Journal of Health Economics 31 (2012) 705–718

Contents lists available at SciVerse ScienceDirect

Journal of Health Economics

journal homepage: www.elsevier.com/locate/econbase

The impact of direct-to-consumer television and magazine advertising on antidepressant use☆

Rosemary J. Avery[a], Matthew D. Eisenberg[b], Kosali I. Simon[c,*]

[a] Department of Policy Analysis and Management, Cornell University, United States
[b] H. John Heinz III College, Carnegie Mellon University, United States
[c] School of Public and Environmental Affairs, Indiana University and NBER, United States

ARTICLE INFO

Article history:
Received 25 February 2011
Received in revised form 7 May 2012
Accepted 8 May 2012
Available online 1 June 2012

JEL classification:
I1

Keywords:
Depression
DTC advertising
Magazine
Television
Pharmaceutical

ABSTRACT

We examine whether exposure to direct-to-consumer advertising (DTCA) for antidepressant drugs affects individual use of these medications among those suffering from depression. Prior studies have almost exclusively relied on making connections between national or market-level advertising volume/expenditures and national or individual-level usage of medications. This is the first study to: estimate the impact of individual-level exposure to DTCA on individual-level use of antidepressants; estimate the impact of individual-level exposure to television DTCA on individual-level use in any drug class; consider the relative and interactive impact of DTCA in two different media in any drug class; and, consider the heterogeneity of impact among different populations in an econometric framework in the antidepressant market. There are also important limitations to note. Unlike prior market level studies that use monthly data, we are limited to aggregated annual data. Our measures of potential advertising exposure are constructed assuming that media consumption patterns are stable during the year. We are also not able to study the impact of advertising on use of antidepressants for conditions other than depression, such as anxiety disorders. We find that: DTCA impacts antidepressant use in a statistically and economically significant manner; that these effects are present in both television and magazine advertising exposure but do not appear to have interactive effects; are stronger for women than for men in the magazine medium, but are about equally strong for men and women in the TV medium; and, are somewhat stronger for groups suffering from more severe forms of depression. The overall size of the effect is a 6–10 percentage point increase in antidepressant use from being exposed to television advertising; the corresponding magazine effects are between 3 and 4 percentage points.

1. Introduction

The United States and New Zealand are the only two countries that allow direct-to-consumer advertising (DTCA) of prescription drugs, and the practice is surrounded by substantial controversy. DTCA started in the U.S. in the early 1980s and since that time has been subject to evolving regulatory control standards by the Food and Drug Administration (FDA). Since a 1997 change in FDA regulations that clarified and relaxed restrictions on DTCA, especially in the medium of television, the practice has burgeoned into a multi-billion-dollar industry. This is particularly true of the period between 1997 and 2005, when spending on DTCA increased by 296.4 percent while advertising aimed at physicians increased by only 86 percent. According to the Nielsen Company data, overall DTCA spending increased 1.9 percent to $4.51 billion during the period 2008–2009, while television spending was up 0.6 percent to nearly $3 billion (PharmaLive, 2010). After more than two decades of DTCA, it is important to assess the effects of this practice, especially in the largest drug classes (such as antidepressants), using new methods of accounting for targeting of ad placement by marketers.

Antidepressants are the second largest drug class in the U.S. (second only to statins), and depression affects close to 15 million American adults in a given year (National Institute of Mental Health, 2008a). Despite the high sales of antidepressants, 50–66

☆ The collection of the magazine pharmaceutical advertising database (PhADS) used in this study began with support from NIH Grant No. 5 R01-CA094020-5. The archive was expanded to include television ads with support from NIH Grant No. 1 R01 CA113407-01A1, and a grant from the Substance Abuse Policy Research Program of the Robert Wood Johnson Foundation. The project was expanded to include ads for other prescription drug products with support from an unrestricted educational grant to Cornell University from the Merck Company Foundation, the philanthropic arm of Merck & Co. We thank Donald Kenkel, Dean Lillard, and Alan Mathios for their generosity in sharing the PhADS database. We are also grateful to Jordan Matsudaira and Jeffrey Prince for helpful comments.

* Corresponding author. Tel.: +1 812 856 3850.
E-mail address: simonkos@indiana.edu (K.I. Simon).

0167-6296/$ – see front matter © 2012 Elsevier B.V. All rights reserved.
http://dx.doi.org/10.1016/j.jhealeco.2012.05.002

percent of those with depression are estimated to receive no treatment (Kahn and Meyer, 2006; Kessler et al., 2003). Depression is currently the leading cause of disability in the U.S. as well as other countries (World Health Organization, 2005). It results in more absenteeism than almost any other physical disorder, costs employers in the U.S. more than $51 billion per year in lost productivity, and contributes to the high cost of medical and pharmaceutical bills (Cross, 2004).

From its inception DTCA has sparked a fierce debate among scholars and interest groups, both domestically and abroad, over its potential impact on consumer information and decision making, physician prescribing behavior, drug consumption, drug prices, and public health in general (Ackerberg, 2001; Leffler, 1981). Although the FDA encourages "fair balance" in the presentation of benefits and risks in DTCA (Avery et al., 2011), the social desirability of DTCA remains uncertain and contentious. Proposed legislation in the European Union (EU) and Canada may open the door to this type of marketing more broadly in other countries. The European Commission, the executive branch of the EU, recently announced a proposed law that includes provisions to lift the current ban on DTCA in television, radio, and print. A similar provision in a proposed amendment to the Canadian Food and Drugs Act would lift Canada's ban in the same media. New Zealand, on the other hand, is the only other country besides the U.S. to allow DTCA, although even they considered banning the practice in 2006 (Yan, 2008).

