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The impact of direct-to-consumer advertising of prescription drugs on physician visits and drug requests: Empirical findings and public policy implications ☆

Qiang Liu [a], Sachin Gupta [b,*]

[a] Purdue University, Krannert Building 411, West Lafayette, IN 47907, United States
[b] Cornell University, Sage Hall, Ithaca, NY 14853, United States

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ABSTRACT

This study analyzes the effect of DTCA expenditures for anti-hyperlipidemia drugs on patient behaviors. The key findings are: (a) DTCA expenditures have a positive and long-term effect on the number of visits to physicians by newly diagnosed hyperlipidemia patients. (b) The effectiveness of DTCA in generating new patient visits varies substantially across patient sub-groups. (c) The effect of DTCA is larger on drug visits than on non-drug-only visits. (d) Own-brand DTCA expenditures increase the number of patient requests for Lipitor and Zocor, but have no effect on patient requests for Pravachol. Competing drugs' DTCA expenditures have a positive effect only on patient requests for the leading brand, Lipitor. (e) A cost-effectiveness analysis suggests that the economic benefits of DTCA in terms of life years saved by preventing cardiovascular disease are considerably larger than the costs of advertising. (f) DTCA on TV has strong effects on underserved segments of the population, such as those on Medicaid. We believe this finding should be carefully considered by proponents of a complete ban or stricter regulations on DTCA.

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1. Introduction

Direct-to-consumer advertising (DTCA) by pharmaceutical companies has always been a controversial public policy issue in the US and New Zealand, the only two developed countries where it is fully allowed. The issue has also been hotly debated in the European Union, Canada and Australia, where regulatory changes to lift current restrictions are being actively considered or have been considered. In August 1997, the U.S. Food and Drug Administration (FDA) revised its rules on Direct-to-Consumer Advertising (DTCA) for prescription drugs and allowed pharmaceutical firms to use DTCA containing both the brand name and medical claims without the "brief summary" of drug effectiveness, side effects, and contraindications that had previously been required. The FDA clarification effectively opened up mass media such as TV and radio to DTCA, which was mainly limited to print media prior to 1997. Following the clarification, DTCA expenditure for prescription drugs in the U.S. grew explosively, from $1.1 billion in 1997 to $4.8 billion in 2007 (IMS Health, 2007). New Zealand experienced similar growth in DTCA from its beginning circa 1995, during which there were unsuccessful attempts to change the liberal legislation on DTCA. Stremersch and Lemmens (2009) believe that sales of pharmaceutical drugs are hurt in markets that forbid DTCA, and this effect is stronger for new drugs than for mature drugs. In the European Union, a 5-year pilot project allowing DTCA for AIDS, asthma and diabetes was proposed by the European Commission, but it was rejected by the European Parliament in 2003. Despite this decision, pharmaceutical companies, media industries and the European Commission have continued to push for watering down this strict ban on DTCA in the European Union.

Proponents of DTCA stress its informational role in educating potential patients and argue that advertising benefits the public because it informs them of the existence of a health condition, possible symptoms and consequences, as well as the availability of a treatment. Better informed patients, in turn, will be able to better understand their health conditions and may be led to seek medical consultation by visiting a physician. Therefore, DTCA can help to reduce underdiagnosis and undertreatment and help patients make better decisions about their health care (Holmer, 1999). On the other hand, opponents blame DTCA for the rising cost of prescription drugs (Findlay, 2001; Hollon, 1999). They argue that (1) DTCA drives patients to request unnecessary drug treatments or more expensive drugs, even though equally effective cheaper drugs are available; (2) patients informed by DTCA may initiate unnecessary discussion, thereby wasting physicians' valuable time; and (3) billions of dollars of expenditure on DTCA eventually carry over to patients and increases their financial burden.

In recent years, opponents of DTCA in the US have called for a variety of regulatory measures ranging from a moratorium on the advertising of new drugs for one to three years after introduction to a complete ban on all advertising (Stange, 2007). The pharmaceutical industry responded by calling on firms to self-regulate. In 2006, the Pharmaceutical Research and Manufacturers of America (PhRMA)

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* Corresponding author. Tel.: +1 607 255 2354; fax: +1 607 254 4590.
E-mail addresses: liu6@purdue.edu (Q. Liu), sg248@cornell.edu (S. Gupta).

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issued guiding principles to its members intended to address concerns about both the timing and content of DTC advertisements. The content guidelines are intended to improve the balance and accuracy of advertisements. Because the guidelines relating to the disclosure of risks and side-effects are easier to meet in print advertising when compared to TV, an interesting unintended consequence seems to be a shift in DTCA spending from television to magazines. In the first six months of 2006, the year the industry adopted the guidelines, magazines' share of total DTCA spending went up from 29% to 34%, whereas the share of TV decreased from 64% to 59%.[1]

Two pertinent questions to these debates are (1) what is the impact of DTCA on patients' behaviors; and (2) what are the public policy implications of the impact? For example, consistent with proponents' argument for its informational role, DTCA should mainly have a category- expanding effect on drug sales, and further, it should be cost-effective in reducing underdiagnosis or undertreatment. However, consistent with opponents' arguments, DTCA should mainly affect a drug's market share within a therapeutic class and should not be cost-effective, even if it has a category-expanding impact. Therefore, the debate on DTCA should be informed by specific empirical evidence of its impact on patient behaviors and its cost-effectiveness. The goals of this study are to add such empirical evidence to the existing literature and discuss its public policy implications.

