



National Survey Reveals Barriers to Outpatient Antibiotic Stewardship Efforts

Physicians don't recognize their own inappropriate prescribing, are skeptical of some stewardship strategies

The Pew Charitable Trusts

Michael Caudell-Feagan, *executive vice president and chief program officer*

Michael Thompson, *vice president and head of government performance*

Team members

Kathy Talkington, *director, health programs*

David Hyun, *senior officer*

Kasia O'Neill Murray, *senior manager*

Rachel Zetts, *officer*

Gaurav Dhiman, *associate*

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External reviewer

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Overview

Outpatient settings account for the majority of antibiotics used in human health care, and in these settings an estimated 1 in 3 antibiotic prescriptions is unnecessary. Additionally, only half of patients treated with antibiotics for common outpatient conditions receive the recommended first-line drugs. Antibiotic stewardship efforts—which aim to ensure that these drugs are used only when needed and that the most appropriate antibiotic is used at the right dose and duration of treatment—are crucial to improving outpatient prescribing practices, reducing the harm of antibiotic-associated adverse drug events, and minimizing the spread of antibiotic resistance.

To better understand the attitudes of doctors toward antibiotic resistance, inappropriate antibiotic prescribing, and the need for and perceived impact of stewardship interventions, The Pew Charitable Trusts and the American Medical Association conducted a national survey of 1,550 primary care physicians between August and October 2018. Understanding the perceptions that physicians have of these issues can help stakeholders identify and tailor effective strategies to spur the implementation of stewardship efforts.

Key survey findings include:

- Although most physicians recognized antibiotic resistance and inappropriate antibiotic prescribing as problems nationally, fewer viewed them as issues within their own practices. Moreover, 60% of respondents said they believed that they prescribe antibiotics more appropriately than their peers. This lack of recognition of their own contributions to resistance and inappropriate prescribing presents a barrier to the implementation of stewardship efforts.
- Respondents generally supported the need for antibiotic stewardship in health care facilities: 72% believed that these efforts are necessary to effectively address antibiotic resistance, and 91% felt that stewardship is appropriate for office-based practices. Although this support is

promising, 47% of respondents said they would need a lot of help implementing stewardship interventions in their practices.

- When asked about specific types of stewardship activities, respondents strongly supported patient education efforts, with 79% believing that stewardship is ineffective without patient education. However, there was less support for activities aimed at assessing prescribing practices. Half of respondents said they thought that it would be difficult to track and report antibiotic use in a fair and accurate manner.
- On an encouraging note, respondents indicated that a wide range of approaches carried out by health care stakeholders could spur stewardship implementation at the practice level. Reports detailing local antibiotic resistance patterns from state departments of health and financial incentives from payers show the greatest likelihood of encouraging the adoption of stewardship efforts.
- Pediatricians, when compared with internal medicine and family medicine physicians, were less likely to agree that inappropriate prescribing is a problem in their practices and more likely to agree that they prescribe more appropriately than their peers. Yet they are also more likely to express support for antibiotic stewardship interventions.

The survey found a clear need to improve antibiotic prescribing in outpatient health care settings. Even as the number of hospitals with stewardship programs nearly doubled from 2014 to 2017, the adoption of stewardship efforts in outpatient settings continues to lag. Health care stakeholders should leverage these findings to better tailor stewardship interventions and incentivize stewardship efforts in outpatient facilities nationwide.

Background

Inappropriate Antibiotic Prescribing Is a Problem in Outpatient Settings

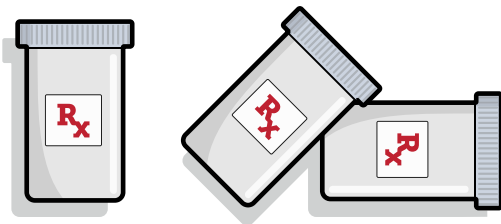
Outpatient health care settings—such as primary care offices, emergency departments, and urgent care settings—account for the majority of antibiotics prescribed in the United States for human health care.¹ However, in some outpatient settings—including primary care offices, emergency departments, and hospital-based clinics—an estimated 1 in 3 antibiotic prescriptions is unnecessary, amounting to some 47 million unnecessary prescriptions each year.² Additionally, in urgent care clinics, nearly half of visits for diagnoses in which antibiotics are not recommended result in an antibiotic prescription.³ In these health care settings, antibiotic stewardship efforts are essential to reducing inappropriate prescribing, decreasing antibiotic-associated adverse drug events, and minimizing the threat of antibiotic resistance, particularly within the community.

Outpatient settings account for **the majority** of antibiotics prescribed in human health care in the U.S.



1 in 3

antibiotic prescriptions written in doctors' offices, emergency rooms, and hospital-based clinics is **unnecessary**—this equals about **47 million prescriptions** each year.

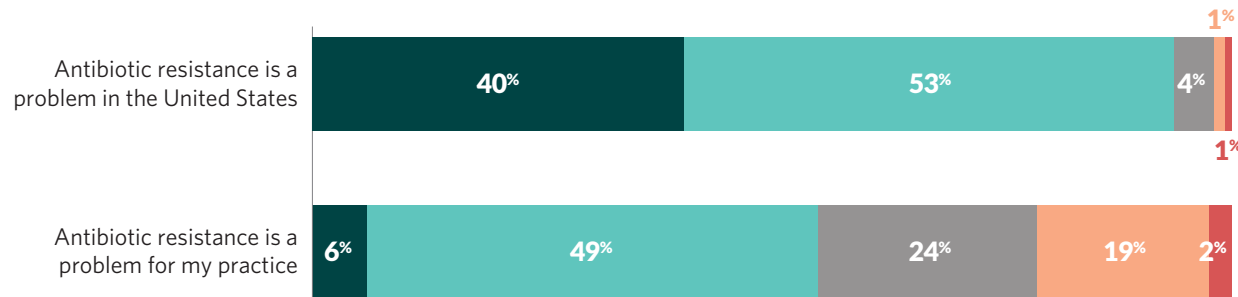


46% of all urgent care visits for diagnoses that do not require an antibiotic still result in an antibiotic prescription

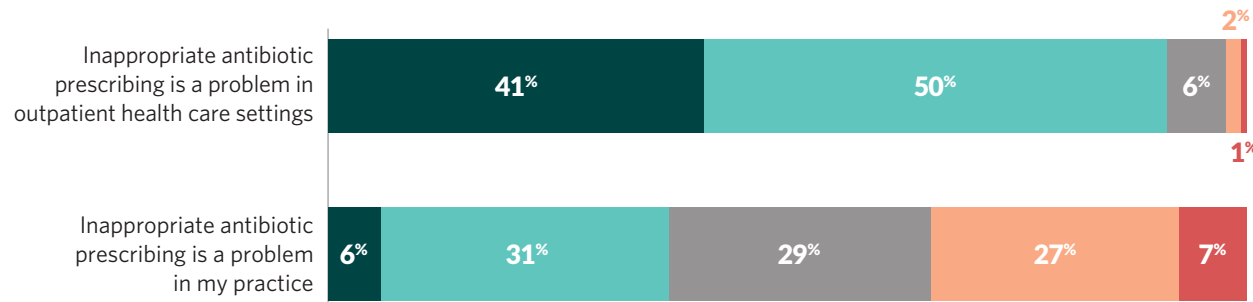
Figure 1

Physicians See Antibiotic Resistance and Inappropriate Antibiotic Prescribing as Problems Nationally, but Are Less Concerned About These Issues in Their Own Practices

Antibiotic resistance



Inappropriate prescribing



■ Strongly agree
 ■ Agree
 ■ Neither agree nor disagree
 ■ Disagree
 ■ Strongly disagree

