Creation of a better medication safety culture in Europe – Recommendations by the Council of Europe

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Background: The Council of Europe established the multidisciplinary Expert Group in 2003 to review medication safety and to prepare recommendations to specifically prevent adverse events caused by medication errors in European health care. Its report represents the first evidence-based international publication on this topic with a special focus in Europe. The work is complementary to the work of the Council of Europe Committee of Experts on Management of Safety and Quality in Health Care, the recommendations being adopted in 2006.

The goal of the report is to enhance awareness of medication errors across the European countries and recognition as an important system-based public health issue. It provides guidance for reducing preventable adverse drug events in all the processes of the medication use system, both in hospital and ambulatory care settings, based on reporting, analyzing, and active learning from the medication errors and on evidence-based strategies already recommended. The goal is to help European Health Authorities, governments and regulatory agencies, pharmaceutical companies, organizations and professional societies, health professionals and patients selecting top safety practices for implementation both at national and local levels.

The report is divided into six sections: 1) the scope of the report and overview of the seriousness of the problem in Europe; 2) prevention of adverse drug events by learning from medication errors; 3) methods of measuring and evaluating medication safety; 4) review on the product design in Europe as a safety risk, and recommendations for improving the product design; 5) description of methods for improving safe medication practices; and 6) contributions of medicine information practices to medication safety.

The report also supplies a glossary of terms; an assessment tool; and best practices guide. Complementary bilingual versions of the glossary and other national contributions will be collected on the Council of Europe website.

The aim of this presentation is to give an overview of the key contents and recommendations of the report and to discuss its usefulness in health policy decision making in the Nordic countries, particularly from the pharmacists’ perspective.

References
Medication safety research in the division of Social Pharmacy, University of Helsinki, Finland

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Background. Finland has been actively involved in the Council of Europe expert groups on patient¹ and medication safety². Inspired by these initiatives, several studies have been started in the Faculty of Pharmacy, University of Helsinki to assess the baseline situation in Finland concerning medication errors from the system approach. These studies have been done in cooperation with the National Centre for Pharmacotherapy Development that established a voluntary multidisciplinary working group on medication safety in 2004. The first action taken by the group was to create a Finnish glossary of terms related to medication safety (http://www.rohto.fi/doc/T28-2006-VERKKO.pdf).

Studies in progress. The goal of the studies and related literature search is to make an inventory on existing knowledge on medication safety incidents and their monitoring systems for setting up recommendations on creating safety culture in Finland. A series of studies started with an inventory of existing reporting practices in university and central hospitals, primary health care centers, and community pharmacies. These studies also assessed attitudes of general practitioners and community pharmacists towards safety culture. Studies have also been started on preventive actions against medication errors in primary and secondary health care, with the emphasis on creating new multidisciplinary medicines management and medication review procedures, assessing incidence of severe drug-drug interactions in outpatients, and existence of special mechanisms to error minimization with high-alert medications.

Most recently, a study was started to learn from existing medication error reporting (MER) systems in different countries, and barriers in establishing MER systems. This study is conducted in cooperation with the University of Bath, UK and the International Pharmaceutical Federation (FIP). Another study having an international approach is exploring safety risks related to use of medicines and pharmaceutical services among mobile citizens within EU, involving Finnish immigrants in Spain as an example of mobile citizens.

Methods development. One of the current studies is focusing on developing methodology to learn about the process leading to severe medication errors. The study is conducted in cooperation with the National Authority for Medicolegal Affairs, and the data consist of their investigation documentation on severe medication safety incidents during 2000-2005. The study will assess the usefulness of the modified Root Cause Analysis in determining underlying factors contributing to occurrence of severe medication errors. More research will be conducted in this field in the future.

References
Scientific studies for master in science degree students specializing in Social Pharmacy – an integrated model

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Introduction
Social pharmacy was recognized as an independent discipline in 1996 at the Faculty of Pharmacy, University of Helsinki. Since then, it has been possible to specialize in social pharmacy and to take a M.Sc. degree with scientific studies and a research project (Master’s thesis). Since 2004, the Division has been actively involved in the redesigning of the pharmacy curriculum under Bologna process1. This provided an opportunity to establish new scientific studies for Master’s students taking their subject in social pharmacy. The aim of this presentation is to describe the pedagogic basis and the core content of the new Master’s curriculum (about 1.5 years of studies, 70 ECTS credits).

Pedagogic basis of the new scientific studies
A starting point for designing the new scientific studies was the fact that pharmacy students will enter to the program after 3.5 years of pharmaceutical studies mainly consisting of biomedical and natural sciences. This means that they need to adapt to a different scientific paradigm with different theory base and methodology. The curriculum was planned to integrate own research project with the scientific studies and to exploit peer support. Also development of scientific writing skills and critical thinking, as well as understanding key research areas in social pharmacy were set as main learning objectives. The studies are pedagogically based on constructive learning, applying experiential learning methods and students’ active involvement. The motto of the integrated model is “eating an elephant bit by bit”, referring to processing a Master’s thesis project during the studies.

Outline of the studies
The studies are organized in three main blocks: obligatory scientific studies (17 ECTS credits), elective studies (13 credits), and a Master’s thesis project (40 credits). The basic scientific skills of the discipline are taught within a course Research Methods in Social Pharmacy (8 credits). Other obligatory and elective courses are planned to support and complement this course theoretically and methodologically. The other obligatory courses are related to Health Promotion (5 credits), and Medication Review and Drug Interactions (4 credits). The elective courses deal with Drug Information and Drug Information Services (3 credits); Introduction to Health and Pharmaceutical Policy (3 credits); Outcomes Assessment, Rational Drug Therapy and Pharmacy (3 credits); Research Seminars (3 credits), and Theme Seminars (3 credits). Students are also encouraged to take courses outside the faculty. The new curriculum was piloted with a group of 13 Master’s students during the academic year 2004-2005. It has been well received by the students and continuously developed on the basis of their feedback. The next big step will be integration of basic studies in pharmacoeconomics in the curriculum.

Reference
Liberalizing community pharmacies in the Nordic countries – lessons learned

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Introduction: New legislation liberalizing pharmacy ownership and the establishment of
pharmacies came into force in Iceland in 1996 and 2001 in Norway. Prior to the new laws, a
system known as the “Nordic Model” had been in place for decades in these countries as well
as in Denmark i.e. the number and location of pharmacies was determined by the authorities
and pharmacies were privately owned by pharmacists. In Denmark the old system is still in
place in spite of debates in the end of the 1990’s concerning whether or not to liberalize. A
deregulation of certain over-the-counter medicine did however take place in 2001 in Denmark
and a similar deregulation took place in Norway in 2003.

Aim: To investigate whether access to pharmacies has changed after the liberalization in
Norway and Iceland and whether the national drug expenditures have decreased.

Method: This is a descriptive study of trends over time using relatively short time series. A
number of parameters concerning the pharmacy sectors and national drug expenditures in
Iceland, Norway and Denmark were studied. Data from Denmark is used as a control time
series.

Results: The access to pharmacies in Norway has increased, both in urban and rural areas.
There was an increase in the number of pharmacies during the first years after the
liberalization in Iceland but there has been a decrease in the rural areas since 1999 and in the
capital area since 2005. In 2007 fewer pharmacies are in the rural areas than before 1996.
The number of pharmacies in Denmark has been decreasing the past decade; there is no
evidence that this is in any way related to the 2001 legislation. Around 97% of personnel in
Norwegian pharmacies are pharmacists or pharmacy technicians but only less than half of the
personnel in Icelandic pharmacies. The national drug expenditures in all three countries have
been increasing steadily since 1999 with the slowest increase has been in Denmark. National
drug expenditures have decreased in Norway and Iceland since 2004 and it remains to be seen
if the decrease is permanent or temporary. On the whole, early experiences with the
deregulation of over-the-counter medicines in Norway and Denmark did not, on the whole,
show any increase in the sale of these products.

Conclusion: Access to pharmacies increased in Norway, but decreased in Iceland as a result
of the liberalization.
And then what…? A study of how prescribers, pharmacies and patients have acted during the first four years of generic substitution

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**Background:** In October 2002 mandatory generic substitution was introduced with the aim to increase price competition for substitutable drugs and hence curb costs for these pharmaceuticals. Data from the first year showed that the main actors acted in accordance with the reform and that considerable savings were generated through substitutions [1].

**Aim:** To investigate how different actors have acted after the introduction of generic substitution and to assess how saving per substitution and cost per volume has developed during the first four years of generic substitution.

**Methods:** The study encompassed dispensed prescribed medicines on regular prescriptions during the period October 1 2002 to December 31 2006. Prescriptions issued on October 1 2002 or later and encompassed by the reimbursement scheme were included. National sales of five substitutable substances with different patent expiry times were obtained from Apoteket AB. Data included costs both for prescribed pharmaceuticals and dispensed pharmaceuticals, volumes in defined daily doses (DDD) and number of dispensed prescriptions. The outcome measures of how the actors acted were: the proportion of prescriptions where the prescriber restricted substitution, the proportion of prescriptions where the pharmacy restricted substitution, the proportion of prescriptions where the patient opposed substitution and the proportion of dispensed prescriptions where substitution was performed. The average saving per substitution and the cost per DDD for dispensed pharmaceuticals were calculated.

**Results:** According to preliminary results the proportions of dispensed prescriptions where the prescriber and the pharmacy had restricted substitution were around 5% throughout the period. The proportion of patients that opposed substitution was often less than 5 % in three of the investigated substances where the saving per substitution was high. The proportion of patients declining substitution was higher and fluctuated during the first year (10-25%) and then declined somewhat (in general below 10%) for the two substances where saving per substitution was low. The proportion of dispensed prescriptions where substitution was performed increased over the period (from 20-70% in some groups and 20-60% in others) in four of the substances. For the fifth, the proportion of performed substitutions fluctuated over the period on a high level (60-80%). Saving per substitution varied between the substances and over time for several of the substances. Cost per DDD for dispensed drugs declined in all groups over the study period.

**Conclusions:** The preliminary results showed that the key actors continued to adhere to the reform also after the first year. Furthermore the cost per volume continued to decrease throughout the period.

**References**
Diagnosing infections or not: general practitioners’ real and practical prescription basis, - and an update after a decade

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Background: General practitioners (GPs) have frequently been found to prescribe antibiotics liberally without sufficient diagnostic basis and be relatively insusceptible to interventions.

Aim: To understand, in-depth, GPs' decision-making processes in diagnosing common infection, how diagnoses create a basis for antibiotic prescriptions and how diagnostic procedures develop throughout a decade.

Methods: 10 Icelandic GPs were interviewed (¾-2 hours) and 3 observed in the consultation (3-10 hours) in 1995. The observations were described in detail and the interviews transcribed verbatim. Diagnostic issues were extracted and analysed. In 2006 the 8 informants who are still alive commented on the analysis and provided an update.

Results: There were wide variations in the GPs’ diagnostic procedures, both in 1995 and 2006, although the individual GP remained remarkably consistent throughout the decade. Some GPs had developed rules-of-thumb. They often balanced risks against other issues, like money, time, need for the workforce, clients’ need for job and/or earnings and adverse effects on the doctor-patient relationship. Perceptions of risk varied from being focused on possible development of resistance to being focused on possible consequences of an untreated infection. Some informants mentioned both issues and discussed the balancing act, others focused on one side, and some were not worried one way or another. Changes during the decade between interviews were increased use of point-of-care testing and a perception of patients being more willing to “wait and see”.

Conclusion: Large variability and individuality characterized the GPs' diagnostic procedures. The findings were basically unchanged at follow-up 11 years after the initial research. If changes in GPs' diagnostic routines are considered necessary, it is not sufficient to bombard the GPs with “scientific facts” and technological aids. A prerequisite for changing practice is the GPs’ acceptance that the information is correct, the technology is reliable, and that both are practical, applicable and relevant for the individual physician and/or patient.

