

THE EFFECT OF PRESCRIPTION DRUG ADVERTISING ON DOCTOR VISITS

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The dramatic increase of direct-to-consumer advertising (DTCA) of prescription drugs created intensive debates on its effects on patient and doctor behaviors. Combining 1994–2000 DTCA data with the 1995–2000 National Ambulatory Medical Care Surveys, we examine the effect of DTCA on doctor visits. Consistent with the proponents' claim, we find that higher DTCA expenditures are associated with increased doctor visits, especially after the Food and Drug Administration clarified DTCA rules in August 1997. After 1997, every \$28 increase in DTCA leads to one drug visit within 12 months. We also find that the market-expanding effect is similar across demographic groups.

1. INTRODUCTION

The year 1997 witnessed an important change in direct-to-consumer advertising (DTCA) of prescription drugs. Prior to 1997, any DTCA that contained both brand name and medical claims must disclose a "brief summary" of drug effectiveness, side effects, and contraindications. Consequently, TV advertising was prohibitively expensive, and DTCA was largely limited to newspapers and magazines. A small number

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of the prescription drug ads that aired on TV included only brand names without describing their indications. This tradition changed drastically after August 1997, when the Food and Drug Administration (FDA) clarified that pharmaceutical firms can use DTCA on TV that contain both brand name and indications without a "brief summary."¹ Following the clarification, DTCA expenditures increased from \$800 million in 1996 to \$2.5 billion in 2000. As of 2000, DTCA accounted for 2.5% of the overall mass media ad spending in the United States. The top promoted drug—Vioxx—spent \$146 million in DTCA, beating Pepsi Cola, Budweiser Beer, and most automobile manufacturers (NIHCM, 2001).

The effects of prescription drug advertising are controversial. Proponents argue that DTCA primarily has a market-expanding effect: the ads inform consumers of new treatment options and, therefore, generate new doctor visits. If true, this could improve patient welfare, because many diseases are underdiagnosed. Opponents argue, however, that DTCA has a business-stealing effect that misleads patients into demanding heavily advertised drugs, leading to inappropriate drug use and the unnecessary purchase of expensive drugs. Not surprisingly, pharmaceutical firms support the former position, while insurers and medical providers generally agree with the latter view.² Clearly, the heart of the debate is the distinction between the market-expanding versus business-stealing effects of advertising, a familiar issue in economics literature (e.g., Roberts and Samuelson, 1988; Gasmi et al., 1992).

This paper contributes to the growing literature that investigates the effects of DTCA on the demand for prescription drugs.³ We focus our analysis on one type of market-expanding effect, namely, the extent to which DTCA affects patients' visits to the doctor. For this study, we use nationally representative, patient-level data that cover all classes, which allows us to generalize the effect of DTCA beyond specific categories studied by previous papers (e.g., Berndt et al., 1995; Calfee et al., 2002; Wosinska 2002; Rosenthal et al., 2003).⁴ In addition, we exploit a rich,

1. DTCA still needs to include a "major statement" of the most important risks and refer consumers to other sources for more comprehensive information.

2. Both sides of the debates are well documented. See Holmer (1999, 2002) for a summary of the proponents' position, and Hollon (1999) and Wolfe (2002) for a summary of the opponents' position. See, also, the debate on the role of DTCA by several authors published in the February 26, 2003, issue of *Health Affairs*. In response to these debates, the FDA held a public hearing in September 2003 to review its policy on DTCA.

3. In addition to the economics literature we discuss here, a number of surveys have been conducted in order to understand consumer and doctor responses to DTCA. For example, the FDA conducted surveys on DTCA in 1999 and 2002. *Prevention Magazine* (1998–2000) has also conducted surveys on DTCA annually since 1998. Gonul et al. (2000) analyze one of those surveys conducted by Scott-Levin, a pharmaceutical information company, and find that consumers and doctors value DTCA differently depending on ongoing needs for health care, degree of experience, and exposure to DTCA.

4. We discuss these papers in more detail in the next section.

patient-level dataset and provide new insights into the heterogeneous responses to DTCA. The question of whether DTCA has a business-stealing effect is addressed in a companion paper (Iizuka and Jin, 2004).

Combining 1994–2000 monthly DTCA data with the 1995–2000 National Ambulatory Medical Care Surveys (NAMCS), we estimate the effect of DTCA on doctor visits using a nonlinear least-squares regression with drug-class-fixed effects and allow DTCA to depreciate over time. We find that higher DTCA expenditures are associated with increased doctor visits and that this relationship is stronger after the 1997 clarification. Specifically, after the clarification, every \$28 increase in monthly DTCA expenditures leads to one patient visit within 12 months, and the effect concentrates on the visits that result in prescription drugs. In terms of heterogeneous responses to DTCA, we find that the market-expanding effect does not vary across demographic groups.

The rest of the paper is organized as follows. Section 2 discusses the background and reviews the literature. After a data description in Section 3, we set up the empirical model in Section 4 and report estimation results in Section 5. Our conclusion is offered in Section 6.

2. BACKGROUND AND RELATED LITERATURE

The large increase of DTCA after the 1997 FDA clarification has created a controversy over the effects of DTCA. From a social planner's perspective, DTCA will improve consumer welfare if its benefits outweigh the costs. One benefit that proponents suggest is the market-expanding effect of DTCA. For example, DTCA may inform untreated patients of existing or new drug treatments and encourage them to seek medical help via office visits. This effect could be substantial because a number of leading diseases, such as diabetes, high cholesterol, and high blood pressure, are underdiagnosed and undertreated (Holmer, 1999). Holmer, who represents the pharmaceutical industry, further asserts, "DTCA merely motivates patients to learn more about medical conditions and treatment options and to consult their physicians, but once the dialogue is started, the physician's role is preeminent" (p. 381).

