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Movies, stigma and choice: Evidence from the pharmaceutical industry

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Abstract

Do movies reduce stigma, increasing healthcare product choices offered by firms? We provide causal evidence on this question in the context of Indian pharmaceutical markets. For unpacking these effects, we use an exogenous shock to the market due to the release of a Bollywood blockbuster movie - My Name is Khan (MNIK) where the protagonist, superstar Shahrukh Khan, suffers from Asperger's Syndrome (AS). Using a difference-in-differences design, we find a positive and statistically significant effect of MNIK (between 14% and 22% increase in variety sold and prescribed) on product differentiation and choices in the market for antipsychotic medicines used to clinically treat AS. Results are consistent using alternative controls, a placebo treatment-based test and with a variety of other robustness checks. Our findings document likely for the first-time, supply side responses to *edutainment* and suggests potential associated welfare effects in healthcare markets characterized by sticky demand. Implications for global health and public policy given worldwide concerns around a mental wellness epidemic with Covid-19 are discussed.

KEYWORDS
antipsychotics, destigmatization, edutainment, global health, mental health

1 | INTRODUCTION

Do movies unlock sticky healthcare demand by destigmatizing products and increasing choices?[1] In this paper, we ask this question in the context of Indian pharmaceutical markets. Recent work in public health have pointed to this role (Dorfman and Krasnow, 2014) and development scholars have provided supporting evidence (Dupas, 2011). Related literature has examined the broader economic and social impacts of media through influence on the demand side (DellaVigna and Gentzkow, 2010; DellaVigna and La Ferrara, 2015; La Ferrara, 2016) but it seems the effects of edutainment and related destigmatization on supply-side expansion of choice and product variety facilitated by firms remains under-investigated.

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Understanding the supply-side responses have major implications for policy makers as they may complement governmental policies around health-seeking behavior, especially in low- and middle-income countries (LMICs). Governments around the world today are investing copious amounts of money to induce changes in behavior that seem stuck with social norms and taboo. Examples range from advertisements to fight racism[2] or to support free sexual orientations.[3] Movies by the Indian motion picture industry known as *Bollywood*, are also emerging in their message for public health issues like *Toilet* on open defecation problems in India in 2017 to Oscar award winning *Period. End of Sentence* in 2019 around the Indian market for sanitary napkins.[4] Even during the Covid-19 pandemic, multilateral organizations have issued advisories to deal with stigma causing frictions and sticky demand for healthcare products like testing, masks and vaccines.[5] Celebrity destigmatization efforts (Clair, Daniel, and Lamont, 2016) are now much discussed relatedly in US as well, as evidenced with the Couric-Jolie effect.[6]

A common feature defining stigmatized product markets is that the relevant product or service is already available, but possibly due to social frictions like stigma or taboo (Cook et al., 2014; Hatzenbuehler, Phelan, and Link, 2013), consumers remain reluctant in consuming these offerings. In the short run, this creates inefficient matching between buyers and sellers; in the long run, with stymied diffusion of such products, societies potentially suffer adverse welfare effects. Stigma also deepens discrimination for example, the Covid-19 pandemic negatively impacted healthcare service providers (Campo-Arias et al., 2021; Cassiani-Miranda & Campo-Arias, 2020) hampering effective healthcare delivery.

While celebrities can play a role in addressing this stigma, surprisingly few empirical examinations quantify the causal effects of such celebrity destigmatization efforts through movies for example, on market structure, especially when there is a potential for supply side expansion of choices and product varieties offered by the firms. From the perspective of firms, destigmatization in a focal market can lead to incentives for variety expansion due to anticipated market demand. Such an event may create an expectation of an increase in the market size, and a larger market size may attract the firms to innovate ex-ante with product introductions to extract potential profits (Acemoglu & Linn, 2004). Additionally, a broader variety of products may lead to higher demand faced by the firms (Bayus and Putsis, 1999; Berry, 1990) which is consistent with the expectation of market expansion. However, the increase in sales usually lags the product variety expansion (Bayus, Kang, and Agarwal, 2007) and therefore, may not be immediately observable. Thus, choice expansion may naturally follow destigmatization as a first order effect, and it complements the extant literature in industrial organization where product varieties are shown to be impacted by other market factors like mergers (Berry and Waldfogel, 2001), level of market concentration (Berry, 1990) and prices (Richards and Hamilton, 2015; Sweeting, 2013) among others.

In this paper, we examine firm-level market responses to a destigmatization shock through a movie as an edutainment tool.[7] Our context is the Indian market of antipsychotic drugs, and we use a difference in differences framework exploiting the release of *My Name is Khan* (MNIK), a phenomenally successful Bollywood movie on the corresponding market of drugs. MNIK was released in India in February 2010. The storyline in the movie centered on the protagonist Rizwan Khan (played by Bollywood celebrity actor Shahrukh Khan) who is shown to be diagnosed with Asperger's Syndrome (AS).[8,9] Throughout MNIK, Rizwan portrays and talks about his severe symptoms of AS (Garner, Jones, and Harwood, 2015 [10]) while he resists and fights anti-Muslim sentiments in India and in post-9/11 US.

Clinically, AS till recently[11] was classified by the US National Institute of Health (NIH) as a rare disease in the spectrum of autism spectrum disorder (ASD), a group of disorders that affect the development of social and communication skills in children. Baxter et al. (2015) report that the global prevalence of autism was about 52 million in 2010. In India, there are approximately 1.7 to 2 million children affected by autism and around 1 million with AS in particular (Chauhan et al., 2019; Mahapatra et al., 2019). Therefore, the total number of people including children affected by autism in India, would be much larger. However, mental health (just as in many other developing economies) is stigmatized in India both in urban and rural regions (Koschorke et al., 2017; Patel et al., 2016; Ridley et al., 2020).[12] Thus the release of MNIK with Shahrukh Khan's unexpected destigmatization role provides a natural experimental setting to causally examine its edutainment effects in the market for antipsychotics, medicines that are used to treat these disease conditions (Sochocky and Milin, 2013). We use disaggregated data from relevant product markets in India and also examine physician prescription behavior to tease out these destigmatization effects of MNIK on pharmaceutical choices.

Our initial investigations show that the release of the movie was very well covered by the print media creating a dual narrative around Shahrukh Khan along with AS. This led to a sudden massive upsurge in newspaper mentions and online search behavior about AS within India (Figure 1a,b). Subsequently, our estimate at the geographic region, time, and drug molecule level shows that there was an increase in variety of drugs sold all over India following the release of MNIK. To be precise, using our difference-in-differences design, we find a positive and statistically significant effect of MNIK (between 14% and 22% increase in variety sold and prescribed) on product differentiation and choices in the market for antipsychotic medicines used to clinically treat AS.

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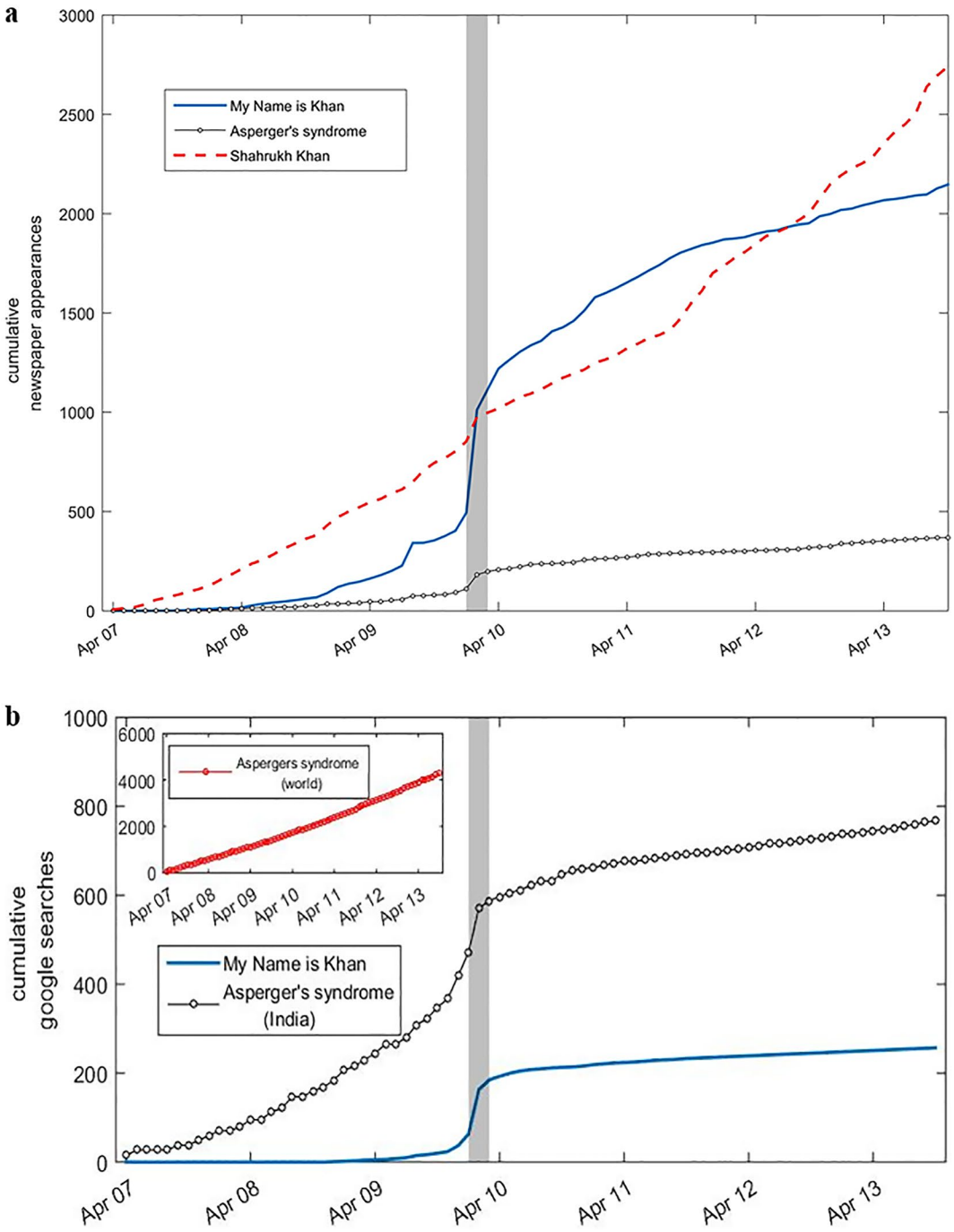


FIGURE 1 (a). Newspaper Coverage: We show here newspaper coverage of My Name is Khan and Asperger's Syndrome within India. The gray bar indicates the release of the movie MNIK, on Feb. 2010. There is a clear change around the release of the movie for newspaper coverage of the relevant terms within India. Source: EMIS Intelligence (ISI Emerging Markets—Asia). (b). Patterns in Google Keywords Search: We show here patterns in Google keywords search for My Name is Khan and Asperger's Syndrome within India (inset shows the Google search pattern for Asperger's syndrome worldwide). The gray bar indicates the release of the movie MNIK, viz. Feb. 2010). There is a clear change around the release of the movie for related keywords' searches in India. Source: Google Trends. [Colour figure can be viewed at wileyonlinelibrary.com]

This effect is robust to alternative specifications in which we control for unobserved heterogeneity at various levels and when we account for market competition. The results are robust in shorter duration samples, remain consistent when examining pre-trends and anticipation effects and align when we employ alternative and synthetic controls in our analyses. Results also hold when we experiment with treated group definitions due to changing medical guidelines. Finally, our results also go through a mid-point test using a placebo treatment following Higgins et al. (2021). In exploratory analyses, we find that the effects were less prominent in lower willingness to pay markets, Hindi-speaking parts of India which consists of relatively

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economically underdeveloped parts of India. These regional results (albeit exploratorily) provide indirect evidence from the demand side in the role of higher willingness to pay and educational awareness.[13] These effects also show up in prescribing behavior with a positive shift in the number of physician prescriptions and varieties of medicines prescribed controlling for all else.

