

EUROPEAN DRUG UTILISATION RESEARCH GROUP CONFERENCE 2020

Medicines: benefits and burdens



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SELECTED ABSTRACTS FOR ORAL PRESENTATION ON THURSDAY, 5 MARCH 2020

Session T-TS1: The role of drug utilisation data in evaluating safety of drug use

T-TS1-1

Nature, frequency and relevance of prescription modifications in Dutch community pharmacies [#156]

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Background: As part of the dispensing process, pharmacists check every prescription for pharmacotherapeutic appropriateness, administrative correctness and logistic availability. We investigated the frequency, nature, and relevance of prescription modifications by community pharmacists in the Netherlands.

Methods: In this cross-sectional study Dutch community pharmacists documented all prescription modifications that they performed during one predetermined day. The pharmacists classified the nature of the prescription modification as potential drug related problem (DRP), administrative or logistic problem. A random sample of 160 modifications which were classified as potential DRP were evaluated by a multidisciplinary expert panel. They judged the relevance of the modifications in general and regarding the aspects pharmacotherapeutic effectiveness, medication safety, efficiency and ease of use.

Results: 275 pharmacists completed the study. Out of 98,125 prescriptions, 5.5% were modified, corresponding to a mean of 19.6 modifications per pharmacy on the study day. The incidence of prescription modifications that solved potential DRPs was 1.8%. The incidence of administrative inaccuracies was 1.3%, and 2.4% of all prescriptions were modified because of logistic issues.

In a sample of 160 prescriptions with a potential DRP, 60% were judged as relevant (56.3%) or very relevant (4.2%) in general; 25% were judged to be a major improvement in at least one of the aspects effectiveness, medication safety, efficiency and ease of use.

Conclusion: Pharmacists modified a considerable proportion of prescriptions and a third of the modifications were because of potential DRPs. Over half of a sample of potential DRPs were judged as relevant or very relevant.

Sex differences in reported adverse drug reactions are primarily seen in the first weeks after metformin initiation [#87]

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Background: Women experience generally more often metformin-associated adverse drug reactions (ADRs) than men. We assessed whether sex differences in reported ADRs for metformin are observed at different time periods after initiation, and to explore the concurrence with sex differences in the dose over time.

Methods: This study had a longitudinal design using data about patients initiating metformin collected by the Dutch National Pharmacovigilance Center Lareb through their Intensive Monitoring program. Patients completed a web-based questionnaire at six time periods after initiation (i.e. 2, 6 weeks, 3, 6, 9, 12 months). The outcome variables were the proportion of patients reporting any ADR (primary) and the dose of metformin (secondary). Sex differences in the proportions of ADRs and metformin dose were tested at each time period using respectively Pearson Chi-Squared tests and Wilcoxon rank-sum tests. Using Bonferroni adjustment for multiple testing, a P-value <0.01 was considered statistically significant.

Results: The number of included patients was 1,712 (40.9% women). Women reported more often an ADR than men, which was statistically significant at the assessment at 2 weeks (34% versus 25%, $P < 0.001$), and 6 weeks (37% versus 28%, $P = 0.001$) after initiation. For all time periods, women reported to be prescribed a lower dose than men which became statistically significant at the 9 months assessment ($P < 0.01$).

Conclusion: Sex differences in reported ADRs were seen in the first weeks after metformin initiation, whereas differences in dosing were observed after several months. This suggests that patients might benefit from being prescribed lower metformin doses at treatment initiation.

Can we trust in all patient reported drug allergies? Questionnaire based survey [#141]

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Background: According to the “primum nil nocere” rule, acknowledgement of patients’ drug allergy is an important drug-safety issue. On the other hand, inadequate labelling of minor adverse reactions as drug allergy can impair optimal drug choice. In the present work, we aimed to access the prevalence of self-reported drug allergy, and based on detailed medical anamnesis, aimed to differentiate the potentially allergic adverse drug reactions (ADR).

Methods: We conducted anonymous patient interviews with structured questionnaire at different inpatient departments of the University of Szeged. The study was performed in 2018-2019, on nineteen different study days.

Results: Out of the 1522 inpatients during the study days, 242 patients (16%) considered himself/herself as drug “allergic”. Most of the patients (n=164) were allergic to one active agent, 43 patients were allergic to two active agents while 35 were polysensitized (allergic to 3 or more antibacterials). Evaluation of the adverse reactions (n=383) showed that 173 drug reactions (45% of all ADRs) had a strong grounding to be allergic, while in case of 65 ADR allergic nature/origin could be excluded. Further 145 drug reactions could not be classified due to recall problems/controversial information. Unintended re-exposition with the ‘culprit’ drug happened in 11 cases (6 %).

Conclusion: Many inadequate allergy labelling can be excluded by simple targeted questions. Such screening can be executed by hospital pharmacists. Accurate recording of the ADR by the observing physician would be of further help to exclude/confirm allergic cases.

**Medication reconciliation at hospital admission and discharge in a cardiology unit: a pilot study
[#128]**

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Background: To promote patient safety in hospital transitions, the implementation of medication reconciliation (MR) has been encouraged. The objective of this study was to evaluate the frequency of medication discrepancies in hospital admission and discharge at the cardiology unit.

Methods: It is a pilot observational study carried out in a University Hospital in the southwestern of Brazil. Clinical pharmacists performed MR by collecting medication history and comparing with admission and discharge prescriptions to identify medication discrepancies. Descriptive analysis was performed to characterize the studied population, medication discrepancies and medication errors. Patients younger (<18 years), in contact isolation precautions and hospitalized for a period less than 24 hours were excluded.

Results: During August 2019, MR was conducted with 30 patients (mean age: 56 years), 53% of whom were woman. The average number of medications used per patient at home, at hospital admission and at discharge was 6,1 ($\pm 3,1$), 8,5 ($\pm 3,2$) and 6,6 ($\pm 1,8$), respectively. Of the 332 reconciled medicines at admission, 15 unintentional discrepancies and 175 undocumented intentional discrepancies were found. At discharge, 23 undocumented intentional discrepancies and 5 unintentional discrepancies were found. Unintentional discrepancies were present in 36,7% patients at admission and in 33,3% patients at discharge. The drug omission was the most frequent reconciliation error (73,3% at admission and 100% at discharge). Of the 20 pharmaceutical interventions, 12 were accepted and generated change in prescription.

Conclusion: These results show the need to improve MR, with integration between prescribers, nurses and pharmacists to identify discrepancies and prevent harm to patients.

Session T-TS2: Improving the accuracy of medication adherence assessment

T-TS2-1

Real-world evaluation of the impact of statin intensity on adherence, persistence and discontinuing of statin therapy: evidence from the Scottish population [#18]

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Background: Recent treatment guidelines recommend high intensity statins for secondary prevention; however, the impact on patients' medication taking behaviour is unknown. This study aimed to address this using Scottish datasets.

Methods: Retrospective cohort study, using the Scottish linked electronic health records, comprising adult patients (≥18 years) newly initiating statins between Jan/2010 and Dec/2015. Study outcomes were adherence, discontinuation, and persistence to treatment, stratified by three exposure groups (high, moderate, and low intensity) based on the level of cholesterol reduction. Discontinuation and persistence were calculated using the refill-gap and the anniversary methods (admissible gap 60 days). Proportion of Days Covered was used as a proxy for adherence. Kaplan-Meier survival curves and Cox Proportional Hazard models were used to evaluate discontinuation. Associations between adherence, persistence and statin intensity were assessed using logistic regression models; analyses were adjusted for the main confounders.

Results: 73,716 patients with a mean age of 61.4±12.6years were included; the majority (88.3%) initiated on moderate intensity statins. Discontinuation rates differed significantly between intensity levels, with high intensity patients 57% less likely to discontinue treatment compared to moderate intensity (HR 0.43 [95% CI 0.34 – 0.55]; no prior CVD: 0.80 [0.74 – 0.86]). Persistence declined over time. High intensity patients had the highest persistence rates at all analysed time points. Overall adherence was 52.6%; higher among high-intensity (63.7%).

Conclusion: Interestingly, high intensity statins was associated with better persistence and adherence to therapy; however, overall long-term persistence and adherence to statins therapy remain a challenge, particularly among patients without prior CVD.

Predictors of different types of non-adherence to antihypertensive or antihyperlipidemic drugs among patients with diabetes: a multicenter study in Indonesia [#170]

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Background: To develop tailored and targeted interventions for addressing non-adherence, it is important to identify underlying factors. The aim of this study is to identify predictors of intentional and unintentional non-adherence to antihypertensive or antihyperlipidemic drugs among patients with type 2 diabetes in Indonesia.

Methods: We conducted a multicenter cross-sectional survey among patients with type 2 diabetes using either antihypertensive or antihyperlipidemic drugs in four regions in Indonesia. Intentional and unintentional non-adherence were assessed using Medication Adherence Report Scale. We applied multinomial logistic regression to assess associations of medication beliefs, sociodemographic and clinical-related factors to these different types of non-adherence and report Odds Ratios (OR) with 95% Confidence Intervals (CI).

Results: Of the 571 diabetes patients, 45.5% and 52.7% were non-adherent to antihypertensive and antihyperlipidemic drugs, respectively. A lower necessity belief was a predictor of all types of non-adherence to antihypertensive drugs, while younger patients were more likely to be adherent (OR: 0.06; 95%CI: 0.01–0.49). For antihyperlipidemic drugs, higher concerns beliefs were a predictor of unintentional (OR: 1.11; 95% CI: 1.01–1.22) and intentional (OR: 1.19; 95%CI: 1.03–1.37) non-adherence, while longer duration of diabetes was predictor of intentional non-adherence (OR: 1.16; 95%CI: 1.04–1.30). Patients with high necessity beliefs were more likely to be adherent to antihyperlipidemic drugs (OR: 0.89; 95%CI: 0.80–0.98).

Conclusion: Medication beliefs were predictors for different types of non-adherence to antihypertensive as well as to antihyperlipidemic drugs. More attention should be paid by healthcare providers to identify and address medication beliefs during patient counselling.

Non-persistence with statin treatment in patients following an ischemic stroke [#6]

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Background: Administration of statins in patients with a recent stroke, regardless of their serum cholesterol levels, represents a basic tool of secondary prevention of stroke recurrence. Our study was aimed at evaluating non-persistence with statin therapy in patients after an ischemic stroke and identifying patient-related characteristics that influence the risk of non-persistence.

Methods: The database of the largest health insurance provider of the Slovak Republic served as a source of data for our study. Our study cohort included 4147 stroke patients (52.0% of them women), in whom statin therapy was initiated between 1 January 2010 and 31 December 2010. Patients were followed for three years from the index date. Patients with a treatment gap of at least 6 months without any statin prescription were considered as non-persistent. The Cox proportional hazards model was used to identify patient-associated characteristics predicting the patient's risk for non-persistence.

Results: At the end of the follow-up period, 45.5% of patients were non-persistent with statin treatment. Older age ≥ 65 years (hazard ratio HR=0.81), diabetes mellitus (HR=0.79), arterial hypertension (HR=0.90), dementia (HR=0.84) hypercholesterolemia (HR=0.61) and polypharmacy (HR=0.89) represented factors decreasing the patient's probability for becoming non-persistent.

Conclusion: The results of our study suggest that in stroke patients aged < 65 years and those taking < 6 drugs or without certain comorbid conditions special attention should be paid in terms of their persistence with statin treatment if secondary preventive measures are to be successful.

T-TS2-4

Asthma medicine compliance determinants among 20,157 individuals from the general population [#57]

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Background: Compliance to asthma medicines is of crucial importance for successful disease management. Research on determinants of asthma medicine compliance in the general population is sparse. We identified and ranked asthma medicine compliance determinants using data from 20,157 adults from the Danish General Suburban Population Study.

Methods: We used self-reported data for asthma diagnosis and compliance to asthma medicine, and self-reported and clinical data for determinants of asthma medicine compliance. We ranked asthma medicine compliance determinants based on magnitude of odds ratios (ORs), and the population attributable risks (PARs).

Results: Among 20,157 individuals from the general population (45.5% men, average age 56.8), 1128 (6%) currently suffered from asthma and 822 (73%) of these were asthma medicine compliant. ORs for the three top-ranked determinants were 4.0 (95% CI, 2.9-5.4) for asthma attacks within the past year, 2.9 (95% CI, 2.0-4.1) for age above 57 years, and 1.63 (95% CI, 1.0-2.6) for shortness of breath. PARs for the three top-ranked determinants were 68% for asthma attacks within the past year, 46% for age above 57 years, and 24% for asthma diagnosed after the age of 25 years.

Conclusion: In the general population, individuals without or with mild asthma symptoms (i.e. without a recent asthma attack, being of younger age, having no shortness of breath) were more likely asthma medicine noncompliant. The importance of maintaining asthma medicine compliance even in the absence of symptoms should be communicated better to the general population.

Session T-TS3: Challenges for drug and health policy

T-TS3-1

Sex proportionality in pre-clinical and clinical trials evaluated in the dossiers supporting marketing approval [#88]

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Background: Concerns have been raised about women being underrepresented in drug trials and a lack of sex-specific analyses on drug responses. We aimed to assess to what extent women were proportionally to disease prevalence included in all phases of drug development, and sex-specific data on efficacy and safety is available in the dossiers supporting marketing approval.

Methods: Data were extracted from dossiers submitted to the Dutch Medicines Evaluation Board. Preclinical animal studies, clinical pharmacokinetic (PK) studies and phase 3 clinical trials of drugs approved between 2011-2015 for the treatment of hepatitis C, HIV, depression, schizophrenia, epilepsy, heart failure, thrombosis, hypercholesterolemia, and diabetes were evaluated. Descriptive statistics were used and participation to prevalence ratios (PPR) were calculated.

Results: Dossiers of 23 new drugs were evaluated. Of the animal pharmacodynamic studies, 86% included males only. An equal representation of male and female animals was present in the safety studies. Women were included in the clinical PK studies. Their number was generally lower than prevalence rates but differences were shown across trial phases and diseases. Proportional representation of women in the phase 3 clinical trials was observed for depression (PPR: 1.02), epilepsy (PPR: 0.98), thrombosis (PPR: 1.04), and diabetes (PPR: 0.92). All dossiers contained sex-specific information on efficacy and safety.

Conclusion: Women are included throughout all phases of clinical drug research and sex-specific information is available in the dossiers. For some diseases (e.g. heart failure), the number of included women is relatively low compared to disease prevalence rates.

T-TS3-2

The impact of regulatory guidance on valproate prescribing and harm reduction for females of childbearing potential in NHS Scotland [#35]

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Background: Valproate (VPA) is an established medicine for epilepsy, bipolar disorder and migraine. However it is a known teratogen and in utero exposure can cause cognitive impairment and developmental delay. Since 2014 regulators have issued a series of strengthened guidance for prescribing VPA to females of childbearing potential. Using the Scottish national prescribing information system (PIS) we report the impact of these on VPA prescribing.

Methods: All VPA prescriptions to females between January 2010 and December 2018 were extracted from PIS. The number of patients treated per calendar quarter by age band (<14years; 14-45years; >45years) was analysed using Joinpoint models. Incident VPA prescribing, defined as first prescription within the dataset, was similarly analysed from January 2011

Results: Between 2018 and 2010, females receiving VPA declined from 12 602 to 9594 (-24%) overall; (<14years: -49.7%; 14-45years: -49.4%; >45years: -4.9%). Incident prescribing reduced even more from 1441 new patients in 2011 to 311 in 2018, (-78.4%) overall; (<14years: -81.1%; 14-45years: -89.2%; >45years: -68.2%). Joinpoint identified that the rate of decline accelerated in 2014 quarter 3 and 2018 quarter 1 among all aged 14-45years and from 2014 quarter 2 for incident prescribing.

Conclusions: There was a marked decline in VPA prescribing among females of reproductive age (14-45 years) and those (<14years) who will become so, which even more marked in relation to new initiations of VPA. Acceleration in the rates of decline coincided with the initial regulatory guidance in 2014 and again with the most recent and most restrictive guidance in 2018.

Serious adverse events with high-cost drugs accessed through litigation in Brazil [#2]

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Background: Brazilian patients have legal right to access unlicensed drugs undergoing clinical research, if there is evidence of efficacy and safety. This study investigated the occurrence of serious adverse events related to very high-cost medicines from clinical studies and obtained by patients through health litigation.

Methods: A descriptive study using secondary data investigated unlicensed medicines obtained through lawsuits from 2010 to 2017, costing more than 1 million Brazilian reais (BRL), adjusted by the Brazilian Consumer Index to July 2017. Data sources were the Brazilian Health Surveillance Agency Registry (DATAVISA) and Adverse Events in Clinical Studies (NotivisaEC) Databases. Medicines were categorized by the Anatomical Therapeutic Chemical classification to level 03 and events by the WHO Adverse Drug Reaction Terminology. Patient age was classified according to NIH (US). The study received ethical approval by the UnB IRB.

Results: In the period, 812 drugs in clinical studies were obtained through litigation. 44 (5.4%) were related to 1248 serious events. Total Brazilian Government expenditure was 3.2 billion BRL. Class L04A (n=7) presented greater expenditures (over 1.8 billion BRL). 196 deaths occurred and L01X was the most involved category (49.5%). Most other serious events (n=419) and aftereffects (n=42) were related to L01X, including effects in children and adolescents.

Conclusion: Very high-cost drugs paid for by the government and obtained through health litigation are related to deaths and serious adverse events in Brazil.

Can cross-country collaborations improve access to medicines? [#149]

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Background: In recent years, governments responded to the challenge of ensuring affordable access to new medicines by working together. The study aims to investigate cross-country collaborations in Europe, to assess their performance and to identify facilitating factors and barriers.

Methods: The Baltic Procurement initiative, Beneluxa initiative, Fair and Affordable Pricing, Nordic Pharmaceutical Forum (NPF) and Valletta Declaration were analysed based on a literature and documents review and 19 semi-structured interviews.

Results: The Baltic Procurement Initiative and NPF collaborate on joint procurement, whereas the other collaborations aim at performing joint price and/or reimbursement negotiations. Joint health technology assessments and horizon scanning are further (planned) tasks in most of these initiatives. Information sharing is a key activity in all collaborations.

Except for the Baltic Procurement Initiative, the cross-country collaborations were established a few years ago, and some are still in the process of developing a working structure.

Trust between the members, political support, commitment of highly qualified technical experts, procedural rules and information technology were identified as supporting factors. Challenges include legal barriers, differences between the national pricing and reimbursement systems, language, resources and reluctance of industry to negotiate with the collaboration.

Conclusion: Cross-country collaborations appear to be a promising approach for improving access to medicines. However, as most have not yet established a monitoring and evaluation framework, it is difficult to assess the performance in terms of endpoints and efficiency. Experts involved in the cross-country collaborations consider these vital, in particular due to the exchange of information.

Session T-TS4: Psychotropic drug use

T-TS4-1

Using an e-Delphi consensus technique to develop mental health related indicators to assess prescribing safety [#26]

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Background: Preventable medication-related safety incidents are common in patients with mental illnesses. However, no set of indicators have been developed specifically to assess the safety of prescribing in this population. Our aim is to develop mental health prescribing indicators to assess prescribing safety, and to estimate the risk associated with each indicator.

Methods: A two-stage e-Delphi was conducted with a panel of 31 mental health experts from across the UK. In stage 1 experts were asked in two rounds to rate their agreement on a set of potential indicators using a 5-point scale. An indicator was accepted when 80% of the ratings fell within the top two points. In the second stage, a single round was undertaken to reach consensus (80%) on the risk associated with each accepted indicator, where experts rated the likelihood of occurrence and the severity of the most likely outcome on two 5-point scales. Ethical approval was obtained from the University of Manchester ethics committee.

Results: Seventy-five indicators were accepted in the first stage. Following the second stage, 42 of the 75 (56%) were considered to be high or extreme risk for patient care. Indicators covered different types of potentially hazardous prescribing, including drug-drug and drug-disease interactions, inappropriate dose and duration, and inadequate drug monitoring.

Conclusion: This research has generated the first set of indicators to assess prescribing safety specifically for patients with mental disorders. These can also be used in health information technology interventions and in computerised clinical decision support to improve prescribing safety.

T-TS4-2

Psychotropic drug use among elderly Swedish people with dementia – a study based on national registries [#31]

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Background: Psychotropics include many drugs that might be inappropriate in elderly individuals with dementia or mild cognitive impairment. In Sweden, many people newly diagnosed with dementia are registered in the Swedish Dementia Registry. In the present study, we aim to describe psychotropic drug use and associated factors among elderly Swedish people with dementia.

Methods: This study included people >65 years in the Swedish Dementia Registry with diagnosis dates during 2007-2017 and alive on December 31, 2017. Drug use was defined as at least one filled prescription recorded in the Swedish Prescribed Drug Register within a period of six months (July 1-December 31, 2017). Associations between groups of psychotropics and various factors comprising age, sex, diagnosis date, and dementia type were analyzed through multiple logistic regression.

Results: Among the 38,251 people included in the analysis, 12.0% (n=4,594) filled at least one prescription for antipsychotics, 22.0% (n=8,430) for anxiolytics, 23.0% (n=8,783) for sedatives or hypnotics, and 43.2% (n=16,511) for antidepressants. In brief, the use of psychotropic drugs was associated with female sex, higher age, early diagnosis date, and certain dementia types. For example, we found a relationship between the use of antipsychotics and Lewy body dementia.

Conclusion: Psychotropic drug use appears to be common among elderly Swedish people with dementia. This warrants concern, especially regarding people with Lewy body dementia who are highly sensitive to antipsychotics. A more restrictive prescribing pattern of these medications might be a means to reduce the risk of drug-related problems in this vulnerable group of people.

T-TS4-3

Multidose drug dispensing and longitudinal changes in psychotropic prescribing patterns among older adults: national matched cohort study [#164]

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Background: An increasing number of frail and multimorbid older adults are dispensed drugs in machine-packed disposable pouches that contain all the drugs that are intended for a given dose occasion ('multidose'). It has been suggested that multidose may promote psychotropic overuse. We aimed to compare the use of psychotropics before and after the transition to multidose drug dispensing among older adults in Sweden.

Methods: Matched cohort study using individual-level drug dispensing data with national coverage in Sweden. Older adults (≥65 years) who initiated multidose drug dispensing between 1 January and 31 December 2013, matched 1:2 on sex, age and index date with older adults who remained on manually dispensed medications. Study participants were followed from 24 months before until 24 months after the index date, with censoring at time of death or emigration.

Results: A total of 31,612 cases and 63,224 controls were included. Mean age at index date was 83.9 (7.4) years. The prevalence of psychotropic polypharmacy (i.e. ≥3 concomitant psychotropics) increased substantially among multidose initiators, from 15.1% 2 years before the transition, to 37.5% the month after, up to 43.7% 2 years after. This psychotropic polypharmacy was fueled by a dramatic increase in the incident use of long-acting benzodiazepines (e.g. clonazepam), Z-drugs (e.g. zopiclone), strong opioids, antipsychotics, antidepressants, and – to a lesser extent – antidementia drugs. No change was observed among controls.

Conclusion: Older adults who switch to multidose drug dispensing are at high risk of adverse drug-related events due to a sustained increase in exposure to substantial psychotropic polypharmacy.

T-TS4-4

Incidence of diagnosed pediatric anxiety disorders and use of prescription drugs: a nation-wide registry study [#121]

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Background: A growing number of children and adolescents receive pharmacological treatment for mental disorders. An increase in the number of patients diagnosed with mental disorders, could possibly contribute to the increase in prescribed drugs. The aim of this study was to calculate time trends in incidence of diagnosed anxiety disorders, including obsessive-compulsive disorder, and post-traumatic stress disorder, and to examine changes in use of prescribed drugs in the pediatric population. Furthermore, we aimed to investigate whether comorbid mental disorders are associated with use of prescribed drugs.

Method: Nation-wide registries with data from 2008-2015 in Norway were used, covering diagnostic data from primary and secondary health care, and data on prescribed drugs.

Results: During 2010-2015, 19 154 children and adolescents (61% girls) received a first diagnosis of anxiety disorders in primary care. The corresponding number in secondary care was 17 115 (61% girls). The incidence of diagnosed anxiety disorders increased over time, especially in girls, with an overall raise of ~2 per 1000 children across 2010-15. Anti-anxiety drugs were used by <12% of diagnosed children and <25% of diagnosed adolescents, mainly by those with several contacts with the specialist health care system and these proportions did not increase over time. Of other drugs, the most frequently prescribed were hypnotics and psychostimulants. Psychiatric comorbidity (33-55%) contributed to the use of drugs, including anti-anxiety drugs.

Conclusion: The incidence of diagnosed anxiety disorders increased from 2010-2015, but the percentage using anti-anxiety drugs was stable. Drug use was mainly in line with the Norwegian guidelines.

SELECTED ABSTRACTS FOR ORAL PRESENTATION ON FRIDAY, 6 MARCH 2020

Session F-TS5: Cancer and biologicals

F-TS5-1

Are there socio-economic inequalities in utilisation of novel cancer therapies? A systematic review [#148]

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Background: Patients presenting with the same cancer, at the same stage, do not always receive the same treatment. These health inequalities exist across healthcare systems and persist over time. Research shows that low socio-economic status forms a barrier to surgery, radiotherapy and chemotherapy utilisation. It is unknown if the rise in new targeted therapies entering clinical practice is subject to similar inequalities. This review investigated this topic.

Methods: A systematic review and meta-analysis were conducted. Eligible papers reported observational data for solid tumour targeted therapy utilisation by a measure of socio-economic status (poverty, education, income, employment, deprivation or a composite index). Comparators, where reported, inferred no targeted therapy or a clinical alternative (e.g. chemotherapy).

Results: 10,649 citations were identified; following title and abstract screening, 463 progressed to full text review. 64 papers met the inclusion criteria (57 were suitable for a meta-analysis). 55 papers reported USA cohorts, the remainder were from Canada, China, Australia, the UK and Ireland. Outcome data of interest covered 11 cancers and 12 targeted therapies, of which trastuzumab (n = 18) and bevacizumab (n = 15) were most common. Utilisation by socio-economic status did vary with cancer and drug type, although not always significantly. Generally, utilisation was less in lower socio-economic groups.

Conclusion: This review highlights the challenge of synthesising varied socio-economic data detailing drug utilisation for multiple therapies and cancers. Further studies in other healthcare settings, especially publicly-funded ones, would be valuable for determining whether utilisation varies and the possible reasons for this.

Cross-country comparison of policies for biosimilar medicines [#150]

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Background: Biosimilar medicines are considered as an opportunity to ensure access to biological medicines at more affordable prices and thus to treat more patients. The study explored the policies that governments use to set the price of these medicines and to enhance their uptake.

Methods: Biosimilar policies as of 2018/2019 were surveyed from the Pharmaceutical Pricing and Reimbursement Information (PPRI) network that comprises competent authorities for pricing and reimbursement of medicines in 47, mainly European, countries.

Results: 23 of the 32 countries that set the prices of generic medicines in relation to the originator prices also apply this pricing policy for biosimilar medicines. The required price difference between a biosimilar and the biosimilar reference medicine (frequently 15%-20%) is usually lower than the corresponding reduction for a generic medicine. Prescribing by International Non-Proprietary Name (INN) is in place in 43 of the studied 47 countries, thereof obligatory in 18 countries. A few countries (e.g. UK) exclude biologicals from INN prescribing. While a switch of a doctor from the biological to a biosimilar or between biosimilars is supported in most countries, only 15 countries allow biosimilar substitution at the level of community pharmacy (compared to 43 countries that have generic substitution).

Conclusion: While certain policies have been standard for generic medicines, this is not the case for biosimilars. Governments are struggling to develop most appropriate policies for these medicines. There is some progress compared to a few years ago when specific policies for biosimilars lacked in several countries.

Linking regional administrative healthcare data with the pathology registry of the University Hospital of Siena (Italy) to describe treatment patterns of patients with non-small-cell lung cancer [#144]

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Background: During the last decade, treatment guidelines for advanced stage non-small cell lung cancer(NSCLC) have rapidly changed mainly due to the introduction of new drugs, as target- and immunotherapies. The aim of the study is to describe treatment patterns in NSCLC patients between 2009 and 2017 at the University Hospital of Siena(UHS).

Methods: Patients with NSCLC diagnosis recorded in the pathology registry(PR) of UHS in 2009-2017 were identified through SNOMED codes and free text keywords. Using regional anonymized identifier code, PR data were linked to administrative healthcare database(AHD) of Tuscany region. Pharmacotherapy, and survival were observed in patients who did undergo lung surgery(SUR) and those who did not(NO-SUR).

Results: A total of 2003 NSCLC patients were identified. NO-SUR were the 57.1% of the study cohort(n=1144). The latter subpopulation was divided in elderly, aged≥70 years(n=587), and young patients, aged 18-69 years (557). In the 6 months after index date, percentage of subjects who received both immunotherapy and target therapy was higher among young patients, 5.9% vs 1.7% and 13.1% vs 11.1%, respectively. From 2015 to 2017 the percentage of subjects receiving immunotherapy increased from 2.8% to 28.2% in young patients(p<0.001) and from 1.4% to 6.9% in elderly patients. Among patients recruited up to the end of 2013, the average 50 months survival rate was 60.3% for SUR while for NO-SUR patients it was 11% in 2009 and 21% in 2013.

Conclusion: This study demonstrate the feasibility of linking PR and AHD and provided evidence on treatment patterns in NSCLC patients at UHS.

“Biosimilar, so it looks alike, but what does it mean?” – A qualitative study of patients’ perceptions of biosimilars in Denmark [#61]

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Background: Biosimilars are follow-on products for biologics and their introduction aims to foster biologics competition. Denmark has one of the highest biosimilar uptake in the world. International questionnaire studies have attempted to gauge the patient perspective on biosimilars, but none has delved deeper into how patients view biologics and their switching. The aim was to investigate how Danish patients with psoriasis, inflammatory bowel disease and/or arthritic diseases perceive biosimilars.

Methods: Two focus groups were held in the Copenhagen area (Denmark) with each 3 participants mixed according to disease group and whether they were on an originator or a biosimilar. Subsequently, internet-based individual interviews were conducted with 6 participants in other parts of the country, also purposefully recruited according to disease groups and originator/biosimilar use. Data were inductively coded.

Results: Participants on originators voiced more reluctance towards using biosimilars than those already using them. Worries about reoccurrence of disease symptoms due to unequal effectiveness and safety seemingly influenced how both groups of patients viewed biosimilars. Participants generally struggled with understanding biosimilarity, and they voiced a need to be well informed about the decision to switch, but not necessarily to have shared decision-making. However, they were well aware of and accepted how healthcare budget restrictions play a role in the push to switch to biosimilars in Denmark.

Conclusion: The difficulty for patients to understand the complexity of biosimilarity is a challenge in treatments with biologics. Gaps in knowledge and lack of involvement are prominent and seem to influence patients’ acceptance of and willingness to use biosimilars.

Session F-TS6: Elderly patients – the clinical perspective on polypharmacy

F-TS6-1

Time trends in the use of proton pump inhibitors in the elderly in Norway, including co-medication with NSAIDs or low-dose ASA [#168]

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Background: Use of Proton pump inhibitors (PPIs) is increasing and PPIs are frequently prescribed for prevention of gastric and duodenal ulcers associated with NSAID therapy and ASA (acetylsalicylic acid). However, PPIs may expose patients to potentially harmful adverse effects, especially in vulnerable elderly. Our objective was to investigate time trends in use of PPIs in elderly in Norway, including co-medication with NSAIDs or low-dose ASA, for prevention of thrombotic events.

Methods: The Norwegian Prescription Database (NorPD) covers prescriptions to all persons living in Norway. We studied the population 70 years or older in the period 2005-2018. Prevalence, DDD/user and actual proportions and ratios were calculated from number of users registered according to the ATC/DDD classification.

Results: The prevalence of PPI use in home dwelling elderly has increased significantly in the period: in 2005 11% were dispensed a PPI, compared to 24% in 2018. Prevalence of PPI increased with age; the prevalence ratio 2018/2005 in age group 70-79 were 2.1 compared to 3.0 in the age group 90+. Average DDD per user increased with 10% over the period. From 2005 to 2018 the proportion of PPI use in NSAID-users increased from 15% to 36% and the proportion of PPI use in ASA-users increased from 13-32%.

Conclusion: The use of PPIs has increased in the elderly population. Furthermore, co-prescription of PPIs in NSAIDs-users and ASA-users has increased. Additional research should address the appropriateness of increased PPI use in the elderly.

F-TS6-2

Use of medication among nursing home residents: A Danish drug utilization study [#27]

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Background: Data on drug utilization patterns in nursing home residents is scarce. We therefore aimed to describe drug use patterns in timely relation to nursing home admission among Danish nursing home residents.

Methods: We established a database of 5,179 individuals (63% women; median age of 84 years) admitted into 94 Danish nursing homes during 2015-2017. Data on prescription drug use and other census data were obtained from the nationwide Danish health registries and linked to individual-level data on nursing home admission.

Results: The incidence rate of new drug treatments peaked at 71 new treatments / 100 residents / month prior to nursing home admission and leveled off after 6-9 months. The drug classes primarily responsible for this peak were laxatives, antibiotics, and analgesics. The total number of drug classes filled increased from a median of 6 drugs (interquartile range [IQR] 3-9) at 18-24 months before admission to a median of 8 drugs (IQR 6-11) just after admission. The most common drug classes at baseline comprised paracetamol (61%), platelet inhibitors (41%), proton pump inhibitors (33%), statins (32%), and potassium supplements (31%). The largest absolute increases were seen for laxatives (53%), paracetamol (43%), and antidepressants (36%), all showing a marked increase up to and also following admission. A high proportion of residents remained on therapy in the 3-year period following admission, with users of antidepressants and antimentia drugs being most persistent.

Conclusion: Nursing home admission is associated with an increase in use of both preventive and non-preventive drug classes.

F-TS6-3

Linking anticholinergic exposure to outcome in nursing home residents: Associations with anticholinergic symptoms, alertness and mortality [#95]

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Background: Polypharmacy and anticholinergic exposure in nursing home residents is high. The aim is to explore the relationship between anticholinergic exposure, the anticholinergic burden and mortality in nursing home residents with and without dementia.

Design: An inception cohort (n=741) of nursing home residents 3 years after entering the nursing home (n=295) was used. Anticholinergic exposure was quantified using the MARANTE (potency & dosage), and categorised (no, low, high). Anticholinergic burden was investigated through nurse observation of common anticholinergic symptoms, and categorised (no, few, many). Survival analysis for mortality during the following 30 months was performed using Kaplan-Meier and Cox regression.

Results: Mean age was 83.7 (65-101), with 72.2% females. Mean number of chronic medications was 8.6 (0-21), with 61.2% taking an anticholinergic. Median score on the MARANTE was 1 (range 0–11,5), predominantly due to the use of Trazodone, Quetiapine and Escitalopram.

Most common central and peripheral symptoms were disorientation (51.4%) and pruritus (37.4%) respectively. Dementia patients were reported to experience significantly more central symptoms (agitation, drowsiness), while non-dementia patients experienced more peripheral symptoms (dizziness, constipation).

There was a significant correlation ($R_s=0.12$, $p=0.042$) between number of symptoms and scores on the MARANTE.

There was a 34.9% mortality rate. Patients with the highest anticholinergic burden had a significant higher risk for mortality compared to those with no exposure (HR 4.0, 95%CI 1.7-9.2 in dementia patients, and HR 2.7, 95%CI 1.2-6.1 in non-dementia patients).

Conclusion: Anticholinergic exposure and burden in nursing home residents was high and linked, and associated with higher mortality rates.

