were clearly judged favourable or unfavourable. In decisions where the evidence was rated uncertain or was not assessed, we found that the number of stakeholders participating in the voting stage (odds ratio=2.52; p=0.03) and the scientific rigour in assessment of costs/cost-effectiveness (OR=6.25; p=0.06) increased the likelihood of a positive decision outcome. On the contrary, it significantly decreased for prescribed medicines (OR=0.05; p=0.003). **CONCLUSIONS:** Despite claims for making transparent and participative coverage decisions, the phase of evidence generation and synthesis is most critical for technology appraisal. Decison makers usually adapt the assessment recommendations. Decision outcomes seem to a large extent independent of how processes are configured.

PODIUM SESSION III: VACCINE RESEARCH

VA1

A EUROPEAN-WIDE STUDY ON THE ROLE OF STREPTOCOCCUS PNEUMONIAE IN COMMUNITY-ACQUIRED PNEUMONIA AMONG ADULTS: A META-ANALYSIS

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OBJECTIVES: Community-acquired pneumococcal pneumonia is an important cause of hospitalization and death among adults, but figures on the prevalence of *Streptococcus pneumoniae* largely vary. We aimed to identify the prevalence of *Streptococcus pneumoniae* by systematically reviewing all available etiological studies of adult patients with community-acquired pneumonia (CAP) over the period January 1990- November 2011 across European countries. **METHODS:** Two reviewers conducted a systematic literature search using PubMed of English-language articles on the prevalence of adult CAP caused by *S. Pneumoniae* and manually reviewed the article bibliographies. A mixed-effects meta-regression model was developed and populated with 24,236 patients obtained from 79 articles that met in- and exclusion criteria. The meta-regression was adjusted for country and region characteristics as well as other possible independent covariates. **RESULTS:** The findings from the mixed-effects meta-regression model indicate that the observed prevalence of *S. pneumoniae* in CAP significantly differs between European regions even after adjusting for various covariates including patient characteristics, diagnostic tests, antibiotic resistance and health-care setting. Performing a diagnostic PCR assay increased the probability of detecting *S. pneumoniae* substantially, compared to all other diagnostic tests included. Furthermore, *S. pneumoniae* was more likely to be confirmed as the cause of a CAP in cases treated in the ICU as compared to those treated in the hospital or in the community. **CONCLUSIONS:** This study provides estimates of the prevalence of S. Pneumoniae in CAP, independent of study design, or other risk factors, which could be used for predictions of the health and economic impact of adult pneumococcal vaccination.

VA2

CORRELATES OF PROTECTION FOR VACCINES: WHEN DOES A CORRELATE EQUAL PROTECTION?

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OBJECTIVE: A fundamental information needed to conduct economic evaluations of vaccines is effectiveness against disease. However, effectiveness is not always observed directly and relies on an immunological response that predicts protection. Typical immune responses which are predictive of protection are neutralizing antibodies, called surrogates or correlates of protection (COP). Often the COP is reduced to a threshold value that differentiates between protected and susceptible. COPs are relied on in place of estimates of effectiveness and for immunization policy, however there are no consistent criteria or statistical methods for establishing candidate immune response as predictive COP. Our aims were to review proposed hierarchies of evidence necessary to establish a COP and statistical methods used to relate immune responses to protection. **METHODS:** The strength of evidence for demonstrating a COP based on different frameworks and early and modern statistical methods approaches to establish a COP were reviewed. Findings and Recommendations: Different frameworks define different levels of confidence in COPs. The Prentice framework is significance testing-driven and requires protection to be related to vaccination, the correlate related to the vaccine and correlate related to clinical endpoint. Moreover vaccination should not add additional information on protection over that explained by the correlate. A framework by Qin proposes levels of evidence based on single or multiple randomized trials. To estimate thresholds, early vaccine studies relied on inspection of disease rates observed in discrete intervals of assay values. Modern examples employed Chang-Kohberger method, but this requires an estimate of vaccine efficacy based on occurrence of disease before it can be used. The scaled-logit model permits estimation of continuous protection curves by antibody titer. In addition to statistical criteria, other considerations include clear endpoint definition, laboratory assays, host and population factors. New statistical methods should be developed and tested within evidence frameworks to better obtain estimates of vaccine effectiveness.