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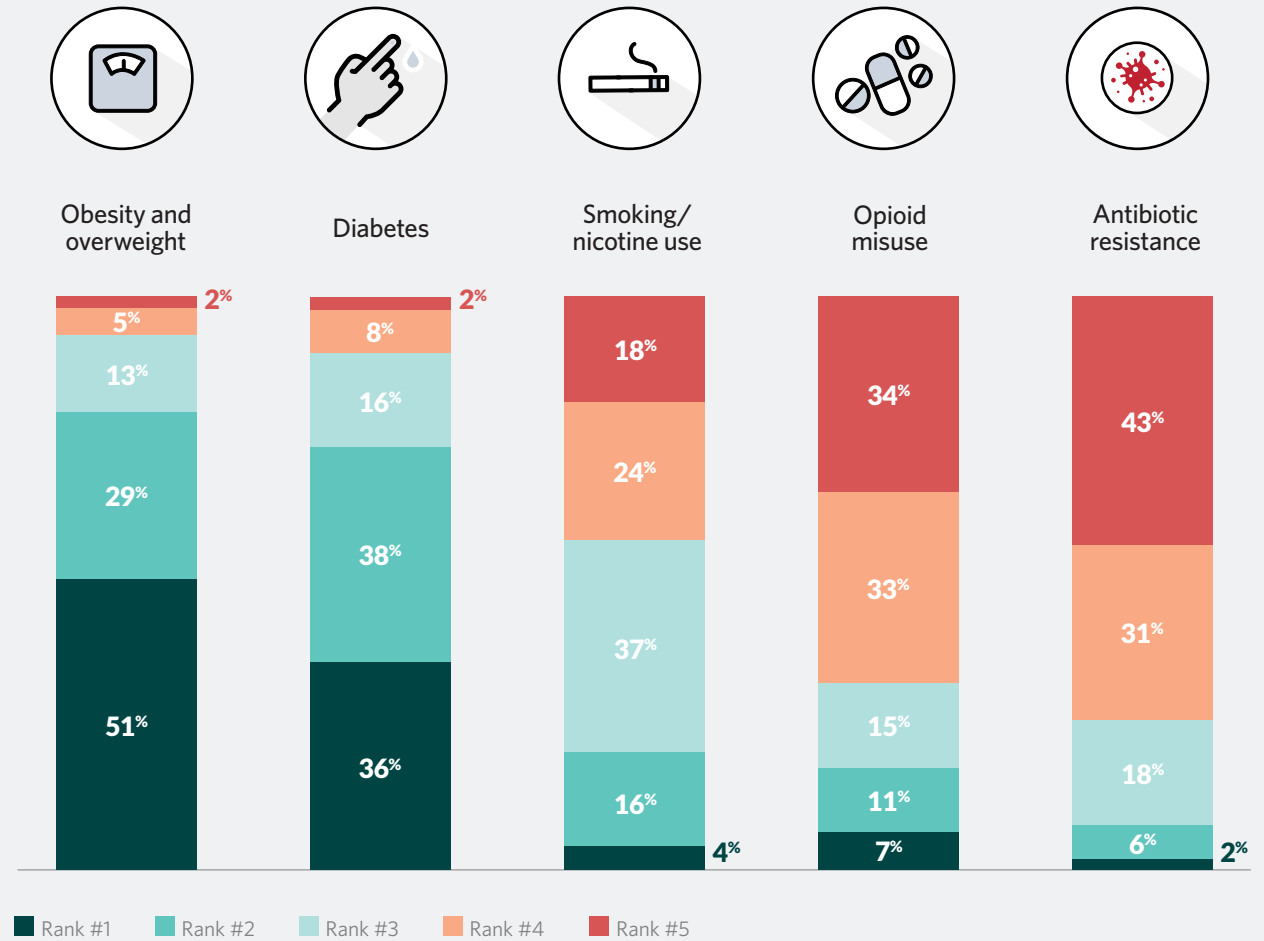
The survey showed a disconnect between respondents' perceptions of antibiotic resistance and inappropriate outpatient antibiotic prescribing as problems at the national level versus within their own practices. Nearly all physicians surveyed (almost 94%) agreed that antibiotic resistance is a concern in the U.S., but only 55% agreed that it was a problem in their own practices. Additionally, 91% agreed that inappropriate prescribing was an issue nationally, but only 37% agreed that it was a problem within their own practices. The disconnect presents a barrier to stewardship implementation.

Figure 2

Comparative Ranking of Antibiotic Resistance as a Public Health Issue

“There are many important health care issues facing health care practitioners in the USA. For the following public health issues, please rank in order of impact on your patients and in your daily practice.”

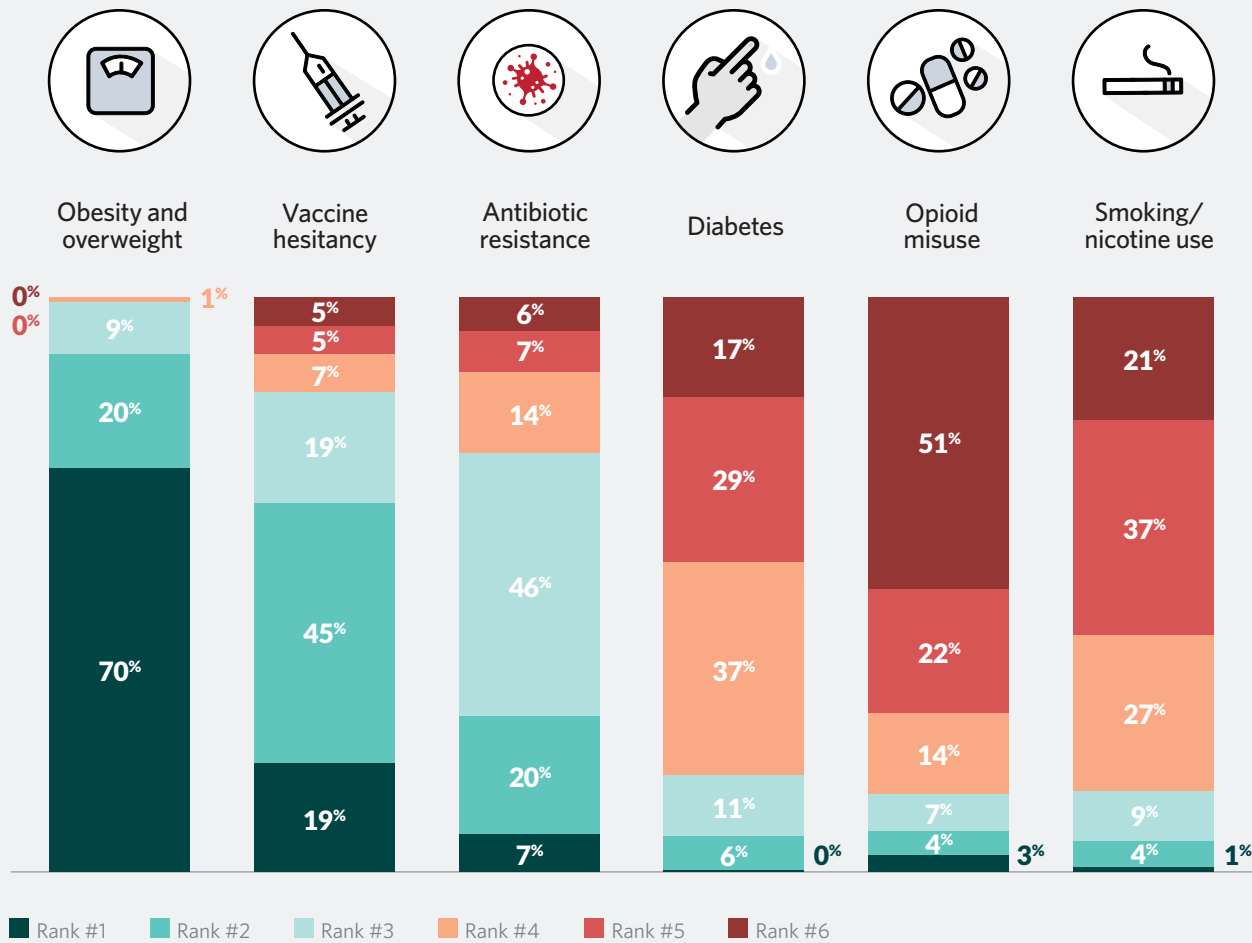
Internal medicine and family medicine physicians



