



Truven Health Analytics MarketScan ®

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Outline

- MarketScan ® Commercial Claims and Encounters - nuts and bolts
- Examples of use
- Next steps

MarketScan® Commercial Claims and Encounters

Contributors to Funding

- Institute for Clinical and Translational Research
- Center for Drug Safety and Effectiveness
- Department of Health Policy and Management
- Center for Health Services and Outcomes
- Center for Surgical Trials and Outcomes Research
- Division of General Internal Medicine



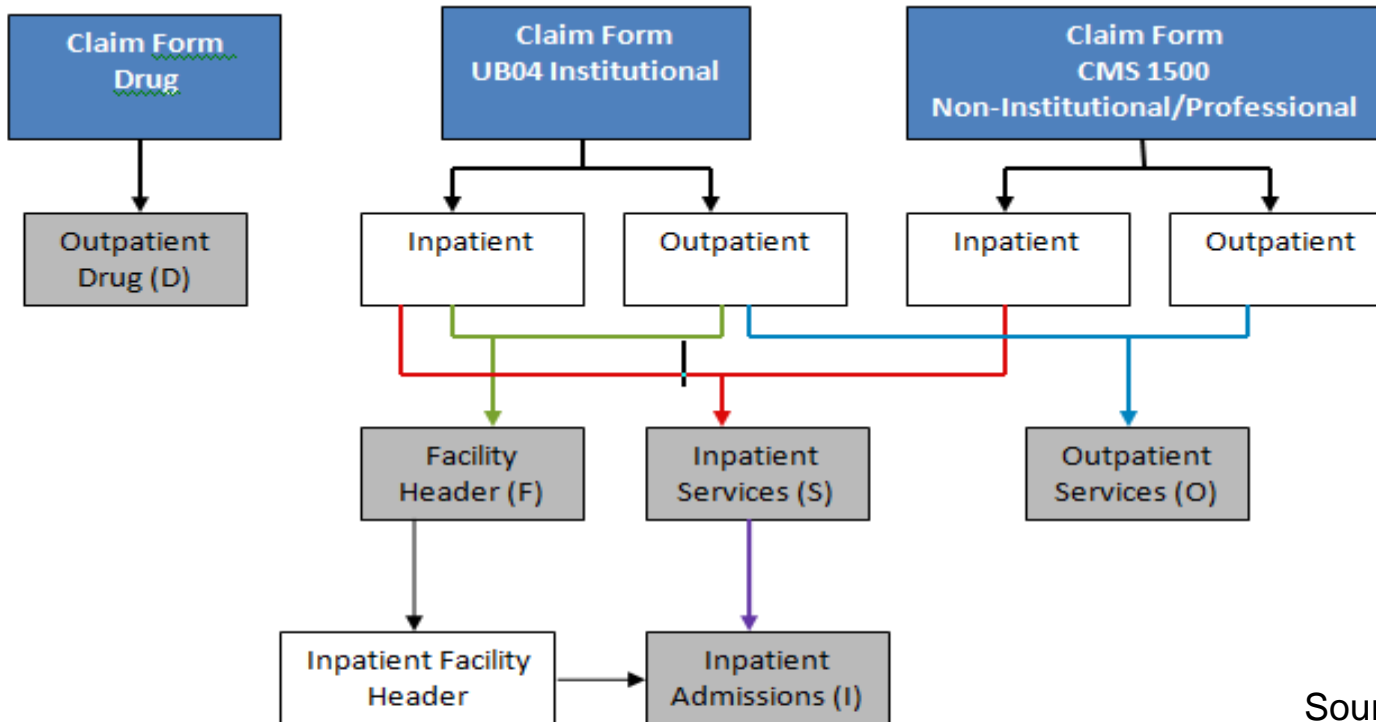
Data Source

- Data represent the medical experience of **insured employees and their dependents**
- These are active employees, early retirees, COBRA continuees and Medicare-eligible retirees with employer-provided insurance
- Claims data are collected from approximately 100 different insurance companies, including Blue Cross Blue Shield plans, and third party administrators
- The MarketScan Databases are constructed from these privately insured paid medical and prescription drug claims.
- No Medicaid or Workers Compensation data are included!

