BENCHMARKING OUTPATIENT ANTIBIOTIC PRESCRIBING

The Children's Hospital of Philadelphia®
RESEARCH INSTITUTE

Perelman School of Medicine
University of Pennsylvania

US Outpatient Antibiotic Prescribing Variation According to Geography, Patient Population, and Provider Specialty in 2011

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- IMS Health Xponent database
- 262.5 million antibiotic prescriptions dispensed in 2011
- 842 prescriptions per 1000 persons

Clinical Infectious Diseases 2015;60(9):1308–16

Table 2. Antibiotic Courses Prescribed and Prescriptions Per Provider in 2011, by Provider Specialty

Provider Specialty	Prescriptions, No. in Millions (%)	Providers, No.	Prescriptions per Provider, Rate
All Providers	262.5	911 814	289
Persons <20 y	73.8 (29)	. . .	. . .
Persons ≥20 y	182.8 (71)	. . .	. . .
Family practice	64.1 (24)	96 073	667
Persons <20 y	12.9 (21)	. . .	. . .
Persons ≥20 y	49.7 (79)	. . .	. . .
Dermatology	8.2 (3)	11 329	724
Pediatrics	32.4 (12)	54 228	598
Otolaryngology	4.1 (2)	9536	430
Emergency medicine	13.8 (5)	32 346	427
Internal medicine/ pediatrics	1.4 (1)	3329	421
Internal medicine	32.1 (12)	83 841	383
Physician assistants	17.5 (7)	63 467	276
Infectious diseases	1.3 (1)	6166	211
Dentistry	25.6 (10)	122 706	208
Obstetrics/ gynecology	6.7 (3)	37 590	178
Nurse practitioners	19.5 (7)	109 741	178
Surgery (general)	6.9 (3)	69 536	99
Pediatric subspecialty	0.8 (<1)	8273	97
Medical subspecialty	6.9 (3)	74 424	93
Other	8.2 (3)	113 783	72
Urology	6.0 (2)	10 131	59

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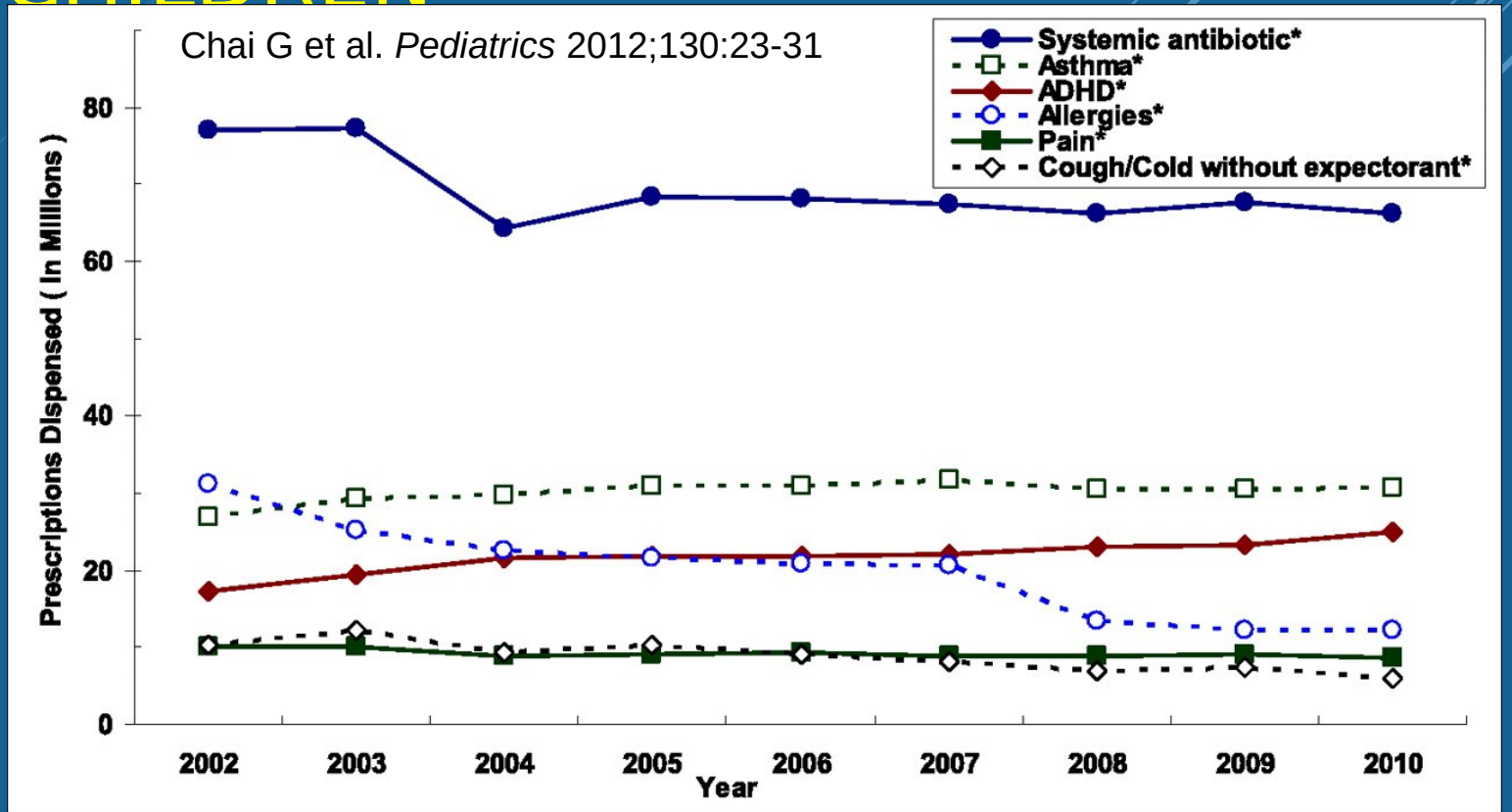
ANTIBIOTIC USE: OUTPATIENT CHILDREN