On the other hand, most opponents of DTCA worry about the business-stealing effects of DTCA. They are concerned that, once underinformed patients watch DTCA, they may demand inappropriate therapies from doctors and increase the cost of treatment. For example, Hollon (1999), who provides a doctor's perspective, argues that "by creating consumer demand, [DTCA] undermine the protection that is a result of requiring a physician to certify a patient's need for a prescription drug" (p.382). Cohen (1990) also argues that DTCA may encourage people to try more expensive drugs though cheaper, but equally effective, drugs may be available.

This paper contributes to the debate by providing a detailed analysis of the market-expanding effects of DTCA in outpatient office visits. We not only examine an aggregate market-expanding effect, but also examine the distribution of this effect among patient groups. Understanding the heterogeneous effects of DTCA is important because not all market-expanding effects are welfare improving. For example, moral hazard may encourage insured patients who watched DTCA to visit doctors "too often," because they do not bear all the costs of the visit (and the costs of resulting treatment). In such cases, DTCA may or may not improve welfare even if DTCA has a market-expanding effect.

Our paper complements the few academic studies on DTCA. On the demand side, the earliest paper examining the effect of DTCA on prescription drugs is Berndt et al. (1995). They used the data for antiulcer drugs for 1977–1994, which precedes the surge of DTCA in the late 1990s.⁵ Calfee et al. (2002) estimated a monthly time-series regression of total statin drug prescriptions on advertising expenditures during 1995 and 2000. They found that advertising had no statistically significant effect on new statin prescriptions or renewals, but television advertising increased the proportion of cholesterol patients who had been successfully treated. Rosenthal et al. (2003) investigated the effects of DTCA and detailing on the aggregate sales of prescription drugs, using monthly data for five therapeutic classes between August 1996 and December 1999. They found that DTCA has a significant effect on total class sales, but does not have any significant impact on market shares within each class. Our study builds upon these studies by using nationally representative, patient-level data that cover substantially larger number of therapeutic classes. Because of the advantage of the data, the conclusion of our paper is more applicable to a broader class of prescription drugs.

Wosinska (2002) also examined the effect of DTCA on the demand for cholesterol-reducing drugs, using individual prescription claim data between 1996 and 1999. She finds that DTCA may affect the demand for an individual brand positively, but only if that brand is on the third-party payer's formulary. Similarly, using the NAMCS data as in the current paper, Iizuka and Jin (2004) examined the business-stealing effect of DTCA in non-sedating antihistamines. This paper is different from those papers because, while the above references are concerned about the

5. In related research, Ling et al. (2002) examined the spillover of DTCA between prescription and over-the-counter (OTC) segments. Using data for antiulcer drugs, many of which switched from prescription to the OTC market in the late 1990s, they found small but significant spillovers from prescription to the OTC market for some brands, but not vice versa.

effect of advertising once patients arrived at doctor offices, that is, the business-stealing effect of DTCA, this paper examines whether DTCA brings potential patients to doctor offices, that is, the market-expanding effect of DTCA.

On the supply side, Rosenthal et al. (2002) analyzed the industry-wide trends for DTCA and found that DTCA is highly concentrated on a subgroup of products and the spending fluctuates over time. Iizuka (2004) examined the determinants of DTCA and found that DTCA tends to concentrate in classes that involve fewer competitors. He also found that drugs that are new, of high quality, and for undertreated diseases are more frequently advertised. Our finding that DTCA of prescription drugs has a market-expanding effect on the demand side complements their findings.

This paper also contributes to the body of literature that empirically distinguishes the market-expanding effect from the business-stealing effect of advertising [see Bagwell (2001) for a broad overview of classic papers on the economics of advertising, and King (2003) for a study on the disagglomeration and growth of the US advertising-agency industry]. An ad is viewed as market expanding when it purely increases total market size and business-stealing when it solely shifts market share among brands. Roberts and Samuelson (1988), for example, found that cigarette advertising has a significant market-expanding effect, but not a business-stealing effect. In contrast, Gasmi et al. (1992) found that advertising in the carbonated soft-drink industry is primarily characterized as business stealing.

Finally, we recognize that the demand effect of direct-to-doctor advertising (i.e., detailing promotion) has been examined in earlier literature. Hurwitz and Caves (1988) looked at a cross-section of 56 off-patent drugs and found that detailing promotion has a positive effect on the market shares between branded and generic drugs. Rizzo (1999) looked at the demand for antihypertension drugs for 1988–1993 and found that detailing promotion lowers price sensitivity. Gonul et al. (2001) showed that detailing and free samples affect physician prescription behavior for an undisclosed therapeutic class. Azoulay (2002) found that, in addition to detailing promotion, scientific evidence from medical literature affected the diffusion pattern of antiulcer drugs. However, none of these papers looked at the effect of advertising directed to consumers. To be sure, this is mainly because DTCA increased its significance only recently, after the FDA clarification in 1997. Moreover, because we are interested in the patient's decision to visit a doctor rather than the doctor's decision to choose a specific drug, it is natural to focus on drug advertising that is oriented toward consumers.

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