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## Research Paper

## Who enrolls and graduates from web-based pharmacy education – Experiences from Northern Sweden

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## ABSTRACT

**Introduction:** As a response to the shortage of prescriptionists in Northern Sweden, a web-based Bachelor of Science in Pharmacy program was introduced at Umeå University in 2003. This study explored who is likely to enrol and graduate from the web-based bachelor program and whether the program has addressed the shortage of prescriptionists in rural Northern Sweden.

**Methods:** Data from three different sources were included in this study; the initial cohort including students admitted to the program in 2003 (survey), the entire cohort including all people admitted to the program between 2003 and 2014 (university's admissions data) and the alumni cohort including graduates who participated in an alumni survey in 2015.

**Results:** A typical student of the web-based pharmacy program is female, over 30 years of age, married or in a de-facto relationship and has children. Furthermore, the students graduating before 2009 were more likely to live in Northern Sweden compared to those graduating later.

**Discussion and conclusion:** The results indicate that the introduction of a web-based bachelor of pharmacy program at Umeå University was to some extent able to address the shortage of prescriptionists in Northern Sweden. Web-based education may potentially help address the maldistribution of health professionals by providing flexible education opportunities.

## Introduction

The maldistribution of health professionals in Sweden and elsewhere possesses a problem, leading to shortage of professionals in rural areas. There are two main issues: one of distance and one of highly disparate population trends in rural versus urban areas. In Northern Sweden the shortage of professionals in rural areas is particularly acute for doctors, specialised nurses, dentists and pharmacists/prescriptionists.<sup>1</sup> In this context “rural” refers to settlements and towns outside urban areas including regional centres.<sup>2</sup> Past research has shown that there are multiple, complex and overlapping issues for the recruitment and retention of health professionals in rural areas. Factors associated with higher probability of practicing in a rural area are: growing up in a rural community, rural background (origin), presence of family members, having a rural placement and preference for small communities and rural lifestyle.<sup>3–5</sup>

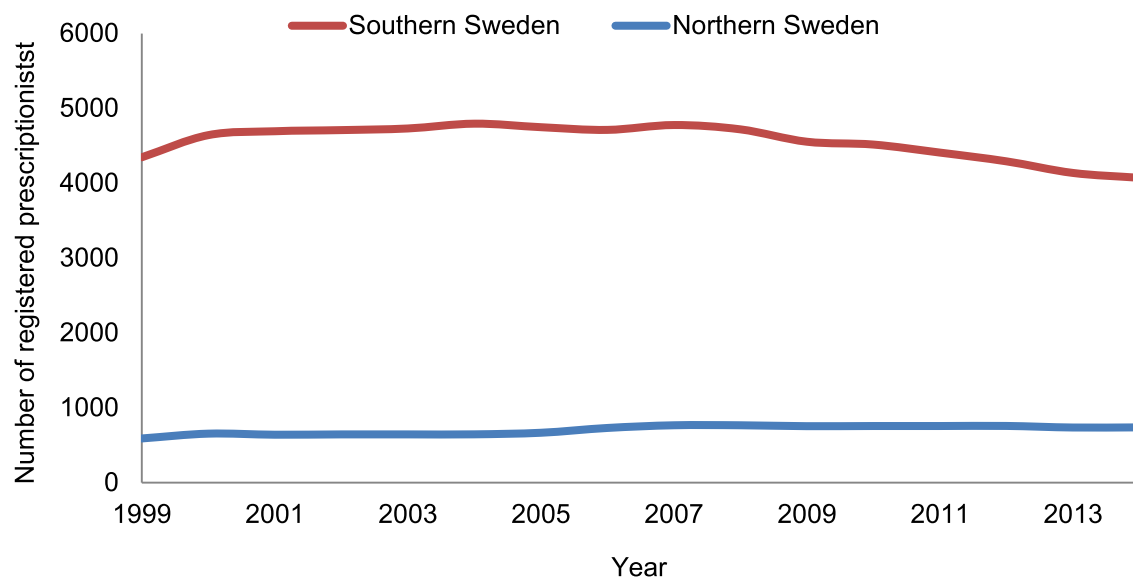
In order to overcome the maldistribution of healthcare professionals, countries such as Australia, the US and Canada have implemented a number of initiatives to increase the number of pharmacists working in rural areas. Initiatives have focused on two areas: increasing the pharmacy workforce and providing incentives for pharmacists to work outside major urban centres. In Australia incentives have been provided for pharmacy students to undertake placements in rural and remote areas of Australia and pharmacy