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Prevalence and Management of Iron Deficiency Anaemia in Hospitalised Paediatric Patients at Agogo Presbyterian Hospital in Ghana

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Background: Iron deficiency anemia is common among children in developing countries due to poor nutrition and high rate of infectious and parasitic diseases. In many countries in sub-Saharan Africa including Ghana, severe anaemia has been found to be responsible for most of the deaths from malaria infection 1. This study was done to determine the prevalence of iron deficiency anaemia in paediatric patients admitted to Agogo Presbyterian hospital from January 6th to February 6th 2004, and how the anaemia was managed.

Method: Data was collected prospectively from case notes of patients admitted within the study period with a diagnosis of anaemia (Hb less than 100g/L). Information obtained included patient characteristics, co-morbidities and possible causes of the anemia and how the anaemic conditions were managed. The prevalence of anaemia was estimated based on the proportion of anaemic cases out of the total number of admissions within the study period. Outcomes of the various treatment interventions were also assessed following daily monitoring of the patients Hb, their well being and quality of life.

Results: One hundred and twenty eight patients were admitted within the study period. Out of this, 50 patients had anaemia representing a prevalence rate of 39%. Twenty four (49%) of the 50 were less than one year old, the rest were between the ages of one year and five years. Twenty seven (53%) of the patients had the anaemia as a complication of severe malaria. Twelve (23 %) presented with bacterial infections (bronchopneumonia: 6, enteric fever: 3 and septicemia: 3) in addition to having low Hb concentration. Four (8%) were patients with sickle cell disease, another four (8%) had Glucose-6-Phosphate dehydrogenase deficiency and malnutrition also accounted for anemia in another four (8%). The Hb concentration of the anaemic patients ranged from 10 to 80 g/L. Twenty eight (54%) of the patients with Hb of 40g/L and above were managed with liquid oral iron preparation containing12mg elemental iron/ml, Folic acid (0.3mg/ml) and B vitamins. The remaining 22 and those who failed to respond to the oral iron preparation were managed with blood transfusion. All but one of the patients (98%) had their conditions improved with the administration of either the oral liquid iron preparation or blood transfusion. The one patient died.

Conclusion: The prevalence of anemia among hospitalized pediatric patients at the hospital was 39%. Oral haematinics and blood transfusions were used to manage the anemia with good outcomes.

Reference:
Overestimation of the risk for ADR’s due to the presentation in patient information leaflets.
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Assessing the risk of drug treatment is important in the decision making by patients and is linked to compliance. Patients´ interpretation and estimation of risk depend on how the information is presented and may play a large role for how the receiver understands and interprets the information as well as the acceptance or denial of risk (1, 2). However, communicating risk may be tricky. It has been known for long that we tend to overestimate the risk for unusual and underestimate the risk for common events (3). Presentation of the risk for adverse drug reactions in verbal form is associated with large individual differences and overestimation of the risk (4, 5,) and increase negative perceptions of the medicine that may increase non-compliant behaviour (6).

The EU Directive 2004/27/EC (2001/83/EC; 2002/98/EC; 2004/24/EC) of the European Parliament, states that inclusion in the packaging of patient information leaflets (PIL) is obligatory, shall include a description of the adverse reactions which may occur under normal use of the medicinal product and if necessary the action taken in such a case and must be written and designed to be clear and understandable (Title V, Article 58; 59 and 62). A guideline states that the frequency of adverse drug reactions (ADRs) can be denoted by the use of five verbal descriptors (7).

Aim: To study how the risk for adverse drug reactions is presented in patient information leaflets.

Material and Methods: Package leaflets for drugs belonging to ATC-codes C07 (betablockers); D05 and D07; N02 (opioids); N05B (anxiolytics) and M01 (NSAIDS) were studied. The patient information leaflets were collected at http://www.lakemedelsverket.se (the Swedish Medical Product Agency).

Results: Overall, 123 patient information leaflets were collected. On about two thirds of them, the risk for adverse drug reaction was expressed verbally and numerically. On one fifth of the leaflets only verbal expressions of the risk were used, and for an equally number the risk was sometimes expressed numerically, sometimes verbally only and sometimes both verbally and numerically. For substances, where several brands and/or generics are available on the market, the ADR’s mentioned in the patient information leaflets varied from 23% (3/13) to 93% (37/40) of those found in the Summary of product Characteristics (SPC).

Discussion: There is a large variation concerning the adverse drug reactions mentioned and how the risk is expressed in patient information leaflets. Knapp et al (6) found that if ADR’s were presented verbally only, patients estimated the risk for an ADR several times higher compared with a numerical presentation (percentage). When assessing the benefit-risk ratio of a drug treatment, a presentation of the risk for ADR’s in package leaflets which leads to an overestimation of the risk may contribute to patients´ non-compliant behaviour. This may be further emphasized when patients experience that for different brands (generics) of the same drug, both ADR’s and the risk for them varies.

References
7. European Commission A guideline on the readability of the label and package leaflet of medicinal products for human use. EC Pharmaceuticals Committee 1998
Chronic pain sufferer’s experiences of analgesic medication.

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Introduction: Chronic pain has an estimated prevalence of between 12% and 50% in the population and sub-optimal treatment is reportedly common. Results from the Irish patients in a large European survey showed that several aspects of drug treatment could be improved1.

Aim: To identify problems and issues in the treatment of chronic non-malignant pain by investigating experiences, attitudes and satisfaction among chronic pain sufferers in Ireland.

Methods: A postal questionnaire and a semi-structured interview schedule consisting of previously validated questions were used with chronic pain sufferers who were members of the Irish Chronic Pain Association (ICPA) at their monthly meeting. Questions were drawn from the Chronic Pain Grade Questionnaire2, Pain Treatment Satisfaction Scale3, Medicines study questionnaire4, Voices of chronic pain questionnaire5 and European pain questionnaire1. Ethics Committee approval was obtained.

Results: From the 21 ICPA members attending the meeting, 16 agreed to participate and 4 postal questionnaires were returned and 9 patients were interviewed. The ICPA patients reported a mean pain intensity score of 67. The mean number of prescription analgesics used was 3.5 and the total number ranged from 0-9 including other adjuvant drugs. The most common prescription analgesics were NSAIDs/aspirin. A wide spectrum of side effects had been experienced, particularly with opioids and with tramadol. Despite extensive drug use, the ICPA patients appeared to be satisfied with their analgesics overall, with almost 75% of the patients being satisfied or very satisfied, compared to 50% of the pharmacy patients. Only 3 out of 11 patients felt that their analgesics improved their mood and 8 patients felt that their analgesics restricted their daily lives. The majority of sufferers had used complementary therapies, with varying results, and one had experienced side effects and most had also tried other, non-drug approaches. Patient’s comments highlight the positive and negative aspects of their experience of analgesic use.

Conclusion: This qualitative study has managed to capture the essence of the experiences and attitudes of a group of patients suffering from chronic pain in Ireland. A proportion of these patients are not satisfied with their treatment. Pharmacists could help individualise the treatment of chronic pain and decrease drug related problems by offering more information and closely monitoring patients.

References:
4. University of Aberdeen; Department of General Practice and Primary Care. Medicines Study Questionnaire. c2003 [cited 2006 Sept 5]; Available from: www.abdn.ac.uk/general_practice/research/drugs.htm
Prescriptions on split tablets – a common and unnecessary drug related problem

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Background and Objective: It is common that patients have difficulties to follow the prescribed treatment. Dosages with half a tablet, one and a half tablet etc. are common in Sweden. The use of medicines increases with increasing age. Many elderly have difficulties to handle packs and tablets due to problems with vision and fumbling. Splitting tablets in halves may increase the problem to comply with the prescribed treatment. In Sweden, data on all dispensed prescriptions including the dosage string are available in “Apotekets transaktionsdatabas”.

Objective: To examine to what extent dosages with split tablets are prescribed and the possible reasons.

Design: Data on dispensed prescriptions were gathered from “Apotekets transaktionsdatabas”. The data included patient gender and year of birth; dispensed drug (ATC-code; name; administration form; strength; pack size) and prescribed dosage.

Inclusion criteria: Drugs: betablockers; calcium inhibitors; ACE/AII-inhibitors; lipid lowering agents; levothyroxin; neuroleptics; anxiolytics and sedatives; and antidepressants (SSRIs).

Exclusion criteria: Prescriptions to animals.

Setting: Sweden.

Main Outcome Measures: Numbers and percentages of prescriptions with dosages of split tablets.

Results: 607,520 prescriptions on 74 different substances were examined. Dosage with split tablets were prescribed on 9.7% of all prescriptions; 7.8±8.6% (mean±SD); Md 3.9% (range 0; 34%). For 9 substances with a large prescription volume – levothyroxin; 2 betablockers, 3 antidepressants and 3 bensodiazepines – dosage with split tablets occurred on >15% of all prescriptions. In the 4th quartile (19 drugs) 15.3±7.1% (Mean±SD; Md 16.7%) of prescriptions were with dosages on split tablets and constituted for 92.8% of all prescriptions studied. There were only small differences with reference to age - proportions were similar for young (-64 years) and old (65+) patients and gender. Thyroxin and SSRI´s were studied separately. The prescribing with split tablets was unnecessary in 50.5 and 44.7% of the cases and could be regarded as possible to avoid in 95.3 and 81.8% of the cases respectively.

Conclusions: Prescribing dosages of split tablets is common. The reasons for using split tablets vary with drug. Pharmaceutical companies may however be unaware of how their drugs are prescribed and the most common single dose strengths may not be licensed. In many instances, dosage with split tablets can be avoided if prescribers use available information on licensed strengths - in about half of the instances a tablet strength corresponding to the prescribed dose was available on the market and in the majority of cases could have been avoided if available strengths on tablets had been combined. Dosages with split tablets are so common that the problem may be overlooked by pharmacists.

References:
Fawell NG, Cookson TL, Scantont S. Relationship between tablet splitting and compliance, drug acquisition cost and patient acceptance. AJHP 1999; 56: 2542-5

Keywords: Pill splitting; Drug related problems; drug dosage
Medication reviews by community pharmacists in Norway

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Background
In Norway, as in other countries medication reviews and clinical pharmacy are topics of great interest. Patients’ knowledge about drugs is probably not any better in Norway than elsewhere in the world, and drug related problems are most likely quite common. No previous studies have been conducted in Norway to assess whether medication reviews by community pharmacists can contribute to identify and reduce such problems.

In June 2006 the Directorate of health- and social affairs initiated research projects with the aim of performing medication reviews both in hospital and community pharmacies. The Norwegian Pharmacy Association (Apotekforeningen) received funding for the project “Medication reviews in community pharmacies”.

Aim
The aim of the study is to investigate whether community pharmacists are able to identify drug related problems (DRP) by reviewing a patient medication list combined with a 30 minutes dialog with the patient.

Method and material
A total of 39 pharmacists were recruited to perform 2-4 reviews each. The patients were recruited among the pharmacies’ customers matching one of three criteria: 1) Older than 60 years and using 5 or more drugs, 2) using drugs for lung disease or 3) using drugs for heart and vascular disease. During the dialog the pharmacist also tried to find a solution for the DRPs, either by a discussion with the patient’s physician or by general advice to the patient from the pharmacist.

Results
Medication reviews were performed for 135 patients. DRP were identified in 127 reviews (94 %) including a total of 543 DRP (range 1 - 12 DRP). The physician was contacted for 90 DRP (17 %), and made a change of medication in 51 of these cases. A change based on the pharmacists’ advice alone was given for 128 DRP (24 % of all).

Conclusion
This study shows that community pharmacists are able to identify DRP during a medication review and that community pharmacies are suitable settings for such reviews.
Perceived competence and work situation among pharmacy personnel

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Introduction
An increased number of prescription drugs are being made available over the counter (OTC) through pharmacies, encouraging the public to self-medicate their symptoms and diseases. Community pharmacists and pharmacy technicians increasingly provide advice for self-medication for a range of symptoms. A new pharmacy act was put into force in Norway in 2001; in principle based on free ownership and liberal establishment of pharmacies. The new competition between pharmacy owners and increased focus on sale may have triggered a change of focus from the dispensing of prescription medicines towards patient information on OTCs, and in particular towards remedies who previously were not sold in pharmacies. Before the implementation of the new pharmacy act, a study was performed to determine the confidence by which advice for self-medication was provided by pharmacy staff for a range of medical complaints (1). The aim of our study was a) to investigate the self-perceived competence among pharmacy personnel six years after the new pharmacy act and b) to investigate the relationship between perceived competence and the pharmacy staff’s education, age, work experience and psychosocial factors.

