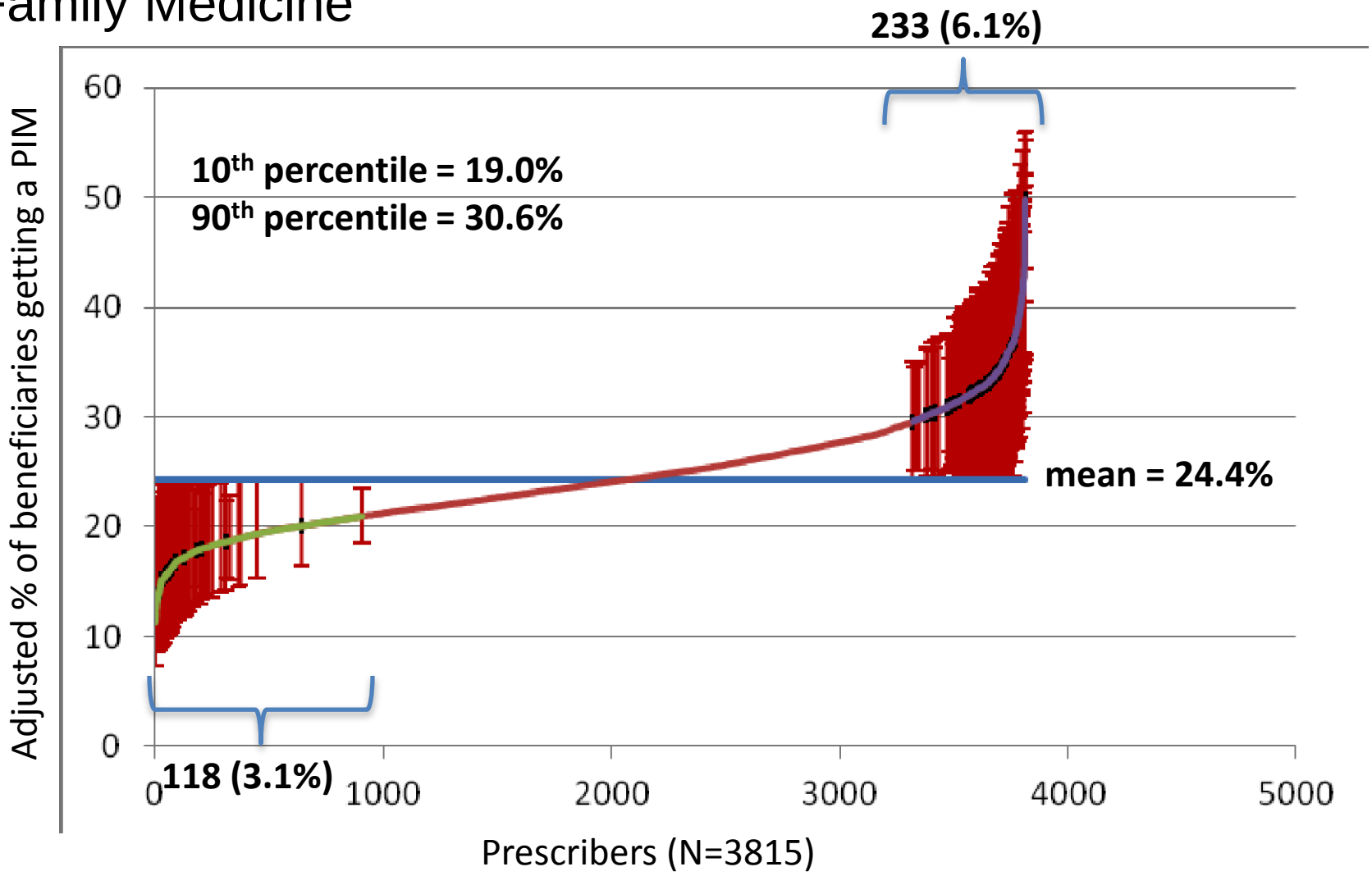
- General Internal Medicine



INFORMATION NOT RELEASABLE TO THE PUBLIC UNLESS AUTHORIZED BY LAW:
This information has not been publicly disclosed and may be privileged and confidential. It is for internal government use only and must not be disseminated, distributed, or copied to persons not authorized to receive the information. Unauthorized disclosure may result in prosecution to the full extent of the law.

