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ORIGINAL ARTICLE

# Towards greener prescribing? Swedish general practitioners' support for policies to reduce pharmaceutical pollution

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**Aims:** Prescribing pharmaceuticals is essential to improve health, but it also has substantial environmental impact. This study investigated the extent to which Swedish general practitioners (GPs) are willing to integrate environmental aspects into treatment decisions and their opinions on policies to reduce pharmaceutical pollution.

**Methods:** A questionnaire assessing environmental considerations in prescribing was developed and distributed to 1233 Swedish GPs and physicians in training (response rate: 22%) between September 2023 and June 2024. It included 3 patient cases to assess trade-offs between therapeutic effect and environmental impact of pharmaceuticals used for pain management, blood pressure reduction, and contraception. Questions about attitudes to policies to reduce the environmental impact of pharmaceuticals were also included. Data were analysed using descriptive and inferential statistics.

**Results:** Most respondents were willing to prescribe a less effective pharmaceutical if it was environmentally preferable, 77% for pain management and blood pressure reduction, and 50% for contraception. Environmental impact was ranked as the least important factor in prescribing decisions when compared to cost, regional treatment guidelines, dosage intervals, and user-friendliness. A total of 68% of respondents agreed that physicians should consider environmental aspects when prescribing, however only a few often searched for environmental information when prescribing. Policies directed towards other stakeholders, such as authorities and the pharmaceutical industry, received substantial support.

**Conclusion:** Swedish GPs are willing to consider environmental factors when prescribing. However, other factors are more often considered and GPs attribute higher responsibility to other actors. Improving access to environmental information about pharmaceuticals could support greener prescribing.

KEYWORDS
environment, general practitioners, health policy, prescribing, pharmaceutical

## 1 | INTRODUCTION

Prescribing pharmaceuticals is one of the most important interventions in healthcare. However, it also has substantial environmental consequences. Pharmaceuticals reach ecosystems where they pose potential risks to both human health and the environment.[1,2] Their residues are found in water courses all over the world,[3] and, in Europe, some substances have been detected at or above concentrations that surpass values for safe environmental quality standards.[4,5]

In recent years, the European Commission has intensified its efforts to minimise the environmental impact of pharmaceuticals. In 2019, the European Green Deal[6] and the Strategic Approach to Pharmaceuticals in the Environment[7] were introduced to address environmental challenges in Europe. As part of the Green Deal's commitment to achieving climate neutrality and sustainability by 2050, these initiatives underscore a coordinated effort to reduce pollution and promote sustainable healthcare practices across Europe. The Strategic Approach aims to mitigate environmental impact through a range of measures directed at healthcare professionals, the pharmaceutical industry, government authorities, and the general public, addressing the entire pharmaceutical lifecycle, from design and production to prescribing, use, and disposal.

Sweden has been a forerunner in research and development of policy measures to mitigate the impact of pharmaceuticals on the environment.[8] Notably, the Swedish Medical Products Agency, the Dental and Pharmaceutical Benefits Agency, and the Public Health Agency of Sweden have joined forces to propose a restriction on the sale of nonprescription pharmaceuticals that pose a significant environmental risk.[9] There is also an ongoing pilot test on financial incentives included in the reimbursement system to encourage more environmentally safe production of pharmaceuticals.[10] Furthermore, region Stockholm and the Swedish association for the research-based pharmaceutical industry have been at the forefront of providing environmental information on pharmaceuticals via publicly accessible resources, Janusinfo[11] and Fass.[12] Some Swedish Drug and Therapeutic Committees (DTCs) have also included environmental aspects as a selection criterion when formulating treatment recommendations, in addition to previous criteria on efficacy, safety, and cost-effectiveness.[13–15] However, more targeted measures that promote sustainable prescribing practices and integrate environmental factors into clinical decision-making should be explored.[16]

Physicians play a crucial role in all treatment decisions. As such, physicians' opinions about pharmaceuticals in the environment and their willingness to consider environmental aspects when deciding on treatment are essential to reduce the environmental impact of pharmaceuticals. Previous studies show that physicians' choice of treatment is influenced by their professional background, practice culture, prescribing guidelines, cost of treatment, and patient preferences.[17–19] There is some research on the role of physicians in preventing environmentally harmful practices[20–24] but little on general practitioners' (GPs), even though they are responsible for the largest share of prescriptions in ambulatory care.

