



# Unavailable prescriptions at Danish community pharmacies: A descriptive study

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## Abstract

**Background** Handling of unavailable prescriptions, i.e. prescriptions missing on the online server, is considered troublesome and time-consuming by community pharmacy staff and may result in both patient dissatisfaction and non-compliance. **Objective** To describe the occurrence and reasons for unavailable prescriptions at Danish community pharmacies as well as the types of drugs involved. **Method** An online 11-item questionnaire was developed and distributed to 24 community pharmacies across Denmark which each collected data on unavailable prescriptions handled within a 3-week period. **Results** Out of 194,358 prescriptions dispensed during the study period, a total of 2765 (1.4%) unavailable prescriptions were registered. Of these, 51.1% (n = 1412) occurred when a patient expected a new prescription after having consulted a physician, most often the patient's general practitioner (75.6%; n = 1067). Of all unavailable prescriptions, 68.1% (n = 1882) concerned prescriptions on regular drugs for treatment of a chronic condition, with the patient not having any medication left in 27.9% (n = 526) of these cases. Unavailable prescriptions most frequently concerned cardiovascular drugs (15.8%; n = 437) followed by nervous system drugs (14.4%; n = 399). **Conclusion** Unavailable prescriptions occur in approximately 1% of all dispensing at Danish community pharmacies. Miscommunication between the patient and general practitioner seems to be the primary source of unavailable prescriptions.

**Keywords** Community pharmacy · Drug prescription · Electronic prescribing · Missing prescription

## Impacts on practice

- Unavailable prescriptions constitute a problem at Danish community pharmacies, placing an additional workload on pharmacy staff.
- The majority of unavailable prescriptions at Danish community pharmacies are caused by communication with the patient's general practitioner.

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## Introduction

When a patient requests to have an electronic prescription filled at a community pharmacy in Denmark and the prescription is missing on the online server, this is referred to as an unavailable prescription. A prescription may be unavailable if the prescription has not been correctly sent to the server, if all refills on the prescription have been used, or if the prescription has expired. Unavailable prescriptions are considered troublesome by pharmacy staff as they have to

spend additional time on retrieving new prescriptions [1, 2]. From the patient's perspective, unavailable prescriptions may result in dissatisfaction and frustration as the patient has to wait longer than expected for her/his medication [1, 3]. Further, if the pharmacy staff and/or patient are unable to retrieve a new prescription, the patient may become non-compliant, with an increased risk of experiencing adverse health outcomes [4]. To our knowledge, the extent and reasons for unavailable prescriptions in community pharmacies have not previously been investigated.

## Aim of the study

We aimed to describe the occurrence and reasons for unavailable prescriptions at Danish community pharmacies as well as the types of drugs involved.

## Ethics approval

According to Danish legislation, ethical approval was not required since the study did not include any personal data.

## Method

We developed a questionnaire for collecting information on unavailable prescriptions in Danish community pharmacies. An online version of the questionnaire was distributed to community pharmacies across Denmark which each collected data on unavailable prescriptions handled within a 3-week period.

## Setting and participants

In Denmark, electronic prescriptions are stored on an online server in a database called the Joint Medicine Card. This database contains all information about a patient's electronically prescribed medication and can be accessed by health care professionals from both primary and secondary care. Prescriptions are valid for up to 2 years.

The study was conducted between November 2017 and January 2018. Community pharmacies were recruited through the Danish Network for Research and Development of Pharmacy Practice, comprising 60+ community pharmacies across Denmark [5], as well as private networks. Each pharmacy collected data on unavailable prescriptions handled within a 3-week period. Only trained staff at the pharmacies collected data, including students.

## Questionnaire

The questionnaire was developed in a 3-step process. First, one author (AVN) held a meeting with staff from a Danish community pharmacy who had previously conducted a similar project. Based on their experiences, AVN made an initial draft of the questionnaire which was piloted at a large community pharmacy in Copenhagen. The pilot test included testing by four staff members and subsequent individual interviews with each staff member. During these interviews, the staff members' comprehension of each question was investigated, and they were encouraged to make suggestions for improvements of the questionnaire. Based on the results from this pilot test, the questionnaire was discussed and ultimately adjusted into a final version among the full author group. The final 11-item questionnaire explored reasons for the prescription being unavailable, information about the drug requested, and how it was handled by the pharmacy staff and/or patient. The questionnaire was developed in Danish; however, an English version of the questionnaire is provided in online Appendix. REDCap was used for configuration of the questionnaire as well as storage of the collected data [6].

