



# **Use and Choice of Biologic Therapies in Medicare Patients with Rheumatoid Arthritis: Relationship with Cost-sharing and Utilization Management Tools**

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CMS Part D Symposium

(ARS Response Card: Channel 51)

# Agenda

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- Disclosure
- Learning Objectives
- Background
- Study Objectives
- Methods
- Results
- Discussion
- Conclusion

# Disclosure

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- This study was funded by a grant from Pfizer Inc.
  - Pfizer co-markets etanercept with Amgen Inc. and is currently developing other biologics for rheumatoid arthritis
- The funder played no role in design, analysis or interpretation of results for this study
- The authors declares no other conflicts of interest or financial interests in any product or service mentioned in this presentation, including grants, employment, gifts, stock holdings, or honoraria”

# Learning Objectives

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- Identify characteristics of use between physician-administered and self-administered RA biologics in the Medicare population
- Identify the potential role that differential cost-sharing and drug utilization management tools may have on choosing between a self-or physician–administered RA biologics in the Medicare population

- Debilitating chronic, inflammatory disease
- Autoimmune disease
- Morning stiffness and joint pain
- Unknown cause
- Prevalence: 1.5 million (2007)<sup>1</sup>



<sup>1</sup> *Arthritis Rheum.* 2010 Jun, 62(6):1576-82;

- Traditional treatments available for decades
  - Mainly consist of oral medications such as anti-inflammatories and disease-modifying antirheumatic drugs
- New biological treatments available since late 1990s
  - Significantly reduce pain, joint swelling, and radiologic damage compared to oral agents
  - Very expensive i.e. \$15,000 - \$20,000 per patient per year

Generic name	Target	Administration	Dosing frequency	FDA approval for RA
Etanercept	TNF	Self	Weekly, twice weekly	11/1998
Infliximab	TNF	Physician	0, 2, & 6 weeks then every 8 weeks	11/1999
Anakinra	IL-1	Self	Daily	11/2001
Adalimumab	TNF	Self	Biweekly	12/2002
Abatacept	T-cells	Physician	Biweekly (weeks 0-4) then monthly	12/2005
Rituximab	B-cells	Physician	Biweekly (2 doses)	02/2006
Golimumab	TNF	Self	Monthly	04/2009
Certolizumab	TNF	Self	Biweekly (weeks 0-4), then biweekly/monthly	05/2009
Tocilizumab	IL-6	Physician	Monthly	01/2010

TNF – Tumor necrosis factor, IL – Interleukin inhibitor

- Medicare covers RA biologics under
  - Part B: physician-administered biologics
  - Part D: self-administered biologics
- Prior to 2006
  - Only physician-administered biologics, namely infliximab was covered under Medicare Part B
- Starting in 2006
  - Part B coverage for new FDA approvals expanded choices for physician-administered biologics
    - abatacept (late 2005), rituximab (early 2006)
  - Part D coverage expanded coverage for self-administered biologics
    - etanercept, adalimumab, anakinra



Generic name	Target	Administration	Dosing frequency	FDA approval for RA
Infliximab	TNF	Physician	0, 2, & 6 weeks then every 8 weeks	11/1999

TNF – Tumor necrosis factor, IL – Interleukin inhibitor

# RA Biologics Under Medicare in 2006

## Background

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# RA Biologics Under Medicare Since 2006

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TNF – Tumor necrosis factor, IL – Interleukin inhibitor

- Medicare spending on biologics: \$13 billion (2007)
- Part B:
  - Top biologics: Rituximab (3) and Infliximab (5)
  - \$1.9 billion
  - 11% of all Part B drug spending (650 drugs)
- Part D: all biologics \$3.9 billion (6% of Part D spend)
  - Top biologics: Etanercept (1) and Adalimumab (4)
  - \$480 million
  - 12.3% of Part D biologics spending

<sup>1</sup>MEDPAC, June 2009 Report to Congress, Chapter 5, Medicare payment systems and follow-on biologics

- Comparative effectiveness
  - TNFs (etanercept, infliximab, adalimumab) appear equally effective<sup>1-7</sup>
  - TNFs appear to be more effective than anakinra<sup>1,2,7</sup>
- Cost-effectiveness
  - Compared to DMARDs: biologic therapies are  $\leq \$61,600$  per QALY but highly uncertain (2011)<sup>4</sup>
  - Compared to infliximab, etanercept and adalimumab are dominant (same effectiveness, lower costs) but ankinra is not cost-effective (less costly yet less effective)<sup>1,2,4,6</sup>
- Limited studies comparing newer biologics

<sup>1</sup>Wailoo et al., *Arth & Rheum*, 58(4), 939-46, 2008; <sup>2</sup>Walsh et al., *Rheum.*, 46, 1148-53, 2007; <sup>3</sup>Nixon et al., *Rheum*, 46, 1140-44, 2007; <sup>4</sup>Malottki, *Health Tech. Assessment*, 15(14), 2011; <sup>5</sup>Donahue et al., *Ann Intern Med.*, 148, 124-34, 2008; <sup>6</sup>Weycker et al., *Clin Therap.*, 27(5), 646-56, 2005; <sup>7</sup> Gartlehner et al., *J of Rheum.*, 33(12), 2398-408, 2006

- Little is known about overall utilization of RA biologics in the Medicare program
    - Percent of RA patients using infliximab (Part B)<sup>1</sup>
- | 2002 | 2006 |
|------|------|
| 4.8% | 6.1% |
- Despite expansion in choices of biologic agents after Medicare Part D, little is known about utilization and choice of physician-administered vs. self-administered biologics
    - Compared to privately insured patients, Medicare patients were 30% more likely to receive infliximab compared to etanercept <sup>2</sup>
  - All studies were before Part D

1 Doshi et al., *Arth Care & Res*, 62(3), 354-61; 2 DeWitt et al., *Arch Intern Med.*, 166, 57-63, 2006;

- Patient Factors
  - Out of pocket costs<sup>1</sup>
  - Frequency of dosing, professional administration, leisure time<sup>3</sup>
  - Flexibility with treatment timing, administration time, home therapy<sup>3</sup>
- Physician Factors
  - Financial incentives - Reimbursement<sup>2</sup>
    - Administration
    - Part B drug
- Plan Design Factors
  - Cost-sharing
  - Utilization Management tools