### What is already known about this subject

- Prescribing of pharmaceuticals is essential to improve health but contributes significantly to environmental harm.
- Physicians' treatment choices are influenced by professional background, practice norms, prescribing guidelines, cost and patient preferences.
- Little is known about how environmental impact is considered in prescribing decisions, highlighting a need for further exploration.

### What this study adds

- Swedish general practitioners are willing to integrate environmental factors into prescribing decisions.
- A quarter of general practitioners state they currently consider environmental impact when prescribing, but it is still considered less important than other factors
- There is support for policy changes and recognition of professional responsibility for environmentally safe prescribing

This study aimed to investigate to what extent GPs in Sweden are willing to integrate environmental aspects in treatment decisions and their opinions on policies to reduce pharmaceutical pollution. While emissions from pharmaceutical production, such as untreated wastewater discharges, contribute to environmental pollution, this study primarily focuses on the environmental impact of pharmaceuticals during their use by patients.

## 2 | METHODS

### 2.1 | Study design and population

A cross-sectional study was conducted using a questionnaire distributed via email or outreach visits to GPs, medical residents, and physicians in training, including medical interns, in Swedish primary healthcare centres.

### 2.2 | Setting

This study took place within the Swedish healthcare system, which is publicly funded and provides universal access to healthcare services.[25] GPs in Sweden have the legal right to prescribe almost all pharmaceuticals. There are budgets for practices but their treatment choices are

**PRIMARY HEALTH CARE IN SWEDEN**

- Sweden has a decentralised healthcare system. Each of the 21 geographical regions are responsible for the organisation, delivery, and financing of healthcare services.[25]
- Healthcare services are primarily tax financed, but a small proportion is covered directly by patient co-payments.[25]
- Drug and Therapeutics Committees (DTCs) formulate treatment recommendations based on efficacy, safety, and cost-effectiveness. The DTCs are conducting outreach visits to healthcare centers, providing continued professional education.[26]
- Most general practitioners (GPs) work at primary healthcare centers that may be either public or private. These centers provide a wide range of healthcare services, and patients have the freedom to choose their preferred center within the publicly funded system.[25]
- The number of GPs varies between 55 and 65 per 100,000 inhabitants.[27] Several regions report a shortage of physicians, particularly of GPs.

**BOX 1** Primary healthcare in Sweden.

primarily guided by recommendations formulated by regional DTCs.[26,27] Box 1 presents basic characteristics of primary healthcare in Sweden.

## 2.3 | Development and description of the questionnaire

A structured digital questionnaire with 2 parts was developed. The design of the first part, which consisted of 3 patient cases, was inspired by previously developed questionnaires.[28,29] The cases dealt with pharmaceuticals used for pain management, blood pressure reduction and contraception. The patient cases were developed with input from clinicians to ensure relevance to clinical practice. After each patient case, the respondents were presented with 2 hypothetical pharmaceuticals and their attributes: therapeutic effect and environmental impact. The attribute levels were categorised as low, medium, or high (see a detailed description in Table 1). There were 9 possible combinations of these attribute levels for each of the 3 patient cases, but combinations with an apparent superior alternative were excluded (i.e., the combination of low therapeutic effect and high environmental impact and vice versa), resulting in 7 combinations. The respondents received a different combination of attribute levels for each patient case, and they were asked to indicate which pharmaceutical they would prescribe if given the choice. Further, they were asked to assume that the first, and then the second of the presented pharmaceuticals was the only available option and that the DTC in their region considered them equivalent. They were then asked to rate their satisfaction with each pharmaceutical on an ordinal scale from 1 (not at all satisfied) to 10 (very satisfied), and, additionally, to indicate which pharmaceutical they would prescribe if given the choice. The cases contained hypothetical pharmaceuticals to ensure that the response was not influenced by properties of the pharmaceuticals not given in the case. To make the results transferable to practice, the attribute levels were based on pharmaceuticals that are commonly used in routine treatment and the information was retrieved from the Swedish drug information database Janusinfo.[11]