Methods
In 2007, a web-based electronic questionnaire was mailed to 299 randomly selected community pharmacies in Norway, inviting all pharmacists and pharmacy technicians to answer. To assess the self-perceived competence, the following question was asked: “Describe how you normally perceive questions from customers approaching the pharmacy with the following symptoms/complaints/needs.” The list included 21 symptoms to be scored. Descriptive analysis, t-tests and regression analysis were performed.

Results
Pharmacists and pharmacy technicians represented 51% and 47% respectively of the 693 responders (2 % is unknown). The pharmacy personnel reported the highest self-perceived competence for providing advice for allergy, flu and headache. The lowest self-perceived competence was for providing advice on leg ulcer treatment, self-test kits and tiredness. Pharmacists perceived higher competence than pharmacy technicians when customers asked about allergy, indigestion and constipation. Conversely, pharmacy technicians found it easier than pharmacist to answer questions about healthy skin, skin disease and wound treatment (both related to injury and ulcers). Multiple regression analysis showed that high role clarity was significantly associated with high self-perceived competence.

Conclusion
Self-perceived competence among pharmacy personnel was higher for symptoms where OTC medicines are available than for symptoms where no such treatment alternative is available over the counter. The role clarity seemed to be important for the perceived competence.

Reference:
Drug-related problems in nursing home patients – the impact of pharmacists in multidisciplinary teams

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Background
Drug related problems (DRPs) have been studied with great interest during the last decade. Previous studies indicate that 76 % of nursing home patients have DRPs. The aim of this study was to identify and resolve DRPs in nursing home patients by introducing a pharmacist to the multidisciplinary team.

Materials and Methods
An intervention study was performed on 150 patients aged 65 years or older in 3 nursing homes in Bergen, Norway. A systematic medication review was conducted by a pharmacist. The identified DRPs were discussed with every patient's physician and nurse(s) at multidisciplinary team meetings. The acknowledged DRPs were consequently classified according to type of problem and drug involved, and actions to solve the DRPs were planned. A follow-up medication review was performed after 3 weeks.

Results
Medication reviews were performed on 142 patients (106 women, 36 men, mean age 86.9 years). The patients used together 1629 prescriptions (mean 11.5). Altogether 509 DRPs were identified in 135 of the 142 patients (mean 3.8). The most frequent DRPs were “Unnecessary drug” (38 %) and “Need for monitoring” (14%). DRPs were most frequently related to drugs affecting the nervous system and the alimentary tract and metabolism.

Conclusion
A multidisciplinary team was successful in identifying and solving DRPs in nursing home patients. Pharmacist can facilitate the identification of DRPs. Drugs used for the nervous system or for the alimentary tract and metabolism are most likely to cause DRPs.

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Young women’s use of medicines:  
Autonomy and positioning in relation to family and peer norms

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Youth’s medicine use is an important topic, yet it is relatively understudied. Research indicates that medicine use among youths is widespread and on the increase (Holstein, Hansen, Due, & Almarsdottir, 2003). This is especially true for young females, whose utilisation of a variety of medications grows considerably during the teenage years (Hansen, Holstein, Due, & Currie, 2003). These findings point to a need for a greater understanding of how young women use medicines within the context of their everyday lives. Given that social norms within the family and peer arenas are known to play a role in the health and risk behaviour of youth, this study focuses on the social context that surrounds medicine taking behaviour. More specifically, this study aims to explore what young women perceive as the norms for medicine use at home and among peers, as well as what these perceptions mean for their own use of medicine.

In order to elicit the young women’s perspective, a qualitative approach was chosen for data collection. In-depth semi-structured interviews were conducted with 20 young women between the ages of 16 and 20. Informants were recruited via two public high schools in Copenhagen, Denmark. Interviews were audio taped, transcribed verbatim and transferred to a computer analysis program. Transcripts were analysed via a phenomenological approach, which revealed central elements in the participants’ accounts. Inspiration for the interpretation was found in Schutz’s ideas of folkways and stock of knowledge (Schutz & Luckman, 1973).

Informants’ accounts provided rich descriptions of their perceptions of family and peer norms for medicine use. Young women possessed a great awareness of others’ medicine related practices and ideas regarding proper medicine use, although it was a topic only rarely discussed. At the interface of these themes pertaining to family and peer norms, a unifying concept pertaining to growing autonomy in medicine use emerged from the data. This theme consisted of three parts: the great influence of family norms when autonomy was limited, growing autonomy under changing influences, and lastly, assertion of autonomy and positioning of own behaviour relative to the norm. This study’s findings indicate that despite increases in autonomy in medicine use, normative perceptions continued to serve as important reference points for informants’ own medicine taking behaviour. Practitioners involved in the health care and promotion of youth may benefit from an increased awareness of the influential role that perceived norms in peer and family arenas can play in young women’s use of medicine.

Reference List


Advice about herbal drugs to pregnant women –
Difference among pharmacists and personnel in herbal drugs stores

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Background: Herbal drugs are often promoted as “natural” and “safe” alternatives to conventional drugs. These claims may especially appeal to pregnant women who are often concerned about their unborn child’s well-being. Two previous studies among together 1000 Norwegian women showed that approximately 2 out of 5 women had used herbal drugs during pregnancy (Nordeng, 2005). The most frequently used herbal drugs where echinacea, ginger and cranberry. Among the women that had been breastfeeding their previous child, nearly 40 % had used herbal drugs to increase their breast milk production (galactalogues).

Objective: The aim of the study was to compare the advice from pharmacists and personnel in herbal drugs stores regarding the use of echinacea, ginger and cranberry in pregnancy and galactalogues during breastfeeding. In addition we wanted to assess the pharmacists and personnel in herbal drugs stores’ knowledge about and attitude towards herbal drugs.

Material and methods: A total of 40 randomly selected pharmacists and 20 personnel in herbal drug stores in Oslo, Norway were interviewed by a specially trained pharmacy student using a standardized questionnaire.

Results: In total, 90 % of the interviewed pharmacists were negative to the use of echinacea during pregnancy. All personnel in herbal drugs stores would recommend ginger against pregnancy related nausea compared to 13 % of the pharmacists. In total, 90 % of the herbal drugs stores’ personnel would recommend cranberry compared to 13 % of the pharmacists. Galactalogues were the one product that the pharmacists were most positive towards in the study. One out of two of the pharmacists would recommend such use. The pharmacists had a higher level of knowledge about the safety and use of herbal drugs during pregnancy. Not unexpectedly, the personnel in herbal drugs stores had a more positive attitude towards herbal drugs than pharmacists.

Conclusions: There are differences among pharmacists and personnel in herbal drug stores when it comes to advising pregnant women about herbal drugs. Pharmacists were more reluctant to recommend the use of herbal drugs during pregnancy and lactation. The study also implies that pharmacists are more qualified in advising pregnant and lactating women about the use of herbal drugs during pregnancy and breastfeeding.

Nordeng H, Drug Use in Pregnancy and after Delivery. Dissertation, Faculty of Medicine, University of Oslo, Norway, 2005.
Aims:
To evaluate the effects of two interventions aimed to enhance medication adherence and self-management among users of antihypertensives in a Danish community setting and to compare the outcomes to a control group receiving no intervention.

Methods:
From the Danish county of Funen, 12 pharmacies were included in the project. At each pharmacy a pharmacist and a pharmacist assistant (pharmaconomist) were included in the study to perform two different interventions; the pharmacist an extensive intervention and the pharmaconomist a short, focused intervention. Each health professional was allocated 10 patients for intervention, i.e. 240 patients all together. The patients were randomly selected from a pool of 1,426 interested users of antihypertensives. The intervention period was 10 months, and during that time period, at least 4 visits to the pharmacy were required for intervention and monitoring. The outcome measures were: compliance-measures and medicine use, health related outcomes, health related cost, knowledge and self-efficacy.

Results:
The interventions were multidimensional and based on needs identified for the individual patient. The nature of adherence problems were identified at baseline by a questionnaire filled in by all potential intervention patients. In addition the pharmacist and the pharmaconomist interviewed the patients during the first visit to help identify further medication-related problems and to subsequently find solutions to the problems. These solutions included counseling, patient story telling, reminder technologies, coaching approaches, patient education and medication review. The intervention model included a concordance-partnership between the patient, the pharmacy and the general practitioner to ensure consistent solutions to all medication-related problems identified as a result of the interventions. Midterm evaluation showed that approximately 10% of the patients had adherence problems. The technical interventions offered at midterm evaluation were: individual reminder systems (10%), MEMS (12%), SMS (6%), E-mail (4%), dose dispensing (2%), dosing aid (16%), self-monitoring blood pressure (18%) and diary (7%). The cognitive and motivational interventions were: introduced medication profile (28%), gave written materials (51%), referred to web-pages (20%), patient education (36%), Information and counseling (75%), coaching (30%) and recommended contact to the GP (22%).

Conclusions:
The interventions were successfully implemented for patients selected to participate in the program. A large variety of interventions were implemented, and the concordance-partnership model has been tested. Specific outcomes from the two interventions will be presented at the conference.
How to cope with missing data when calculating subjective patient reported data.

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Introduction:
How to avoid or cope with missing data is a key question when dealing with patient related outcome, due to the subjective nature of these data and the related problems in predicting missing data. In a study exploring the changes in quality of life due to Minirin® treatment of Nocturia (getting up one or more times a night to void) a large group of data was missing. It was decided to explore the consequences of using different approaches towards missing data.

Objective:
To discuss the consequences of different approaches regarding missing data when dealing with subjective patient related data.

Patients and method:
71 patients entered the trial and were asked to complete the SF-36 at baseline and after 1 and 3 month of treatment. 42 patients completed all questions in the SF-36 at all 3 times. 29 patients either missed one or more questions in one questionnaire or missed a whole questionnaire. The possible change was assessed through the vitality domain by using 3 different approaches: completed cases (CC) where the calculation was restricted to the 42 patients who completed all questions, last observation carried forward (LOCF) where the last observation was extrapolated without considering why the answers were missing, and imputation of data where the results were based on likelihood (MAR).

Results:
Table 1:

<table>
<thead>
<tr>
<th></th>
<th>CC (n=46)</th>
<th>LOCF (n=71)</th>
<th>Imputated values (n=71)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Baseline</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Mean and standard deviation)</td>
<td>52.8 (28.5)</td>
<td>55.3 (26.4)</td>
<td>55.1 (27.1)</td>
</tr>
<tr>
<td><strong>1 month treatment.</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Mean and standard deviation)</td>
<td>63.2 (22.4)</td>
<td>62.4 (22.4)</td>
<td>63.9 (22.9)</td>
</tr>
<tr>
<td><strong>3 month treatment.</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Mean and standard deviation)</td>
<td>62.7 (26.1)</td>
<td>62.2 (24.2)</td>
<td>63.5 (27.6)</td>
</tr>
</tbody>
</table>

Table 1 shows data material based on the answers of 71 patient receiving Minirin against nocturia and indicates the difference imposed by the different missing data approach.

Conclusion:
The different approaches lead to different levels of significance of the result. Only the CC approach for 1 month treatment completely changed the result to non-significant.

When combining small populations with high level of missing data and subjective data it is vital to describe the missing data approach and the impact on the result (e.g. with sensitivity tests). Not intentionally using any approach towards missing data does in reality mean that the completed cases approach is chosen.
Changes in the role of the Norwegian chief pharmacist after the liberalization of the pharmacy system

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Introduction
The Norwegian pharmacies have undergone considerable changes since the new, liberal Pharmacy Act came into force on March 1st 2001. The most important changes concern ownership and pharmacy establishment policies. The number of pharmacies has increased from 400 in 2000-2001 to 589 in June 2007. Three internationally owned vertically integrated pharmacy and wholesaler chains now control more than 80% of the pharmacies. While the pharmacies according to the old Pharmacy Act were professionally owned, principally anybody can own a pharmacy today. The new pharmacy owners must however engage a chief pharmacist to run the pharmacy and have the overall responsibility with respect to safety and professional services. A chief pharmacist has to fulfil the same formal requirement as the former pharmacy owners; in this context both can be named “chief pharmacists”.