Results: Adjusted % of Beneficiaries on PIMs Across Prescribers

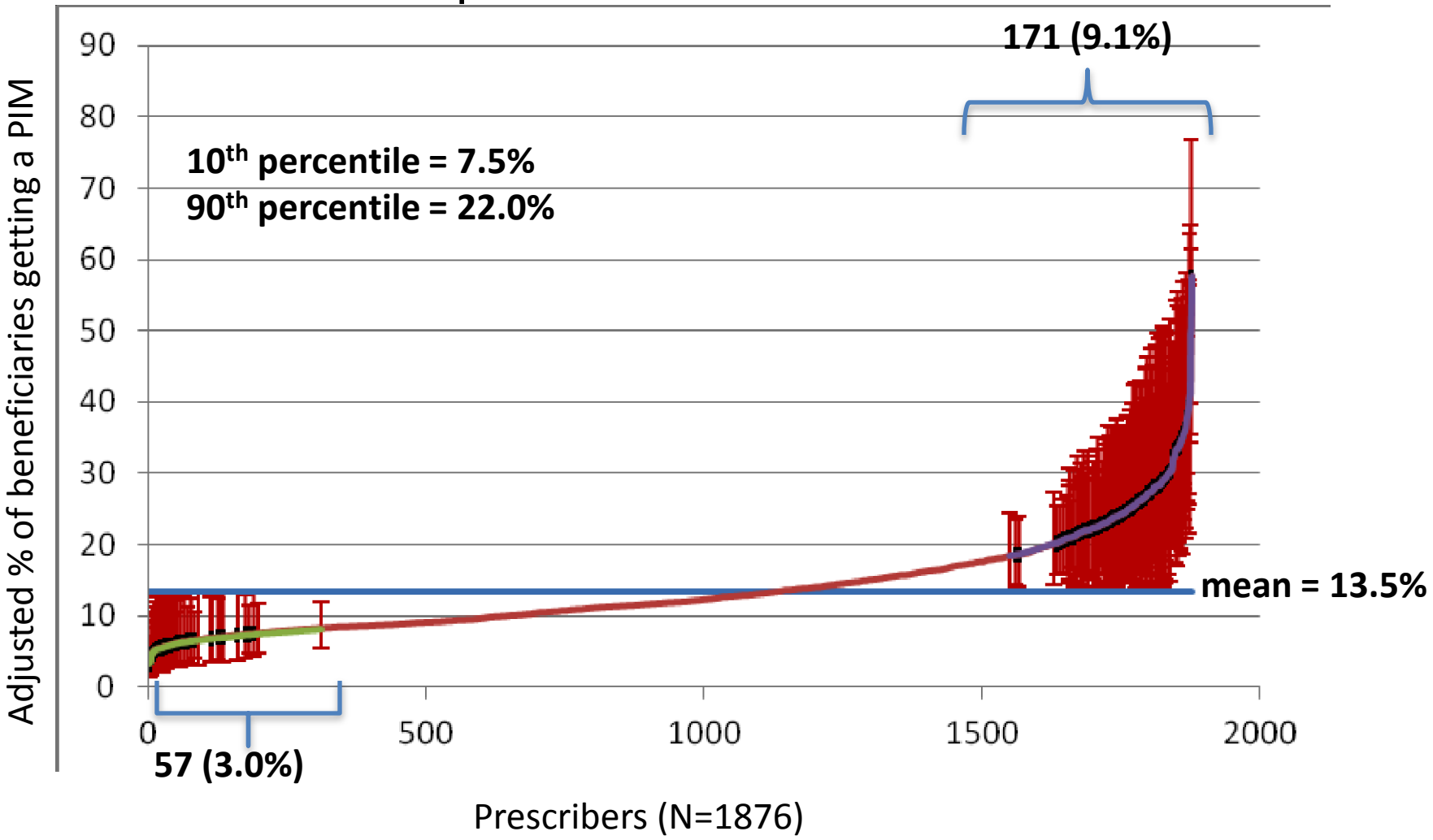
- Family Medicine



INFORMATION NOT RELEASABLE TO THE PUBLIC UNLESS AUTHORIZED BY LAW:
This information has not been publicly disclosed and may be privileged and confidential. It is for internal government use only and must not be disseminated, distributed, or copied to persons not authorized to receive the information. Unauthorized disclosure may result in prosecution to the full extent of the law.