Our identification strategy leverages the date of release of MNIK to examine the impact of its release on demand for a certain class of antipsychotic medicines in India before and after the movie release. To accomplish a causal interpretation, our difference in differences specification in our baseline investigations use the treated group of drugs in *atypical antipsychotics* (second generation antipsychotics as per Duggan (2005)) and the control group are *typical antipsychotics*.[14] In terms of aggregate behavior (Table 1), we see that the variety expansion is very prominent in the atypical antipsychotics vis-à-vis typical antipsychotics (18% as opposed to −10%). If we turn to prescriptions data, similar trends show up. The corresponding variety expansion in prescriptions was 25% for atypical antipsychotics as opposed to −3% for typical antipsychotics. While these are only summary statistics, they still suggest a rapid divergence between the treatment and control group of antipsychotics. In more formal econometric analysis, we model this descriptive evidence controlling for observed and unobserved factors and show that a large treatment effect emerges in the post-treatment regime as highlighted above.

Some reflections on shift in treatment choices maybe salient now. Earlier, autism spectrum disorders like AS were treated by both of these two types of drugs, atypical and typical antipsychotics (see Sochocky and Milin, 2013; Zuddas, Zanni, and Usala, 2011; Owen et al., 2009; McCracken et al., 2002 among others). But the clinical literature documents that atypical antipsychotics are newer generation drugs with significantly fewer side effects (Dolder et al., 2002; Jensen et al., 2007; LeClerc and Easley, 2015). This is in comparison to typical antipsychotics whose consumption often lead to irreversible problems and extrapyramidal adverse impact (Keks, 2004). Better efficacy of atypical antipsychotics is also reflected in the fact that compared to typical antipsychotics they maybe costlier (Crystal et al., 2009; Duggan, 2005); thus researchers have recommended their use given quality considerations (McGorry et al., 1993; Posey et al., 2008).

We expect MNIK to increase awareness among patients and their families about AS, induce peer effects like some have documented for new technologies (Miller and Mobarak, 2015) and all of this to potentially influence their interactions with physicians thereby impacting market structure and choice expansion (Białkowski & Clark, 2022). This should on the margin translate into an uptake of the more efficacious treated group of atypical antipsychotic medicines than our control group of typical antipsychotic medicines. We find supporting evidence of an expected firm level market variety push, likely in anticipation of these market expansion effects. To conceptualize our findings in a theoretical framework, we present a simple model in the appendix (see Appendix A.1.0) based on the insights of a benchmark Dixit-Stiglitz framework of monopolistic (Acemoglu, 2008) competition to capture the variety expansion of atypical antipsychotics, primarily as a supply side response to a demand shock. In addition, consistent with our intuitions around the effect at the level of physicians, we find that the spike in aggregate variety in atypical antipsychotics, happened more in molecules that did not adhere to global protocols (U.S. Food and Drug Administration (USFDA) approved or not), indicating that there might be some shifting of clinical standards of treatment for AS among physicians post-MNIK in India (see Table 5 & Table A.2). Approval data from Indian regulatory authorities (see Table OA.2) also indicate that there was launch of 5 new molecules after MNIK release consistent with our baseline supply-side responses.[15]

TABLE 1 Summary statistics for typical antipsychotics. Summary statistics for atypical antipsychotics

Table 1a						
	Before MNIK			**After MNIK**		
Variable	**Mean**	**S.D**	***N***	**Mean**	**S.D**	***N***
Variety (aggregated)	74.3760	17.8453	782	66.6783	13.0975	1035
HHI	0.6812	0.2575	8764	0.6849	0.2776	10,796
Variety (aggregated) (prescription)	59.8346	17.2991	272	57.1778	19.7260	360
Table 1b						
	Before MNIK			**After MNIK**		
Variable	**Mean**	**S.D**	***N***	**Mean**	**S.D**	***N***
Variety (aggregated)	276.8491	55.0961	782	327.5488	40.0009	1035
HHI	0.5042	0.2744	9281	0.5412	0.3068	15,685
Variety (aggregated) (prescription)	214.5441	63.4883	272	268.5111	67.2179	360

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One important novelty in our analyses is the availability of rich choice and prescribing behavior data from two diverse datasets rarely available in the developing world. These data for medicines sales comes from the All-India Organization of Chemists and Druggists (AIOCD), an organization that maintains a database Pharmatrac™, which collects data from 0.85 million pharmacists and chemists. To investigate physician prescribing behavior, we turn to monthly IQVIA Prescription Audit data for India from April 2007 to October 2013, which draws around one million prescriptions monthly on an average and collected over eight geographic regions in India. These datasets have now been used in recent work around pharmaceutical economics and market structure in India (Adbi et al., 2018a, 2018b, 2022). All the variables considered are listed in Table 2. Our analysis with both the datasets shows the variety expansion effect unambiguously.

Overall, our findings on physician prescribing behavior adds to the economics of treatment choices and the critical role of physicians (Chandra, Cutler, and Song, 2011; Taub et al., 2011)[16] in pharmaceutical settings and in demand for mental health treatment (Meyerhoefer and Zuvekas, 2010). More broadly, we contribute to recent work around the role of mass media in easing frictions in healthcare markets with sticky demand (Addis and Holbrook, 2010; Dalton et al., 2003) and, to prior work that demonstrates the role of media and information in bringing about societal and even political choices (Adena et al., 2015; Manacorda and Tesei, 2020). We also relate to literature around the role of deliberate celebrity involvements in promotion activities and endorsements and more broadly on the role of promotions in different markets (Erdogan and Zafar, 1999; Garthwaite, 2014; Garthwaite and Moore, 2012; Knittel and Stango, 2013; Shapiro, 2018; Sinkinson and Starc, 2019).[17]

Celebrity induced destigmatization has now generated interest among health policy formulators given the behavioral changes they may induce. Alatas et al. (2019) recently report from a Twitter experiment promoting vaccination in Indonesia that destigmatization mattered. Tweets that users identified from a celebrity were far more likely to be liked or retweeted by users than similar tweets seen by the same users but without the celebrities' imprint. Similar behavior was associated with MNIK release too through the pre-release activities around it in Bollywood.[18] For MNIK, we find that about 6 months before release, in August 20, 09,[19] Shahrukh Khan was discussing the crucial role of autism and AS in MNIK in his press conferences. Shahrukh Khan was also highlighting in other interviews that he hoped MNIK can help educate people on problems faced by

TABLE 2 Variable Description

Dependent variables	Description
Variety	Number of unique SKUs which has sales in particular month for a particular drug in AIOCD Pharmatrac data.
Variety (prescription)	Number of unique SKUs prescribed for a particular molecule as per IQVIA prescription data.
Independent variables	
$Khandummy_t$	0 for months before Feb 2010 and 1 after Feb 2010. (*My Name is Khan* was released in Feb 2010)
$Atypical_m$	Molecules belonging to the group of Atypical Antipsychotics have a value of 1, otherwise 0.
$Atypical_m \times Khandummy_t$	Interaction term which takes the value one for Atypical Antipsychotics after Feb 2010.
$Quarterly_t$	Dummy variable for each quarter where quarter ranges from 1 (Q2:2007) to 26 (Q3:2013).
$Atypical_m \times Quarterly_t$	Interaction term which takes the value one for Atypical Antipsychotics for particular quarter
Control variables	
HHI	Herfindahl-Hirschman Index based on market share of mg sales at the molecule level.
time (dummy)	Dummy variable for each month *t* where *t* ranges from 1 (Apr 2007) to 79 (Oct 2013).
Molecule	Dummy variable for each molecule *m*
Geography	Dummy variable for each geographical market *g* covering 23 regions as per classification of AIOCD data.
molecule × geography	Interaction between molecule dummies and geography dummies.
geography × time	Interactions of geography dummies and time dummies.
molecule (prescription)	Dummy variables for each molecule *m* (prescription)
geography (prescription)	Dummy variables for each geographical market covering eight regions in India as per classifications by IQVIA prescription data.
molecule × geography (prescription)	Interactions between molecule and geography in IQVIA prescription data.
geography × time (prescription)	Interactions between geography and time dummies in IQVIA prescription data.
Gender	Gender of patients for whom prescription was written as in IQVIA prescription data.

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individuals with autism and AS.[20] This also has the potential to induce an indirect information dissemination effect through external coverage of stigma associated with mental health.[21]

We are not the first to unearth such effects of edutainment on economic behavior. That said, our contribution primarily lies in demonstrating for the first time the supply side choice expansion effects from edutainment, extending prior work on demand side responses. Banerjee, Ferrara, and Orozco-Olvera (2019) found that in urban Nigeria social messaging variations in the TV series MTV Shuga resulted in significant improvements in knowledge and attitudes toward HIV and risky sexual behavior just like Orozco-Olvera et al. (2019) also report more broadly on this in a meta-analysis. Related work also show that whether it is in the context of soap operas and fertility in Brazil (Ferrara et al., 2012), movies for inducing consumption of iron fortified salt (Banerjee, Barnhardt, and Duflo, 2015), or in empowering the rural poor in India (Ravallion et al., 2015); the influencing and edutainment role of celebrities to change behaviors remain pertinent. There is also past work on cable TV and its role in improving women's status in India (Jensen and Oster, 2009). Dupas (2011) highlights how in Egypt in the early 1980s, television changed the information environment creating awareness around usage of ORT (oral rehydration therapy) kits, thereby reducing infant diarrheal deaths by 82% (Levine and Kinder, 2004). In the developed world, Angelina Jolie's New York Times editorial has been shown to impact BRCA gene testing (Desai and Jena, 2016).

The welfare enhancing role of edutainment is also explored in the context of other social vices like for violence against women. Experiments in Uganda found video-dramatization led to higher willingness to report violence to authorities (Green, Wilke, and Cooper, 2020). Jewkes et al. (2021) discuss interventions using messaging through mass media or educational drama in more effectively conveying anti-violence messages against women. Overall, social welfare effects of edutainment are of enduring interest; but our findings are among the few showing the causal impact on the supply side with firm's market choice expansion and physician-level responses (see also Dahl and DellaVigna, 2009; DellaVigna, and Kaplan, 2007; Oliveros, and Várdy, 2015). With this literature in the background, our paper should resonate with policy makers pondering cost-effective ways to enhance the welfare effects of edutainment through the celebrity destigmatization mechanism. Particularly so in sticky healthcare demand like in mental wellness, which Covid-19 seems to have exacerbated, causing a global hidden pandemic waiting to unfold.[22]

The rest of this paper proceeds as follows. In the following section, we provide a discussion of our data and then discuss our empirical identification strategy in Section 3. We then report our findings in Section 4 and conclude with a discussion on policy implications in Section 5.

2 | DATA

We use two novel sources of data, one on product variety from firm level market sales data for pharmaceuticals in India and the other on prescribing behavior of AS medicines (typical and atypical antipsychotics) in the country. The first dataset is sourced from the All India Organization of Chemists and Druggists (AIOCD) Pharmatrac™ database, which represents private sales of medicines in India (some 60% of the overall Indian market of medicines according to Adbi et al. (2018a, 2018b, 2022)) across 0.85 million pharmacists and chemists. Available at the firm-stock keeping unit (SKU) level, our data varies monthly for 79 months from April 2007 to October 2013 and gives us market information for 1428 SKUs in the antipsychotics market. The detailed variables include which firms are selling these medicines, their choices and prices to retailers, quantities of SKUs sold (which we convert using the SKU string information to milligrams sold) and product characteristics information like dosage form (tablets/capsules) and strength. We work with oral dosages in our analysis that accounted for over 95% of our overall observations following prior work in pharmaceutical economics (Dutta, 2011). Pharmatrac's primary advantage is the reliability of the data since members of India's key pharmacist and retailer association AIOCD feed in data monthly to this database. Also, the information is at a state-geographic region level in India.

Our baseline sample consists of a treated group of total 18 atypical antipsychotic molecules and a control group of 15 typical antipsychotic molecules (see Table OA.1 in the Online Appendix for AIOCD and WHO ATC classifications and Table OA.2 for approval data of these molecules in India and US). We also have access to a broader set of molecules that are classified as psycholeptics medicines (2387 SKUs) under the broader central nervous system drugs. This included molecules that were hypnotics and sedatives beyond antipsychotic molecules. We aim to estimate the causal impact of MNIK's release on product variety in particularly in the antipsychotics markets but in additional analysis we also use the entire sample of psycholeptics medicines in alternative controls and our results remain consistent. As we discussed before, we employ this treatment-control approach given our discussions with psychiatrists in India and prior work (Duggan, 2005; McGorry et al., 1993; Posey et al., 2008) that document the effectiveness of atypical antipsychotics compared to typical antipsychot-

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ics in treating ASD conditions like AS. There are 34 months of data before MNIK release and 45 months of data after the release.