<sup>1</sup> Curkendall et al., *Arth & Rheum*, 59(10), 1519-26, 2008; <sup>2</sup> DeWitt et al., *Arch Intern Med.*, 166, 57-63, 2006; <sup>3</sup> Fajri et al., *Clin Rheum*, 28, 599-602, 2009

# Medicare Coverage, Cost-Sharing, and Utilization Management Tools

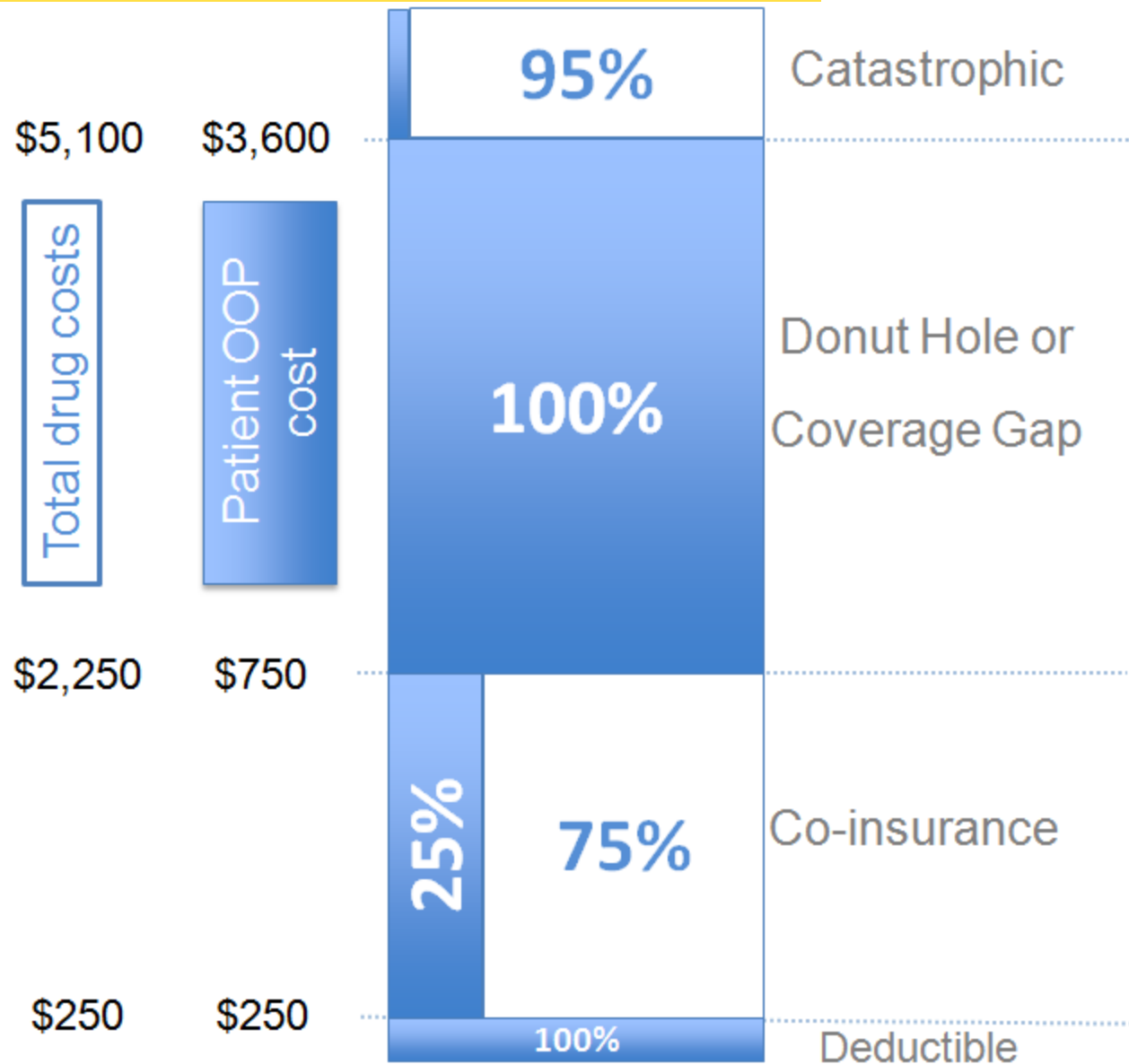
## Background

	Part B	Part D
Coverage	Physician-administered biologics	Self-administered biologics
Cost-sharing	<ul style="list-style-type: none"> <li>20% co-insurance, <u>lower or none if supplemental insurance</u></li> </ul>	Depending on LIS status and type of plan enrolled <ul style="list-style-type: none"> <li>LIS – minimal cost sharing*</li> <li>Non-LIS in standard Part D plan               <ul style="list-style-type: none"> <li>➤ 25% co-insurance in initial phase</li> <li>➤ 100% co-insurance in donut hole</li> <li>➤ 5% during catastrophic coverage</li> </ul> </li> </ul>
Utilization management tools	<ul style="list-style-type: none"> <li>None</li> </ul>	<ul style="list-style-type: none"> <li>Specialty tier placement</li> <li>Step-therapy</li> <li>Prior authorization</li> </ul>

\* Low-income subsidies (LIS) required \$3 copay for full benefit dual with income < 100% FPL in 2006; \$5 copay for full benefit dual with income ≥ 100% FPL (or individuals with incomes < 135% FPL) in 2006; and 15% cost-sharing for individuals with income 135%-150% FPL



# Standard Part D Benefit for Non-LIS Patients in 2006



# Subsidies Under Part D for LIS Patients in 2006

## Background

LIS	Subsidy level	Deductible	Premium	Copayments		
				Generic	Brand	Catastrophic
Full LIS	Income < 100% FPL	\$0	\$0	\$1	\$3	\$0
	Income ≥ 100% FPL and < 135% FPL + asset test	\$0	\$0	\$2	\$5	\$0
Partial LIS	Income 135%-150% FPL + asset test	Sliding scale to \$37	\$50	15%	15%	\$2/generic \$5/brand