OUTPATIENT ANTIBIOTIC PRESCRIBING (Rx/1000)

	US	Sweden
All	**833**	**388**
quinolones	105	25
macrolides	185	12
cephalosporins	117	12

Ternhag A. NEJM 2013;369:1175-1176.
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ADVERSE EFFECTS OF ANTIBIOTIC USE

- use drives resistance
- bacteria have shown the ability to become resistant to every antibiotic that has been developed

NATIONAL SUMMARY DATA

Estimated minimum number of illnesses and deaths caused by antibiotic resistance*:

At least **2,049,442** illnesses,

23,000 deaths

**bacteria and fungus included in this report*

+

Estimated minimum number of illnesses and death due to *Clostridium difficile* (*C. difficile*), a unique bacterial infection that, although not significantly resistant to the drugs used to treat it, is directly related to antibiotic use and resistance:

At least **250,000** illnesses,

14,000 deaths

WHERE DO INFECTIONS HAPPEN?

Antibiotic-resistant infections can happen anywhere. Data show that most happen in the general community; however, most deaths related to antibiotic resistance happen in healthcare settings, such as hospitals and nursing homes.

U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

CS239559

RESISTANCE ASIDE…

- 5%–25% diarrhea
- 1 in 1000 visit emergency department for adverse effect of antibiotic
  - comparable to insulin, warfarin, and digoxin
- 1 in 4000 chance that an antibiotic will prevent serious complication from ARTI

Shehab N. CID 2008:47; Linder JA. CID 2008:47

ANTIBIOTIC USE FOR ARTIs

- 21% of all ambulatory visits for children receive an antibiotic RX
  - **72% for ARTI**

Hersh *Pediatrics* 2011;128;1053

Original Investigation

Prevalence of Inappropriate Antibiotic Prescriptions Among US Ambulatory Care Visits, 2010-2011

Katherine E. Fleming-Dutra, MD; Adam L. Hersh, MD, PhD; Daniel J. Shapiro; Monina Bartoces, PhD; Eva A. Enns, PhD; Thomas M. File Jr, MD; Jonathan A. Finkelstein, MD, MPH; Jeffrey S. Gerber, MD, PhD; David Y. Hyun, MD; Jeffrey A. Linder, MD, MPH; Ruth Lynfield, MD; David J. Margolis, MD, PhD; Larissa S. May, MD, MSPH; Daniel Merenstein, MD; Joshua P. Metlay, MD, PhD; Jason G. Newland, MD, MEd; Jay F. Piccirillo, MD; Rebecca M. Roberts, MS; Guillermo V. Sanchez, MPH, PA-C; Katie J. Suda, PharmD, MS; Ann Thomas, MD, MPH; Teri Moser Woo, PhD; Rachel M. Zetts; Lauri A. Hicks, DO

- diagnosis-specific rates of total and appropriate antibiotic prescribing determined based on national guidelines and regional variation
  - 30% overall reduction suggested
  - 50% for ARTIs

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FIGHTING BACK AGAINST ANTIBIOTIC RESISTANCE

Four Core Actions to Prevent Antibiotic Resistance

1 PREVENTING INFECTIONS, PREVENTING THE SPREAD OF RESISTANCE

Avoiding infections in the first place reduces the amount of antibiotics that have to be used and reduces the likelihood that resistance will develop during therapy. There are many ways that drug-resistant infections can be prevented: immunization, safe food preparation, handwashing, and using antibiotics as directed and only when necessary. In addition, preventing infections also prevents the spread of resistant bacteria.