**TABLE 1** Attributes and their levels for the patient cases.

| Attribute | Level |
|---|---|
| **Therapeutic effect** | |
| Pain relief (Percentage of patients who receive good pain relief) | Low: 30% |
| | Medium: 45% |
| | High: 60% |
| High blood pressure reduction (Reduction in blood pressure) | Low: 10 mmHg systolic, 5 mmHg diastolic |
| | Medium: 15 mmHg systolic, 8 mmHg diastolic |
| | High: 20 mmHg systolic, 11 mmHg diastolic |
| Contraception (Percentage of women becoming pregnant despite *perfect* use) | Low: 2.0% |
| | Medium: 1.1% |
| | High: 0.2% |
| **Environment impact** | Low: the pharmaceutical degrades rapidly in the environment and no/few studies have shown toxic effects on aquatic organisms at realistic/normal concentrations. |
| | Medium: the pharmaceutical has shown some negative impact on aquatic organisms at concentrations measured in Swedish watercourses. |
| | High: studies have shown that the pharmaceutical has a large negative impact on aquatic organisms and levels have been measured above the limit values for good ecological status in several Swedish lakes. |

The second part of the questionnaire contained 10 statements on policy measures regarding environmentally conscious use of pharmaceuticals and who should be the responsible party. These measures are coupled to mitigation of pharmaceutical pollution discussed in Sweden and at the EU level. Responses were given on a scale consisting of *very negative*, *quite negative*, *neither negative nor positive*, *quite positive*, and *very positive*.

The questionnaire also included questions about the use of sources of environmental information and how often they consider different factors, such as cost of treatment, user-friendliness, dosage interval, DTC recommendations, and environmental impact, when prescribing. Additionally, the questionnaire contained questions about the respondent's age, sex, region, year of graduation, and educational status, as well as their engagement in quality improvement activities, professional networks, and environmental organisations.

The questionnaire was pilot tested by 4 GPs in the authors' networks using a *think aloud* method.[30] The questionnaire was also pilot

tested by 1 medical intern to test the feasibility and measure the time it took to complete it. The pilot tests resulted in slight changes to both the patient cases and the statements to make them more realistic and clearer. Responses from the pilots are not included in the results.

### 2.4 | Recruitment of respondents and distribution of the questionnaire

All 21 DTCs in Sweden were asked to help distribute the questionnaire to GPs in their region. The preferred method of distribution was in the course of the DTC's outreach visits to local health centres, which were carried out in seven regions. Where this was not possible (5 regions), the questionnaire was distributed via email. Additionally, in 1 region, medical interns were specifically invited to complete the questionnaire during an educational day. In total, the questionnaire was sent to 1233 potential respondents. The questionnaire was distributed using REDCap (13.7.14—© 2023 Vanderbilt University) between September 2023 and June 2024.

### 2.5 | Statistical analyses

Data were prepared and analysed using R software version 4.2.1.[31] The respondents' educational status was divided into 2 groups: physicians in training (including medical interns) and physicians with a full medical degree (including medical residents and GPs). The questions about satisfaction with the different pharmaceuticals were treated as numerical variables (1–10), where 1 was *not at all satisfied* and 10 was *very satisfied*. To facilitate statistical analysis, the attribute levels were changed from categorical variables (low, medium, and high) to numerical variables (1, 2, and 3). The question regarding opinions on environmental statements had categorically graded responses (very negative–very positive), which were changed to numerical variables (1, 2, 3, 4, and 5).

To analyse the trade-off between therapeutic effect and environmental impact, associations between the attributes and satisfaction were examined using mixed effects linear regression. This analysis took into account the correlation between multiple responses from the same subject. The assumptions of this model were evaluated by plotting the residuals in a histogram and using a Q-Q plot. To evaluate whether the association between the attributes was additive, an interaction between the 2 was added to the model. To test if the interaction was significant, suggesting a multiplicative association, the model with and the model without the interaction were compared using a likelihood ratio test. The choice of pharmaceutical for the different cases was analysed using descriptive statistics. Logistic regression was used to estimate the odds ratios (OR) for choosing the less environmentally harmful option in relation to sex, age, and educational status. Opinions on environmental statements were examined using descriptive statistics and the Wilcoxon signed rank test. If complete responses required for the analysis were missing, they were excluded from the analysis. Consequently, the number of responses varies across analyses.