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# Study Aims

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- To examine the use and choice of biologic therapies in Medicare patients with RA
- To examine the relationship between cost-sharing and utilization management tools and the use and choice of RA biologics

- 2005-2008 5% Chronic Conditions Warehouse (CCW) Medicare files
  - Hospital claims (Part A)
  - Outpatient and physician claims (Part B)
  - Prescription drug event data (Part D)
- 2006-2008 Part D Plan characteristics file
  - Contract, Plan, and Formulary identifiers
- 2006-2008 Area resource file (county level information)
  - Education level
  - Urban/rural
  - Median income
  - Region of country

- Sample
  - Medicare beneficiaries in each year with
    - 12 months fee-for-service Part A and Part B
    - 12 months stand-alone Part D enrollment
    - 1 inpatient or 2 outpatient diagnoses of RA (ICD9-CM 714.xx)
- Study Design
  - Cross-sectional analysis
  - Pooled annual cross-sections from 2006 to 2008

- Use: Any RA biologic use
  - Sample: All RA patients
- Choice: Any Part D biologic use (vs. only Part B biologic use)
  - Self-administered biologics identified by NDC codes in Part D PDE files
  - Physician-administered biologics identified by HCPCS codes in Part B files

Sample: Among RA biologic users

- Cost-sharing
  - Low-income subsidy (LIS) status serves as a proxy
    - **Non-LIS**
    - **Full LIS**
    - Partial LIS
    - Switch LIS
- Utilization Management Tools
  - Step-therapy (fail first)
  - Prior authorization
  - Specialty tier/highest tier placement
  - Any UM tool for any biologic
    - Step, prior authorization, and/or highest tier



# LIS Serves as Proxy for Cost-sharing

## Methods

	Part B		Part D	
	Full LIS	Non-LIS	Full LIS	Non-LIS
Coverage	Physician-administered biologics	Physician-administered biologics	Self-administered biologics	Self-administered biologics
Cost-sharing	20% co-insurance, <u>but lower with supplemental insurance (i.e. Medicaid)</u>	20% co-insurance, <u>but lower with supplemental insurance (e.g. Medigap)</u>	No deductible Small copay* No donut hole	Deductible 25% co-insurance Donut hole
UM tools	None	None	Prior auth., step-therapy	Prior auth., step-therapy, specialty tier placement

\* \$3 copay if full benefit dual with income < 100% FPL and \$5 copay if full benefit dual with income  $\geq$  100% FPL (or individuals with incomes < 135% FPL) in 2006

- Patient characteristics
  - Patient level
    - Age group (< 65, 65-69, 70-74, 75-79, 80+)
    - Gender
    - Race (White, Black, Hispanic, Asian, Other race)
    - Prescription drug hierarchical condition category risk score (RxHCC, prior year)
    - RA hospitalizations (any)
    - RA physician visits (1-2, 3-4, 4 or more)
  - County level
    - Mean income
    - Low education
    - Urban/rural status
    - Region of country
- Year Dummies

- Logistic regression using general estimating equations with robust standard errors clustered at Part D plan formulary level
- Binary outcome variable (biologics use/no use, any Part D use/only Part B use)
- Logistic regression – model probability of outcome

$$f(z) = \frac{1}{1 + e^{-z}} \quad \text{where } z = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_k x_k$$

- Robust standard errors – heteroskedastic error term
- Clustered – intra-group correlations (formulary level)

- 2006 Data
  - First year of part D
  - Enrollment deadline for non-LIS 15-May-2006
  - 2007/2008 pooled analysis
- Regressions run on LIS and non-LIS separately
- Inclusion criteria: 1 inpatient or 1 outpatient RA claim
- Model specification: All models re-run as probit and LPM
- Multinomial logistic regression (part B only, part D only, both B and D)
- Standard errors clustered at plan level and contract level

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# Sample Characteristics - Sociodemographics

Results

	All RA	Biologics Users
N	47,511	7,831
Female	78%	81%
Age(mean):	70.2	65.9
Race: White	78%	81%
Black	12%	10%
Hispanic	5%	5%
Asian	2%	1%
Other	2%	2%
County low education	19%	16%
County income (mean, \$)	30,142	29,839
Urban	75%	73%
Northeast	19%	16%
Midwest	22%	23%
South	41%	42%
West	18%	19%