High-risk medication in community care [#10]

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Background: A documented and coordinated approach to safely manage high-risk medication (HRM) is currently unavailable but needed to optimize drug therapies. The HaRMoniC project aims to develop a HRM guideline in community care.

Methods: First, a review was performed to gain understanding of the definitions and types of medication that are considered HRM in community care. Second, based on the results of the first study, a list of HRM that are a priority in home care was developed and validated in a Delphi consensus study. Third, a cross-sectional study was conducted in a large sample of Belgian (Flemish) home care nurses to investigate the existing policy and interventions regarding patients taking HRM and the way HRM is handled.

Results: A list of 66 HRM was identified in literature, after which 15 HRM were considered a priority in home care by a panel of experts. In the third study, 2283 home care nurses participated. Participants reported that they manipulate on average 4 HRM per shift. A large part of the nurses experience a strong need for additional training, even though they feel competent enough most of the time with regard to HRM care.

Conclusion: Safely managing high-risk medication (HRM) is a crucial aspect in the entire medication process and ensures positive patient outcomes, reaches patient safety goals and decreases healthcare costs. The next steps of the project are the investigation of the prevalence of HRM in the community setting and the adverse drug reactions patients experience with this type of medication.

Session F-TS7: Implementation of interventions

F-TS7-1

Impact of a new pharmaceutical care model on polypharmacy in long term care facilities in Canada [#157]

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Background: Polypharmacy and potentially inappropriate medication (PIM) are known to be predominant in long-term care (LTC) facilities and to increase morbidity. We aimed to determine the impact of a new pharmaceutical care model based on inter-professional collaboration and pharmacist's expanded scope of practice on the proportion of elderly 1) exposed to ≥ 10 medications (excessive polypharmacy) and 2) exposed to at least a PIM in LTC facilities.

Methods: We performed a quasi-experimental controlled study among residents aged ≥ 65 living in two LTC facilities exposed to the new model (± 359 beds) and two non-exposed LTC facilities (± 241 beds). Data on medications and clinical information was obtained through electronic pharmacy and medical records. We computed all active prescriptions at specific days, 0, 3, 6, 9 and 12 months following implementation. We compared exposed and non-exposed groups before and after implementation using repeated-measures mixed Poisson regression and logistic regression models.

Results: In 12 months, the mean total number of medications per patient went from 10.53 ± 0.71 to 8.88 ± 0.6 (exposed group) and remained stable in the non-exposed group (difference in difference: 1.12; $p < 0.0001$). The proportion of elderly receiving excessive polypharmacy went from 42% to 21% among exposed and from 49% to 41% among non-exposed (difference in difference: 13%; $p < 0.0001$). The proportion of elderly receiving at least a PIM went from 62% to 46% among exposed and from 69% to 60% among non-exposed (difference in difference: 7%; $p = 0.39$).

Conclusions: This pharmaceutical care model leads to the reduction of excessive polypharmacy but not PIM in LTC facilities.

F-TS7-2

Electronic Prescription data to Improve Primary care Prescribing (EPIPP) [#82]

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Background: Patient-level prescribing analysis provides an opportunity to expand and enhance the secondary use of prescription data, particularly the creation of prescribing feedback that is better able to assess prescribing quality and identify potentially inappropriate prescribing (PIP) for individual patients.

Aim: To pragmatically evaluate the impact of feedback to GP practices of patient-level PIP in a cluster-randomised trial in all practices in one Scottish Health Board.

Methods: Cluster-randomised controlled trial (partial 2 x 2 Latin square design) in 235 general practices where all practices sent a feedback intervention. Practices randomised to receive patient-level feedback in one of two distinct PIP topics three times (July 2015, February 2016 and August 2016). PIP topics were asthma bronchodilator PIP (excessive/unsafe prescribing of asthma bronchodilators over 12 months) and UTI antibiotic PIP (recurrent prescribing of UTI antibiotics to women over 12 months).

Results: Following the intervention there were statistically significantly fewer patients with asthma bronchodilator PIP in practices sent the asthma bronchodilator feedback compared to the control practices (-3.7 patients per practice, 95% CI -5.3 to -2.0). Increases in the number of women with UTI antibiotic PIP were smaller in practices sent the UTI antibiotic feedback compared to the control practices but this difference was not statistically significant (-0.6 patients per practice, -1.6 to 0.4).

Conclusion: PIP feedback was effective at reducing excessive/unsafe prescribing of asthma bronchodilators but not recurrent use of UTI antibiotics in women, possibly reflecting differences in ability of GP practices to implement the desired improvements in prescribing behaviours.

Session F-TS8: Antimicrobial stewardship interventions

F-TS8-1

Antimicrobial consumption at a high complexity hospital in Brazil: Utilization profile from different wards [#154]

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Background: In the 71st General Assembly of United Nations, for the fourth time in history a health subject was debated: antimicrobial resistance. This is a great public health problem, causing disease worsening and mortality increase. Thus, investigate antimicrobial consumption is important to understand how to promote a better utilization and reduce selective pressure on antimicrobial resistance. We aimed to assess the antimicrobial prophylaxis and therapeutic consumption at a high complexity hospital.

Methods: This is a descriptive study conducted at the Clinics Hospital of Ribeirão Preto with all adult inpatients who received antimicrobial prescription during the year of 2014. The data collection were performed by hospital's electronic information system, obtaining: patient registration, sociodemographic and hospitalization informations, culture and antibiogram results, and information on antimicrobial prescription. Descriptive analysis was done by means of summary measures (mean and standard deviation) and absolute and relative frequency distribution. The consumption was calculated by DDD/1000 inpatients-day.

Results: There were 7287 patients with 90475 antimicrobial prescriptions. The consumption of prophylactic antimicrobials covers 11,69% of all consumption, and more than a half of this consumption (56,3%) comes from orthopedic ward, postoperative intensive care unit and postoperative chest and cardiovascular unit. In addition, cefazolin was the most commonly used drug for prophylaxis (52%). Among the consumption for treatment, 84% was empirical with a high use of broad-spectrum antimicrobial agents, like cefepime and meropenem.

Conclusion: There is a high use of antimicrobial prophylaxis in some hospitalization wards, like orthopedics, in addition to a greater proportion of consumption of empirical treatment.

Variations in antibiotic prescribing for children — Hungary, 2017 [#132]

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Background: The burden of infectious diseases and antibiotic use in children is high. Our objective was to assess antibiotic prescription for children by physician specialty, county and season in Hungarian ambulatory care.

Methods: This study was a population-based, retrospective, observational study. Data on dispensed ambulatory antibiotic prescriptions in 2017 were obtained from the Hungarian National Health Insurance Fund. The analysis focused on children aged 0-19 years. Data were stratified by physician speciality (e.g. GP, otolaryngologist), region (i.e. county), age group (5-year age groups) of patients and month of antibiotic dispensation. Antibiotic use was expressed as the number of prescriptions per 100 inhabitants in the age group concerned per year or per month. The proportion of broad-spectrum beta-lactam and macrolide use, as defined by the European Centre for Disease Prevention and Control, was calculated.

Results: In 2017, antibiotic use among children (aged 0-19 years) was 108.3 antibiotic prescriptions/100 children/year. Antibiotic use was highest in children aged 0-4 years with 183.9 prescriptions/100 children/year. Broad-spectrum agents were frequently prescribed and their prescription dominated in each physician specialty. Variation between counties was high: the highest value was 175.6 prescriptions/100 children/year, while the lowest was 63.8 prescriptions/100 children/year, with an obvious western-eastern increasing gradient. Seasonal variation was substantial: antibiotic prescribing peaked in January while the lowest use was observed in July, with a 4-fold difference between the two.

Conclusion: Physicians of all specialties contributed to the high use of broad-spectrum antibiotics. Considerable regional variation and high seasonality of antibiotic use in children may necessitate targeted interventions.

Acknowledgements: We are grateful for László Kőrösi from National Health Insurance Fund for retrieving antibiotic consumption data.

F-TS8-3

The impact of law enforcement on the dispensing antibiotics without prescription in Saudi Arabia: findings and implications [#14]

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Background: Dispensing antibiotics without a prescription (DAwP) has been widely practised in Saudi Arabia despite being illegal. This is a concern increasing AMR. In May 2018, the law and regulations were enforced including fines up to 100,000 SR (equivalent to US\$26,666) and cancellation of licences. Consequently, we wanted to evaluate the impact.

Methods: Mixed method study among 116 community pharmacies in two phases. Pre-law enforcement phase between December 2017 and March 2018 and post-law enforcement phase one year later. Each phase consisted of a cross-sectional questionnaire-based survey and a simulated client method (SCM). In SCM, clients presented with either pharyngitis or urinary tract infections (UTI) with 3 levels: level 1 – SC asked for something to relieve the symptoms, level 2 – SC asked for something stronger if an antibiotic was not dispensed, level 3 – SC requested an antibiotic. In SCM for each phase, all 116 pharmacies were visited with at least one of the scenarios.

Results: Before law enforcement, 70.7% of community pharmacists reported DAwP was common. 96.6% and 87.7% of participating pharmacies dispensed antibiotics without a prescription for pharyngitis and UTI respectively. After law enforcement, only 12.9% of community pharmacists indicated that DAwP was common, with only 12.1% and 5.2% dispensing antibiotics without prescriptions for pharyngitis and UTI respectively and mostly after level 3.

Conclusion: Law enforcement was effective. However, there is still further scope for improvement as community pharmacists are worried patients may go elsewhere if no antibiotic dispensed on request. This could include educational activities.

Eight-year study of antibiotic utilisation in the Republic of Srpska (2010-2017 years); findings and implications [#51]

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Background: There have been multiple initiatives to improve antibiotic utilisation in the Republic of Srpska in recent years including educational activities with all key stakeholder groups, greater scrutiny over self-purchasing of antibiotics and reimbursement restrictions. Thus study aimed to analyse total antibiotic utilisation following these initiatives including the quality of use and assess whether additional measures are needed.

Methods: Analysis of total outpatient antibiotic utilisation from 2010 to 2017 in DIDs based on data obtained from the Public Health Institute of the Republic of Srpska. Quality indicators based on ESAC, ECDC and WHO recommendations and compared with neighbouring countries in the WHO AMC network.

Results: Antibiotic utilisation ranged from 15.6 DIDs to 23.1 DIDs, which is encouraging versus other similar neighbouring countries. Penicillins were the most used antibiotics, accounting for approximately 50-55% of total antibiotic utilisation, with amoxicillin the most used (29 – 41% of total utilisation) versus low use of co-amoxiclav (7 - 11% of total utilisation). This compares favourably with other countries. Cephalosporins were the second most used antibiotic class (13-14%) followed by macrolides (8-9 %) and quinolones (8-9 %). Low use of third and fourth generation cephalosporins (10-20% of total cephalosporins) versus first and second generation. However, rising utilisation of co-amoxiclav and azithromycin (5-10% per years) and higher rates of quinolone utilisation in recent years are noted and are now being addressed through additional interventions.

Conclusion: Multiple interventions in the Republic of Srpska have helped enhance the appropriate use of antibiotics. Identified concerns are being addressed.

Session F-TS9: Evolving data streams

F-TS9-1

Patients address more than medication related problems with their pharmacist – A video observation study of clinical medication reviews [#127]

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Background: The goal of clinical medication reviews (CMRs) is to optimize medication use. Patients with diabetes are likely to benefit from a CMR as they often have complex medication regimens. The contribution of patients during a CMR is largely unknown. The aims of this study are to describe problems addressed by patients during CMRs and the pharmacists' response behaviour to these problems.

Methods: We conducted a cross-sectional video observation study of CMRs between patients with diabetes and pharmacists. We developed a coding scheme to analyse problems presented by patients as well as for the pharmacists' responses to it. Analysis was independently performed by two researchers. Disagreements were discussed to reach consensus.

Results: 1,299 problems were categorized in 68 CMRs conducted by 40 pharmacists. We identified five main themes; physical complaints (n = 550), medication-related problems (n = 373), psychological complaints (n = 293), experiences with healthcare (n = 52) and lifestyle (n = 31). The responses of pharmacists were mainly non-explicitly providing space for patients to further disclose their problems. Our results suggest that pharmacists more often provide information and advice to patients in reply to medication related problems compared to physical or psychological complaints.

Conclusion: Patients share a variety of topics with their pharmacist during a patient interview. Although pharmacists' responses are mainly non-explicit, these results show pharmacists are acknowledged by patients as trusted healthcare providers. Future research should focus on enabling pharmacists to better respond to topics indirectly related to medication to make patient interviews more efficient.

**The Danish translation of the Medicines-Related Quality of Life scale from the patient perspective
[#62]**

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Background: Pharmacist interventions (PIs) have shown varying effect on Health-Related Quality of Life (HRQoL). However, the instruments used to measure HRQoL may lack sensitivity in detecting the effect in relation to PIs. In 2017 the Medicines-Related Quality of Life (MRQoL) scale was translated from Chinese into Danish, but the Danish MRQoL scale showed marked ceiling effects. The objective was therefore to evaluate the validity of the Danish MRQoL scale from a patient perspective.

Methods: Semi-structured cognitive interviews with patients (≥18 years of age) taking ≥5 medicines regularly were conducted. A purposive sampling strategy was applied recruiting from different locations in the Greater Copenhagen Area. Interviews were recorded, transcribed, and analyzed thematically.

Results: Eight patients were interviewed (ages 33-87 years; average 7 medicines). Two major themes emerged from the interviews: The role of the medicines in everyday life and Understanding and filling in the questionnaire. The latter theme consisted of three sub-themes: Interpretations of the questions, Recall period and Interpretation and use of scale possibilities. The patients did not think about their medicines when answering the questionnaire. Several items were interpreted differently by the patients and they used different recall periods. Some patients used the scale possibilities incorrectly, either by overstating or understating their answers, or simply to create variation in responses.

Conclusion: Several reliability and validity issues were identified for the Danish MRQoL scale based on the interviews and further research is needed to develop more reliable and valid measurement tools to detect the effect of PIs on HRQoL.

Monitoring burden and benefits of medication for overactive bladder: combining electronic health records and patient reported outcomes [#33]

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Background: Monitoring benefits and risks of medicines is important for safe and effective treatment of patients. Aim of this project is to monitor the effect and adverse reactions (ADRs) of pharmacotherapy for overactive bladder by using a flexible infrastructure combining general practitioner's (GP) routine electronic health records (EHRs) with patient reported outcomes (PROs).

Methods: Overactive bladder (OAB) was selected as use case. OAB patients were flagged in EHR data on a weekly basis. The GPs checked whether the patient was eligible. PROs were obtained by electronic questionnaires and concerned bladder complaints, treatment (physiotherapy or medicines), ADRs, compliance, and quality of life.

Results: In a pilot study in 2 practices, 109 OAB patients were selected. After assessment by GPs, 82 (75%) patients were invited. Nineteen patients (23%) participated. Average age was 63 years (38-79) and 14 of them were women. Patients reported an average score of 4.0 for urogenital complaints, on a scale from 1 (none) to 10 (very much). Eleven patients received physiotherapy and 5 pharmacotherapy. Of these, 3 experienced ADRs. At EuroDurg, additional results will be presented from over 200 patients that currently participate in the study.

Conclusion: The infrastructure is capable of providing clear information about patients' perspective of the benefit and ADRs of their treatment at relatively low effort. The infrastructure is designed to monitor new medication on the market and has several advantages above more traditional monitoring instruments like longer follow-up, combining patient perspective with EHR data and a real life setting.

F-TS9-4

What do prostate cancer patients and clinicians want from an app and a dashboard to collect Patient Reported Outcome Measures (PROMs) as part of routine care? [#15]

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Background: The quality of life (QoL) impact of cancer medicines is not routinely documented out with clinical trials. QoL data can improve patient outcomes (Basch et al 2016; Basch et al 2017). This study aimed to explore views on a patient app and a clinician dashboard for capturing and viewing QoL data respectively.

Methods: Mock-ups of an app and dashboard were used in focus groups with prostate cancer patients and interviews with clinicians respectively. The interview schedules were based on the Technology Acceptance Model and focused on the perceived use and usefulness of the technologies. All data were audio recorded, transcribed verbatim and analysed thematically.

Results: Nineteen patients and 14 clinicians participated. Both the app and dashboard were perceived as useful and empowering. Main concerns focused on IT reliability, health service specific and patient characteristic-specific considerations. Clinicians worried about managing expectations of time and ability to respond to QoL data and had concerns around age and disease-related limitations. Suggested improvements for both focused around increasing text size and accessibility. Patients wished to input data in addition to viewing letters / test results via the app.

Conclusion: This work corroborates the value in utilising QoL data in routine care and highlights considerations for successful implementation. Next steps involve implementing suggested changes and building prototypes for testing.

F-TS10-1

Tramadol use in Romania during 2014-2018 [#65]

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Background: Increasing use of tramadol has been reported in Europe in the last years. Therefore, we aimed to quantify the use of tramadol and its combination with paracetamol in Romania.

Methods: We retrospectively analyzed consumption data provided by IQVIA Romania. Two datasets were included: sell-in information (wholesalers/manufacturers to retail pharmacies) during 2014-2018 and prescriptions dispensed from retail pharmacies during 2017-2018.

Results: The first dataset showed a decrease of 11.3% in the sales in units of plain tramadol products from 2014 to 2018, while the sales increased by 132.5% for its combination with paracetamol. The second dataset showed a higher number of prescriptions reported in 2018 than 2017, 4.6% higher for tramadol and 25% for the combination. The main indications on plain tramadol prescriptions were polyarthrititis (8.3%), dorsalgia (6%) and gonarthrosis (knee) (4.9%). The most frequent prescribers were primary care physicians (73.0%) and oncologists (15.3%). For the combination with paracetamol, the main indications were polyarthrititis (7%), dorsalgia (6.7%) and intervertebral disc disease (6%). The main prescribers for the combination were primary care physicians (72.6%) and rheumatologists (6.7%). The average duration of treatment for plain tramadol was 12.3 days as compared to 8.3 days for the combination.

Conclusion: Romania is facing an overall increase in the consumption of tramadol products, mostly prescribed by primary care physicians. The main indications for prescription tramadol products were rheumatic diseases.

F-TS10-2

Use of tramadol and other opioids following media attention and risk minimization measures from regulators: A Danish nationwide drug utilization study [#173]

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Background: Use of tramadol, including its potential for abuse, has been heavily discussed in recent years. In this study, we described use of tramadol and other opioids in Denmark, with particular focus on the impact of lay media attention (in June and December 2017) as well as new regulatory actions by the Danish Medicines Agency (September 2017 and January 2018).

Methods: Using the Danish nationwide health registries, we described the use of tramadol and other opioids in the adult Danish population during 2014 to mid-2019.

Results: From early 2017 until mid-2019, total tramadol use decreased markedly (decrease of 38%). Concomitantly, total use of morphine and oxycodone use decreased slightly (12% and 8.3%, respectively). The prevalence of tramadol use decreased from 32/1,000 individuals in 2014 to 19/1,000 mid-2019, dropping mainly at the time of media attention. Concomitantly, the prevalence increased for oxycodone (from 5.1 to 7.7) and morphine (from 8.5 to 9.5), mainly due to more short-term and sporadic users. From 2014 to mid-2017, the incidence of tramadol use was stable (around 2.2/1,000 person-months) but dropped in June 2017 to 1.7/1,000, coinciding with the media attention, and continued to decrease to 1.1/1,000 in mid-2019. Tramadol was primarily initiated by GPs (64% in 2018) and hospital prescribers (27%), while treatment was mainly maintained by GPs (93%).

Conclusion: We identified a considerable decline in the use of tramadol coinciding in time with the media attention and regulatory actions. Concomitantly, the use of other opioids also decreased slightly.

F-TS10-3

Prescriptions of rapid onset fentanyl in Dutch primary care [#133]

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Background: Risks of opioids can be related to the administration form. Fentanyl is a strong opioid with low oral bioavailability. Whereas dermal administration as a plaster has a slow onset of action, nasal and oromucosal administration of fentanyl is characterised by a rapid onset of action and therefore have a higher abuse potential. These rapid-onset opioids (ROOs) have market approval for patients with cancer who experience breakthrough pain despite use of chronic opioid treatment. There are signals that ROOs are also prescribed for other diagnoses. This study aims to provide insight in how rapid onset fentanyl is prescribed in Dutch primary care.

Methods: Data (2010-2018) were derived from routine electronic health records of general practices participating in Nivel Primary Care Database. Adult patients with a prescription of fentanyl were selected and diagnoses were recorded using International Classification of Primary Care. Descriptive analyses were performed.

Results: There is an increase in fentanyl use from 2010 to 2018, from 4 to 8 per 1000 registered patients. Fentanyl is mostly used transdermally but there is an increase in nasal and oromucosal use. Nasal administration increased from 2.4% in 2010 to 6.5% in 2018, oromucosal use increased from 3.1% to 7.4%. For both nasal and oromucosal administration the percentage fentanyl prescriptions for cancer-pain decreased (resp. from 42% to 32% and from 39% to 28%).

Conclusion: There is an overall increase in fentanyl prescriptions in Dutch primary care. The increase in rapid onset fentanyl prescriptions for non-malignant pain is alarming and should be reduced.

F-TS10-4

Is opioid prescribing in out-of-hours primary care followed by prescriptions from the patient's own daytime general practitioner? [#69]

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Background: There are concerns about the increase of opioid prescribing in general and for chronic non-malignant pain in particular. Opioids to treat acute but non-life threatening pain could be prescribed during out-of-hours (OOH) and prolonged during regular care, increasing the chance of chronic opioid use. In this study we investigate for how many patients an OOH opioid prescription for non-malignant pain is followed by opioid prescriptions by the patient's own general practitioner.

Methods: Data were derived from routine electronic health records of OOH primary care services and general practices participating in Nivel Primary Care Database. We selected patients of 18+ years without cancer and with an OOH opioid prescription in 2017. Only patients with data available in six months before and after this opioid prescription were included, resulting in a cohort of 2,802 patients (42.2% male; mean age 51). Opioids were classified as strong or weak.

Results: 48.3% of all patients with an OOH opioid prescription received at least one follow-up prescription. This percentage differed between opioid naïve patients (no prior prescriptions) and non-naïve patients (40.9% vs. 74.3%). Follow-up treatment more often consisted of only one prescription in naïve patients compared to non-naïve patients (54.1% vs. 21.3%). Of naïve patients, 38.4% received a strong opioid during OOH care compared to 74.2% of non-naïve patients.

Conclusion: OOH opioid prescribing in primary care services is often followed by opioid prescriptions in regular care. As many of these patients receive more than one follow-up prescription, chance of chronic treatment increases.

F-TS11-1

Trend of antihypertensive medicine use in the Baltic States between 2014 and 2018 [#109]

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Background: High blood pressure is the most important risk factor contributing to death and disability rates in all three Baltic states. The aim of this study is to compare utilization of antihypertensive medicines in Estonia, Latvia and Lithuania during the last 5-years.

Methods: Wholesale data was used to calculate the use of antihypertensive medicines in 2014-2018. Data was obtained from the National retail audit IQVIA. The ATC/DDD methodology was used to calculate utilization of RAAS inhibitors (C09), beta receptor blockers (C07), calcium channel blockers (C08), diuretics (C03) and other antihypertensives (C02). The results were expressed in DDD per thousand inhabitants per day (DDD/TID). Time series analysis was used to analyze trends.

Results: The total use of antihypertensive drugs was 373.4 DDD/TID in Estonia, 379.5 DDD/TID in Lithuania and 267.0 DDD/TID in Latvia in 2018. The utilization increased by 1.98% in Estonia ($p=0.028$), 1.20% in Latvia ($p=0.023$) and decreased by 0.35% in Lithuania ($p=0.94$) in five years. The most frequently used class was RAAS-inhibitors. The use of older antihypertensives (C02) was 41.33 DDD/TID in Lithuania compared to 4.45 DDD/TID in Estonia and 16.82 DDD/TID in Latvia. The use of fixed-dose combinations has increased from 68 to 95, from 67 to 89 and from 77 to 107 DDD/TID respectively in Estonia, Latvia and Lithuania

Conclusion: The use of antihypertensive medicines increased in Estonia and Latvia, but remained stable in Lithuania. The use of fixed-dose combinations has increased in all three countries. Further research is needed to explain differences between the Baltic states.

Low adherence to statin treatment during the first year after an Acute Myocardial Infarction is associated with increased second year mortality risk— An inverse probability of treatment weighted study on 54,872 patients [#42]

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Background: Experiencing an acute myocardial infarction (AMI) is a life-threatening event and use of statins can increase the probability of freedom from recurrent events and improve long term. However, the effectiveness of statins in the real-world setting may be lower than the reported efficacy in randomized clinical trials. Therefore, we aimed to answer the question: Is low adherence with statin treatment during the year following an AMI episode associated with increased second year mortality risk?

Methods: We analysed all 54,872 AMI patients aged ≥ 45 years and admitted to Swedish hospitals between 2010 and 2012. We calculated the days covered by statins during the first year after the AMI episode and defined low adherence as a coverage $< 50\%$ including statin non-use. By applying inverse probability of treatment weighting (IPTW) we investigated the association between low adherence and mortality, circulatory and ischaemic Heart Disease mortality (CIHD), and non-CIHD mortality during the second year.

Results: Overall 20% of the patients had low adherence during the first year after the AMI episode and 8% died during the second year. In the IPTW analysis, low adherence was associated with a conclusive higher risk for mortality (Absolute risk difference (ARD) = 0.05, Number Need to Harm (NNH) = 20, Relative Risk (RR) = 1.77), CIHD (ARD= 0.04, NNH= 26, RR= 1.68) and non-CIHD mortality (ARD= 0.01, NNH=74, RR=2.24).

Conclusion: In the real-world setting, low adherence to statin treatment the first year after an AMI episode is associated with increased mortality during the second year. Our results reaffirm the importance of using and achieving a high adherence to statin treatment after suffering from an AMI.

Sex differences in cardiometabolic treatment among patients with type 2 diabetes [#89]

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Background: Guidelines for the treatment of patients with type 2 diabetes (T2D) give similar recommendations for males and females. There are indications, however, that prescribing behavior may differ between male and female patients. The aim of this study was to assess sex differences in cardiometabolic treatment among patients with T2D.

Methods: A cohort study was conducted using the Groningen Initiative to Analyse Type 2 diabetes Treatment (GIANTT) database containing primary care data from patients with T2D in the province of Groningen, the Netherlands. We assessed level and type of cardiometabolic treatment in 2013, after an update of the Dutch primary care treatment guidelines. Level was defined according to the step-wise recommendations of glucose-lowering, blood pressure-lowering and lipid-lowering treatment. For type, the prescription (yes/no) of specific cardiometabolic drugs was assessed. Sex differences were assessed using logistic regression analyses, adjusting for age, diabetes duration, BMI, comorbidities (yes/no), and risk factor level.

Results: Included were 27,172 patients (50% females, average age 67 years). For level of treatment, females were less likely to receive any glucose-lowering (adjusted odds ratio 0.85, 95%CI 0.76-0.94) and lipid-lowering (0.89; 95%CI 0.82-0.98) treatment than males. For type of treatment, females were less likely to receive metformin, sulfonylureum derivatives, ACE inhibitors, calciumblockers and atorvastatin but more likely to receive insulin, ARBs and diuretics.

Conclusion: There were sex differences in level and type of cardiometabolic treatment. Further studies are needed to assess the reasons for these differences and whether guidelines for the treatment of patients with T2D should be more sex-specific.

The first year experience of PCSK9 inhibitors availability in Tuscany: a regional multidatabase drug utilization study [#90]

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Background: This study aims to characterize patients treated with evolocumab or alirocumab-PCSK9i, and to describe their pattern of use during the first year of National Healthcare reimbursement in Italy.

Methods: We included and sociodemographic characteristics of individuals newly prescribed with evolocumab/alirocumab in Tuscany between 01/07/2017 and 30/06/2018. To distinguish between primary and secondary prevention, previous cardiovascular events (CVE) were detected during the available look-back period (up to 1996). Previous use (6 months) of any Lipid Lowering Therapies-LLTs was assessed. Adherence (PDC $\geq$ 75%), persistence (no treatment gap >30 days) of PCSK9is and treatment discontinuation were assessed during the 6 months follow-up.

Results: Patients included were 269 (incidence of use 7.2/100,000-inhabitants), 176 with evolocumab and 93 with alirocumab. Users were mostly male (71%), and with “intermediate/low” educational level (57%). Mean age was 59. Patients with $\geq$ 1 condition increasing CV risk were 68%. Those in secondary prevention (189 out of total) started a PCSK9i after 4.8 years from the last CVE. In the previous 6 months, 61.3% of patients received $\geq$ 1 prescription of ezetimibe or high intensity statins and 45.7% were persistent to these drugs. Patients adherent to PCSK9i treatment were 80%, 73% were persistent, while 6.0% of new users interrupted the treatment (1.5% after first dispensing).

Conclusion: Patients starting a PCSK9i were mainly in secondary prevention and persistent to previous LLTs, suggesting scarce benefit from previous LLTs. The majority of patients were adherent and persistent to PCSK9i treatment. Future studies should assess PCSK9i appropriateness of use and economic impact during longer follow-up time.

SELECTED ABSTRACTS FOR ORAL PRESENTATION ON SATURDAY, 7 MARCH 2020

Session S-TS12: The re-rewarding primary data collection and field research

S-TS12-1

Individual and contextual determinants of out-of-pocket expenditure on medicines in primary care [#41]

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Background: The Brazilian National Healthcare System is one of the largest in the world that aims to provide free access to medicines. Although advances have occurred, it is still not possible to overcome the risk of impoverishment due to out-of-pocket (OOP) expenditure on medicines. This study aims to estimate the prevalence and determinants of OOP among primary care users in Brazil.

Methods: We administered, in 2017, exit surveys to a representative sample of users (n=1221) from pharmaceutical services in primary care in a health pole municipality (234,937 inhab.) from the midwest macrorregion in Minas Gerais State, Brazil. We assessed the prevalence and examined the role of social and demographic factors, health conditions, health system characteristics and contextual factors on OOP. Descriptive statistics and logistic regression analysis were applied.

Results: The prevalence of OOP was 76.5%. OOP showed significantly relationship with poor perception of health (OR=1.90; 95%CI: 1.65-2.19), multiple comorbidities (2+, OR=2.82; 95%CI: 2.07-3.83), private health insurance coverage (OR=1.41; 95%CI: 1.07-1.89), older age (50+, OR = 1,83; 95%CI: 1,35-2,49), polypharmacy (4+, OR=3,09; 95%CI: 2,28-4,18), high personal income (OR=1,55; 95% CI: 1,11-2,15). Furthermore, perceptions of neighborhood safety and generalized trust showed higher odds of OOP (OR = 1.35, 95%CI 1.01-1.80; OR = 1.39, 95%CI 1.06-1.81, respectively).

Conclusion: This is the first study in Brazil that analyzed individual and contextual factors associated with OOP. The high prevalence of OOP suggests that there is an unfinished public agenda for attaining universal medicines coverage.

S-TS12-2

Self-reported causes of hypoglycaemia and problems with self-management of blood glucose treatment in type 2 diabetes patients: a survey study [#116]

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Background: Self-management in type 2 diabetes (T2D) patients is a complex task. Poor self-monitoring and an inability to correctly respond to deviations in exercise, nutrition and medication use can lead to hypoglycaemic events. Our aim was to quantify the problems T2D patients have with the self-management of their blood glucose treatment in relation to preventing hypoglycaemic events.

Methods: Dutch speaking T2D patients using insulin and/or sulfonylureas completed a survey about hypoglycaemia and self-management problems. This survey was developed based on a previously conducted interview study with T2D patients who experienced hypoglycaemic events. Descriptive statistics were used to quantify self-management problems and self-reported causes of hypoglycaemia.

Results: In total 208 out of the 820 invited patients completed the survey (mean age 67.7 +/-10.7, female 44.4%, insulin use 41.8%, sulfonylurea use 76.4%) of whom 39.9% experienced at least one hypoglycaemic event and 7.2% experienced at least one severe event ever. Overall, 23.5% lacked knowledge on how to adjust their medication after food or exercise related deviations from their routine and/or based on a glucose measurement. The most frequently self-reported causes of hypoglycaemia were: excessive exercise (43,4%), delayed, skipped or too little food intake (30.1%), deviations from daily routine (24,1%), stress (19,3%) and hypo-unawareness (15,7%).

Conclusion: This study shows that a significant portion of T2D patients lacks procedural knowledge on how to adjust their medication in order to prevent hypoglycaemia. Health care providers could provide these patients with more practical tailored advice on how to adjust their medication in specific situations.

S-TS12-3

Demographic and clinical factors that impact importance attached to drug effects: a preference study among type 2 diabetic patients [#159]

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Background: About 50% of patients with type 2 diabetes (T2D) do not reach their glucose (HbA1c) treatment targets. Differences in patient preferences may be a reason for such low target achievements. Preferences may be influenced by demographic and clinical factors. We aim to evaluate to what extent such factors influence the importance patients attach to certain drug effects.

Methods: A cross-sectional survey was administered to adult T2D patients in The Netherlands and Turkey. The anti-diabetic agents were described by six attributes: HbA1c decrease, cardiovascular risk (CVR) reduction, weight change, gastrointestinal (GI) adverse drug events (ADEs), hypoglycaemic events and bladder cancer risk (BCR). Multinomial logit models with treatment attributes and patient characteristic interactions were fitted for each of the factors.

Results: The survey was responded by 381 patients, 52% were Dutch. Median age was 63, 45% were male, mean BMI was 29 and 35% were higher educated. Median diabetes duration was 9 years and 19% reported experience with ADEs. Drug preferences varied strongly between country and age. Turkish patients valued more reducing CV risk while Dutch patients preferred to not having GI ADEs and reducing hypoglycaemic events. Younger patients valued more reducing CVR and no increasing BCR, while older patients preferred to maintain body weight and not having GI ADEs. Experience with ADEs, sex, BMI, and diabetes duration were marginally associated with drug preferences. Education did not show any effect.

Conclusions: The observed heterogeneity should be acknowledged when prescribing drugs because it would increase treatment satisfaction, adherence and therefore treatment outcome.

S-TS12-4

Nurses' role in interprofessional pharmaceutical care in 14 European countries: A qualitative interview study in pharmacists, physicians and nurses [#52]

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Background: Safe pharmaceutical care (PC) requires an interprofessional team approach, involving physicians, nurses and pharmacists. We aimed to describe what nurses' role in interprofessional PC should be, in order to obtain best quality of care and patient outcomes. We also aimed to learn from pharmacists', physicians' and nurses' insights in strengths, weaknesses, opportunities and threats of nurses' role.

Methods: A qualitative research design was used. Semi-structured interviews in 14 countries were conducted in key informant pharmacists, physicians and nurses with knowledge of PC with/by nurses. We used thematic analysis to identify (sub)themes related to nurses' role in interprofessional PC.

Results: 326 respondents participated in the interviews. Nurses' role in interprofessional PC consisted of four main responsibilities: 1) monitoring therapeutic/adverse effects of medication, 2) monitoring medication adherence, 3) decision making including (de)prescribing, 4) providing patient education/information. Within these responsibilities, tasks were defined. Nurse responsibility can range from 'full autonomy' to 'under supervision' and can be limited to a restricted number of medicines. Many contextual factors which influence nurses' role have been defined. Most informants would associate nurses taking up responsibilities in PC with a positive impact on care quality and patient outcomes. Lack of time and nurses, a missing legal framework and limited education are examples of threats for nurses' role.