### 2.6 | Ethical considerations

Participation in the study was voluntary and without payment and all respondents were asked to give their informed consent before answering the questionnaire. Data were anonymous and treated confidentially so that no unauthorised persons could access them. The Ethical Review Authority was consulted and had no ethical objections to the research project (2023–01949-01).

## 3 | RESULTS

### 3.1 | Background information about the respondents

In all, 272 GPs and physicians in training responded to the questionnaire (22% response rate), of whom 254 completed the entire questionnaire (Table 2). More than half (58%) of the respondents were women, 63% were born in 1980 or later, and 29% were physicians in

**TABLE 2** Characteristics of general practitioners and physicians in training participating in the study.

| | % ($n = 272$) |
|---|---|
| **Sex** | |
| Women | 58% |
| Men | 39% |
| Do not want to answer | 3% |
| **Year of birth** | |
| 1990 or later | 35% |
| 1980–1989 | 28% |
| 1970–1979 | 18% |
| 1960–1969 | 11% |
| 1959 or earlier | 5% |
| Do not want to answer | 3% |
| **Educational status** | |
| *In training* | |
| Medical interns | 29% |
| *Full medical degree* | |
| Medical residents | 25% |
| General practitioner | 46% |
| **Regions with the most respondents** | |
| Uppsala | 28% |
| Gävleborg | 19% |
| Värmland | 11% |
| **View on the importance of environmental issues** | |
| Very important | 46% |
| Fairly important | 42% |
| Not particularly important | 9% |
| Not important at all | 1% |
| Do not know/do not want to answer | 2% |

training (including medical interns). The response rate varied from 3 to 60% across the regions. Three regions together accounted for 58% of the total responses. Most respondents (88%) reported that environmental and climate issues were either fairly or very important to them. A considerable proportion of the respondents (38%) were engaged in some quality improvement activities, professional networks, or environmental organisation, of whom 14% were members of a DTC, and 3% were members of the Swedish environment organisation called *Doctors for the Environment*.[32]

## 3.2 | Trade-offs between therapeutic effect and environmental impact

The highest mean satisfaction (6.58) was reported for pharmaceuticals with medium therapeutic effect and low environmental impact (Figure 1). Conversely, the lowest mean satisfaction was reported for pharmaceuticals with medium therapeutic effect and high environmental impact (3.91). The interaction between the attributes was not statistically significant ($P = .97$), so we proceeded with the simpler additive model. Compared with low environmental impact, the satisfaction was 1.18 and 2.39 units lower for medium and high environmental impact, respectively, corresponding to an average decrease of 1.2 units per increased level. The level of satisfaction was 0.05 and 0.08 units lower, respectively, for medium and high therapeutic effect compared with low therapeutic effect (Table S1).

Overall, when asked which pharmaceutical they would choose for each presented patient case, the respondents were most inclined to choose the least environmentally harmful option. For treatment of pain, 77% stated that they would choose the least effective and least environmentally harmfuloption, and 20% that they would choose the most effective and most environmentally harmful option. The corresponding percentages for treatment of high blood pressure were 77 and 19%, and 50 and 40% for contraception (Table S2).

**TABLE 3** Unadjusted and adjusted ORs for choosing the less environmentally harmful option in relation to age, sex, and educational status. The ORs are based on 241 unique respondents.

| | Unadjusted OR (95% CI) | Adjusted OR (95% CI) |
|---|---|---|
| Age interval | **1.4 (1.2–1.6)** *** | **1.3 (1.1–1.6)** ** |
| Sex | | |
| Women | 1 | 1 |
| Men | 0.8 (0.6–1.1) | 0.8 (0.6–1.1) |
| Educational status | | |
| Full medical degree | 1 | 1 |
| In training | **0.6 (0.4–0.8)** *** | 1.8 (0.5–1.2) |

*Note*: Values are adjusted for all variables presented in the table. Bold indicates statistical differences when comparing support among women to men, between age intervals and physicians with a full medical degree to physicians in training (*$P < .05$, **$P < .01$, ***$P < .001$).
Abbreviations: CI, confidence interval; OR, odds ratio.