VA3

HOW AGENT-BASED MODELS REVEAL THE DYNAMIC OF EPIDEMICS – A CASE STUDY ON INFLUENZA

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OBJECTIVES: Influenza is a disease that occurs every year for a few months in winter season. Predictions on vaccination strategies require a deep understanding of current influenza epidemics. The aim of this work is the reproduction of a past influenza season through a model, its examination and to make its dynamics transparent. **METHODS:** We used an agent based epidemic model to simulate the spread of influenza. It belongs to the class of dynamic transmission models and simulates single persons with individual behavior who live in an environment, meet each other and spread the virus from person to person upon contacts. Contacts are based on statistical data and social studies; epidemiological parameters are found in clinical studies and through calibration. **RESULTS:** Estimates say that about 5% of the population fall sick with influenza every year in Austria. The model shows clearly that this number is highly implausible under naive assumptions because the epidemic would not behave like this; instead it would be much stronger or die out – depending on the parameters. This reveals that our knowledge on influenza is insufficient. Three additional assumptions might solve the problem: First, that the influenza season highly depends on the seasonal climate, second, that many people are generally resistant for the whole season and third, that many people undergo infections without symptoms. Simulation of these assumptions reveal three different possible propagations of the influenza that all result in 5% sick people. **CONCLUSIONS:** The model cannot answer all questions about influenza. But it is able to show clearly where we need more information and it provides the possibility to test different assumptions and evaluate them. In other words, the model can lead to a deeper understanding of the real world by examining assumptions that could not be observed directly so far.

VA4

FOUND THE MISSING LINK? HOW TO RELATE COHORT MODELS TO OBSERVED POPULATION DATA

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OBJECTVES: Pre-launch economic models are constructed to simulate long-term changes in costs and effects. Typically Markov cohort models are used, whereas the input often available to parameterize the models is obtained from cross-sectional, annual, population data. The question is how to make the link and reconcile results from long-term cohort models with annual observed population data? An illustration is given with modelled and observed hospitalisations due to rotavirus related acute gastroenteritis. **METHODS:** The spread of hospitalisations of children up to the age of 5 years, observed over a one -year period follows a normal distribution (seasonality of the infection) with a peak around February March each year. The assessment is done by 1-year age-groups (0 to 1y; 1 to 2y; 2 to 3y; 3 to 4y; 4 to 5y). The parameters of this normal distribution are used to construct an overall modelled population density curve with the same annual spread. Within this construction the weekly spread of hospitalisations by age follows the density curve of the cohort model with an age-specific Weibull distribution. To compare the model results with the observation we analyse the age-group spread of hospitalisations but also the results following the introduction of a specific intervention such as vaccination. **RESULTS:** Pre-vaccination, the fit of the age-related spread of hospitalisations modelled using the population model to the observed data was compelling (regression-scale model fit < 0.05). Post-vaccination the modelled and observed reduction in hospitalisations matched, however in the unvaccinated older children the model predicted a lower reduction than observed which could be explained by a herd protection effect in the observed population (indirect vaccine benefit). Herd protection was not captured in the static model. **CONCLUSIONS:** It is possible to make the link between cohort models and observed population data provided the underlying model characteristics reflect reality.

RESEARCH POSTER PRESENTATIONS – SESSION I HEALTH CARE USE & POLICY STUDIES

HEALTH CARE USE & POLICY STUDIES - Consumer Role In Health Care

PHP1

INCORPORATING THE PATIENT'S VOICE INTO THE ASSESSMENT OF MEDICAL DEVICES: A COMPARISON OF THE UNITED STATES AND EUROPE

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OBJECTIVES: Medical devices (MDs) play a major role in many aspects of health care. The United States (US) and Europe (EU) categorise MDs into different classes, with greatest regulatory control imposed on the highest risk Class III devices. In the US, the Food and Drug Administration (FDA) approves Class-III MDs. In EU, the European Commission sets the regulatory framework through which 'notified bodies' confer a Confomité Européene (CE) mark for MDs. The purpose of this study was to evaluate the extent to which patient-reported outcomes (PROs) are considered in the assessment of Class-III MDs in the US and EU. **METHODS:** The Drug Approval Packages of MDs granted approval by the FDA from 2006-2011 were reviewed to identify MDs presenting PRO-related data. Ophthalmology MDs were reviewed in greater detail to explore the range of PRO constructs presented. No publically available database of EU MD approvals exists, making a parallel search impossible. Instead, clinical trial databases (e.g. ClinicalTrials.gov) were searched to identify EU-registered trials with PRO-endpoints for the ophthalmology MDs identified from the US FDA review. **RESULTS:** The FDA approved 197 MDs from 2006-2011, of which 52(26.4%) presented PRO data. PRO-claims were lowest in 2008

(15.5% approvals) and highest in 2006 (39.5%) but there was no clear trend over time. Ophthalmology MDs (6 MDs with 7 approvals) primarily focused on symptoms, vision-related functioning and satisfaction. Only two used validated PRO-instruments. In the EU, PRO endpoints were used in clinical trials for three of the six ophthalmology MDs, and included symptoms, functioning and health-related-quality-of-life. **CONCLUSIONS:** Discrepancies in the transparency of the US/EU MD-approval process render comparative research impossible. However, PROs do not appear to be widely used in the assessment of MDs, particularly in the EU. This is a missed opportunity to capture the patient-perspective on efficacy and acceptability of MDs.