We unpack a channel for market expansion through physician behavior in our context leveraging our second database, the monthly IQVIA Prescription Audit data for India from April 2007 to October 2013. These prescription data is based on a panel of 6000 physicians in India.[23] Drawing some one million prescriptions monthly on an average and collected over eight geographic regions in India (north, west, south and east where it is split into metropolitan and non-metropolitan regions), the final unit of observation in this data is at the molecule-geography-time level where we can also observe the disaggregate SKU, the SKU's product characteristics information, the varieties of SKUs being prescribed and also heterogeneities in prescribing behavior by gender of the patients.[24,25] Figure A.2 plots the evolution of aggregate stocks of SKU varieties available nationally in India varying between atypical and typical antipsychotics. It shows that while choices go up for the former, flattens for the latter after the release of MNIK.

3 | EMPIRICAL APPROACH AND IDENTIFICATION STRATEGY

3.1 | Did choice sets change and was there more variety in the market?

In our baseline econometric specification, we estimate if there was a variety expansion in the market given the release of MNIK. Specifically, we examine whether firms were selling more unique types of SKUs (i.e., choice sets and variety expanded) at the molecule-geography-time level. For this, we employ the following difference in difference specification.

$$\begin{aligned}\text{variety}_{\text{mgt}} = {} & \beta_0 + \beta_1 \text{Atypical}_m + \beta_2\, \text{Khandummy}_t + \boldsymbol{\beta_3}\, \mathbf{Atypical_m \times Khandummy_t} + \beta_4 \text{HHI}_{\text{mgt}} + \text{molecule}_m \\ & + \text{geography}_g + \text{time}_t + \text{molecule}_m \times \text{geography}_g + \text{time}_t \times \text{geography}_g + \epsilon_{\text{mgt}}\end{aligned} \tag{1}$$

where $\text{variety}_{\text{mgt}}$ in Equation (1) measures variety (or number of unique SKU choices sold) of a particular molecule m occurring in geography g in month t Atypical_m corresponds to whether molecule belongs to atypical antipsychotics (1 for our treatment group) or typical antipsychotics (0 for our control group). Khandummy_t equals 1 for months after release of MNIK (February 2010 and after), zero otherwise. Here we control for competition (HHI) and introduce controls for unobserved heterogeneity not only at the molecule, geography, and time level but also at the molecule-geography and geography-month level. Standard errors are clustered at the molecule-geography level in all these specifications, with Equation (1) employing Poisson regressions. Our coefficient of interest is β_3 which should measure the percentage change in variety in the treatment market's average molecule compared to the control market after release of MNIK.

For robustness purposes, we also compared the treated atypical antipsychotic group of molecules against the set of all psycholeptics (27 such molecules) and typical antipsychotic molecules apart from conducting sensitivity checks with the treated group definition of molecules. In addition, we also did a sub-sample analysis with a curtailed sample of two, three, four and 5 years of data, the results remained consistent. Further as we discuss below in Section 5.6, results are qualitatively similar when we employ synthetic controls (see Appendix Figure a.1) following prior work (Abadie et al., 2010; Abadie & Gardeazabal, 2003). We also conducted a mid-point test (Table 7) using a placebo treatment following prior recent work (Higgins et al. (2021)) to rule out pre-trends, our baseline results hold mitigating concerns on pre-trends.[26]

3.2 | Did physicians induce the choice expansion of SKUs?

We next unpack whether physicians were also prescribing greater variety of SKUs in our treated molecule markets compared to our control markets after release of MNIK. To understand this, we employ the following specifications.

$$\begin{aligned}\text{variety}_{mgts} = {} & \beta_0 + \beta_1\, \text{Atypical}_m + \beta_2\, \text{Khandummy}_t + \boldsymbol{\beta_3}\, \mathbf{Atypical_m \times Khandummy_t} + \text{molecule}_m + \text{geography}_m \\ & + \text{time}_t + \text{gender}_s + \text{molecule}_m \times geography_g + time_t \times geography_g + \epsilon_{mgts}\end{aligned} \tag{2}$$

Our unit of observation was at the molecule, geography, month at the gender s level. *Variety* measures the number of unique SKUs being prescribed at our relevant level of unit of observation. We control for standard types of unobserved heterogeneities at the molecule, geography, month level, and additionally at the molecule level varying by geography and month with paired fixed effects like in Equation (1). In Equation (2) we additionally control for gender specific unobserved heterogeneity. We

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continue to care about β_3 which should measure change in SKU varieties being prescribed after MNIK in our average treated molecule compared to our average control molecule.

3.3 | Are the "control" group molecules treated?

One can argue that there are two ways the typical antipsychotics can also be assumed to be treated. First, since MNIK destigmatizes mental illness in general, both types of antipsychotics can be used in treatment beyond AS; this may imply an increase in anticipated demand of both typical and atypical antipsychotics. Secondly, even for AS, Internet searches show that typical antipsychotics have found their use in treatment and therefore, it is possible that due to MNIK, there would be a positive expected shock to the demand for typical antipsychotics as well. If so, both the arguments would go against our differences in differences motivated empirical design.

We however differ from such arguments for the following reasons. First, atypical antipsychotics are second generation drugs that have significantly lesser side-effects than the typical antipsychotics which are first generation drugs. This was reiterated with us by a random sample of anonymous physicians whom we reach out to in India to understand the clinical background of our study. Thus, clearly there seems to be a clinical reason to prescribe atypical antipsychotics more than typical antipsychotics that is also validated in studies on demand for second-generation antipsychotics in US (Duggan, 2005).[27]

Second, as Table 1 exhibit, the physicians prescribed more varieties of atypical antipsychotics on an average in the post-MNIK period whereas for typical antipsychotics, there was a slight decline in varieties prescribed. It is important to note that the panel of doctors also remained fixed (see discussion on lack of attrition in our sample in Footnote 25) during this time period. Therefore, this shift in favor of atypical antipsychotics cannot be attributed to entry and exit of physicians in the IQVIA panel. The increase in the prescribed varieties is thus the most important factor in setting up the treatment versus control group. Note that even if the efficacy of the two groups of medicines were not different, if the physicians consider them to be different, there would be differential impacts on their relative product heterogeneity.

Therefore, the question boils down to establishing if the physicians both within the sample and outside, do consider the medicines to be different? As we have discussed above, within sample, the physicians clearly showed a stronger response in favor of the atypical antipsychotics. Furthermore, this *taste* of physicians favoring atypical antipsychotics has been observed in other countries as well (see e.g., Duggan, 2005; Huskamp et al., 2013; Makhinson, 2010). In addition, as we show below, we have also estimated our model with a broader alternate control group comprising all other psycholeptics along with typical antipsychotics. These results align and remain robust with this alternative control group. Our results also remain consistent when we experiment with a narrower definition of treated molecules given changing medical guidelines (see Appendix Table A.7).

Finally, one can ask if there was any pre-trend in the data. Our event study estimates rule out the concern about pre-trend and we also have a mid-point test using a placebo treatment as we highlight earlier following Higgins et al. (2021) to argue for absence of pre-trends (Table 7). Beyond the econometric evidence, we note also that the sharp spike in public attention on AS around the time of MNIK is noticeably clear, while acknowledging the possibility of a small anticipation effect given pre-release activities of the movie from August 2009. Taken together along with tests for alternative controls and in shorter time periods, our results indicate a clear causal choice expansion with release of MNIK in the Indian market for particularly atypical antipsychotic drugs (see also Footnote 25 relatedly).

4 | FINDINGS

4.1 | Descriptive analysis

Figure 1a is constructed by scraping data from EMIS Intelligence database from ISI Emerging Markets—Asia. This database contains newspaper articles published within India in English language between 2007 and 2013. We search here for news articles that had mentioned the words *Shahrukh Khan*, *My Name is Khan* or *Asperger's Syndrome*. The *y*-axis in Figure 1a is a cumulative count of number of appearances of the above words in newspapers and *x*-axis indicates the time period. We see that *Shahrukh Khan* was appearing all along, which is expected given his celebrity status. However, both *My Name is Khan* and *Asperger's Syndrome* started getting coverage closer to the release date of the movie and shows sharp increase during the release month of the movie. Manual inspection shows that newspaper articles covering AS during the time release were almost invariably mentioning MNIK.

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Figure 1b indicates that around the time of release of MNIK there was a spike in interest both in the movie and in Asperger's Syndrome on Google trends searches in India. Interestingly while there were spikes in searches for AS in India, as inset in Figure 1b shows, the searches for AS on google-trends around the world increased secularly.

Table 1 corroborate the above descriptive findings with summary statistics pre and post release of MNIK. Varieties (number of unique SKUs) sold at a monthly frequency of atypical molecules for an average region increased from 276 to 327 (an 18% increase), for typical antipsychotics it decreased from 74 to 66 (about 10% decrease). For unique SKU varieties prescribed, we observe an increase in atypical antipsychotics from 214 to 268, a 25% increase compared to a decrease from 59 to 57 of 3% in variety of SKU being prescribed on an average in typical antipsychotics.

4.2 | Econometric estimates of the impact on choice and variety

We report next our econometric findings. Models 1-4 in Table 3 provides our baseline results from estimating Equation (1) across a variety of specifications. All models in Table 3 have errors clustered at the molecule-geography level. Across all the Poisson models, we report a positive and statistically significant impact of MNIK on average variety being sold in atypical antipsychotics compared to typical antipsychotics. For example, using model 4 as a preferred specification and following interpretation of Poisson models in a recent study (Becker and Pascali (2019)) we see that after the release of MNIK, the number of unique SKUs that got sold in the average atypical antipsychotic molecule was (exp (0.1386) = 1.14) 14% greater than those that got sold in the average typical antipsychotic molecule.

We note in this context that this increase can be either due to diagnosis of new patients or revisits of already diagnosed patients. The crucial point to recognize is that non-adherence of patients to psychiatric medication can be extremely high (50% as reported by Cotton et al. (2009); 23%–58% in various psychiatric contexts in India as discussed by Avasthi (2010)). Thus, the positive response can be mostly attributed to a potential anticipated market expansion via diagnosis of new patients. It is widely recognized that treatment of mental health can be sensitive to relative cost of treatment. For example, Large et al. (2008) documented that average mean duration of untreated psychosis has strong negative correlation with income (average mean duration of untreated psychosis in low- and middle-income countries is 125.0 weeks compared to 63.4 weeks in high-income countries). Therefore, the higher growth rate for atypical antipsychotics is probably welfare enhancing as the comparative literature on atypical and typical antipsychotics recognizes that extra-pyramidal side-effects of atypical antipsychotics are much lesser (Crossley et al., 2010).[28] To explore in detail the drivers of firm decision making

TABLE 3 Increase in Variety of Atypical Antipsychotics after MNIK was released in February 2010

	(1)	(2)	(3)	(4)
	Variety	**Variety**	**Variety**	**Variety**
Atypical × Khandummy	**0.1524*** **	**0.1440*** **	**0.1515*** **	**0.1386*** **
	(0.0295)	**(0.0285)**	**(0.0290)**	**(0.0277)**
HHI	−1.3991***	−1.6425***	−1.4074***	−1.6876***
	(0.0692)	(0.0923)	(0.0695)	(0.0913)
N	44,526	44,524	44,526	44,524
log pseudolikelihood	−106115.58	−101219.68	−104956.39	−100031.97
Time dummies	Yes	Yes	Yes	Yes
Molecule dummies	Yes	Yes	Yes	Yes
Geography dummies	Yes	Yes	Yes	Yes
Molecule × geography dummies	No	Yes	No	Yes
Geography × time dummies	No	No	Yes	Yes

Note: This table provides our baseline findings estimating Equation (1). Across model specifications, we see that the interaction term (**Atypical × Khandummy**) is positive and statistically significant. The effects of MNIK on our treated group are visible for variety of SKUs (Models 1–4) being sold. The models control for various plausible forms of unobserved heterogeneity. Constant term and variables collinear with fixed effects are included but not reported. Robust clustered standard errors at the molecule-geography level are provided in parentheses. Time period of sample is April 2007- October 2013. Bold values indicate the size and significance of that particular coefficient estimate.