# Sample Characteristics – LIS Status and UM tools Results

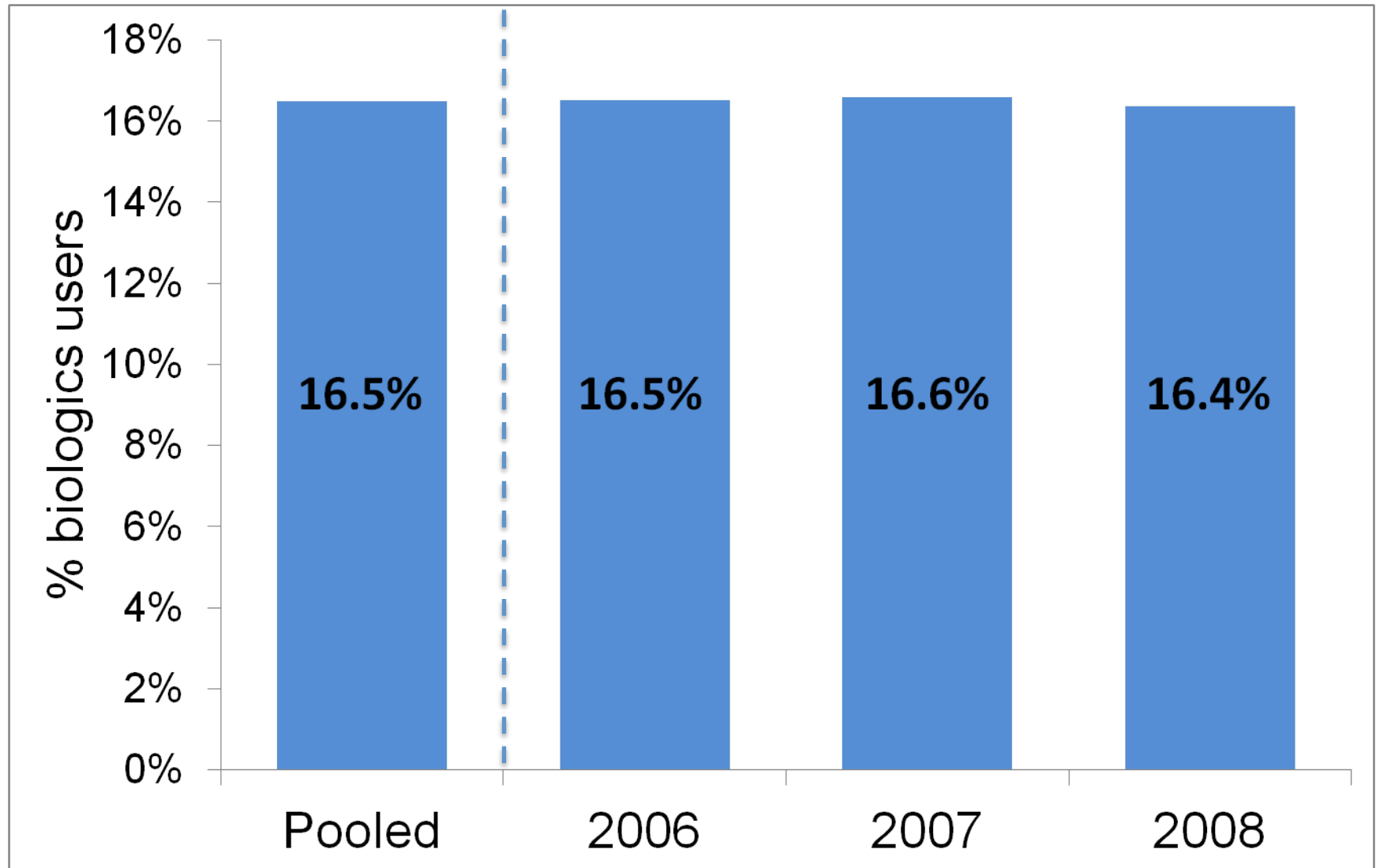
	All RA	Biologic Users
N	47,511	7,831
LIS eligibility status		
Non-LIS	47%	48%
Full LIS	44%	47%
Partial LIS	2%	1%
Switch LIS	7%	4%
UM tools in Part D plan		
Prior Authorization	6%	7%
Step Therapy	91%	90%
Specialty/Highest Tier	88%	88%
Any UM tools	93%	92%
None	7%	8%

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## Any RA Biologic Use



# Percent of RA Beneficiaries with any Biologic Use <sup>Results</sup>



# Any Biologic use by LIS Status and UM Tools

## Results

	N	% biologics users
Overall	47,511	16.5%
LIS status		
Non-LIS	22,330	16.8%
Full LIS	20,905	17.7%
Partial LIS	950	8.2%
Switch LIS	3,326	9.4%
In Part D plan with		
Any UM tool	43,124	16.3%
No UM tool	4,387	18.4%

# Main Regression Results for Any Biologic Use

Results

n= 47,511

	Adjusted odds ratios	95% CIs
LIS status		
Full non-LIS	1.00	ref
Full LIS	1.23**	(1.14-1.32)
Partial LIS	0.82**	(0.67-1.00)
Switch LIS	0.90	(0.65-1.25)
UM tools in Part D plan		
None	1.00	ref
Any	0.83**	(0.74-0.95)

\* \*p < 0.05

# Other Regression Results for Any Biologic Use

Results

n= 47,511

	Unadjusted Rates	Adjusted Odds ratios	95% CIs
Overall	16.5%		
Gender			
Males	13.9%	1.00	ref
Females	17.2%	1.26**	(1.18-1.34)
Age			
< 65	24.3%	1.57**	(1.44-1.72)
65-69	18.7%	1.00	ref
70-74	16.9%	0.86**	(0.79-0.95)
75-79	14.1%	0.76**	(0.70-0.82)
> 80	7.8%	0.47**	(0.42-0.54)
Region			
Northeast	13.5%	1.00	ref
Midwest	17.4%	1.19**	(1.11-1.28)
South	16.9%	1.11**	(1.02-1.20)
West	17.7%	1.21**	(1.10-1.33)