PHP2

EVALUATION AND COMPARISON OF PHARMACOVIGILANCE SYSTEMS IN 70 DIFFERENT COUNTRIES FOR CONSUMER REPORTING OF ADVERSE DRUG REACTIONS

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Traditionally, the reporting of adverse drug reactions (ADRs) by health care professionals is recognized well. In the recent decades, the significance of consumer reporting of ADRs have been give due attention in the developed nations. There are documented reasons on the failure of health care professionals in reporting ADRs communicated by the patients. **OBJECTIVES:** The present study aimed to evaluate and compare the Pharmacovigilance systems in 70 different countries with regards to consumer reporting of ADRs. **METHODS:** The official websites of regulatory/medicines agencies or National Pharmacovigilance Centres of selected 70 countries, which joined the World Health Organization's (WHO) International Drug Monitoring Program between 1968 and 2010, were evaluated. **RESULTS:** In most of the countries, health care professionals are legally obliged to report ADRs to the respective medicines authorities. Only 17 countries (24.3%) accept ADR reports directly from consumers. Of them, only 4 countries (5.7%) accept consumer reports by phone and 11 countries (15.7%) have a web-based electronic system for consumer reporting. **CONCLUSIONS:** The consumers report relatively untapped suspected reactions for many prescription and non-prescription drugs. Recent literature from these countries strongly stressed the WHO's view in successful use of consumers as one of the valuable source of drug safety data. It is high time that the consumer reporting should be encouraged in all the countries, especially the developing nations, for better drug surveillance. Proper educational interventions are required to the general public towards active involvement in the respective National Pharmacovigilance Programs, which in turn improves the quality use of medicines.

PHP3

INTEGRATION OF EVIDENCE ON PATIENT PREFERENCES IN HEALTH CARE DECISION MAKING: CURRENT STATE OF PLAY

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OBJECTIVES: Despite the increasing attention for active patient participation in health care policy decisions, systematic use of the available evidence on collective patient preferences (passive patient participation) is still limited. Objective of this study is 1) explore opinions and ideas regarding the use of evidence on patient preferences in coverage decisions and clinical practice guideline (CPG); 2) describe how and what type of evidence on patient preferences is considered in health care policy decisions in 5 European countries. **METHODS:** A literature search was performed to identify opinion papers on patient preferences in the context of CPG or coverage decisions. A document search was performed on websites and databases of the responsible organisations of the Netherlands, England, Scotland, Germany and France. Furthermore, a few coverage decisions and CPG were checked on the subject. **RESULTS:** The debate on the integration of evidence on patient preferences concerns the definition and terminology of preferences, the question whether patient or public values should be used for policy-making, the different methods, quality and evidence synthesis of research on patient preferences, the relevance of including patient preferences, and the discussion on outcomes beyond the QALY. The procedures for coverage decisions do not mention the search for or use of evidence on patient preferences, nor was information found in the coverage decisions. Only in the Scottish CPG procedure a literature search on patient evidence (not necessarily patient preferences) is obligatory prior to the first meeting. In the Netherlands this is optional. Only the selected CPG from Netherlands, England and Scotland mention the use of information on patient preferences in different conceptualisations. **CONCLUSIONS:** In coverage decisions evidence on patient preferences has no formal role yet. In CPG this role is limited. Several issues and possible barriers are under debate regarding in the integration of evidence on patient preferences in health care policy decision-making.