Another question with significant policy implications concerns whether the effects of DTCA vary across patient sub-groups. A robust and well- documented finding in the social sciences literature is the relationship between socioeconomic status (SES) and health. In general, there are significant disparities in medical testing, treatment and health outcomes associated with SES. For example, the 1990 National Health Interview Survey (Piani & Schoenbom, 1993) found that patients of a higher SES (college educated and white race) reported a higher likelihood of cholesterol testing. Because DTCA can be an important form of consumer information about diseases and pharmaceutical products, it is useful to explore whether the response to DTCA varies across patients. In our data, we offer insights into this question by defining patient groups based on their health insurance status, a characteristic that is expected to be strongly related to demographic variables such as age and income. For instance, patients on Medicare are older, whereas patients on Medicaid have lower incomes. We also assess whether DTCA in TV versus print media is equally effective for patients of a lower SES.

In terms of the statistical methodology, we employ a hierarchical Bayesian Negative Binomial Distribution (NBD) regression to model the relationship between patient behaviors and DTCA expenditures on drugs for hyperlipidemia. The analysis is conducted at the Designated Media Area (DMA) level. Specifically, we measure the effects of DTCA expenditures on the number of visits to physicians by patients newly diagnosed for hyperlipidemia and on the number of drug requests by patients in this therapeutic class. As previously noted, we also explore the effects of DTCA by insurance groups.

The rest of this paper is organized as follows. In the next section, we present the background of the study and a brief review of the extant literature. We describe the data in Section 3. In Section 4, we specify the econometric model of DTCA effects and discuss the estimation strategy. Empirical results and evidence of robustness are presented and discussed in Section 5. Next, we discuss public policy implications of our empirical results with a cost-effectiveness analysis of DTCA and an assessment of whether DTCA in TV and print media is equally effective for patients of lower SES. We conclude and present a discussion of the limitations of our study and directions for future research in Section 7.

[1] Source: TNS Media Intelligence news reports, October 05, 2006.

2. Background and literature review

The potential effects of DTCA on prescription drug sales are complex and occur at different stages of patient flow. In Fig. 1, we conceptualize the role of DTCA at each stage of patient flow to provide a context for the specific roles that we examine.

As shown in Fig. 1, DTCA may impact patients' behaviors at different stages: first, DTCA conveys medical information about health conditions and treatments to patients. The information may encourage potential patients to seek professional medical help and reminds patients with chronic or continuing illnesses to revisit their physician and continue medical treatment. DTCA at stages (1) and (5) therefore expands the demand for the whole drug category. Second, DTCA may remind patients who already have prescriptions to follow the drug regimen. Therefore, DTCA's effect at stages (3) and (4) contributes to category expansion. Finally, a typical DTC advertisement often urges patients to talk to their doctor about the advertised drug. As a consequence, the role of DTCA at stages (2) and (6) is to affect the share of the advertised drug within a drug class. Of course, the physician's response to the patient's request determines the actual outcome.

The dramatic increase in DTCA expenditures in the US since 1997 has generated a growing body of research on the role of DTCA. In a meta-analysis of the effectiveness of pharmaceutical promotional expenditures, Kremer, Bijmolt, Leeflang and Wieringa (2008) identify seventeen empirical studies of the effects of DTCA on pharmaceutical demand. A few papers have empirically examined the category-expanding effects of DTCA. Rosenthal, Berndt, Donohue, Epstein and Frank (2003) investigate the effect of DTCA and detailing[2] on drug sales in five therapeutic classes and find that DTCA has been primarily effective in expanding the sales of the entire class instead of any individual drug. Narayanan, Desiraju and Chintagunta (2004) find that DTCA and detailing affect drug demand synergistically and that DTCA has a significant, positive effect on drug class sales. In an interesting recent study, Osinga, Leeflang, Srinivasan and Wieringa (2011) find that although DTCA has modest effects on sales and market share, investors value DTCA positively, as it leads to higher stock returns and lower systematic risk.

Two studies specifically examine the impact of DTCA on patients' visits to physicians. Calfee et al. (2002) examine this relationship using national aggregate data for 1996–2000. They find that DTCA does not have a significant effect on the number of patient visits to physicians. They also examine the impact of DTCA on new prescriptions[3] and renewal prescriptions but again fail to find a significant effect.[4] In contrast, using data pooled across 151 drug classes, Iizuka and Jin (2005) report a positive, statistically significant effect of DTCA on patient visits. In particular, they find that every $28 increase in DTCA leads to an additional drug visit within 1 year. Neither study, however, distinguishes between physician visits by newly diagnosed patients and those by previously diagnosed patients.

Long-term compliance with therapy for a chronic ailment has been a difficult issue in health care. It is estimated that in developed countries, only 50% of patients who suffer from chronic diseases adhere to the drug therapy prescribed to them (Sabaté, 2003). The effect of DTCA at stages (3), (4), and (5) in Fig. 1 reflects the impact of DTCA on patients' therapy compliance. An empirical study by Wosinska (2005) finds that DTCA of cholesterol-lowering drugs was not particularly effective in increasing compliance, compared with other drivers.

[2] Detailing refers to visits to physicians by sales representatives of pharmaceutical firms.

[3] New prescriptions include prescriptions for newly diagnosed patients and prescriptions for previously diagnosed patients who are switched from other drugs.

[4] In Section 5.5 we will provide possible explanations why Calfee, Winston and Stempski (2002) do not find an effect.

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