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Pediatricians



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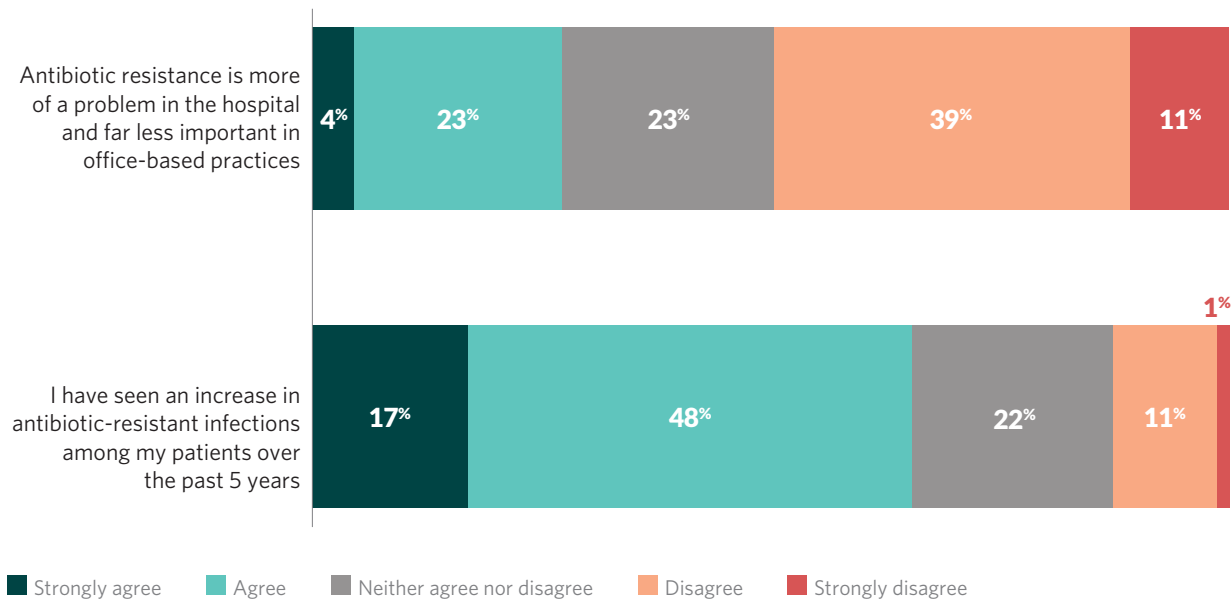
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Only 26% of the internal medicine and family medicine physicians surveyed ranked antibiotic resistance as a top-three public health issue. Obesity, diabetes, smoking, and opioid misuse outranked resistance as having a greater impact on patients and daily practice. A relatively low ranking may have implications for a physician's decision to allocate resources for antibiotic stewardship versus other public health initiatives.

In contrast, 73% of pediatricians ranked antibiotic resistance as a top-three issue. Obesity and overweight remained the issue of highest concern among all physicians.

Figure 3

Half of Primary Care Physicians Disagree That Antibiotic Resistance Is More of a Hospital Problem, and Many Have Seen an Increase in Resistant Infections Among Their Patients



Half of the physicians surveyed disagreed with the statement, “Antibiotic resistance is more of a problem in the hospital and far less important in office-based practices.” This response indicates some recognition that antibiotic resistance is a problem in both inpatient and outpatient settings. Additionally, 65% had seen a rise in resistant infections among their patients over the past five years. This finding is consistent with a 2019 Centers for Disease Control and Prevention (CDC) report, which found an increasing number of community-associated infections caused by resistant pathogens.⁴

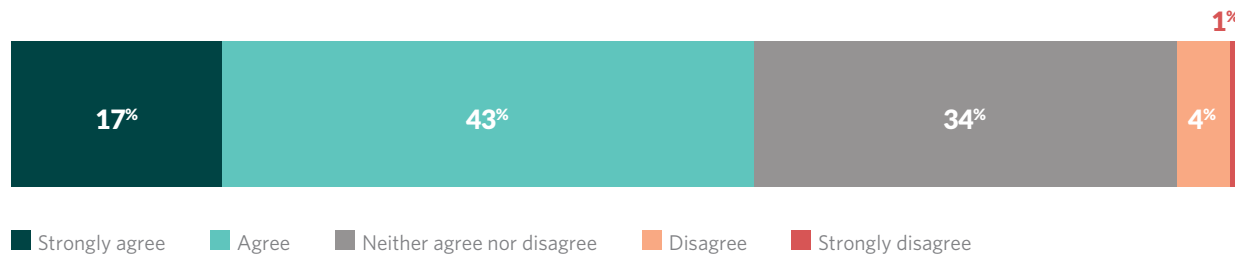
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Figure 4

Physicians Feel That They Prescribe Antibiotics More Appropriately Than Their Peers

“I prescribe antibiotics more appropriately than the average rate of my peers.”



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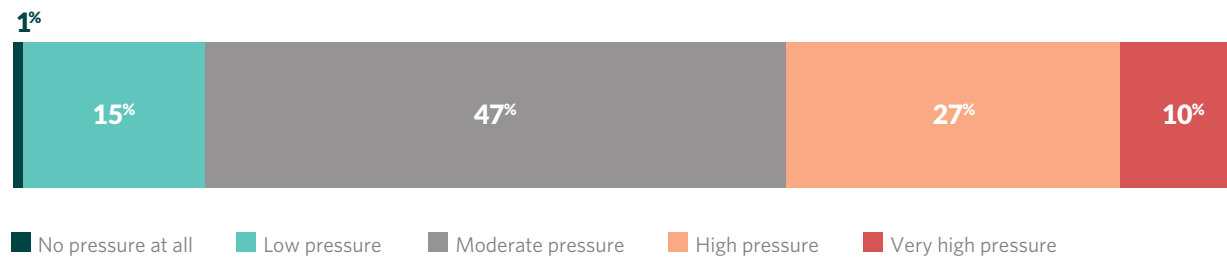
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Sixty percent of respondents agreed with the statement, “I prescribe antibiotics more appropriately than the average rate of my peers,” revealing a perception that other clinicians are more responsible for the problem of inappropriate prescribing—and, therefore, the growing threat of antibiotic resistance—than they are. This belief is another potential barrier in the uptake of stewardship activities, as physicians may view improvements in their own prescribing practices as unnecessary.

Figure 5

Physicians Most Frequently Experience Moderate Pressure to Prescribe Antibiotics From Patients or Their Parents

“Overall, how much pressure do you experience from patients/parents to prescribe antibiotics?”