Conclusion: Based on the results, a model for nurses' role in interprofessional PC was developed. This model is a much needed framework to guide interprofessional collaboration in PC and to organize education focused on competences required in the labour market.

S-TS13-1

Use of different types of gonadotropins for infertility treatment: different patterns and time trends in a central Italian region [#11]

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Background: Gonadotropins (Gonas) are used for infertility treatment in women and they are available as urinary extracts or recombinants: In 2015, the first biosimilar of follitropin alfa was authorised. We aimed to evaluate treatment cycles, use patterns, temporal and spatial variations in the use of different Gonas.

Methods: From administrative healthcare databases, prescriptions of Gonas to women aged 18-45 years in 2007-2017 were retrieved. Treatment cycles were defined as a 21-day mobile time window. Gona's use was grouped as treatment with urinary (u), recombinant (r), a mixture of both (m). Special focus was made on biosimilars. Use patterns were investigated with respect to socio-demographic and health characteristics of the woman treated, time trends, and differences among local health units.

Results: We retrieved 91582 treatment cycles in 37069 women with a median age of 38 years. Treatment cycles with r-Gona accounted for 51%, followed by u-Gona (27%), whereas in 22% both, r- and u-Gona were prescribed. The characteristics of the women treated were similar between the three groups. Use patterns were comparable between different local health units (r-Gona: 48.6-55.6%; u-Gona: 23.1-29.6%; mixed prescriptions: 20.8-24.7%). Over time, the share of the different groups was quite stable. Since its authorisation in 2015, biosimilar r-Gona steadily gained market, accounting for 11.2% of treatment cycles in 2017.

Conclusion: In clinical practice, in the Lazio region, r-Gona is the most commonly used treatment for infertility, and market uptake of r-Gona biosimilars is increasing.

S-TS13-2

Use and choice of contraception among valproate-treated females aged 14-45 years in comparison with the general population in Scotland and the impact of regulatory safety guidance [#34]

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Background: Valproate (VPA) is an established medicine for epilepsy, bipolar disorder and migraine but is a known teratogen and in utero exposure can cause cognitive impairment and developmental delay. Since 2014 regulators have issued increasingly strengthened guidance on the need for adequate contraception for VPA-treated females of childbearing potential. Using Scotland's national medicines resources we report on contraceptive use among this group.

Methods: Data on contraceptive use for all females aged 14-45 years between January 2010 and December 2018 were extracted from the national Prescribing Information System along with information on those also receiving VPA. Contraceptives were classified as highly effective (intra-uterine devices (IUDs) or implants) and effective (oral contraceptives and depot injections). Initial annual rates were calculated for 2014-8. Data were adjusted to account for direct supplies through family planning clinics and other non-prescription routes. Data for the VPA group was also age-standardised against the general population.

Results: Between 2014 and 2018 the age-standardised estimated proportion of VPA-treated females aged 14-45 years using highly effective or effective contraception increased from 56.7% to 66.3% (absolute rates: 22.0% and 41.1% respectively) compared to 58.5% and 60.8% in the general population. Use of highly effective contraception was higher among VPA treated females: 42.1% vs 39.2% in 2018 of those using contraception.

Conclusions: Use of contraception increased between 2014 and 2018 among VPA-treated females while remaining fairly constant among the general population. This increase appears to have accelerated following VPA being placed within a formal pregnancy prevention programme.

In utero opioid exposure and risk of ADHD in childhood: A Scandinavian registry study [#151]

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Background: A few studies have suggested that prenatal opioid exposure is associated with increased risk of ADHD. We, therefore, investigated the relationship between in-utero opioid exposure and risk of ADHD in childhood

Methods: We linked data from different nationwide health registers in Scandinavia. We identified two groups of women; chronic analgesic opioid users before pregnancy and women in opioid maintenance treatment (OMT). We compared children of women who continued opioid use during pregnancy with those who discontinued opioid treatment before pregnancy. The outcome was defined as an ADHD diagnosis (ICD-10 F90) or a filled prescription for an ADHD drug. We estimated the effect of the different opioid exposures on the cumulative risk of ADHD using Cox proportional hazard regression. We applied Inverse probability of treatment weights based on the propensity scores to adjust for confounders.

Results: The pooled adjusted HR of ADHD after long-term opioid analgesic exposure compared to discontinuers was 1.12 (95% Confidence Interval 0.77 to 1.47). In a dose-response comparison, the pooled adjusted HR of ADHD was 0.99 (0.67 to 1.31) when long-term exposure (30 or more DDDs) was compared to short-term exposure (less than 30 DDDs). The results of no increased risk was consistent when we compared OMT exposed to discontinuers among Danish women; adjusted HR 0.84 (0.51-1.38).

Conclusion: After adjustment, we did not observe any increased risk of ADHD among children prenatally exposed to opioids when compared to children of opioid discontinuers regardless of type of opioid treatment. Nor did we find a dose-response relationship.

S-TS14-1

Don't stop me now? The continuation of statins among newly admitted nursing home residents [#163]

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Background: nursing home residents have a limited life expectancy and are thus unlikely to derive a clinically meaningful benefit from statins for cardiovascular prevention. Whether statins are routinely continued or discontinued after nursing home admission is largely unknown.

Methods: Nationwide prospective cohort study of all nursing home residents aged ≥ 75 years admitted in 2013–2014, followed until either death or the end of the observation period (31 Dec. 2015). Utilization of preventive medications was assessed from 1 year before until 1 year after the date of nursing home admission, by using routinely collected healthcare data.

Results: A total of 47,014 newly admitted residents were included (65% women, mean age 87 [SD 5.6] years). These people had on average 7.5 (SD 3.7) co-existing chronic diseases, 19% were at high risk of frailty-related adverse event, and the mortality rate was 36 per 100 person-years. The overall proportion of older adults using statin therapy decreased from 21% to 18% during the year prior to nursing home admission, and further decreased from 18% down to 14% during the year after. Among nursing home residents who were prescribed statins at the time of admission ($n=9297$), those with no history of cerebrovascular or ischemic heart disease during the past 5 years ($n=2393$) were more likely to discontinue than those treated for secondary prevention ($n=6904$), adjusted HR = 1.21 (95% CI 1.11–1.32). However, statin discontinuation remained infrequent even in the primary prevention group (mean difference -2%).

Conclusions: almost one out of five older adults admitted to nursing homes are treated with statins, and many continue treatment in spite of a limited life expectancy.

“I simply don’t know because I don’t know which drugs I get”: A qualitative study of perspectives on deprescribing among older adults with limited life expectancy and their relatives [#21]

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Background: To effectively carry out deprescribing among older adults reaching the last years of life, it is important to understand the perspectives of both patients and relatives. Thus, we aimed to explore perspectives on deprescribing among older adults with limited life expectancy and their relatives.

Methods: We conducted semi-structured face-to-face interviews with nursing home residents. Each resident selected a relative who was subsequently interviewed. Interviews were audio recorded, transcribed verbatim, and analysed using systematic text condensation.

Results: Ten nursing home residents (aged 72-96 years) and nine relatives (aged 45-82 years) were interviewed. Three main themes reflecting their perspectives on deprescribing were identified: 1) Wishes and attitudes towards medication, 2) Knowledge and experiences with medication, and 3) Relationship with health care professionals regarding medication. Medication was generally perceived as a necessity by the participants. Most participants had not considered the possibility for deprescribing but were open towards medication changes if proposed by the physician. Most participants did not have an in-depth knowledge of the medication, did not find medication challenging to take, and would not notice if the medication was changed. Rather, they considered the physician or the nursing home staff as being responsible for the medication; however, they would also like to be involved in decisions about medication to some degree. Lastly, they generally had faith in health care professionals despite limited contact.

Conclusion: Older adults with limited life expectancy and their relatives are generally interested in deprescribing activities; however, the initiative of deprescribing resides with the health care professionals.

S-TS14-3

Attitudes of older patients' towards deprescribing in general and regarding diabetes and cardiovascular medication [#119]

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Background: Understanding patients' attitudes towards deprescribing is crucial for medication optimization. Our primary aim was to assess older patients' attitudes towards deprescribing in general and regarding diabetes and cardiovascular medication. Our secondary aim was to assess the association between attitudes, medication groups and patient characteristics.

Methods: Dutch speaking patients included were 70 years or older, used statin(s) and antihypertensive(s) or sulfonylurea(s) and/or insulin(s). They completed the revised Patients' Attitudes Towards Deprescribing (rPATD) questionnaire, which consists of two global questions and four factors (appropriateness, burden, involvement and concerns about stopping). A part about statins, antihypertensives, insulins and sulfonylureas was added. The association between patients' age, gender, number of medications and rPATD responses were tested in univariate analyses. Additionally, the differences in concern and appropriateness between medication groups was tested.

Results: Most of the patients (n=314, mean age 76.7) were willing to stop one or more of their medications (87.9%). Concerns about stopping were similar for the medication groups. Patients found antihypertensives more appropriate than statins (p<0.0001). Furthermore, patients found insulins more appropriate than sulfonylureas (p=0.026) or statins (p=0.002). There were no associations with gender. Using more medications was associated with a higher perceived medication burden (p=0.0015) and older people were more satisfied with their medication (p=0.042).

Conclusion: Most of the patients were willing to have medication deprescribed. Willingness to have a specific medication deprescribed can depend on the perceived appropriateness, which differed between medication classes. This implies that patients' ideas about the appropriateness of their medication should be explored before starting deprescribing.

Attitudes of community-dwelling older adults and caregivers towards deprescribing in French-speaking countries [#28]

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Background: To optimize prescriptions in the geriatric population, knowing the attitudes of older adults and caregivers towards deprescribing is essential. The aim of this study was to capture attitudes and beliefs of older adults and caregivers towards deprescribing in French-speaking countries.

Methods: A multicenter cross-sectional study was conducted by administering the transculturally adapted and validated French version of the revised Patients' Attitudes Towards Deprescribing questionnaire in France, Canada, Belgium and Switzerland. Older adults ≥65 years living in the community or in institutions and who were taking at least one chronic medication, as well as caregivers of older adults with similar characteristics were included.

Results: A total of 367 older adults (79.3±8.7 years, women: 63.2%, 63.1% lived at home and ≥5 medications: 53.5%) and 255 caregivers (64.4±12.6 years, women: 74.9%; their care recipients: 83.4±7.9 years, 52.2% lived at home and ≥5 medications: 68.9%) answered the questionnaire. For older adults and caregivers respectively, 87.5% and 75.6% would be willing to stop taking one of their medications or their care recipient's medications if the physician said it was possible. The willingness to stop medications was higher for older adults in Switzerland (98.6%) compared to Canada (88.6%), France (84.3%) and Belgium (81.0%) (p=0.013). For caregivers, the highest proportion was reported in France (77.8%) followed by Belgium (77.5%), Switzerland (74.5%) and Canada (73.6%) (p=0.049).

Conclusion: A significant proportion of older adults and caregivers were willing to deprescribe current medications. These findings reveal opportunity for physicians to implement shared decision-making process about deprescribing with patients.

Development of a deprescribing manual for the COFRail study, a cluster-randomised controlled trial in primary care [#23]

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Background: Polypharmacy is associated with a high risk for adverse drug events, particularly for frail older patients. Deprescribing medications whose benefits no longer outweigh the risks may improve quality of life and reduce adverse outcomes. In the COFRail study, deprescribing is part of a complex intervention involving family conferences and joint prioritisation of treatment (funding: Innovationsfonds 01VSF17053, registration: German Clinical Trials Register DRKS00015055).

Methods: A deprescribing manual was developed for general practitioners in the intervention group. Covered indications were chosen according to their prevalence in geriatric patients in primary care and their potential for reducing drug burden (i.e. hypertension). We conducted a literature search and extracted information from lists of potentially inappropriate medication, clinical practice and deprescribing guidelines, and deprescribing studies. Additionally, algorithms were drawn to offer a graphic representation of each chapter. General practitioners involved in the COFRail study piloted preliminary versions in an expert workshop and in eight family conferences. Their feedback was incorporated into the manual's structure to further improve usability.

Results: The deprescribing manual contains recommendations for withdrawing medications concerning 11 indications or topics. Each chapter consists of patient-related criteria, medication-related criteria, possible priorities for targeting different drugs, suggestions for communicating the potential benefit of deprescribing and monitoring recommendations. The following sections contain drug/drug class specific harms and precautions, and excerpts of the cited literature.

Conclusion: The manual covers selected indications and frequently used drugs only. However, it focuses on major issues in geriatric pharmacotherapy. Its practicability and use will be investigated in the COFRail study.

POSTER PRESENTATIONS

Adherence

AD1

The influence of quality of life in medication adherence among type 2 diabetes patients [#30]

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Background: Although studies show that the health-related quality of life (HRQoL) of patients with diabetes type 2 (T2DM) can influence medication adherence, the analysis of their relationship is still contradictory in the literature. The aim of this study was to assess whether better HRQoL leads to increased or decreased level of medication adherence in these patients.

Methods: We conducted a retrospective chart review of 323 patients with T2DM attending the primary health care center of the Foča municipality in eastern part of Bosnia and Herzegovina. Adherence was measured using a validated survey form consisting of seven questions (4-point Likert scale). The SF-36v2 Health Survey was used to measure HRQoL.

Results: Females predominated (57.89%), about 44.27% had diabetes between 5 and 10 years and oral therapy was the most common treatment for all patients (75–88%). Half of the patients (51,5%) were non-adherent. In the multivariate logistic regression model, statistically significant predictors of non-adherence were: male respondents ($B=-1,251$; $p < 0.001$) whose odds ratio was $OR=0.29$; and the variables Physical Component Summary (PCS) ($B = -0.042$; $p = 0.007$) and the Mental Component Summary (MCS) ($B = -0.038$; $p = 0.007$) whose odds ratio was $OR=0.96$, indicating that respondents for each additional unit score of PCS or MCS were 4% less likely to be non-adherent.

Conclusion: Results illustrated that patient's HRQoL seems to be important parameter enhancing adherence. Planning interventions to improve HRQoL and enhance treatment adherence is crucial for these patients. This work was supported by the Ministry of Science and Technological Development, Serbia (project No. 41012).

Geographical and sociodemographic differences in discontinuation with medication for Chronic Obstructive Pulmonary Disease: An innovative multilevel analysis [#45]

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Background: While discontinuation to COPD maintenance medication is a known problem and an indicator of low COPD care quality, the proportion of patients with discontinuation and its geographical and sociodemographic distribution is so far unknown in Sweden. Therefore, we analyse this question applying an innovative approach denominated multilevel analysis of individual heterogeneity and discriminatory accuracy (MAIHDA).

Methods: We analysed 51,899 patients categorized into 18 sociodemographic contexts and 21 counties of residence. All patients had both a hospital COPD diagnosis and were on inhaled maintenance medication during the previous five years before the study baseline in 2010.

We defined “discontinuation” as the absolute lack of retrieval from a pharmacy of inhaled maintenance medication during 2011. We performed a cross-classified MAIHDA and obtained the average proportion of discontinuation as well as county and sociodemographic absolute risks and compare them with a proposed benchmark value of 10%. We calculated the variance partition coefficient (VPC) and the area under the receiver operating characteristics curve (AUC) to quantify county and sociodemographic differences. To summarize the results, we used a framework with 15 scenarios defined by the size of the differences and the level of achievement in relation to the benchmark value.

Results: Around 20% of COPD patients in Sweden discontinue maintenance medication, so the benchmark values were not achieved. There were no county differences (VPC= 0.4%, AUC= 0.53). The sociodemographic differences were relatively higher but still small (VPC= 5.9%, AUC= 0.570).

Conclusion: Reducing discontinuation of inhaled maintenance medication could improve the quality of pharmacological COPD-care in Sweden. There are no geographical differences and the sociodemographic inequalities are small, but the proportion of discontinuation is unjustifiably high overall. Geographical comparisons should be combined with sociodemographic analyses. Cross-classified MAIHDA is an appropriate tool to assess differences in health care quality.

AD3

Factors associated with primary non-adherence to newly initiated direct oral anticoagulants in patients with non-valvular atrial fibrillation [#78]

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Background: Direct oral anticoagulants (DOACs) are widely used for stroke prevention in non-valvular atrial fibrillation (NVAf); however, few studies examine primary adherence to these medications. This study estimates the rate of primary non-adherence, defined as failure to initiate taking a medication, and identifies associated factors.

Methods: The Information System for the Development of Primary Care Research, covering ~76% of patients in Catalonia, will be used to identify new users of DOACs between 2008 and 2015. Rates of primary non-adherence will be estimated through comparison of prescribing and pharmacy billing data; patients who do not collect their first DOAC prescription will be defined as primary non-adherent. Bivariate analysis (Chi-squared) and multivariate logistic regression will be used to identify associations between primary non-adherence and demographics (age, sex), medication factors (type of DOAC, frequency of DOAC dosing) and comorbidities (alcohol abuse, cancer, cardiovascular disease, chronic kidney disease, chronic obstructive pulmonary disease, dementia, diabetes, gastric bleed, gastric ulcer, heart failure, hypertension, liver disease and stroke).

Results: There is estimated to be around 13,000 new users of DOACs with NVAf during the study period. The rate of primary non-adherence will be presented together with results of the logistic regression examining associated factors.

Conclusion: Primary adherence is integral to effective medication use, yet estimates of rate are variable. Medication class has been associated with primary adherence in other studies. This study will shed some light on the rate of primary adherence to DOACs and what factors may be associated with lower primary adherence.

AD4

Patterns of antipsychotic use in incident users of second-generation long-acting injectable antipsychotics [#93]

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Background: Public drug programs in Canada limit coverage of second-generation long-acting injectable antipsychotics (SG-LAIAs) to patients with schizophrenia and a history of non-adherence, non-response or intolerance to previous antipsychotics. We aim to evaluate the extent to which SG-LAIA prescribing is consistent with formulary criteria and to describe patterns of antipsychotic use in SG-LAIA users.

Methods: We used the administrative databases of the Manitoba Centre for Health Policy (MCHP) to identify SG-LAIA users in Manitoba, Canada between 2004 and 2015. We linked to population registry, hospital discharge abstracts and medical services databases to obtain information on demographics, diagnoses and hospitalizations. Descriptive statistics were used to determine the proportion of SG-LAIA users who met formulary criteria at the time of LAIA initiation.

Results: We identified 586 incident risperidone LAI (RLAI) users, 143 paliperidone (PLAI) users and 15 aripiprazole (ALAI) users. More than 90% had a diagnosis of schizophrenia and history of antipsychotic dispensation; 9.0% of RLAI users and 15.4% of PLAI users had prior clozapine dispensation. Non-adherence (MPR <0.8) was observed in 44.5% and 42.7% of RLAI and PLAI users, respectively. Less than one-third of RLAI users were hospitalized with a primary diagnosis of schizophrenia in the 2 years prior to incident dispensation, while 51.1% of PLAI users had at least 2 previous hospitalizations for schizophrenia.

Conclusion: SG-LAIA use appears generally consistent with formulary criteria.

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Adherence of antidepressant drugs in Catalonia, 2010-2015 [#102]

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Background: There are not specific adherence studies in patients over 65 about antidepressant use in Spain. We aimed to describe patterns of adherence to antidepressants such as primary adherence, switching and discontinuation.

Methods: A retrospective descriptive study was conducted between 2010-2015, including new antidepressant users (excluding IMAO inhibitors) aged ≥65 years. Prescription information was retrieved from the SIDIAP (Information System for Research in Primary Care from Catalan Institute of Health) database, and dispensing from DATAMART database. A switcher was defined as any patient with a subsequent dispensing of another antidepressant within the first treatment episode, including a permissible gap of 30 days following the theoretical end date of the prior dispensing. A discontinuer was defined as any patient who does not receive a subsequent antidepressant within the permissible gap. Primary adherence, as collection of a prescription within 60 days following the prior dispensing, was calculated. Kaplan Meier analysis described switching and discontinuation patterns.

Results: A total of 199,168 new antidepressant users were identified. Women (67.4%) and people aged 75-84 (40.4%) prevailed. At baseline, 72.9% new users had cardiovascular diseases followed by mental disorders (61.8%). SSRI was the major prescribed group. The pick up rate for the prescriptions was of 86% for 171,281 users who had a subsequent dispensing. Switching and discontinuation patterns will be presented.

Conclusion: Primary adherence of antidepressant drugs in the elderly was better than other studies. Switcher patterns on antidepressant drugs across time will allow to assess the adherence to prescription guidelines.

Longitudinal trajectories of adherence to direct oral anticoagulants and associated factors in patients with atrial fibrillation in the SIDIAP database (Catalonia) [#161]

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Background: Direct oral anticoagulants (DOACs) are recommended by the updated atrial fibrillation (AF) guidelines for prevention of stroke and systemic embolism, except in mitral stenosis or mechanical heart valves, and are associated with lower risk of serious bleeding. Adherence to treatment is essential for effectiveness; therefore, this study will identify different adherence patterns over time and associated predictors.

Methods: An observational retrospective cohort study in new users of DOACs with AF in the SIDIAP database from 2009 to 2015. Patients will be classified through adherence trajectory models and the proportion of days covered (PDC) will be estimated. Multivariable logistic regression will be used to identify factors associated with secondary non-adherence: demographic characteristics, prescription details (DOAC prescribed, dosage, dosing frequency, prescription duration, prescriber specialty), prior prescription of a vitamin K antagonist (VKA), polypharmacy, comorbidities, specific concomitant medications and clinical conditions.

Results: An estimated 15,000 patients were new DOAC users with AF during the study period. The adherence trajectory models and PDC will be presented, together with results of the logistic regression used to identify factors associated with secondary adherence.

Conclusion: Nonadherence to DOACs has been previously shown to be related to an increased risk of adverse cardiovascular events. The identification of different adherence patterns over time and their predictors can be a useful approach in many settings, so as to understand the reasons for low adherence and decide on treatment needs and behavioral support.

AD7

Identifying adherence patterns across multiple medications and their association with health outcomes in older community-dwelling adults with multimorbidity [#176]

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Background: Previous evidence on medication non-adherence measurement in older people with multimorbidity is limited and the association between adherence and health outcomes inconclusive.

Methods: Community-dwelling adults aged ≥ 70 years were recruited from 15 general practices in Ireland in 2010 (wave 1) and followed-up two years later (wave 2). Participants had ≥ 2 RxRisk-V multimorbidity conditions at wave 1 and had ≥ 2 dispensings of RxRisk-V medications (wave 1-wave 2). Average adherence across RxRisk-V conditions was estimated based on continuous multiple-interval measure of medication availability (CMA7 function in AdhereR). Group-based trajectory models (GBTM) were used to group participants' adherence patterns for RxRisk-V medications. Multilevel regression was used to examine the association between adherence patterns and (i) EQ-5D utility (linear) and (ii) vulnerability, using the Vulnerable Elders Survey (VES ≥ 3 defined as vulnerable; logistic) at wave 2, controlling for potential confounders.

Results: Average adherence (CMA7) was 77% (SD 19%) across 501 participants. GBTM identified five adherence groups: (1) initial low adherers, gradual increase; (2) high adherers, sharp decline; (3) steady adherers, gradual decline; (4) consistent high adherers and (5) consistent non-adherers. Average adherence was associated with a clinically significant increase in EQ-5D utility. (adjusted $\beta=0.11$, Robust Standard Error 0.04) Group 5 was associated with significantly increased vulnerability compared to Group 4 (adjusted Odds Ratio= 1.88, 95% CI 1.01, 3.50).

Conclusion: Increased average adherence was associated with higher EQ-5D utility. Adherence grouping did not significantly impact utility. Suboptimal adherence to multiple medications in older adults with multimorbidity was also associated with increased risk of vulnerability.

Adherence to the oral antidiabetic therapy with gliptins [#186]

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Background: According to the evaluation of the International Diabetes Federation, 425 million of adults all over the world suffer from diabetes. It is also proven that low adherence to therapy implies an increased morbidity and mortality, reducing the pharmacological efficacy and intensifying hospitalization because of diabetes complications. The study was aimed to verify the adherence to gliptins (A10BH) in an Italian Local Health Unit (LHU) in 2018.

Methods: Prescriptions were analyzed through a retrospective, observational and descriptive study. Only patients with a prescription since January 2018 were selected in order to calculate adherence during the study period. Adherence was measured by using Medication Possession Ratio (MPR) as the parameter and calculated by referring to Defined Daily Dose (DDD).

Results: 200 out of 546 pts (37%) showed an adherence less than 50%, 184 (34%) an adherence between 50% and 80%, 144 (26%) an adherence greater than 80%, whereas 18 (0,3%) switched from a gliptin to another. Sitagliptin was the most prescribed active principle (231 pts totDDD 47705), followed by linagliptin (136 pts totDDD 31388). On the contrary, saxagliptin was used only by 10 pts, with a single case of adherence greater than 80%.

Conclusion: Poor adherence to chronic therapy represents a major problem of public health, contributing to the worsening of patients' conditions and to the consequent rise in health care costs. The aim of all health professionals involved should be to take notice of this considerable health problem and to identify more effective tools to improve adherence.

Persistence of biologic treatments in patients with inflammatory bowel disease [#201]

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Background: Biological drugs are known to be effective for treating inflammatory bowel disease (IBD). However therapy discontinuation still appears frequently reported by many studies for various reasons. High cost of medication, side effects and loss of response can be identified as reasons for quitting Therapy. The aim of this study was to evaluate the persistence of biologic treatments in patients with IBD and to compare the results with reports from other countries.

Methods: In this single centre, retrospective study using administrative claims database of the Hungarian National Health Insurance Fund, patients receiving adalimumab, infliximab, vedolizumab or ustekinumab therapy between 2017 and 2019 were included. Demographic characteristics, therapy discontinuation and switch were analysed.

Results: Overall, 133 people with IBD were prescribed biological therapy during the two year timespan, 57 infliximab, 62 adalimumab, 9 vedolizumab and 5 ustekinumab. Biological treatment was switched in 21 cases and only 11 people discontinued the medication completely, all of them were from the Anti-TNF Inhibitor group. 3 out of 11 stopped using infliximab and 8 out of 11 discontinued adalimumab therapy.

Conclusion: 8 per cent (11 of 133) of the patients discontinued the biological therapy for various reasons (2 remission, 2 bowel resection, 2 no response, 2 patient compliance, 1 cancer, 1 adverse drug reaction, 1 unknown). This rate is very low compared to published data. In this cohort, demographical features had no association with persistence of therapy.

AB1

Antibiotic prophylaxis for the prevention of surgical site infection in low and middle income countries (LMICs): A scoping review [#5]

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Background: The findings from point prevalence studies in two hospitals in Ghana indicated suboptimal use of antibiotics for surgical prophylaxis including prolonged postoperative antibiotic prescribing, similar to other African countries. However, the evidence for such practice is unclear. We conducted a scoping review of the evidence surrounding antibiotic use for surgical prophylaxis in LMICs to shape future interventions.

Methods: Databases were searched from inception to 22 July 2019 surrounding antibiotic use for surgical prophylaxis in LMICs alongside grey literature, websites and reference lists of included studies. Data extracted included study characteristics, interventions, outcomes and recommendations.

Results: Of 185 records screened, 26 studies related to surgical site infections (SSI) and timing of antibiotic prophylaxis in LMICs were included. The incidence of SSI was significantly higher in LMICs compared with high income countries; recording of infection surveillance data was found to be poor and there is lack of local guidelines for antibiotic prophylaxis. Several studies in Africa have reported reductions in SSI with single dose preoperative antibiotic use compared with post-operative prophylaxis and a reduction in costs and nurses time after implementing a multidisciplinary intervention. Despite evidence to the contrary, many surgeons continue to use post-operative antibiotic prophylaxis.

Conclusion: There is evidence for the effectiveness of single dose preoperative antibiotic use in preventing SSI in LMICs; however, behavioural change interventions are required to change clinicians' behaviour around this area. Interventions must include local contexts and address strongly held beliefs. The establishment of local multidisciplinary teams will promote ownership and sustainability of change

**Assessment of antimicrobial use and prescribing practices among paediatric inpatients in Zimbabwe
[#17]**

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Background: Antimicrobial resistance threatens our ability to effectively treat infections. A key driver is inappropriate antimicrobial use. There is currently limited information on antibiotic utilisation in Zimbabwe including children. Consequently, the objective of this study was to assess antimicrobial consumption in the paediatric department of a tertiary care public hospital in Zimbabwe.

Methods: Clinical records of paediatric inpatients admitted to two general paediatric wards at Harare Central Hospital over a 3-week period were reviewed prospectively. Antimicrobial consumption was described as days of therapy per 100 inpatient days (DOT/100 PD). Adherence of antimicrobial drug prescriptions to the National Guidelines was also evaluated.

Results: A total of 121 (93.1%) children were prescribed at least one antimicrobial out of 130 children admitted. The median age was 14 months (IQR: 3 – 48 months). Overall antimicrobial consumption was 155.4 DOT / 100 PD (95% CI 146-165.2). The most frequently prescribed antimicrobials were benzylpenicillin, gentamicin and ceftriaxone. In 111 children, adherence to national guidelines was evaluated and 64 (57.7%) received antimicrobials according to guidelines. For instance, in children admitted with neonatal sepsis, nonadherence (64%) mostly due to prescribing of ceftriaxone or benzylpenicillin and gentamicin versus cloxacillin and gentamicin.

Conclusion: There is high antimicrobial drug usage in hospitalized children in Zimbabwe and a considerable proportion of prescriptions are non-adherent with national guidelines. These findings emphasize the need for antimicrobial stewardship programmes across Zimbabwe and for strengthening diagnostic capacity in low-income settings which is a concern enhancing AMR rates.

Antimicrobial Point Prevalence Surveys in two Ghanaian hospitals: opportunities for antimicrobial stewardship [#24]

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Background: There is an urgent need to support antimicrobial stewardship (AMS) and reduce antimicrobial resistance (AMR) in Ghana. Point prevalence studies (PPS) were conducted in two hospitals as part of a global health partnership project in order to: (i) provide baseline antimicrobial utilisation data for Keta Municipal Hospital (KMH) and Ghana Police Hospital (GPH) to identify priorities for improvement; (ii) assess the feasibility of conducting PPS studies; (iii) compare results with other African countries.

Methods: The Global PPS system was used. Training of hospital staff was undertaken by the Scottish team prior to data collection.

Results: Prevalence of antibiotic use was 65% in GPH and 82% in KMH. Penicillins and other beta-lactams were the most commonly prescribed antibiotics, with third generation cephalosporins mainly used in GPH. Antibiotics were administered empirically and usually initiated IV and infections were mainly community acquired. Indication documentation for antibiotic use in both hospitals was good and guideline compliance was > 50%. Notably for many indications no guidelines were available. Most prescriptions had recorded stop dates and there appeared to be no missed doses. Penicillin allergy was not recorded for any patient. The duration of surgical prophylaxis was generally more than one day (69% in GPH and 77% in KMH).

Conclusion: PPS was feasible and achieved with limited training. Encouraging findings were seen which can be shared with other countries. Identified concerns included broad spectrum antibiotics, length of prescribing including prophylaxis and oral use post IV, and lack of freely available microbiology resources to inform treatment.

Availability and use of therapeutic interchange policies in managing antimicrobial shortages among South African public sector hospitals; findings and implications [#40]

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Background: Therapeutic interchange policies in hospitals are useful in dealing with antimicrobial shortages and minimising resistance rates. However, the extent of antimicrobial shortages and availability of therapeutic interchange policies is unknown among public sector hospitals in South Africa, which is a concern. This study aimed to ascertain the extent of antimicrobial shortages among public sector hospitals, the presence of current therapeutic interchange policies and the role of pharmacists in the process to guide future practice.

Methods: A quantitative and descriptive study was conducted with a target population of 403 public sector hospitals. Data were collected from hospital pharmacists using an electronic questionnaire administered via SurveyMonkeyTM. The main outcome measure was the prevalence of public sector hospitals with antimicrobial shortages over the past six months and the prevalence of hospitals with therapeutic interchange policies.

Results: The response rate was 33.5%. Most (83.3%) hospitals had experienced shortages in the previous six months. Antimicrobials commonly reported as out of stock included cloxacillin (54.3%), benzathine benzylpenicillin (54.2%), erythromycin (39.6%) and ceftriaxone (38.0%). Reasons for shortages included pharmaceutical companies with supply constraints (85.3%) and an inefficient supply system. Only 42.4% had therapeutic interchange policies, and 88.9% contacted the prescriber when there was a need for substitution.

Conclusion: Antimicrobial shortages are prevalent in South African public sector hospitals with penicillins and cephalosporins being the most affected. Therapeutic interchange policies are not available at most hospitals. Effective strategies are required to improve communication between pharmacists and prescribers to ensure safe, appropriate and therapeutically equivalent alternatives are available

Assessment of multidrug-resistant tuberculosis (MDR-TB) treatment outcomes in Sudan; findings and implications [#54]

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Background: Multidrug-resistant Tuberculosis (MDR-TB) has an appreciable socioeconomic impact and threatens global public health leading to initiatives across countries to address this. There is a need to assess treatment outcomes of MDR-TB and predictors of poor treatment outcomes in Sudan given current high prevalence of resistance.

Methods: Combined retrospective and prospective cohort study at Abu-Anga hospital (TB specialized hospital in Sudan). All patients with MDR-TB between 2013-2017 were targeted and all confirmed MDR-TB cases received an 18-month standardized regimen in two phases: 8-month intensive and 10-month continuation phase.

Results: 156 patients were recruited as having good records, 117 (75%) were male, and 152 (97.4%) had pulmonary TB (PTB). Patients were followed for a median of 18 months and a total of 2108 person-months. Overall success was 63.5% (cure or completed treatment) and the mortality rate was 14.1%. Rural residency ($P < 0.05$) and relapsing on previous treatments ($P < 0.05$) were determinants of time to poor MDR-TB treatment outcomes (died, treatment failure or defaulters).

Conclusion: The current situation of TB in general and MDR-TB, in particular, is a concern in Sudan. More attention needs to be given to special MDR-TB groups that are highly susceptible to poor outcomes, i.e. rural patients. It is highly recommended to the authorities to maintain total coverage of medicines for all MDR-TB patients for the entire period of treatment in Sudan, and instigate more treatment centers in rural areas together with programmes to enhance adherence to treatment including patient counselling. We will be following this up.

Knowledge level and attitude assessment of Hungarian and International medical students on antimicrobial use and resistance: a cross-sectional survey [#58]

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Background: The prevention, diagnosis and therapy of infectious diseases is the everyday task of physicians, which is not feasible without the adequate knowledge level. The WHO has recently released a competency framework for health workers' education and training on antimicrobial resistance, defining the desirable knowledge level for physicians.

Methods: A self-administered questionnaire-based study was performed during practical classes of 2nd to 5th year medical students enrolled at the University of Szeged. The questionnaire included 30 knowledge-based questions related to infectious diseases and antimicrobial use. An attitude score (0-7) was also determined, based on responses to specific questions. Data collection has been running since February 2017. Statistical analyses were performed by IBM SPSS 24.0.

Results: The 796 respondents (513 Hungarian, 283 International) were polled 62.5% female (average age: 23.9±1.8 and 24.2±3.4 years, respectively). 57.8% were aware of the medical field they would like to specialize in (in the clinical module, $p < 0.001$), only 0.6% was interested in infectious disease. Based on correct answers, each grade showed significantly better results than the previous one ($p < 0.001$). 30.9% of 2nd year students had zero correct answers. Hungarian students predominantly presented with high (≥ 5) attitude scores (82.4-99.2%), International students had variable (37.3-70.3%) performance. There was significant association between attitude scores and correct answers ($p < 0.001$).