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**Fig. 1.** Number of registered prescriptionists in Sweden, divided into Southern and Northern Sweden (see map in Fig. 3). Data obtained from The National Board of Health and Welfare.<sup>8</sup>

schools have been established in regional and rural areas.<sup>6</sup> The latter incentive appears to have a positive impact on the pharmacist workforce.<sup>4</sup>

In Sweden, there are two different professional degrees within pharmacy: prescriptionists and pharmacists. Prescriptionists have a three-year degree (Bachelor), mainly work in community pharmacies, and are typically involved in day-to-day dispensing and counselling with patients. Pharmacists have a five-year degree (Master) and work in community pharmacies, hospitals, the pharmaceutical industry, universities and government. Both degree programs are offered at Umeå University in Sweden. However, this paper focuses on the bachelor program.

In the late 1990s, a shortage of prescriptionists was observed in Sweden. This shortage was especially pronounced in Northern Sweden. As a consequence of this shortage, pharmacies had to reduce their opening hours and in some cases even shut down.<sup>7</sup> As a response to the shortage of prescriptionists in Northern Sweden, a web-based Bachelor of Science in Pharmacy program was introduced at Umeå University in 2003.<sup>7</sup> This was the first web-based pharmacy program in Sweden. A web-based approach was chosen partly to facilitate the future recruitment of prescriptionists to the northern part of the country. Apoteket AB, the state pharmacy monopoly at that time, supported the introduction of the program. Fig. 1 shows the trends in number of registered prescriptionists in Sweden between 1999 and 2014, divided into Northern and Southern Sweden (see the map in Fig. 3).<sup>8</sup> The trend in Southern Sweden is that the number of registered prescriptionists is decreasing, whereas in Northern Sweden the opposite is observed. The trends in the number of registered prescriptionists in three counties in Northern Sweden (Västerbotten County, Norrbotten County and Väster-norrland County) are shown in Fig. 2.<sup>8</sup> These counties were the primary targets when the pharmacy program was established with a particular focus on Västerbotten County.

In the web-based pharmacy program, education is mainly conducted online with some mandatory gatherings on campus in Umeå. The online material contains recorded and streamed lecturers, assignments, animations and simulations. Assessments are conducted through various methods, for example written exams and reports, online assessments/tests, oral assessments both online and during gatherings at campus and laboratory work on campus. The written exams can be undertaken at the university or at other universities and municipal learning centres. The rules and regulations established by the university regarding written exams apply irrespective of where the exam takes place. The Bachelor of Science in Pharmacy program has offered different forms of study over the years, including both local study groups and distance groups. The purpose of the local study groups was to facilitate the recruitment of students living in areas of Sweden where a shortage of prescriptionists was identified, with the aim that these students, upon graduating, would remain in those areas. The students belonging to a local study group would have face-to-face meetings with teachers on a regular basis at these specific locations. For students belonging to the distance group, these regular meetings were held online instead. All students followed the same curriculum and had regular on-campus meetings at the university (2–4 times each semester). When applying to the program, the students chose which local study group they wanted to belong to or if they wanted to belong to the distance group. Each group had a limited number of positions. Fig. 3 shows the location of the local study groups offered between 2003 and 2014. The Bachelor of Science in Pharmacy program at Umeå University is not offered as a campus-based alternative.

This study will report on the experiences of the first web-based pharmacy program, a bachelor program established in regional Northern Sweden. More specifically, the study explored who is likely to enrol and graduate from the web-based bachelor program and if the program has addressed the shortage of prescriptionists in rural Northern Sweden.

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