## Data collection

Prior to data collection, a project manager from each pharmacy was thoroughly instructed in filling in the questionnaire through a preliminary meeting with one author (AVN). Hereafter, an online test link to the questionnaire was sent to the pharmacies for training of staff members included in the data collection. This training included an introduction to the questionnaire by the pharmacy's project manager after which the test link was made available to the staff members until the start of the data collection. During this time period, the staff members had the opportunity to make as many test registrations as needed in order to become comfortable with using the questionnaire. The final link to the questionnaire was sent 1 week prior to data collection.

During data collection, each staff member filled in the questionnaire whenever she/he had handled an unavailable prescription. During busy hours, some pharmacies used a paper version of the questionnaire and filled in all registrations electronically at the end of the day. Finally, each pharmacy made a report on the total number of prescriptions dispensed during the data collection period.

Unavailable prescriptions were only registered in cases where patients visited the pharmacies in person or other persons, e.g. family members, presented to the pharmacies to collect medication on behalf of a patient. For patients

presenting with more than one unavailable prescription, the questionnaire was filled in for each of these prescriptions. Unavailable prescriptions for inquiries via telephone or regarding dose-dispensed medication were disregarded.

## Data analysis

Results were reported using descriptive statistics. Data analysis was performed using REDCap [6].

## Results

A total of 24 Danish community pharmacies agreed to participate in the study. All five Danish regions were represented.

During the study period, a total of 2765 unavailable prescriptions were registered. The unavailable prescriptions constituted a median of 1.2% of the total number of prescriptions dispensed ( $n = 194,358$ ) across the 24 community pharmacies (interquartile range [IQR] 1.0–1.7%, mean 1.4%, standard deviation [SD] 0.7%). The median time used on handling an unavailable prescription was 2 min (IQR 1–3 min, mean 2.6 min, SD 3.4 min), corresponding to approximately 17 min spent on handling unavailable prescriptions per pharmacy per day.

Of the 2765 unavailable prescriptions, 51.1% ( $n = 1412$ ) occurred when a patient had consulted a physician and expected a new prescription (Table 1). Of these, 75.6% ( $n = 1067$ ) was requested from the patient's general practitioner (GP). Other reasons were when all refills on a prescription had been used (26.8%) and when a patient had consulted a medical secretary and expected a new prescription (15.4%). Of the prescriptions requested through a medical secretary, 89.2% ( $n = 380$ ) originated from the patient's GP.

According to the Anatomical Therapeutic Chemical (ATC) classification system [7], the drugs most frequently requested were cardiovascular drugs (ATC C; 15.8%) (Table 2). Other drugs frequently requested were drugs related to the nervous system (ATC N; 14.4%), anti-infectives (ATC J; 6.8%), and alimentary tract and metabolism (ATC A; 6.6%). Of the 2765 unavailable prescriptions, 68.1% ( $n = 1882$ ) concerned prescriptions on regular drugs for treatment of a chronic condition. In 27.9% ( $n = 526$ ) of these cases, the patient had no medication left.

Of all unavailable prescriptions, 13.8% ( $n = 381$ ) was registered outside the GPs' opening hours. Of these, 70.3% ( $n = 268$ ; 9.7% of the total number of unavailable prescriptions) concerned drugs for treatment of a chronic condition and without potential for abuse.

**Table 1** Sources of and reasons for unavailable prescriptions

	Records (no.)	Records (%)
Sources of unavailable prescriptions		
After consulting a physician, the patient expected new prescription from	1412	51.1
General practitioner	1067	75.6
Hospital physician	169	12.0
Medical specialist	108	7.6
Out-of-hours medical service	16	1.1
Other physician	18	1.3
Not known	34	2.4
After consulting a medical secretary, the patient expected new prescription from	426	15.4
General practitioner	380	89.2
Hospital physician	16	3.8
Medical specialist	15	3.5
Out-of-hours medical service	1	0.2
Other physician	4	0.9
Not known	10	2.4
Reasons for unavailable prescriptions		
All refills on prescription used	742	26.8
Prescription expired	55	2.0
Other reasons <sup>a</sup>	130	4.7
<b>Total</b>	<b>2765</b>	<b>100.0</b>