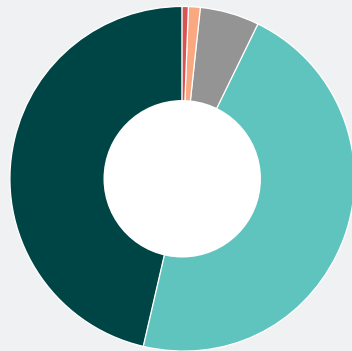
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Forty-seven percent of respondents indicated that they experience moderate pressure from patients or parents to prescribe antibiotics, and an additional 37% experience high or very high pressure. This finding is consistent with previous research showing that patient (or parent) demand is an important driver of outpatient prescribing practices.⁵

Figure 6

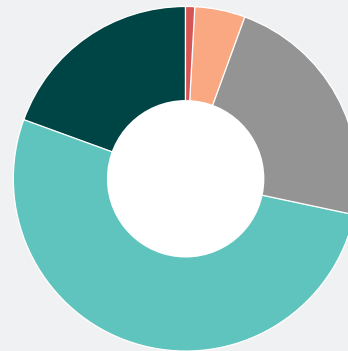
Physicians Recognize the Need for Antibiotic Stewardship, but Need Help With Implementation

Inappropriate antibiotic prescribing in outpatient health care settings accelerates the emergence of antibiotic-resistant bacteria



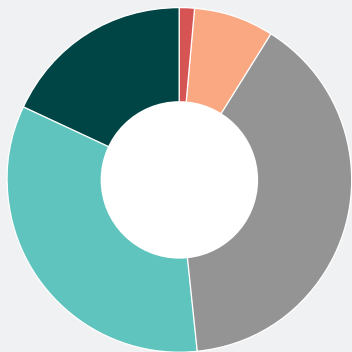
Strongly agree **46%**
Agree **47%**
Neither agree nor disagree **6%**
Disagree **1%**
Strongly disagree **1%**

Antibiotic stewardship programs are needed in health care settings to effectively deal with antibiotic resistance



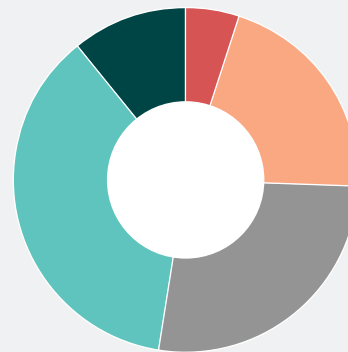
Strongly agree **19%**
Agree **52%**
Neither agree nor disagree **23%**
Disagree **5%**
Strongly disagree **1%**

Overall, to what extent do you believe antibiotic stewardship programs are appropriate for office-based medical practices?



Extremely appropriate **18%**
Very appropriate **34%**
Appropriate **39%**
Not very appropriate **8%**
Not at all appropriate **1%**

I would need a lot of help to implement antibiotic stewardship interventions in my practice

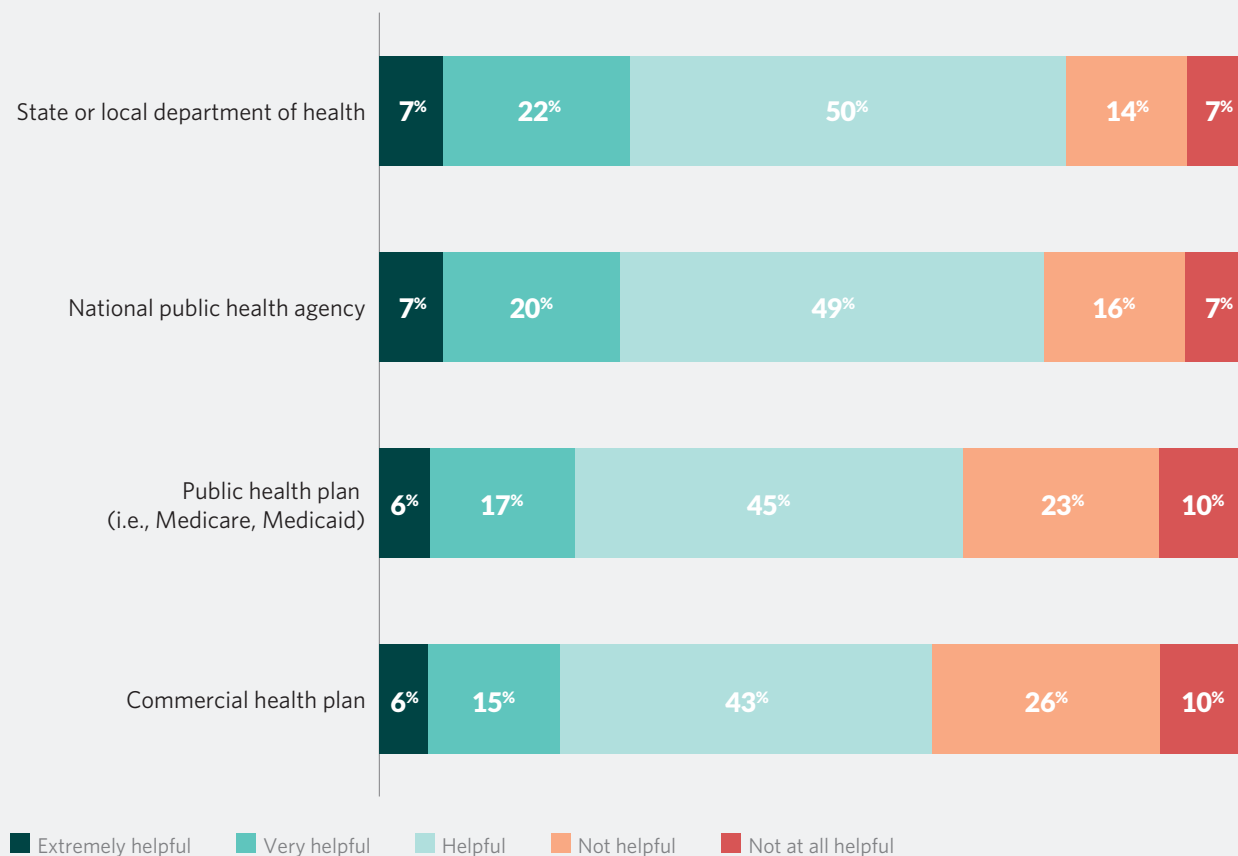


Strongly agree **11%**
Agree **37%**
Neither agree nor disagree **27%**
Disagree **21%**
Strongly disagree **5%**

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How useful would you find it if the following external organizations provided you with resources and/or technical assistance to conduct antibiotic stewardship activities?