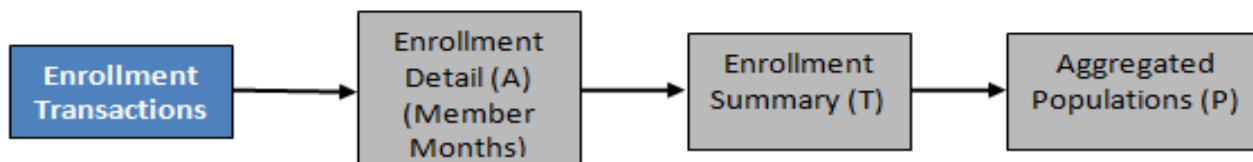
Key words

- Commercial claims
- Employer-based

Data Flow Diagram



Source: 2012 MarketScan®
CCAIE MDCR User Guide



Data Files (1)

Inpatient Admissions (I) : Admission summary records

Inpatient Services (S): The individual inpatient claim records that were used to create the admissions records

Outpatient Services (O): Individual outpatient claim records

Facility Header (F): Header records from the inpatient and outpatient services

Outpatient Pharmaceutical Claims (D): Individual outpatient prescription drug claim records

Data Files (2)

Population (P): Summarizes demographic information about the eligible population

Annual Enrollment Summary (A): Contains one enrollment record per enrollee during the database year

Enrollment Detail (T): Contains multiple records per enrollee; one record per enrollee per month during the database year

Sample Data Elements

Demographic	Enrollment
Enrollee ID	Date of enrollment
Age	Member days
Gender	Date of disenrollment
Employment status	
Geographic location (MSA)	
Industry	

Sample Data Elements

Demographic	Enrollment	Health Plan
Enrollee ID	Date of enrollment	Coordination of benefits amount
Age	Member days	Deductible amount
Gender	Date of disenrollment	Copayment amount
Employment status		Plan type
Geographic location (MSA)		
Industry		

Sample Data Elements



Demographic	Enrollment	Health Plan	Medical
Enrollee ID	Date of enrollment	Coordination of benefits amount	Admission data and type
Age	Member days	Deductible amount	Principal diagnosis and code
Gender	Date of disenrollment	Copayment amount	Discharge status
Employment status		Plan type	Principal procedure code
Geographic location (MSA)			Secondary codes
Industry			DRG
			Provider ID
			Length of stay

Sample Data Elements



Demographic	Enrollment	Health Plan	Medical	Financial
Enrollee ID	Date of enrollment	Coordination of benefits amount	Admission data and type	Total payments
Age	Member days	Deductible amount	Principal diagnosis and code	Net payments
Gender	Date of disenrollment	Copayment amount	Discharge status	Payments of physician
Employment status		Plan type	Principal procedure code	Payments to hospital
Geographic location (MSA)			Secondary codes	Payments total admission
Industry			DRG	
			Provider ID	
			Length of stay	

Sample Data Elements



Demographic	Enrollment	Health Plan	Medical	Financial	Drug
Enrollee ID	Date of enrollment	Coordination of benefits amount	Admission data and type	Total payments	Generic product ID
Age	Member days	Deductible amount	Principal diagnosis and code	Net payments	Average wholesale price
Gender	Date of disenrollment	Copayment amount	Discharge status	Payments of physician	Prescription drug payment
Employment status		Plan type	Principal procedure code	Payments to hospital	Therapeutic class
Geographic location (MSA)			Secondary codes	Payments total admission	Days supplied
Industry			DRG		National drug code
			Provider ID		Refill number
			Length of stay		Therapeutic group

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DEACLAS DEA Class Code
DEACLDS DEA Class Description
DESIDRG DESI Drug Indicator
EXCDGDS Exceptional Drug Description

EXCLDRG Exceptional Drug Indicator
GENERID Generic Product ID
GENIND Generic Indicator
GENNME Generic Drug Name
GNINDDS Generic Indicator Description

MAINTDS Maintenance Indicator
Description
MAINTIN Maintenance Indicator
MANFNME Manufacturer Name
MASTFRM Master Form Code
METSIZ Metric Size
MSTFMDS Master Form Description