Results: Adjusted % of Beneficiaries on PIMs Across Prescribers

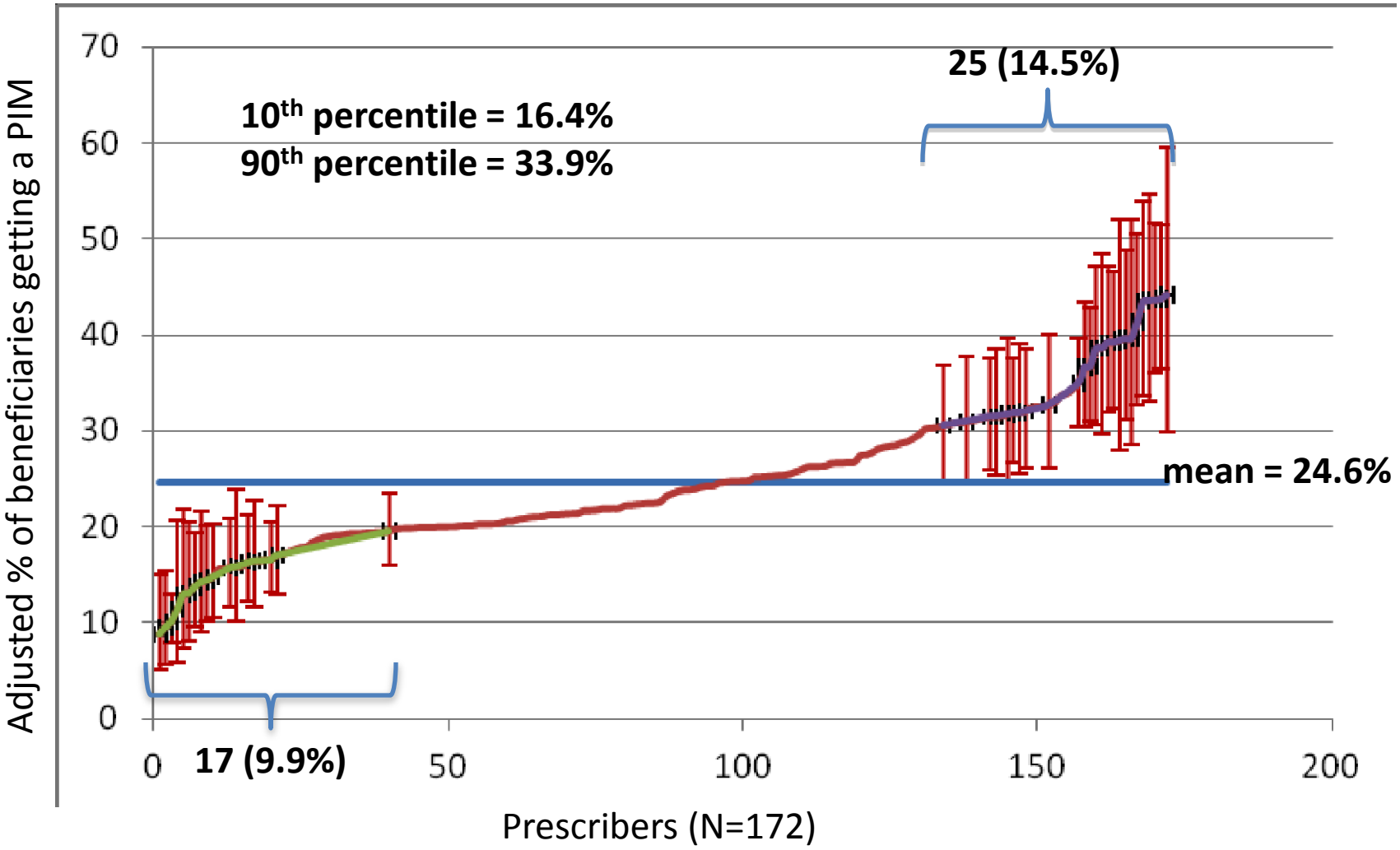
- Internal Medicine Specialties



INFORMATION NOT RELEASABLE TO THE PUBLIC UNLESS AUTHORIZED BY LAW:
This information has not been publicly disclosed and may be privileged and confidential. It is for internal government use only and must not be disseminated, distributed, or copied to persons not authorized to receive the information. Unauthorized disclosure may result in prosecution to the full extent of the law.

Results: Adjusted % of Beneficiaries on PIMs Across Prescribers

- Geriatrics



INFORMATION NOT RELEASABLE TO THE PUBLIC UNLESS AUTHORIZED BY LAW:
This information has not been publicly disclosed and may be privileged and confidential. It is for internal government use only and must not be disseminated, distributed, or copied to persons not authorized to receive the information. Unauthorized disclosure may result in prosecution to the full extent of the law.

Conclusions

- High use of PIMs in our study, which could be due to a number of factors
  - Selection only from a population receiving prescriptions
  - Inclusion of nursing home residents
- We found significant variation in PIM use among prescribing physicians
- Part D event files represent a new tool to look at provider-level variation in care

INFORMATION NOT RELEASABLE TO THE PUBLIC UNLESS AUTHORIZED BY LAW:
This information has not been publicly disclosed and may be privileged and confidential. It is for internal government use only and must not be disseminated, distributed, or copied to persons not authorized to receive the information. Unauthorized disclosure may result in prosecution to the full extent of the law.