Conclusion: The gradient of change in knowledge level is clear, however, 56.3% of Hungarian and 36.2% International students had a below par performance in the clinical module. Our results suggest the need for the implementation of case-based teaching methods and curriculum improvement.

Knowledge, attitude and practice of community pharmacists in Hungary regarding appropriate antibiotic use and antimicrobial resistance [#59]

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Background: Multidrug-resistant infections are a global public health concern, they are associated with prolonged hospitalization, increased mortality rate and higher medical costs. The conscious use of antibiotics is of paramount importance, and community pharmacists have pivotal roles in ensuring the prudent use of all antimicrobials. The aim of our study was to evaluate the knowledge and attitudes of community pharmacists, regarding their roles in antibiotic use and drug resistance.

Methods: A self-administered questionnaire-based study was performed at community pharmacies and postgraduate training courses in Hungary. Data collection has been running since January 2016. Statistical analyses were performed by SPSS Statistics 24.0.

Results: The 172 respondents (average age of 34.75 ± 11.41 years) were polled 72.1% female. According to 93.6%, antibiotics are medicines of special importance, 87.8% believes that enabling non-prescription antibiotic use is a public health concern. 89.0% considered their knowledge on antimicrobial therapy appropriate, while this number was 70.3% regarding the mechanisms and prevention of infectious diseases, and 66.9% on antibiotic resistance. 75.0% of pharmacists stated that they did not give antibiotics to patients without a medical prescription in the last 12 months. 44.2% acknowledged that the temperament of patients significantly influences their dispensing practice.

Conclusion: Community pharmacists are in direct contact with the patients though dispensing and pharmaceutical care, being important players in primary care and representing the first line of action for the adequate use of antibiotics. A fraction of respondents allows for non-prescription antibiotic use and needs help in the realization of the importance of antibiotic resistance.

Co-medication and co-morbidity in Norwegian HIV-positive patients [#74]

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Background: HIV treatment have given HIV-infected persons a longer life expectancy. However, co-morbidities and polypharmacy follows by age. The aim of this study is to describe the use of concomitant medication in the treated HIV-positive patients compared to the general population.

Methods: The Norwegian Prescription Database (NorPD) covers prescriptions to all persons living in Norway. We studied co-medications in a HIV-positive population, defined as users of antiretroviral treatment (ART) above 30 years and compared the use with an age-adjusted general population in Norway for the year 2016.

Results: The most prevalent co-medication among the ART-treated HIV-population were antibacterials (ATC group J01); 32% men and 29.5% female ART-users were prescribed antibacterials, for which the prevalence was 2.1 and 1.2 times higher than in the general population in 2016. Moreover, antihypertensives (ATCgroup C03, C07, C08 and C09), statins (C10AA), anxiolytics (N05B), hypnotics (N05C) and antidepressants (N06A) had a higher prevalence of use among the ART-treated HIV-positive group compared to the general population. The increased risk was 1.3 (males)/1.3 (females) for antihypertensives, 1.2/2.1 for statins, 2.9/1.2 for anxiolytics, 2.8/1.2 for hypnotics and 1.6/0.8 for antidepressants, respectively.

Conclusion: Use of antibacterials, antihypertensives, anxiolytics, hypnotics and antidepressives occur more frequently in ART-treated HIV-positive patients than in the general population. Those aging with ART-treatment will be challenged with polypharmacy and possible harms of this. There is limited knowledge on polypharmacy among the HIV-positive population. More research is needed to address how to deal with challenges such as drug-drug interactions, adverse drug reactions and drug adherence.

Antibacterial consumption among the elderly in community care in Hungary and Sweden [#77]

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Background: According to the 2017 surveillance data of the European Surveillance of Antimicrobial Consumption Network (ESAC-Net), the consumption of systemic antibacterials in ambulatory care was well below the European mean (21.8 DDD/1000 inhabitants/day - DID) both in Hungary (15.6 DID) and in Sweden (11.6 DID). Considering an ageing population and the burden of infectious diseases among older patients, we aimed to map the consumption of antibacterials prescribed in ambulatory care for the elderly.

Methods: Prescription data on systemic antibacterials (ATC code: J01) dispensed in the community in 2017 were retrieved from the databases of the Hungarian National Health Insurance Fund and the Swedish eHealth Agency. Data were stratified by age groups. Elderly age was defined as 65 years or older. Consumption was expressed as number of antibacterial prescriptions/1000 inhabitants/year.

Results: In both countries, the proportion of the elderly is around 20% in the general population. The proportion of antibacterial prescriptions issued for elderly patients in community care was 17.5% in Hungary and 33.6% in Sweden. In 2017, dispensed antibacterial prescriptions for the elderly equalled 649.8 prescriptions/1000 inhabitants/year in Hungary and 545.0 prescriptions/1000 inhabitants/year in Sweden. Co-amoxiclav, levofloxacin and ciprofloxacin were the most commonly used antibiotics in Hungary, while phenoximethylpenicillin, pivmecillinam and flucoxacillin were the most frequently prescribed antibacterials for the Swedish elderly.

Conclusion: The scale and pattern of antibiotic use in the elderly was remarkably different in the two countries. Further investigations are warranted to understand the reasons behind the difference.

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People awareness about antibiotic-resistance: a survey conducted in Southern Italy [#124]

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Background: Antibiotic resistance represents one of the biggest threats to global health. Patients infected with drug resistant bacterial infection need more expensive intervention, so antimicrobial resistance results in increased health care costs to families and societies.

Methods: Cross-sectional survey on drug use involving members of the public in Campania Region, Southern Italy, between May 2016 and December 2018. Survey was based on the original WHO version. Data were obtained from paper questionnaires, translated into Italian and submitted randomly to members of public which completed the questionnaire anonymously. Study population characteristics were analysed using descriptive statistics: quantitative variables were described by averages and standard deviations while categorical variables by counts and percentages.

Results: Of 320 interviewed, 62.5% of jobseekers declared to take antibiotics without prescription, while 8.3% among retired people. People working in health field was more likely to take it without prescription than who didn't work in it (48.8% vs 26.9%). Among the entire sample, highest percentages of people reported taking antibiotics to treat sore throats and fever (35.7% and 34.7%). Self-medication was more frequent as the level of education increased, 7% of people with elementary school declared to buy antibiotics to treat symptoms for which they were previously used, against 28% with bachelor and 25.8% with master's degree. 6.5% of jobseekers also considered it correct.

Conclusion: Analysis showed that there isn't a strong awareness about the problem, moreover, private practice prescription of antibiotics is still applied. Appropriate use of drugs and avoiding self-prescription are valid requirements to tackling antibiotic-resistance.

AB11

Veterinary drug dispensation in community pharmacies: focusing on antiinfectives [#129]

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Introduction: In Hungary, prescriptions issued by veterinary doctors for pets can be redeemed in community pharmacies. Therefore – in relation to the one-health approach – we aimed to assess the scale and pattern of prescriptions issued for veterinary purposes (AUV), with special focus on antibacterials.

Methods: A cross-sectional survey was performed. The study was conducted in eight community pharmacies in the Southern Hungarian region. All veterinary prescriptions – dispensed during 2018 - were manually inspected. Date of prescription, date of dispensing, drug name, quantity, dosage regimen and animal species were recorded. Drug were classified according to the ATC and ATCVet index.

Results: Overall, 1685 AUV prescriptions were reviewed. The average number of AUV prescriptions were 211 per community pharmacy (minimum: 38; maximum: 357 AUV prescriptions). In total, 3211 products were ordered. Most frequently they were prescribed for dogs (1288 prescription; 76.4%), cats (168 prescriptions; 10.0%) but we recorded drug prescription for: pigeon, rabbit horse, cattle, guinea pig, hamster. Mostly human products were prescribed (1605 prescription; 95.3%), 'veterinary-use only products were prescribed in minority of cases (80 prescriptions; 4.7%). Antiinfectives for systemic use (ATC: J) was the most frequently prescribed ATC group (335 prescriptions, 751 packages), mainly amoxicillin (298 packages), doxycycline (203 packages) and ciprofloxacin (94 packages).

Conclusion: Veterinary use of human products for pets seems not to be marginal. In the one-health concept, assessment of veterinary prescriptions on national level would be essential.

AB12

Broad spectrum antibiotics: comparison of prescribing sites in Portugal [#140]

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Background: A cross-sites comparison was performed on antibiotic prescription in Portugal to explore and compare the quality of antibiotic prescription across different prescribing sites. According to ECDC data, Portugal is one of the countries consuming more broad-spectrum antibiotics.

Methods: Ambulatory care systemic antibiotic use (ATC: J01) was retrieved from national databases for year 2018. The main outcome measure was the ratio of prescribed broad-spectrum penicillins, cephalosporins, macrolides and fluoroquinolones (J01(CR+DC+DD+(F-FA01)+MA)) to the prescribed of narrow-spectrum penicillins, cephalosporins and macrolides (J01(CA+CE+CF+DB+FA01)), expressed in defined daily doses (DDD), further stratified by type of prescribing sites (primary care, hospitals, public and private).

Results: In Portugal (mainland), around 95% of antibiotics are consumed in outpatient setting, with most of these prescriptions originating from doctor's offices and private clinics (37%), followed by public primary care (27%), public hospitals (22%), private hospitals (9%) and other locations (5%). In 2018, for each DDD of narrow-spectrum antibiotic, approximately 4,55 DDD of broad-spectrum antibiotic was prescribed and dispensed. Public primary care settings have the best performance on this indicator (3,10), followed by private hospitals (4,91), public hospitals (4,99), doctor's offices and private clinics (5,56) and other locations (7,24). Public primary care settings have the best performance on this indicator, especially those located in the North region.

Conclusions: The pattern of board/narrow-spectrum antibiotic use across Portugal is different. Antimicrobials with a broad spectrum are often preferentially used; however, this practice is not in line with available guidelines on prudent use of antimicrobials.

Updates on WHO tools for monitoring and reporting global antibiotic use [#183]

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Background: Improving antibiotic use through antibiotic stewardship is one of the key interventions necessary to contain the antimicrobial resistance. Data on antibiotic use are collected and analysed in many high- and middle-income countries. However, there was a lack of internationally agreed tools for the collection and reporting on antibiotic use data at the point of care and from lower-income countries.

Methods: The development of WHO methodologies to quantify antibiotic use involved collaborative work with international and national experts, partner organizations and representatives from WHO Regional Offices and Collaborating Centres. The process was based on a multistage approach: define the scope of the tools, map and review existing resources, hold consultations and manage review rounds to refine the content, and pilot tools to provide feedback on practical issues associated with using the tool in settings with limited resources, which is incorporated into the guidance document.

Results: Since 2016, WHO has published tools that cover monitoring of antimicrobial consumption at national and hospital level (ATC/DDD methodology), and antimicrobial use at hospitals (point-prevalent surveys PPS). The first WHO global report (2018) reported national antibiotic consumption data from 65 countries (total consumption range 4.4 - 64.4 DID). At facility level, the methodology for antibiotic consumption was piloted in 2 Asian countries, and PPS is underway in 14 African countries. In parallel, WHO has been developing digital platforms for data upload and use. WHO is currently looking at methodologies to monitor antibiotic use at primary healthcare.

Conclusion: Through consultative processes, WHO developed methods and global databases to collect and report data on antimicrobial use.

AB14

Antimicrobial agent choice for outpatient treatment of non severe community acquired pneumonia – Moscow prescribers' choice and real practice [#184]

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Background: Community acquired pneumonia (CAP) remains one of the most important infections in general practice. Anyway general practitioners (GPs) choice for this condition in Moscow primary care needs further investigation. This study was aimed at investigation of GPs' reported antimicrobial agents (AMAs) preferences, actual prescriptions according to their electronic medical files and comparison of both choices.

Methods: 43 GPs employed in a large Moscow primary care center voluntarily participated in anonymous survey. They indicated an AMA they would administer to a young previously healthy patient with documented mild CAP. 650 cases of documented CAP in the same center (years 2018-2019) were subsequently analyzed with regard to particular AMAs they actually received. The results were compared and adherence to clinical guidelines was estimated. Chi-square test was employed to assess the significance of the differences.

Results: Level of adherence to actual clinical guidelines did not differ between reported and real practice AMA preferences (31.4% и 28.6% respectively). Parenteral administered AMAs also tended to prevail in real practice (20.2% vs 11,8%, NS). Among underreported but significantly more often ($p<0.05$) prescribed AMAs were cephalosporins (15.7% vs 28.8%) and fluoroquinolones (3.9% vs 14.0%). Amoxicillin/clavulanate was significantly more often mentioned than administered by our respondents (49.0% vs 28.0%).

Conclusion: Reported and actual adherence to actual guidelines is not high in surveyed GPs. They tend to use more expensive and potentially more harmful AMAs (cephalosporins and fluoroquinolones) in real practice than they indicated. Antimicrobial stewardship could be a good tool to improve this situation.

Comparison of inpatient-care antibiotic consumption patterns in three Hungarian tertiary-care university hospitals [#189]

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Background: Antibiotic consumption may vary markedly across healthcare institutions, even among facilities with similar patient profile, reflecting local habits. We compared antibiotic consumption across three university clinics.

Methods: Monthly consumption data were obtained from clinical pharmacies of 1825-bed (centre A), 2185-bed (centre B) and 1665-bed (centre C) tertiary-care centres between 2009 and 2017 as defined daily doses per 100 occupied bed-days (DDD/100OBD).

Results: Median monthly consumption of all antibiotics were 32.40 (22.82-45.63), 42.56 (25.19-72.51) and 47.25 (25.65-74.72) DDD/100OBD in centres A, B and C, respectively; with increasing trend but no seasonality in centre A, with seasonality but no trend in centre B (highest in November and lowest in May), with increasing trend and seasonality in centre C (peaks in March and December, lowest in January and July). In centre A the most popular drug groups were cephalosporins (median 9.80; range 0.60-14.36 DDD/100OBD), penicillins with beta-lactamase inhibitors (PBLIs, 5.67; 0.13-8.45 DDD/100OBD) and fluoroquinolones (6.03; 0.37-10.79 DDD/100OBD); in centres B and C PBLIs (9.77; 6.26-37.62 and 13.43; 6.60-24.96 DDD/100OBD, respectively), cephalosporins (8.61; 6.08-14.76, and 8.89; 4.85-15.32 DDD/100OBD, respectively) and fluoroquinolones (6.24; 3.40-12.73, and 7.90; 4.57-14.22 DDD/100OBD, respectively).

Median fluoroquinolone consumption (percentage of total consumption) was 19.5 (12.4-27.3)%, 14.5 (8.7-23.6)% and 17.2 (10.8-24.1)%, in centres A, B and C, respectively, all with decreasing trend (significant in centres B and C). Median third/second generation cephalosporin ratios were 0.38 (0.15-0.57), 1.81 (0.81-4.04) and 1.13 (0.56-2.29) in centres A, B and C, respectively.

Conclusion: Local characteristics, habits and resistance patterns shape antibiotic consumption. This study was conducted in the frame of the EFOP-1.8.0.- VEKOP-17-2017-00001 flagship project. Bence Balázs was supported by the New National Excellence Program of the Ministry of Human Capacities (ÚNKP-19-3-I.)

Predicting future antibiotic consumption using time-series analysis [#191]

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Background: Availability of antibiotics is crucial both for inpatient care and for efficient antibiotic stewardship, while antibiotic consumption is a major source for avoidable drug use with dire consequences. This study attempts to predict expected antibiotic consumption.

Methods: Monthly data on consumption of antibiotics were collected from the clinical pharmacy of a tertiary-care centre between October 2004 and December 2018 in defined daily doses per 100 occupied bed-days. Predictions were based on data between October 2004 and December 2017, prepared twelve month forward and compared to real-life data between January and December 2018. Time-series were analysed and predictions were prepared using exponential smoothing (ES) and autoregressive integrated moving average models (ARIMA) in R. Accuracy was assessed using mean absolute percentage error (MAPE) and mean absolute scaled error (MASE).

Results: Future total antibiotic consumption was forecasted with acceptable accuracy both by ES and ARIMA models (MAPE 14.5% and 13.0%, prediction error ranges -32.8-62.0% and -23.6-41.4%, MASE 0.96 and 0.86, respectively). In case of aminopenicillins with beta-lactamase inhibitors (ATC J01CR01, J01CR02 and J01CR04), quinolones (J01M), cephalosporins of the second (J01DC) and third (J01DD) generation and macrolides, lincosamides and streptogramins (J01F) ES MAPEs were 21.5%, 38.4%, 31.1%, 15.7% and 12.3%, ARIMA MAPEs were 17.1%, 30.9%, 28.0%, 13.8% and 19.6%, respectively.

Conclusion: Future trends and fluctuations were generally well forecasted, but amounts consumed were predicted with variable accuracy. ARIMA generally performed better than ES predictions. This work draws attention to potential utility of time-series analysis in forecasting the future patterns of antibiotic consumption.

Bence Balázs was supported by the New National Excellence Program of the Ministry of Human Capacities (ÚNKP-19-3-I.)

Treatment and outcome of *Clostridium difficile* infections: A retrospective study in a tertiary care infectology unit [#193]

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Background: *Clostridium difficile* infection (CDI) is a common cause of nosocomial enteritis, with high clinical and economic burden. We aimed to assess the treatment features of CDI and to determine clinical outcomes

Methods: This retrospective cohort study was conducted at the University of Szeged, Department of Infectology. The medical records of all inpatients between October 2016 and October 2018 were surveyed. The severity of CDI was defined by the 2014 ECCMID guidance. Possible influencing factors of clinical outcome (cure) were assessed by Fischer exact test and logistic regression.

Results: Overall 213 patients were treated for CDI, which represents 31.5 % of all admissions. One-third of patient had mild (recurrent CDI: 21%), two-third of patients had severe CDI (recurrent CDI: 27%). The rate of recurrent CDI did not differed by CDI severity ($p=0.3736$; $\chi^2=0.7915$). All patients received metronidazol therapy, while vancomycin was administered to 95% of patients. Fidaxomicin therapy was initiated in 82 patients (38.5 %). The combination therapy of metronidazol-vancomycin-fidaxomicin has resulted in significantly higher clinical cure compared to metronidazol-vancomycin dual therapy (OR: 2,71; $p=0.0381$). Logistic regression showed that fidaxomicin therapy and mild CDI had higher rate of clinical cure (fidaxomicin: $p=0.0389$, OR=2.76; mild CDI: $p=0.0410$; OR=3.21), while vancomycin therapy did not ($p=0.1890$, OR=2.48).

Conclusion: Fidaxomicin increased clinical cure.

Use and self-medication with antibiotics among adults living in a Brazilian Amazon city: A panel of two cross-sectional studies, 2015-2019 [#197]

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Background: Self-medication is a major threat to microbial resistance. In Brazil, antibiotics commercialization is based on retention of the medical prescription. The aim of this study was to investigate the trends in antibiotics use and self-medication among adults living in Manaus, Amazonas in 2015 and 2019.

Methods: Panel of two cross-sectional studies conducted in Manaus in 2015 and 2019. Adults aged ≥ 18 years were interviewed at home following probabilistic sampling in both surveys. The primary outcome was the use of antibiotics in the previous 15 days. We considered the complex sampling design to calculate descriptive and analytics statistics. Adjusted Poisson regression with robust variance was employed to calculate the prevalence ratios (PR) of antibiotic use for independent variables and 95% confidence intervals (CI).

Results: The prevalence of antibiotic use in the previous 15 days was 3.7% (95%CI 3.1-4.4%; n=3,479) in 2015 and 8.0% (95%CI 6.7-9.3%; n=2,321) in 2019. Self-medication increased from 19.2% (95%CI 12.4-26.0%) in 2015 to 30.7% (95%CI 22.5-38.8%) in 2019. Cephalexin was the most used (115/317) and amoxicillin was the most self-medicated (41/317) antibiotic in both surveys. Use of antibiotics was higher in 2019 (PR=2.05; 95%CI 1.60-2.64) in comparison to 2015 and among women (PR=1.66; 95%CI 1.16-2.39) when compared to men.

Conclusion: Antibiotic use and self-medication among adults living in Manaus increased from 2015 to 2019. The Brazilian regulations on antibiotic control are probably ineffective in reducing these practices in the region. Enforcement

AB19

Antibiotic stewardship activities performed by clinical pharmacist: report of two efficacious cases [#199]

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Background: Currently increasing number of patients are hospitalized due to MDR infections. We aimed to present two cases of severe infection and related therapeutic efforts.

Methods: Two patients with severe infection were followed by personal observation and data were collected from their medical records.

Results:

Case 1.

72 years old woman was hospitalized due to septic shock developed after sigmoiditis. *Candida albicans* was identified in her haemoculture, therefore parenteral fluconazole treatment was initiated (400 mg daily, for 10 days). Parallel abdominal surgery was performed and MDR pathogens were cultured from secretions: VRE, MDR *A. baumannii* and MDR *P. aeruginosa*. According to the antibiotic sensitivity results: 600 mg linezolid and 4 Million IU colistin were administered daily. Therapy was supplemented with inhalatory (2 million IU three times daily) colistin because of MDR *A. baumannii* colonisation in the trachea. The patient was discharged after clinical and microbiological cure after 37 days.

Case 2.

A 70 years old man was hospitalized in septic condition that developed after gallbladder infection. The empiric ceftriaxone –metronidazole combinations therapy was changed to 2 x 50 mg tigecycline and 4 x 500 mg imipenem /cilastatin daily after microbiological tests due to ESBL producing *Klebsiella* species and VRE. After 24 days of treatment we achieved clinical cure.

Conclusion: Targeted treatment of infections - strengthened by the clinical pharmacist- is essential to achieve clinical cure.

The trends and patterns of antibiotic consumption in a tertiary care Neurosurgery Department [#202]

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Background: The aim of the present study is to map antibiotic use in a tertiary care Neurosurgery Department.

Methods: Data was retrospectively collected on systematically used antibiotics (ATC: J01) delivered from the central pharmacy to the Neurosurgery Department between 2010 and 2017. Consumption data was analysed according to the WHO Defined Daily Dose (DDD) method (version 2019) and expressed as DDD per 100 patient-days. DU90 method was used as quality indicator.

Results: The total antibiotic use in DDD per 100 patient-days increased from 22.46 in 2010 to 32.76 in 2017. Mainly parenteral agents were used (2010: 65%, 2017: 81%). In 2017 a total of 21 different antibacterial agents were used at the department of which 8 agents were responsible for the DU90% segment. Second generation cephalosporins (J01DC) were the most extensively used antibiotics. The use of cefuroxime accounted 26% for the total antibiotic consumption followed by clindamycin (12%), ciprofloxacin (12%) and meropenem (9%). We detected the most prominent increase in meropenem (J01DH02) consumption (sixty-fold) during the studied period. Vancomycin use indicated the second relevant increase (tree-fold). Third generation cephalosporins (J01DD), quinolones (J01M) and penicillins (J01C), use were stable however in the penicillin classes the narrow spectra beta-lactamase sensitive penicillins (J01CE) use showed decreasing trends from 2015. All other antibiotic classes indicated moderate increase.

Conclusion: Our study showed remarkable increase in antibiotic exposure at the Neurosurgery Department. Identified trends and patterns in the antibiotic consumption can guide further antibiotic stewardship program.

AB21

Commonly isolated pathogens and Antibiotic susceptibility testing in patients with decubitus hospitalized at a tertiary care hospital in Stip [#207]

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Background: The increasing rates of hospital infections, plays an important role in the development of chronic, delayed wound healing. Bacterial resistance and multidrug resistance to commonly used antibiotics have created a great problem in the management of different infections. The aim of this study was to identify isolated pathogens from swab samples in patients with decubitus, taken at a tertiary care hospital in Stip and to determine microbial susceptibility to antibiotics.

Methods: The colonies grown were identified based on colony morphology, Gram stains and biochemical tests. Antimicrobial susceptibility testing was performed by Kirby–Bauer disc diffusion technique.

Results: All suspected swab samples taken from patients with decubitus were processed, and all samples (100%) were culture positive. The most common isolated gram-positive bacteria was *Staphylococcus aureus*, among which 50% contained MRSA and other 50% were found to have multidrug resistance to penicillin, macrolides, cephalosporines, clindamycin, folate synthesis inhibitors and quinolones.

Conclusion: Our study is the first surveillance study that examined the antimicrobial susceptibilities in patients with decubitus hospitalized at clinical for tertiary care in Stip. The rate of isolated pathogen (methicillin resistant *S. aureus*) was found to be high and requires additional activities and measures to be taken to improve the clinical outcome of patients.

CB1

Brazilian indigenous population under chemotherapy: A five-year profile [#84]

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Background: According to the 2010 census there are 817,963 indigenous people living in Brazil, of which 502,783 in indigenous lands and 315,180 in urban areas. Epidemiological data and information on cancer treatment in this population are lacking. This study aims to characterize cancer types and treatment profile in the indigenous population.

Methods: An ecological study including indigenous people with a principal diagnosis of cancer was carried out. All chemotherapy procedures financed by Brazil's Unified Health System (SUS) from January 2014 to December 2018 were included. Data source were the 'Authorization for High-Complexity Procedures in Oncology' (APAC/Onco) registers. Case were identified through the 'race/color' field of APAC/Onco. Profile was characterized by age group, types of cancer and types of medicines/regimens used. All the information, software packages, and data used in the study are open-access.

Results: A total of 2,425 treatment registers were analysed, of which 2,111 were adult and 314 pediatric. Most adult APACs concerned breast (601 registers), treated with tamoxifen, and prostate (402) – treated with leuprorelin, followed by chronic myeloid leukemia (CML) (268) treated by imatinib. In children, most APACs were related to acute lymphocytic leukemia (133), treated with vincristine, daunorubicin and asparaginase; osteosarcoma (85), treated with doxorubicin, cyclophosphamide, methotrexate and cisplatin, followed by prostate (39), also treated with leuprorelin. Regimens varied in protocol.

Conclusion: Profile shows distribution of cancer types and treatments among indigenous people, for the first time, disclosing an untoward number of APACs for pediatric prostate cancer in this population.

Real-world safety and effectiveness of systemic treatments against metastatic colorectal cancer: A systematic review [#110]

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Background: Colorectal cancer (CRC) is one of the most common cancers worldwide and the second leading cause of death from cancer in Europe. Approximately 40-50% of all CRC patients will develop metastatic colorectal cancer (mCRC). Fluoropyrimidine based chemotherapy is the backbone of first line chemotherapy alone or in combination with targeted agents. Combination chemotherapy, like FOLFOX or FOLFIRI, contribute towards higher response rates, longer progression-free survival (PFS) and better overall survival (OS) than 5-fluorouracil/leucovorin alone. The last decade has seen an increase in the use of monoclonal antibodies in combination with Fluoropyrimidine based chemotherapy resulting in increased PFS. However, their contribution towards better OS is still questionable. Therefore, the aim of this systematic review is to measure the health related outcomes of the systemic treatments for mCRC in the real world setting.

Methods: A systematic review will be performed based on published observational studies. All observational studies that report the use of systemic treatment of mCRC will be included with no time limits applied. Randomized controlled trials, clinical trials and narrative reviews will be excluded. Safety will be measured using drug-related side effects. Effectiveness measures will include the OS, response rate, PFS, disease free survival and "Response Evaluation Criteria in Solid Tumours". The Newcastle-Ottawa scale will be used to evaluate the observational studies' methodological quality. If the outcomes reported by the included studies are heterogeneous, then a qualitative synthesis of studies fitting the selection criteria will be undertaken.

Results: Preliminary results will be presented at the time of the conference.

Inventory of biological and biosimilar medicine data sources in Europe: The European University Hospitals Alliance (EUHA) landscape [#112]

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Background: The heterogeneity of data sources for biological/biosimilar medicines, together with a lack of standardisation for recording data, with identical codes for originator and biosimilar medicines, contribute to challenges in undertaking cross-national biosimilar utilization studies. We aim to produce an inventory of data sources containing biological/biosimilar medicine information at a national and hospital level in the European University Hospital Alliance (EUHA) and other additional centers, thus facilitating further cross-national drug utilisation studies.

Methods: Through literature review and contact with database providers, the characteristics of national databases containing biological/biosimilar medicines will be identified. The inventory of in-hospital data sources will focus strictly on biosimilar medicines. To this aim, questionnaires will be sent to all EUHA hospitals and other participating university hospitals in order to identify and describe such sources.

Results: Data sources will be identified from 9 EUHA countries: Austria, Belgium, Catalonia, France, Germany, Italy, the Netherlands, Sweden and the United Kingdom. The inventory will describe the characteristics of both national and hospital biological databases, including: type of database, provider, accessibility, population coverage, representativeness, demographic characteristics, medicine coding, validity, linkage to other data sources.

Conclusion: This inventory would be the first step in taking advantage of untapped national and in-hospital biosimilar information, thus facilitating cross-national comparative pharmacoepidemiological studies using real world data.

A systematic review of cost-effectiveness evidence to support primary endocrine therapy for treating older women with primary breast cancer [#134]

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Background: Primary endocrine therapy (PET) is a popular alternative to surgery in treating frail, older women with primary breast cancer and multi-morbidities in the United Kingdom; however, evidence to support the cost-effectiveness of PET is still lacking. This review aimed to explore and appraise the current cost-effectiveness evidence of comparing PET with surgery for treating older women with primary breast cancer.

Methods: Full economic evaluations comparing surgery with other initial treatment strategies for postmenopausal women with primary breast cancer were retrieved by applying structured search strategies to electronic databases to March 2019. The key elements in designing and conducting economic studies were retrieved and appraised by using the CHEERS (Husereau *et al.*, 2013) and Philips Checklists (Philips *et al.*, 2006).

Results: All the 35 included studies evaluated the cost-effectiveness comparing initial surgery against various adjuvant treatment strategies in postmenopausal women aged over 40 years with primary breast cancer. Only two studies assessed a subgroup of women aged over 70 years, and none assessed PET as an initial treatment strategy. Although all the studies reported incremental cost-effectiveness ratio as the primary outcome, these results were not generalisable to the older population due to the limited clinical effectiveness evidence derived from well-designed studies.

Conclusion: Currently, there is no evidence supporting that PET dominating surgery in treating older women with primary breast cancer. Further studies are needed to assess the clinical and cost-effectiveness of PET comparing against other initial treatment strategies in the older population.

Treatment patterns of patients initiating TNF α inhibitor therapy [#142]

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Background: TNF α inhibitors (TNF α -i) are first-line biological treatment for patients with immune-mediated inflammatory diseases. Limited information is available about long-term treatment patterns, including treatment switches. The aim was to assess long-term treatment patterns of patients initiating TNF α -i.

Method: Patients initiating TNF α -i between July 2012 or January 2013 and July 2017 were included. Treatment episodes were constructed allowing for a 90-day treatment gap. Patients were persistent users of first TNF α -i, switched to another biological or discontinued biological treatment. Persistence between TNF α -i was compared using Kaplan-Meier-method. In a sensitivity analysis, treatment gap was narrowed to 45 days. Patterns of switching to other TNF α -i, interleukin inhibitors (IL-I), selective immunosuppressants (SIS) or rituximab were mapped in Sankey diagrams.

Results: 1752 patients were included (56.1% female, median age 41.3); 851 for rheumatic diseases, 635 for inflammatory bowel disease and 266 for other indications. After one year 62.2% of patients were persistent users, 10.7% switched and 27.1% discontinued treatment. 62.3% of switchers switched to second TNF α -i, 20.0% to IL-I, 15.0% to SIS and 2.7% to rituximab. Median persistence was 23.3, 13.8 and 28 months for etanercept, infliximab and adalimumab, respectively. Median time until switch was 7 months for TNF α -i and 8.8 months for non-TNF α -i. Narrowing treatment gap, persistence declined from 25.7 to 17.0 months for s.c.-TNF α -i, but only from 13.8 to 11.8 months for i.v.-TNF α -i.

Conclusion: After one year, 37.8% of patients discontinued first TNF α -i. Treatment gap influences measured persistence of s.c.-TNF α -i, mostly because patients prolong dosing intervals and this is not captured in pharmacy records.

Trends in the use of systemic anti-inflammatory biologics: A Danish nationwide drug utilization study [#206]

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Background: Biologic therapy may have a life-changing effect on the activity of inflammatory diseases. It is, however, expensive compared to traditional treatment and long-term adverse effects are poorly investigated. To monitor utilization patterns, we aimed to describe the use of biologics in Denmark.

Methods: Using nationwide Danish health registries, we investigated use patterns of systemic anti-inflammatory biologics during 2004-2018 among Danish adults treated for inflammatory bowel disease, inflammatory arthritis, or inflammatory skin disease. We described overall drug use patterns as well as specified by individual inflammatory disease entities and regional variation.

Results: We included 36,834 adults who received a biologic during 2004-2018. Within this period, the rate of new users increased from 0.3 to 8.5 per 10,000 person-years. Similarly, the annual proportion of prevalent users increased from 3 to 53 per 10,000 individuals. Whereas the increase in incidence seemed to level off in the recent years, the prevalence showed a continuously increasing pattern. This was mainly driven by an increasing use of TNF-alfa inhibitors and was evident across all disease entities. Within inflammatory arthritis, we observed the highest increase in prevalence to 15% of individuals with the disease receiving a biologic in 2018, followed by inflammatory bowel disease (9% in 2018) and inflammatory skin disease (8% in 2018). Only minor differences were observed across the five Danish regions.

Conclusion: We document an extensive increase in the use of biologics, both overall and within specific disease entities. Underlying drug use patterns including persistence and switching, and predictors hereof should be investigated.

CD1

Medicines availability among hypertensive patients in primary healthcare facilities in a rural province in South Africa [#72]

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Background: Control of blood pressure (BP) remains a challenge among patients in the public health system in South Africa. The objective was to assess availability of all prescribed antihypertensive medicines among patients with raised BP on the day they attended rural primary healthcare facilities (PHCs) and determine the association between medicines availability, the number of prescribed antihypertensive medicines and BP control.

Methods: Secondary data from an operational study from rural PHCs in South Africa including patients' demographics and BP, as well as data on medicine availability. Data analysis included descriptive and inferential statistics.

Results: 55 black African patients were assessed, with 89.1% being female. Some data were not available for all 55 patients. The mean age was 61.3 years, and 54.6% did not have formal education. Two thirds (67.2%) of patients received all their antihypertensive medications whilst 25.5% received some of their medicines during the three months study period with no record in 7.3% of the patients. There was no significant relationship between receiving all antihypertensive medicines and BP control. The majority of patients on one antihypertensive had better BP control; however, this did not reach significance ($p=0.069$). Concerns with the lack of BP recording on all occasions in some patients (20%).

Conclusion: One third of patients went home without all their antihypertensive medicines from the PHC facilities. Other concerns included the lack of routine BP monitoring and the number of prescribed medicines. Studies are ongoing to explore key issues with medicines availability and concerns with adherence and BP control.

CD2

Temporal and spatial variation in the prescribing of oral anticoagulants in Scotland - a nationwide record linkage study [#79]

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Background: Oral anticoagulants (OACs) are widely used in clinical practice to prevent thromboembolic events such as strokes. Following the introduction of direct oral anticoagulants (DOACs) since 2009, major changes in treatment guidelines and prescribing practices have been observed in several countries. The aims of this study are to describe changes in prescribing patterns of oral anticoagulants over time in Scotland; and to evaluate regional variation of their use.

Methods: Retrospective cohort study using linked routinely collected administrative data, comprising patients who received at least one prescription for any oral anticoagulant between January 2009 and December 2017. Analyses include: medicine update and geographical distribution; incidence/prevalence rates; and patient characteristics at time of first OAC prescription.