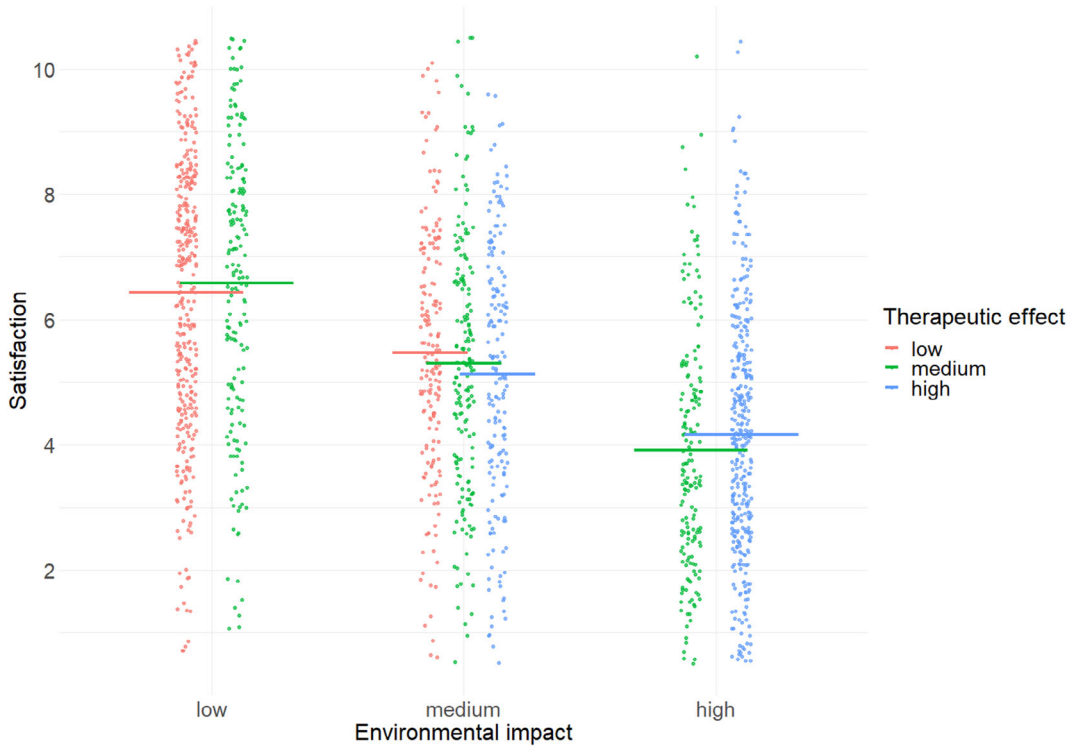


**FIGURE 1** Jitter plot illustrating satisfaction rating by therapeutic effect and environmental impact. Respondents rated their satisfaction with the pharmaceuticals across 3 scenarios and, in total, 6 hypothetical pharmaceuticals. Each point in the plot represents an individual response ($N = 1603$). Satisfaction ratings range from 1 (low satisfaction) to 10 (high satisfaction). The coloured lines indicate the mean satisfaction for each combination of therapeutic effect and environmental impact. Points have been jittered to avoid overplotting.

The unadjusted OR for age showed that for each additional age interval, the odds of choosing a less environmentally harmful pharmaceutical increased by 37% (Table 3). After adjusting for all variables, this association remained significant. Sex differences were not statistically significant in the unadjusted and the adjusted models. Physicians in training were less likely (OR = .56) to choose the less environmentally harmful option compared to physicians with a full medical degree. When controlling for age, the difference between physicians in training and physicians with full medical degree was no longer statistically significant.