2 TRACKING

CDC gathers data on antibiotic-resistant infections, causes of infections and whether there are particular reasons (risk factors) that caused some people to get a resistant infection. With that information, experts can develop specific strategies to prevent those infections and prevent the resistant bacteria from spreading.

3 IMPROVING ANTIBIOTIC PRESCRIBING/STEWARDSHIP

Perhaps the single most important action needed to greatly slow down the development and spread of antibiotic-resistant infections is to change the way antibiotics are used. Up to half of antibiotic use in humans and much of antibiotic use in animals is unnecessary and inappropriate and makes everyone less safe. Stopping even some of the inappropriate and unnecessary use of antibiotics in people and animals would help greatly in slowing down the spread of resistant bacteria. This commitment to always use antibiotics appropriately and safely—only when they are needed to treat disease, and to choose the right antibiotics and to administer them in the right way in every case—is known as antibiotic stewardship.

4 DEVELOPING NEW DRUGS AND DIAGNOSTIC TESTS

Because antibiotic resistance occurs as part of a natural process in which bacteria evolve, it can be slowed but not stopped. Therefore, we will always need new antibiotics to keep up with resistant bacteria as well as new diagnostic tests to track the development of resistance.

ANTIBIOTIC STEWARDSHIP

IN YOUR FACILITY WILL

DECREASE

- ANTIBIOTIC RESISTANCE
- C. DIFFICILE INFECTIONS
- COSTS

INCREASE

- GOOD PATIENT OUTCOMES

PROMOTE ANTIBIOTIC BEST PRACTICES— A FIRST STEP IN ANTIBIOTIC STEWARDSHIP

- ENSURE ALL ORDERS HAVE DOSE, DURATION, AND INDICATIONS
- GET CULTURES BEFORE STARTING ANTIBIOTICS
- TAKE AN "ANTIBIOTIC TIMEOUT" REASSESSING ANTIBIOTICS AFTER 48–72 HOURS