Issues in Using Part D Data for Prescriber-Level Studies

- Need linkage to AMA data to better characterize prescribers
- Link to Medicare Part B at the prescriber level would help to better characterize role of the prescriber in that patient's care (eg., how often seen, duration of relationship, site of care)
- Part B data would give us better denominator info for each provider. Currently the denominator is all patients the prescriber wrote a script for, rather than all patients seen
- In our multilevel analysis, we assigned each patient to a predominant prescriber. We need to use cross-classification models so each patient can be clustered within several providers

INFORMATION NOT RELEASABLE TO THE PUBLIC UNLESS AUTHORIZED BY LAW:
This information has not been publicly disclosed and may be privileged and confidential. It is for internal government use only and must not be disseminated, distributed, or copied to persons not authorized to receive the information. Unauthorized disclosure may result in prosecution to the full extent of the law.

Issues in Using Part D Data for Studies of PIM Use

- Nursing home patients have a high rate of PIM use, but we did not identify them in our study. Information on nursing home patients would help through linkage to MDS data
- We haven't looked at the amount of exposure using dosage of medication, duration of prescriptions, or refill history
- Need better measures of *actually* inappropriate medication use, as opposed to *potentially* inappropriate use

INFORMATION NOT RELEASABLE TO THE PUBLIC UNLESS AUTHORIZED BY LAW:
This information has not been publicly disclosed and may be privileged and confidential. It is for internal government use only and must not be disseminated, distributed, or copied to persons not authorized to receive the information. Unauthorized disclosure may result in prosecution to the full extent of the law.

Future Directions

- Need to examine the stability in our estimates of PIM use over time with Part D
- Further exploration of prescriber characteristics using A, B, and AMA data
- Variation at the prescriber level in other types of medication use
  - Underuse of necessary meds and other quality indicators for prescribing (e.g., ACE inhibitors in diabetes, etc.)
- Focus on drug interactions – real ones associated with adverse outcomes – rather than theoretical interactions
- Look for outcomes associated with inappropriate prescribing (for example, ER visits, falls, fractures)

INFORMATION NOT RELEASABLE TO THE PUBLIC UNLESS AUTHORIZED BY LAW:
This information has not been publicly disclosed and may be privileged and confidential. It is for internal government use only and must not be disseminated, distributed, or copied to persons not authorized to receive the information. Unauthorized disclosure may result in prosecution to the full extent of the law.

Assessments

INFORMATION NOT RELEASABLE TO THE PUBLIC UNLESS AUTHORIZED BY LAW:
This information has not been publicly disclosed and may be privileged and confidential. It is for internal government use only and must not be disseminated, distributed, or copied to persons not authorized to receive the information. Unauthorized disclosure may result in prosecution to the full extent of the law.

Assessment Question 1

Which one of the following criteria for inappropriate medication use cannot be evaluated using administrative data?

1/A Beers criteria from 1997

2/B Beers criteria from 2003

3/C GP-GP Algorithm

4/D IPET Tool

INFORMATION NOT RELEASABLE TO THE PUBLIC UNLESS AUTHORIZED BY LAW:
This information has not been publicly disclosed and may be privileged and confidential. It is for internal government use only and must not be disseminated, distributed, or copied to persons not authorized to receive the information. Unauthorized disclosure may result in prosecution to the full extent of the law.

Assessment Question 2

Which of the following indicators of prescribing quality cannot be assessed using administrative data?

1/A Prescription of Beers criteria medications

2/B Prescription of NSAIDs in persons with heart failure

3/C Appropriate dosing of lorazepam

4/D Duplication in therapy with two proton-pump inhibitors

INFORMATION NOT RELEASABLE TO THE PUBLIC UNLESS AUTHORIZED BY LAW:
This information has not been publicly disclosed and may be privileged and confidential. It is for internal government use only and must not be disseminated, distributed, or copied to persons not authorized to receive the information. Unauthorized disclosure may result in prosecution to the full extent of the law.

Questions?

INFORMATION NOT RELEASABLE TO THE PUBLIC UNLESS AUTHORIZED BY LAW:
This information has not been publicly disclosed and may be privileged and confidential. It is for internal government use only and must not be disseminated, distributed, or copied to persons not authorized to receive the information. Unauthorized disclosure may result in prosecution to the full extent of the law.

Contact Information

For more information, please contact:

Holly M. Holmes, MD

hholmes@mdanderson.org

James S. Goodwin, MD

jsgoodwi@utmb.edu

INFORMATION NOT RELEASABLE TO THE PUBLIC UNLESS AUTHORIZED BY LAW:
This information has not been publicly disclosed and may be privileged and confidential. It is for internal government use only and must not be disseminated, distributed, or copied to persons not authorized to receive the information. Unauthorized disclosure may result in prosecution to the full extent of the law.

Presentation Evaluation

Please get your ARS Response Card ready

INFORMATION NOT RELEASABLE TO THE PUBLIC UNLESS AUTHORIZED BY LAW:
This information has not been publicly disclosed and may be privileged and confidential. It is for internal government use only and must not be disseminated, distributed, or copied to persons not authorized to receive the information. Unauthorized disclosure may result in prosecution to the full extent of the law.