## 3.3 | Considerations in prescribing

Six percent of the respondents answered that they often searched for environmental information when prescribing pharmaceuticals. The respondents considered DTC recommendations most important in guiding their prescribing decisions, with 86% considering them often or always (Table 4). Environmental impact was less frequently considered, with 24% of the respondents indicating that they consider it often or always when deciding on treatment of individual patients.

## 3.4 | Opinions on environmental statements

As shown in Figure 2, there was wide support for all the proposed measures to reduce the environmental impact of pharmaceuticals. There was considerable support for increased government and pharmaceutical industry responsibilities: 94% agreed that stricter environmental regulations should be imposed on pharmaceutical companies, and 92% that pharmaceutical companies should be required to publish environmental data about their products; 78% thought authorities

**TABLE 4** Stated factors influencing general practitioners prescribing of pharmaceuticals.

| How often the respondents considered various factors when prescribing | Never | Rarely | Sometimes | Often | Always |
|---|---|---|---|---|---|
| Dosage interval ($n = 260$) | 1.2% | 3.8% | 29.2% | 50.8% | 15.0% |
| User-friendliness ($n = 258$) | 0.4% | 6.6% | 32.2% | 52.7% | 8.1% |
| Environmental impact ($n = 259$) | 8.5% | 24.7% | 43.2% | 19.7% | 3.9% |
| DTC recommendations ($n = 260$) | 1.5% | 3.5% | 9.2% | 59.6% | 26.2% |
| Cost of treatment ($n = 257$) | 3.1% | 13.6% | 35.8% | 40.5% | 7.0% |