+ $p < 0.1$, *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

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we also performed exploratory sub-sample analysis along regions and molecule approval status and report next those findings.

4.3 | Exploratory analyses of regional variations and Linguistic frictions

The language of use in MNIK was mainly Hindi. Apriori, all else controlled for, for firms evaluating expansion of markets, one can posit that they would probably expand in previously untapped markets with higher willingness to pay. Thus, from the firms' point of view, MNIK should positively impact the market in Southern India (where Hindi is not dominant as a language but where willingness to pay might be higher and literacy level might be higher than levels in rest of India). So, we should expect to see more variety expansion in non-Hindi speaking region. However, there can be an opposing affinity oriented sociological argument. From the demand side, we would expect MNIK to impact physicians and patients more forcefully in Northern India (where Hindi is the dominant language spoken) than in Southern India.

To examine these nuances, in a new model specification, we divide the regions in Hindi-speaking[29] and non-Hindi[30] speaking regions. Since it is difficult to establish a clear segregation in terms of Hindi-speaking population across states, we follow a broad classification for regions based on whether they belong to Hindi-belt or not. We also include Mumbai, Marathwada and Vidarbha in the set of Hindi-speaking regions since the Bollywood film industry is physically located in Mumbai, which could create information spillovers due to geographic proximity. We estimated regression models with variety as the outcome variable using the specification from Equation (1) with molecule-geography dummies. The results are presented in Table 4. Hindi-speaking regions respond less compared to non-Hindi speaking regions in terms of variety expansion. We interpret this finding as follows. Since the non-Hindi speaking states are generally considered to have higher levels of economic development translating into higher willingness to pay, it is likely that firms would explore these markets by providing more choices than they would in non-Hindi belt.

In fact, we find supporting evidence to this assertion with complementary evidence from a regional analysis with a cut on literacy (with data from the 2011 Government of Indian Census). We split the regions into regions with high and low literacy. The summary of the results is presented in Table A.1 in the Appendix. The results are consistent with the above findings. Regions with high literacy exhibit stronger responses in variety expansion than the regions with low literacy. Overall, while our results here varying by regions and literacy are exploratory in nature and may need more careful unpacking in future, they do

TABLE 4 Variety sold of Atypical Antipsychotics Spike post-MNIK in non-Hindi-speaking regions

	(1) Variety Hindi speaking	(2) Variety Non-Hindi speaking
Atypical × Khandummy	**0.1160*** **	**0.1758*** **
	(0.0356)	**(0.0432)**
HHI	−1.7715***	−1.5730***
	(0.1165)	(0.1435)
N	27,373	17,153
log pseudolikelihood	−61864	−39169
Time dummies	Yes	Yes
Molecule dummies	Yes	Yes
Geography dummies	Yes	Yes
Molecule × geography dummies	Yes	Yes
Geography × time dummies	Yes	Yes

Note: This table estimates model 4 from Table 3 to examine if our baseline results showed sub-national variations. We observe that in Hindi speaking regions in our data, the effect on variety is slightly lower than in non-Hindi speaking regions by observing the coefficient of the interaction term (**Atypical × Khandummy**). We control here for unobserved heterogeneity at all plausible levels and employ robust clustered standard errors at the molecule-geography level reported in parentheses. Constant term and variables collinear with fixed effects are included but not reported. Time horizon for this sample is April 2007- October 2013. Bold values indicate the size and significance of that particular coefficient estimate.

$+ p < 0.1$, $*p < 0.05$, $**p < 0.01$, $***p < 0.001$.

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highlight the role of willingness to pay in some markets over others. In addition, there may be an intertwined effect of educational awareness driving the baseline supply side choice expansion effects.

4.4 | Following global protocols: USFDA approved molecules

One question arises now on welfare. Was this choice expansion truly welfare enhancing? How might we unearth some evidence of that in a reduced form setting. To check this, we investigate if our baseline effects were different across USFDA approved molecules vis-à-vis other non-approved molecules[31] in the atypical and typical antipsychotics medicines market. Here, we ran two models with variety as the dependent variable and the specification from Equation (1) with molecule-geography dummies. This is important because recent discussions point to a *quality of medicines* concern in Indian market for medicines.[32] Should the expansion of demand be in substandard medicines, the potential welfare effects of celebrity destigmatization efforts from enhanced choices in removing sticky demand could then be diminished in the aggregate. The summary of the results is given in Table 5 point to these concerns. We see that the effects are less pronounced in USFDA approved molecules compared to non-approved molecules hinting indeed at unintended welfare consequences of destigmatization by more choice expansion in non-approved medicines that may merit future work on their health outcome consequences.

Next, we unpack physician behavior as channels through which edutainment impacted the supply side from a comprehensive prescription database.

4.5 | Overall impact on physician prescription variety

Table 6 reports our findings from estimating Equation (2) on the prescription data at the molecule-geography-month and gender level. All models have errors clustered at the molecule-geography level. We also control unobserved heterogeneity by introducing fixed effects at the month, molecule, geography, and gender level. In addition, we also control for unobserved heterogeneity at the molecule-geography level in Model 2 and geography-month level in Model 3 and finally with all the fixed effects in Model 4.

TABLE 5 Atypical Antipsychotics Variety Spike post-MNIK in USFDA non-approved Drugs

	(1) **Variety** **Approved Atypicals versus Approved typicals.**	**(2)** **Variety** **Non-approved Atypicals versus Non-approved typicals.**
Atypical × Khandummy	**0.1944*** **	**0.2487*** **
	(0.0268)	**(0.0370)**
HHI	−0.9713***	−2.0323***
	(0.0874)	(0.0693)
N	23,255	21,269
log pseudolikelihood	−54086.64	−42690.40
Time dummies	Yes	Yes
Molecule dummies	Yes	Yes
Geography dummies	Yes	Yes
Molecule × geography dummies	Yes	Yes
Geography × time dummies	Yes	Yes

Note: This table estimates model 4 from Table 3 to examine if our baseline results were following global protocols. From the interaction term coefficient estimates (**Atypical × Khandummy**), we observe that in USFDA non-approved drugs in our sample, the effect on variety is more positive and statistically significant relative to approved drugs. We control here for unobserved heterogeneity at all plausible levels, employ robust clustered standard errors at the molecule-geography level and report in parentheses. Constant term and variables collinear with fixed effects are included but not reported. Time horizon for this sample is April 2007- October 2013. Atypicals and typicals are short forms of our treated and control molecules. Approved stands for molecules approved by USFDA, non-approved otherwise. Bold values indicate the size and significance of that particular coefficient estimate.

$+ p < 0.1$, $*p < 0.05$, $**p < 0.01$, $***p < 0.001$.

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TABLE 6 Varieties of Physician-prescribed Atypical Antipsychotics Spike post-MNIK

	(1)	(2)	(3)	(4)
	Variety (prescription)	**Variety (prescription)**	**Variety (prescription)**	**Variety (prescription)**
Atypical × Khandummy	**0.1943*** **	**0.2006*** **	**0.1954*** **	**0.2051*** **
	(0.0425)	**(0.0425)**	**(0.0390)**	**(0.0385)**
N	22,525	22,522	22,525	22,522
log pseudolikelihood	−49465.19	−44500.13	−48910.29	−43960.29
Time dummies	Yes	Yes	Yes	Yes
Molecule dummies (prescription)	Yes	Yes	Yes	Yes
Geography dummies (prescription)	Yes	Yes	Yes	Yes
Gender dummies	Yes	Yes	Yes	Yes
Molecule × geography dummies (prescription)	No	Yes	No	Yes
Geography × time dummies (prescription)	No	No	Yes	Yes

Note: When we estimate Equation (2) on IQVIA Prescription Audit data at the molecule-region-gender-time level, controlling for all else, we observe an increase in the variety (i.e., number of unique SKUs) being prescribed by psychiatrists in India of atypical antipsychotics vis-a-vis typical antipsychotics after the release of *My Name is Khan* in February 2010 from examining the coefficient of the interaction term (**Atypical × Khandummy).** We control here for unobserved heterogeneity at all plausible levels and employ robust clustered standard errors at the molecule-geography level as reported in parentheses. Constant term and variables collinear with fixed effects are included but not reported Time horizon for this sample is April 2007- October 2013. Bold values indicate the size and significance of that particular coefficient estimate.

$+ p < 0.1$, $*p < 0.05$, $**p < 0.01$, $***p < 0.001$.

We find examining the coefficient estimate of the interaction term, a strong statistically significant positive effect on variety of SKUs being prescribed in the average atypical antipsychotic molecule compared to the average typical antipsychotic molecule. Physicians seem to have expanded the choice set of SKUs that are being prescribed after MNIK's release in atypical antipsychotics compared to typical antipsychotics. Specifically, the average molecule in atypical antipsychotic after release of MNIK grew by at least 22% (exp (0.20) = 1.22) in variety of SKUs being prescribed compared to the average molecule in typical antipsychotics controlling for all else.

But when we estimate the variety expansion phenomenon in our physician prescribing behavior data with USFDA approved versus non-approved products we find evidence related to concerns around quality of medicines like we observed in SKU choice data (see Table A.2 in the Appendix). Interestingly, while the overall effects on prescription behavior are still positive and statistically significant, consistent with our market choice expansion results through prescriptions in Table 6; Table A.2 also shows that physicians likely have a higher preference for prescribing non-approved medicines than approved medicines. This may be indicative of purchasing power consideration of patients driving prescribing behavior as some psychiatrists indicated to us, but ultimately this may also result in adverse health outcome consequences that need to be studied in future work.

4.6 | A synthetic control strategy

To enhance causal identification in our analysis and to establish robustness, we next employed the synthetic control method (Abadie et al., 2010; Abadie & Gardeazabal, 2003). It is a matching technique which creates an artificial control group to match the characteristic of treated group pre-treatment based on observed covariates and outcome variable from the pre-treatment periods. The approach for synthetic control differs from other methods such as propensity score matching or coarsened exact matching in that here the weights are assigned dynamically based on the input data with the objective to minimize the mean error between the observed and the synthetic data. This data-driven approach is more robust and agnostic while determining weights for the groups, which makes it free from prior hypothesizing about the results (Abadie et al., 2010). Also matching on covariates as well as outcome variable partially takes care of endogeneity concerns due to unobserved heterogeneity (Botosaru and Ferman, 2019) making the results much more reliable. These advantages of synthetic control method has led to use of this method in recent studies (Adbi et al., 2022; Green, Heywood, and Navarro, 2014; Peng, Meyerhoefer, and Chou, 2018) as a means for robustness test for difference in differences estimates where researcher arbitrariness in choosing control groups could bias results.

For our study, the outcome of interest is the *mean number of unique SKUs* sold per month for atypical antipsychotics. For the treated group of molecules in a geographic region, we construct synthetic control group of molecules in the same region

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matching before treatment with covariate as competition (HHI). To construct the synthetic control group, the weights are assigned by the algorithm to match the mean of the treated group with competition and variety.

Variety plots using synthetic controls shown in appendix (Figure a.1) shows that post movie release there was an uptake in variety in Andhra Pradesh (AP), Bihar, Jharkhand, Uttar Pradesh and Vidarbha, while the gaps in Kerala, Mumbai, Odisha decreased. Out of 23 geographic regions, we observe a positive impact on variety from MNIK in 15 regions and in other regions, we see muted responses. Overall, the results for synthetic control are qualitatively in line with our difference in differences estimates[33] and lend strength to our identified causal impact of MNIK on variety of atypical antipsychotic medicines compared to typical antipsychotic medicines.

4.7 | Robustness checks

Finally, we rule out a possible concern that both typical and atypical antipsychotics might be treated by MNIK. While synthetic controls and other robustness analyses above address these issues to a considerable extent, we conduct four sets of additional analyses to lend further strength to our identification strategy.

***Truncated and Revised Treatment Sample*:** We run our baseline variety models in a truncated sample of two, three, four- and 5-years to evaluate whether results held in the sub sample. These results presented in Table A.3–A.6 in the Appendix align with our baseline findings. We also ran our baseline models after excluding molecules whose classification to atypical or typical may not be universally acceptable (Abou-Setta et al., 2012; Bai et al., 2017; Jenner and Marsden, 1982). The results hold and are presented in Table A.7.