\* \*p < 0.05,

# Other Regression Results for Any Biologic Use (2)<sup>Results</sup>

n= 47,511

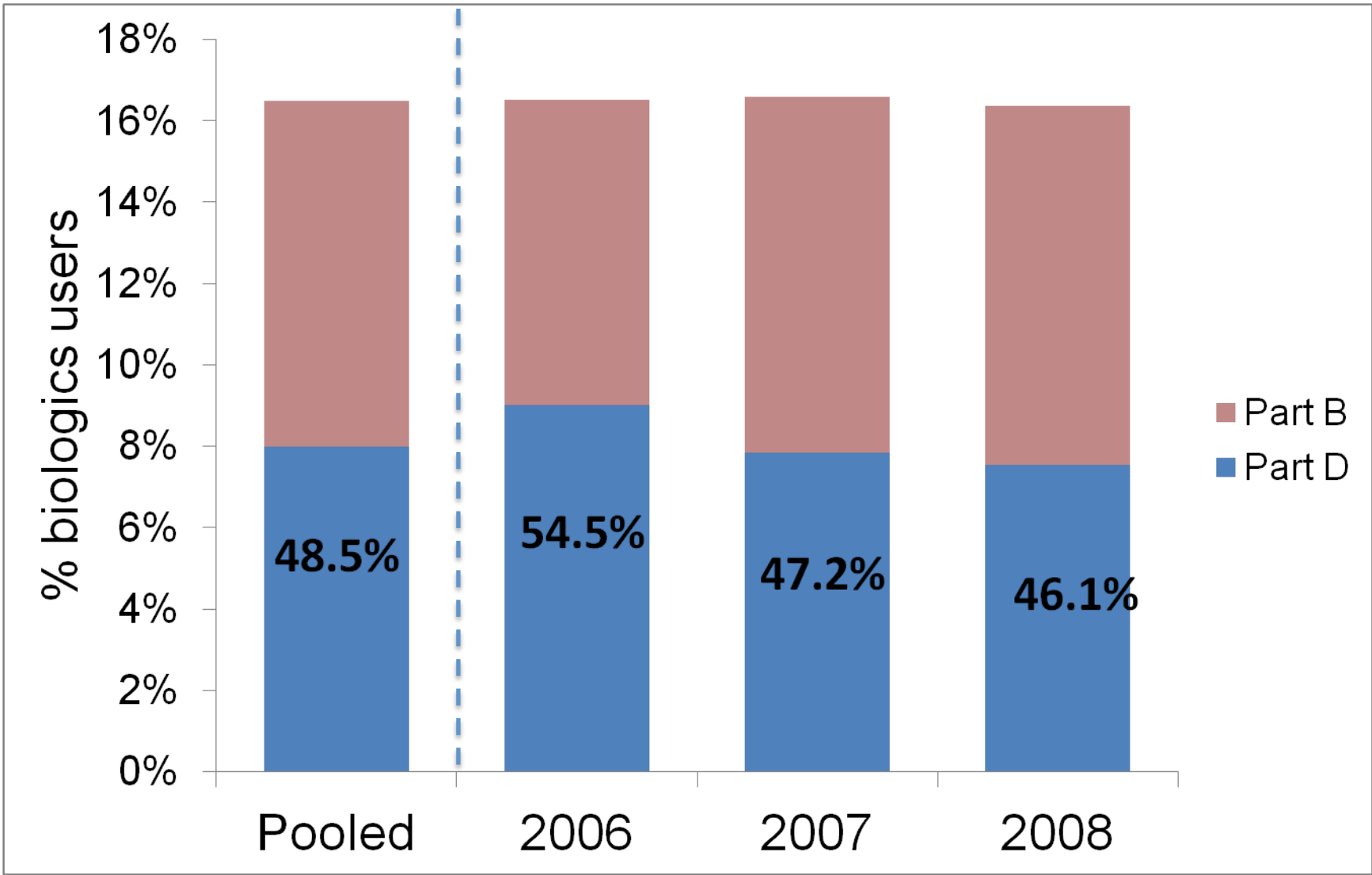
		Odds ratios	95% CIs
Hospital RA claims			
None	16.2%	1.00	ref
Any	29.2%	1.40**	(1.18-1.67)
Evaluation & Management visit for RA			
None	2.8%	1.00	ref
1 to 2	10.5%	1.13**	(1.02-1.25)
3 to 4	24.4%	4.57**	(4.23-4.94)
5 or more	45.2%	11.8**	(11.1-12.7)
RxHcc score		0.73**	(0.65-0.81)

\*\* p < 0.05

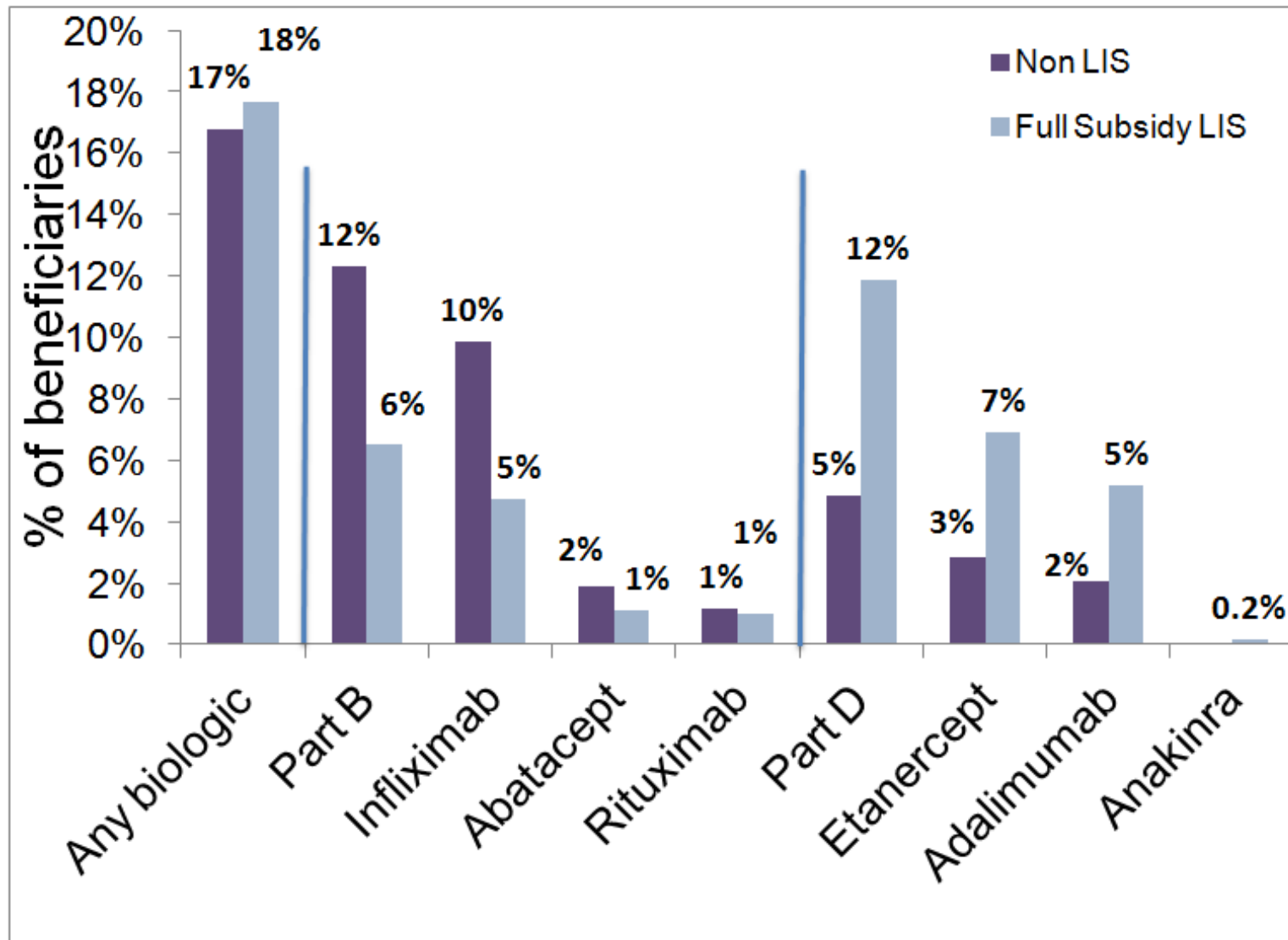
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## **Choice of RA Biologic: Physician-Administered (Part B) versus Self-Administered (Part D)**