Aim
The purpose of the study was to:

- define the changes in the role of the chief pharmacist before and after implementation of the new Pharmacy Act
- look for future challenges perceived by the “modern” chief pharmacists

Methods
In August 2006, 18 former and present chief pharmacists participated in three focus groups. A semi-structured interview guide was used to search for the participants’ views on several aspects of their work as the head of a pharmacy, i.e. their role in economic questions, as human resource managers and as the main responsible for all the professional activities in a pharmacy.

- Group 1 consisted of former pharmacy owners who quit working in connection with the implementation of the new Pharmacy Act.
- Group 2 was composted of chief pharmacists working under both old and new Pharmacy Act.
- Group 3 consisted of today’s chief pharmacist working in chain pharmacies.

The interviews were registered digitally, transcribed verbatim, themes were established and analyzed by the author, partly using QRS NUD*IST and partly manually.

Results
This paper presents results of the part of the study dealing with the chief pharmacist’s role as an economic manager. From being totally and solely responsible for all the economic transactions concerning running a pharmacy, the chief pharmacist has become an administrator of budgets being prepared and decided upon in the chain hierarchies. Complying with the budget seems to be a main task for the chief pharmacist giving little room for professional improvement initiatives. A development of conflicts between economic and professional goals can be foreseen. The chief pharmacists express this as their main future challenge.

References
1. Lov om apotek (apotekloven). 2. juni 2000 nr 39. 2-6-2000 (new Norwegian Pharmacy Act)
Adherence to antihypertensive treatment after generic substitution -
a study from the Norwegian Prescription Database

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Background
Generic substitution has reduced the growth in public pharmaceutical expenditures in a lot of countries. In Norway, generic substitution was implemented in 2001 together with a new pharmacy legislation. The drugs have to be bioequivalent (-20%, +25%) and have the same dosage form as their branded alternatives to meet the requirements for substitution. However, problems may arise on the individual level when a branded drug is substituted for a generic equivalent; variations in name, taste, shape, and colour occur, and the patients or others responsible for the medication may not have sufficient knowledge of generic substitution to use the drugs as intended. This may contribute to reduce health improvement and increase health care expenditures for the public.

Aim
The aim of this study was to investigate whether generic substitution contributes to reduced adherence to antihypertensive treatment and/or changes in medication regimens, and estimate the associated costs.

Material and method
The material consisted of prescriptions of antihypertensive drugs delivered from Norwegian pharmacies in the period 1.1.2004 - 31.12.2006 to patients who had their branded antihypertensive drug substituted with a non-branded alternative in a pharmacy in 2004. The data were obtained from The Norwegian Prescription Database, a national health register containing information connected to all delivery of drugs from pharmacies in Norway. The material was analyzed in SPSS (version 14.0).

Results
The results of this study will be presented at the conference.
Prevalence of medicine use in Finnish children under 12 years – preliminary results of a population survey


Background: Only a few studies have been conducted on medicine use among children under 12 years in Finland and internationally. However, such knowledge is essential in order to help health care professionals to develop their treatment practices and to generate ideas for better medications for children.

Aim: The aim of the study was to investigate the use of prescribed and over-the-counter (OTC) medicines among Finnish children under 12-years.

Methods: A population survey was carried out during the spring 2007. Questionnaires were mailed to parents of a random sample of 6000 children under 12-years of age. The home addresses of the parents (primary mother) were obtained from the Finnish Population Register Centre where the random sampling was conducted. The register covers all permanent residents of Finland. The child’s name was printed on the questionnaire to specify the child, especially in families with more than one child. The parents were asked to report their child’s use of medicines prescribed by a physician at the present moment, and OTC medicine use during the preceding two days. Data were analyzed with statistical software SPSS 14.0 (SPSS Inc, Chicago, IL). Categorical variables were compared using cross-tabulations, and Pearson’s chi-square test was used for statistical testing.

Preliminary results: A total of 4115 questionnaires were returned, yielding a response rate of 69%. Altogether, 17% of the children had used at least one prescribed medicine. The use of prescribed medicines (range 13%–23%) was more common among one- and two-year-olds (23% and 21%, respectively) than among the older children. Boys used more prescribed medicines (18%) than girls (16%). The most commonly used prescription medicines were medicines for obstructive airway diseases (10% of the children) and the most commonly used substance was salbutamol (4% of the children).

A total of 20% of the children had used OTC medicines (vitamins, which were used by 25% of the children, not included). The OTC medicine use was most common among children under the age of one (31%) and it decreased with age. There were no gender differences in the use of OTC medicines. Analgesics including NSAIDs were the most commonly used OTC medicines (7% of the children) and paracetamol was the most commonly used substance (5% of the children).

Conclusions: Children’s medicine use is common, especially among younger children. Health care professionals should pay attention to the counselling of parents, especially parents of younger children.
Three years of medicine education in Finnish schools – educating the youngest children most challenging

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The importance of educating children about the proper use of medicines has been acknowledged worldwide. In Finland, health education, including the proper use of medicines, became an obligatory subject in schools through a new curriculum in 2004. However, medicine education is mentioned very generally leaving the teachers without concrete ideas of what medicine education can be. Furthermore, teachers lacked teaching materials on the proper use of medicines. A research project begun in early 2002 to address these problems. A tool for medicine education (www.uku.fi/medicinescurriculum), now available partly in English, was developed and evaluated in Finland during this project in 2002–2004 (1). The aim of this presentation is to describe the experiences which have been gained from the teachers as well as research after the website has been launched.

Background philosophy of the material is to teach children practical skills to act on knowledge when using medicine, e.g., what one should check before taking medicines or how to find reliable information. The goal is to empower children to be actively involved in discussions with health care professionals about their own medicines. The website is most appropriate to the junior secondary school teachers. Furthermore, the attitudes of these teachers are generally positive towards medicine education. Primary school teachers are more reserved and they often question the appropriateness of medicine education, especially for the youngest children. This attitude is promoted by school books: a content analysis of books of environmental studies in primary school, and health education in junior secondary schools revealed that in the books for primary school medicine education is scarce (2). Mainly, medicines are briefly mentioned when describing treatment of illnesses. Furthermore, the books warn that medicines can be dangerous. In the books for junior secondary and high school, medicine use is described more in detail. However, they rarely appear as an own logical section, but instead, small details are spread in different parts of the books.

The usefulness of three assignments targeted to 7–9-year-old children was evaluated by four primary school teachers who used them during 2–3 lessons of medicine education with their own classes (3). These assignments were found to be useful and the learning objectives were achieved. However, teachers’ attitudes toward medicine education were, again, found to be important since they may influence their willingness to teach medicine education and use the assignments provided in the website. Further studies are needed to evaluate how medicine education is implemented in school health education, and how the teachers use the website.

Patient and physician-related barriers to cancer pain management with opioid analgesics: a systematic review of the literature

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Introduction: The prevalence of acute and chronic pain in cancer patients is high.¹ Under-treatment of cancer pain can be caused by the barriers to the use of analgesics, in particular opioids. In this respect, institutional, health care professional and patient-related barriers have been identified.² However, there were no attempts systematically to review the existing evidence concerning these barriers in the literature.

Objective: The objective was to describe and summarise the findings from the literature regarding patient and physician-related barriers associated with opioid treatment of cancer pain.

Methods: The literature search was conducted in PUBMED database.

Results: Thirty-eight relevant papers with respect to patient-related barriers were identified. The majority of these articles studied cognitive patient-related barriers to cancer pain management, while affective and sensory barriers, as well as pain communication and pain medication adherence were studied to a lesser extent. The findings from different studies regarding the relationship between patient-related cognitive barriers and pain intensity were not consistent. Nevertheless, cognitive barriers were consistently related with less optimal adherence to opioid analgesics. The findings on pain communication were also consistent: the quality of pain communication was consistently found to be inadequate in some key areas.

Seventy papers regarding physician-related barriers were identified. Physicians consistently claimed that medical school education in pain management was not satisfactory. Most of physicians understood the importance of cancer pain management, but did not have enough confidence in treating cancer pain. The most common barriers preventing physicians from prescribing adequate doses of opioids were concerns about opioid side-effects. At the same time, treatment of side effects from opioids was found to be very poor. Physicians’ barriers to cancer pain management varied considerably in different countries.

Conclusions: Validated instruments to assess patients’ pain communication and adherence to analgesic regimen are lacking. The methodologies used to conduct many of the studies on physician-related barriers were quite weak. Further research is needed to differentiate the role of patient-related cognitive, affective and sensory factors with respect to their impact on pain relief and medication adherence. Besides that, the evaluation of the influence of a cultural-social-economical background on physician-related barriers, as well as the differences in barriers between different specialists involved in cancer patients’ care should be explored in order to obtain a better insight into the area of unrelieved cancer pain.

Medication review by pharmacists – is there room for savings in drug costs?

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Background: In Finland, pharmacists have been educated to evaluate medication at the University of Kuopio, Centre for Training and Development. The medication review training was targeted to pharmacy practitioners in community pharmacies and hospitals. It was organised as a long-term continuing education. This study considers a pilot education group trained in 2005-2006. These pharmacists conducted medication reviews as student work in co-operation with physicians, patients and other members of the patient’s health care team. The model for medication review was taken from the Australian Home Medication Review System (HMR). This education initiative is a continuation to a four-year national development project called “TIPPA” (Customized Information for the Benefit of Community Pharmacy Patients). The purpose of this study was to analyze whether a medication review can achieve economic savings in direct drug costs incurred by the patient and society.

Methodology: The 26 pharmacists participating in the study reviewed the medication of 130 patients in Finland. A total of 61 reviews were available for this study. The pharmacists wrote informal reports on each case. The primary reason for excluding the remaining 69 cases from the study was the lack of proper notes concerning drugs used before and after the medication review. In this study, we have included only drugs, the prices of which have been possible to determine, and excluded drugs that are taken when needed or are freely priced. We have determined the prices with the SALIX pharmacy software according to the prices valid as of 15 March 2006.

Results: Among the 61 patients analyzed, 34 % lived in their own homes, 59 % in nursing homes and 7 % in hospitals. The patients’ age ranged from 49 to 99 years, averaging 81 years. Most of them (53 %) were 80-89 years old. The vast majority of the patients (82 %) were woman, which is expectable in that age range. The average monthly savings in drug costs achieved through medication review were found to be EUR 16 per person. This includes the shares of both health insurance (or society in Finland) and the consumers themselves. At the end of the review period, 13 (21 %) of the 61 patients had no changes in their drug costs, 40 (65 %) had reduced drug costs and 7 (12 %) had increased drug costs. Before the medication review, the number of drugs prescribed per person was 6-30 and 12 on average. After the review, the corresponding figures were 6-27 and 11 on average.

Conclusion: This study has evaluated savings in drug costs achieved through medication review by pharmacists. It seems that there is room for savings in drug costs if medication reviews are focused on patients that are expected to benefit from it on the basis of their extensive drug use, high age, multiple chronically deceases and so on. Medication reviews may result in reductions in drug costs and also in the number of drugs prescribed. Other studies are needed because the number of patients included in the study was quite limited.

References:

Implementation of the National Current Care Guideline on Smoking Cessation in Finnish Community Pharmacies

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Sponsorship: This study was conducted by a grant of Pfizer

Implementation of the National Current Care Guideline on Smoking Cessation in Finnish Community Pharmacies

The National Current Care Guideline on Smoking Cessation (SC) in Finland was first established in 2002 and updated in 2006. The Guideline is based on the idea of local collaborative practise to support SC. According to the Guideline the role of pharmacists in the health care team is to promote rational and safe use of nicotine replacement products (NRT) by offering counselling and support to those purchasing the products. They also should be aware of other local SC services and offer non-medical support and follow-up. To facilitate the implementation of the Guideline in pharmacies the Association of Finnish Pharmacies has developed several practical tools and resources. The aim of this study was to assess the implementation of the SC Guideline in Finnish community pharmacies.