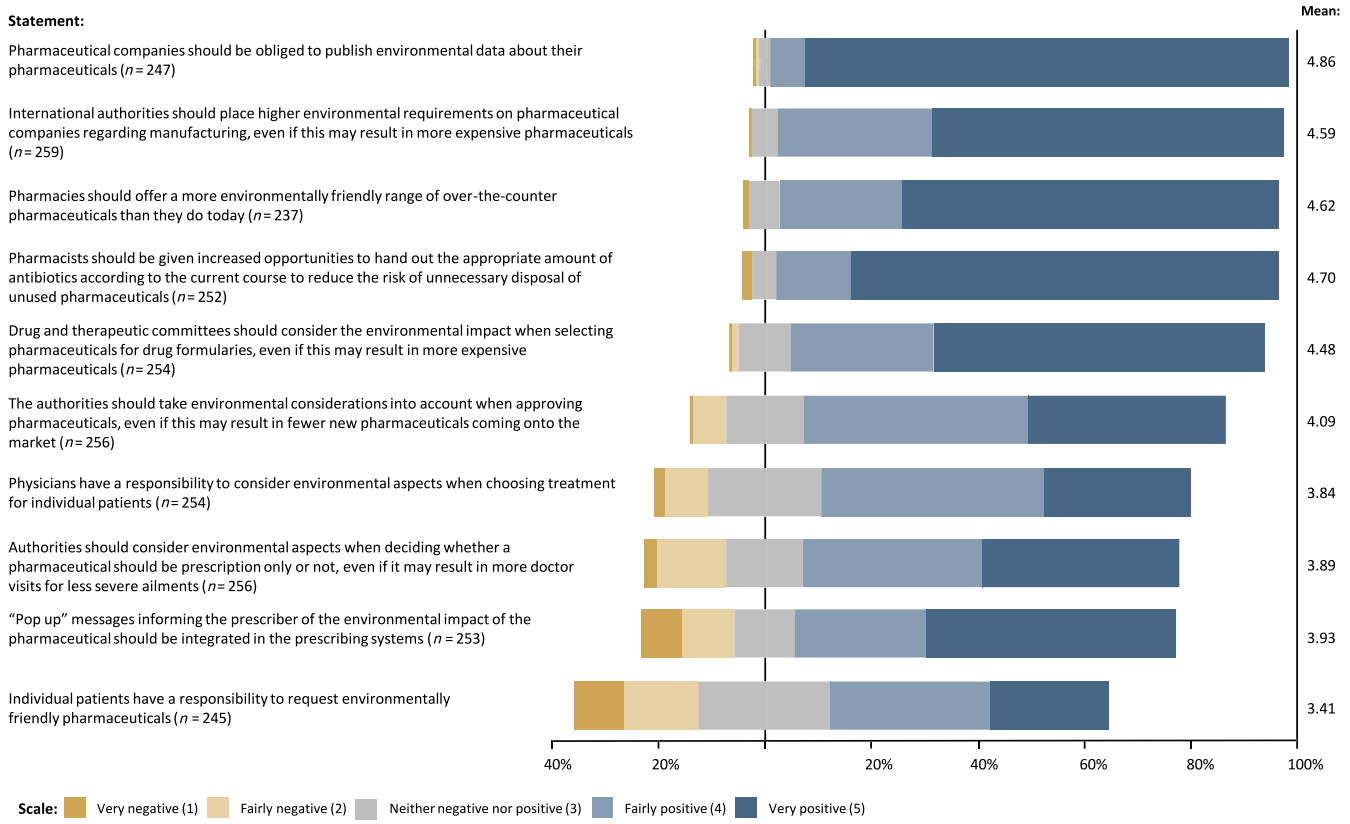


**FIGURE 2** Likert graph showing the extent to which respondents agreed with 10 statements on environmentally sustainable use of pharmaceuticals, reported as a percentage of total respondents. Responses indicating *no opinion* or missing answers are not included in the figure.

should take environmental considerations into account when approving pharmaceuticals, and 69% that environmental aspects should influence decisions about prescription only status.

In general, women were more positively inclined towards the presented statements than men (Table S3). This was especially clear with regard to support for incorporating environmental considerations into the approval of new pharmaceuticals and for integrating *pop-up* messages in prescribing systems to inform physicians of a pharmaceutical's environmental impact. Respondents born before 1980 expressed stronger support than those born in 1980 or later. Older respondents showed significantly higher agreement with several statements, particularly regarding environmental requirements on prescription status. Physicians with a full medical degree were more positively inclined towards the proposed policy measures than those in training.

## 4 | DISCUSSION

This study indicates that a majority of Swedish GPs and physicians in training are willing to integrate environmental aspects into their treatment decisions. Nearly 8 out of 10 respondents chose the least environmentally harmful but also least effective option for treatment of pain and high blood pressure, while half chose this option for contraception. Although DTC prescribing guidelines, treatment costs, and patient preferences were cited as the most important factors when prescribing, about a quarter said they also consider environmental impact. The respondents were more willing to choose the less environmentally harmful option for the treatment of pain and high blood pressure, probably because these treatments allow minor compromises in therapeutic effect without critically compromising pati-ent care. For these conditions, the therapeutic goal is often symptom management or gradual improvement, where a marginally less effective treatment may still be acceptable if it provides environmental benefits. In contrast, contraception demands high effectiveness in preventing unintended pregnancies.

More than 2/3 of the respondents were supportive of the idea that their professional responsibility also should include taking environmental aspects into account when prescribing. However, this contrasts with other results in our study, where fewer respondents reported considering environmental impact, and the fact that so few of them used available sources to obtain information about environmental impact of pharmaceuticals. This gap can possibly be explained by the fact that GPs find it challenging to address environmental factors during time-constrained consultations, partly because information about environmental impact is perceived as inaccessible. Additionally, it is likely that a lack of education and training on the environmental impacts of pharmaceuticals contributes to this issue, leaving many GPs unaware of the relevance of these considerations. This gap in awareness and utilisation of existing resources highlights the need to integrate environmental considerations into prescribing practices, for example, through treatment guidelines, something that some regions have already done.[14,15] The statement with the least support was that patients should be responsible for requesting pharmaceuticals with lower environmental impact. This may be because physicians feel that it means placing too much responsibility on patients. However, previous studies have shown that consumers care about pharmaceutical pollution and are willing to consider environmental risks when choosing treatment.[28,29,33]

This study builds on existing research demonstrating that physicians recognise their responsibility for sustainability.[20,34] However, it is the first, to our knowledge, to specifically focus on GPs and their prescribing practices. Earlier research has primarily examined surgeons, encompassing not only the use of pharmaceuticals but also healthcare materials and single-use plastics.[20,34]