# Percent of Biologic Users with Part D Biologic Use Results



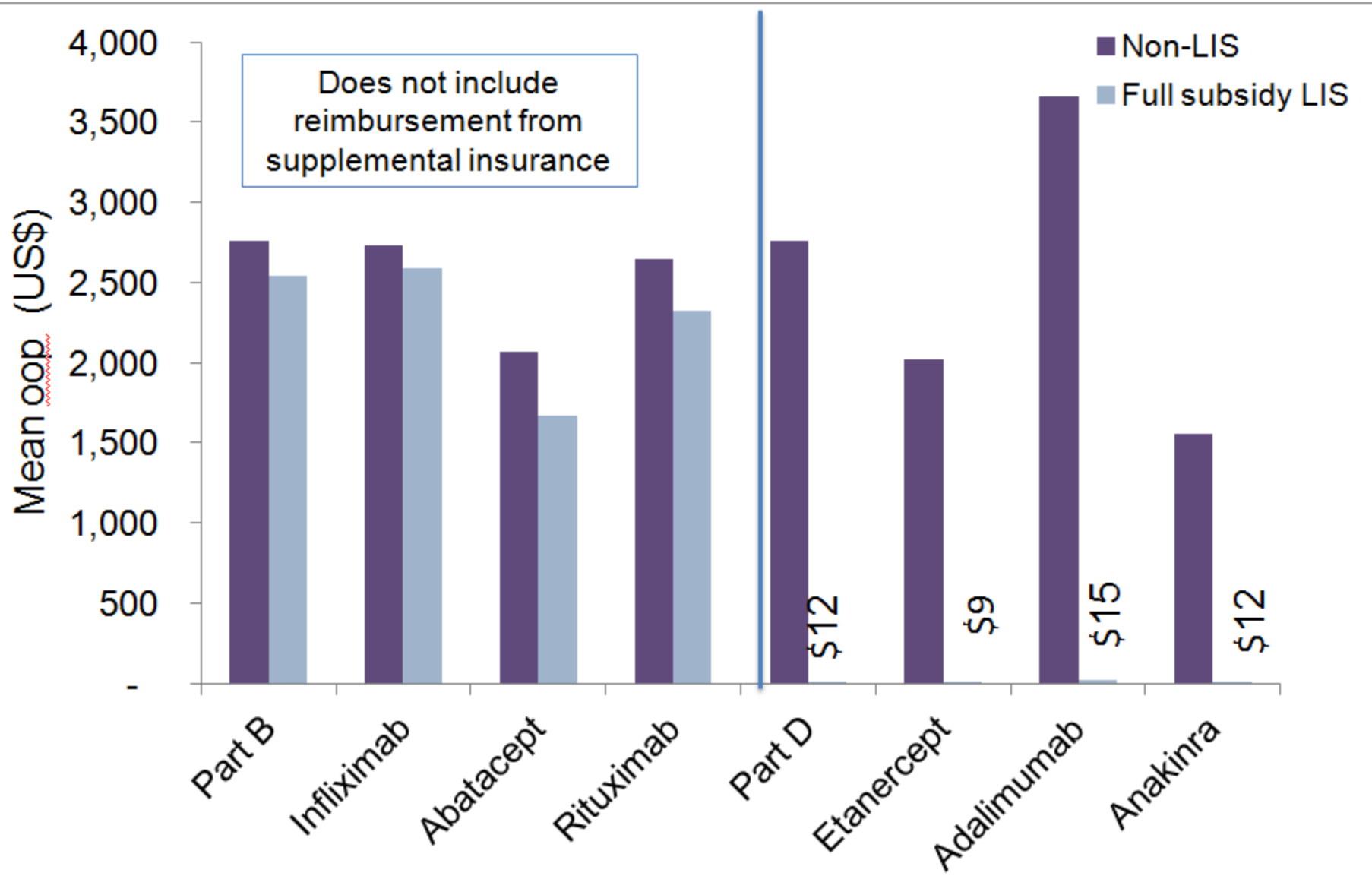
# Choice of RA Biologic by LIS Status

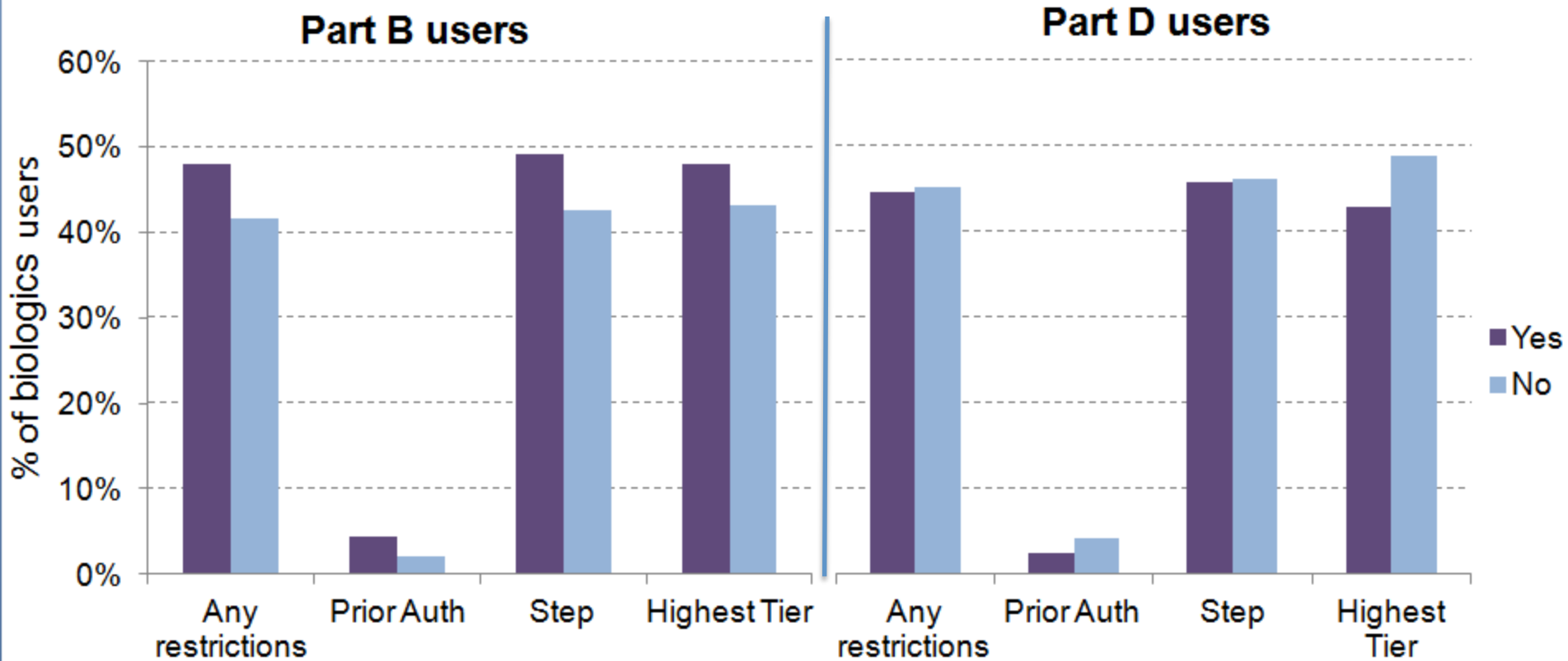




# Out-of-Pocket Costs per User by Low-Income Subsidy Status

## Results





# Main Regression Results for Part D Biologic Use Results

n= 7,831

	Unadjusted Rates	Adjusted Odds Ratio	95% CIs
Overall	48.5%		
LIS status			
Full non-LIS	29.0%	1.00	ref
Full LIS	67.2%	1.86**	(1.40-2.47)
Partial LIS	55.0%	1.27	(0.88-1.82)
Switch LIS	65.2%	0.84	(0.47-1.49)
Utilization management tools			
Any step therapy	49.8%	0.67**	(0.46-0.99)
Any prior authorization	36.7%	0.90	(0.66-1.23)
Any top tier (specialty)	48.6%	0.44**	(0.32-0.60)

\*\*p < 0.05

# Other Regression Results for Part D Biologic Use Results

n= 7,831

	Unadjusted Rates	Adjusted Odds Ratios	95% CIs
Overall (Part D use)	45.4%		
Gender			
Males	45.9%	1.00	ref
Females	45.2%	0.96	(0.87-1.06)
Age			
< 65	60.1%	1.37**	(1.20-1.56)
65-69	40.9%	1.00	ref
70-74	35.3%	0.79**	(0.67-0.93)
75-79	33.9%	0.73**	(0.59-0.89)
> 80	34.3%	0.74**	(0.61-0.89)
Region			
Northeast	50.8%	1.00	ref
Midwest	40.2%	0.72**	(0.60-0.85)
South	46.2%	0.83**	(0.71-0.97)
West	45.0%	0.80**	(0.68-0.94)

\* \*p < 0.05

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- First nationally representative study
- 1 in 6 RA Medicare beneficiaries use biologics