Methods
A nationwide, postal survey was sent to every second Finnish community pharmacist (n=2291) during November 2006- March 2007. After one reminder the response rate was 54% (n=1190). The survey instrument was mainly structured, reflecting key principles of the SC Guideline.

Results
A majority (87%) of the respondents were familiar with the SC guideline, 70% had at least briefly scanned it and 10% had read it carefully through. More then a quarter (28%) of the respondents had never applied the Guideline in their daily work and only 12% considered the Guideline had changed their work. Still only 5% of all the respondents considered the Guideline difficult to apply and only 12% considered that it did not take pharmacist’s work enough into account.

About two thirds (63%) of those who had used the Guideline also considered that it works well. Over half (52%) of all the respondents had the opinion that the Guideline was followed at their workplace. If the Guideline was followed at the workplace 48% of the respondents reported they used it, while only 9% used it if the Guideline was not implemented at their pharmacy (p<0.001). A fifth (18%) of the respondents considered that they have been encouraged to use the Guideline in their daily work.

Conclusions
Even though most of the Finnish community pharmacists are aware of the National SC Guideline, it is not so well implemented in their daily practise. Implementing the Guideline at an organisational level in a community pharmacy strongly increases the probability that individual pharmacists will apply it in their daily work.

Evaluation of publicly reimbursed cognitive services – based on the case “Check inhalation”


Background:
In 2005 the first Danish publicly reimbursed cognitive service in community pharmacies was launched. The service concerns counselling asthma patients on correct inhalation technique when using asthma devices and is entitled “Check inhalation”.

Objective:
The aim of this poster is to illustrate how such services can be evaluated, when the specific aim of the evaluation is to create knowledge on significant factors in the process of implementing publicly paid cognitive services. Knowledge on facilitators and barriers to implementation is important when developing indicators as part of a quality assurance model in order to monitor and evaluate future publicly reimbursed cognitive services.

Methods:
To gain insight into how publicly reimbursed services can be evaluated, so far two sub-studies have been undertaken as part of the ph.d. study. Firstly, the historic and political background of “Check inhalation” has been investigated by analysing documentary sources through recent literature on pharmaceutical policy. Further, a pilot study in one community pharmacy has been carried out using field observations and interviews based on theory on organisational culture and medical technology assessment as well as grey literature on the specific topic.

Results:
The two sub-studies showed how both the political context and the concrete practice of implementing “Check inhalation” are highly complex phenomena. It is thus important, that the analytic tool to evaluate the implementation process of “Check inhalation” incorporates a similar complexity. Several international studies have tried to address the issue of implementation of cognitive services based on pharmacy staff’s first hand experiences. Studies which due to their realistic approach reveal the implementation process to be multifaceted. The results of these studies will thus be transformed into one operational model, which will be used as a template for characterising differences between community pharmacies, in relation to how many services the pharmacies provide.

The model will be developed by integrating quality assurance theory and the results of the included studies will thus be categorised according to the theory on whether barriers and facilitators belong to a structure, process or outcome level.

Conclusion:
The evaluation model of the first publicly paid cognitive service will be developed through a literature review on studies that investigate pharmacy staff’ s experience on the implementation process of specific cognitive services. The model will be tested in Danish community pharmacies by the use of interviews and field observations. Sampling of pharmacies to be included in the study will be based on the evaluation model. It’s important that both “strong” and “weak” providers are present in the study, as earlier studies have often focused only on early adopters.
Impact of generic substitution on medication adherence: Facing challenges in planning a prospective, randomised controlled trial

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Background: Adherence constitutes a major barrier to the effective treatment of chronic conditions requiring maintenance therapy. Identification of risk factors for poor adherence is imperative for helping patients to better adherence to chronic medications and ultimately in obtaining a better health outcome. In light of the variability in product and packaging appearance between different generics of the same drug formulation, the use of generic substitution may be a potential factor for poor adherence. Thus far only a limited number of studies have investigated the relationship between generic substitution and adherence, none of which used a randomised controlled trial (RCT) design, which if conducted properly, is considered the most powerful form of clinical evidence. Hence, research evidence on the impact of generic substitution on adherence is sparse, warranting investigation.

Objective: The objectives are 1) to present the final RCT design of the study aiming at investigating the relationship between generic substitution and adherence for two types of antihypertensive medication, and 2) to elaborate and discuss the challenges occurring in the setup of this prospective RCT.

Results: A parallel, prospective, multicentre, cluster randomised controlled study comprising 400 patients from 10 Danish pharmacies will be conducted. The RCT will evaluate an intervention including exemption of patients from generic substitution of enalapril and amlodipine over a 12-month period, with refill adherence as primary endpoint. Patients above the age of 18 years receiving either one or both of the two antihypertensives will be included in the study. Patients assigned to the intervention pharmacies will receive the antihypertensives from the same generic company, while patients assigned to the control pharmacies will switch between generics from different companies in accordance with the generic substitution law. Evaluation of the intervention will be based on comparison of refill adherence and substitution index after 12 months for both groups.

The intervention including exemption of generic substitution is, however, associated with several practical obstacles that may ultimately deteriorate the results of the present prospective RCT. The researcher does not have full control of the market mechanisms of generic substitution, e.g. the competitive prices and availability of generics for the intervention as well as control group. Under the circumstances of usual pharmacy practice at community pharmacies, the intervention requires involvement of all members of a community pharmacy staff which may in practice be difficult to carry out.

Discussion and conclusion: Despite the practical challenges encountered in a prospective investigation of the use of generic substitution, the implications of using an RCT design are strong. Although the practical barriers would not occur in a retrospective study e.g. a case-control study of groups with low substitution index versus high substitution index, the association under investigation would include a potential risk of confounding by an overall personal attitude towards generic substitution. Hence, an RCT lowers this risk and thus, whenever feasible, should be employed when evaluating clinical interventions.

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Misunderstandings regarding drug therapy and dermatologist-patient communication

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Background: Adherence to topical treatment tends to be suboptimal. The treatment is often cumbersome and time-consuming, and instructions on how to apply topicals are often imprecise. Patients who understand the information received from their doctor are more likely to follow their prescribed medication. Misunderstandings may, on the other hand, jeopardize effective treatment. Here, a misunderstanding is defined as erroneously understood content or intention, or an understanding of something that is not correct, because of lack of information.

Objective: To identify misunderstandings regarding drug therapy in the communication between dermatologists and their patients, focusing on misunderstandings that may have a potential negative impact on the patient’s subsequent treatment. A further aim was to identify agreements between doctor and patient that, correspondingly, may have a potential positive impact on the patient’s treatment.

Design: Cross-sectional, qualitative study

Setting: An outpatient dermatology clinic at a university hospital in south Sweden.

Participants: 15 doctor-patient pairs. Patients referred from primary care, with chronic dermatologic disorders, primarily psoriasis and atopic eczema; median age 46 years (23-70); 50% women. Doctors’ median age was 48 years (37-58): 83% women.

Data collection: Three sources were combined: non-participant observation of the consultation through tape recording and parallel, tape-recorded interviews with patients and doctors immediately after the consultation, asking about the patient’s treatment.

Analyses: Data from the different sources were compared qualitatively to identify misunderstandings and agreements.

Results: The majority of the patients were satisfied with the medical consultation, referring to their doctor as being attentive and reporting that they had received adequate answers to their questions. Nevertheless, preliminary analyses show that misunderstandings were identified in almost every consultation. Most misunderstandings were associated with the category “patient information unknown to the doctor”. Other categories of identified misunderstandings were "doctor information unknown to patient” and “diverging perceptions of information flow between doctor and patient”. Examples of agreement between doctor and patient included “adjusting treatment to patient preferences”. A second category described concordance in the sense of having a “shared view of what constitutes important information content”.

Conclusions/implications: Misunderstandings between dermatologists and their patients were often a result of the dermatologist having limited knowledge about the patients’ behaviour, concerns and preferences, or the patient having limited knowledge about the doctor’s view of the disease and treatment. Agreements were similarly, the result of effective exchange of relevant information.
Medication reviews by pharmacists - reasons for reviews, recommendations and implemented changes

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Background: As part of efforts to improve patient counselling in community pharmacies and clinical pharmacy skills of pharmacists in Finland, a new continuing education programme of medication reviews was initiated in the University of Kuopio, Centre for Training and Development. The pilot education was arranged between 2005 and 2006, and was continuation for a 4-year, national development project TIPPA (Customized Information for the Benefit of Community Pharmacy Patients). The aim of the pilot was to create a national model for implementing medication reviews. The Australian Home Medication Review (HMR) programme has had a great influence on the Finnish Medication Review System and at present, the system closely resembles HMR. The aim of both HMR and Finnish Medication Review is to optimise patient understanding, use of medicines and improve patient health outcomes [1]. It is also expected that the reviews will bring economical savings directly for the patient and indirectly for the society. The process involves the patient, physician, pharmacist, and other members of the patient’s health care team. The aim of this study was to analyze the frequency and nature of the reasons for medication reviews, recommendations of the pharmacists and the implemented changes during the pilot programme.

Methods: Twenty-six pharmacists reviewed 130 patients’ medications during a ten month period between Aug 2005 and May 2006. Of the 119 patients, 58 (49%) lived in nursing homes and 61 (51%) lived either in their own homes or in sheltered homes. The patients’ ages ranged from 47 - 99 years (mean 79 years). The number of drugs per patient ranged from 6 - 40 (median 13 drugs). Total number of drugs involved in the medication reviews was 1668. Out of the 130 patients’ medication reports 119 were available for evaluation. The selection criterion for the patients was a medication or health related problem identified by a physician. The outcome of each review was reported to the physician and after discussion the needed interventions were implemented by the physician. Within a period of 1 - 3 months, the patient’s condition was inquired from her/himself, from the nurses or the physicians in 53 (45%) cases.

Results: Of the 119 patients, 112 (94%) had at least one recommendation made to the physician and 76 (64%) patients had changes in their medication. Only 10 (8%) patients had no changes, even though recommended. The reasons (n=249) for the reviews were ‘unpleasant symptoms’ (34%), ‘polypharmacotherapy’ (30%), ‘a problem in the treatment balance’ (6%), ‘patient related problem’ (4%), ‘assumed adverse drug reaction’ (3%), ‘assumed interaction’ (3%) and other reasons (20%). The pharmacists gave 480 recommendations, 440 being medicine-related while 40 were non-medicine-related recommendations. Two hundred and twenty seven (44%) recommendations were accepted and implemented out of all the recommendations. The condition of the 53 patients who had a follow up, improved in 22 (42%) cases.

Conclusion: This study demonstrates that medication review by a pharmacist can identify medicine-related problems requiring interventions, even though the reviews were done as part of continuing education for pharmacists.

Control of patients’ glucometers and SMBG technique in community pharmacies

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Introduction
Patient error accounts for a large proportion of errors in blood glucose measurements(1;2). To control patients’ self-monitored blood glucose (SMBG) measurements, it is therefore important to assess the patients’ technique as well as the blood glucose strips and the SMBG device itself. Most diabetes patients in Norway obtain their SMBG equipment from community pharmacies. Using a procedure initially developed by the Norwegian Quality Improvement of Primary Care Laboratories (NOKLUS) for use in general practice; the aim of this study was to test the pharmacies suitability as a place to control patients’ glucometers and SMBG technique.

Methods
A standard operating procedure and quality control system for the control of SMBG in pharmacies was developed. Sixteen community pharmacies were trained in the procedure, enrolled in NOKLUS’ External Quality Assessment Scheme (EQAS) and recruited a total of 338 patients. Patients brought their own glucometer to the pharmacy, and performed their measurement as they would at home. The pharmacy employee noted comments during the patient measurement, and then repeated the measurement on the pharmacy’s reference instrument (HemoCue Glucose 201+). If the two measurements differed with more than 20 % (ISO 15197), the cause of the deviation was attempted explained and corrected. Three months later the control was repeated.