PHP4

FINANCIAL PENALTIES FOR IMPROVING DRUG ADHERENCE

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OBJECTIVES: Drug non-adherence is associated with significant negative economic and public health burdens. The objective is to contribute to the literature on negative monetary incentives (i.e., penalties) by developing a discourse for an innovative approach that could be validated in further experimental studies. **METHODS:** A comprehensive database search (PubMed, EconLit) was conducted on economic incentive programs to enhance adherence in drug therapy. Criteria for evaluation of the retrieved economic studies have been taken from the literature. **RESULTS:** Little evidence explicitly dealing with economic incentives in the form of monetary sanctions in order to improve adherence or compliance was retrieved from the literature search. Ethics legitimate incentive-based health care designs including penalties if elements such as the standard of knowledge, social awareness, and individual responsibility are well addressed and outweigh any profit orientation. Transaction costs remain the main barrier in both institutional implementation and practical enforcement of contractual monitoring and settlement of penalties. Hence, a multifaceted approach would be necessary to present a sustainable concept fulfilling the aspects of equal access to health care, social equity, and economic viability. **CONCLUSIONS:** Financial penalties for drug non-adherence are still a long way off as the concept lacks a simple solution. This paper contributes to the widespread discussion by concentrating and aggregating widely scattered figures of dispute within a coherent argumentative discourse drawing on insights from the field of health economics.

PHP5

USE OF HEALTH SERVICES AND MEDICINES AMONG STUDENTS IN SERBIA

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OBJECTIVES: The first real independence makes student population exposed to various health risks. The aim of this study was to examine the health of students and their using of health care services and medicines. **METHODS:** The cross-sectional study was carried out at the three State Universities from February to May in the academic year 2011/2012. and included 2285 students of both sexes. The students filled in a questionnaire consisting of 30 questions referring to socio-economic characteristics, life-style habits, health assessment, as well as some health problems and use of health services. **RESULTS:** Half of all students reported having a selected physician. Of the total number of students 59.8% of them had been to the doctor and 63.8% of students used the services of a dentist at least once in the year preceding the survey. As the most common reasons for visiting general practitioners, students cited the control of health and medical examinations (40.4%), the existence of an illness or injury (32.1%), as well as instructions for obtaining a specialist (11.7%). The average number of physician visit per student was 1.89 (SD 2.81) and the number of actual dental visit per student was 2.33 (SD 3.93). Of the total number 77.2% of students had never been hospitalized. Most students taking the medication on the advice of doctors (49.1%). Medication is not used at all for 24.2% of students. Cochran's Q test showed a statistically significant difference between groups of drugs which the students took on their own initiative, where the first stand pain medication, and then the drugs to strengthen the body ($p < 0.001$). **CONCLUSIONS:** Universities should be encouraged to provide efficient, affordable counseling services for their students. Students must be encouraged to become actively involved in health promotion.

PHP6

COMPARING THE EFFECTIVNESS OF DIFFERENT EDUCATIONAL PROGRAMS FOR CHILDREN ON APPROPRIATE ANTIBIOTIC USE

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OBJECTIVES: The use of antibiotics is found to be irrational by patients as well as prescribers and lack of knowledge and information about the adverse effects and the increasing prevalence of resistant organisms are some of the important factors which caused it. So national education programs about the dangers of irrational antibiotic use should be the priority. Affecting on these ideas in adults takes too much time and money, but education is more effective in children and its effect on a child becomes fixed in their beliefs. This study aimed to assess and compare the effectiveness of wallpaper news and story book designed to teach children about the benefits of appropriate use of antibiotics. **METHODS:** The children story book and wallpaper news which have been designed and published by National Committee on Rational Use of Drug (NCRUD) were delivered to 18 primary school (9 for girls and 9 for boys) that volunteered to participate in the study in Tehran. All student of third, fourth and fifth grade have been educated by their trained teachers. The evaluation of children's Knowledge has been done on all of students before and after intervention. **RESULTS:** The research results found that there was significant difference between the student knowledge before and after both interventions in girls' and boys' primary schools. ($p<0.0001$) and the effectiveness of wall news paper is more than story book in girls' primary school. ($p<0.006$). **CONCLUSIONS:** We conclude that children stories have good impression on the level of student's knowledge and it seems that teaching the students about the advantages of appropriate antibiotic use by using children stories can influence their knowledge significantly and its good way to increase their level of knowledge and positive behavior in future life.

HEALTH CARE USE & POLICY STUDIES - Diagnosis Related Group

PHP7

HOW DO REIMBURSEMENT SYSTEMS ENCOURAGE OR INHIBIT ADOPTION OF INNOVATIVE MEDICAL DEVICES IN AN AMBULATORY SETTING?

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OBJECTIVES: To consider how reimbursement systems in 5 EU countries encourage or inhibit adoption of medical device technologies that facilitate care in an ambulatory setting. **METHODS:** A literature review of payment systems for medical devices operating in England, Germany, Italy, France and Spain was undertaken. Examples of technologies that could be used in an out-patient setting, but which were predominantly being used in hospital were identified. Uterine balloon endo-