

# Letters

## RESEARCH LETTER

### Prevalence and Predictors of Generic Drug Skepticism Among Physicians: Results of a National Survey

Generic drugs are low-cost, therapeutically equivalent versions of brand-name drugs. Use of generic drugs increases patient adherence and improves health outcomes.<sup>1</sup> However, a 2009 survey of physicians showed that 23% disagreed that generic drugs were as effective as brand-name drugs and 50% reported quality concerns, leading more than one-quarter not to recommend generic drugs as first-line therapy.<sup>2</sup>

Because generic drugs now make up more than 85% of prescriptions,<sup>3</sup> we reassessed physicians' perceptions and determined how professional or demographic characteristics predict physicians' support of generic drug prescribing.

**Methods** | From a master list of American Board of Internal Medicine diplomates, we randomly selected 300 clinically active internists and 900 specialists in endocrinology, hematology, and infectious diseases (52 excluded for lacking contact information). We emailed the survey link (\$50 honoraria), with non-responders receiving 2 reminders, a mailed version, and a final email reminder (the study was approved by Brigham and Women's Hospital Institutional Review Board with an authorization agreement from the US Food and Drug Administration Research Involving Human Subjects Committee). Consent was implied based on reading the survey goals and participating. Using 5-point Likert scales, we measured respondents' perceptions of generic drugs and how they last learned about a newly available generic drug.

Our first outcome variable was generic skepticism, defined as answering neutral or negative to whether generic drugs were as safe and effective as brand-name drugs, or answering neutral or positive to whether generic drugs cause more adverse effects. In sensitivity analyses, we excluded neutral responses. The second outcome variable was self-reported "brand-name-only" prescribing more than 5% of the time.<sup>4</sup>

We assessed response variations among demographic and practice characteristics, using Pearson  $\chi^2$  test and 2-sample *t* tests. The Wilson method identified confidence intervals for proportions<sup>5</sup> and logistic regression estimated adjusted associations (Stata, version 13.1; StataCorp).

**Results** | Among 718 respondents (62.3% response rate), the mean (SD) age was 46 (10) years, 54% (374 of 687) were male, 61% (387 of 639) trained at US medical schools, and 58% (393 of 675) were white. Nonrespondents had a mean (SD) age of 49 (11) years, and 57% (293 of 510) were male.

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Table 1. Physicians' Perceptions About Generic Drugs<sup>a</sup>

Perception	Respondents Who Strongly or Somewhat Agree, Proportion (% [95% CI]) <sup>b</sup>
In general...	
I would rather prescribe a generic drug over a brand-name drug	500/717 (70[66-73])
Americans spend too much money on prescription drugs	649/716 (91[88-93])
Generic drugs should represent a higher proportion of the prescription drugs that Americans use	607/717 (85[82-87])
When taking medications myself, I prefer to use generic drugs	559/713 (78[75-81])
When advising my family members, I recommend that they use generic drugs	566/714 (79[76-82])
Generic drugs are less expensive than their corresponding brand-name versions	695/713 (97[96-98])
Generic drugs are a better value than their corresponding brand-name versions	631/717 (88[85-90])
Generic drugs are of high quality in the US	645/717 (90[88-92])
Skepticism Index	
In general, generic drugs...	
Are as effective as their corresponding brand-name versions	638/717 (89[86-91])
Are as safe as their corresponding brand-name versions	653/717 (91[89-93])
Do not cause more adverse effects than their corresponding brand-name versions <sup>c</sup>	523/714 (73[70-76])

<sup>a</sup> All responses were measured on a 5-point Likert scale of "strongly agree," "somewhat agree," "neither agree nor disagree," "somewhat disagree," and "strongly disagree."

<sup>b</sup> Denominators vary across questions due to missing data.

<sup>c</sup> This question asked whether physicians believe that generics cause more adverse effects than brand-name drugs. Responses inverted for consistency of interpretation with the other questions in this Table.

Generic drugs were widely favored: 638 respondents (89% [95% CI, 86%-91%]) perceived them as effective and 653 (91% [95% CI, 89%-93%]) perceived them to be as safe as their brand-name counterparts, while 523 (73% [95% CI, 70%-76%]) agreed that they do not cause more adverse effects and 500 (70% [95% CI, 66%-73%]) preferred prescribing generic over brand-name drugs (Table 1).

Generic skeptics (32% of sample [227 of 718]) showed no significant variation in demographic or practice characteristics. Approximately half "sometimes," "rarely," or "never" knew when generic drugs became available, with 155 (22% [95% CI, 19%-25%]) last learning about generic availability from pharmaceutical representatives (Table 2), a connection significantly associated with generic skepticism (41% [63 of 155] vs 29% [164 of 563]; *P* = .006).