Results
All the participating pharmacies obtained acceptable assessments in NOKLUS’ EQAS. Approximately 5 % of the patients’ measurements were outside the quality specifications. The pharmacy employees had comments to 124 (37 %) of the patients’ measurements, such as “strips expired”, “did not remove first drop of blood”, or “meter not coded”. However, only 9 of these were related to poor results.

Conclusion
The pharmacies are capable of controlling patients’ glucometers and SMBG technique with a satisfying quality. However, the low percentage of inaccurate measurements indicates that perhaps we did not reach the patients who needed the control the most.

Reference List
Background and aim
The prevalence of mental disorders is high among the elderly, as is psychotropic drug utilization. However, studies regarding the very old are few. This population-based study aimed at increasing the knowledge on how psychotropic drugs are utilized among 95-year olds.

Methods
A population-based sample of 338 individuals (263 women and 75 men) aged 95 years old, born between 1901 and 1903, living in Göteborg, Sweden participated in the Göteborg 95+ Study and were examined by psychiatrists. Information on drug utilization was collected from medication lists, or when these were not available by interviews or drug inspections in their homes. Drugs were classified according to the ATC-system.

Results
The prevalence of psychotropic drug utilization was high, 60% (95% CI: 55-65) used at least one psychotropic drug. The most common psychotropic drug group was hypnotics (ATC-code N05C), used by 43% (95% CI: 38-49) in total, followed by anxiolytics (N05B; proportion 21%; 95% CI: 17-26). Antidepressants (N06A) and neuroleptics (N05A) were used by 14% each. In total, 56% lived in institutions and 52% were diagnosed with dementia. The utilization of neuroleptics, anxiolytics and antidepressants was significantly higher among institutionalized individuals compared to non-institutionalized subjects, and among demented compared to non-demented. No such differences were observed regarding hypnotics. The proportion of individuals using three or more psychotropic drugs was 12% (95% CI: 9-16) in total, the proportions were higher among women, demented and institutionalized individuals. Benzodiazepines (N05BA or N05CD) were used by one third of the population, with no significant differences regarding institutionalization or dementia.

Conclusions
The prevalence of psychotropic drug utilization was high, especially among demented and institutionalized individuals. Hypnotic drugs were most common in all subgroups of the study population. Further studies are warranted in order to analyse the quality in psychotropic drug treatment of the very old.
Appropriate prescribing - The prescribers' perspective

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Background. Appropriate prescribing has been defined as the outcome of a process of decision-making that maximises net individual health gains within society's available resources[1]. By exploring the prescribers' perceptions of appropriate prescribing, the validity of available definitions of appropriateness can be assessed from the perspective of those who are to execute the intentions of policy makers. If changes in prescribing behaviour are desired, knowledge of the prescribers’ point of view facilitates implementation. Our research has focused on hospital care. An in-depth understanding of the prescribing process in the more specialised secondary care is not only important for secondary care itself, but because it also influences prescribing in primary care. We have studied what hospital doctors’ view of appropriate prescribing by using qualitative interviews. Qualitative studies of the influences of prescribing in hospital are scarce, but form a useful complement to quantitative research.

Objective. To investigate secondary care doctors’ views of appropriate prescribing, using qualitative interviews.

Method. Qualitative, semi-structured interviews were conducted with fifteen hospital doctors working in different medical specialities. The interviews, covering the doctors' views of the meaning of 'appropriate' prescribing, were audiotaped and analysed from an interpretivist perspective.

Results. Three different themes were identified in the analysis of how the doctors perceived appropriate prescribing: "individualisation of treatment", "cost" and "time". Most importantly, treatment should be adjusted to the individual patient, although cost should also be justified. Ongoing medication reviews should be carried out, to adjust to changes in patient-related factors over time.

Conclusions. The hospital doctors brought up continuous review as a necessary part of appropriate prescribing. Thus, for appropriate prescribing from the prescribers’ point of view, this time perspective should be explicitly incorporated in definitions of this concept, in addition to individualisation of treatment and cost considerations.

Multimedication in community dwelling elderly
– The patients’ perspective. A focus group study

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Objectives: The number of people over the age of 75 constitutes a tenth of the Swedish population but consumes a fourth of all drugs (1). Important quantitative studies have been published regarding multimedication, e.g. on prevalence (2). There are also studies about experiences of medicine taking in different diseases and attitudes to drugs in general (3) but few with a focus on elderly multimedicated patients. Hence, the aim of this study was to explore experiences of and attitudes to multimedication in elderly (≥ 65 years of age) using multiple medications (≥ 5 drugs).

Material and methods: Twelve semi-structured focus groups (six with men, six with women) with 3-7 participants in each group were conducted before saturation. The content of the discussions were analysed using Framework analysis (4), while the interaction in the groups were analysed using the analytical template of Lehoux et al (5).

Results: Three levels of knowledge among multimedicated elderly were found. Firstly, factors similar to those presented in other studies on lay experience on medicine taking (3), e.g. acceptability of regimen and self experimentation. Secondly, factors that appears more specific to multimedication, e.g., uncertainty about how the body handles the combinations of drugs. Thirdly, elderly multimedicated patients may experience poorer quality of life and have unmet needs for services, which might not be captured briefly as the elderly did not reveal their ‘private’ opinion about their drug regime before it was approved in the group. Further how participants experienced the drug regime depended on how they experienced the encounter with health professionals. “Bad” experience included; access and time, concordance, and episodes revealing doctors’ limited knowledge about treating multimedicated elderly.

Conclusion: We need to be sensitive to elderly co-existing accounts of both ‘private’ and ‘public’ responses to the drug regime when deciding on proper services. Further the elderly perception of their drugs appears to be guided by the success of their encounter with doctors. This introduces a new factor into the act of concordance with elderly multimedicated patients; the doctor and patients need to appreciate the doctor’s sometimes limited knowledge.

References:
Follow-up of patients receiving a pharmaceutical care service

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Background and objective
An essential part of pharmaceutical care (PC) services is to follow-up the patients’ goals of drug therapy and evaluate the outcomes of treatment, clinical decisions and pharmacotherapeutic advice. In Sweden, a PC-service is provided by specially trained pharmacists in 240 out of 870 community pharmacies. The service is built up from two integrated components: continuous counselling for the patient and a supportive patient medication record (PMR) database for the pharmacists. Anyone on prescription medicine may sign up for the service, which is free of charge to the patients and aims to achieve improved outcomes of drug therapy. An initial counselling session of about 30 minutes is succeeded by follow-up meeting(s), according to the needs of the individual patient.

In order to further develop and optimize the outcome of PC activities, it is important to identify what specific features characterize the patients who already have opted for this service as well as to evaluate pharmacists’ actions in clinical practice. Hence, the objectives of this study were (i) to identify characteristics of patients who signed up for the PC service, (ii) to explore demographic, drug-related and service-related factors associated with followed-up/non-followed-up patients, and (iii) to describe the documented results of pharmacists’ interventions within the PC service.

Methods
The study was a non-experimental, retrospective assessment of individuals in a national PMR-database, which included all patients who signed up for the PC service during three consecutive years. Based on the aims of the study, a set of variables was defined and collected from the PMR-database. Eligible for follow-up analysis were patients who had been registered for the service at least 2 months. Outcomes of pharmacists’ interventions were reported by the patients to the pharmacists on a three level scale (better, no change or worse).

Preliminary findings
In total, 3298 patients received the PC service during the study period. Two thirds of them were women and 85% were over 60 years of age. The patients used in mean 10.5 (± 4.6) prescription drugs, 50% used dosett, 24% had problems opening medicine packages and 34% stated some kind of allergy to drugs or preservatives.

Of patients eligible for follow-up analysis (n=3248), half (47%) were followed-up at least once. Patients who had received follow-up used more medications, used more often many drugs (≥16) concomitantly and were more likely to use a dosett than non-followed-up patients. The followed-up patients presented to a greater extent DRPs when signing up for the service, and pharmacists’ interventions to solve DRPs were more often counselling or referral to prescriber, compared to the non-followed up patients.

A majority (79%) of the followed-up patients (n=1515) had at least one piece of advice documented at the registration meeting, 46% had at least one piece of advice that required specific follow-up evaluation, and 63% had at least one followed-up advice. Of the interventions that were specifically followed-up (n=3170), had 45% led to a better outcome, 49% led to no change in outcome and 6% led to a worse outcome.
Does medical, pharmaceutical or nursing education influence beliefs about medicines?

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Background: It has been suggested that health related beliefs are formed in an early age and stable during childhood (1). However, recent studies indicate that level of education (2) and knowledge about medicines (3) affect attitudes and general beliefs about medicines.

Objective: To analyse if education in medicine, pharmacy and nursing influence general beliefs about medicines. Further, to investigate general beliefs about medicines by background variables in university students.

Method: The students were registered as medicine, pharmacy, pharmaceutical bioscience, dispensing pharmacy, nursing and economy students (control group) at Göteborg University, Sweden. The data collection was performed twice: first year (2003) and third year (2005) students. Questionnaires were used and included the general part of Beliefs about Medicines Questionnaire (BMQ) (4, 5) and background questions: gender, age and own medicine experience.

Results: Of 642 registered first year students 2003, 450 filled out the questionnaire (70.1%). In 2005, 293 of 398 registered third year students completed the questionnaires (73.6%). Over 70% were women and half were 24 years or younger. Forty to seventy percent currently used OTC either/or prescribed medicines. General-Harm was 2.44, General-Benefit 4.15 and General-Overuse 3.56 among first year students. Among third year students General-Harm was 2.08, General-Benefit 4.40 and General-Overuse 3.42. Differences were found in general beliefs about medicines between the educations: e.g. medicine and pharmacy students saw medicines as more beneficial and less harmful compared to nursing students. According to linear regression analysis, level of education, level of nursing and pharmacy education, the sex of medicine students and experience of conventional and herbal medicines influenced General-Harm. Education in pharmacy and medicine, level of nursing and pharmacy education and experience of herbal medicines were associated with General-Overuse. Education in medicine, level of education and experience of conventional medicines influenced General-Benefit.

Discussion: It seems as if level and type of education in healthcare are important to general beliefs about medicines. In the future, many of these students will work with patients and hopefully for a common goal – a better and healthier life for the patient. Since different beliefs may exist between these professions it could result in different messages to the patient. It is important to educate future healthcare personnel the impact of education on beliefs and the impact of beliefs on communication.

Pharmacists’ experiences of drug marketing

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Pharmacists (BSc) are mainly responsible for customer service in Finnish pharmacies. They have a considerable role in selecting OTC-preparation for customers. After generic substitution, which was introduced in Finland on April 2003, they also have a role in choosing interchangeable medicine for customers. Pharmaceutical industry has increased marketing to pharmacies after generic substitution. However, there are only a few studies concerning marketing directed to pharmacists.

The aim of the study was to analyze what kind of marketing is directed to pharmacists and their experiences and thoughts about drug marketing. In addition, the aim was to study possible changes in marketing after generic substitution.

Pharmacists (BSc) working in pharmacies in Kuopio region were interviewed between September and November 2005. A qualitative semi-structured theme interview method was used, in which themes for the interviews were defined in advance, but no detailed questions were planned. Altogether 15 pharmacists were interviewed. All interviews were recorded and transcribed verbatim. Interviews were then divided into themes and issues under themes condensed so that the analysis could be made.

Majority of the pharmacists hold a positive attitude towards drug marketing. They regarded material produced by drug industry as a source of information. Marketing included written material sent by mail, visits of sales-representatives, seminars, free product samples and occasionally small gifts, e.g. pens, t-shirts, caps and socks. Especially visits by sales-representatives were experienced important. Prescription drug advertising has increased after generic substitution and companies use the price of the drug more in marketing.

Pharmacists thought that they recommend OTC-medicines according to customers needs. However, they mentioned a number of facts that affects recommendation, e.g. products reliability, reputation and consumption. Pharmacists told that customers inquired herbal food products on the basis of advertisements. However, pharmacists found it difficult to sell herbal food products because there is no evidence-based information about them.