Results: A total of 7,900,564 prescriptions for OACs were issued between 2009 and 2017: 955,420 for DOACs, and 6,945,144 for vitamin-K antagonists (VKAs). During the study period, the overall number of OAC prescriptions steadily increased year on year; the use of DOACs increased considerably over time, with the share of VKAs among all prescriptions dropping to 64.7% by 2017. There were, however, wide geographical variations in the use of DOACs vs VKAs (ranging from 51.0% to 83.2%), and variations in the specific DOACs most commonly prescribed. Patient characteristics to be presented.

Conclusion: This study provides an in-depth overview of how prescribing of OACs has evolved in Scotland since the introduction of DOACs in 2009. This information will be useful for both clinical practice and further research.

Overview of insulin utilization between 2013 and 2018 [#91]

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Background: Diabetes prevalence has exceeded 10% of the population in Hungary. Although many drug groups have been used successfully in the treatment, insulin have fundamental role in the therapy. Our aim was to evaluate the utilization trends and the financial burden of insulins in Hungary between 2013 and 2018.

Methods: Data was collected from the National Health Insurance Fund database including the entire population. Data was collected and analyzed according to the WHO's ATC/DDD method and expressed in Defined Daily Dose per 1000 inhabitants per day (DDD/TID).

Results: Total insulin utilization grew from 24.1 DDD/TID in 2013 to 26.5 DDD/TID in 2018. Regarding insulin types, while human insulin use decreased (14.2 DDD/TID vs. 11.9 DDD/TID), analogue insulin consumption emerged constantly (9.9 DDD/TID vs. 14.7 DDD/TID) and by 2016 its consumption exceeded the human insulins' use. While fast acting human insulin and intermediate acting human insulin use slightly decreased, the consumption of fast acting analogues and long acting analogues emerged considerably.

Emerging use of analogue insulins puts a high financial burden on health care system and on patients. Since 2013, total expenditure on insulins increased by 42.47%. Comparing the unit price of human and analogue insulins, while short acting and mixed analogue insulins are 1.3-1.4 times more expensive than human insulins, long acting analogues cost 2.2-4.6 times more than human insulins.

Conclusion: The use of analogue insulins showed a constant grow during the study period. Although the use of these preparations is essential, the financial consequences are considerable.

Lipid modifying drug use in Hungary between 2008 and 2018 [#92]

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Background: Morbidity and mortality rate of cardiovascular diseases are very high in Hungary and lipid modifying drugs have an important role in prevention and treatment. Our aim was to analyse the trends of lipid modifying agents use focusing on statin utilization in Hungary between the period of 2008 and 2018.

Methods: Reimbursed national drug utilization data for the entire population of Hungary were obtained from the National Health Insurance Fund. Data were analysed using the WHO's ATC/DDD system and were expressed in Defined Daily Dose per 1000 inhabitants per day (DDD/TID), and in percentage of the total use.

Results: The use of lipid lowering agents (ATC: C10) grew from 69.7 DDD/TID in 2008 to 110.1 DDD/TID in 2018. 91.2% of the total use was statins (also including combination products) and 6.4% of the total use was fibrates and 2.4% of the total use was ezetimibe in 2018. During the study period the statin use was emerging, 87.2% of the total use was statin monocomponent products (95.9 DDD/TID) and 3.9% of the total use was combined statin products, mainly atorvastatin or rosuvastatin with amlodipine (4.4 DDD/TID) in 2018. While in 2008 the most consumed drug was atorvastatin, rosuvastatin has showed a growth and overtook atorvastatin use by 2014. These two agents accounted for 94.0% of total statin use in 2018.

Conclusion: Lipid modifying drug use considerably grew, and statin use was the highest throughout the 11-year study period.

Utilization of anticoagulants in Central Europe and the neighbouring countries [#123]

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Background: A broad spectrum of parenteral and oral anticoagulants, indicated in various acute and chronic health conditions, has been introduced to the market. The aim of this study was to analyze trends in anticoagulant utilization in Croatia, Czech Republic (CR), Hungary, Romania, and Slovakia.

Methods: A retrospective drug utilization study on drug supplies reported in administrative databases was carried out from 2007 to 2018. The analysis was focused on ATC codes B01AA, B01AB, B01AE, B01AF, and B01AX. The utilization in each country was expressed as the number of defined daily doses per 1000 inhabitants per day (DDD/TID).

Results: An increasing trend in the utilization of oral as well as parenteral anticoagulants was seen in all countries. The highest increase was observed in Romania (from 3.08 to 11.98 DDD/TID) and Slovakia (from 10.89 to 29.72 DDD/TID). In recent years, the utilization of vitamin K antagonists has decreased in Hungary and Slovakia, whereas showed nearly stable levels in the CR. In 2018, the oral anticoagulants covered 69.82%, 65.43%, 61.97%, 59.75%, and 51.02% of all anticoagulants in Croatia, Romania, CR, Hungary, and Slovakia, respectively. The use of direct oral anticoagulants (DOACs) varied from 3.78 DDD/TID in Romania, to 9.27 DDD/TID in Slovakia in 2018. Rivaroxaban was the most preferred DOAC in Hungary (2.89 DDD/TID), CR (2.79) and Croatia (2.27); dabigatran prevailed in Slovakia (3.43), and apixaban in Romania (1.57).

Conclusion: Despite a consistent trend in increasing consumption, countries have shown a number of differing characteristics in drug use patterns, which requires further analysis.

The role of pharmacists in assessing the cognitive functions of patients with metabolic syndrome [#136]

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Background: Metabolic syndrome (MetS) is a cluster of cardiometabolic disorders and it is associated with elevated prevalence of morbidity and mortality. Recent research suggests a link between insulin resistance and cognitive impairment what makes the pharmaceutical elderly care in patients with MetS more difficult. We hypothesized the feasibility of cognitive testing in pharmaceutical care and its potential in identifying MetS subject affected by cognitive impairment.

Methods: MetS was classified according to International Diabetes Federation Worldwide Definition of MetS (2005). We used standardized validated cognitive screening tools of Montreal Cognitive Assessment (MOCA) and Clock Drawing Test (CDT).

Results: Study was realized in random 323 respondents (32 % Male, 68 % Female) in community pharmacies and in the adult day care centres in Slovakia. The median age was 71 years (min. 60 – max. 95). We identified MetS in 22 % of patients (n=70). We found significant cognitive decline in patients with MetS, 84 % according to MOCA and 60 % according to CDT. In group of patients without MetS we identified cognitive decline in 72 % of individuals (MOCA) and in 46 % (CDT).

Conclusion: These results show that presence of metabolic syndrome contributes to impairment of cognitive functions and also suggest the feasibility of this kind of testing during community pharmacy. Cognitive assessment might be an important tool for identifying risk groups of patients which would benefit from specific approach in pharmaceutical care.

Barriers and Enablers of Deprescribing Preventive Cardiovascular/ Diabetes Medication: Health Care Professionals' Perspective [#147]

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Background: Both the benefits and risks of preventive medication change over time for ageing patients. Not much is known about barriers and enablers for deintensifying preventive medication from the perspective of healthcare professionals (HCPs) in the Netherlands. The aim of this study was to identify barriers to and enablers of deprescribing preventive cardiovascular and diabetes medicines from the perspective of HCP and to explore the role of the pharmacist in deprescribing.

Methods: Three focus groups with in total 5 general practioners (GP), 8 pharmacists, 3 nurse assistants, 2 geriatricians, 2 elder care physicians were conducted in 3 cities in the Netherlands. Interviews were recorded and transcribed verbatim. Directed content analysis was performed on the basis of the Theoretical Domains Framework (TDF). Two researchers separately coded the data.

Results: Most HCPs agreed that deprescribing in this area is relevant but that barriers include poor communication between the various prescribers, insufficient reimbursement, and lack of knowledge on the subject. Some HCPs feared the deterioration of their patients' health after discontinuation their cardiovascular or diabetes medicines. All HCP stated that adequate patient communication and addressing the patients' priorities enables deprescribing. A guideline could enable the process of deprescribing such medication in elderly patients. Several HCPs stated that pharmacists could enable deprescribing by conducting medication reviews or advising about side effects and drug interactions.

Conclusion:

HCPs recognize the importance of deprescribing cardiovascular and diabetes medication as a medical decision that must be well grounded. A multidisciplinary approach including the pharmacist could support deprescribing.

Key factors influencing the prescribing of statins: a qualitative study among physicians working in primary health care facilities in Indonesia [#152]

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Background: Despite statin effectiveness in primary and secondary prevention of cardiovascular disease has been established, there is an indication of underutilization of these medications. We aimed to elicit key factors influencing physicians' decision to prescribe statins.

Methods: We conducted a qualitative study using a phenomenological approach within a pragmatism interpretive framework. The method of sampling was a combination of purposive and snowball sampling. Data were collected through face-to-face, semi-structured, interviews with physicians working in primary health care facilities in a capital of a province in Indonesia. We recorded and verbatim transcribed the interviews. Coding was done independently by two researchers and data were analyzed using phenomenological data analyses. Key factors influencing physicians' decision to prescribe statins were classified into factors at the micro, meso, and macro levels according to the structural model by Scoggins et al.

Results: Ten physicians participated in the study. We identified key factors at the micro level as physicians knew guidelines in general, but there was uncertainty how to take into account the level of total cholesterol in combination with other cardiovascular risk factors such as diabetes and hypertension. At the macro level, the new National Health Insurance system (NHIS) appeared to facilitate the prescription of statins though more clinical information should be integrated in the system's platform to support appropriate prescribing.

Conclusion: The findings indicate lack of awareness of specific details in current guideline recommendations. Appropriate prescribing of statins should be enhanced using the new NHIS.

DH1

Public purchases of eculizumab by the Brazilian Ministry of Health: A profile of volumes and expenses from 2007 to 2018 [#3]

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Background: Eculizumab, approved by the FDA in March 2007, is a high-cost monoclonal antibody used for complications in patients with Paroxysmal Nocturnal Hemoglobinuria and Atypical Haemolytic Uremic Syndrome. Eculizumab has led government spending with litigated medicines for several years. The study examined purchases of eculizumab by the Brazilian federal government from 2007 to 2018, in terms of quantities, expenditures and prices.

Methods: We extracted eculizumab purchases data between January 2007 and December 2018, from the Integrated General Services Administration System (SIASG), examining number of purchases, quantities, annual expenses and prices. Prices were restated by the IPCA for December 2018 and values converted to US dollars (1R\$ = USD 0.2580778). Trend analyses were performed using the least square method.

Results: From 2009, the provision of litigated medicines by the Brazilian Ministry of Health has waived bidding. An increasing trend in number of purchases and quantities was observed, over time. 283 purchases were made, totaling 116,792 vials, of which 28.2% were purchased in 2018. Total adjusted expenses amounted to more than 2.44 billion BRL (630.73 million USD). After market approval, in March 2017, the weighted average annual price (WAAP) fell approximately 35%, from USD 5,446.53 in 2017, to values below regulated prices established by the Medicines Market Regulatory Chamber (CMED).

Conclusion: Eculizumab represented extremely significant expenses during the period. All purchases were made to address litigation, outside the competitive environment. Market approval promoted significant price reduction, which may be enhanced by incorporation by the SUS, which took place in December 2018.

Profiling purchase volumes and expenditures with Direct-Acting Antiretrovirals for Hepatitis C by the Brazilian Ministry of Health, 2015-2018 [#4]

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Background: Hepatitis C represents a great challenge for public health. Incidence rate in Brazil in 2017 was 11.9 cases/100 thousand inhabitants. Treatment can reduce risk of hepatocarcinoma and cirrhosis to 75%. The Ministry of Health (MoH) began incorporating Direct Acting Antiretrovirals (DAA) from 2015. This study examined MoH policy implementation, observing DAA purchases from 2015 to 2018, to profile volumes, expenditures and prices.

Methods: Data from the federal government purchasing system (SIASG) were collected for 13 DAAs and combinations. Number of purchases, volumes, unit prices, yearly expenditures and type of purchase were analyzed. The weighted average annual price (WAAP) for each drug was calculated. Prices were adjusted by the National Consumer Price Index to December/2018.

Results: 63 DAA purchases, totaling 19,951,932 dosage forms, were observed, the first in 2015, when availability of DAAs and inclusion in Hepatitis C clinical guidelines (PCDT) began. They corresponded to 2,551,556,008.21 BRL in total expenditures. Only one DAA was purchased in 2018, a sofosbuvir + ledipasvir fixed-dose combination in small quantities to supply litigation claims. Sofosbuvir and daclatasvir totaled 73% of acquired volumes and 88.4% of expenditures. Small volumes of simeprevir were bought in 2015 e 2016, while simeprevir-ritonavir, incorporated in 2016, totaled over 4,22 million dosage forms and 21.1% of expenditures. All medicines had a drastic decrease in price after incorporation.

Conclusion: Brazil has been actively incorporating DAAs for Hepatitis C in SUS, and the related expenditures are steep. However, sharp decreases in prices have revealed incorporation as a strategy to scale up access.

Out of pocket or out of control: A qualitative analysis of healthcare professional stakeholder involvement in pharmaceutical policy change in Ireland [#8]

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Background: Mandatory co-payments attached to prescription medicines on the Irish public health insurance [General Medical Services (GMS)] scheme have undergone multiple iterations since their introduction in October 2010. To date, while patients' opinions on said levies have been evaluated, the perspectives of community pharmacists (CPs) and general practitioners (GPs) have not. The study objective aimed to capture the experiences and perceptions of both CPs and GPs on the dynamic nature of this pharmaceutical policy.

Methods: A qualitative study using purposive sampling alongside snowballing recruitment was used. Nineteen semi-structured, face-to-face interviews (13 CPs, 6 GPs) in areas of varying socioeconomic grade were carried out in a Southern region of Ireland. Data was analysed using the Framework method.

Results: Three major themes emerged from the data: The withered tax-collecting pharmacist; Concerns and prescribing of physicians; The co-payment system – past, present, future. Both CPs and GPs were happy with the theoretical concept of a co-payment system attached to the GMS scheme as it prevents moral hazard. There were multiple references to the burden that the method of co-payment collection placed on CPs in terms of direct financial loss and reductions in workplace productivity. GPs independently suggested that a co-payment system being implemented in their practice may inhibit moral hazard in utilisation of GP services.

Conclusion: Overall, interviewees liked the concept behind the co-payment system. CPs were unhappy because of the manner in which this system is implemented. GPs would like a similar co-payment set-up in their practice but did not elaborate on how this would be executed.

Health Technology Assessment Decisions for Oncology-related technologies in Brazil: an assessment of CONITEC recommendations, 2012-2018 [#22]

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Background: In Brazil, 582,590 new cases of cancer were expected in 2018. Anticancer drugs play a prominent role in health care costs and there is strong pressure to incorporate new treatments into the Brazilian Health System (SUS). This study aimed at characterizing the National Committee for Incorporation of Technologies (CONITEC) reports and recommendations between January/2012 and December/2018.

Methods: This is an exploratory-descriptive study based on reports, ministerial orders, and public consultations extracted from CONITEC's official website, restricted to oncology-related requests. Recommendations were classified according to decision year, clinical condition, origin of request, and final recommendation. The scientific evidence supporting the recommendation was analyzed.

Results: A total of 49 oncology-related recommendations were issued during the study period, 60% for medicines. Drug-related demands were less likely to receive favorable recommendation for incorporation than those for other technologies. Most demands came from the pharmaceutical industry and the medical societies. Breast cancer, non-Hodgkin's lymphoma and colorectal cancer were the main clinical conditions covered. Drugs that received a favorable recommendation for incorporation were mainly old, with a median of 14 years of licensing in the country. The main rationale for a favorable recommendation was the presence of additional clinical benefit and the possibility of decrease in budgetary impact through price negotiation and reduction, and through technology transference.

Conclusion: Considering the increase in cancer prevalence and the pressures for the incorporation of new technologies, the number of incorporated new oncology medicines was relatively small, despite the field being characterized by continuous innovation.

Consumer willingness to pay for a hypothetical chikungunya vaccine in Brazil and the implications [#25]

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Background: Chikungunya fever is an important infectious disease transmitted by the bite of *Aedes* genus mosquitoes infected with the Chikungunya Virus (CHIKV). Information about consumers' willingness to pay (WTP) for a hypothetical vaccine against CHIKV can help discussions about prices and funding in countries with limited resources.

Methods: Cross-sectional study among adult residents of Minas Gerais, Brazil, asking if they were willing to pay the price for a hypothetical chikungunya vaccine defined by the authors with an effective protection of 80% and the possibility of local and systemic side-effects. Residents were provided with information if not familiar with the virus. The price was randomly varied between participants in five values: US\$11.69 (45.00BRL), US\$23.38 (90.00BRL), US\$46.75 (180.00BRL), US\$93.51 (360.00BRL) and US\$187.90 (720.00BRL). We included this aspect due to issues with any anchoring effect.

Results: 496 individuals were interviewed. Among these, 23 were excluded. Most of the respondents were female (57.3%), had completed at least high school (90.7%), were employed (87.7%) and had private health insurance (62.6%). The median value of the WTP was US\$ 31.17 (120.00 BRL) for a unique dose vaccine. There was a statistical significant correlation with monthly family income and access to private health insurance.

Conclusion: This study can contribute to decision-making about potential prices for a CHIKV vaccine when it becomes available in Brazil. We also showed the anchoring effect as a possible influence on consumers' WTP in studies with similar techniques. Finally, we encourage the development of a chikungunya virus vaccine to benefit the Brazilian population.

Antineoplastic agents for breast cancer in Brazil: Which federal institutions practise best prices? [#39]

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Background: Breast cancer is the most incident type of cancer among women in Brazil. The Brazilian Public Health System (SUS) is the main care provider. Federal expenditures for all cancer drug treatments total over BRL 2.8 billion, annually. Scaling up access for these drugs depends on effective procurement. We analyzed average weighed prices for antineoplastic agents for breast cancer in Brazilian federal purchases.

Methods: Breast cancer-specific drugs were identified in the Brazilian Ministry of Health (MoH) Diagnostics and Therapeutic Guidelines (DDT). Purchase data were extracted from the General Services Management System (SIASG), from Jan 2013 to Jul 2019, and aggregated by main buyer category: MoH, Ministry of Education (ME), Ministry of Defense (MD) and Other Entities (O). Purchase prices were adjusted by the Brazilian Price Consumer Index to July 2019. Average weighed price of all purchases per year were calculated and compared against MoH prices taken as reference.

Results: Purchases of anastrozole, docetaxel, exemestane, letrozole, paclitaxel, tamoxifen, trastuzumab and vinorelbine were examined. Total expenditure in the period was over BRL 870 million. The ME practiced prices with smaller variation and sometimes purchased better than the MoH, while the MD consistently presented higher prices. The MoH paradoxically presented the highest prices for vinorelbine.

Conclusion: The MoH practised the lowest prices in the period – except for vinorelbine prices - and the MD the highest. As drugs and suppliers are the same, an effort must be made by federal institutions to buy well, as savings could imply in thousands more being treated.

National Pharmacovigilance Systems of Portugal and Brazil [#43]

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Background: The National Pharmacovigilance Systems (SINAF), when performing health risk management, identify, evaluate and act on its minimization, contributing to the adequate use of medicines, patient safety and to the quality of care. Accelerated market approval, that has been increasingly used, makes it difficult to evaluate the efficacy and safety of new substances, adding challenges to contemporary regulation and health protection.

Methods: The paper analyzes, through the application of indicators proposed by the World Health Organization, the SINAF of Portugal and Brazil.

Results: The Brazilian SINAF was institutionalized more recently, generates less safety signals, has a lower notification rate of suspected adverse drug events and demonstrates difficulty in producing and disseminating information to health professionals and population. Portugal is favoured by the condition of being member state of the European Agency of Medicines. It is also suggested that differences related to the political-social context hinder the implementation of public policies and compromises the effectiveness of the Brazilian SINAF.

Conclusion: The challenges for SINAF include raising awareness among professionals, adopting complementary methods to voluntary reporting, pharmacovigilance of biological and genetically based medicines, and assessing the impact of their actions. The Brazilian SINAF's complementary challenge is to improve the capture and quality of notifications, including from industry, to generate safety signals in the national context and to communicate the risk to professionals and the population.

Market approval of new medicines in Brazil, United States of America and Portugal [#44]

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Background: The role of drug regulation has been questioned when discussing support for innovation and access vis-à-vis safety and public health. Market approval is an important step for the development of a new medicine and its use in clinical practice.

Methods: This descriptive study analyzed 29 market approval of new medicines, in 2016, in Brazil, comparatively to the USA and Portugal. Market approval date, orphan medicine, adoption of an accelerated approval mechanism in the FDA, Marketing Authorization Holder (MAH), active substance and therapeutic indications were searched in the websites of regulatory agencies.

Results: Cancer drugs were the most frequent (41,3%), specially melanoma (13,8%) and 25% were biological medicines. Bendamustine, for the treatment of chronic lymphocytic leukemia, was the only substance selected from the WHO List of Essential Medicines There were 18 MAH, predominantly from Eisai Laboratories Ltda (22%). FDA was the first to grant market approval (65.5%). 58.6% of the new drugs registered were considered by the FDA as orphan drugs and 14 (48.2%) were registered with at least one type of accelerated approval.

Conclusion: Most of new drugs registered needed further studies to establish better evidence on efficacy and safety. Orphan drugs and accelerated approval for the public system may mean a mandate to pay high prices for a treatment not yet properly approved. The high cost of new medicines can impact the access of the population of low and middle income countries. It is also necessary that other important causes of the Brazilian burden of disease be addressed to meet health needs.

Neuropsychiatric drug expenditures' trends and drivers in Minas Gerais, Brazil, from 2010 to 2017
[#47]

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Background: Increasing consumption of neuropsychiatric drugs leads to rising expenditure with the potential to compromise public health budgets. This study analyzes public expenditures on neuropsychiatric drugs, its trends and drivers.

Methods: Drug Utilization Study based on longitudinal data from the Integrated System for Materials and Services Management (SIAD) database from Minas Gerais' State (20.8 mi inhab.), Brazil. Volume and inflation-adjusted expenditure were calculated for neuropsychiatric drugs purchased from 2010 to 2017. Procurement trends were estimated. Decomposition analysis was performed to identify the determinants of public expenditure variation (price, volume and / or therapeutic choice).

Results: From 2010 to 2017, 168 chemical substances in 565 pharmaceutical products were purchased, totaling 4.03 million drug packages of neuropsychiatric drugs. Purchased quantities decreased by 34.5%, from 472 million in 2010 to 163 million units in 2017. Total accumulated expenditure for the period was USD 256.3 million, also recording a downward trend, falling 36% in 2017 when compared to 2010. Main expenditure variation drivers were volume and therapeutic choice.

Conclusion: This study contributes to a better understanding of public expenditures on neuropsychiatric drugs. The observed reduction on expenditures and purchased volumes may have been influenced by the new procurement policy for medicines, adopted in Minas Gerais in 2016, with management centered on the municipalities. It is necessary, however, to further evaluate this policy's impact on municipalities to avoid the risk of shortage of medicines for their population.

DH10

Knowledge of prescribed drugs among primary care patients [#48]

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Background: Patients' knowledge of their pharmacotherapy impacts the correct use of their drugs and, consequently, is paramount to the effectiveness of the prescribed treatment.

Methods: Exit surveys administered to a representative sample of 1221 adult patients (≥18 years) from pharmaceutical services at primary care in a health pole municipality (234,937 inhab.) from the midwest macrorregion in Minas Gerais State, Brazil. Data on medical prescriptions and dispensed medications were collected and one of the prescribed drugs was randomly selected for analysis. Patients' responses to the following items: drug name, dosage, frequency of administration, indication, directions of use, treatment duration, warnings (patient's attitudes when doses are missed, contraindications, side effects and interactions) were compared with prescription and/or literature and scored. Subsequently an overall level of knowledge index was constructed with the following cutoff points: less than 8 points (insufficient), 8 to 10 points (regular) and 11 points or more (good).

Results: The level of knowledge of pharmacotherapy was considered insufficient for 30.8% of the patients, regular for 64.0% and good for 5.2% of them. Misinformation was more concentrated on warnings (side effects (96.3%), interactions (91.0%), missed doses (71.1%)) and indication (53.5%).

Conclusion: The low level of treatment knowledge indicates the need for investment on redirecting patients' counseling and monitoring work practices among primary care professionals.

DH11

Are the medicines really available in the Brazilian public health system? [#49]

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Background: Medicines availability in public healthcare systems varies from 17.6% to 88.6%. However, accurate measures of this indicator taking into account each prescribed medicine and the respective quantity required for the entire treatment are scarce. The aim of this study is to evaluate the availability of medicines in primary care and to identify its associated factors.

Methods: Exit survey in 2017 with 1221 primary care users in a medium-sized municipality (234,937 inhab.), Minas Gerais state, Brazil. Each prescribed medicine was considered available if dispensed in adequate quantity for the duration prescribed. Prescriptions were classified as: totally filled, partially filled and unavailable. Pearson's Chi-Square test was used to examine the association of full prescription availability with individual sociodemographic and health status variables at a significance level of 5%.

Results: 1186 prescriptions were analyzed, totaling 4039 medicines [mean = 3,4; Min = 1; Max = 11]. Prevalence of prescriptions totally filled was 39.4%, partially filled 48.23% and unavailable, 12.48%. The most and least available therapeutic groups were antiparasitic (100%) and anti-infectious (38,6%), respectively. Significant associations between full availability of the prescription and younger age ($p = 0.000$); more schooling ($p = 0.000$); poor perception of health ($p = 0.001$) and fewer comorbidities ($p = 0.000$) were identified.

Conclusion: This study used a variety of indicators to characterize the availability of prescription medicines. The results show the need of implementing improvements in public policies to promote adequate access to medicines and reduce inequalities, especially among the most vulnerable populations.

National Formulary - A tool to support prescription and efficient use of medicines in Portugal [#56]

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Introduction: Harmonization and worksharing has evolved at European level. However, it is up to each Member State to implement at national level the measures agreed at European level, as well as to define national strategies to ensure efficient management of its public health resources. The aim of this work was to describe the role of the National Pharmacy and Therapeutic Commission (NPTC) and the guiding principles for the elaboration of the National Formulary (NF).

Methods: Review of all information published in the area of NPTC of INFARMED's website.

Results: NPTC is a specialized technical committee of INFARMED, I.P. One of NPTC's main activities is the elaboration of the NF. The NF includes all medicines considered necessary and appropriate for the diagnosis, treatment or prophylaxis of clinical conditions.

The NF provides information on each medicine, including a description of indications for use, medicine positioning in the therapeutic armamentarium available for each disease, alternative therapies, as well as information on its conditions of use, the need of prescribing justification, authorization mechanisms and monitoring use.

The NF includes also attachments and direct links to supporting documents, including labelling information, educational materials, health technology assessment reports, protocols for use and therapeutic guidelines.

Conclusion: The NF is a tool to support prescription and use of medicines, aiming at a consistent and equitable therapeutic management in clinical practice, based on a cost-effectiveness rationale to ensure NHS sustainability. The monitoring of compliance is still a challenge and needs further improvements regarding IT systems for data collection and analysis.

Medicine shortages and challenges with the procurement process among public sector hospitals in South Africa; findings and implications [#55]

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Background: Medicine shortages are a complex global challenge affecting all countries, and a key aspect of drug utilization patterns. This includes South Africa (SA) where ongoing medicine shortages are a concern among public sector hospitals as SA strives for universal access to healthcare. This research aimed to highlight challenges affecting medicines availability in the current pharmaceutical procurement process for public sector hospitals in SA.

Methods: Qualitative in-depth interviews conducted among 10 pharmacy managers in public sector hospitals in Gauteng Province, SA. A content analysis was performed. Transcripts were coded by two of the authors, with categories developed and grouped into themes.

Results: The 'Procurement process' emerged from the data as the overarching theme, rooted in five main themes: (i) Delayed payment of supplier accounts which led to suppliers withholding orders; (ii) The buy-out process that was used to procure medicines from suppliers other than the contracted ones; (iii) Suppliers not performing thereby contributing to medicine shortages in the hospitals; (iv) Shortage of active pharmaceutical ingredients causing suppliers to fail to supply orders further causing medicine shortages in the hospital; and (v) Challenges such as the inaccuracy of the electronic inventory management system used to manage the inventory in the hospitals.

Conclusion: Effective management of supplier contracts by the National Department of Health is crucial to ensure accessibility and availability of essential medicines to all citizens. Ongoing monitoring and support for the future use of computerised inventory management systems is important to reduce medicine shortages. These are challenges for the future.

DH14

A qualitative evaluation of compliance to prescribing guidelines in public health care facilities in Namibia [#70]

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Background: WHO estimates over 50% medicines are prescribed inappropriately and the main driver of antimicrobial resistance. There have only been a limited number of studies evaluating prescribing patterns in Namibia as the country strives to continue providing comprehensive healthcare; the majority using quantitative methods. Consequently, there a need to address this. The objective was to evaluate prescribing practices among public health care facilities in Namibia to provide future guidance.

Methods: A mixed methods medicines use evaluation was conducted to assess compliance to national standard treatment guidelines (NSTGs). Qualitative methods used to evaluate factors and practices associated with prescribing at three levels of health care, i.e. hospital, health centre and clinic. Main outcome measures for the quantitative study were compliance to current STGs with 85% compliance considered acceptable.

Results: Of the 1,243 prescriptions, 73% complied with the NSTGs and 69% had an antibiotic. Of the 3759 medicines (mean of 3.0 ± 1.1 per prescription) prescribed, 64% had generic names (INN). 94.6% of prescribers were aware and had access to NSTGs for reference purposes, with 82% reporting NSTGs easy to use. Main thematic factors driving compliance to therapeutic guidance were programmatic, that is access to up-to date objective guidelines, continued education on their use, and ease of referencing using an index. Lack of systems to regulate noncompliance impacted on their use.

Conclusion: Given concerns with adherence to guidelines, lack of INN prescribing and high use of antibiotics, a prescribing performance management system should be introduced in Namibia to improve prescribing. This will be monitored.

DH15

Presentation of a web-based tool to monitor drug utilization and healthcare consumption in Region Stockholm [#81]

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Background: Data on drug utilization as well as data on healthcare consumption in Region Stockholm has been monitored for decades. There was a need of combining different types of data to improve the quality of monitoring. The aim was to build a web-based tool to make data on drug utilization and healthcare consumption easily available for monitoring.

Methods: The tool was built in SAS Visual Analytics. The administrative healthcare databases in Region Stockholm was used, which includes data on all prescription medications dispensed at Swedish pharmacies as well as data on all diagnoses and healthcare consumption for primary care, specialized ambulatory care and hospitalizations. Asthma, defined as ICD-10 J45-J46, was used as an example.

Results: One month after introducing the web-based tool, the number of sessions was 189. In total, 72 674 individuals (55% female) had a registered diagnosis of asthma in 2018. The mean number of visits for asthma was 1,9, with 84% of the visits in primary care. The 5-year prevalence of asthma was estimated to 7,1%. Among them, 91% had at least one drug for obstructive airway diseases (ATC-code R03) and 78% had an inhaled corticosteroid (ICS). In 2018, 140 180 individuals were dispensed an ICS and 41% of them had an asthma diagnosis. When expanding the diagnosis to also include chronic obstructive pulmonary disease, the proportion was 48%.

Conclusions: The web-based tool has enabled improved monitoring of drug utilization and healthcare consumption. It was possible to get a comprehensive overview of individuals with asthma.

Dosing patterns of non-vitamin K oral anticoagulants in patients with atrial fibrillation in Valencia Spain [#111]

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Background: Current treatment guidelines recommend a reduced dose of non-vitamin K antagonist oral anticoagulants (NOAC) for patients with atrial fibrillation (AF) and renal disease/dysfunction or high risk of bleeding. This study aimed to assess the patterns of dose prescription of NOAC dosing related to the recommendations and its association with adverse clinical outcomes.

Methods: Population-based retrospective cohort study using electronic health records from Valencia Region, Spain. We included all new users of NOAC from Nov2011 to Dec2015 with AF diagnosis. We classified patients as potentially overdosed if they received a standard dose and had a recommendation for dose reduction, and as potentially underdosed if they received a reduced dose and did not have a recommendation for dose reduction. Cox models using inverse probability of treatment weights were used to assess the association with adverse outcomes.

Results: We evaluated 7,948 AF patients (apixaban 25.8%, dabigatran 36.8%, rivaroxaban 37.4%), 43% received a reduced dose, ranging from 35% (apixaban) to 56% (dabigatran). The reduced dose was recommended to 23% of patients, ranging from 9% (apixaban) to 43% (dabigatran). We classified 4.7% as potential overdosed and 25% patients as potential underdosed. Dabigatran showed the highest proportion of potential overdosing (7.8%), while rivaroxaban users showed the highest potential underdosing (27.9%). We did not find associations between being potentially misdosed and a higher risk of death, stroke or gastrointestinal bleeding.

Conclusions: Using real-world data, we found that some of the prescribed NOAC doses were inconsistent with the guideline's recommendations without significant associations to adverse outcomes.

DH17

Trend and pattern of proton pump inhibitors use in Portugal [#138]

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Background: International clinical evidence has associated the use of proton pump inhibitors (PPI) with potentially serious clinical situations. Trend analyses are being performed on PPI use in Portugal since 2014. In 2016 and 2017 public health authorities developed regional and national campaigns on PPI prudent use.

Methods: Ambulatory care PPI (ATC: A02BC) was retrieved from national databases from 2000 to 2018. The main outcome measure was defined daily doses (DDD) per 1000 inhabitants per day (DID) and was further stratified by age groups and gender.

Results: Omeprazole was the most widely used PPI throughout the period under review. In 2017, for the first time, there was a reversal of the upward trend in the use of PPI, with a reduction of 6.3% compared to 2016 (year with the highest use, 93.58 DID) in total consumption (mainly due to Omeprazol reduction). However Pantoprazole and Esomeprazole consumption are still strengthening their increasing trend. In 2018, women (63%) consumed more than men (37%). It was also observed that age group over 85 years used these medicines the most. Market share varies according to age groups due to different pharmaceutical formulations availability.

Conclusions: PPI should be used at the minimum effective dose for the shortest possible time, periodically re-evaluating the need for treatment. Due to high consumption level, it is important to further understand the causes for pharmacological treatment need of Portuguese patients. In patients with dyspeptic symptoms, non-pharmacological measures such as lifestyle intervention should be the first line treatment.

Comparing drug expenditures in the Scandinavian capitals [#181]

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Background:

Pharmaceutical expenditure has been rising rapidly in most countries, partly attributed to the introduction of new expensive medicines. In recent years the drug market has changed with an increasing number of medicines introduced in the hospital setting. Cross national comparative studies on drug utilization are valuable tools to identify areas for improvement, few such studies have been conducted in the hospital setting.

Methods:

In this cross-sectional study, we compared the top substances (ATC5th level) by pharmaceutical expenditure 2017-2019 between the three Scandinavian capital regions of Copenhagen (1.8 million inhabitants), Oslo (0.7 million inhabitants) and Stockholm (2.4 million inhabitants). All analyses were based on sales data including all medicines used in hospitals and all dispensed prescriptions in ambulatory care (reimbursed expenditure and copayment).

Results:

In 2019, specialist medicines administered or prescribed in the hospital setting, dominated the top-15 medicines by expenditure in all three regions. However, there were differences in the rank and volume of most of these medicines. Four substances prescribed by hospital specialists (aflibercept, coagulation factor VIII, lenalidomide and intravascular immunoglobulins) appeared on all three countries top-15-list. The specialist drugs accounting for the highest spending were aflibercept, coagulation factor VIII and adalimumab in Copenhagen, Oslo and Stockholm, respectively.