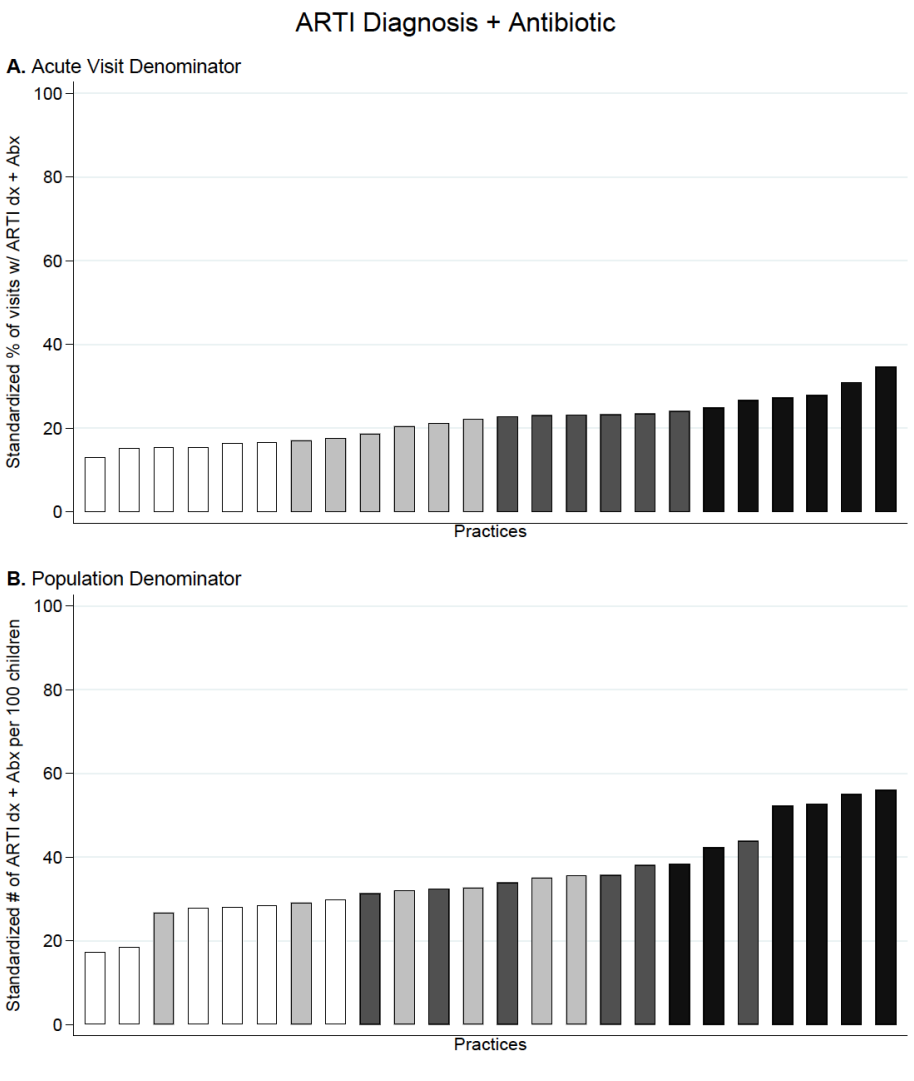
ANTIBIOTIC STEWARDSHIP PROGRAMS ARE A "WIN-WIN" FOR ALL INVOLVED

A UNIVERSITY OF MARYLAND STUDY SHOWED ONE ANTIBIOTIC STEWARDSHIP PROGRAM **SAVED A TOTAL OF $17 MILLION** OVER EIGHT YEARS

ANTIBIOTIC STEWARDSHIP HELPS **IMPROVE PATIENT CARE AND SHORTEN HOSPTIAL STAYS,** THUS **BENEFITING PATIENTS AS WELL AS HOSPITALS**

WHAT WE WOULD LIKE TO DO:

- Show antibiotic prescribing rates across CHOP practices
- Get YOUR FEEBACK on how best to display these data
- Use these data to establish an achievable benchmark for antibiotic prescribing for ARTIs


ARTI Diagnosis + Antibiotic
A. Acute Visit Denominator
Standardized % of visits w/ ARTI dx + Abx
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Practices
B. Population Denominator
Standardized # of ARTI dx + Abx per 100 children
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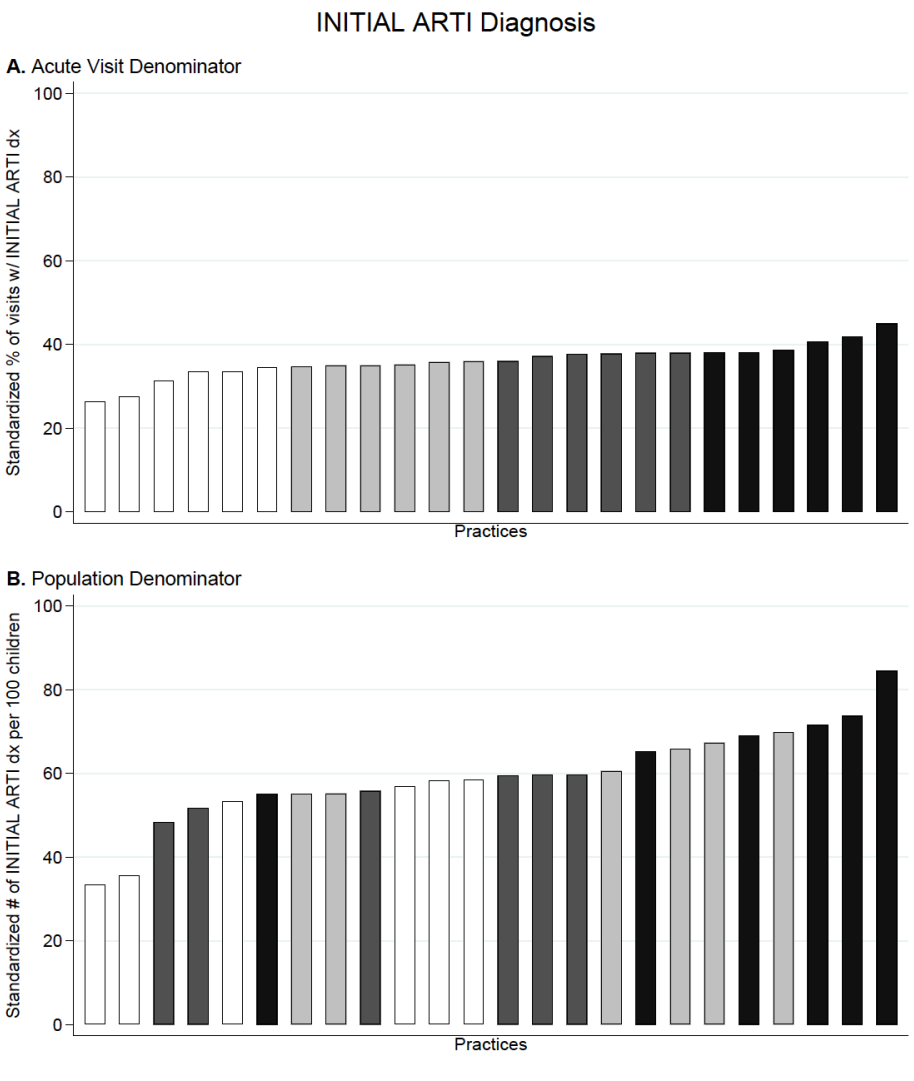
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THANK YOU

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