In our study, older physicians were more inclined to choose less environmentally harmful pharmaceuticals and were generally more supportive of policy measures to reduce pharmaceutical pollution. There was no association between sex and the likelihood of choosing the less environmentally harmful pharmaceutical. However, women were generally more positive than men towards the presented policy measures. These findings align with other studies that have shown that older individuals generally tend to be more supportive of environmentally focused initiatives and more aware of the environmental risks associated with pharmaceuticals than younger people.[28,35] Additionally, women tend to express greater concern for environmental issues and are more supportive of policy measures addressing environmental challenges.[28,35]

This study has several strengths. GPs and physicians in training from different parts of Sweden participated. The included regions are geographically diverse, encompassing large and small regions, including cities and rural areas. This spread in experience and geography helps to capture a range of perspectives and practices. The experimental design of the questionnaire is useful for investigating how people trade different traits against each other and also helps to reduce socially desirable responses. Instead of directly asking respondents about the importance of environmental considerations in their choice of treatment, the experimental design allows for more nuanced insights into their true preferences.[36] A further strength of the study is that the policy statements contained both pro and con arguments, prompting the respondents to make trade-offs and encouraging them to consider the possible consequences of each position.

However, we also acknowledge some important limitations. There is a risk of selection bias, and the study sample was not representative of all GPs and physicians in training in the country. The low response rate may have influenced the results, as those who chose to participate probably have a greater interest in environmental issues than GPs on average. Another important aspect is that almost half of the respondents were engaged in quality improvement activities, professional networks, or environmental organisations and, thus, possibly more engaged in professional issues than the general population of GPs in Sweden. Moreover, variations in dissemination methods may be a limitation, as response rates are likely to differ between email distribution and outreach visits. However, we chose to allow multiple dissemination methods, even if some were less optimal than others, in order to include a larger number of regions. There are also limitations with the experimental design: it represents a simplified model of

reality, which does not capture the complexity of real-world decision-making. In the questionnaire, the least environmentally harmful option was consistently presented as an alternative with a lower therapeutic effect, causing respondents to make a trade-off. This does not necessarily reflect reality, where less environmentally harmful pharmaceuticals do not have to be less effective. Besides environmental impact, the patient case design is limited to therapeutic effect as the only described attribute and does not take into account other aspects, such as dosage frequency and side effects, that may influence the prescribing decisions. Future research should further explore how prescribers navigate trade-offs between environmental considerations and strict pharmacological concerns, as well as how other clinical factors influence decision-making in relation to sustainable prescribing.

## 5 | CONCLUSION

This study shows that Swedish GPs are willing to consider environmental factors when prescribing and that many already state that they do so. However, other factors, such as treatment recommendations from DTCs and cost, were more important. The findings also provide new insights into prescribers' attitudes. The respondents expressed support for policies promoting more environmentally conscious use of pharmaceuticals and that the authorities should take greater responsibility. To strengthen the conditions for greener prescribing, this study suggests the need for more targeted education and better access to environmental information about pharmaceuticals. This, in turn, underscores the importance of integrating environmental considerations in treatment recommendations, enabling the profession to contribute to a more sustainable use of pharmaceuticals.

### AUTHOR CONTRIBUTIONS

Johanna Villén designed the study, developed the questionnaire, disseminated the questionnaire, and was responsible for all data analysis and writing of the original draft of the manuscript. Johanna Laux was involved in the design of the study, development of the questionnaire and manuscript review. Björn Wettermark, Sofia Kälvemark Sporrong, Marmar Nekoro, and Helle Håkonsen were involved in the design of the study, development of the questionnaire, recruitment of participants, data analysis, and manuscript review. All authors revised the manuscript and approved the final version.

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### CONFLICT OF INTEREST

The authors declare no competing interests. Marmar Nekoro is employed at the Swedish Medical Products Agency, SE-751 03 Uppsala, Sweden, the views expressed in this paper are the personal views of the authors and not necessarily the views of the Government agency.

### DATA AVAILABILITY STATEMENT

Data will be made available on request.

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## SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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