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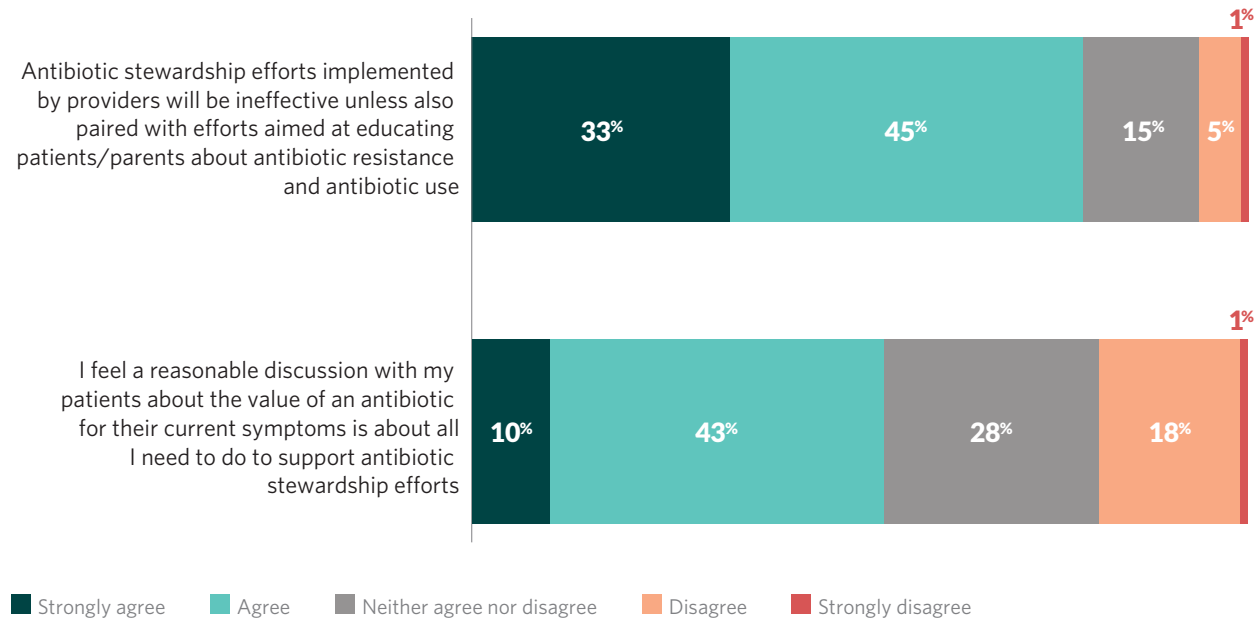
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The majority (93%) of physicians surveyed agreed or strongly agreed that inappropriate prescribing in outpatient settings accelerated the emergence of resistant bacteria. To contend with antibiotic resistance, almost 72% agreed or strongly agreed that antibiotic stewardship programs are needed in health care settings, and most respondents (91%) felt that stewardship programs were appropriate for office-based practices.

When asked about implementing stewardship interventions in their own practice, about 47% felt that they would need a lot of help doing so. Respondents were generally open to external organizations providing them with resources and/or technical assistance to support stewardship activities. Local and state departments of health were seen as most helpful (79%), followed by a national public health agency (almost 77%), public payers (about 67%), and commercial payers (64%).

Figure 7

Physicians Favor Patient Education as a Stewardship Approach



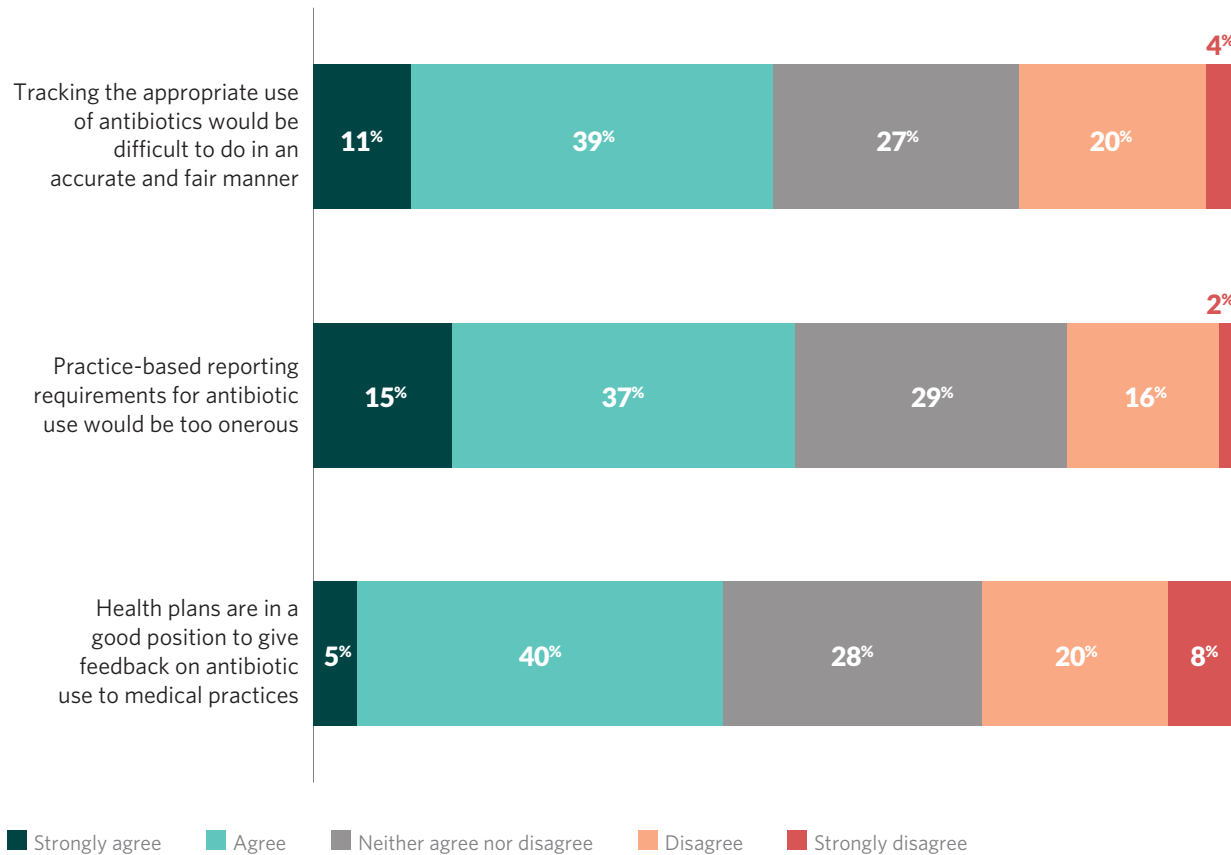
Patient education is a key element of outpatient antibiotic stewardship.⁶ The majority (almost 79%) of respondents agreed that patient education was essential to ensure the success of stewardship efforts. However, 53% of respondents also felt that a reasonable discussion educating their patients about antibiotic use and resistance was all they needed to do to support stewardship efforts. This finding highlights a potential barrier to the adoption of more comprehensive stewardship efforts, as physicians might be less willing to commit to efforts beyond patient education that may require more time and resources.

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Figure 8

Physicians Are Skeptical of Tracking and Measuring Antibiotic Prescribing



Tracking and reporting antibiotic use, particularly at the individual physician level, is another key element of outpatient antibiotic stewardship.⁷ However, in contrast to patient education, respondents were less supportive of tracking and reporting antibiotic use as a stewardship approach. Half of participants said that tracking appropriate antibiotic use would be difficult to accomplish in a fair and accurate way, and 52% of respondents felt that practice-based antibiotic use reporting requirements would be too onerous. Additionally, about 44% of physicians surveyed felt that health plans (which have access to prescribing data) were in a good position to provide prescribing feedback.