NDCNUM National Drug Code
ORGBKCD Orange Book Code
ORGBKDS Orange Book Code Description
ORGBKFG Orange Book Standard Flag
PKQTYCD Package Quantity Code
PKSIZE Package Size
PRDCTDS Product Category Description
PRODCAT Product Category Code
PRODNME Product Name
SIGLSRC Single Source Indicator
STRNGTH Strength
THERCLS Therapeutic Class
THERDTL Therapeutic Detail Code
THERGRP Therapeutic Group
THRCLDS Therapeutic Class Description
THRDTDS Therapeutic Detail Code Description
THRGRDS Therapeutic Group

Demographics of Enrollees

- Claims years: 2010 through 2015
- Roughly 80 million covered lives
- Age
 - 0-17: 27%
 - 18-34: 27%
 - 35-44: 16%
 - 45-54: 17%
 - 55-64: 14%
- Gender: 51% female
- No Race/Ethnicity data

Examples of Use

- Published examples
- Hopkins examples

Am J Cardiovasc Drugs
DOI 10.1007/s40256-016-0176-1



ORIGINAL RESEARCH ARTICLE

Use of Statins and the Risk of Incident Diabetes: A Retrospective Cohort Study

Busuyi S. Olotu^{1,2,3} · Marvin D. Shepherd² · Suzanne Novak^{2,3} · Kenneth A. Lawson² ·
James P. Wilson² · Kristin M. Richards² · Rafia S. Rasu¹

Results: Statins and Incidence DM

Table 2 Weighted^a and unweighted incidence density and cumulative incidence of diabetes by statin use

	Subjects (N) [a]	Sum of follow-up months (person-months) [b]	Number of new cases of diabetes [c]	Incidence density rate (per 1000 person-months) [c/b × 1000]	Cumulative incidence (per 1000 population) [c/a × 1000]
Study population	106,424	1,608,088.77	2478	1.54	23.2
	4,554,802	68,836,394.87	115,720	1.68	25.4
Statin users	53,212	798,909.73	1833	2.29	34.4
	2,454,285	36,851,101.44	88,208	2.39	35.9
Non-statin users	53,212	809,179.03	645	0.80	12.1
	2,100,517	31,985,293.44	27,512	0.86	13.1

Quality of care

Psychiatr Serv. 2016 Jun 1

Prescriptions Filled Following an Opioid-Related Hospitalization.

Naeger S, Ali MM, Mutter R, Mark TL, Hughey L.

OBJECTIVE:

The purpose of this study was to identify patterns of postdischarge prescription fills following an opioid-related hospitalization.

METHODS:

Using the 2010-2014 MarketScan Commercial Claims and Encounters database, this analysis identified the percentage of patients (N=36,719) with an opioid-related inpatient admission who **received substance use disorder treatment medications within 30 days of being discharged.**

RESULTS:

Thirty-five percent of the sample did not have any prescription fills in the 30-day postdischarge period. **Less than a quarter (16.7%)** of patients received any FDA-approved opioid dependence medication in the 30 days following discharge. Forty percent of patients in the sample received antidepressants, 15.6% received antipsychotics, 13.9% filled a prescription for a benzodiazepine, and 22.4% filled a prescription for an opioid pain medication.

CONCLUSIONS:

More effort is needed to ensure that patients hospitalized for opioid misuse are receiving recommended services. 20