Conclusion:

The drug market has changed with specialist medicines administered or prescribed in hospitals dominating expenditure in all the three Scandinavian capital countries. However, there are substantial differences between countries in rank order and expenditure. Cross national comparative studies may therefore be used to identify areas for improvement.

How many and how fast Latin American regulators approve new cancer drugs previously approved by EMA? [#195]

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Background:

We aimed to describe the Latin American (LA) marketing authorization (MA) status of new cancer drugs approved by EMA between 2006 to 2016, and the time-lapse between first MA by EMA, and the date of the first approval in LA countries.

Methods:

Twenty official websites from LA regulators were searched to collect the MA status of new cancer drugs. The date of the first MA was retrieved from regulators' databases as well as from the EMA Public Assessment Reports. Only publicly and trustfully available information was included. Two independent researchers collected the information. Country experts were contacted in case of discrepancies.

Results:

Six LA countries were included. Out of 56 new cancer drugs approved by EMA, Ecuador and Colombia approved 35 (62.5%), Chile 38 (67.9%), Peru 40 (71.4%), Argentina 45 (80.4%) and Brazil 46 (82.1%). The median time (months) [IQR] between EMA and Ecuador was 21.5 months [9.0–36.2], Colombia 18.5 months [9.2–30.7], Peru 15.0 months [5.5–34.5], Brazil 14.0 months [9.0–26.0], Argentina 9.0 months [2.0–19.5] and Chile 7.5 months [0.0–21.0]. In all countries, some drugs (n=24) were approved before EMA approval.

Conclusion:

More than 60% of new cancer drugs approved by EMA (2006–2016) were also approved by LA regulators, and these were approved between 7.5 to 21.5 months after EMA first marketing authorization. Several LA countries have launched regulations to directly recognize new drugs in case of earlier approval by EMA. This

Do Latin American regulators directly recognize new drugs approved by internationally known regulators? [#198]

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Background:

In last years, several Latin American (LA) countries reformed their marketing authorization (MA) rules in order to allow direct recognition of MA in case of earlier authorization by EMA, FDA and some other internationally known regulators. We aimed to assess the direct recognition rules for new drugs in LA, including the regulatory authorities considered as reference regulators for LA countries.

Methods:

Official websites from LA regulators were searched to find the current legislation for MA. All 20 continental LA countries were included. Two independent authors collected information regarding direct recognition in every country, the reference regulators defined as such by LA countries, and the applicable drugs to this process. Country experts were contacted in case of doubtful information, all discrepancies were solved by consensus.

Results:

Regulatory information was available for sixteen countries; information from Nicaragua, Belize, Suriname and Guyana was not available. Eleven out of sixteen LA countries (Argentina, Ecuador, El Salvador, Uruguay, Peru, Paraguay, Guatemala, Honduras, Colombia, Mexico and Panama) explicitly accept direct recognition of MA from EMA, FDA and Canada (100%), Japan (80%), Switzerland and Australia (70%), and some other LA regulators (60%). With few exceptions, all drug classes are accepted.

Conclusion:

Direct recognition of MA is an accepted regulatory practice in two thirds of LA countries. European, United States and Canadian regulators are the most important reference regulators for these countries. MA decisions taken by reference regulatory authorities must be based on the strongest and most transparent clinical data; the implications go far beyond its borders.

EL1

Rates, Determinants, and Effects of Implementing Deprescribing in People with Type 2 Diabetes: A Scoping Review Focusing on Cardiometabolic Medication [#1]

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Background: Setting personalized goals for people with type 2 diabetes implies that medication might be deintensified in vulnerable patients, but little is known about whether or when such deprescribing is conducted. We conducted a scoping review to assess what is known about the rates, determinants, and effects of implementing deprescribing of cardiometabolic medication in people with type 2 diabetes.

Methods: We searched Medline and Embase between January 2007 and November 2018 for studies on deprescribing and diabetes. Outcomes were rates of deprescribing according to patients' eligibility criteria, determinants, and effects of deprescribing and its implementation. Risk of bias was assessed.

Results: Fourteen studies were included; 8 reported on rates, 9 on determinants, and 6 on effects; bias was particularly high for studies on effects. Deprescribing rates ranged from 14% to 27% in elderly patients with low HbA1c levels, and from 16% to 19% in elderly patients with low systolic blood pressure levels. Rates were not much affected by age, gender, frailty or life expectancy. Rates were higher when a reminder system was used to identify patients with hypoglycaemia, which led to less overtreatment. Most healthcare professionals accepted the concept of deprescribing but differed in when to conduct deprescribing. Deprescribing glucose-lowering medication resulted in small rises of HbA1c and less hypoglycaemic events in high risk patients.

Conclusion: Although deprescribing of glucose-lowering medication seems feasible and acceptable, it is not widely implemented. Little is known about deprescribing of cardiovascular medication. Support systems may enhance deprescribing in eligible patients.

High-risk medication in community care: a scoping review [#12]

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Background: The University of Antwerp and the organization for home care nursing, White-Yellow Cross Flanders, are collaborating to develop a policy on high-risk medication (HRM) in community care. HRM should be managed with care as the risk for adverse drug reactions and harm for patients is higher. Health care institutions should identify HRM and use specific safety measures and guidelines in dealing with HRM.

Methods: A first step in the context of this collaboration is a review to examine the existing literature about HRM in community care. The literature search was conducted in the following electronic databases: MEDLINE (PubMed); Scopus; Web of Science; Cochrane; and CINAHL. Data extraction and analysis was completed on all included studies by independent reviewers. Articles were primarily assessed with regards to their view on HRM and the way in which they reported on this subject.

Results: Our review highlights the paucity of studies in community care, more specific about HRM. Only 13 articles met the inclusion criteria. Despite this limitation, 66 HRM or overall categories were identified as bearing a high-risk for patient harm in a community setting. Most researchers rely on the ISMP (Institute for Safe Medicine Practice) list of HRM, literature or reported incidents. The HRM (categories) most frequently identified in community care were opioids, warfarin, heparin and digoxin.

Conclusion: The findings of this review suggest that additional research is needed to identify high-risk medication in community care. Improving (high-risk) medication care is a crucial aspect that involves all healthcare settings on a worldwide basis.

High-risk medication in community care: a Delphi consensus study [#13]

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Background: Being pressured by a general accreditation trend and the need for standards of care, community-based organizations have been trying to achieve a higher quality of care. A documented and coordinated approach to safely manage high-risk medication (HRM) is considered a Required Organizational Practice (ROP) by accreditation bodies. Consensus is needed on what is considered to be high-risk medication for home care to devise a HRM policy for home care agencies.

Methods: This study aimed to reach consensus on which medication (groups) can be considered as bearing a heightened risk of (serious) harm in a community care setting; for which medication (groups) additional monitoring or interventions are needed from home care nurses; and for which medication (groups) specific procedures for home care nurses are needed.

Results: The Delphi consensus method was used. (Inter)national researchers with extensive knowledge and/or experience with (high-risk) medication were recruited. A systematic review identified a list of HRM, used to shape the assessment document for the first round. Additional items were included in the second round, based on the panel's feedback. Thirteen purposively selected healthcare professionals from 4 countries & different fields: general practitioners (n = 4), pharmacists (n = 4), specialists (n = 2), nurses (n = 3) were included.

Conclusion: Consensus was defined as at least 80% agreement on an item. On the basis of a previously conducted scoping review and the expert opinions in this study, we reached consensus on a considerable list of 15 HRM that are considered a priority in home care by experts.

Cross-cultural adaptation and psychometric validation of the French version of the revised Patients' Attitudes Towards Deprescribing (rPATD) questionnaire [#29]

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Background: Knowing the attitudes of older adults and their caregivers towards deprescribing is essential for the deprescribing process to be effective. Thus, the revised Patients' Attitudes Towards Deprescribing (rPATD) questionnaire was developed and contains main four dimensions. We aimed to transculturally adapt and validate the rPATD questionnaire in 4 French-speaking countries (France, Belgium, Switzerland and Canada).

Methods: Translation and back-translation were performed by an expert panel. Psychometric properties validation was determined among older adults ≥65 years living in the community or in institutions and who were taking at least one chronic medication. Similarly, caregivers for older adults with similar characteristics were included. Face and content validity were assessed in a subgroup of participants during a pre-test phase and by experts. Construct validity (exploratory factor analysis) and internal consistency (Cronbach's alpha) were investigated in all participants without missing data. Test-retest reliability was evaluated using Intra-class Correlation Coefficient (ICC) in a sample of participants.

Results: In total, 320 older adults and 215 caregivers were included to evaluate construct validity and internal consistency. Exploratory factor analysis extracted four factors in both versions of the questionnaire. Internal consistency of all factors was acceptable (older adults: Cronbach's alpha between 0.68 and 0.80; caregivers: 0.60 and 0.88). Test-retest reliability was overall good for factors with ICC between 0.65 to 0.84 for older adults' version and 0.78 to 0.91 for caregivers' version.

Conclusion: The French version of the rPATD questionnaire presents good psychometric properties and can be used to explore attitudes about deprescribing.

Updating the PRISCUS list of potentially inappropriate medications for the elderly – Asking the right questions to consult the oracle(s) of Delphi [#63]

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Background: Lists of potentially inappropriate medication (PIM) have become popular tools to improve pharmacotherapy in geriatric patients. The German PRISCUS list is more than 8 years old, making an update necessary. An important step during PIM list development is establishing which drugs should be evaluated during the Delphi process and gathering data on risks of these medications in older patients.

Methods: We conducted a literature search to identify international PIM lists. Then, we used prescription data supplied by the WIdO covering all German patients > 65 insured by statutory health insurance to review the listed drugs' relevance to the German healthcare system. We also performed a systematic review on adverse drug events in the aged to identify additional drugs for potential assessment. To enable an evidence based rating process, we are performing a set of systematic reviews on the safety of various drugs in geriatric patients enriched for the reviews carried out for the PRIMA-eDS (www.prima-eds.eu) project. We will apply an adapted GRADE to the results, which will be presented to the expert panel to support their evaluation of all selected drugs in a 2-round Delphi process.

Results: We selected 251 drugs and prescribing criteria to be rated. The systematic review on adverse events in older patients did not identify additional drug classes or individual drugs of relevance. Ten systematic reviews are on-going.

Conclusion: In order to clearly communicate the evidence for PIM lists an improved process for defining the basis of Delphi expert rounds is suggested.

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Benzodiazepine and other potentially inappropriate medication use among older adult in relation with multimorbidity: a population-based descriptive study from 2000-2016 [#64]

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Background: Benzodiazepines and other sedative-hypnotics have been associated with an increased risk of fall and confusion. Older people with multimorbidity are more likely to receive these medications and to experience side effects. We aimed to describe the annual prevalence of benzodiazepine and other sedative hypnotic use in relation with chronic diseases among older patients in the province of Quebec, Canada, from 2000 to 2016.

Methods: We conducted a population-based cohort study using data from the Quebec Integrated Chronic Disease Surveillance System. We included all individuals aged 66 years and over who were covered by the public drug insurance. All benzodiazepines and other medications used as sedative-hypnotic (ex. tricyclic antidepressants) were included. For each year, we evaluated the age-standardized proportion of individuals using these drugs, defined as the presence of at least one claim in the given year. We stratified our results according to the number of chronic diseases.

Results: The proportion of individuals using benzodiazepines decreased from 34.8% in 2000 to 24.8% in 2016, but multimorbid people remained the highest users. Conversely, the proportion of users increased for other sedatives, in particular for trazodone (1.2% to 3.3%) and quetiapine (less than 0.1% to 2.2%), and especially among individuals with ³6 chronic diseases.

Conclusion: From 2000 to 2016, older adults in Quebec were less likely to be prescribed benzodiazepines, but used more trazodone and quetiapine. There is a need to address the use of these medications, particularly in multimorbid people who present a higher risk of adverse events.

Retrospective analysis of inappropriate medication prescription in elderly population in two Italian settings [#75]

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Background: A lots of drugs are often prescribed inappropriately, especially in elderly patients. The aim of this study was to retrospectively evaluate prevalence of polypharmacy and Potential Inappropriate Prescribing (PIP) in community-dwelling elderly population of two Italian regions.

Methods: The study population was composed by all patients over 65 years followed by a general practitioner (GP) of eight local health units (LHUs) in Lombardy and Campania. Data were retrieved from pharmacy claims records in 2016. We defined a list of inappropriate drugs (ERD-list) in elderly based on validated Beers, STOPP and EU-(7)-PIM criteria, which were selected, updated, and adapted to Italian context. Polypharmacy was classified as: excessive polypharmacy (>10 drugs), polypharmacy (5-9 drugs) and non-polypharmacy (<4 drugs).

Results: Polypharmacy was common in both regions; percentage of elderly who received 5-9 drugs ranged from 35% in Lombardy to 42% in Campania, while those in excessive polypharmacy were 22% in Campania and 8% in Lombardy.

For Lombardy LHUs, the percentages of elderly who received at least an ERD drug ranged from 25.9% to 32.9%. For Campania LHUs, more than 49% of patients were involved in the ERD list. The most inappropriate drug/drug class prescribed in Lombardy was proton pump inhibitors (ATC A02BC) for more than 8 weeks, while in Campania was ketoprofen (ATC M02AA10).

Conclusion: PIP and polypharmacy in the elderly population is widespread, with some remarkable geographical differences. Therefore, it is necessary to implement local strategies to improve the rational prescription of drugs.

Predicting falling by medication use – assessing diagnostic performance of the Drug Burden Index and the list of Fall Risk-Increasing Drugs [#76]

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Background: Medications are a common cause of increased fall risk in older people. Different models assess medication-related fall risk, but little is known which model pharmacists could use in practice. In this study we assessed the diagnostic performance to predict falling of two models: (1) the Drug Burden Index (DBI) and (2) the list of Fall Risk-Increasing Drugs (FRIDs).

Methods: A retrospective cohort study was conducted using pharmacy dispensing data of 3393 adult Dutch patients of whom 986 fell at least once and 469 fell recurrently in the preceding year. The DBI, a measure of a patient's use of anticholinergic and sedative medication and the use of FRIDs was determined for each patient. The Receiver Operating Characteristic Curves (ROC) in predicting (recurrent) falls were determined for the DBI and the FRIDS model.

Results: The ROC of the DBI model was 0,629 [95% CI: 0,601 – 0,657] and FRIDs model was 0,6375 [95% CI: 0,609 – 0,667].

Conclusion: It is difficult to predict falling by medication use. Our models were not specific nor sensitive. Pharmacists should examine other factors than medication use to select patients for deprescribing interventions.

The prevalence of polypharmacy and the use of potentially inappropriate medications: a cross-national study in Five European countries [#83]

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Background: The reported prevalence of polypharmacy in populations aged ≥65 years varies (38% - 65%) between European countries. This is partly attributable to differences in methodology and definitions, limiting the comparability of polypharmacy prevalence. There is a lack of comprehensive data on polypharmacy across multiple European countries. This study aims to investigate the prevalence of polypharmacy in older people with physician contact in primary care for five European countries, describe factors associated with polypharmacy, and explore the use of selected (potentially inappropriate) drugs in this population.

Methods: Primary care electronic medical record data from Belgium (Longitudinal Patient Database [LPD]), France (LPD), Germany (LPD), Italy (LPD), and UK (IQVIA Medical Research Data) were used. These databases provide systematic ongoing information from office-based physician visits on patients' consultations, diagnoses and treatment. The study time period was January-December 2018. The index date was the last physician visit recorded during 2018. Patient inclusion criteria comprised: ≥65 years old at index; active (at least two primary care visits) during 2018, at least 12 months history at index. Polypharmacy was defined as five to nine, and ≥10 drugs prescribed in six months prior to index. Use of selected drugs (opioids; antipsychotics; benzodiazepine; proton pump inhibitors) was explored.

Results: Preliminary results will be presented by country to include: number (%) of subjects with polypharmacy; demographic characteristics (sex, age), selected comorbidities and Charlson Comorbidity Index; number (%) prescribed selected drugs.

Conclusion: This study will allow presentation and exploration of any differences and similarities in polypharmacy across Europe.

Deprescribing antipsychotics in nursing homes [#85]

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Background: Antipsychotics are often prescribed inappropriately in the management of behavioral symptoms of dementia. Despite the fact, that antipsychotic treatment of people with dementia carries an increased risk of death. This study aimed to investigate the extent of inappropriate antipsychotic consumption among nursing home residents in the Capital Region of Denmark. Furthermore, to explore potential barriers to antipsychotic deprescribing among General Practitioners (GPs).

Methods: A mixed-method approach was applied, which included medication reviews and observations. Inappropriate consumption of antipsychotics was investigated by performing medication reviews in a collaboration between the GP and a multidisciplinary medicine team. Observations of the GPs were conducted during medication review meetings in order to observe potential deprescribing barriers. Conventional content analysis was used to analyze observation data.

Results: In total 18.5 % of the 92 included nursing home residents were prescribed antipsychotics. Inappropriate antipsychotic treatment was prescribed to 14% of the residents. During medication review, 65 recommendations for 192 drugs were suggested, of which 10.8% were related to antipsychotics. About half of the antipsychotic recommendations were accepted by the GPs (n=5). Two overall barriers towards antipsychotic deprescribing were revealed. The primary barrier was not to interfere with psychiatrist prescriptions. The other barrier was that the GPs did not feel, they had sufficient knowledge about deprescribing antipsychotics.

Conclusion: Antipsychotics were inappropriate prescribed in 14 % of the included residents. Barriers to discontinuation were the desire not to interfere with other specialists' prescribing and lack of deprescribing knowledge, respectively.

Prevalence of drug-disease interactions in older patients in primary care – observational register study [#86]

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Background: Drug-disease interactions (DDIs) are present when a drug prescribed for one disease worsens a concomitant disease. The prevalence of DDIs in older patients in primary care is largely unknown, as well as to what extent physicians individualize drug prescribing in relation to concomitant diseases. We therefore analysed the prevalence of DDIs in older patients in primary care, and explored to what extent physicians take possible DDIs into account when prescribing.

Methods: Cross-sectional population-based register study in 336 295 patients aged ≥65 registered at one of a total of 206 primary care practices in Stockholm Region, Sweden. Prevalence and prevalence differences for 31 DDIs derived from Irish STOPP-Criteria were assessed. We extracted data from a regional administrative healthcare database including information on all healthcare consultations and dispensed prescription drugs in the Region. Data on demography, diagnoses, drug dispensations and healthcare consumption were analysed. Drug use was assessed during 2016.

Results: In 10,7% of older patients at least one DDI was observed. Non-steroidal anti-inflammatory drugs (NSAIDs) were implicated in more than 75% of cases. The most common DDI was NSAID/hypertension (8,1%), followed by NSAID/cardiovascular disease and loop diuretics/urinary incontinence (both 0,7%). Comparing dispensation patterns of patients with and without an interacting disease, physicians seem to be aware of possible harms of NSAIDs.

Conclusion: DDIs were present in every tenth older patient in primary care. Physicians prescribe NSAIDs cautiously, but there is room for improvement.

EL12

Medication review in elderly at long term care facilities with caregiver qualification [#94]

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Background: It is estimated that almost 30.000 elderly are hospitalized in Denmark each year, as a result of preventable adverse events due to prescription medications and polypharmacy increase the risk significantly. Polypharmacy might be reduced by medication review(MR).

For many elderly in long term care facilities(LTCF) the quality of life(QoL) in the last years are more important, than increased life expectancy.

Methods: This is an intervention study, where patients at three LTCF are offered a MR. The medication team consisting of a pharmacist and a general practitioner(GP), examine the patients medication by access to the LTFC journals and short interviews with the caregivers. Subsequently the team visit the patients' GP and recommend changes to the medication.

QoL questionnaire (EQ-5D-5L and ESAS) are completed at baseline and at 3-month follow-up.

Inclusion criteria: ³5 medications, ³65 years old.

Results: 144(45 %) patients are included in the project and 76% meet the inclusion criteria. The caregiver interviews ensure the focus is on the patients' needs. Recommendations of deprescribing may be supported by the caregiver. Or it may be abandoned if the caregiver has information against the change.

Further preliminary results will be presented at the conference.

Conclusion: The elderly at the LTCF were willing to get their medication reviewed, but many did not meet the inclusion criteria. The caregiver interview qualify the MR, removes misunderstandings and ensures the recommendations are beneficial. The caregiver interview appears to be of great value in the medication review.

EL13

Use of medicines by the elderly in Portugal [#97]

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Background: Current estimates point to an increase from 2.1 to 2.8 million in the number of inhabitants older than 65 years in Portugal in 2080. The aim of the present study was to characterise medication use by the elderly Portuguese population, with specific focus on the oldest-old (85+).

Methods: Information was retrieved from the National Health System's Control and Monitoring Centre database on reimbursed medicines prescribed and dispensed to individuals older than 65 years in 2017 in all community pharmacies in Portugal mainland. We performed an analysis of demographic and geographic data by INN and therapeutic groups. Use was measured by absolute number of packages and per capita.

Results: A higher consumption of medicines was observed in women, and this difference becomes more evident with ageing. However, use per capita shows an opposite trend, with the oldest-old men having a similar consumption to oldest-old women (mean packages 53.1 vs. 53.4). In women, the top 10 therapeutic class ranking is led by cardiovascular medicines (40%), followed by CNS medications (34%) and antidiabetics (10%); in men, 43% of TOP 10 consumption is due to cardiovascular medications, antidiabetics (14%) and drugs used in benign prostatic hypertrophy (12%).

Conclusions: In the elderly, the pattern of medicines' use is clearly gender-based, and there are also significant age-related differences. With ageing, co-occurrence of multiple diseases becomes more frequent and often leads to polypharmacy. Our study is a first step towards the generation of the evidence needed to develop and implement specific measures to tackle polypharmacy-associated risks.

EL14

Interventions to deprescribe proton pump inhibitors among patients with no indication for continued treatment [#98]

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Background: We aim to test the efficacy of two informative interventions to stop treatment with proton pump inhibitors (PPI) among patients without an indication for continued treatment.

Methods: Patients will be recruited at community pharmacies when redeeming a PPI prescription. Pharmacy staff will determine eligibility for inclusion based on the following: ≥18 years old, currently no or mild symptoms of acid reflux, on daily PPI >6 months, not treated with NSAIDs or antithrombotics. Patients will be randomized 1:1 into two groups: (1) simple intervention or (2) extended intervention. The simple intervention is providing patients with a pamphlet on PPI deprescribing. The extended intervention is the patient pamphlet and an individual telephone consultation with a pharmacist where a collaborative plan for PPI deprescribing is developed. Both interventions are based on evidence-based material provided by Deprescribing.org. Follow-up will occur at four and 12 months in the simple intervention arm, and one, four and 12 months in the extended intervention arm. We aim to include 220 patients in the trial.

Results: The primary endpoint will be the proportion of patients with either no PPI use for the past 14 days or as needed PPI use (≤4 times in the last 14 days). Secondary endpoints will be: The proportion of patients who achieve dose reduction of PPI (but did not discontinue), antacid consumption, symptom scores, and proportion of patients in contact with either their GP or hospital for gastric acid-related disorders.

Preliminary results will be presented at the conference.

Conclusion: To be determined.

Attitudes towards deprescribing in older adults with limited life expectancy: Two systematic reviews [#99]

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Background: Deprescribing of unnecessary medications is particularly relevant in older adults with limited life expectancy. Thus, we aimed to explore the literature on attitudes of health care professionals (HCPs) as well as patients and relatives towards deprescribing in older adults with limited life expectancy.

Methods: We conducted a systematic literature search from inception to December 2017 using MEDLINE, EMBASE, and CINAHL. Both quantitative and qualitative studies were included if they concerned older people with limited life expectancy, including older people residing in any kind of aged care facility.

Results: We identified eight studies on HCPs' attitudes towards deprescribing in older adults with limited life expectancy, the latter mainly describing the views of primary care physicians. Factors that influenced HCPs' decisions to initiate or suggest deprescribing in this population were related to four overall themes: 1) Patient and relative involvement, 2) The importance of teamwork, 3) HCPs' self-efficacy and skills, and 4) The impact of organizational factors. We identified seven studies on the attitudes of older adults and their relatives. Four main themes were identified: 1) The well-being of older adults with limited life expectancy, 2) Involvement of older adults and their relatives in deprescribing, 3) Health care professionals' role in deprescribing, and 4) Medication-related factors affecting deprescribing.

Conclusion: We identified multiple and interdependent barriers and facilitators for deprescribing among older adults with limited life expectancy. Initiatives to facilitate deprescribing practices within this population should target several of the possible issues identified.

Multimorbidity and polypharmacy patterns: systematic association between chronic diseases and dispensed drugs [#101]

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Background: We aimed to identify multimorbidity and polypharmacy patterns in young and adult population. To evaluate the systematic associations among chronic diseases and drugs in the form of patterns and to describe the constituted patterns with a focus on exploring the existence of potential drug-drug and drug-disease interactions and prescribing cascades.

Methods: Observational cross-sectional study in the EpiChron Cohort. Data were retrieved from medical databases and pharmacy billing records of all patients aged ≤65 years of the Spanish region of Aragon in 2011. An exploratory factor analysis was carried-out based on the tetra-choric correlations among the diagnoses of chronic diseases and dispensed drugs. The analysis was stratified by age and sex.

Results: Six multimorbidity-polypharmacy patterns were identified: allergic-derma; respiratory; nervous-system; cardiometabolic; endocrinological-metabolic; osteo-metabolic. Endocrinological-metabolic and osteo-metabolic patterns appeared only in women. Three different variants were described in the respiratory pattern: a generic one, a pattern with acute infection, and a respiratory pattern with an asthma-allergic component. Patterns were more complex as age advanced and there were differences between men and women. Almost all the patterns included drugs for preventing or treating potential side effects of other drugs/diseases in the same pattern.

Conclusion: Six multimorbidity-polypharmacy patterns confirmed the existence of systematic associations among chronic diseases and medications, and revealed some associations probably caused by prescribing cascade phenomenon. The present study may help to avoid the onset of potential drug interaction among multimorbid patients in which the establishment of adverse events can commonly be observed.

Nursing home residents' thoughts on discussing deprescribing of cardiovascular preventive medications [#106]

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Background: Decisions surrounding deprescribing of cardiovascular preventive medications should be individualized in nursing home residents. Little is known about how residents would like to participate in such decisions and what topics they consider important to discuss. We explored how nursing home residents would like to discuss deprescribing of cardiovascular preventive medications with their physician.

Methods: We conducted a qualitative study with face-to-face, semi-structured interviews. Participants were Danish nursing home residents aged ≥70 years deemed cognitively able to participate by nursing staff. They were taking one or more of: statins, antihypertensives, antihyperglycemics, or antiplatelets. We used systematic text condensation for analysis.

Results: Nine residents (median age 85 years, 7 female) were interviewed. Participants were aware of their overall number of medications but unaware of specific medications and why they were taking them. Participants displayed a high degree of trust in their physicians and generally believed their medications were necessary if the physician prescribed them. Residents were open to deprescribing if their physician suggested it but were not aware of the possibility to be involved in the decision (e.g. discuss goals of care and treatment preferences) and had difficulty imagining what they could discuss with their physician.

Conclusion: The interviewed nursing home residents were unable to articulate how they might discuss deprescribing of cardiovascular medications with their physician, and what topics would be important. Future work should explore how residents can be encouraged to be part of discussions and investigate ways to have residents share their goals/preferences regarding deprescribing.

Medication review in long-term care facility for blind and visually impaired elderlies [#107]

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Background: The ever-increasing number of elderlies in society suffer from many chronic diseases and are therefore using many medications. Polypharmacy and inappropriate use of medication increase the risk of adverse drug reactions and unplanned hospitalization.

Objective: The objective of this study was to perform medication reviews(MR) in the close network group(NG) around each resident and subsequently evaluate the structure of the MR as well as the degree of accepted and implemented interventions.

Method: This study is an intervention study where MRs were performed in corporation with the NG. The NG consisted of a clinical pharmacist, a consulting physician from the Department of Clinical Pharmacology, the patients' general practitioner(GP), the clinical nurse specialist, a nurse and the patients' primary caregiver. Residents of the facility using medications and wanting to participate were included. A three-and eight-months follow-up will be performed.

Preliminary results: Fifty of the 65 residents signed informed consent and had MR performed. All MRs were performed in the NG at the facility. The mean age was 87.9 years and 39(78%) were female. In total they used 595 medications(mean 11.9 medication). The NG agreed on 133 interventions in total. Discontinuation was suggested in 70 cases(53%) followed by dose reduction in 33 cases(25%). Most interventions referred paracetamol and pantoprazole which were among the most used medications.

Conclusion: There is a high degree of willingness to participate among the residents at the long-term facility. This may be due to the structure of the study and the involvement of the staff at the facility.

Comparing polypharmacy in nursing homes and in the community dwelling Elderly in Italy: different patients, tools and methods to monitor risk of drug-drug interactions (DDIs) [#113]

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Background: To assess the prevalence of widespread drug-drug interactions (DDIs) with clinical impact in the Elderly both territorial patients and nursing homes residents.

Methods: We defined a list of literature-based DDIs and analysed archive of reimbursed prescriptions in 9 Local Health Authorities of Emilia-Romagna on drug use in over 65-years-old territorial patients in the first semester of 2018 (for each DDI, at least one drug should reach 90 DDDs- chronic use). We also collected DDI data in a sample of nursing homes, by searching clinical charts in one 2018 index day.

Results: The prevalence of polypharmacy (≥ 10 drugs) was 23.8% in nursing homes and 0.5% in territorial patients. Patients with at least one interaction were 53.7% and 26.4%, respectively. In nursing homes, the most frequent interactions were antidepressants-anxiolytics (11.9%) and SSRIs-ASAs (7.4%), while among territorial patients were ACE-i-NSAIDs (7.2%) and calcium channel blockers-a-blockers (2.3). Out of 190 potential DDIs, only 159 could be searched in reimbursed prescriptions.

Conclusions: Risk of DDIs appeared very different in the two settings. Both technical and clinical reasons should be considered in discussing it: 1. Reimbursed prescriptions don't detect some drug classes, like benzodiazepines, therefore frequency of DDIs is underestimated; 2. High age and complex clinical conditions are more frequent in nursing homes, as well as strict monitoring by health personnel. In order to reduce the risk of ADRs in the elderly and the resulting health burden, a continuous overview on DDIs should be implemented. Electronic tools suitable for each setting of care are available.

Developing an algorithm to identify patients at high risk for hypoglycaemia in community pharmacies [#114]

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Background: Strict glucose control in type 2 diabetes (T2D) patient is essential for preventing long-term complications but is also associated with an increased risk for hypoglycaemia. Early detection of patients at risk can help prevent hypoglycaemia. In this study we aim to develop an algorithm for early identification of T2D patients at high risk for hypoglycaemic events using routinely available pharmacy data.

Methods: A retrospective cohort study was conducted using a longitudinal data set collected from primary care in the northern part of the Netherlands. T2D patients with at least one glucose lowering drug prescription were included. The performance of several machine learning algorithms were evaluated to discriminate between patients with at least one hypoglycemic event between 2007–2014 and patients without an event. We used c-statistic as a metric to evaluate the predictive performance of the algorithms using 5-fold cross validation.

Results: In total, we used data from 13236 patients (67.6 age $\pm$ 12.2, 50.8% female, 19.1% patients with events) in this study. Logistic regression model using least absolute shrinkage and selection operator (LASSO) outperformed the other machine learning models with a c-statistic = 0.71. The algorithm included age, sex, total drug count, number of glucose lowering drugs, insulin use, pre-mixed insulin use, number of different types of insulin, insulin duration, sulfonylurea use and anti-depressant use.

Conclusion: A good hypoglycemia prediction is possible using data routinely available in community pharmacies. Early detection of patients at risk can help pharmacist to intervene in time.

EL21

Pharmacovigilance programme in emergencies room (ER) [#115]

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Background: Adverse drug reactions (ADRs) are a major public health problem because of their impact in terms of morbidity, mortality and economic cost. Few studies assess the prevalence of ADR in ER.

Methods: Observational retrospective study of intensive ADRs monitoring patients admitted in ER. Primary endpoint was the ADR-related ER visit. A descriptive analysis of patient, drug and ADR characteristics was performed.

Results: 352 out of 15,722 ER visits were due to ADRs (prevalence: 2.24%). Mean age was 74.7 (SD: 15.6) years and 151 (55.3%) were men. Most frequent comorbidities were: hypertension, diabetes mellitus and atrial fibrillation. Mean number of drugs was 8 (SD: 3.7). Most patients (81.8 %) were exposed to polypharmacy, and a drug-drug interaction was suspected in 48.3 % of cases. 31.8% patients were hospitalized due to suspected ADRs: mean length of stay admissions (SD) was 9.0 (8.2). ADRs-related costs were € 1,871.6/ADR. 68.1% were severe, with a fatal outcome in five patients. 94.9% ADRs were type A reactions. Gastrointestinal disorders represented the most common ADRs. Drugs most frequently associated with ADRs were antithrombotics, psychoanaleptics and psycholeptics. The most frequent drug-reaction associations were haemorrhages and hypoglycemia due to antithrombotics and insulin, respectively.

Conclusions: ADRs are a relevant cause of ER visits, and often lead to hospital admission and increased costs. They are dose-related and predictable in more than 90 % of cases. Most cases involve elderly patients with pluripathology and polymedicated, and result from well-known reactions of a few commonly used drugs.

Causes of hypoglycemia in type 2 diabetes patients from patients' perspective: a qualitative interview study [#118]

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Background: Hypoglycemia can lead to complications, hospitalization and mortality. Exercise, nutrition and medication are important factors in developing hypoglycemia, yet little is known about the underlying problems type 2 diabetes (T2D) patients face. The aim of this study is to explore the causes of hypoglycemia from patients' perspective.

Methods: Semi-structured interviews were conducted amongst sixteen T2D patients who used sulfonylurea and/or insulin and recently experienced severe and/or multiple hypoglycemic event(s). Patients were purposively sampled via Dutch general practices. The interview guide was based on the Theoretical Domains Framework (TDF). The interviews were audio-recorded, transcribed verbatim and coded by two researchers. Directed content analysis was used.

Results: Most important TDF domains were knowledge, nature of behaviour and emotion. Exercise, nutrition and/or diabetes medication were the main causes of hypoglycaemia according to the patients. Several patients lacked procedural knowledge to handle specific situations. Some patients mentioned that they struggled to develop regular habits while others were not capable of coping with deviations from their habits. In such cases, they did not know how to adjust their medication. In case of emotional stress or burden, patients were not always able to adjust their nutrition or medication to prevent hypoglycemic events.

Conclusion: This study provides insight into causes of hypoglycemia from patients' perspective. Although patients have a general idea about the relevant causes of hypoglycemia, they have difficulties in addressing these issues to prevent hypoglycemia. Health care professionals could support these patients with practical advice regarding medication and diet adjustments.

Polypharmacy in elderly out patients population in Southern Italy [#125]

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Background: Polypharmacy is common in older population increasing healthcare costs. An analysis among elderly regarding prevalence and costs associated to polypharmacy and excessive polypharmacy was performed.

Methods: Retrospective study cohort. Data were obtained from outpatient drug prescriptions collected from administrative databases in Campania, Southern Italy Region of about 6 million inhabitants, in 2018. Study population included patients ≥ 65 years with at least one drug prescription and prevalence has been evaluated. Differences in prevalence rate between males and females were expressed as age-adjusted risk ratios (RR) with 95% Confidence Interval (CI).