It is worrying that pharmacists consider marketing as an information source. Further studies about the content of the information from the pharmaceutical companies are needed. In addition, the effects of the marketing should be defined.
The DARTS Tool for Assessing Internet-Based Medicines Information: A study among people with depression


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Background: People frequently use the Internet to access medicines information. However, the quality of Internet-based medicines information (IBMI) is highly variable. DARTS is a new quality assessment tool developed to assist consumers to appraise IBMI.

Objective: The objectives of the study were 1) to explore the technique and the criteria used by people with depression when they assess the quality of IBMI, 2) compare these criteria with those included in the DARTS tool (Date, Author, References, Type and Sponsor), and 3) to determine the perceived usefulness of DARTS tool among people with depression.

Methods: Six focus groups (67–109 minutes duration) were conducted with a cross-section of people with depression (n=29) in metropolitan Helsinki. The focus groups were digitally audio taped and transcribed verbatim. The transcripts were thematically content analyzed independently by two researchers.

Results: Focus group participants reported lacking the skills necessary to undertake a thorough quality assessment. However, most participants indicated they made an attempt to assess the quality of IBMI they retrieved. Purpose of the site, the owner of the site, sponsor, and references were commonly cited, although not systematically used factors in relation to quality assessment. The date the information was produced or updated was mentioned in only one focus group prior to participants being shown the DARTS tool. Participants appreciated the brevity of the DARTS tool and believed it would help them discriminate between high and low quality IBMI.

Conclusions: People with depression apply various criteria when appraising the quality of IBMI. The criteria they used were rather similar to the criteria listed in the DARTS and other quality assessment tools. The DARTS tool was perceived useful, concise, and focusing on the most relevant issues. It may assist people assess the quality of medicines information they access online, and could also serve as a reminder of the importance of quality assessment.
The Danes and Over-the-Counter Drugs: opinions, behaviour, and attitude

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Background: In October 2001 the retail distribution of over-the-counter drugs was deregulated. This made it possible to obtain over-the-counter drugs in supermarkets, Matas, kiosks, etc. The consumer preferences for these products have not been investigated since October 2001.

Objective: The purpose of this project is to investigate consumer preferences regarding over-the-counter drugs.

Methods: The method design is a cross section investigation based on representative random samples on the Danish population. The test samples were randomly chosen and 1500 Danes from the age of 15 upwards, living on Funen were extracted from the CPR-Register. 1081 have returned the questionnaire, out of which 818 wished to participate giving a respondent percentage of 54.5%. The collection of data took place from December 2002 till February 2003. The analysis of representation shows that the data can be considered as statistically representative of the Danish population from the age of 15 upwards.

Results: The investigation shows that consumers have different opinions on what the terms over-the-counter drugs and over-the-counter medicine cover, and which are everyday necessities also differ from official definitions. The general tendency is that men, women and age-groups all differ in their opinions on what these products are. Several young people see the prescription drugs as over-the-counter drugs. The products the consumers recently bought were mainly weak painkillers, cough medicine, throat-and-nose products. There was no difference as to which shopping channels men and women chose, however, there is a difference in age distribution. The two youngest age groups also buy these products in a supermarket. A little below half of the consumers state that they have not received information in connection with their latest purchase, but in most cases the same product had been purchased earlier. Particularly the age groups 25-44 years and 45-66 years had not received any information. Nine out of ten consumers prefer the pharmacy in cases where they have not tried the product before. There is no difference in sex and the attendance at the pharmacy rose with the age of consumers. Among other things the pharmacy was chosen because of “best guidance”, “qualified personnel” and “giving most confidence”. The consumers’ two primary sources of information are the pharmacies and the doctors.

Conclusion: It can be concluded that it is the older consumers particularly who have preferences in the choice of the pharmacy as a shopping channel and source of information. The younger consumers want more shopping channels, more sources of information, and more information. Generally there are few differences in sex.

Keywords: Over-the-counter drugs, consumers, ‘the new consumer’, opinions, behaviour and attitudes.
Medicine use among Finnish children during the past two decades – a review of available statistical data

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Medicines play an important role in treating many childhood diseases and symptoms. Yet, not all medicines that children could benefit from have been accurately studied in children, dosage forms are not always optimal for use in children, and the information on the use of medicines provided for the parents and children is still insufficient in many ways. The aim of this paper is to describe the trends in utilization of medicines among Finnish children during the past two decades, in order to provide background information for further studies.

For this presentation, the proportion of recipients of refunds on medicine expenses among children aged 0–15 years was gathered from the Finnish Statistics on Medicines published in 1987–2005 by National Agency for Medicines (NAM) and Social Insurance Institution (KELA). The information on the proportion of children entitled to special refunds¹ on medicines was drawn from the SOTKAnet Indicator Bank which is an information service maintained by National Research and Development Centre for Welfare and Health (STAKES). The prevalence figures of medicine use in Finnish children were obtained from the Finnish Health Care Surveys conducted in 1987 by KELA and in 1995/1996 by KELA and STAKES. The survey data had been collected by interviewing adult household members, and the study population consisted of 3131 children aged 0–14 years in 1987 and 2525 children in 1995/1996. Rearrangement of the above-mentioned data and some new calculations have been performed for this work.

The proportion of recipients of refunds on medicine expenses among children has been slightly declining; 54% of the children received refunds in 1987 as compared to 41% in 2005. Yet, the proportion among adults has not been noticeably declining. The proportion of children entitled to special refunds has been increasing from 1990 till 2002, but a slight decline can be seen after that, 2.3% of the children were entitled to special refunds in 1990, 4.4% in 2002 and 4.2% in 2005. In 2005, the proportion of boys entitled to special refunds was 1.4 times higher than that of girls. According to the Finnish Health Care Surveys the proportion of children having used prescribed medicines at the time of the interview significantly increased since 1987 till 1995/1996; 12% of children had used prescribed medicines in 1987 and 17% in 1995/1996. The proportion of children using vitamin supplements also increased, being 7% in 1987 and 17% in 1996. The use of non-prescription medicines (excluding vitamin supplements) declined, 12% of children used them in 1987 compared to 10% in 1996. In addition, a higher proportion of boys than girls had used prescription medicines, but a slightly higher proportion of girls than boys had used non-prescription medicines.

In conclusion, the use of prescription medicines and vitamins in children has been increasing, while the use of non-prescription medicines has remained quite constant or even slightly declined. At the same time, the proportion of recipients of refunds on medicine expenses has diminished.

¹An entitlement to special refunds (72% or 100%) can be granted if the disease is chronic and severe and requires long-term medication.
Socio-demographic characteristics of users of dose-dispensed medicine and associated costs of medicine and health care: A register-based analysis

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Objective
To describe socio-demographic characteristics of users of dose-dispensed medicine (DDM) and to assess medicine use and medicine costs, hospitalisations and costs in a cohort of DDM patients.

Methods
A profile of all Danish patients using DDM in November 2004 (n=19,004) was generated from two registers (Danish Register of Medicinal Product Statistics and the Danish Population Register). A six-month before-and-after analysis was performed on a cohort of patients aged 65+ (n=4,491) focusing on use and cost of medicines and hospitalisations (Danish Patient Register).

Results
64% of the DDM users were women, 82% were over the age of 60 years and 77% were living at home. Patients used 5.3 different DDMs and 1.2 other medicines.

The cohort analysis showed that the total medicine use increased from 181.4 DDD per patient per month 190.6 DDD after application of dose-dispensing. The half-year usage increased from 1,022 DDD to 1,240 DDD and the medicine costs increased by 29%. The proportion of patients being hospitalised decreased from 0.06 to 0.04 and the average number of days in hospital decreased from 9.7 days to 5.6. The total hospital costs decreased with 39%.

Conclusion
DDM was primarily supplied to elderly people living in their own home. 75% of the total number of medicines was dose-dispensed. The introduction of DDM increased the use and costs of medicine and reduced the costs of hospital care. Both the proportion of patients hospitalised and the length of hospital stays decreased.

Keywords: Dose-dispensed medicine, Socio-demographic characteristics, Drug utilisation, Drug costs, Hospitalisation. Hospital costs

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Effect of reimbursement restrictions on use and costs of statins

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Background
Cholesterol-lowering statins have rapidly entered into treatment practices. In Finland, costs of statins increased continuously until the beginning of this millennium (Paldan and Klaukka 2003). Generic substitution was introduced in 2003, and it created price competition and lowered remarkably the prices of those statins which were not patent protected. This concerned especially simvastatin and lovastatin, whereas the prices of atorvastatin and rosvastatin remained unchanged. In October 2006, a new reimbursement restriction was introduced for atorvastatin and rosvastatin: they are reimbursed only in severe dyslipidemias in high-risk patients, if desired cholesterol levels have not been achieved with diet, weight reduction or using less expensive statins, or if such statins cannot be used due to adverse effects or interactions.

Aims
To find out how the new restriction was implemented, and how it affected the numbers of users and prescribing costs.

Materials and methods
A retrospective prescription database study was carried out. All reimbursed statin purchases in the nationwide Prescription Register of the Social Insurance Institution in Finland from January 2006–June 2007 were included. The register covers 97% of the statin purchases in the country.

Results
Almost 10% of the whole population of Finland used statins in 2006. The restriction to the reimbursement of atorvastatin and rosvastatin in October 2006 immediately decreased the number of users of both drugs, whereas the use of simvastatin, the least expensive alternative on the market, increased considerably. The average cost per user in October–December 2006 was 144 € for atorvastatin, 115 € for rosvastatin and 14 € for simvastatin. Although testing of less expensive statins was a prerequisite for reimbursement of atorvastatin or rosvastatin, 34% of the users of these drugs had not used another statin before.

Discussion
The reimbursement restriction had an influence on statin use even though it was not completely followed. The increasing drug bill is a concern for many stakeholders. The drug reimbursement system is a powerful tool in directing the money flows to the directions favoured by health authorities. It remains to be seen whether the cost savings gained will persist.


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Generic substitution in the Finnish press—viewpoints of the drug industry and the authorities

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Background and aims: Generic substitution was introduced in Finland at the beginning of April 2003. It was a considerable health policy reform which was preceded by animated debate in the media. The aim of this study was to analyse articles and other publications published about the generic substitution in Finland. Because the drug industry and the public authorities had quite different opinions about the new law, we chose to study the viewpoints of both. The aim was to analyse the topics of the articles, and the attitude of the drug industry and the authorities toward generic substitution.

Materials and methods: The research material included articles discussing generic substitution published either by the drug industry or by the authorities in Finland during 1.1.2002-30.6.2003. Other publications (e.g. newspapers) were also included if their articles highlighted viewpoints (e.g. interviews) of the drug industry or the authorities. As the drug industry was defined the drug companies, the drug wholesales and the Pharma Industry Finland which is an association of the pharmaceutical industry in Finland. As the authorities was defined The Social Insurance Institution of Finland, the National Agency for Medicines and the Ministry of Social Affairs and Health. The articles were collated from big national and regional newspapers, magazines and consumer brochures, professional magazines for physicians and pharmacists and formal notifications issued by different parties. The research material was analysed with methods of quantitative and qualitative content analysis.

Results: The research material consisted of 177 articles. Of those, 37 (21 %) had been published by the drug industry and 21 (12 %) by the authorities. Most articles (67 %) had been published by other parties, usually newspapers. Of those, the officials were interviewed in 67 %, and the representatives of drug industry in 40 %. The most common topics of the all publications were the prices of pharmaceutical products (67 %) and drug safety and compliance (44 %). In their own publications, the authorities usually wrote about the definition of generic substitution (62 %), the definition of generic drugs (52 %) and refusals of generic substitution (52 %). In proportion, the drug industry usually wrote about drug safety and compliance (76 %) and the prices of pharmaceutical products (62 %). The drug industry had a negative and the authorities a positive attitude towards generic substitution.
Parents’ adherence when administering cytotoxic drugs to their children

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Aims - When a child gets a leukemia or lymphoma diagnosis the treatment is usually chemotherapy (cytotoxic drugs) for two years or more. Administration of these drugs is an important part of family life when in periods the child is in and out of hospital, and the drugs have to be administered at home. The aim of the present study was to investigate what factors had influence on the adherence of Norwegian parents when giving such drugs to their children, and also what feelings and attitudes they had about it.