- Being eligible for the LIS (lower cost sharing) increases your likelihood of utilizing biologics therapy

	Non-LIS	LIS
Overall use	16.8%	17.7%
Part D use	32.9%	73.4%
Avg. OOP (D)	\$2,763	\$12
Avg. OOP (B)*	\$2,757	\$2,542

- Enrollment in a Part D plan that has UM Tools for RA biologics reduces the likelihood of starting any biologic

\*90% of beneficiaries have some form of supplemental coverage that pays for Part B cost-sharing <sup>1</sup>

<sup>1</sup> Kaiser family foundation, Medicare Chartbook, 4<sup>th</sup> edition, 2010

- Cost-sharing and placement of biologics on a formularies top tier, or requiring step therapy appears to decrease Part D biologic use and increase Part B biologic use
- RA biologics are 11% of all Medicare Part B drug spending with infliximab being the most frequently used
- Infliximab not cost-effective compared to etanercept and adalimumab, more research need on newer biologics
- Further research needed to determine how UM tools are impacting optimal biologics use and choice

- Self-administered RA biologics use declining

	2006	2008
Percent of biologic use with Part D biologic	55%	46%
Percent of RA patients enrolled in a plan with etanercept on highest tier	45%	84%

- Unexplained regional variation in biologics use
  - Living outside northeast:
    - More likely to use biologics and Part B biologics
    - LIS living outside the northeast more likely to use part B biologics
  - Practice patterns?



