

# Swedish Pharmaceutical Benefit Reforms – Analyses of implementation, pharmaceutical sales patterns and expenditures

## AKADEMISK AVHANDLING

som för avläggande av medicine doktorexamen vid Sahlgrenska akademien vid Göteborgs universitet kommer att offentligen försvaras i sal 2119, Hus 2, "Hälsovetarbacken", Arvid Wallgrens Backe, Göteborg, fredagen den 22 september 2006, kl 09.00

av

**Karolina Andersson**  
Farmacie magister

Fakultetsopponent  
Professor Hannes Enlund  
Department of Social Pharmacy  
University of Kuopio, Kuopio, Finland

Avhandlingen baseras på följande delarbeten:

- I Andersson K, Petzold MG, Sonesson C, Lönnroth K and Carlsten A. Do policy changes in the pharmaceutical reimbursement schedule affect drug expenditures? Interrupted time series analysis of cost, volume and cost per volume trends in Sweden 1986-2002. *Health Policy* (in Press).
- II Andersson K, Jörgensen T and Carlsten A. Physicians' opinions and experiences of the Pharmaceutical Benefits Reform. *Scandinavian Journal of Public Health* (in Press).
- III Andersson K, Sonesson C, Petzold M, Carlsten A and Lönnroth K. What are the obstacles to generic substitution? An assessment of the behaviour of prescribers, patients and pharmacies during the first year of generic substitution in Sweden. *Pharmacoepidemiology and Drug Safety* 2005;14:341-8.
- IV Andersson K, Bergström G, Petzold MG and Carlsten A. Impact of a generic substitution reform on patients' and society's expenditure for pharmaceuticals. Accepted for publication in *Health Policy*.
- V Andersson K, Petzold MG, Allebeck P and Carlsten A. Influence of generic substitution on drug sales pattern. Submitted.



**Sahlgrenska akademin**  
VID GÖTEBORGS UNIVERSITET

**Swedish Pharmaceutical Benefit Reforms – Analyses of implementation, pharmaceutical sales patterns and expenditures.** Karolina Andersson, The Sahlgrenska Academy at Göteborg university, Institute of Medicine, Department of Public Health and Community Medicine, Social Medicine, Box 453, 405 30 Göteborg, Sweden.

**Background:** Over the last few decades, the sales of prescription drugs have increased dramatically in many western countries; however, this increase requires individuals and society to bear larger economic consequences. To improve cost control for pharmaceuticals, several reforms attempt to reconcile the economic responsibility of the patients, prescribers and third party payers.

**Aims:** The overall purpose was to investigate effects of policy changes concerning reimbursed pharmaceuticals in Sweden with focus on the latest reform comprising mandatory generic substitution. Specifically this thesis analyses effects of policy changes on development of expenditure and volume of pharmaceuticals, prescribers' opinions on the latest reform and how prescribers, patients and pharmacy personnel acted during the implementation of generic substitution.

**Methods:** One study analysed pharmacy invoice data comprising expenditure and volume between 1986 and 2002 for five selected drug groups and all pharmaceuticals in total. A questionnaire was distributed to 1388 physicians working in Region Västra Götaland. Associations between opinions and background characteristics were analysed with logistic regression. Three studies comprised data on reimbursed dispensed prescription medicines. One study examined data on the dispensing procedure for Region Västra Götaland between October 2002 and September 2003. Another study analysed expenditure data for each county council and the whole country between January 2000 and December 2004. One study examined data on volumes sold for the whole country between January 2000 and June 2005. In two studies, interrupted time series analysis was used to analyse the effects of policy changes.

**Results:** Increased patient co-payment was not associated with any significant effects on expenditure and volume. Introduction of co-payments for pharmaceuticals that previously were free and co-payment based on the price of the products were associated with a temporary decline in cost increase. Reference-based pricing was associated with decreased cost per volume. Generic substitution was implemented rapidly after introduction and the key actors acted in accordance with the reform. A large percentage of the prescribers were positive to the reform. Sales of prescribed substitutable pharmaceuticals increased proportionally more than sales of non-substitutable pharmaceuticals in the same therapeutic group after introduction of generic substitution. The patients were price sensitive and chose substitution to cheaper alternatives when the price differences were high. Generic substitution was associated with decreased average patient co-payment, subsidised cost and total cost.

**Conclusions:** Mandatory generic substitution effectively reduced overall expenditure. Policies that increase competition limited growth in pharmaceutical expenditures more effectively than co-payment reforms.

**Key words:** pharmaceutical policy, health care reform, reimbursement, co-payment, reference-based pricing, generic substitution, drug cost, cost sharing

ISBN 91-628-6875-6

Göteborg 2006