Advocates of DTCA highlight its benefits, including: increasing awareness about diseases; educating patients about treatment options; motivating patients to contact their physicians and engage in a dialogue about health concerns; increasing the likelihood that patients will receive appropriate care for conditions that are frequently under-diagnosed and under-treated; and, encouraging compliance with prescription drug treatment regimens (PhRMA, 2005). Others support DTCA on constitutional and efficiency grounds. The American Advertising Federation (2008) believes that any moratoriums on DTCA would violate the First Amendment protection for free speech. Also supporting this view are arguments that DTCA makes information dissemination more efficient—a virtue in information-intensive markets such as pharmaceuticals (Calfee, 2002).

Opponents of DTCA contend that the ads distort health information, provide only partial truths about conditions and cures, and leave consumers with false impressions regarding the efficacy of drug treatments (Foley and Gross, 2000). They point to ads that do not fully disclose drug risks and overstate the prevalence of health conditions. Furthermore, opponents argue that FDA regulations do not require DTCA to disclose less-expensive pharmaceutical alternatives, such as generics and potentially efficacious over-the-counter (OTC) treatments. Other arguments focus on the role of DTCA in contributing to consumer healthcare expenditures (Foley and Gross, 2000). Some studies indicate that DTCA puts pressure on physicians to prescribe new, expensive, and often only marginally helpful drugs, that it undermines the doctor–patient relationship, and creates excessive demand for prescription drugs (American College of Physicians, 2008; Angell and Relman, 2002). Other research has examined whether DTCA benefits certain manufacturers at the expense of others (a "market stealing" effect) or whether it could have a treatment-expanding effect (Donohue and Berndt, 2004; Iizuka and Jin, 2005b).

2. Objectives of the study

The debate surrounding DTCA rests on the assumption that consumer exposure to pharmaceutical ads impacts consumers' interaction with physicians, their perception of whether they suffer from the disease (especially in hard-to-diagnose conditions, such as depression), and ultimately their consumption of specific pharmaceutical products. While there is evidence that increased spending on DTCA results in increased market sales overall, all of these studies have used aggregate market-level advertising volume/expenditure data to draw conclusions regarding the impact of DTCA on individual consumption decisions. That approach amounts to assuming everyone within a market is exposed to the same amount of advertising. In this study we are able to improve on measures of exposure used in previous studies by connecting DTC antidepressant drug advertising on television and in consumer magazines to individual-level media behavior (i.e., reported television viewing and magazine reading) to estimate the impact of these ads on reported consumption of antidepressant drugs, while accounting for biases from ad targeting behavior by marketers. However, this approach also comes with its own limitations. While market level studies have often used monthly data, our data are aggregated to the annual level assuming that media consumption patterns are fairly stable throughout the year. We make the assumption that conditional on individual level characteristics that we observe through marketing surveys, variables that describe program and magazine choices pick up enough of the problematic unobserved differences in demand for antidepressants to allow us to identify a causal effect of advertising exposure on antidepressant use. We are also not able to study the impact of advertising on use of antidepressants for conditions other than depression, such as anxiety disorders. We explain these and other assumptions in Section 5.

Our main data source for drug consumption and media behavior is a large, nationally representative commercial marketing survey (Simmons National Consumer Survey, 2008) used by marketing firms to plan their media buys. The richness of the data allows us to control for the same variables used by marketers in their targeting decisions, including a wide variety of demographic characteristics known to be connected to the incidence of depression. It should be noted, however, that simply including these variables in our model will not adequately control for bias in the results caused by targeting because we do not know the exact functional form in which these demographic data are used by marketers. For this reason, we rely on an identification strategy that controls for targeting by including fixed effects for the specific categories (or titles) of television programs and magazines the individual reports viewing/reading, as well as controls for the total hours of television watched and total quantity of magazine issues read during the exposure period. Once we include these fixed effects, the variation we use to identify DTCA effects is largely exogenous and not due to targeting. We have now introduced variables that are themselves choices, but we assume that conditional on all other information in the model, these choices proxy adequately for unobserved factors that indicate demand so that they are not correlated with any remaining problematic unobserved factors.

Another innovation in this study is the type of advertising media examined. We are able to compare the impact of DTCA in two alternative media (television and magazines) and separately examine the impacts for men and women and individuals with various depression severity conditions. Magazine advertising for smoking cessation products has been studied at the individual level in Avery et al. (2007), but the current study is the first to use individual-level data and exposure to DTCA in the medium of television. It is also the first to compare in the same model the impact of DTCA appearing in television and magazines. Studying television DTCA is important since a large percentage of growth in DTCA expenditures in the past decade has been in this media (Congressional Budget Office, 2009; Pharma Marketing Blog, 2010; PharmaLive, 2010). Furthermore, Naik and Raman (2003) investigated the theoretical and empirical effects of a synergy