***Alternate Control Group*:** We also employ our baseline specification in an alternate treatment control sample, with the atypical antipsychotics molecules compared to all other psycholeptics molecules (including typical antipsychotics) as control group (27 such molecules) in our data. This specification allows us to address potential confounders coming from the fact that sometimes physician prescribing behavior might be driven by certain specific characteristics of typical antipsychotic molecules; by moving beyond them as a control group, we likely free ourselves of those effects. Our findings reported in Table A.8 in the Appendix continue to generate a statistically significant positive effect giving more strength to the causal claims in our analysis.

***Ruling out Pre-trends*:** Finally, and importantly, we check for pre-trends in the data. In Figure 2, we present the coefficients estimates pre- and post-MNIK estimating Equation (3) and plotting coefficient of interaction of Atypical with quarterly dummies.

$$\begin{aligned}\text{variety}_{mgt} = {} & \beta_0 + \beta_1 \text{Atypical}_m + \beta_2 \text{Quarterly}_t + \beta_3 \text{Atypical}_m \times \text{Quarterly}_t + +\beta_4 \text{HHI}_{mgt} + \text{molecule}_m + \text{geography}_g \\ & + \text{time}_t + \text{molecule}_m \times \text{geography}_g + t\text{ime}_t \times \text{geography}_g + \epsilon_{mgt}\end{aligned} \tag{3}$$

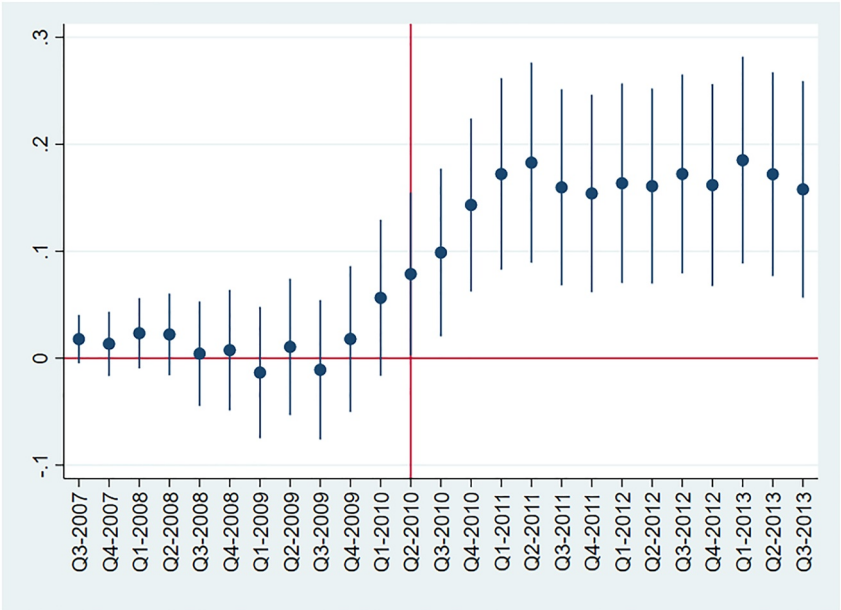


FIGURE 2 Pre-trends Examination of Varieties in Firm's Product Choice Offerings. Based on model two of Table 3 with quarterly interactions we plot here the coefficients on the quarterly interaction terms over time. In our estimations, we have controlled for differential trends with interactions between the treated group and month dummies. Shift in the coefficients for variety from zero to positive and significant values post-release of MNIK, is evident, albeit with weak anticipation effects due to potential pre-release activities around the movie from at least August 2009 (see also mid-point test Table 7 relatedly). [Colour figure can be viewed at wileyonlinelibrary.com]

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TABLE 7 Evidence of lack of Pre-trends with Mid-point Test

	(1) Variety	(2) Variety	(3) Variety	(4) Variety
Atypical × **Placebotreatment**	**0.0207**	**0.0044**	**0.0223**	**0.0062**
	(0.0260)	**(0.0257)**	**(0.0244)**	**(0.0241)**
HHI	−1.1923***	−1.3707***	−1.1818***	−1.3780***
	(0.0709)	(0.1000)	(0.0710)	(0.0967)
N	18,045	18,040	18,045	18,040
log pseudolikelihood	−41961.60	−39502.75	−41535.22	−39071.06
Time dummies	Yes	Yes	Yes	Yes
Molecule dummies	Yes	Yes	Yes	Yes
Geography dummies	Yes	Yes	Yes	Yes
Molecule × geography dummies	No	Yes	No	Yes
Geography × time dummies	No	No	Yes	Yes

Note: We evaluate for pre-trends by doing sub sample analysis of a pre-treatment period with an arbitrary mid-point as *Placebotreatment* (0 before September 2008 and 1 after that and estimate our main specification (Equation (1)). We observe that the coefficient of the interaction term (**Atypical × Placebotreatment**) is statistically insignificant across all the models. Constant term and variables collinear with fixed effects are included but not reported. Robust clustered standard errors at the molecule-geography level in parentheses. Time horizon is April 2007- January 2010. Bold values indicate the size and significance of that particular coefficient estimate.

$+ p < 0.1$, $*p < 0.05$, $**p < 0.01$, $***p < 0.001$.

We see that variety follows a clean transition from pre-to post-MNIK, exhibiting a clear change in the coefficient estimates.[34]

An additional test for pre-trends we conduct is to quantitatively examine presence of pre-trends follow prior work (Higgins et al., 2021). We took the pre-treatment period that is, from April 2007 to January 2010 and created a placebo treatment which divides the pre-treatment period into two equal parts (0 before September 2008 and 1 after that) that is, 17 months in pre-treatment period and 17 months in post treatment period. We estimate our main difference in difference specification (Equation (1)). If pre-trends are present, the coefficient of interaction of placebo treatment with Atypical (β_3) will be statistically significant. We report the results in Table 7. In all the four models, coefficient is statistically insignificant providing additional evidence for lack of pre-trends in our data. Broadly, all the results taken together indicate that the broad features of rapid shift in choices on the supply side coming from edutainment and celebrity destigmatization effects from MNIK are both qualitatively and quantitatively robust.

5 | DISCUSSION AND CONCLUSION

In this paper, we study the role of destigmatization induced by movies and its edutainment effects on product choices for antipsychotic medicines in India. Our context is the release of a highly successful Bollywood movie *My Name is Khan* in February 2010, where the protagonist (enacted by one of India's most popular movie stars, Shahrukh Khan) was suffering from Asperger's Syndrome. Since this movie was not explicitly geared toward promoting a market or a firm and yet unintendedly raised awareness about AS, we argue that this is an exogenous shock to exploit for a causal analysis of unexpected celebrity destigmatization efforts on choice set expansion through the supply side in the market in anticipation of a demand expansion.

Our baseline models utilize a difference in differences design to examine if the release of MNIK had an impact on variety for medicines in antipsychotics markets in India. Our novel data captured both geography-molecule level time and product variety information of medicines and prescriptions in the Indian private retail market for pharmaceuticals. In our analysis, our treated group consists of atypical antipsychotics since the clinical literature has shown that these medicines are more effective than typical antipsychotics to treat conditions in the autism spectrum disorder of which Asperger's Syndrome is a particular disease condition. We analyze changes in product variety in our treated medicines compared to our control group(s), typical antipsychotics (baseline) and all psycholeptics (robustness).

Controlling for all else, we show that there was a marked increase in choices in the treatment group of medicines after the release of MNIK, compared to our control group of medicines. These baseline results remained consistent with an alternative control group of medicines and other robustness checks. Our baseline results are complemented by additional findings

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that demonstrate an increase in varieties of products being prescribed by physicians in our data for atypical antipsychotics compared to typical antipsychotics, controlling for all else but physicians prescribe more non-approved medicines than approved medicines.

These findings can be evaluated in conjunction with the observation that there exist significant market barriers in medicines for mental health in emerging markets (Patel et al., 2016). Concerns around this are increasingly being highlighted in our Covid-19 ravaged world. Few studies however show how supply and choice of medicines can be increased for patients enhancing access to medicines. Kitchener & Jorm (2002) find a 13.5% improvement in community level intention of providing help post mental health first aid training course. Blunt et al. (2020) found that expansion of affordable care act led to 1.96% increase in probability of healthcare provider accepting Medicaid and hence increased access and choice for patients. Barnett, Lee, & Frank, (2019) find that change in regulations regarding buprenorphine prescription that is, medicine used for opioid use disorder led to a 111% increase in choice of clinicians per ten thousand population in rural areas and hence providing more access to patients. None of these studies are however at the market-geography level like we leverage on. Our study provides new estimates given approximately 14% expansion in product choices (and 22% expansion in prescription choices of physicians) for atypical antipsychotics driven by a movie induced edutainment and destigmatization nationally within India. These results, with a different unit of observation (where prior work use samples of individuals or households), clearly highlight the vital role of edutainment as a cost-effective way of improving access and choices in developing countries.

We do recognize that our study and its implications have scope for future work given its limitations. First, one should remember that the National Health Service in the United Kingdom and other regulators have now issued cautionary notes on healthcare product endorsements by celebrities especially for problematic product categories.[35] Although our results suggest that there was a market expansion aided by choices both in product market and prescriptions data, it is worth examining in future work whether the medicines being prescribed are generating favorable health outcomes and if endorsements are happening for social goods (rather than bads). Second, while one would ideally like to evaluate the validity of our results in case of other movies and other disease conditions, we do not have data from both an extended market and prescribing behavior sample spanning at least 2 decades in India. Third, not all movies are as commercially and socially successful as MNIK in generating an impact and that heterogeneity in impact potentially needs further evaluation. Fourth, our data is at the firm-geography-product level and by physician cohorts and product level for our prescribing behavior data. We cannot assess the evolution of underlying interactions between patients and physicians in our data, but it is worth examining how that may change with an unexpected celebrity destigmatization event with an edutainment implication (perhaps through surveys and experiments). While the "edutainment" aspect may be difficult to implement directly as a policy intervention, cheaper social network incentivizing approaches maybe worth considering in this line of thought. Future researchers may disentangle the underlying mechanisms also using experimental data. Finally, there may also be potential for future work with information from Bollywood industry of region-time varying ticket sales data to investigate disaggregate implications of our findings.[36]

Our work has important policy and managerial implications also given recent findings in psychology and behavioral economics where scholars have discussed the effects of conceptual consumption (Ariely and Norton, 2009), the role of celebrities in public health behaviors (Brown and Basil, 1995), observational learning effects and the role of expert reviews (Cai, Chen, and Fang, 2009; Friberg and Grönqvist, 2012). We also relate to emerging literature in behavioral marketing that examines peer effects in beliefs and the phenomena of conditional projection (Orhun and Urminsky, 2013). Like with all work, more remains to be done.

CONFLICT OF INTEREST

The author declares that there is no conflict of interest that could be perceived as prejudicing the impartiality of the research reported.

DATA AVAILABILITY STATEMENT

The authors are bound by a non-disclosure and confidentiality agreement with data providers and will not be able to share the data for replication purposes. However, the authors are very happy to share their STATA code and connected future researchers with the data providers to commercially procure the data.

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ENDNOTES

[1] We use *choice*, *variety*, *product differentiation and product introductions* interchangeably in this paper. They all measure new products offered by firms in our pharmaceutical market context following prior literature (Chaudhuri, 2005; Duggan et al., 2016).

[2] See: http://www.rfi.fr/en/20180319-france-targets-online-hate-new-anti-racism-campaign—Accessed 12th October 2022.

[3] See: https://www.businessinsider.in/5-Ads-That-Defy-Social-Taboos-In-India/articleshow/47640779.cms—Accessed 12th October 2022.

[4] Other instances from Bollywood movie industry include Black, released in 2005 around Alzheimer's disease, Taare Zameen Par, released in 2007 on dyslexia, Ghajini released in 2008, on short-term memory loss, Paa, released in 2009 on Progeria, or Hichki released in 2018 on Tourette syndrome.

[5] See: https://www.who.int/docs/default-source/coronaviruse/covid19-stigma-guide.pdf; https://www.unicef.org/documents/social-stigma-associated-coronavirus-disease-covid-19; https://en.unesco.org/news/covid-19-related-discrimination-and-stigma-global-phenomenon and https://www.telegraph.co.uk/global-health/science-and-disease/families-abandon-dead-relatives-covid-19-fear-stigma-grips-pakistan/ -—Accessed 12th October 2022.

[6] See: https://www.health.harvard.edu/blog/impact-celebrities-medical-advice-2017120112831 -—Accessed 12th October 2022.

[7] See Jain, Pandey, and Roy (2017) and Thacker, Vashishtha, and Thacker (2016) for descriptive documentation of some effects of Bollywood on Indian healthcare system.

[8] The movie was also globally successful. Noted Brazilian author Paulo Coelho thought Shahrukh Khan deserved an Oscar for his role in MNIK (See: https://www.thehindu.com/entertainment/movies/SRK-deserved-an-Oscar-for-My-Name-is-Khan-Paulo-Coelho/article17291886.ece - Accessed 12th October 2022)

[9] To the best of our knowledge, the use of AS in the MNIK script by Shahrukh Khan was unexpected and unmotivated, not influenced by any discussion with firms, public health authorities, or social campaigns. It is in that sense we posit that MNIK's use of AS as a destigmatization context, is exogenous to the market that we study.

[10] There are famous examples of patients recognizing that they have Asperger's through media induced anchors. Bill Gross, American co-founder of the Pacific Investment Management Company recently acknowledged that he learned he had Asperger's after reading about Michael Burry, a character in Michael Lewis' *The Big Short*. See https://www.bloomberg.com/news/articles/2019-03-01/taxes-deficits-and-asperger-s-the-bill-gross-you-didn-t-know—Accessed 12th October 2022. We thank Michael Spence for pointing us to this reference.

[11] Toward the end of our sample period in May 2013, AS was declassified into a single label disorder along with three other independent diagnoses, see: https://www.spectrumnews.org/opinion/dsm-5-redefines-autism/. Accessed 12th October 2022.

[12] See: https://qz.com/india/1237314/fear-and-apathy-how-indians-look-at-those-suffering-mental-illnesses/ - Accessed 12th October 2022.

[13] Gambhir, Vijay (1995). The Teaching and Acquisition of South Asian Languages. University of Pennsylvania Press. ISBN 978-0-8122-3328-5.

[14] One concern might arise about whether the choice of typical versus atypical antipsychotic constitutes the most appropriate comparison groups for causal inference. We address the potential factors (e.g., whether both groups are treated or not) in our analysis and show that our results are quite robust, and the choice of treatment and control groups are valid, both in econometric and medical sense. Finally, we have also estimated our model with a broader alternate control group comprising all other psycholeptics along with typical antipsychotics. The results align and remain robust. We also corroborate our choices of treatment and control group with anonymous psychiatrist conversations in India. They highlighted to us that our design makes clinical sense, consistent with supporting evidence from a US setting investigating demand for second generation (or atypical) antipsychotics (Duggan 2005). See Section 3.3 for further discussion on this issue.

[15] See approval information from Central Drugs Standard Control Organization (CDSCO) in India provided in online appendix Table OA.2.

[16] See in this context Schnell and Currie (2018), Buchmueller, Carey, and Meille (2019) and Buchmueller and Carey (2018).

[17] There is a long history of celebrity endorsement in US. Cadbury Brothers in 1854 released an advertisement showing Queen Victoria drinking their cocoa. Mark Twain endorsed cigars, flour, and fountain pens in the early 1900s. American singer Roy Rogers endorsed the Pennsylvania Railroads in 1951, while Ronald Reagan and Marlene Dietrich (controversially) have endorsed vice goods like cigarettes.

[18] Sarkar et al. (2020) discusses that pre-release activities in Bollywood usually range for at least 3 months prior to actual release of movies, many times even more, costing up to 30% of overall costs of promotion of movies.

[19] See: My Name is Khan not about terrorism: SRK - India Today, Accessed 11th October 2022.

[20] http://archive.indianexpress.com/news/srk-plays-a-character-with-asperger-s-syndrome/556738/, Accessed 11th October 2022.

[21] https://www.hindustantimes.com/entertainment/bollywood-has-mental-disabilities-too-on-mind/story-OCpn7dsuD9mx6Cuse8elaI.html, Accessed 11th October 2022.

[22] See Addressing the hidden pandemic: The impact of the COVID-19 crisis on mental health | The OECD Forum Network (oecd-forum.org)—Accessed, 12th October 2022.

[23] Unfortunately, we do not get access to individual physician data, instead physicians are bucketed into 19 specialties (like cardiologists, psychiatrists etc.) and only cohort-level information is provided. We work with prescribing behavior of the cohort of psychiatrists in our sample.

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[24] In an ideal world, we would have liked to match the demand data with prescription data but given that the prescription data was provided to us at the physician cohort level like psychiatrists, general physicians, pediatricians, or gynecologists - it was impossible to conduct this match. Another complication is that the regional splits in IQVIA RX data is coarser, between metropolitan and non-metropolitan regions in North, East, West and South of India; not directly mappable to the regional dimension in AIOCD Pharmatrac. Nonetheless, this data is useful to understand heterogeneity in prescription behavior in India as has recently been investigated in some recent work (Adbi et al., 2018a, 2018b, 2022; Bhaskarabhatla and Chatterjee, 2017). For our paper, we use prescriptions written by psychiatrists in our data since we observed that other physician cohorts were not prescribing antipsychotics.

[25] An anonymous referee insightfully pointed to us concerns on attrition in the datasets. We were careful to check about it in our context and feel confident that this would not be salient in our sample. Our data is market level disaggregate sales information extracted commercially from market sales of retailers from a stable universe of retailers who are part of AIOCD, a national pharmaceutical retailer association in India (see Bhaskarabhatla et al. (2016) for institutional details around AIOCD). As such this data (and the physician panel data from a stable panel of 6000 physicians maintained by IQVIA) are slightly different from a canonical administrative dataset that one maybe using to analyze similar issues in developed world markets like with MEPS-AHRQ for example, in the US. We also cross-checked and confirmed stability of the panels with the data providers during data purchase. It is also worth highlighting that most of our specifications had time, molecule, geography and molecule-geography, geography-time paired fixed effects; this should control for any unobserved inflationary or deflationary effect on sales or prescriptions if attrition was distorting the results. We thank the anonymous referee for this comment.

[26] We are grateful for an anonymous referee's insightful comments here. Our baseline pre-trends investigation while robust in a mid-point test with a placebo treatment, did show some anticipation effects few months before release. This is to be expected. As we have highlighted earlier, even in August 2009, almost six months before actual release, MNIK was being discussed by Shahrukh Khan in pre-release activities highlighting the role of AS in the movie. Thus, information dissemination is expected to induce mild pre-trends even before actual treatment and we do observe that in our descriptive plots (Figures A.3–A.5 in appendix on regional evolution of sales and prescriptions especially in some parts of Southern Indian regions).

[27] Although this claim has been challenged recently and not all atypical antipsychotics strictly dominate typical antipsychotics in terms of side effects in all dimensions. See for example, the CATIE study https://www.nimh.nih.gov/funding/clinical-research/practical/catie/phase1results.shtml.

[28] While, one would have to carefully construct a counterfactual and structurally estimate true welfare gains in this context, our overall intuitions around a welfare effect were corroborated in conversations with a few doctors, parents and schools in India across Kolkata, Bhubaneshwar, Ahmedabad, and Bengaluru.

[29] The regions were Bihar, Chhattisgarh, Delhi, Gujarat, Haryana, Jharkhand, Madhya Pradesh, Marathwada, Mumbai, Punjab, Rajasthan, UP East, UP West, Uttarakhand and Vidarbha.

[30] The regions were AP coastal, AP rest, Karnataka, Kerala, Kolkata, North-East, Odisha, Tamil Nadu, West Bengal Rest.

[31] USFDA versus non-USFDA molecules for atypical and typical antipsychotics are listed in Table OA.2 in the Online Appendix.

[32] See for example, Eban (2019) and Pisani et al. (2019) among other work. Also see recent deaths in Gambia from export of Indian manufacturer made cough syrups, WHO alert over India-made cough syrups after deaths in The Gambia - BBC News—Accessed 15th October 2022.

[33] For the sake of a comprehensive analysis, we have also estimated a synthetic diff-in-diff model as a complementary exercise. The effect of MNIK on varieties remains positive and significant. Results are available with the authors on request.

[34] Admittedly, there are mild anticipation effects couple of quarters before release, but Bollywood pre-release activities are non-trivial as we mention earlier and information diffusion from Shahrukh Khan discussing MNIK and AS from as early as August 2009 may have played a role.

[35] See: https://www.theguardian.com/society/2019/feb/02/nhs-social-media-companies-celebrity-adverts-health-products, Accessed 11th October 2022.

[36] At the suggestion of an anonymous referee, we did try to access ticket sales data from both commercial websites as well as by trying to reach out to industry producers in Mumbai's film industry. Unfortunately, we did not receive any positive responses.

REFERENCES

Abadie, A., Diamond, A., & Hainmueller, J. (2010). Synthetic control methods for comparative case studies: Estimating the effect of California's tobacco control program. *Journal of the American Statistical Association*, *105*(490), 493–505. https://doi.org/10.1198/jasa.2009.ap08746

Abadie, A., & Gardeazabal, J. (2003). The economic costs of conflict: A case study of the Basque country. *The American Economic Review*, *93*(1), 113–132. https://doi.org/10.1257/000282803321455188

Abou-Setta, A. M., Mousavi, S. S., Spooner, C., Schouten, J. R., Pasichnyk, D., Armijo-Olivo, S., ., & Hartling, L. (2012). First-generation versus second-generation antipsychotics in adults: Comparative effectiveness agency for healthcare research and quality (US). PMID: 23035275.

Acemoglu, D. (2008). *Introduction to modern economic growth*. Princeton University Press.

Acemoglu, D., & Linn, J. (2004). Market size in innovation: Theory and evidence from the pharmaceutical industry. *Quarterly Journal of Economics*, *119*(3), 1049–1090. https://doi.org/10.1162/0033553041502144

Adbi, A., Bhaskarabhatla, A., & Chatterjee, C. (2018). Stakeholder orientation and market impact: Evidence from India. *Journal of Business Ethics*, *161*(2), 1–18. https://doi.org/10.1007/s10551-018-3919-x

10991050, 2023, 5, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/hec.4653 by Ahmedabad University, Wiley Online Library on [09/01/2025]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

Adbi, A., Chatterjee, C., Drev, M., & Mishra, A. (2018b). When the Big one came: A natural experiment on demand shock and market structure in India's influenza vaccine markets. *Production and Operations Management*, *28*(4), 810–832. https://doi.org/10.1111/poms.12948

Adbi, A., Chatterjee, C., & Mishra, A. (2022). How do MNEs and domestic firms respond locally to a global demand shock? Evidence from a pandemic. *Management Science*, *68*(12), 9003–9025. https://doi.org/10.1287/mnsc.2022.4313

Addis, M., & Holbrook, M. B. (2010). Consumers' identification and beyond: Attraction, reverence, and escapism in the evaluation of films. *Psychology and Marketing*, *27*(9), 821–845. https://doi.org/10.1002/mar.20359

Adena, M., Enikolopov, R., Petrova, M., Santarosa, V., & Zhuravskaya, V. (2015). Radio and the Rise of the Nazis in Prewar Germany. *The Quarterly Journal of Economics*, *130*(4), 1885–1939.

Alatas, V., Chandrasekhar, A. G., Mobius, M., Olken, B. A., & Paladines, C. (2019). *When celebrities speak: A nationwide twitter experiment promoting vaccination in Indonesia*. National Bureau of Economic Research.w25589.

Ariely, D., & Norton, M. I. (2009). Conceptual consumption. *Annual Review of Psychology*, *60*(1), 475–499. https://doi.org/10.1146/annurev.psych.60.110707.163536

Avasthi, A. (2010). Preserve and strengthen family to promote mental health. *Indian Journal of Psychiatry*, *52*(2), 113. https://doi.org/10.4103/0019-5545.64582

Bai, M., Ma, Z., Sun, D., Zheng, C., Weng, Y., Yang, X., Jiang, T., & Jiang, H. (2017). Multiple drug transporters mediate the placental transport of sulpiride. *Archives of Toxicology*, *91*(12), 3873–3884. https://doi.org/10.1007/s00204-017-2008-8

Banerjee, A., Barnhardt, S., & Duflo, E. (2015). Movies, margins, and marketing: Encouraging the adoption of iron-fortified salt. In *Insights in the economics of aging* (pp. 285–306). University of Chicago Press.

Banerjee, A., La Ferrara, E., & Orozco-Olvera, V. H. (2019). *The entertaining way to behavioral change: Fighting HIV with MTV*. National Bureau of Economic Research.w26096.

Barnett, M. L., Lee, D., & Frank, R. G. (2019). In rural areas, buprenorphine waiver adoption since 2017 driven by nurse practitioners and physician assistants. *Health Affairs*, *38*(12), 2048–2056. https://doi.org/10.1377/hlthaff.2019.00859

Baxter, A. J., Brugha, T. S., Erskine, H. E., Scheurer, R. W., Vos, T., & Scott, J. G. (2015). The epidemiology and global burden of autism spectrum disorders. *Psychological Medicine*, *45*(3), 601–613. https://doi.org/10.1017/s003329171400172x

Bayus, B. L., Kang, W., & Agarwal, R. (2007). Creating growth in new markets: A simultaneous model of firm entry and price. *Journal of Product Innovation Management*, *24*(2), 139–155. https://doi.org/10.1111/j.1540-5885.2007.00239.x

Bayus, B. L., & Putsis, W. P., Jr. (1999). Product proliferation: An empirical analysis of product line determinants and market outcomes. *Marketing Science*, *18*(2), 137–153. https://doi.org/10.1287/mksc.18.2.137

Becker, S. O., & Pascali, L. (2019). Religion, division of labor, and conflict: Anti-semitism in Germany over 600 years. *The American Economic Review*, *109*(5), 1764–1804. https://doi.org/10.1257/aer.20170279

Berry, S. T. (1990). Airport presence as product differentiation. *The American Economic Review*, *80*(2), 394–399.

Berry, S. T., & Waldfogel, J. (2001). Do mergers increase product variety? Evidence from radio broadcasting. *Quarterly Journal of Economics*, *116*(3), 1009–1025. https://doi.org/10.1162/00335530152466296

Bhaskarabhatla, A., & Chatterjee, C. (2017). The role of physicians in prescribing irrational fixed-dose combination medicines in India. *Social Science and Medicine*, *174*, 179–187. https://doi.org/10.1016/j.socscimed.2016.12.022

Bhaskarabhatla, A., Chatterjee, C., Anurag, P., & Pennings, E. (2016a). Mitigating regulatory impact: The case of partial price controls on metformin in India. *Health Policy and Planning*, *32*(2), 194–204. https://doi.org/10.1093/heapol/czw109

Bhaskarabhatla, A., Chatterjee, C., & Karreman, B. (2016b). Hit where it hurts: Cartel policing using targeted sales and supply embargoes. *The Journal of Law and Economics*, *59*(4), 805–846. https://doi.org/10.1086/691093

Białkowski, J., & Clark, J. (2022). The effects of drug safety warnings on drug sales and share prices. *Health Economics*, *31*(1), 174–196. https://doi.org/10.1002/hec.4440

Blunt, E. O., Maclean, J. C., Popovici, I., & Marcus, S. C. (2020). Public insurance expansions and mental health care availability. *Health Services Research*, *55*(4), 615–625. https://doi.org/10.1111/1475-6773.13311

Botosaru, I., & Ferman, B. (2019). On the role of covariates in the synthetic control method. *The Econometrics Journal*, *22*(2), 117–130. https://doi.org/10.1093/ectj/utz001

Brown, W. J., & Basil, M. D. (1995). Media celebrities and public health: Responses to'Magic'Johnson's HIV disclosure and its impact on AIDS risk and high-risk behaviors. *Health Communication*, *7*(4), 345–370. https://doi.org/10.1207/s15327027hc0704_4

Buchmueller, T. C., & Carey, C. (2018). The effect of prescription drug monitoring programs on opioid utilization in medicare. *American Economic Journal: Economic Policy*, *10*(1), 77–112. https://doi.org/10.1257/pol.20160094

Buchmueller, Thomas, C., ColleenCarey, M., & Meille, G. (2019). How well do doctors know their patients? In *Evidence from a mandatory access prescription drug monitoring program*. National Bureau of Economic Research. w26159.

Cai, H., Chen, Y., & Fang, H. (2009). Observational learning: Evidence from a randomized natural field experiment. *The American Economic Review*, *99*(3), 864–882. https://doi.org/10.1257/aer.99.3.864

Campo-Arias, A., Álvarez-Solorza, I., Felipe Tirado-Otálvaro, A., & Arturo Cassiani-Miranda, C. (2021). Proposal of a scale for COVID-19 stigma-discrimination toward health workers. *Journal of Investigative Medicine*, *69*(1), 100–101. https://doi.org/10.1136/jim-2020-001647

Cassiani-Miranda, C. A., & Campo-Arias, A. (2020). Stigma-discrimination: Significant collateral damage of COVID-19. *Indian Journal of Psychiatry*, *62*(5), 610. https://doi.org/10.4103/psychiatry.indianjpsychiatry_506_20

Chandra, A., Cutler, D., & Song, Z. (2011). Who ordered that? The economics of treatment choices in medical care. In: *Handbook of Health Economics*, (Vol. 2, pp. 397–432). Elsevier.

10991050, 2023, 5, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/hec.4653 by Ahmedabad University, Wiley Online Library on [09/01/2025]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

Chaudhuri, S., Goldberg, P. K., & Gia, P. (2006). Estimating the effects of global patent protection in pharmaceuticals: A case study of quinolones in India. *The American Economic Review*, *96*(5), 1477–1514. https://doi.org/10.1257/aer.96.5.1477

Chauhan, A., JitendraSahu, K., Jaiswal, N., Kumar, K., Agarwal, A., Kaur, J., Singh, S., Singh, M., & others (2019). Prevalence of autism spectrum disorder in Indian children: A systematic review and meta-analysis. *Neurology India*, *67*(1), 100. https://doi.org/10.4103/0028-3886.253970

Clair, M., Daniel, C., & Lamont, M. (2016). Destigmatization and health: Cultural constructions and the long-term reduction of stigma. *Social Science and Medicine*, *165*, 223–232. https://doi.org/10.1016/j.socscimed.2016.03.021

Cook, J. E., Purdie-Vaughns, V., Meyer, I. H., & Busch, J. T. A. (2014). Intervening within and across levels: A multilevel approach to stigma and public health. *Social Science and Medicine*, *103*, 101–109. https://doi.org/10.1016/j.socscimed.2013.09.023

Cotton, S. M., Lambert, M., Schimmelmann, B. G., Foley, D. L., Morley, K. I., McGorry, P. D., & Conus, P. (2009). Gender differences in premorbid, entry, treatment, and outcome characteristics in a treated epidemiological sample of 661 patients with first episode psychosis. *Schizophrenia Research*, *114*(1–3), 17–24. https://doi.org/10.1016/j.schres.2009.07.002

Crossley, N. A., Constante, M., McGuire, P., & Power, P. (2010). Efficacy of atypical v. typical antipsychotics in the treatment of early psychosis: meta-analysis. *The British Journal of Psychiatry*, *196*(6), 434–439. https://doi.org/10.1192/bjp.bp.109.066217

Crystal, S., Olfson, M., Huang, C., Pincus, H., & Gerhard, T. (2009). Broadened use of atypical antipsychotics: Safety, effectiveness, and policy challenges: Expanded use of these medications, frequently off-label, has often outstripped the evidence base for the diverse range of patients who are treated with them. *Health Affairs*, *28*(Suppl1), w770–w781. https://doi.org/10.1377/hlthaff.28.5.w770

Dahl, G., & DellaVigna, S. (2009). Does movie violence increase violent crime? *Quarterly Journal of Economics*, *124*(2), 677–734. https://doi.org/10.1162/qjec.2009.124.2.677

Dalton, M. A., Sargent, J. D., Beach, M. L., Titus-Ernstoff, L., Gibson, J. J., Ahrens, M. B., Tickle, J. J., & Heatherton, T. F. (2003). Effect of viewing smoking in movies on adolescent smoking initiation: A cohort study. *The Lancet*, *362*(9380), 281–285. https://doi.org/10.1016/s0140-6736(03)13970-0

DellaVigna, S., & Gentzkow, M. (2010). Persuasion: Empirical evidence. *Annual Review of Economics*, *2*(1), 643–669. https://doi.org/10.1146/annurev.economics.102308.124309

DellaVigna, S., & Kaplan, E. (2007). The Fox News effect: Media bias and voting. *Quarterly Journal of Economics*, *122*(3), 1187–1234. https://doi.org/10.1162/qjec.122.3.1187

DellaVigna, S., & La Ferrara, E. (2015). Economic and social impacts of the media. In: *Handbook of Media Economics*, (Vol. 1, pp. 723–768). Elsevier.

Desai, S., & Jena, A. B. (2016). Do celebrity endorsements matter? Observational study of BRCA gene testing and mastectomy rates after Angelina Jolie's New York times editorial. *BMJ*, *355*, i6357. https://doi.org/10.1136/bmj.i6357

Dolder, C. R., Lacro, J. P., Dunn, L. B., & Jeste, D. V. (2002). Antipsychotic medication adherence: Is there a difference between typical and atypical agents? *American Journal of Psychiatry*, *159*(1), 103–108. https://doi.org/10.1176/appi.ajp.159.1.103

Dorfman, L., & Krasnow, I. D. (2014). Public health and media advocacy. *Annual Review of Public Health*, *35*(1), 293–306. https://doi.org/10.1146/annurev-publhealth-032013-182503

Duggan, M. (2005). Do new prescription drugs pay for themselves?: The case of second-generation antipsychotics. *Journal of Health Economics*, *24*(1), 1–31. https://doi.org/10.1016/j.jhealeco.2004.08.001

Duggan, M., Garthwaite, C., & Goyal, A. (2016). The market impacts of pharmaceutical product patents in developing countries: Evidence from India. *The American Economic Review*, *106*(1), 99–135. https://doi.org/10.1257/aer.20141301

Dupas, P. (2011). Health behavior in developing countries. *Annual Review of Economics*, *3*(1), 425–449. https://doi.org/10.1146/annurev-economics-111809-125029

Dutta, A. (2011). From free entry to patent protection: Welfare implications for the Indian pharmaceutical industry. *The Review of Economics and Statistics*, *93*(1), 160–178. https://doi.org/10.1162/rest_a_00056

Eban, K. (2019). *Bottles of lies : Ranbaxy and the dark side of Indian pharma*. Juggernaut.

Erdogan, B., & Zafer (1999). Celebrity endorsement: A literature review. *Journal of Marketing Management*, *15*(4), 291–314. https://doi.org/10.1362/026725799784870379

Friberg, R., & Grönqvist, E. (2012). Do expert reviews affect the demand for wine? *American Economic Journal: Applied Economics*, *4*(1), 193–211. https://doi.org/10.1257/app.4.1.193

Gambhir, V. (1995). *The teaching and acquisition of South Asian languages*. Amsterdam University Press.

Garner, A., Jones, S., & Harwood, V. (2015). Authentic representations or stereotyped "outliers": Using the CARS2 to assess film portrayals of autism spectrum disorders. *International Journal of Culture and Mental Health*, *8*(4), 414–425. https://doi.org/10.1080/17542863.2015.1041993

Garthwaite, C., & Moore, T. J. (2012). Can celebrity endorsements affect political outcomes? Evidence from the 2008 US democratic presidential primary. *Journal of Law, Economics, and Organization*, *29*(2), 355–384. https://doi.org/10.1093/jleo/ewr031

Garthwaite, C. L. (2014). Demand spillovers, combative advertising, and celebrity endorsements. *American Economic Journal: Applied Economics*, *6*(2), 76–104. https://doi.org/10.1257/app.6.2.76

Green, C. P., Heywood, J. S., & Navarro, M. (2014). Did liberalising bar hours decrease traffic accidents? *Journal of Health Economics*, *35*, 189–198. https://doi.org/10.1016/j.jhealeco.2014.03.007

Green, D. P., Wilke, A. M., & Cooper, J. (2020). Countering violence against women by encouraging disclosure: A mass media experiment in rural Uganda. *Comparative Political Studies*, *53*(14), 2283–2320. https://doi.org/10.1177/0010414020912275

Hatzenbuehler, M. L., Phelan, Jo C., & Link, B. G. (2013). Stigma as a fundamental cause of population health inequalities. *American Journal of Public Health*, *103*(5), 813–821. https://doi.org/10.2105/ajph.2012.301069

10991050, 2023, 5, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/hec.4653 by Ahmedabad University, Wiley Online Library on [09/01/2025]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

Higgins, M. J., Yan, X., & Chatterjee, C. (2021). Unpacking the effects of adverse regulatory events: Evidence from pharmaceutical relabeling. *Research Policy*, *50*(1), 104126. https://doi.org/10.1016/j.respol.2020.104126

Huskamp, H. A., James O'Malley, A., Horvitz-Lennon, M., Taub, A. L., Berndt, E. R., & Donohue, J. M. (2013). How quickly do physicians adopt new drugs? The case of second-generation antipsychotics. *Psychiatric Services*, *64*(4), 324–330. https://doi.org/10.1176/appi.ps.201200186

Jain, P., Pandey, U. S., & Roy, E. (2017). Perceived efficacy and intentions regarding seeking mental healthcare: Impact of Deepika Padukone, A Bollywood celebrity's public announcement of struggle with depression. *Journal of Health Communication*, *22*(8), 713–720. https://doi.org/10.1080/10810730.2017.1343878

Jenner, P., & Marsden, C. D. (1982). The mode of action of sulpiride as an atypical antidepressant agent. *Advances in Biochemical Psychopharmacology*, *32*, 85–103.

Jensen, P. S., Jan, B., Pandina, G. J., Binder, C., & Haas, M. (2007). Management of psychiatric disorders in children and adolescents with atypical antipsychotics. *European Child and Adolescent Psychiatry*, *16*(2), 104–120. https://doi.org/10.1007/s00787-006-0580-1

Jensen, R., & Oster, E. (2009). The power of TV: Cable television and women's status in India. *Quarterly Journal of Economics*, *124*(3), 1057–1094. https://doi.org/10.1162/qjec.2009.124.3.1057

Jewkes, R., Willan, S., Heise, L., Washington, L., Shai, N., Kerr-Wilson, A., Gibbs, A., Stern, E., & Christofides, N. (2021). Elements of the design and implementation of interventions to prevent violence against women and girls associated with success: Reflections from the what works to prevent violence against women and girls? Global programme. *International Journal of Environmental Research and Public Health*, *18*, 22, 12129. https://doi.org/10.3390/ijerph182212129

Keks, N. A. (2004). Are atypical antipsychotics advantageous? - the case for. *Australian Prescriber*, *27*(6), 146–149. https://doi.org/10.18773/austprescr.2004.120

Kitchener, B. A., & Jorm, A. F. (2002). Mental health first aid training for the public: Evaluation of effects on knowledge, attitudes and helping behavior. *BMC Psychiatry*, *2*(1), 1–6. https://doi.org/10.1186/1471-244x-2-10

Knittel, C. R., & Stango, V. (2013). Celebrity endorsements, firm value, and reputation risk: Evidence from the tiger woods scandal. *Management Science*, *60*(1), 21–37. https://doi.org/10.1287/mnsc.2013.1749

Koschorke, M., Padmavati, R., Kumar, S., Cohen, A., Weiss, H. A., Chatterjee, S., Pereira, J., Naik, S., John, S., Dabholkar, H., Balaji, M., Chavan, A., Varghese, M., Thara, R., Patel, V., & Thornicroft, G. (2017). Experiences of stigma and discrimination faced by family caregivers of people with schizophrenia in India. *Social Science and Medicine*, *178*, 66–77. https://doi.org/10.1016/j.socscimed.2017.01.061

La Ferrara, E. (2016). Mass media and social change: Can we use television to fight poverty? *Journal of the European Economic Association*, *14*(4), 791–827. https://doi.org/10.1111/jeea.12181

La Ferrara, E., Chong, A., & Duryea, S. (2012). Soap operas and fertility: Evidence from Brazil. *American Economic Journal: Applied Economics*, *4*(4), 1–31. https://doi.org/10.1257/app.4.4.1

Large, M., Farooq, S., Nielssen, O., & Slade, T. (2008). Relationship between gross domestic product and duration of untreated psychosis in low-and middle-income countries. *The British Journal of Psychiatry*, *193*(4), 272–278. https://doi.org/10.1192/bjp.bp.107.041863

LeClerc, S., & Easley, D. (2015). Pharmacological therapies for autism spectrum disorder: A review. *Pharmacy and Therapeutics*, *40*(6), 389.

Levine, R., & Kinder, M. (2004). *Millions saved: Proven successes in global health* (Vol. 3). Peterson Institute.

Mahapatra, P., Pati, S., Sinha, R., Singn Chauhan, A., Ranjan Nanda, R., & Srinivas, N. (2019). Parental care-seeking pathway and challenges for autistic spectrum disorders children: A mixed method study from bhubaneswar, Odisha. *Indian Journal of Psychiatry*, *61*(1), 37.

Makhinson, M. (2010). Biases in medication prescribing: The case of second-generation antipsychotics. *Journal of Psychiatric Practice*, *16*(1), 15–21. https://doi.org/10.1097/01.pra.0000367774.11260.e4

Manacorda, M., & Tesei, A. (2020). Liberation technology: Mobile phones and political mobilization in Africa. *Econometrica*, *88*(2), 533–567. https://doi.org/10.3982/ecta14392

McCracken, J. T., McGough, J., Shah, B., Cronin, P., Hong, D., Aman, M. G., Arnold, L. E., Lindsay, R., Nash, P., Hollway, J., McDougle, C. J., Posey, D., Swiezy, N., Kohn, A., Scahill, L., Martin, A., Koenig, K., Volkmar, F., Carroll, D., ., & McMahon, D. (2002). Risperidone in children with autism and serious behavioral problems. *New England Journal of Medicine*, *347*(5), 314–321. https://doi.org/10.1056/nejmoa013171

McGorry, P. D., Guy, C., Baldessarini, R. J., & Fleischhacker, W. W. (1993). Regional considerations in the use of antipsychotic drugs. *Drugs and Therapy Perspectives*, *2*(1), 11. https://doi.org/10.1007/bf03259670

Meyerhoefer, C. D., & Zuvekas, S. H. (2010). New estimates of the demand for physical and mental health treatment. *Health Economics*, *19*(3), 297–315. https://doi.org/10.1002/hec.1476

Miller, G., & Mobarak, A. M. (2015). Learning about new technologies through social networks: Experimental evidence on nontraditional stoves in Bangladesh. *Marketing Science*, *34*(4), 480–499. https://doi.org/10.1287/mksc.2014.0845

Oliveros, S., & Várdy, F. (2015). Demand for slant: How abstention shapes voters' choice of news media. *The Economic Journal*, *125*(587), 1327–1368. https://doi.org/10.1111/ecoj.12169

Orhun, A. Y., & Urminsky, O. (2013). Conditional projection: How own evaluations influence beliefs about others whose choices are known. *Journal of Marketing Research*, *50*(1), 111–124. https://doi.org/10.1509/jmr.10.0052

Orozco-Olvera, V., Shen, F., & Cluver, L. (2019). The effectiveness of using entertainment education narratives to promote safer sexual behaviors of youth: A meta-analysis, 1985-2017. *PLoS One*, *14*(2), e0209969. https://doi.org/10.1371/journal.pone.0209969

Owen, R., Sikich, L., Marcus, R. N., Corey-Lisle, P., George, M., McQuade, R. D., Carson, W. H., & Findling, R. L. (2009). Aripiprazole in the treatment of irritability in children and adolescents with autistic disorder. *Pediatrics*, *124*(6), 1533–1540. https://doi.org/10.1542/peds.2008-3782

Pisani, E., Nistor, A. L., Hasnida, A., Parmaksiz, K., Xu, J., & Kok, M. O. (2019). *Identifying market risk for substandard and falsified medicines: an analytic framework based on qualitative research in China, Indonesia, Turkey and Romania*. Wellcome Open Research, 4.

10991050, 2023, 5, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/hec.4653 by Ahmedabad University, Wiley Online Library on [09/01/2025]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

Patel, V., Xiao, S., Chen, H., Hanna, F., Jotheeswaran, A. T., Luo, D., Parikh, R., Sharma, E., Usmani, S., Yu, Y., Druss, B. G., & Saxena, S. (2016). The magnitude of and health system responses to the mental health treatment gap in adults in India and China. *The Lancet*, *388*(10063), 3074–3084. https://doi.org/10.1016/s0140-6736(16)00160-4

Peng, L., Meyerhoefer, C., & Chou, S.-Yi (2018). The health implications of unconventional natural gas development in Pennsylvania. *Health Economics*, *27*(6), 956–983. https://doi.org/10.1002/hec.3649

Posey, D. J., Stigler, K. A., Erickson, C. A., & McDougle, C. J. (2008). Antipsychotics in the treatment of autism. *The Journal of Clinical Investigation*, *118*(1), 6–14. https://doi.org/10.1172/jci32483

Ravallion, M., van de Walle, D., Dutta, P., & Murgai, R. (2015). Empowering poor people through public information? Lessons from a movie in rural India. *Journal of Public Economics*, *132*, 13–22. https://doi.org/10.1016/j.jpubeco.2015.09.010

Richards, T. J., & Hamilton, S. F. (2015). Variety pass-through: An examination of the ready-to-eat breakfast cereal market. *The Review of Economics and Statistics*, *97*(1), 166–180. https://doi.org/10.1162/rest_a_00447

Ridley, M., Rao, G., Frank, S., & Patel, V. (2020). Poverty, depression, and anxiety: Causal evidence and mechanisms. *Science*, *370*(6522). https://doi.org/10.1126/science.aay0214

Sarkar, S., Shah, A. M., & Dutta, S. K. (2020). Bollywood in transition: Chiragdeep's reflection of the film industry. *Emerging Economies Cases Journal*, *2*(2), 79–86. https://doi.org/10.1177/2516604220968537

Schnell, M., & Currie, J. (2018). Addressing the opioid epidemic: Is there a role for physician education? *American Journal of Health Economics*, *4*(3), 383–410. https://doi.org/10.1162/ajhe_a_00113

Shapiro, B. T. (2018). Positive spillovers and free riding in advertising of prescription pharmaceuticals: The case of antidepressants. *Journal of Political Economy*, *126*(1), 381–437. https://doi.org/10.1086/695475

Sinkinson, M., & Starc, A. (2019). Ask your doctor? Direct-to-consumer advertising of pharmaceuticals. *The Review of Economic Studies*, *86*(2), 836–881. https://doi.org/10.1093/restud/rdy001

Sochocky, N., & Milin, R. (2013). Second generation antipsychotics in Asperger's disorder and high functioning autism: A systematic review of the literature and effectiveness of meta-analysis. *Current Clinical Pharmacology*, *8*(4), 370–379. https://doi.org/10.2174/15748847113086660073

Sweeting, A. (2013). Dynamic product positioning in differentiated product markets: The effect of fees for musical performance rights on the commercial radio industry. *Econometrica*, *81*(5), 1763–1803.

Taub, A. A. L., Kolotilin, A., Gibbons, R. S., & Ernst, R. B. (2011). *The diversity of concentrated prescribing behavior: An application to antipsychotics*. National Bureau of Economic Research.w16823.

Thacker, N., Vashishtha, V. M., & Thacker, D. (2016). Polio eradication in India: The lessons learned. *Pediatrics*, *138*(4), e20160461. https://doi.org/10.1542/peds.2016-0461

Zuddas, A., Zanni, R., & Usala, T. (2011). Second generation antipsychotics (SGAs) for non-psychotic disorders in children and adolescents: A review of the randomized controlled studies. *European Neuropsychopharmacology*, *21*(8), 600–620. https://doi.org/10.1016/j.euroneuro.2011.04.001

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