Results: 1,038,120 elderly people was treated with at least one drug. Prevalence rate was 96.5% (CI 95% 96.20-96.86). Median number of prescriptions were 32 (IQR 14-45) and increasing among patients aged 65-74, 75-84 and ≥ 85 . The same trend occurred for cost for treated. Of 319,860 patients taking 1-4 drugs, not considered as polypharmacy, major percentage was observed among 65-74 years (37.3%). While, for polypharmacy (5-9 drugs) and excessive polypharmacy (≥ 10 drugs), differences in percentage of treated was recorded between 65-74 and 75-84 years and were higher in the latter (46.0% vs 50.0%; 16.7% vs 26.2%). Moreover, among patients of these age groups, was recorded a higher percentage of females than males, both for polypharmacy and excessive polypharmacy. Conversely, patients in excessive polypharmacy aged ≥ 85 years were mostly males than females (28.0% vs 26.9%).

Conclusion: Polypharmacy burden is strongly age-related. Differences were observed with increasing age in terms of prevalence and costs, and between males and females within age groups.

Gender difference analysis in elderly out patients population in Southern Italy [#126]

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Background: A gender specific analysis among elderly population of Campania, Southern Italy region, regarding prevalence and costs, was performed.

Methods: Retrospective study cohort. Data were obtained from outpatient drug prescriptions collected from administrative databases in Campania region (about 6 million inhabitants), in 2018. Study population included patients ≥65 years old with at least one drug prescription. Prevalence was used as a measure to estimate degree of exposure to drugs prescription. Differences in prevalence rate between males and females were expressed as age adjusted risk-ratios (RR) with 95% Confidence Interval (CI).

Results: 1,038,120 elderly people were treated with at least one drug. For patients aged 65-74 years and 74-84 years, prevalence rates were higher in females than males (94.2% vs 92.6%; 95.9% vs 95.0%) and similar for patients aged ≥85 (91.4% vs 91.3%). Conversely, treatment duration was longer among males in all age-groups, reason why mean cost was higher in males than females. Pharmacological groups with highest adjusted relative differences in prevalence regarded intestinal antiinflammatory agents (ATC II: A07E) (RR 1.88), Ace inhibitors (ATC II: C09A) (RR 1.26), antigout preparations (ATC II: M04A) (RR 1.22) and blood glucose lowering drugs (ATC II: A10B) (RR 1.17) dispensed more to males than females. While, drugs affecting bone structure and mineralization and calcium were more commonly used in females.

Conclusion: Our findings carried out in Southern Italy elderly population, showed substantial differences between males and females in terms of drug prescriptions prevalence, higher for females and duration of treatment and costs, higher for males.

Analgesic use and pain among older adults with intellectual disabilities: A cross-sectional study [#131]

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Background: People with intellectual disability (ID) are living longer and often experience polypharmacy and multiple morbidities. Evidence suggests that pain may not always be appropriately treated in this population. The aim of this study is to investigate the prevalence and patterns of analgesics among older adults with ID, and to explore the relationship between analgesics and characteristics including self-reported pain.

Method: Data was drawn from Wave 2 (2013/204) of the Intellectual Disability Supplement to the Irish Longitudinal Study on Ageing (IDS-TILDA), a nationally representative study of 708 adults with ID >44 years of age. Participants and/or carers were asked about pain, including location and severity and provided open text data on pain. Self/proxy reported medication data was available for 677. Analgesic use were classified using the BNF.

Results: Of 646 participants with pain information, 30% (n=194) reported pain, with 46% (n=84) having moderate pain. Of 677 with medicines data, 40.2% (n=272) reported analgesics. Paracetamol accounted for 67.5% of analgesics, followed by oral NSAIDs (17.8%). Weak or strong opioids accounted for 5.6% and 3.1% of analgesics respectively. Gastro-intestinal pain was most commonly reported, with 23% of those with GI pain reporting no treatment. Open text data identified themes including belief that patients with ID have a high pain threshold and difficulty of carers determining presence of pain.

Conclusion: Pain was prevalent among older adults with ID. Difficulties in the identification and appropriate treatment of pain were identified. Pharmacists, carers and doctors need further education regarding appropriate treatment of pain in this population.

Polypharmacy in older men and women in Greece [#153]

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Background: Polypharmacy is common among older people in Greece. The aim of this study was to explore differences in polypharmacy between older men and women in the community of Thessaloniki, Greece.

Methods: Information was collected by using data from prescriptions (paper and electronic) and from actual medication sales concerning older patients of a pharmacy store in Thessaloniki during one month. Furthermore, older people were asked about other medications provided from other pharmacy stores either with or without prescription. Polypharmacy was defined as the use of five or more medicines per day.

Results: Polypharmacy was observed in 55% of older patients, from whom 42% were men and 58% women. The most commonly used medications by men older than 65 years were cardiovascular (86%), analgesic (61%), hypolipidemic (59%), antiulcer (55%), anticoagulant / antiplatelet (55%), antidiabetic (41%) and medicines acting on the central nervous system (25%). The most commonly used medications by women older than 65 years were cardiovascular (87%), analgesic (76%), antiulcer (43%), medicines acting on the central nervous system (43%), anticoagulant / antiplatelet (39%), antidiabetic (33%) and hypolipidemic medicines (28%).

Conclusion: In our study there were differences in polypharmacy between older men and women: Polypharmacy was more common in older women than in older men. Women consumed more analgesics and medicines for the central nervous system than men. Men consumed more hypolipidemic, antiulcer, anticoagulant / antiplatelet and antidiabetic medicines than women.

EL27

Can pharmacist-led medication reviews be integrated in a diabetes care program? An exploratory study in Dutch primary care [#166]

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Background: Yearly pharmacist-led medication reviews improve medication use in patients with type 2 diabetes. But so far, these are not integrated in the diabetes care program of general practitioners in the Netherlands.

Aim: To explore whether pharmacist-led medication reviews can be integrated into the diabetes care program by general practitioners.

Method: Patients with type 2 diabetes who participated in an integrated care program in two general practices were eligible for the study. All patients received a pharmacist-led medication review following Dutch guidelines. Group I received the medication review before the yearly diabetes check-up performed by the physician assistant, group II after the check-up and group III independently from the check-up. A structured questionnaire evaluated patients' and health professionals' opinion of integrating the medication reviews in the diabetes care program.

Results: Overall, 17 patients and 4 health professionals participated in the study. All patients and health professionals were positive about integrating the medication reviews in the care program. 94% of the patients and 75% of the health professionals preferred the medication reviews to be linked to the yearly diabetes check-up.

Conclusion: This exploratory study suggests that patients and health care professionals are positive about integrating pharmacist-led medication reviews into the diabetes care program of general practitioners. This is a step towards collaborative drug therapy management to improve diabetes care.

Prevalence and predictors of potential drug-drug interactions in an older community-based population [#179]

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Background:

Drug-drug interactions (DDIs) are an avoidable cause of patient harm. The aim of this study was to: (1) determine the prevalence of severe cardiovascular and central nervous system (CNS) DDIs in a cohort of community-dwelling patients; and (2) investigate potential predictors of DDIs.

Methods:

A prospective cohort study (aged ≥70 years) using linked data from a national pharmacy claims database and Waves 1 and 2 of The Irish Longitudinal study on Ageing (TILDA). ‘Severe’ cardiovascular and CNS DDIs were identified using the BNF 77. These were then cross-referenced using Stockley’s Drug Interactions and drug combinations identified as being contraindicated or requiring close monitoring were included. Logistic regression was used to examine patient-level risk factors associated with risk of DDI between Waves 1-2. Patient-level risk factors included: age, gender, marital status, education, social network, morbidity, polypharmacy (5-9 drugs, ≥10 drugs) smoking status, depression and delayed cognitive recall.

Results:

In total, 1,466 patients were included (mean age=78 SD=5.53; Female N=795, 54.23%). The overall prevalence of DDIs was 29.60% (N=434); 210 (48%) of these patients had a chronic DDI (> 3 consecutive prescriptions). The prevalence of DDIs per prescription claim was 14.38% (N=33,548). Polypharmacy (≥ 10 drugs) (adjusted odds ratio (OR)=29.18; 95% CI 9.11, 93.49), frailty (OR=1.71; 95% CI 1.08, 2.70), smoking history (OR=1.34; 95% CI 1.01, 1.78) and depression (OR=1.66; 95% CI 1.07, 2.58) were significantly associated with experiencing a DDI.

Conclusion:

DDIs are highly prevalent in older people and frail patients with polypharmacy require regular medication reviews and prescribing optimisation.

Towards safe medication use of geriatric patients at care homes: a combined tool for identification of potential drug related problems [#192]

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Background:

Medication review (MR) is increasingly recognized as an essential element of pharmaceutical care, assessing patients' medications to identify drug related problems (DRPs). There is a growing amount of evidence-based research suggesting older people are at risk of potentially inappropriate medications (PIMs) due to multimorbidity and polypharmacy. The aim of the present study was to develop and assess a combined tool for evaluation of medications against DRPs of geriatric patients of nursing homes.

Methods:

The EU(7)-PIM list and INXBASE database were used to identify PIMs and drug-drug interactions (DDIs) among ≥65 years old patients (n=303) living in nursing homes in Estonia and receiving medications via automated dose-dispensing (ADD) service.

Results:

The result demonstrated that 56% of older patients in nursing homes had at least one PIM prescribed and 3.3% of the patients were exposed to clinically significant DDIs. In addition, during six months study period nursing home patients experienced changes in treatment regimen through polypharmacy increase (38%).]. The most common PIMs were related to NSAIDs (e.g., acetylsalicylic acid, diclofenac) and PPIs (e.g., omeprazole).

Conclusions:

The pharmacist-supervised sustainable MR could be an important supportive activity to ensure the rational and safe medication of the geriatric patients. The results of the present study suggest that the EU (7)-PIM list and INXBASE database could be implemented for the identification of DRPs for nursing home patients in Estonia.

Factors associated with potentially inappropriate medications among elderly with Alzheimer's disease in the Brazilian public health system [#196]

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Background:

Elderly with Alzheimer's disease (AD) often require multiple medications to adequately treat their disease and associated comorbidities. The use of multiple medications may also lead to the use of potentially inappropriate medications (PIMs), which place medication users at higher risk for adverse events. Purpose: To investigate the prescription and determinants of PIMs among elderly with AD.

Methods:

A cross sectional study was conducted with elderly (≥ 65 years), who obtain their medications for treatment of AD by the public health system at Sorocaba city, Brazil. PIMs were identified in accordance with 2019 Beers Criteria. The association between PIMs and independent variables were analyzed by Poisson regression. The study was approved by Ethics Committee of the University of Sorocaba (protocol number: 1860724).

Results:

A total of 201 patients and/or caregivers was interviewed. Overall, 49.8% of the participants had at least two PIM prescription and 27.4% at least three. Central nervous system medications were the most frequently prescribed PIM group. Lower age (Prevalence Ratio-PR 1.66, Confidence Interval CI95% 1.05 - 2.64), higher number of comorbidities PR 5.07, CI95% 1.77; 14.51), depression (PR 1.65, CI95% 1.09-2.49) and polypharmacy (PR 1.87, CI95% 1.08; 3.22) were associated with the prescription at least two PIMs.

Conclusion:

Our study showed a high number of PIM prescriptions. These results may indicate that standard care for elderly with AD should include the development of strategies to assist physicians in prescribing for these vulnerable patients, especially for those with the higher number of comorbidities and take multiple medications.

Drug-related problems among older ambulatory patients in Bulgaria – a pilot study [#205]

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Background:

Drug-related problems (DRPs) are a common issue among elderly patients. Age influences drug metabolism and Potentially inappropriate medications (PIMs) can be prescribed. We aimed at identifying and analyzing PIMs, according to Beers criteria, and DRPs among patients over 65 in Bulgaria.

Methods:

A prospective, questionnaire-based pilot survey conducted in general practitioner or cardiologist offices. The questionnaire was developed for the purposes of comprehensive assessment of older adults in a H2020 project EUROAGEISM, FIP7 program, financed by the European Commission (2017-2021). The participants were randomly enrolled on the basis of provided signed informed consent. Descriptive statistics was applied.

Results:

30 older patients 65+ (45% female and 55% male). 97% were diagnosed with hypertension with most prescribed medicines being *Agents acting on the renin–angiotensin system* (ATC code C09) (23 out of 150 medicines). On average, 5.53 drugs per person were prescribed (95% CI 4.78-6.28, SD=2.00). Complaints were fatigue (n = 23), chronic constipation (n = 11), gastric disturbances (n = 9), and headache (n = 9). 29 types of DRPs were identified: 17 (58.6%) drug interactions; 2 (6.66%) overdose due to duplication; 8 (26.66%) side effects; 2 (6.66%) improper use. 7 PIMs were identified, but only 1 (clonidine) was strongly recommended to avoid.

Conclusions:

Polypharmacy and multiple concomitant diseases were confirmed. Our analysis identified low number of PIMs, and a large number of DRPs which highlights the need for regular review of drug therapy in elderly patients. Therefore, the role of the clinical pharmacist should be considered.

Interventions and implementations

II1

Barriers and strategies to successful tuberculosis treatment in a high-burden tuberculosis setting: A qualitative study from the patient's perspective [#16]

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Background: Previously treated tuberculosis (TB) patients are a widely reported risk factor for multi-drug-resistant tuberculosis. Therefore, identifying patients' problems during treatment is necessary to control TB, especially in a high-burden setting. We investigated and constructed barriers to successful TB treatment from the patients' perspective, aiming to identify potential strategies to improve treatment outcome in Indonesia.

Methods: A phenomenological qualitative study was conducted in a province of Indonesia with high TB prevalence. Participants from various backgrounds (i.e. TB patients, physicians, nurses, pharmacists, people responsible for TB at the district health office, TB activist and TB programmers) were subject to in-depth interviews and focus group discussions. All interviews were transcribed verbatim from audio and visual recordings and the respective transcriptions were used for data analysis. Barriers were constructed by interpreting the codes' pattern and co-occurrence. The information's trustworthiness and credibility were established using information saturation and participant validation and triangulation approaches. Data were analysed using the Atlas.ti 8.4 software.

Results: We interviewed 62 participants and identified 15 barriers. We classified the barriers into three themes, i.e. socio-demography and economy; knowledge and perception and TB treatment. Five main barriers were identified across all barrier themes, i.e. lack of TB knowledge, stigmatisation, long distance to the health facility, adverse drug reaction and loss of household income.

Conclusion: Effective treatment outcome improvement requires target interventions that can be focused on the five main barriers. A multi-component intervention including TB patients, healthcare providers, community and policy makers is required to improve TB treatment success in Indonesia.

Development of a risk prediction tool for *Clostridium difficile*: A Scottish experience [#68]

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Background: Risk prediction tools in clinical practice are aimed to support clinicians during decision making, facilitate patient education on their health conditions, and identify and initiate preventive approaches. The development and implementation of risk prediction tools can vary depending on the setting and the user it is being implemented for. This study aims to highlight the process of developing a risk prediction tool for *Clostridium difficile* infection (CDI) in Scotland.

Methods: Initially three GPs were recruited for interviews, shadowing and co-design of a CDI prototype. The study focused on gathering GP's perception of CDI and the usefulness of a CDI tool in supporting their antibiotic prescribing. Subsequently, non-medical prescribers from secondary care were interviewed with the same objective. The study process and analysis were guided by the Consolidated Framework for Implementation Research and The Guideline Implementation with Decision Support (GUIDES) checklist.

Results: As CDI is not common in primary care, GPs deemed a CDI tool unnecessary; however, higher support for the tool could be achieved with its integration into their prescribing system and providing advice on an action(s) rather than a risk score. Differently in secondary care, clinicians were receptive to having a tool for antibiotic decision making. However, due to patient data being stored in different systems, only a website or mobile app of the CDI tool would be feasible.

Conclusion: Despite the initial reticence by GPs for a CDI tool, through the guidance of the Implementation frameworks, CDI tools with preferred formats by both cohorts are under development.

Implementation research of medication reconciliation in hospital care: contributions of qualitative research to decision making [#175]

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Background: One of the strategies to promote patient safety in care transitions is Medication Reconciliation (MR). However, its implementation is a challenge. The objective was to analyze the MR implementation process in hospital care.

Methods: This is a qualitative research that used the Case Study methodology and the Consolidated Framework for Implementation Research (CFIR), to guide the collection and analysis of data. The study was carried out in the gastroenterology and cardiology ward of a teaching hospital, located in the city of Vitória/Espírito Santo/Brazil, which since 2015 has been implementing an MR process led by a pharmacist. Data collection consisted of face-to-face interviews with health professionals involved in the implementation of MR and a direct observation of the descriptive nature. From the thematic content analysis, interview data and observations were coded and grouped into the CFIR domains and constructs.

Results: Interviews were conducted with six pharmacists involved in the management and conduct of the RM process, as well as other professionals involved in the RM process, such as doctor, nutritionist and nurse. Preliminary results indicate the influence of knowledge and skills of pharmacists leading to MR, and the complexity of the process. The context setting, team culture and social networks also seem to influence the implementation of MR, revealing themselves as facilitators or as barriers.

Conclusions: It is expected that the results of this research can be used to improve the service implementation, as well as contribute to its expansion, tailoring strategies to address the identified barriers and qualifying decision making.

Pharmacy-led implementation of evidence based medicine in primary care: Evaluating Diuretics in Usual Care study (EVIDENCE) [#177]

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Background: Obtaining evidence of comparative effectiveness and safety of widely prescribed drugs in a timely cost-effective way is emerging as a major global challenge for healthcare systems. The Evaluating Drugs in Normal Care (EVIDENCE) programme addresses this challenge through novel methodology. We describe an exemplar pilot study comparing thiazide type diuretics for hypertension.

Methods: Patients prescribed either indapamide or bendroflumethiazide for hypertension were identified in each primary care practice recruited. Random allocation of a prescribing policy for one or other of these drugs was then applied to the whole practice and where required repeat prescriptions were switched to comply with randomised policy. Patients were informed of the potential switch by letter with the option to discuss further with the study team and/or opt-out of the switch. Routinely collected hospitalization and death data in NHS will be used to compare cardiovascular event rates between the two policies.

Results: We found bendroflumethiazide was prescribed to 78% of patients prescribed either of these drugs despite recent NICE preference for indapamide. 29 primary care practices in 5 Scottish NHS boards were recruited and 14 randomised to indapamide and 15 to bendroflumethiazide creating a study population of 5985 patients. Less than 0.23% of patients opted out.

Conclusion: This pilot study demonstrated the feasibility and cost efficiency of the EVIDENCE approach. A relatively large study was generated rapidly with negligible disruption to practice workflows. EVIDENCE methodology offers a novel way to compare the effectiveness of a wide range of medicines where there is clinical equipoise.

Valproate utilisation trends among women of child-bearing potential in Ireland between 2014 and 2017: a drug utilisation study using interrupted time series [#180]

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Background: Use of valproate (VPA) during pregnancy is associated with increased risk of congenital malformations and neurodevelopmental disorders in exposed children. Following an EU-wide safety review in 2014, the European Medicines Agency strengthened the warnings on VPA use in women of childbearing potential (WCBP), which was communicated to healthcare professionals and patient organisations in Ireland. We examine the trend in VPA use among women aged 16-44 years in Ireland between 2014-2017 and the effect of regulatory intervention on these trends.

Methods: National pharmacy claims data identified prescriptions dispensed for women aged 16-44 years, and by individual 10 year age-groups, from community pharmacies in Ireland between Jan 2014 and Dec 2017. The rate of VPA use per 1000 was calculated using annual population estimates for Ireland. Segmented regression analysis of interrupted time series was used to examine slope changes in monthly dispensing of VPA before and after regulatory intervention (Dec 2014).

Results: Overall, the rate of VPA use among those aged 16-44 years from Jan 2014 (2.06/1000 eligible pop) to Dec 2014 (2.06/1000) was stable, however, there was a non-significant decrease in subsequent months to Dec 2017 (1.80/1000; $p=0.077$). Analysis stratified by age-groups found that the decrease post-intervention was only significant in the youngest 16-24 year age-group ($p=0.009$).

Conclusion: There is evidence that changes in use of VPA among WCBP, particularly those aged 16-24 years, were observed following targeted regulatory intervention. Future research should examine the impact of the 2018 EU-wide safety review on VPA use in this cohort.

Implementation and effectiveness of an interprofessional support program for patients with type 2 diabetes in Swiss primary care settings [#182]

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Background: The Swiss government supported an interprofessional patient support program to investigate the pharmacist's contribution to chronic care management in the French-speaking part. The program includes motivational interviewing (patient-pharmacist), electronic drug monitoring, and feedback reports to the physician. The aim of this study was to assess the implementation and effectiveness of this program for patients with type 2 diabetes followed for 15 months.

Methods: This is a prospective, multicentre, observational, cohort study using a hybrid design and the Framework for the Implementation of Services in Pharmacy. The evaluation assessed: (1) the implementation strategies, (2) the implementation process, and (3) the effectiveness of the program. Outcomes are assessed at each stage of the implementation process using both qualitative and quantitative methods.

Results: 212 patients were included among 27 pharmacies (9 pharmacies reached the target with ≥10 patients included): 120 (57%) patients were followed ≥ 15 months. 140 (66%) patients were male, mean age was 64±11 years and mean number of chronic drugs was 5±3. Medication adherence was approximately 86% during the follow-up (n=178 patients, 84%). At baseline, mean HbA1c and BMI were 7.5% and 31 kg/m² respectively and decreased by 0.5 (p=0.012) and 0.6 units (p=0.017) over 15 months. Key influencing factors were pharmacist skills, the pharmacy owner support, and local interprofessional networking.

Conclusion: This program appears to support medication adherence and clinical outcomes and provides key information on the processes for implementing large-scale patient support programs. It enables to adapt the traditional community pharmacy practices towards the delivery of patient-centred and collaborative care.

Medication use review at community pharmacies: an international pilot project [#188]

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Background: Polypharmacy is common in both older people and patients with chronic diseases. Medication Use Review (MUR) is a structured evaluation of a patient's medicines in order to optimize medicines use and improve health outcomes. The aim of this pilot project is to introduce MUR, focused on patient education about diseases and medication use, in community pharmacies.

Methods: In the on-going pilot study (January 2019-April 2020) the MUR standard adapted from Pharmaceutical Care Network Europe 2013 statement and amended in Estonia is being used in community pharmacies in Estonia, Latvia, Lithuania, Poland, Croatia, Bosnia and Herzegovina, Hungary, Romania, Bulgaria, Slovakia and Iran. Identified drug related problems and feedback from patients, pharmacists and GPs to MUR will be analyzed.

Results: By November 2019, 268 patients had received MUR in 7 project countries. Mostly older (65+ years) patients receiving polypharmacy (5+ medicines) had MUR. More frequently identified problems were insufficient awareness about diseases and drug related problems including low medication adherence. In general, patients and GPs were satisfied with MUR results. Community pharmacists have reported increased use of professional knowledge, but faced lack of time, funding and fragmented patient medical record data as barriers to the provision of this service.

Conclusion: Initial outputs of MUR in community pharmacies have been mostly positive. In the future it would be important to increase knowledge about this service among patients, GPs and politicians for broader provision of MUR at community pharmacies to support safe and effective use of medicines by patients.

Deprescribing Protonpumpinhibitors in primary care: how often and how? [#190]

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Background:

Protonpumpinhibitors are frequently prescribed to treat and prevent gastrointestinal diseases. However, longterm use of these drugs is associated with several serious side effects and needs to be limited. This study aims to assess 1) the frequency of patients, chronically using PPIs in primary care, without a current indication for this use and 2) barriers and facilitators for deprescribing of PPIs.

Methods:

Patients of 12 GPs, chronically using PPIs (>180 days) in 2017, were identified. Per GP, we randomly selected 50 patients (25 patients < 70 years; 25 patients > 70 years) and determined if their PPI use can be justified based on information about comedication and age. If unclear, the GP was asked to review patient's medication use. Furthermore, semi structured interviews were held with 29 patients, 7 GPs and 5 pharmacists.

Results:

In 2017, 16% of all patients chronically used a PPI. No current indication could be determined for 38.4% (< 70 years) and 29.1% (>70 years) of the randomly selected patients. The average duration of PPI use among these patients was 79 months. Main barriers mentioned by patients for deprescribing PPIs were fear, negative experiences, low priority, and limited communication with GPs. Counseling and dislike of medication could facilitate deprescribing. Barriers mentioned by GPs and pharmacist are lack of time, money and a clear guideline.

Conclusion:

About one third of all PPI users are qualified for deprescribing. Clear guidelines, good communication and counseling of patients, are important factors when starting deprescribing in primary care.

The survey of drug-drug interactions in kidney transplant patients [#200]

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Background: In Hungary the number of renal transplant patients is growing. Due to their immunosuppressive therapy and health status, they considered a high risk patient population. Moreover these patients have various comorbidities, leading to polypharmacy, which can potentially cause serious drug-drug interactions.

The study aimed to assess the drug-drug interactions among kidney transplant patients and to evaluate their clinical significance.

Methods: Within 24 hours of patient admission, as the part of the comprehensive medical reconciliation drug-drug interaction review was performed by the clinical pharmacist using Lexicomp® Drug Interactions tool. The interactions were rated by Lexicomp®'s rating system: X – avoid combination, D – consider therapy modification, C – monitor therapy, B – No action needed, A – no known interaction. Group B and A cases were excluded from the study to focus on the more clinically relevant interactions.

Results: During the pilot study (from 22/Oct/2019 to 25/Nov/2019.) thirty-seven patients (51% male, mean age: 51) were included. The average number of concomitantly used medications were 11,5±4,5 per patient. Overall 355 interactions were identified and classified (X: 13, D: 32, C: 310). Most of the patient used proton pump inhibitor (27 patients) or H2-antagonist (5 patients) which can negatively affect the absorption of their immunosuppressant drug. Allopurinol treatment against hyperuricaemia, which is common in kidney transplant patients, can also cause several interactions with various medication (e.g. warfarin, furosemide, rosuvastatine, esomeprazole).

Conclusions: By the involvement of clinical pharmacist in the medical team, the medication treatment could be more personalized and potential drug related interactions could be prevented.

Mental health

MH1

Utilization of antidepressants in Brazil: a study based on private and public consumption data [#36]

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Background: Disease burden in Brazil shows that mental health disorders, especially depression, are on the rise. Economic recession has generated impoverishment and impacted on government health expenditures. This study profiles consumption and expenditures of antidepressants viewed considering social and economic context.

Methods: In a time-series analysis, from 2011 to 2017, drug purchase data was used as proxy for consumption. 10 commonly prescribed antidepressants were selected, based on availability for retail and for government purchases. The ATC/DDD system standardized medicines and consumption output, in DDDs /1000 inhab per year. Linear regression was used for trend analysis.

Results: Time series showed variation in consumption and expenditures. Private and public consumption was expressed in six tiers, and public expenditures in three tiers, according to range of DDDs/1000 inhab per year. Results showed rise in private purchases of all antidepressants; public purchases showed downward or constant trends. Fluoxetine was the top drug in consumption from retail and government purchases.

Conclusion: Rising out-of-pocket expenditures for depression and decreasing government purchases reflect budget health cuts, possibly herding users to the private sector for their medicines. Increased antidepressant use may reflect disease burden as well as despondency and disenfranchisement in Brazil.

MH2

Systematic review of economic evaluations on the use of memantine alone or combined with donepezil for moderate to severe Alzheimer's disease [#37]

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Background: Alzheimer's disease (AD) represents the most common cause of dementia. The literature observes that the effects of memantine on AD are small or controversial. This study synthesizes the available evidence and the state of the art of economic evaluations that assessed memantine alone or combined with donepezil for moderate to severe Alzheimer's disease, focusing on elaborate analytical decision models.

Methods: Evidence search was carried out in MEDLINE, EMBASE, NHS EED, CEA Registry and LILACS. After the duplicates were removed, two independent researchers reviewed titles and abstracts and, later, the complete texts. After the application of the eligibility criteria, fifteen complete economic evaluations were included. Study quality was assessed with the tool developed by Drummond and collaborators.

Results: Of the 12 included studies one evaluation was conducted through a clinical trial and eleven used Markov models. The main measure of outcome adopted was cost per QALY. The use of memantine was considered cost-effective and dominant in eleven studies; in a single study, its use was dominated when compared to donepezil for moderate Alzheimer's Disease. Sensitivity analyzes were systematically performed, showing robust results. The quality assessment indicated good methodological quality.

Conclusion: Although there is controversy regarding the benefits derived from the use of memantine associated or not with donepezil, evidence collection suggests that it is cost-effective in the countries where the studies were done. However, local economic studies need to be performed, given the great variability derived from the different parameters adopted in the assessments.

MH3

Cost-effectiveness analysis of memantine for severe Alzheimer's disease in Brazil [#38]

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Background: Alzheimer's disease (AD) represents the most common cause of dementia, being the main cause for functional dependence among the elderly and representing an important economic impact for families and for universal health systems. The study examined cost-effectiveness of using memantine alone in severe Alzheimer's disease in Brazil from the public health system perspective.

Methods: A Markov model simulated disease progression through a set of finite health states related to the cognitive domain, considering a time horizon of 5 years. The probabilities of disease progression was modeled using data from population-based studies, clinical trials and economic evaluations already published on the use of memantine. Costs were considered from the perspective of the public health system and included hospitalization, drugs for treatment, others prescription drugs, physician visit and laboratory tests. The Quality Adjusted Life Year (QALY) was used to measure effectiveness. Health outcomes and costs were discounted by 5%.

Results: Memantine monotherapy was associated with higher costs and greater clinical effectiveness in terms of QALYs, when compared with standard treatment. This model showed that there was a gain in 0.00308 QALYs and cost increase of BRL 351,50 per patient, resulting in an incremental cost-effectiveness ratio (ICER) of BRL 114,205.75 per QALY. Sensitivity analysis supported the findings.

Conclusion: The use of memantine for patients with severe AD represents gain, in terms of QALY and additional costs, when compared with non-pharmacological standard treatment, but at a high ICER considering the reality of the Brazilian public health system.

MH4

Morbi-mortality consequences of misuse of psychoactive prescription drugs in Portugal: A retrospective observational study - the MisuMedPT project [#103]

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Background: In Portugal, there are no published data on the health-related consequences of prescription drug misuse, which is therefore a public health issue of unknown dimension in our country. Poison control centres, together with other pharmacoepidemiological sources, can be part of an active surveillance system for monitoring medicine's misuse and drug abuse.

Methods: Retrospective observational study of intentional exposures to opioid analgesics, antiepileptics, anxiolytics, hypnotics and sedatives, antidepressants, psychostimulants and drugs used in opioid dependence reported to the Portuguese Poison Information Centre (CIAV) between 2014 and 2018. The variables studied were demographic characteristics of individuals, geographic distribution of calls, co-exposure to alcohol or illicit drugs, call origin, case evaluation and case guidance.

Results: Between 2014 and 2018, 24624 calls were received at CIAV reporting 34203 intentional exposures to any medicinal product, with 31169 (91.1%) involving one of the psychoactive medicines included in the study. Of these, 20906 exposures had emergency room visit advice or effective hospitalisation. The most frequently involved psychoactive medicines were benzodiazepines (62.0%), leading alprazolam (15.4%) and diazepam (12.0%), with trazodone ranking fifth (6.0%). Intentional exposure to the studied medicines was combined with non-medicinal products in 2169 calls (9.4%), 2052 (94.6%) of which with alcohol.

Conclusion: Benzodiazepines and antidepressants are the top therapeutic classes involved in poisonings reported to CIAV. Given the fact that both these classes currently account for a large proportion of medicines' consumption in Portugal, health-related consequences of their misuse should be further studied, in order to minimise the associated risks.

MH5

Antidepressant treatment in children and adolescents: a descriptive cohort study [#122]

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Background: Although several studies have identified a possible increased risk for suicidal behaviour among children and adolescents treated with antidepressants, recent international data show a wide use of these drugs in paediatric population. The purpose of the study was to analyse the antidepressant prescriptions in children and adolescents in an Italian Local Health Unit (LHU) for the years 2017 to 2018.

Methods: A retrospective, observational and descriptive study was designed including patients younger than 18 years, with at least one antidepressant prescription and dispensed during 2017-2018 by the retail pharmacies of LHU considered (76.269 inhabitants aged 0 to 17 years). Analyses were stratified by age, sex, and drug type.

Results: During the study period, 132 children/adolescents (0.17% of the paediatric population), received at least one antidepressant prescription: 66 male and 66 female. Boys received a greater number of prescriptions in comparison to girls: 222 vs 98 prescriptions; 301 vs 128 medication packages. The mean age of users was 11.98 years (SD±5,20); the median age was 14 (interquartile range 7-16). A total of 320 prescriptions were dispensed, corresponding to 429 medication packages. Selective serotonin reuptake inhibitors (SSRIs) resulted the most prescribed substance class (217 prescriptions and 266 medication packages), followed by Non-selective monoamine reuptake inhibitors (65 and 116) and other antidepressants (38 and 47). Sertraline was the substance most frequently prescribed (87 prescriptions and 109 medication packages).

Conclusion: Our analyses reveal a predominant use of SSRIs, especially among adolescents. However, the results suggest a lack of approved drugs for the treatment of depression in children/adolescents rather than an inappropriate prescription.

PV1

Measurement of Health Outcomes associated with National Level Medicines Usage in Ireland [#9]

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Background: Public discourse on medicine provision predominantly focuses on overall expenditure. However, current literature suggests measurement of alternative indicators can provide a method to benchmark or ameliorate medicine provision. Previous research has investigated the viability of using health outcome metrics such as number of patients treated, quality adjusted life year (QALY) gain and life year gain (LYG) to provide macro level estimates on medicines' societal contributions. The research objective was to calculate macro level estimates associated with medicines' utilisation using various health outcome metrics.

Methods: A feasibility analysis using a selection of medicines from the Pfizer product portfolio. Volume of medicines, supplied through the Irish healthcare system in 2017 using IQVIA data, were used to derive estimates of the number of patients treated. Patient number estimates were subsequently paired with LYG and QALY values associated with the treatment of the primary indication for each medicine. Cost-effectiveness models published in accessible economic evaluations and health technology assessment reports, provided the QALY and LYG input data.

Results: Twenty-nine medicines were analysed across multiple disease areas and were utilised by an estimated 508,242 patients. This resulted in an estimated overall increase QALY gain of 21,538 within the Irish healthcare system. LYG gain was more challenging to measure, as these data were not generally available.

Conclusion: Although medicines do require significant investment, they generate substantial clinical benefits which are shared amongst a wide proportion of the population. This proof of concept assessment required assumptions to be made regarding the duration of patient therapy and indication. Use of prescription level data would improve accuracy of the various health outcomes measured.

The burden of medicines from the patient perspective: Validating the Living with Medicines Questionnaire v3 in a Swedish population [#32]

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Background: Multimorbidity's growing prevalence brings increasing polypharmacy and treatment burden. Research into patients' experiences of concurrent use of several medicines is lacking. Furthermore, patients are rarely included as active partners in interventions targeting 'non-adherence'. The Living with Medicines Questionnaire (LMQ-3) measures patients' experiences and the effects of medicines usage in daily life. The aim is to generate a Swedish version of the LMQ-3, assess its psychometric properties and determine factors affecting medicine experience in Sweden.