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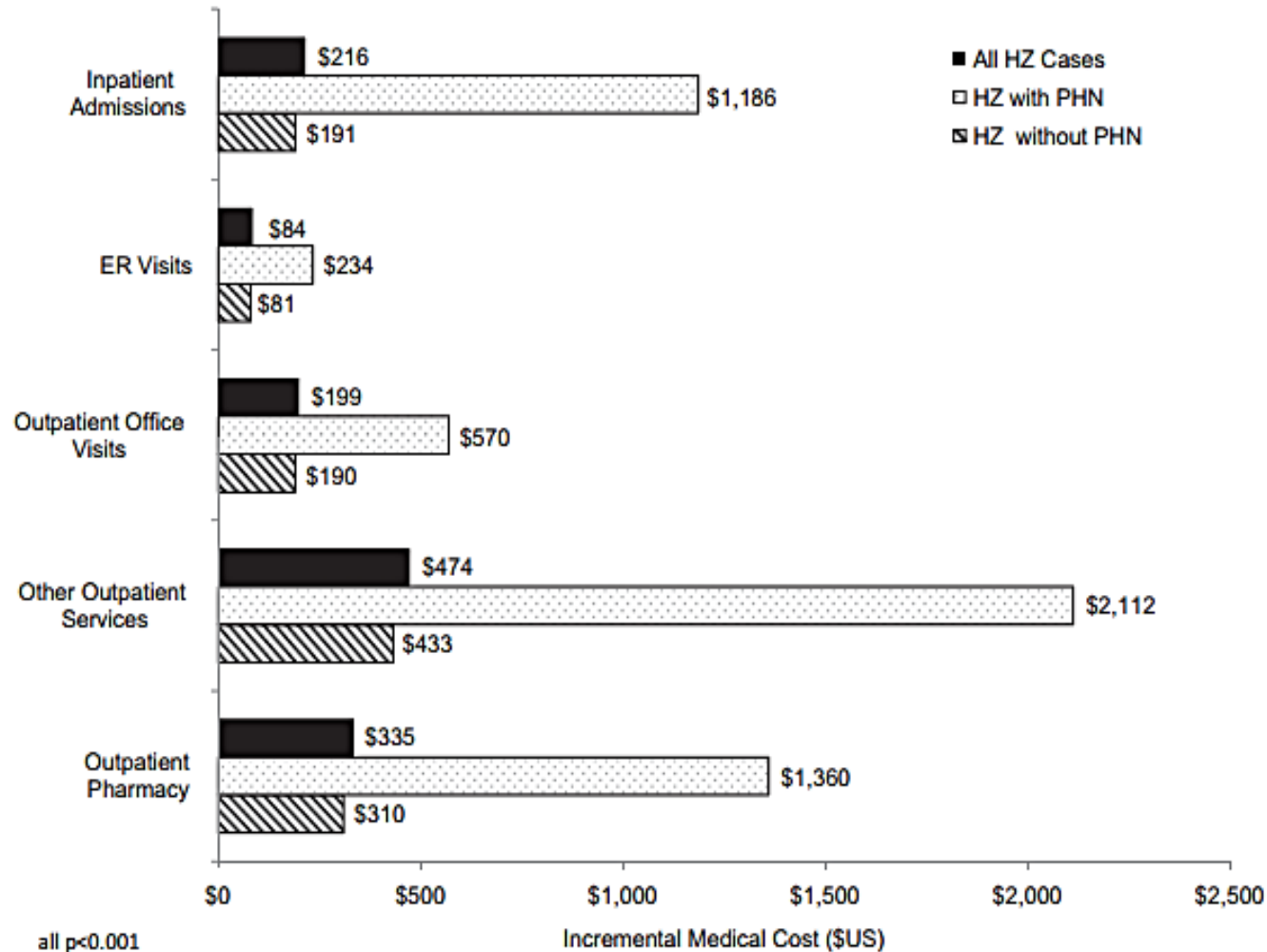
ORIGINAL ARTICLE

Healthcare resource utilization and costs associated with herpes zoster in the US

Barbara H. Johnson^a, Liisa Palmer^a, Justin Gatwood^b, Gregory Lenhart^a, Kosuke Kawai^c and Camilo J. Acosta^d

^aTruven Health Analytics, Ann Arbor, MI, USA; ^bUniversity of Tennessee Health Science Center College of Pharmacy, Nashville, TN, USA; ^cClinical Research Center, Boston Children's Hospital; Harvard Medical School, Boston, MA, USA; ^dCenter for Observational and Real-World Evidence, Merck & Co., Inc., Kenilworth, NJ, USA

Costs of annual incremental office visits



Metformin Use Is Associated with Improved Survival in Patients Undergoing Resection for Pancreatic Cancer

Marcelo Cerullo¹ · Faiz Gani¹ · Sophia Y. Chen¹ · Joe Canner¹ · Timothy M. Pawlik¹