Approximately 35% reported brand-name-only prescribing more than 5% of the time, with higher rates among physicians who last learned about generic drugs from pharmaceutical representatives (51% [79 of 155] vs 30% [170 of 561];

Table 2. Physicians' Prescribing Practices Related to Generic Drugs

Prescribing Practice	Respondents, Proportion (% [95% CI]) <sup>a</sup>
How often do you prescribe a generic drug, if one is available, for a patient who needs a prescription?	
Always	191/716 (27 [24-30])
Usually	469/716 (66 [62-69])
Sometimes	53/716 (7 [6-10])
Rarely/never	3/716 (0.4 [0.1-1])
When you write a prescription for a brand-name drug for which an FDA-approved generic version is available, how often do you specifically request that pharmacists not fill it with the generic?	
Most of the time (>50% of prescriptions)	60/716 (8 [7-11])
Sometimes (21%-50% of prescriptions)	75/716 (10 [8-13])
Occasionally (6%-20% of prescriptions)	114/716 (16 [13-19])
Rarely (1%-5% of prescriptions)	193/716 (27 [24-30])
Very rarely (<1% of prescriptions)	179/716 (25 [22-28])
Never	95/716 (13 [11-16])
I am ___ aware of the date when generic versions of brand-name medications I commonly prescribe become available. [Pick one option to fill in blank]	
Always	32/712 (4 [3-6])
Usually	322/712 (45 [42-49])
Sometimes	249/712 (35 [32-39])
Rarely	94/712 (13 [11-16])
Never	15/712 (2 [1-3])
The last time you learned that a generic version of a brand-name drug that you commonly prescribe was about to become available, from what source did you learn this information? <sup>b</sup>	
Pharmacist	322/718 (45 [41-49])
Physician colleague	274/718 (38 [35-42])
Mailing or literature	213/718 (30 [26-33])
Medical journal	183/718 (25 [22-29])
Pharmaceutical representative	155/718 (22 [19-25])
Patient	104/718 (14 [12-17])
Other	53/718 (7 [6-10])

Abbreviation: FDA, Food and Drug Administration.

<sup>a</sup> Denominators vary across questions because some respondents did not complete the entire survey.

<sup>b</sup> Numbers do not add up to 100% because physicians could identify more than 1 source.

$P < .001$ ), non-US medical school graduates (39% [98 of 252] vs 31% [121 of 387];  $P = .047$ ), specialists vs internists (39% [211 of 547] vs 23% [34 of 145];  $P = .001$ ), and respondents spending more than 80% of time in patient care (39% [148 of 376] vs 27% [73 of 267];  $P = .002$ ).

After restricting the analytic data set to the 612 physicians with complete demographic and practice variables (except type) and adjusting for these variables, learning about availability of a generic drug from a pharmaceutical representative continued its positive association with higher brand-name-only prescribing (47% vs 30%;  $P < .001$ ), but not with generic skepticism (35% vs 30%;  $P = .26$ ). Excluding neutral responses from the skepticism definition reduced the proportion to 15% (108 of 718) but affected none of the comparisons.

**Discussion** | These results suggest an overall shift in the perceptions of board-certified internal medicine physicians and

certain specialists about generic drugs toward greater confidence in their quality and safety. Still, generic skepticism remains common, particularly among physicians who reported pharmaceutical sales representatives as sources of the last times they learned about generic drugs becoming available. While several tests of significance were conducted—increasing the likelihood that at least 1 significant result may be a false positive—our data suggest that limiting interactions with pharmaceutical marketing and directed educational outreach could help ensure that generic drug prescribing remains widespread for the benefit of patients and to help slow the rate of increase of health care costs.

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- Gagne JJ, Choudhry NK, Kesselheim AS, et al. Comparative effectiveness of generic and brand-name statins on patient outcomes: a cohort study. *Ann Intern Med.* 2014;161(6):400-407.
- Shrank WH, Liberman JN, Fischer MA, Girdish C, Brennan TA, Choudhry NK. Physician perceptions about generic drugs. *Ann Pharmacother.* 2011;45(1):31-38.
- Ross JS, Kesselheim AS. FDA policy and cardiovascular medicine. *Circulation.* 2015;132(12):1136-1145.
- Shrank WH, Liberman JN, Fischer MA, et al. The consequences of requesting "dispense as written." *Am J Med.* 2011;124(4):309-317.
- Brown LD, Cai TT, DasGupta A. Interval estimation for a binomial proportion. *Stat Sci.* 2001;16(2):101-133.