Methods: The LMQ-3 will be translated into Swedish, back-translated into English and then the original and back-translated English versions compared. Face validity will be evaluated through cognitive interviews in ten patients of diverse demographic backgrounds using ≥4 prescription medicines. Thereafter, the Swedish LMQ-3 will be validated in 1000 general population adults using ≥4 long-term (≥6 months) prescription medicines. Data will be analysed by confirmatory factor analysis.

Results: This project is ongoing. To date the initial Swedish translation, English back-translation and adjusted Swedish version are complete. Cognitive interviews are to be completed in October 2019 and validation data collection by April 2020. Data analysis to be completed by June 2020.

Conclusion: The project will provide a validated Swedish version of the LMQ-3 questionnaire that can be used to measure the burden of medicines in adult patients currently undergoing polypharmacy treatment in the Swedish general population. The results of this study will provide a person-centred outcome measure in medicines taking and can therefore be used in future intervention studies to improve medicines taking using a person-centred approach.

EUPRON - Nurses' practices in interprofessional pharmaceutical care in Europe: A cross-sectional survey in 17 countries [#53]

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Background: Nurses' role in interprofessional pharmaceutical care (PC) is not transparent and varies between European countries. The lack of transparency and recognition in nursing practice, together with the variation between countries, has a major impact. Interprofessional collaboration in clinical practice, transnational collaboration in research in Europe and labour mobility of nurses are hindered.

Methods: A cross-sectional survey questioned pharmacists, physicians and nurses with an active role in PC on: nurses' involvement in PC, experiences in interprofessional collaboration and communication, and their views on nurses' competences.

Results: A total of 4888 nurses, 974 physicians and 857 pharmacists from 17 European countries responded. Providing patient education and information (PEI), monitoring medicines adherence (MMA), monitoring adverse/therapeutic effects (MAT) and prescribing medicines were reported to be integral to nursing practice by 78%, 73%, 69% and 15% of nurses respectively. Most respondents were convinced that quality of PC would be improved by increased nursing involvement in MAT (95%), MMA (95%), PEI (91%) and prescribing (53%). Mean scores for the reported quality of collaboration between nurses and physicians, collaboration between nurses and pharmacists and interprofessional communication were respectively <7/10, £4/10, <6/10 for all four aspects of PC.

Conclusion: MAT, MMA, PEI and prescribing are part of nurses' activities, but most healthcare professionals perceived their involvement should be extended. Collaboration between nurses and physicians on PC is limited and between nurses and pharmacists even more.

Trends in paracetamol use: a questionnaire pilot study [#66]

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Background: Utilization data on paracetamol, one of the most commonly used over-the-counter medicine worldwide, is scarce in Romania. Therefore, this study aims to test a patient questionnaire that evaluates the patterns of paracetamol use.

Methods: A prospective cross-sectional pilot study was conducted using questionnaires distributed in community pharmacies in Cluj-Napoca. The questions addressed were socio-demographic characteristics of patients, paracetamol use and knowledge about the associated risks.

Results: A total of 67 questionnaires were included, 42 being filled by women (62.6%). The median age of the respondents was 35 (range: 20-79) and most patients were urban residents (65,6%). Patients reported paracetamol products use, 92,5% purchasing them without medical prescription. The main indication for paracetamol use was pain (76,1%), mostly headache (70,1%), followed by cold and flu (71,6%). The main reasons for use were efficacy (68,6%) and tolerability (41,7%). 61,1% of patients always had paracetamol at home and 46,2% used it monthly, 13,4% weekly and 1 patient daily. Two patients reported use of more than 2g at one administration and 1 patient more than 5g /day. If not effective, around half of patients associated other medicines (50,7%) or consulted a pharmacist/physician (47,7%). Hepatic risk of paracetamol was known to 31,3% of patients, while 47,7% reported not knowing the risks. When associating other products, only 37,3% reportedly verified the content in paracetamol.

Conclusion: Patients reported use of over-the-counter paracetamol, mainly for pain relief. Even if it's mainly well-tolerated, paracetamol presents associated risks that are unknown to almost half of patients.

Knowledge, attitudes and practices of healthcare professionals towards adverse drug reaction reporting among public sector primary healthcare facilities in a South African district [#73]

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Background: Adverse drug reactions (ADRs) have an appreciable impact. However, little is known about ADR reporting in ambulatory care especially in low and middle income countries. Consequently, the aim was to determine knowledge, attitudes and practices (KAP) among health care professionals (HCPs) towards ADR reporting in primary health care (PHC) facilities in South Africa. The findings to direct future activities.

Methods: Descriptive, cross-sectional design using a quantitative methodology among 8 public sector Community Health Care (CHC) centres and 40 PHC facilities in the Tshwane District, Gauteng Province. A self-administered questionnaire was distributed to 218 HCPs including medical practitioners, professional nurses, pharmacists and post-basic pharmacist assistants.

Results: 200 responded (response rate of 91.7%). Although an appropriate attitude for ADR reporting existed, actual frequency of ADR reporting was low (16.0%). Nearly two thirds (60.5%) of respondents did not know how to report, where to report, or when to report an ADR and 51.5% said that their level of clinical knowledge made it difficult to decide whether or not an ADR had occurred. Over 97% stated they should be reporting ADRs with 89% feeling that ADR reporting is a professional obligation and over 70% that ADR reporting should be compulsory. When results were combined, the overall mean score in terms of positive or preferred practices for ADR reporting was 24.6% with pharmacists having the highest scores.

Conclusion: Under-reporting of ADRs with gaps in KAP were evident. There is an urgent need for education and training of HCPs on ADRs in South Africa.

Bayesian Hierarchical Approaches for Multiple Outcomes in Routinely Collected Healthcare Data [#80]

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Background: Routinely collected healthcare data provides a rich environment for the investigation of drug performance in the general population, while also offering the possibility of assessing rare outcomes. The statistical analysis of this data poses a number of challenges. The data may be biased and lack the structure and balance provided by the drugs' clinical trials. Outcomes are often modelled individually with an associated lack of control for multiple comparisons, as well as a difficulty in assessing multiple risks.

Methods: Bayesian models provide methods for analysing multiple clinical outcomes, using relationships between outcomes and handling the types of multiple comparison issues which may occur when using multiple single-variate approaches. Lack of balance within the data may be catered for by dividing the population into clusters with similar characteristics, allowing within cluster inferences to be made. A Bayesian hierarchical model for multiple outcomes is proposed and applied to data from a safety and effectiveness study of direct oral anticoagulants (DOACs) in Scotland 2009 – 2015.

Results: The Bayesian modelling results were comparable to the results from the original safety and effectiveness study, with the additional benefit of balancing patient clusters and controlling for relationships in the data.

Conclusion: Bayesian hierarchical models are a suitable approach for modelling routinely collected healthcare data. There is the possibility of moving to an integrated Bayesian approach, with the inclusion of treatment relationships; uncertainty regarding cluster membership; and treatment allocation in the model, eventually leading to more reliable treatment decisions.

Is it time to assign DDDs for oral antineoplastic drugs? Consumption of oral anticancer drugs in Norway compared by different units of measurements [#96]

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Background: Antineoplastic agents have not been assigned DDDs, mainly due to highly inter-individual variation in dosages. Recently, many new oral anticancer drugs have been introduced to the market, often with standardized treatment doses. They have improved the quality of life and increased survival in several patient populations that earlier did not have a safe treatment option. The only way to measure the consumption of these drugs is currently to count packs, tablets, number of grams, or measure costs. The aim of this study is to describe the consumption of oral protein kinase inhibitors (PKIs), ATC group L01XE, in Norway in the period 2002-2018.

Methods: We collected data on weight, packs and tablets from the Norwegian Wholesales database that includes overall sales data (to primary care and institutions). We grouped the oral anticancer drugs according to mechanism of action and calculated grams of active substance as a surrogate for DDDs.

Results: The use of PKIs (measured in grams) in Norway have increased 30 times from 2002 to 2018. Total sales data indicates that five substances (Imatinib, Ibrutinib, Nilotinib, Pazopanib, Nintedanib) accounts for 70% of all PKIs used in Norway in 2018. In number of packages they accounted for 39%, in number of tablets/capsules 45% and by cost 32%.

Conclusions: Using different units of measurements for anticancer drugs will hamper the quality of drug utilization studies by giving variable consumption results. Assigning DDDs to oral anticancer drugs will be a major improvement for drug utilization of anticancer drugs.

Utilization of drugs for obstructive airway diseases in Hungary between 2008 and 2018 [#120]

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Background: The prevalence of asthma and chronic obstructive pulmonary disease have considerably grown in Hungary during the past decade. Our aim was to analyze the utilization of medicines used for the treatment of obstructive airway diseases (asthma and chronic obstructive pulmonary disease) and their financial burden between 2008 and 2018.

Methods: Data was collected from the National Health Insurance Fund of Hungary containing the reimbursed medication use of the entire population. Data was analyzed using the WHO's ATC/DDD system and expressed in Defined Daily Dose per 1000 inhabitant per day (DDD/TID).

Results: The total use of drugs for chronic obstructive airway disease (ATC: R03) increased from 33.27 DDD/TID in 2008 to 42.30 DDD/TID in 2018. In 2008 the most frequently used medicines were the xanthines with 9.96 DDD/TID, and by the end of the study period their consumption decreased by 29% to 7.08 DDD/TID. In 2018 the most popular drug group was inhaled corticosteroids in combination with long acting beta2-agonists which use rose by 56% from 6.41 DDD/TID in 2008 to 9.98 DDD/TID in 2018. During the study period the total drug expenditure showed a 36% increase reaching 95.1 million Euro in 2018.

Conclusions: As the prevalence of chronic obstructive pulmonary diseases increased the utilization of drugs used for their treatment increased as well. The utilization of preparations containing combination of inhalation medications showed the highest increase during the study period.

Cross regional comparison of proton pump inhibitors use in Portugal [#137]

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Background: According to OECD data, Portugal is one of the countries that most use medicines for peptic ulcer and gastro-oesophageal reflux disease (GORD; ATC A02B), a classification group including proton pump inhibitors (PPI). A cross-regional comparison was performed on PPI use in Portugal to explore and compare the scale and pattern of PPI use within the country.

Methods: Ambulatory care PPI (ATC: A02BC) was retrieved from national databases for year 2018. The main outcome measure was defined daily doses (DDD) per 1000 inhabitants per day (DID) and was further stratified by the 18 mainland regions.

Results: In 2018, 8.8% of the population living in Portugal mainland (on average) used one PPI per day (88 DID). Guarda was the region with the highest average consumption (124 DID).

No significant differences were observed in the pattern of active substance distribution at regional level. In 2018, the two most commonly used active substances in all regions were Omeprazole and Pantoprazole, which also correspond to the active substances with the lowest monthly cost of treatment for patients.

Conclusions: There are significant regional asymmetries in the level of consumption of these medicines, ranging from 70.3 DID to 124.8 DID (the mainland average is 88.0 DID). However, the pattern of use is similar in all the regions.

Most of the PPI prescription complies with the guidelines of the General Health Directorate regarding the selection of these medicines (since there is no clinical evidence of superiority among PPIs at equivalent doses, the selection criteria should be their lowest cost).

Capacity Building Electronic Survey in Pharmacoepidemiology and Drug Utilization for the Latin American Region [#146]

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Background: A Capacity Building Electronic Survey (CBES) in Pharmacoepidemiology and Drug Utilization for the Latin American (LatAm) region was developed to identify current status, needs, gaps and priorities in pharmacoepidemiology and drug utilization to support capacity building. The objectives was to describe results from the CBES conducted in the LatAm region between June and July 2019.

Methods: The Potter systemic capacity building model was used. Two questionnaires were developed: 1. Screening questionnaire to identify target population, 2. In-depth questionnaire, and they were translated from English to Spanish, French and Portuguese, and validated by a second set of translators. An online survey builder was used and received IRB approval.

Results: After survey pilot testing, electronic invitations were distributed to decision makers. Twenty-six surveys were responded from Brazil (N=18), Mexico (N=6), Belize (N=1) and Honduras (N=1). 92% reported the existence of databases, 54% are available electronically, and only 49% of responders have access to their databases. There was limited information available for medications in their databases, and 65% of responders carry out drug use surveys to complement the information. 42% of responders identified drug utilization as a focus of research in their institutions. Only 54% of drug utilization studies are published. 61% have processes to assess the quality of their products and 25% reported results.

Conclusion: Administrative databases are available in Latin America but there is limited information available for medications. Drug utilization research is an important focus for Latin American decision makers. Drug utilization research need more development in the Latin American region.

A Modified Chronic Disease Score based on drug prescriptions recorded in the administrative databases [#158]

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Background: Identifying the morbidity of a population is strategic for health systems to improve healthcare. In recent years administrative databases have been increasingly used to predict health outcomes. The aim of this study was to update the Chronic Disease Score (CDS), proposed by Von Korff in 1992, using drug prescriptions to predict 1-year mortality.

Methods: The modified CDS (M-CDS) was developed using 35 variables (from drug prescriptions within two-year before baseline) as one-year mortality predictors of Bologna residents aged ≥50 years. The population was split into training and testing sets for internal validation. Score weights were estimated in the training population using Cox regression model with LASSO procedure for variables selection. The external validation was carried out on the Imola population. The predictive ability of M-CDS was assessed using ROC analysis and compared with that of the Multisource Comorbidity Score (MCS), developed by Corrao et al. (2017).

Results: The predictive ability of M-CDS was similar in the training and testing sets (AUC 95% CI: training [0.763-0.776] vs. testing [0.750-0.765]) and in the external population (AUC 95% CI: Bologna [0.759-0.768] vs. Imola [0.750-0.777]). Using ROC analysis, no significant difference was found between M-CDS (AUC: 0.763, 95% CI [0.759-0.768]) and MCS (AUC: 0.771, 95% CI [0.766-0.777]).

Conclusions: M-CDS can be used as a population risk stratification tool and for risk-adjustment in association studies as well as to predict the individual risk of death. Using only pharmaceutical prescription data does not reduce the predictive performance of the score.

Consumption of psychoactive medicines in disasters: A study in Minas Gerais, Brazil [165]

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Background: In disasters, which are increasing in frequency and intensity, health care is especially challenged, including provision of products and services. Drug utilization is an essential aspect to be studied and post-disaster use of psychoactive medicines is deemed especially important. Brazil underwent a mine tailing disaster in 2015, with contamination of soil and water, loss of life and property. This study aimed to analyze consumption of psychoactive medicines in municipalities directly affected by the Fundão dam disaster.

Methods: Thirteen affected municipalities bathed by the Doce River were identified. Monthly consumption data from the National Controlled Substances Management System (SNGPC), at the National Health Surveillance Agency (Anvisa) were obtained on 12 psychoactive medicines, from January 2014 to December 2017, for each municipality. Consumption was expressed as number of DDD /1000.000 inhabitants per day. Minas Gerais State consumption data was used as baseline.

Results: Immediately after the event a decrease in consumption was observed for all medicines. Starting three to four months after the disaster, we observed an increasing trend in psychoactive consumption, more pronounced, for amitriptyline and clonazepam in specific municipalities. In smaller municipalities changes in consumption trends were more evident.

Conclusions: Disasters may lead to increase in use for different medicines, depending on the post-disaster phase. Psychoactive medicines, for treatment of trauma or consequences of bereavement, are a focus for DUR. We aim to provide groundbreaking information on drug utilization in disasters and contribute to risk reduction strategies in disaster preparedness.

SF1

Which medications are really associated with geriatric syndromes? A pharmacovigilance study [#7]

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Background: Drugs could contribute to geriatric syndromes (GSs), defined as common and multifactorial clinical conditions associated to adverse health outcomes in older adults. A list of medications associated with geriatric syndromes (MAGS) based on both a literature review and an expert panel opinion has been proposed. We investigated the relationship between two high-incidence GSs: falls and delirium and MAGS using a pharmacovigilance database.

Methods: All cases aged ≥65 years logged in the French pharmacovigilance network from 01/01/2016 to 31/12/2016 were analyzed. The following MedDRA “preferred terms” were used: “fall” and “delirium, confusional state, disorientation, post-injection delirium sedation syndrome”. All drugs were coded from the MAGS list and the proportion of reported drugs classified in the MAGS list was estimated for each GS. For non-classified drugs, literature resources were consulted to identify any possible involvement.

Results: Among 265 fall notifications, 678 drugs were reported: 468 (69.0%) were classified in the MAGS list. Among non-classified drugs, proton pump inhibitors (PPI), thiazides and low-ceiling diuretics could be involved in falls. Among 518 delirium notifications, 1561 drugs were reported: 159 (10.0%) were classified in the MAGS list (various drugs for nervous disorders and anticholinergics for obstructive airway diseases). Among non-classified drugs, PPI, serotonin reuptake inhibitors, DDP-4 inhibitors, fluoroquinolones and ACE inhibitors could be involved in delirium.

Conclusion: Based on a nationwide pharmacovigilance study, we showed that the MAGS list is unequally complete according to the geriatric syndrome considered. The MAGS list completeness is necessary as a reference to help preventing GS occurrence.

Determining nationwide benzodiazepines prescribing pattern as a first step to guide rational pharmacotherapy [#46]

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Background: Benzodiazepines are psychoactive drugs used to treat a range of conditions. If used properly they are considered safe, however, there are concerning reports of their extensive overuse worldwide. In Croatia, diazepam and alprazolam are continuously among first ten most used medicines, with continuously increasing DDD/TID (defined daily dose/1000 inhabitants). The aim of our study was to obtain a detailed benzodiazepine-prescribing pattern in Croatia in order to support effective decision-making that will ensure rational prescribing, better health outcomes and reduced cost for healthcare system.

Methods: all electronic prescriptions for medicines with ATC class N05BA prescribed and issued in Croatia in 3-years period (1.1.2015-31.12.2017) were extracted from the national health database. SQL queries were used in order to filter and group data as well as to calculate values.

Results: In a 3-year period, there were 13.848.802 prescriptions for benzodiazepines for 1.237.635 individual patients. Number of prescriptions per patient ranged from 1 to 575 (median 11.2). The most prescribed benzodiazepine is diazepam (44% of all prescriptions). 787.152 patients were female and the sex difference was more pronounced in older age groups. The oldest patient was born in 1909. and the youngest in 2017. The most common indication was Generalized anxiety disorder (2531201, 18.3%) followed by Major depressive disorder (1136397, 8.21%).

Conclusion: The preliminary results reliably characterize the extent of the problem with benzodiazepine overuse in Croatia. Reliable data on drug prescribing pattern as well as details on patients and prescribers characteristic can help focus regulatory actions and consequently improve patient safety.

SF3

Adverse drug reactions in HIV-infected patients registered at four sentinel sites in South Africa [#71]

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Background: HIV and TB are common infections in sub-Saharan Africa. Due to HIV's suppression of the immune system, infected patients are prone to opportunistic infections. Co-treatment of HIV and TB places patients at risk of adverse drug reactions (ADRs) and drug interactions. This study aimed to determine the incidence and risk factors for ADRs in HIV-infected patients and those co-infected with TB.

Methods: Data from patients (aged >15 years) enrolled on the Medunsa National Pharmacovigilance Centre's database from March 2007 to May 2017 were analysed. Censoring targeted the first incident of ADRs in HIV-TB co-infected patients and those not co-infected. A Cox-proportional hazard model was used to determine associations of dependant variables and identify predictors for developing ADRs.

Results: 3608 HIV-infected patients were included. 12% (n=437) had HIV-TB co-infection. Overall prevalence of ADRs was 31% (n=1 131). Of these, 12% were experienced by patients with HIV and TB co-infection and 885 by patients with no co-infection. Higher rates of ADRs were found to be significantly associated with patients initiated on stavudine (aHR=9.4; 95% CI 7.4-12.1; p<0.001) and non-standardised regimens (aHR=6.6; 95% CI 4.5-9.8; p<0.001). Peripheral neuropathy and skin rash were the most common ADRs. Patients initiated on a CD4+ count <350 cells/mm³ (aHR=1.3; 95% CI 1.1-1.4, p<0.001) and cigarette smokers (aHR=1.4; 95% CI 1.1-1.7, p=0.015) were at higher risk of developing ADRs.

Conclusion: Overall, results suggested a modest incidence of ADRs amongst HIV- and TB co-infected, with no significant association between ADRs and TB-coinfection. A pharmacovigilance surveillance system remains essential.

SF4

Gender differences in triptan utilization in Tuscany, Italy [#105]

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Background: The aim of this study was to describe triptan utilization by gender in Tuscany in 2017.

Methods: The population-based regional administrative database of Tuscany was used. Prevalent triptan users (PU) were subjects with ≥ 1 dispensing during 2017. New users (NU) were subjects with no dispensing before 2017. Prevalence and incidence of use by age classes were observed. Utilization patterns were categorized as: sporadic (1 dispensing), occasional (≥ 1 dispensing with >3 months between two dispensings), regular (≥ 1 dispensing with ≤ 3 months between two dispensings), and overuse (>20 posologic units per month for >3 consecutive months). Users with prior acute vasoconstrictive cardiovascular events (AVCVE) were identified. Analyses were stratified by gender.

Results: PU were 19509, 6162 were NU (32%). Female-to-male ratio was 3,7:1 in PU and 3:1 in NU. The peak of prevalence of use was in the age-band 45-54 (women=17x1000inhabitants; men=4x1000inhabitants). The peak of incidence of use was in the age-band 35-44 (women=4.9x1000inhabitants; men=1.4x1000inhabitants). Elderly users were 11% of PU and of NU. Among NU, those with previous AVCVE were 5.5% in men and 2.1% in women, sporadic users were 67% and 64%, regular users were 28% and 21% of women and men, respectively. Overusers were 0,1% of NU of both genders while among PU they accounted for 1.5% and 2.1% of women and men, respectively.

Conclusion: Incidence and prevalence of triptan use reflected gender differences in migraine epidemiology. In order to minimize medication risk, elderly users, overusers and subjects with previous AVCVE should be properly informed and monitored.

Mortal intracranial haemorrhages detection secondary to oral anticoagulants [#117]

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Background: Intracranial haemorrhagic events associated to the use of oral anticoagulants are a major public health problem due to their impact in terms of morbimortality, sequels and economic cost.

Methods: Retrospective study in a tertiary hospital during 2018. Cases were identified by using a diagnosis identification tool (SAP Bussiness Objects), and were reviewed by two investigators to detect the presence of oral anticoagulants. Patient, drug and event data of the selected cases was obtained.

Results: 50 mortal cases of intracranial haemorrhage were identified, 14 of them were related to oral anticoagulant: 9 to acenocumarol and 5 to direct action anticoagulants (dabigatrán n=2, rivaroxaban n=2 and apixaban n=1). Their main indication was non-valvular atrial fibrillation. Patients' mean age was 87 (SD: 6): no differences in age, sex or type of anticoagulant were found. Most frequent comorbidities were arterial hypertension, atrial fibrillation and dyslipidemia. Drug mean was 9 (SD: 3). A drug-drug interaction was found in six cases out of 14. 12/14 cases had a contributive factor (cranial trauma most frequently). All patients were admitted (mean days: 5.2, higher in acenocumarol users), with total cost of 127.206,5€ (9.086,2€/patient).

Conclusion: Intracranial haemorrhages are an important cause of mortality. These cases involved elderly patients with plurypathology and polymedication, and in almost half of them a drug interaction was found.

SF6

The indication and characteristics of proton pump inhibitor use [#130]

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Background: In the last decade the use of proton pump inhibitors (PPI) has increased significantly worldwide, while accumulating evidence proves the negative consequences of their long-term use. The aim of this field study was to analyze the frequency of PPI use among hospitalized patients, to assess its duration and indication.

Methods: An anonymous questionnaire survey (mini-interview) was conducted at the vascular surgery department of our University Clinic at 12 different study days during 2017/2018. PPI users were identified from the medication chart.

Results: Out of the 146 inpatients 65 patients (44.5%) were a PPI user and most of them were on pantoprazole treatment (51 patients). In 53 patients (81.5%) the GP initiated the PPI treatment, in one case it was initiated in the hospital after admission. Sixty-two patients (95.4% of PPI users) have been taking PPI for at least 1 year, and 14 of them (21.5 %) for at least 5 years, without any de-prescribing attempt. Every third patient used a PPI dose higher than the WHO DDD. Gastrointestinal ulcer or reflux disease (GERD) was in the anamnesis of only 9 patients. Twenty patients (30.8%) were on dual antiplatelet therapy (ASA+clopidogrel). The majority (52 patients; 80.0%) claimed that PPI therapy was prescribed as "gastrointestinal protective" agent, in almost all case (in 98%) for at least 1 year.

Conclusion: The prevalence of PPI use among hospitalized patients were high. Majority of patients used PPI for preventive purposes, for a long period.

Characteristics of Epilepsy Therapy – A Questionnaire Based Study [#143]

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Background: The burden of epilepsy disorders is high, as it affects ~40 million people worldwide. The mainstay of therapy is the use of antiepileptic drugs (AED), with expanded armamentarium in the last decades. The aim of this study was to assess AED use in patients with epilepsy: focusing on treatment changes, reasons behind and experienced adverse effects. Perceived stigma were also surveyed.

Methods: This was a questionnaire based survey. Anonymous patient interviews were conducted at two ambulatory care clinics in Szeged and Szolnok, in year 2017. With identical content, an online version of the questionnaire was also developed and distributed via facebook groups of Hungarian epilepsy patients. Stigmatisation questions was evaluated on a metric scale (maximum stigmatisation equaling 20 points).

Results: In total, 81 patients (100%) were enrolled (interview: 36 patients, online questionnaire: 45 patients). The mean age of patients was 42.1±16.1 years. Majority of patients were on AED monotherapy (n=44), most frequently with carbamazepine, while 20% were prescribed dual and 17 % multi AED therapy, respectively. Treatment changes has been done in almost all patients (78 patients, 96%), most frequently (46 %, n=37) due to therapy failure or adverse-effects (31%, n=25). Nearly 40% of patients (n=31) were not aware of the reason of treatment changes. More than half of patients (42 patients, 51.9%) experienced adverse effect during AED use, most frequently increased weight, sedation/tiredness and memory problems. On average epilepsy patients scored 10.3±4.4 points on the stigmatisation scale.

Conclusion: Data proves the difficulties of AED treatment and high psychological burden.

Off-label use of rituximab in patients with glomerulonephritis in a tertiary hospital [#162]

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Background: Rituximab (RTX) is often prescribed off-label for the treatment of patients with resistant glomerulonephritis (GN). The aim of this study is to evaluate its off-label use in GN in order to assess effectiveness and tolerability. The characteristics of patients, previous, concomitant, and subsequent medications are also assessed.

Methods: A retrospective study of requests of off-label use of RTX received at the Pharmacy Service of a tertiary hospital between 2013-2015, was performed. Patients were followed-up until Dec-2018. Each patient could have more than one request. Information was obtained from medical records. Remission was classified as complete (CR), partial (PR) or no response (NR) according to the KDIGO criteria.

Results: A total of 56 requests for 34 patients were received. Median age was 55 (IQR 48-70) years and 12 (35.3%) were women. Median follow-up was 57 (IQR 51-67) months. Most frequent GN was Membranous GN (MGN) and CR or PR was achieved in 80.6% of administrations. Tacrolimus was the most common concomitant and post-RTX treatment. Most Membranoproliferative GN (MPGN) were related to hepatitis C virus and type-II cryoglobulinemia and most had NR. All Minimal-change disease were idiopathic, and most had a CR (44.4%) or PR (33.3%). There were 2 requests for focal-segmental glomerulosclerosis. Seven patients (20.6%) had an adverse event (AE): 5 infusion-related reactions, 1 serum sickness and 1 acute myocardial infarction.

Conclusion: Idiopathic MGN was the most common indication for off-label RTX among GN, achieving CR or PR in most administrations. Infusion-related reactions were the most common AE.

Role of clinical pharmacists in the risk assessment of healthcare associated infections (HAI) in a surgical unit [#178]

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Background: The development of risk assessment process to monitor this rate is an essential first step to identify local problems and priorities, and evaluate the effectiveness of infection control activity.

Methods: The annexes 2. and 3. of the decree (20/2009. (VI.18.) EüM decree, Budapest 2009.) have been adapted to eMedsol computer system. The risk assessment forms are completed by clinical pharmacists. The completed data sheets are displayed in the eMedsol system as a part of the patient's examinations, e.g.: blood tests. The risk assessment forms were filled over an 8-week period, from 9 September to 8 November 2019 at the Department of Vascular Surgery.

Results: We have completed the risk assessment for 109 patients. 51 patients were in high and 38 patients were at medium risk for nosocomial infections. 48 patients were in medium and 41 patients were at high risk for multiresistant microbial infections. Most of the patients were elderly (> 65 years old), and have more comorbidities, such as diabetes or obesity. Furthermore, in their anamnesis they had hospitalization within the past year, which contributes to the high risk of nosocomial infections.

Conclusion: Overuse of antibiotics and PPI could be responsible for the high risk of multiresistant microbial infections. In both cases, inappropriate and prolonged use of devices, such as CVCs, urinary catheters, which are also monitored by the questionnaires, may cause high risk. The ultimate aim is the reduction of nosocomial infections, antibiotics and proton pump inhibitors (PPI) overuse.

SF10

Norwegian stakeholders' definitions of medicines shortage [#187]

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Background: Problems with shortages of certain pharmaceuticals are increasing globally and causing international and regional health care concerns. Norway is relatively vulnerable to drug shortages due to limited local production, small market and emphasis on low prices. Medicines shortages can have serious consequences for patients, even result in deaths. Resource use on problem-solving can be a huge burden on stakeholders involved in the supply chain. Regulators on the Norwegian market have not presented an official definition of medicines shortages, apart from a vague definition in one report. This begs the question of what media are talking about, when writing about shortages of pharmaceuticals. We set out to map how the word is used in media coverage and documents written by stakeholders.

Methods: A qualitative document analysis was undertaken, of texts available in the Retriever archive. In addition, open ended questions were emailed to five stakeholders, for clarification and validation. The analysis approach was Systematic Text Condensation.

Results: Six main themes were found: causes, management, impact, controversies, severity, and implicit definitions. Media coverage is largely negative. Interruptions in supply, insufficient stock, delivery problems and availability of alternatives all appeared. Stakeholders' statements were largely based on the shortage list on the Norwegian Medicines Agency's website. Answers to the emailed questions confirmed the results from the text analysis and elucidated important controversies regarding the definition.

Conclusion: There is a wide variety in what stakeholders are talking about when using the term medicines shortages. A uniform definition could facilitate management and communication between stakeholders.

SF11

Improving safety of drug administration for neonates [#194]

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Background:

The use of drugs for neonates are limited because the lack of licensed medicines. New regulations were applied by the FDA and the EMA to urge clinical studies but only slight recommendations appeared. Lacking the appropriate medicines off-label use and compounding is the only available tool but without precise information it could be risky. The pharmacist has an important role in extemporaneous preparation and patient safety.

Methods:

We created a survey about neonatal medication methods in Hungary to assess the current situation. We searched the market for drugs without possible harmful excipients. For neonates oral liquid forms (e.g. suspensions) are better to use. We searched the literature for different suspension vehicles to make our medicines uniform. Upon finding the optimal solution official permission was needed from the authorities. Finally we have created a database in collaboration with the Neonatal Intensive Care Unit.

Results:

Every NICU lacks an integrated guideline for neonatal medication. However the market is full of generics only a few is acceptable for neonates. Factory-made suspension vehicle powders for reconstitution are available in many European countries. Among all Syrspend® found to be the optimal solution. Currently the admission is under investigation by the authorities. The database is constantly updated and filled. As soon as we get the permission we will complete datas with the formulation instructions and storage.

Conclusion:

Licensed drugs for neonates are still not really available. NICU-pharmacy collaboration is needed for a better and safer medication of the neonates.

Disposal of unused drugs around the world systematic review [#203]

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Background:

The global increase in the use of pharmaceuticals has led to an enhanced international awareness of potential detrimental environmental effects of disposal of medicines from households via unfavorable routes such as the sink, toilet or rubbish bin. The purpose of this systematic review was to determine the practice of medication disposal from households around the world and get insight into possible association between environmental awareness and people's behavior regarding this issue.

Methods:

A literature search (2005–2015) was performed to identify reports with quantitative data on disposal practices published in peer-reviewed literature.

Results:

Search yielded 830 results, after checking the titles and 223 abstracts, 40 articles assessed in full text; 28 were included in the review. The most common disposal method reported for unused household medications is disposal in the household garbage. The practice of flushing drugs into the sewage system is common in New Zealand and US. Only in Sweden and Germany, drugs are returned to a pharmacy to a larger extent. Lack of the adequate information and clear instructions on proper manners of drug disposal are reported in many surveyed countries. Clear and definite connection between knowledge about environmental detrimental effects of improper drug disposal and the preference towards disposal methods cannot be established. Many respondents were generally concerned with the issues of inadequate medicines discarding but the behavior regarding disposal of unused drugs often did not equate the awareness.

Conclusions:

Current data emphasizes the global issue of improper medicine disposal from households, prevalent in environmentally-aware people.

SF13

The health economic analysis of the falsified medicine directive [#204]

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Background: With the increasing globalization of the pharmaceutical supply chain there is a greater risk of falsification and substandard product penetration. Consequently, regulations focusing on the whole supply chain were adapted and are in implementation. However, their costs and benefit has not been yet evaluated thoroughly. Our aim was to collect data available regarding the financial impact of the FMD including hospital pharmacy costs.

Methods: After a literature search and interview with hospital pharmacy experts we identified cost components and developed a 41 item questionnaire for the evaluation of implementation costs (human resource requirements, infrastructural and IT developments) in the Hungarian hospitals. The survey was sent out to 96 hospital pharmacies in September 2019.

Results: It was estimated by the European Commission that the annualized cost for a hospital pharmacy will be 750 €. In the benefit arm it was believed that the total 950 million € direct and indirect costs associated with the counterfeit medicines can be prevented with the implementation of FMD. Our representative survey (n=43, 44,8%) showed that the implementation process required 0,25 pharmacist and 0,75 technician full-time-equivalent/institution. The average infrastructural and IT development costs were 1 868 €.

Conclusion: Our results illustrate that just the infrastructural and IT development costs for the implementation and stabilization period of FMD for Hungarian hospitals exceeds (2,3 times) the previous estimations. Therefore, the authors believe that our methodology should be adapted to other EU countries to collect real world data and re-evaluate previous cost-benefit analysis of FMD.

SF14

Analysis of antidepressant use in two Italian cities: a multidatabase pharmacoutilization study [#135]

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Background: Tuscany is the Italian region where use of antidepressants (AD) is highest. This study aims to analyze patterns of AD use in the urban areas of two nearby cities: Florence, in Tuscany, and Bologna, in a different region.

Methods: Individuals starting a treatment with ADs in Bologna and Florence between 2009 and 2013 were included. Demographic and clinical characteristics were retrieved in the previous 5 years. We analyzed ADs patterns of use in 5 years in patients with at least 5 years of observation time.

Results: During the observed period 219,393 individuals received a first AD dispensing: 70,108 in Bologna and 149,285 in Florence. The majority were female (62%), and aged between 65 and 84 years (35%), with no difference between the two areas. Among the 178,633 individuals with enough follow-up, 38% were treated for 1 trimester only; 12% had repeated short cycles (shorter than 1 trimester); 14% had at least one cycle of 2 or 3 trimesters; 11% had longer cycles during the first two years and then discontinued; 21% had long cycles (between 8 and 19 trimesters), possibly with interruptions; and 4% were continuously treated for 5 years. These patterns were equally distributed among the two areas.

Conclusion: Patterns of AD use in 5 years were similar across Bologna and Florence. Further analysis will investigate reasons underlying the different prevalence of use.

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