- Cross-sectional claims based retrospective study
- No clinical measures of severity, only claims based
- No control for patient and physician preferences
- Limited to 2006-2008 timeframe and biologics available during this time period

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- Part D cost-sharing appears to influence use of biologics
  - Lower likelihood of taking any biologic
  - Lower likelihood of taking a self-administered (Part D) RA biologic among biologic users
- Part D UM tools are also associated with:
  - Lower likelihood of taking any biologic
  - Lower likelihood of using self-administered (Part D) RA biologic among biologic users
- Substantial regional variation in use of RA biologics exists
- Overall cost implications for Medicare should be studied given decreased likelihood of Part D biologic use and increased likelihood of Part B biologic use



# Assessments

## Assessment Question 1

Which of the following characteristics of RA Medicare beneficiaries is associated with having a statistically significantly HIGHER likelihood of using any biologic therapy?

- 1/A Being 80 years of age or older
- 2/B Being sicker, as measured by a person's RxHCC score
- 3/C Being male
- 4/D Living outside of the northeast
- 5/E None of the above

## Assessment Question 2

Which of the following characteristics of RA Medicare beneficiaries is associated with having a statistically significantly HIGHER likelihood of using a self-administered biologic therapy?

- 1/A Being 80 years of age or older
- 2/B Being eligible for Medicare's low-income subsidy (LIS)
- 3/C Being enrolled in a plan that has a step therapy requirement for biologics
- 4/D None of the above



## Questions?

For more information please contact:

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## Presentation Evaluation

**Please get your ARS Response Card ready**

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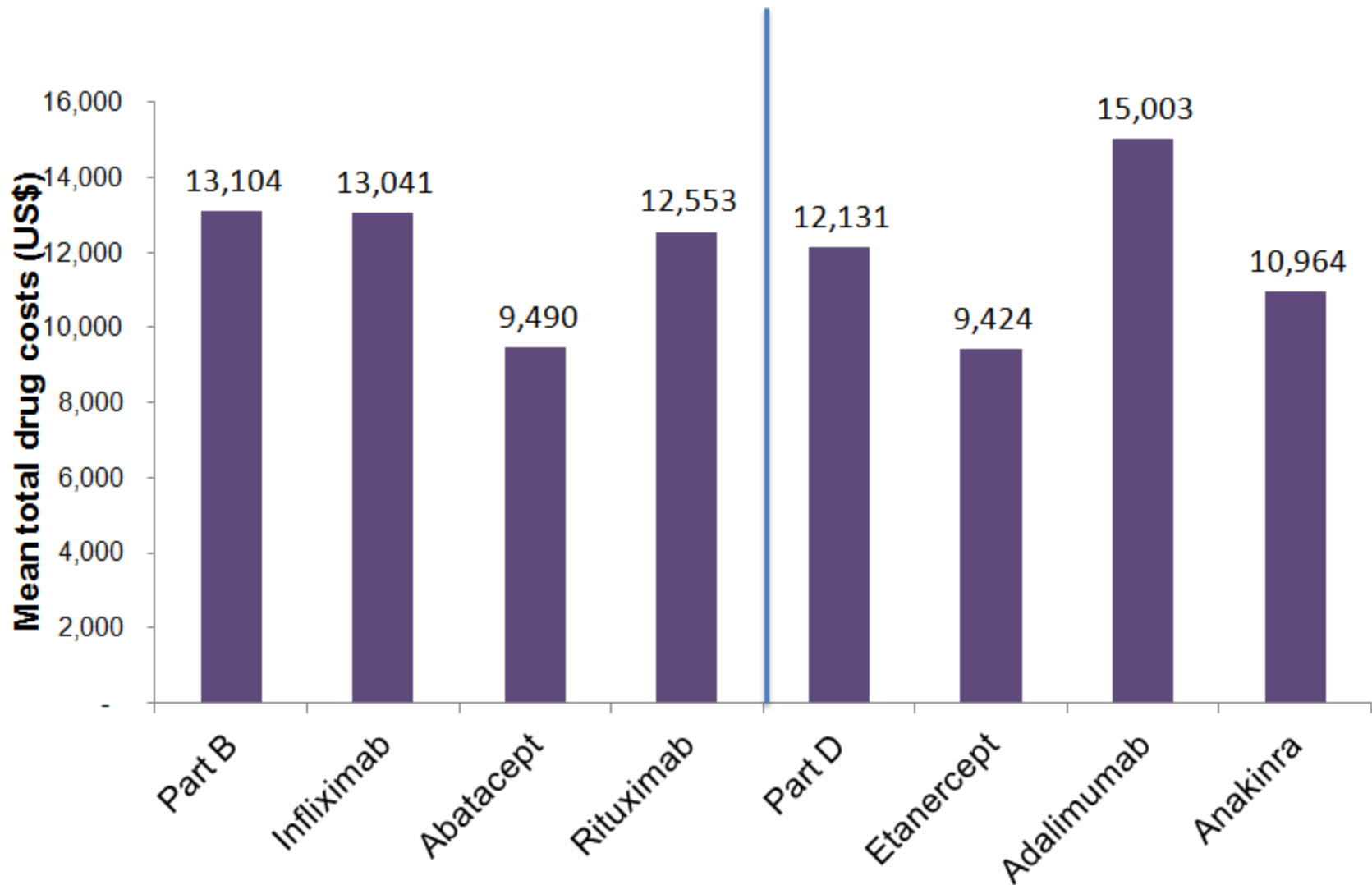
## Appendix and Backup Slides

# Percent of Patients in Sample

	Pooled	2006	2007	2008	2006	2007	2008
All RA	47511	11287	17570	18654	24%	37%	39%
Biologics							
Users	7831	1863	2916	3052	24%	37%	39%
Part D bio							
users	3552	947	1287	1318	27%	36%	37%
Part B bio							
users	4029	847	1537	1645	21%	38%	41%

# Type of Use - Total Drug Costs Per User

Results



- Patients preferences
  - Part B
    - Health professional administration
    - Dosing frequency
    - Leisure time
  - Part D
    - Treatment timing
    - Administration time/driving time
    - Home treatment
- Physician effects
  - Rheumatologist: 50% of total Medicare payments Part B drugs<sup>1</sup>

<sup>1</sup> Medicare Payment Advisory Commission, Report to congress, impact of changes in Medicare payments for part B drugs (2007)