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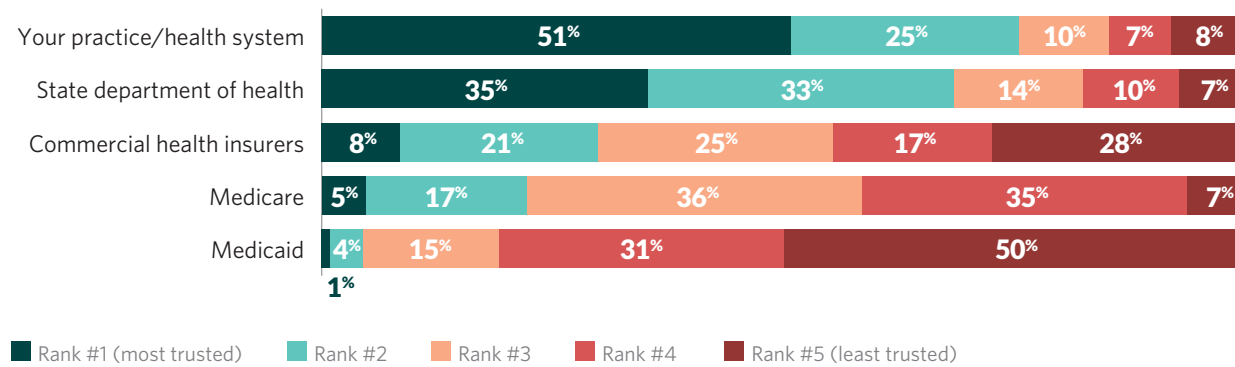
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Figure 9

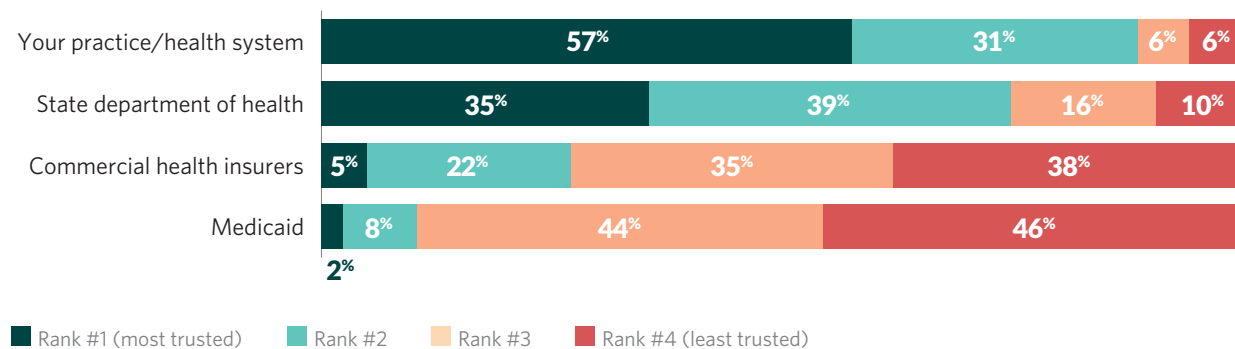
A Physician's Own Practice or Health System Is the Most Trusted Organization to Provide Prescribing Feedback

“Which of the following organizations would you have the most confidence in to provide you with accurate feedback on your antibiotic prescribing practices?”

Internal medicine and family medicine physicians



Pediatricians



When evaluating which health care organizations were most trusted to provide prescribing feedback, internal medicine and family medicine physicians favored their own practice or health system (about 75% ranked that choice as first or second) and the state department of health (68%). Commercial payers were ranked first or second by almost 30% of these physicians, followed by Medicare (22%) and Medicaid (about 4%). The same pattern emerged among pediatricians, with 88% ranking their own practice or health system first or second, followed by the state department of health (almost 75%), commercial payers (27%), and Medicaid (10%).

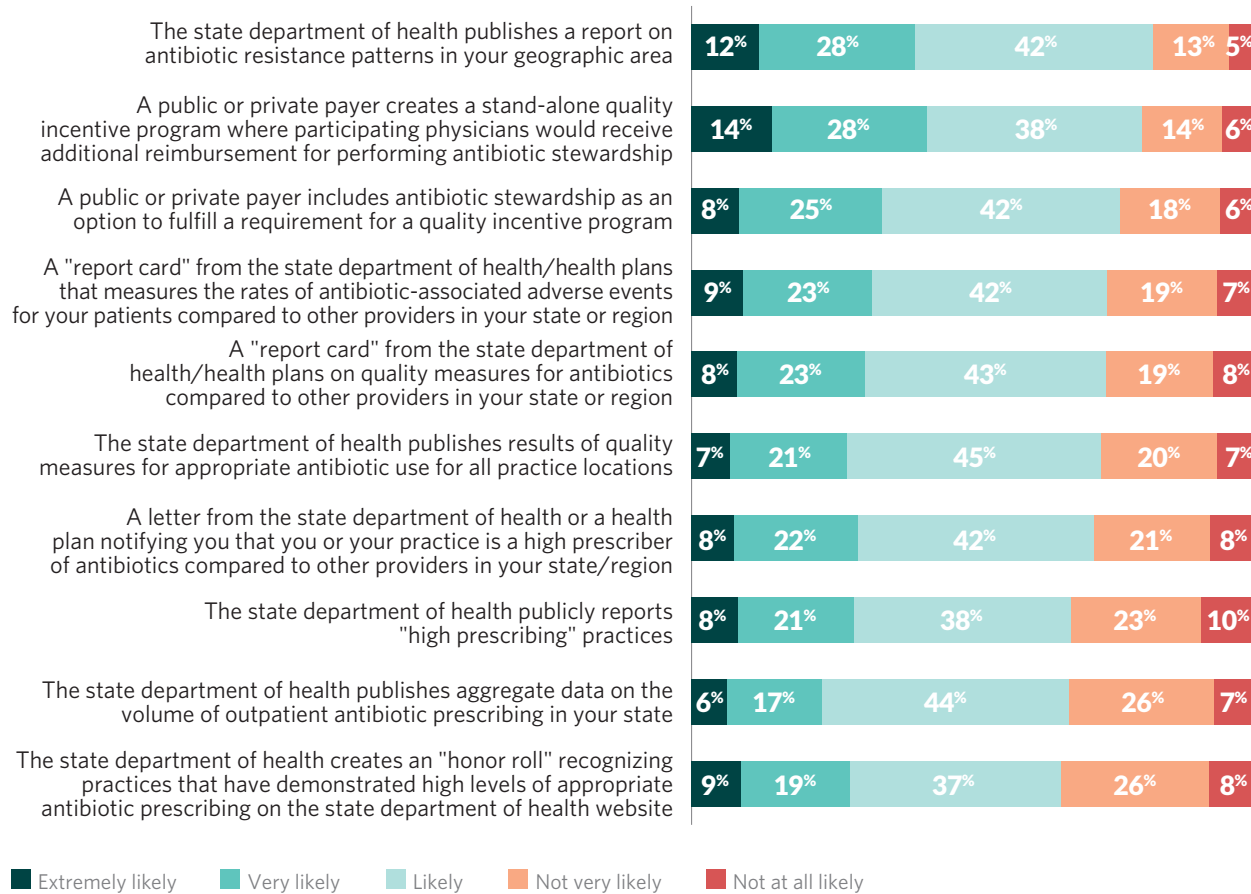
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Figure 10

Physicians Are Likely to Implement Stewardship Efforts in Response to Feedback and Incentives

“How likely is it that you would support the implementation of antibiotic stewardship interventions by your practice in response to the following activities?”



Note: Due to rounding, the percentages here may not add up precisely to those in the text, or to 100%.

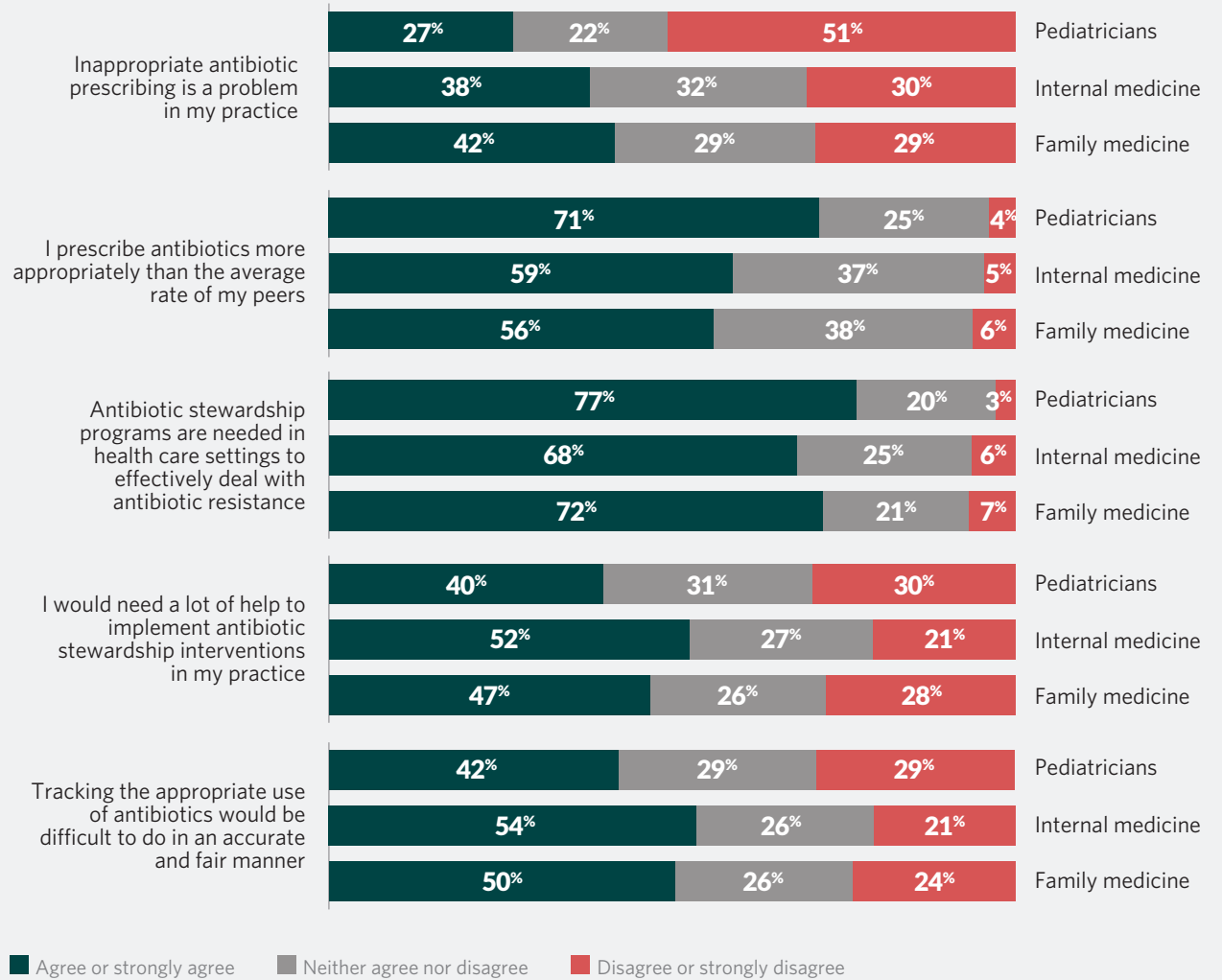
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Expanding the implementation of outpatient stewardship requires the support of different health care stakeholders. Respondents viewed a wide range of activities from state departments of health, health plans, and payers as likely to spur the implementation of antibiotic stewardship at the practice level. More than 80% of physicians indicated that they would support stewardship in response to the state department of health publishing reports on local antibiotic resistance patterns. Integrating antibiotic stewardship into quality incentive programs—both as a stand-alone program and as part of broader quality efforts—were also promising interventions.

These types of activities can help overcome some of the current barriers to outpatient antibiotic stewardship. For example, providing physicians with local resistance data could help emphasize the importance of this issue in individual communities. Additionally, providing physicians with incentives to implement antibiotic stewardship in their practices could help alleviate resource constraints within practices.

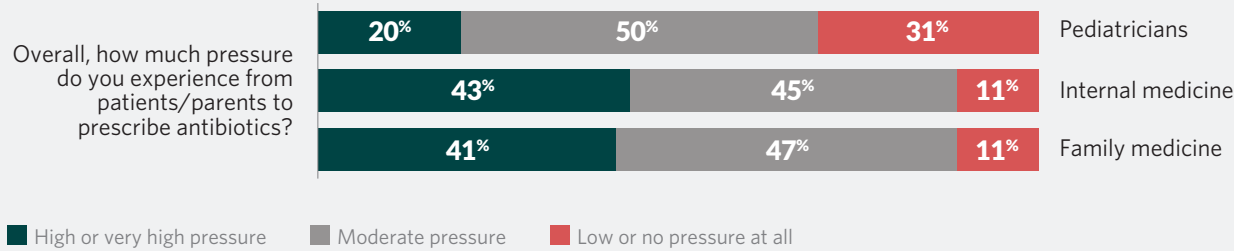
Figure 11

Pediatricians' Perceptions Differ From Those of Internal and Family Medicine Physicians

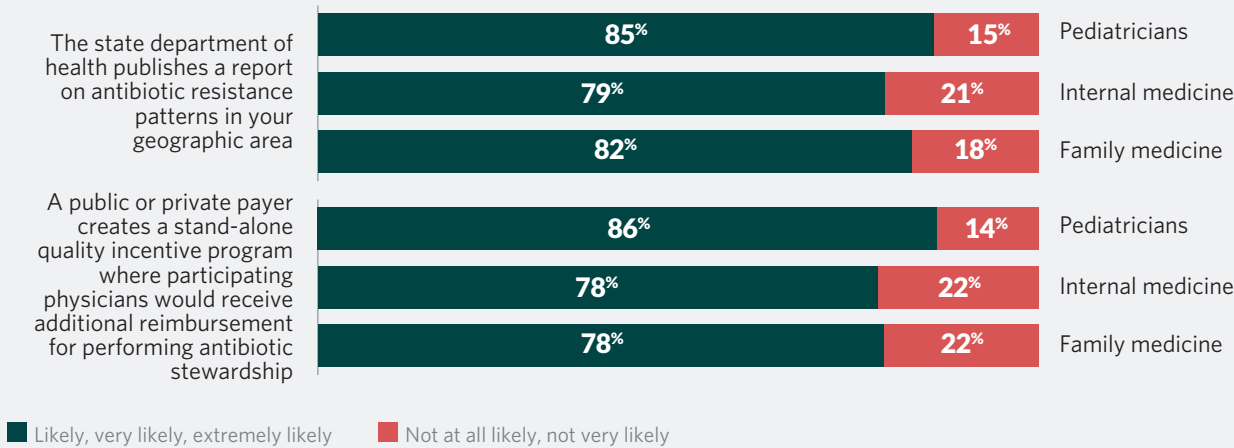


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How likely is it that you would support the implementation of antibiotic stewardship interventions by your practice in response to the following activities?



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An examination of survey results by medical specialty revealed clear differences between pediatricians and family medicine and internal medicine physicians. Although pediatricians were less likely to view themselves as contributing to inappropriate antibiotic prescribing, they were largely supportive of stewardship implementation and activities. These results may seem to be contradictory, but they do appear to be supported by data showing that pediatricians have largely driven the recent decrease in outpatient antibiotic prescribing.⁸ Pediatricians' acceptance of stewardship principles, as well as their perception of less patient or parent pressure to prescribe antibiotics, may already have contributed to this declining antibiotic prescribing trend.

Conclusion

In November 2019, the CDC released a report on the current state of antibiotic resistance threats in the U.S. This analysis showed an increase in community-associated infections caused by resistant pathogens and highlighted the increased need for community-based efforts to combat antibiotic resistance.⁹ However, findings from this survey demonstrate that work remains to be done to ensure widespread adoption of outpatient antibiotic stewardship activities.

Survey results revealed that physicians have a lack of recognition of their own contribution to inappropriate antibiotic prescribing, concerns over the feasibility of implementing stewardship activities in their own practice, and skepticism of tracking and reporting antibiotic use. These issues all present barriers to implementing stewardship and must be addressed when developing effective stewardship interventions.

On an encouraging note, the respondents indicated that a wide range of activities on the part of health care stakeholders would help motivate stewardship implementation in their practices. Concerted action from all health care stakeholders—from physicians to payers to public health authorities—is needed to ensure stewardship implementation in outpatient facilities nationwide.

Appendix A: Methodology

Study participants were recruited by M3 from an opt-in, nonprobability panel of health care professionals it maintains who are recruited to participate through various mechanisms—such as direct mail, online recruitment, and professional conferences. Respondents needed to meet the following criteria for eligibility: self-report of board certification in pediatrics, family medicine (FM), or internal medicine (IM); being a full-time physician (excluding residents and fellows) practicing in a primary care outpatient office setting; and spending $\geq 50\%$ of medical practice time in direct patient care. The data was collected, using a 20-minute online questionnaire, between August and October 2018.

The total of 1,550 participants were stratified based on geographic region (defined as the U.S. Census regions: Northeast, Midwest, South, West) and specialty. Specifically, our recruitment targets were 129 participants per stratum (i.e., family medicine physicians in the Northeast, internal medicine physicians in the Northeast, etc.). Our targets were 130 participants for pediatricians in the Northeast and family medicine physicians in the South to meet our overall target of 1,550 participants. The data was then weighted by geographic region and medical specialty to mirror actual distribution of U.S. physicians according to these characteristics. The American Medical Association's Physician Masterfile was used to identify true population estimates. Descriptive statistics were generated using Stata v14.2. We used the χ^2 test to assess for differences in responses according to medical specialty. As this is a nonprobability survey, it is inappropriate to calculate a margin of sampling error.

A full description of the study methodology is in the article "Primary Care Physicians' Attitudes and Perceptions Towards Antibiotic Resistance and Antibiotic Stewardship: A National Survey" in the journal *Open Forum Infectious Diseases*, Oxford University Press, Volume 7, Issue 7, July 2020, <https://doi.org/10.1093/ofid/ofaa244>.

Appendix B: Survey Demographics

Table B.1

Demographic Characteristics of Survey Respondents

	Percent (weighted)
Age	
25-34 years old	12%
35-44 years old	27%
45-54 years old	32%
55-64 years old	29%
Gender	
Male	58%
Female	42%
Geographic region	
Northeast	18%
Midwest	23%
South	35%
West	24%
Medical specialty	
Family medicine	43%
Internal medicine	35%
Pediatrics	22%

Table B.2

Practice Characteristics of Survey Respondents

	Percent (weighted)
Primary practice setting	
Physician's office, solo practice	18%
Physician's office, two-physician practice	9%
Group practice	72%
Medical practice ownership	
Private, independently (physician)-owned practice	55%
Hospital or health care system-owned practice—community-based practice location	39%
Hospital or health care system-owned practice—hospital-based practice location	7%
Years at current practice location	
1-5 years	28%
6-10 years	18%
10 years or longer	54%
Number of physicians at practice	
1 to 3	44%
4 to 7	27%
8 to 10	9%
More than 10	20%
Number of nurses, nurse practitioners, and physician assistants at practice	
1 to 3	56%
4 to 7	22%
8 to 10	7%
More than 10	15%
Number of nonmedical office staff at practice	
1 to 3	21%
4 to 7	24%
8 to 10	13%
More than 10	42%

Note: Due to rounding, the percentages presented in this figure may not add up to 100%

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Endnotes

- 1 K.J. Suda et al., "Antibiotic Expenditures by Medication, Class, and Healthcare Setting in the United States, 2010–2015," *Clinical Infectious Diseases* 66, no. 2 (2017): 185-90, <https://doi.org/10.1093/cid/cix773>.
- 2 The Pew Charitable Trusts, "Antibiotic Use in Outpatient Settings. Health Experts Create National Targets to Reduce Unnecessary Antibiotic Prescriptions" (2016), <https://www.pewtrusts.org/en/research-and-analysis/reports/2016/05/antibiotic-use-in-outpatient-settings>.
- 3 D.L. Palms et al., "Comparison of Antibiotic Prescribing in Retail Clinics, Urgent Care Centers, Emergency Departments, and Traditional Ambulatory Care Settings in the United States," *JAMA Internal Medicine* 178, no. 9 (2018): 1267-9, <https://doi.org/10.1001/jamainternmed.2018.1632>.
- 4 Centers for Disease Control and Prevention, "Antibiotic Resistance Threats in the United States, 2019" (2019), <https://www.cdc.gov/drugresistance/pdf/threats-report/2019-ar-threats-report-508.pdf>.
- 5 G.V. Sanchez et al., "Effects of Knowledge, Attitudes, and Practices of Primary Care Providers on Antibiotic Selection, United States," *Emerging Infectious Diseases* 20, no. 12 (2014): 2041, <https://dx.doi.org/10.3201/eid2012.140331>; J.E. Szymczak et al., "Pediatrician Perceptions of an Outpatient Antimicrobial Stewardship Intervention," *Infection Control & Hospital Epidemiology* 35, no. S3 (2014): S69-S78, <https://doi.org/10.1086/677826>; P. Petursson, "GPs' Reasons for 'Non-Pharmacological' Prescribing of Antibiotics A Phenomenological Study," *Scandinavian Journal of Primary Health Care* 23, no. 2 (2005): 120-25, <https://doi.org/10.1080/02813430510018491>; C.T. Evans et al., "Providers' Beliefs and Behaviors Regarding Antibiotic Prescribing and Antibiotic Resistance in Persons with Spinal Cord Injury or Disorder," *The Journal of Spinal Cord Medicine* 34, no. 1 (2011): 16-21, <https://doi.org/10.1179/107902610X12886261091794>; P.P. Dempsey et al., "Primary Care Clinicians' Perceptions About Antibiotic Prescribing for Acute Bronchitis: A Qualitative Study," *BMC Family Practice* 15, no. 1 (2014): 194, <https://doi.org/10.1186/s12875-014-0194-5>; C.C. Butler et al., "Understanding the Culture of Prescribing: Qualitative Study of General Practitioners' and Patients' Perceptions of Antibiotics for Sore Throats," *BMJ* 317, no. 7159 (1998): 637-42, <https://doi.org/10.1136/bmj.317.7159.637>; L. May et al., "Multisite Exploration of Clinical Decision Making for Antibiotic Use by Emergency Medicine Providers Using Quantitative and Qualitative Methods," *Infection Control and Hospital Epidemiology* 35, no. 9 (2014): 1114-25, <https://doi.org/10.1086/677637>; H. Bauchner, S.I. Pelton, and J.O. Klein, "Parents, Physicians, and Antibiotic Use," *Pediatrics* 103, no. 2 (1999): 395-401, <https://doi.org/10.1542/peds.103.2.395>.
- 6 Centers for Disease Control and Prevention, "Core Elements of Outpatient Antibiotic Stewardship" (2016), <https://www.cdc.gov/antibiotic-use/core-elements/outpatient.html>.
- 7 Ibid.
- 8 L.M. King et al., "Changes in U.S. Outpatient Antibiotic Prescriptions From 2011–2016," *Clinical Infectious Diseases* 70, no. 3 (2019): 370-77, <https://doi.org/10.1093/cid/ciz225>.
- 9 Centers for Disease Control and Prevention, "Antibiotic Resistance Threats in the United States."

This chartbook was updated in September 2020 to clarify the methodology.

For further information, please visit:
pewtrusts.org/antibiotics

Contact: Heather Cable, manager

Email: hcable@pewtrusts.org

Project website: pewtrusts.org/antibiotics

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