Method - Nineteen parents of children with leukemia or lymphoma took part in a total of five focus groups, each lasting for about two hours, during winter 2004/2005. They had all given their informed consent. The children were recruited from the three Oslo hospitals with this type of patients. The study was approved by the regional ethics' committee.

Results - The parents reported that their adherence was high, and meant that every dose was necessary because of the seriousness of the disease, even if dangerous side effects sometimes occurred. They were occupied with doing what they could to prevent a relapse. They had strict routines for the drug administration, but claimed it more difficult to remember if drugs were to be given several times a day. Despite other people's pushing they did not give herbs or other natural products of fear for causing negative interactions with the prescribed drugs.
The age of the children was an important factor. Young children did not understand the necessity of taking the drugs, and especially the taste was a problem. Older children took sometimes responsibility for their own medication, but could forget to take their medicines. Most parents would have liked to have more information about the disease as well as about the medicines. They were especially interested to know more about side effects, but meant that the hospital staff did not tell too much not to frighten them.

Conclusions - The parents in the study reported to be highly adherent when administering cytotoxic drugs to their children. The seriousness of the disease and anxiety for relapses were the main reasons. The age of the child, the taste of the medicine and a complex drug regimen were factors that could cause a lower adherence.
The quality of pharmacy students’ internship training in community pharmacies: views of the supervisors

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Six months internship training is an obligatory and an important part of the bachelor’s curriculum in pharmacy studies. The aim of the training is to enhance the knowledge and skills that the students have gained from the University and to learn what the pharmacy profession is all about. During the practical training students are able to rehearse their practical skills based on their theoretical knowledge.

The Faculty of Pharmacy at the University of Helsinki has made considerable changes to improve the internship training during the last three years. The Faculty has established a permanent position to co-ordinate and manage all the elements concerning the practical training. Students have now more orientation sessions where they gain information concerning internship training then before. An e-learning platform has been established to support the students before and during the internship training. The platform contains different kind of instructions, including their personal study plan for training, and several discussion forums where students can communicate with the co-ordinator and their peers. Students have feedback sessions after the training and work books that they fill during the training. Work books are also integrated to the courses before and after the training.

The aim of this study was to explore elements that make the practical training successful. The main emphasis was on the perceptions of the supervisors. The survey was conducted by two pharmacy students as a part of their bachelor’s thesis in electronic format and was pilot-tested for face-validity. The questionnaire was sent to all the teaching-pharmacies of the Faculty of Pharmacy at the University of Helsinki that had a student as a trainee in year 2006. The questionnaire was sent to 123 pharmacies and the response rate was 58% (n=71).

Almost one third (27%) responded that they take into consideration student’s previous experience from working in a pharmacy. The personal study plan was also used as a tool in the planning of the training period and it was seen as a good way of carrying out the internship training. One third (31%) of the respondents thought that the internship training was of high quality and successful when students where enthusiastic about their own work. Supervisors at the teaching pharmacies also considered students’ development of self-confidence and independence at work as the most important part of successful training. The work book that is used during the training was considered to be a good tool to support the training period. The majority of the respondents (86%) allowed students to complete their workbooks during working hours but they also claimed that it shouldn’t be done during rush hours and it shouldn’t distract from their daily work in the pharmacy.

The study revealed that not all teaching-pharmacies understand the importance of the workbook in internship training. Some teaching-pharmacies thought that the students’ main task was to rehearse how to do the daily work. The study book was seen as not such an important component of the training.

Internship training requires investments from the students, the University of Helsinki and the teaching-pharmacies. More attention should be paid to the development of the internship training and the co-operation between students, teaching-pharmacies and University. In the future it would be worthwhile to stress the importance of the work book in to the teaching-pharmacies as a useful tool to improve the students’ skills. High-quality practical training guarantees a skilled pharmacy workforce also in the future.
Problem prescriptions - prescription errors requiring contact with the prescriber before dispensing in Estonia, Norway and Sweden

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Aim To investigate and compare the frequency and nature of prescriptions errors requiring contact with the prescriber at community pharmacies in Estonia, Norway and Sweden.

Outcome measurement Prescriptions with errors or ambiguities where the pharmacist decided to contact the prescriber to correct, clarify or complete the information on the prescription.

Method A protocol, based on a scheme originally presented by Michael Rupp (1), revised and developed by Amanda Kennedy (2) and translated and transformed to the Nordic context by Svein Haavik (3), was used in all three settings. In Norway the protocol was self-completed by the pharmacists; in Sweden and Estonia observers (trained students) recorded and classified the interventions.

Setting Estonia – 4 community pharmacies in three cities; Norway – 9 community pharmacies in southern and western Norway; Sweden – 6 community pharmacies in 6 Swedish cities and 6 public pharmacies at 6 hospitals in Sweden;

Results The total numbers of dispensed prescriptions were – Estonia 13,221; Norway 69,315; Sweden 49,657 (community pharmacies) and 36,840 (public pharmacies at hospitals). The proportion of prescriptions where pharmacists contacted the prescriber in was 1.47% in Estonia; 0.46% in Norway; 0.41 and 0.78% respectively in Sweden. At the public hospital pharmacies in Sweden, 96% of the problem prescriptions were new prescriptions compared to about 80% at the community pharmacies in Estonia, Norway and Sweden. In Estonia 73% of the problem prescriptions were manually written compared to 11% in Norway, 12% at community pharmacies and 26% at public hospital pharmacies in Sweden. Administrative problems – reimbursement issues; prescriber data and distribution and licensing issues – were the reason for more than one third (34-43%) of all contacts with the prescribers in all settings. However, the patterns of prescription problems with potential clinical hazards varied – in Estonia and Norway, errors concerning strength, administration form and number of doses were the most common errors and constituted 31 and 24% of the problems. In Sweden, errors concerning the prescribed dosage were the most common reasons (37% at public pharmacies at hospitals and 27% at community pharmacies).

Conclusion The proportion of problem prescriptions requiring a clarifying contact with the prescriber was higher in Estonia compared to Norway and Sweden. The main reason may be that most prescriptions in Estonia were manually written. Administrative problems (reimbursement and availability of prescribed products) constituted a similar large portion in the three countries. However, prescription problems with potential clinical consequences for the patients, varied.

References
Evaluation of a Categorization Scheme for Assessing Pharmacy Internship Students’ Levels of Reflection.

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Objective. The development of the professional role of pharmacists can be mediated through a reflective approach both in undergraduate education and in professional settings.¹ The aim was to test the reliability, feasibility, and responsiveness of a categorization scheme for assessing pharmacy internship students’ levels of reflection.

Methods. Pharmacy interns at Uppsala University were asked to write a reflective essay about patient counseling at the start and end of their internships. A modified version of Kember et al.‘s categorization scheme² for assessing the level of reflection was used to categorize the essays. In the scheme, the categories build upon each other as the students reach higher levels. The level of reflective thinking increases from the bottom to the top. Levels 1 to 3 are non-reflective, while levels 4 to 6 are reflective.

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<td>4. Content reflection</td>
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<td>3. Introspection</td>
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<td>2. Thoughtful action</td>
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<td>1. Habitual action</td>
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To better guide the raters in performing the categorization, each level of reflection in the categorizing scheme was exemplified by a pharmacy-specific example extracted from the essays from the pilot study.

Results. The evaluation of the categorization scheme showed that it has a good inter-rater reliability, feasibility, and responsiveness. The inter-rater reliability of the 182 essays was κ=0.63. The inter-rater reliability score indicate that the raters interpreted and applied the coding scheme consistently. The mean time for categorization was 3 minutes per essay which is reasonable for use in larger settings. According to the responsiveness test, students’ levels of reflectivity increased over time during the internship course as measured by this assessment method, and. (p<0.001)

Conclusions. The categorization scheme seems feasible when assessing reflection based on written essays. This scheme is potentially useful in educational settings related to pharmacy practice, but needs further validation.

Psychotropic Drug Use among Children in Iceland: Does Stimulant Treatment Improve Academic Performance among ADHD Children?

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Background
Transnational increases in psychotropic medication use among children have given rise to both recognition and concern of the effectiveness and safety of treatment. Indicators suggest that psychotropic drug use, especially use of stimulants and antidepressants, is higher among Icelandic children than among children in the neighboring countries. No studies, using an entire national pediatric population, exist on stimulants’ effects on academic performance for children with ADHD.

Objectives
The study is divided into three sub-studies with the following objectives. First, to determine the prevalence and patterns of psychotropic drug use among children (0-18 years) in Iceland, during the years 2003 to 2008. The second aim is to carry out a country-wise comparison of psychotropic drug use among children living in the Nordic countries. The third, and main research objective, will be to answer if stimulant drug treatment has a positive effect on academic performance among children with ADHD.

Data (and Methods)
Nation-wide registry data will be used in all three sub-studies. The Icelandic Register on Prescribed Drugs contains information for all dispensed prescription medication to the Icelandic population since 2003. In addition to being based on figures from an entire nation the data contain individual level information, including a personal identification number for both patients and physicians. The country-wise comparison of pediatric psychotropic drug use will be based on data from similar national data sources from each Nordic country. In the third study phase, the Icelandic Register on Prescribed Drugs will be linked to the National Educational Testing Institute Database via personal identification number.

Scientific Value
This will be the first comprehensive study on psychotropic medication utilization among the Icelandic pediatric population. It will also be the first study to report on and compare psychotropic medication prevalence rates among children of the Nordic countries. The first two sub-studies should serve as a basis for further comparative research on psychotropic medication utilization, with respect to both time and location. For the third sub-study, the intention is to answer an important question regarding the effectiveness of stimulant medication treatment. Studies on stimulant medication therapy in relation to academic achievement among ADHD children have mainly been conducted on small study populations, none have encompassed an entire nation. The results of this study phase, as well as the former two sub-studies, should enhance evidence based decision making of various public and private agencies involved in child health, well-being and education.
Reporting adverse drug reactions

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**Background:** Reporting adverse drug reactions (ADRs) has traditionally been the sole province of health care professionals, but a few countries, including Denmark, have also allowed reporting by consumers. There has been no systematic study of whether the practice of reporting ADRs by lay people in addition to health care professionals has resulted in new knowledge about adverse drug reactions. The purpose of this study is to analyse the characteristics of ADR reports from consumers, including whether they differ from the ADR reports from health care professionals.

**Methods:** We analysed spontaneous ADR reports submitted to the Danish ADR database from 2004 to 2006 (N = 15,531 ADRs) in order to compare the distribution of the ADRs reported by consumers and non-consumers in terms of category of person submitting the report, seriousness criterion of the reported ADRs, ATC level for the suspected drugs and system organ class for the reported ADRs. Data were analysed using the multiplicative Poisson model.

**Findings:** The reporting pattern of consumers and non-consumers differs with respect to the number of ADRs, the degree of seriousness of the ADRs reported, the distribution of ADRs by organ classes, and which drugs are reported to cause ADRs. The relative share of consumer ADRs is either significantly higher or lower than the relative share of non-consumer reports in the following organ classes: Blood and lymphatic system disorders; Ear and labyrinth disorders; Hepatobiliary disorders; Infections and infestations; Investigations; Nervous system disorders; Psychiatric disorders; Reproductive system and breast disorders. The relative share of consumer ADRs is either significantly higher or lower than the relative share of non-consumer reports in the ATC groups B, C, D, J, L, N, P, S and V. Consumers report information about ADRs that is not reported by non-consumers.

**Interpretation:** Reports from consumers contribute new information about ADRs in terms of system organ class level, such as Nervous system disorders, as well as ATC level, such as group N.

This study does not show to which extent this information from consumers contributes new knowledge about ADRs. Further studies should be conducted in order to characterise the precise differences between consumer and non-consumer ADR reports in order to evaluate whether the information in consumer reports add new knowledge about ADRs and how to address this.
Notes: