



Dispensing behaviour of pharmacies in prescription drug markets



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ABSTRACT

Objective: We aim to investigate pharmacies' dispensing behaviour under the existing dispensing regulations in Germany.

Methods: Using administrative data, we performed a cross-sectional retrospective study to analyse whether the competitive environment and pharmacy characteristics, i.e., organisation, lead to dispensing choices aimed at by third-party payers. We specified generalised linear models with the share of imported pharmaceuticals, generic share, and share of preferred brands as dependent variables.

Results: The final dataset contained 49,260,902 prescriptions from 16,797 pharmacies. The average share of imported pharmaceuticals across the pharmacies was 18.4% (standard deviation (SD) 8.8), the average generic share was 92.8% (SD 2.1), and compliance with preferred brands was 81.3% (SD 5.9). Pharmacies with little competition used fewer imported pharmaceuticals ($p < 0.001$), generics ($p < 0.001$) and preferred brands ($p < 0.001$); less organised pharmacies yielded similar results. The difference in outcomes between pharmacies in the first and 4th quartiles of the pharmacy organisation variable is 17.4% vs. 17.0% for share of imported pharmaceuticals, 92.8% vs. 92.7% for generic share and 81.9% vs. 81.1% for compliance with preferred brands.

Conclusion: We show that pharmacies' dispensing choices meet the aims of payers at high levels. However, dispensing behaviour varies between pharmacies. Increasing competition among pharmacies and targeting pharmacies with high shares of bill auditing seem viable options to improving dispensing behaviour as defined by payers.

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1. Introduction

A key element in pharmaceutical care is assuring proper pharmaceutical distribution to the population, i.e., a working dispensing process. Due to increasing health care costs, countries have implemented various regulations that aim

to control pharmacy dispensing behaviour. An objective of such regulations often is to enhance the use of particular products or brands (e.g. parallel-traded pharmaceuticals, generics or a preferred brand). Compliance with these regulations has been shown to substantially reduce pharmaceutical expenditure to the health care system [1] and patients [2].

However, studies that examine pharmacy dispensing behaviour typically only investigate generic substitution at the system level. Such studies are performed either by comparing substitution rates or by analysing the impact of generic substitution on pharmaceutical expenditure from

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the patient or payer perspective [1]. In these studies, regional or patient-related characteristics were identified to explain pharmacy performance and variation in generic substitution [2,3].

Few studies have analysed generic substitution at the pharmacy level so far [2,4]. Their results rely either on self-reported information or on data collection methods that did not blind the observed group, i.e., the pharmacists. Characteristics of dispensing pharmacists, such as their attitudes and the patients' attitudes towards generic substitution were examined as factors to influence dispensing [4]. However, the aforementioned approaches are subject to self-selection and biased reporting of answers. To the best of our knowledge, no study has analysed pharmacy dispensing behaviour based on objective indicators from administrative data at the pharmacy level. Moreover, although generic substitution policies certainly compose an important policy intervention, other regulatory measures that intervene in the dispensing process have not been studied.

Thus, in this paper, we aim to investigate differences in dispensing behaviour. We explored whether pharmacy characteristics, i.e., their organisation and competitive environment as well as regulation, influence pharmacies' dispensing choices. Thus, we aim to understand how pharmacies differ in dispensing (a) imported (i.e., parallel-traded) pharmaceuticals, (b) generics and (c) preferred brands set by payers. We used Germany as an example for several reasons. First, with approximately 20,700 pharmacies in 2013, Germany is the largest market in the EU based on dispensing units. Second, Germany features a high generic share compared to other countries [5]. Finally, evidence shows variations in dispensing regulation compliance [6,7].

2. Materials and methods

2.1. Incentives that influence dispensing behaviour

In the German prescription market, pharmacies face various regulations that produce conflicting incentives for pharmacists. If not specifically excluded by the physician (aut-idem rule), the pharmacy is obliged to substitute an equivalent product with the same active ingredient that is cheaper for the prescribed pharmaceutical [8,9]. Although there is no explicit regulation that demands generic substitution, pharmacies are obliged to dispense one of the three cheapest pharmaceuticals (which normally is a generic) or a parallel-traded product instead of brand-name drugs. In addition, preferred supplier contracts may further restrict choices among brands. When a sickness fund has entered into a preferred supplier contract with a manufacturer, the pharmacist is obliged to dispense a specific brand.

If pharmacies do not comply with these regulations, they may face bill auditing at the level of a single prescription. If noncompliance is detected, sickness funds can retrospectively reduce or fully deny a pharmacy's remuneration claim. For parallel-imported pharmaceuticals, pharmacies may face penalties if a legally required share of imported pharmaceuticals is not met [10]. However, the

incentives are contradictory. First, bill auditing is not fully enforced. Second, remuneration for dispensing partly consists of a fee that is proportional to the pharmaceutical price (for each of the about 742 million prescriptions per year). Thus, the product choice imposed by law may differ from the product choice that is optimal for rent-seeking behaviour.

Moreover, pharmacies also have an incentive to act in accordance with their patients' preferences. Because co-payments for patients are 10% of the sales price with a minimum of five and a maximum of ten Euro [8], dispensing cheaper pharmaceuticals may increase patient satisfaction. Alternatively, patients may perceive cheaper products as inferior [11] or show reluctance to buy the preferred brand and, subsequently, prefer brands recommended by their physician, familiar generic brands or the original.

2.2. Data

We performed a cross-sectional study to analyse pharmacy dispensing behaviour and its variation in Germany using administrative data provided by the largest German sickness fund, i.e., the Techniker Krankenkasse (TK). In 2013, the TK insured 8.4 million persons, which is approximately 12% of the population covered by German statutory health insurance.

Our dataset includes the prescriptions filled in 2013 and bill-auditing information for 2012 and 2013. We excluded prescriptions filled in hospital pharmacies, prescriptions filled abroad and prescriptions that were not assignable to an insured person.

The unit of our analysis is a single pharmacy. To ensure that our analysis was based on sufficient variation in dispensing behaviour within one pharmacy, we excluded pharmacies with less than 1,000 prescriptions filled for the TK in 2013. Moreover, we only included pharmacies that operated throughout 2012 and 2013. The final dataset contained 16,797 pharmacies, which reflects approximately 80% of the pharmacies in Germany.

Additional data on pharmacies and their competitive environment were obtained from other databases. First, we collected data on the pharmacy location to account for district-type regional characteristics, e.g., metropolitan districts, urban districts, rural districts and sparsely populated districts, and the population's average per capita income from the database of the Federal Institute for Research on Building, Urban Affairs and Spatial Development [12]. Second, to determine whether pharmacies offered mail-order delivery, we used information from the mail-order pharmacy register of the German Institute for Medical Documentation and Information [13]. Finally, we acquired information on special services offered by a pharmacy, e.g., diabetes consultation, homeopathic medication, and rental of breast pumps, from an online, searchable database of the pharmacies operated by the German Publishing Company of Pharmacists [14]. Because pharmacies must actively contact website operators to promote offers online, the variable constructed using this source will act as a proxy for advertising services.

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