Abstract Preclinical evidence has demonstrated anti-tumorigenic effects of metformin. The effects of metformin following pancreatic cancer, however, remain undefined. We sought to assess the association between metformin use and survival using a large, nationally representative sample of patients undergoing surgery for pancreatic cancer. Patients undergoing a pancreatic resection between January 01, 2010, and December 31, 2012, were identified using the Truven Health MarketScan database. Clinical data, including history of metformin use, as well as operative details and information on long-term outcomes were collected. Multivariable Cox proportional hazards regression analysis was performed to assess the effect of metformin use on overall survival (OS). A total of 3393 patients were identified. The mean age of patients was 54.2 years (SD=9.1 years). Roughly one half of patients were female ($n=1735$, 51.1 %); 49.1 % ($n=1665$) presented with a Charlson comorbidity index of 3 or greater (CCI ≥ 3); and 19.6 % ($n=664$) had diabetes. At the time of surgery, 60.0 % ($n=2034$) of patients underwent a pancreaticoduodenectomy, 35.7 % ($n=1212$) a partial/distal pancreatectomy, while 4.3 % ($n=147$) had a total pancreatectomy. On pathology, 1057 (31.2 %) had lymph node metastasis. Metformin use was identified in 456 patients (13.4 %) and was more commonly administered among patients without locally advanced disease (14.3 vs. 11.6 %, $p=0.038$). While OS was comparable between patients within the first year of surgery (OS at 1 year 65.4 % [95 % confidence interval (CI) 63.4–67.3 %] vs. 69.2 % [95 % CI 64.2–73.4 %]), patients who received metformin demonstrated an improved OS beginning at 18 months following surgery. On multivariable analysis adjusting for patient and clinicopathologic characteristics, metformin use was independently associated with a decreased risk of mortality (hazard ratio [HR]=0.79, 95 % CI 0.67–0.93, $p=0.005$). Metformin use was associated with an improved overall survival among patients undergoing pancreatic surgery for pancreatic cancer. Further work is necessary to better understand its role in modifying cancer-specific and overall health outcomes.

More Hopkins

Schneider EB, Canner JK, Gani F, Kim Y, Ejaz A, Spolverato G, Pawlik TM. **Early versus late hospital readmission** after pancreaticoduodenectomy. J Surg Res. 2015 Jun 1;196(1):74-81.

Daubresse M, Hutfless S, Kim Y, Kornfield R, Qato DM, Huang J, Miller K, Emery SL, Alexander GC. Effect of **Direct-to-Consumer Advertising** on Asthma Medication Sales and Healthcare Use. Am J Respir Crit Care Med. 2015 Jul 1;192(1):40-6. doi:

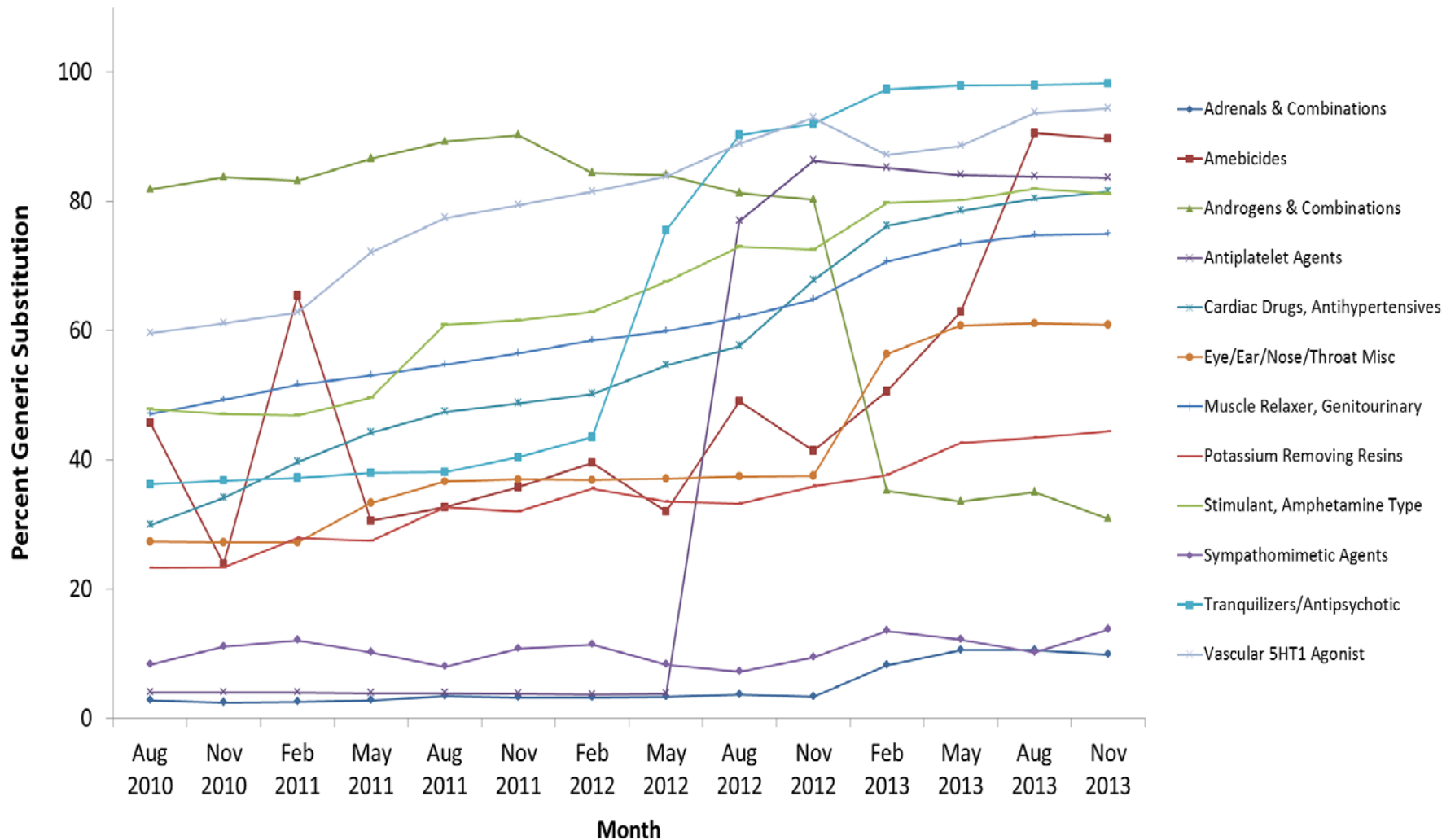
Nazarian S, Reynolds MR, Ryan MP, Wolff SD, Mollenkopf SA, Turakhia MP. Utilization and likelihood of **radiologic diagnostic imaging** in patients with implantable cardiac defibrillators. J Magn Reson Imaging. 2016 Jan;43(1):115-27.