<sup>a</sup>Other reasons included when the patient had made an electronic request for a new prescription, a medical secretary had made an electronic request for a new prescription on behalf of the patient, the patient had mixed up an old printed medication list from the pharmacy with a new prescription, more prescription refills on an old prescription should have been available to the patient, a physician had prescribed the wrong medication, a physician had prescribed the medication for dose dispensing, and no other reason was given

## Discussion

In this study, we found that unavailable prescriptions constituted about one in hundred of the total number of prescriptions dispensed across the community pharmacies included in the study. More than half of the unavailable prescriptions occurred when a patient had consulted a physician or medical secretary and expected a new prescription, most often from the patient's GP. Further, the majority of the unavailable prescriptions concerned regular drugs for treatment of a chronic condition.

The primary strength of this study is the use of a standardized and piloted tool for data registration and the participation of community pharmacies from all five Danish regions. The principle weakness of the study is the possible underestimation of the extent of unavailable prescriptions. Following the data collection, several of the pharmacies reported that they had not been able to register all

**Table 2** Distribution of drugs requested according to the ATC classification system [7]

	Records (no.)	Records (%)
ATC code		
A—Alimentary tract and metabolism	183	6.6
B—Blood and blood forming organs	112	4.1
C—Cardiovascular system	437	15.8
D—Dermatologicals	54	2.0
G—Genito urinary system and sex hormones	137	5.0
H—Systemic hormonal preparations	61	2.2
J—Antiinfectives for systemic use	188	6.8
M—Musculo-skeletal system	99	3.5
N—Nervous system	399	14.4
R—Respiratory system	141	5.1
S—Sensory organs	53	1.9
Other	417	15.1
Not registered <sup>a</sup>	125	4.5
Not known <sup>b</sup>	359	13.0
Total	2765	100.0

<sup>a</sup>This refers to cases where the pharmacy staff forgot to register which drug the unavailable prescription concerned

<sup>b</sup>In the majority of these cases, the patient was not aware of which drug she/he went to the pharmacy to pick up. In the rest of the cases, the pharmacy staff forgot to ask the patient

unavailable prescriptions as they were too busy, meaning that unavailable prescriptions may constitute a larger problem than reported in this study.

Previous qualitative and observational studies have reported missing prescriptions as a recognized problem by community pharmacy staff. To what extent missing prescriptions are considered a challenge varies, with one study reporting them as being only a minor problem [8] and other studies reporting them as being a more frequent and time-consuming problem [1–3, 9]. One of the main reasons mentioned for missing prescriptions is delay in the transmission of prescriptions [1, 3, 8, 9], commonly leading to tensions between pharmacies and prescribers when pharmacy staff contact prescribers and ask for prescriptions and the prescribers insist on already having sent them [1, 3]. The same was found in this study where patients frequently expected a new prescription after having consulted a physician, especially their GP. Besides the possible delay in the transmission of prescriptions, which is expected to be very limited, a more likely explanation is that the patients visited the pharmacy before the GP had time to make the prescription or sign a prescription made by a medical secretary. However, due to the large proportion of unavailable prescriptions originating from the GPs, it seems essential to further investigate the underlying reasons for the missing prescriptions and the apparent miscommunication between patients and their GP.

Dependent pharmacist prescribing [10] is currently undergoing legalization in Denmark. This process will include repeated prescribing of a defined list of medication,

restricted to the smallest available package, for patients who are stable in their treatment of a chronic condition and unable to retrieve a new prescription from their GP. In this study, only 9.7% of the unavailable prescriptions concerned drugs being potential candidates for dependent pharmacist prescribing. As this is a markedly smaller share than what is related to missing GP prescriptions as discussed above, our results imply that dependent pharmacist prescribing may only solve a minor part of the issues related to unavailable prescriptions in Danish community pharmacies. However, due to the possible underestimation of the extent of unavailable prescriptions, the actual number may be higher.

## Conclusion

In this study, we found that unavailable prescriptions occur in approximately 1% of all dispensing at Danish community pharmacies. However, due to missing registrations, this may be an underestimation of the actual number. Most unavailable prescriptions are prescriptions for regular drugs for treatment of a chronic condition and originate from the patient's GP. The missing prescription is seemingly due to miscommunication between the patient and GP.

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**Conflicts of interest** Carina Lundby, Anne Vejrum Nielsen, Susanne Bendixen, Anna Birna Almarsdóttir and Anton Pottegård declare that they have no conflicts of interest.

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