Petri M, Daly RP, Pushparajah DS. **Healthcare costs of pregnancy** in systemic lupus erythematosus: retrospective observational analysis from a US health claims database. J Med Econ. 2015;18(11):967-73.

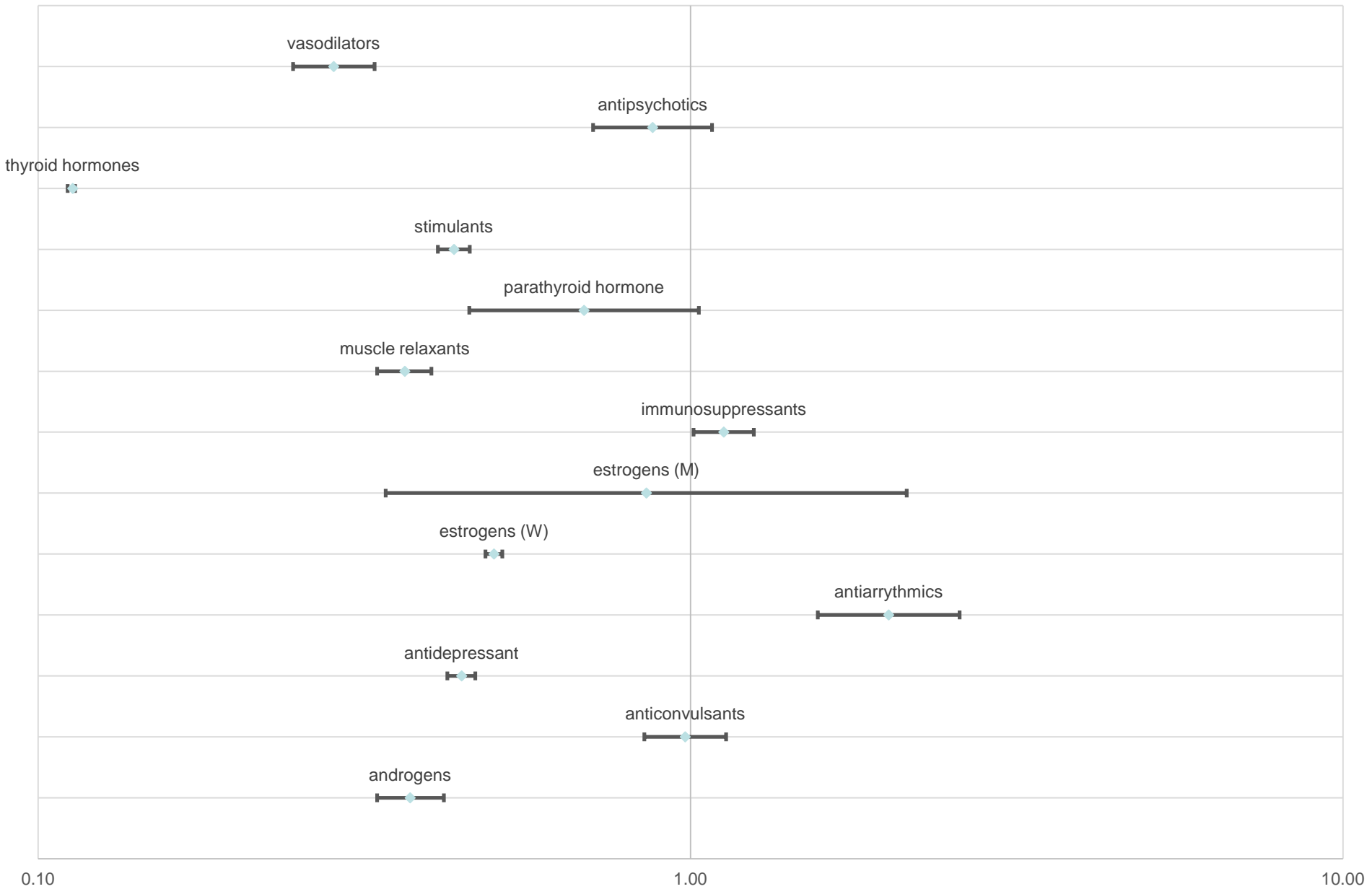
Our work

- Cooperative agreement with FDA Office of Generic Drugs
- We said we would study **determinants of generic drug usage** by therapeutic class

Drugs with >50% relative change in generic substitution over 3 years



Odds Ratios for Generic Substitution for Mail Order Fills versus Retail Fills



Possible or Not Possible

(with MarketScan Commercial Claims)

1. Does use of enoxaparin prophylaxis in the hospital reduce risk of VTE after surgery?

Not possible

No inpatient
drug data

Possible or Not Possible

(with MarketScan Commercial Claims)

2. Does leukemia treatment before age 12 lead to premature coronary events?

Not possible

Highly unlikely that you will have someone insured for that many years in this data

Possible or Not Possible

(with MarketScan Commercial Claims)

3. Do patients in HMO type insurance have fewer emergency room visits than patients with a fee-for-service type insurance?

Sure - possible

Possible or Not Possible

(with MarketScan Commercial Claims)

4. Do patients with laparoscopic hysterectomies have shorter lengths of stay than patients with open hysterectomies?

Sure - possible

Possible or Not Possible

(with MarketScan Commercial Claims)

5. Do older patients with urinary incontinence have more falls than older patients without urinary incontinence?

Not possible

No Medicare data so very few older people

Next Steps

Data access at JHU

- Contact CDSE for more information including: Marketscan User Guide, Data Dictionary

cdse@jhsph.edu
- Brief application and data use agreement for internal use
- **No charge for an unfunded project**
- There is a cost payable to Truven Health Analytics if the data is used as part of a grant (depends on size of grant and source of funding –e.g., federal grant is \$28K)

Options

- You can be given access to the server where the data resides (biostatistics server) -- preferred
 - Will do the short course to be allowed to access the server
 - There is a tiny fee for access
- Staff of Center for Drug Safety and Effectiveness can make an analytic data set (if not overly complex) --not preferred

Caveat

This school-purchased MarketScan data cannot be used for student projects. These data are only for faculty and staff research.

If a student would like to use MarketScan data, they allow use of the MarketScan dissertation-support data set, which is a special data set we provide to the student at no cost. The student must be a PhD candidate and must use the data for his/her dissertation.

The data set we provide to the student would be data years 2008 to 2010 from the MarketScan Commercial Claims Database.

Thank you to:

- Institute for Clinical and Translational Research
- Center for Drug Safety and Effectiveness
- Department of Health Policy and Management
- Center for Health Services and Outcomes Center for Surgical Trials and Outcomes Research
- Division of General Internal Medicine

