

**RESULTS:** Final analysis included 9337 patients. Mean age of patients was 41.75 + 10.11 years. Sixty nine percent patients were males. Treatment success rate was 77.5% (n = 7240). Among 7240 successfully treated patients, 5319 patients cured while 1921 completed their treatment. Among 22.5% (n=2097) unsuccessfully treated patients, 503 died, 502 defaulted, 369 transferred out and 723 were on treatment continued. In multivariate analysis new TB infection (OR=1.315, p-value<0.001) was the only factor associated with successful treatment outcome. Whereas extra pulmonary TB (OR=0.541, p-value<0.001), pulmonary + extra pulmonary TB (O =0.523, p-value<0.001), urban area (OR=0.889, p-value=0.030), smoking (OR=0.890, p-value=0.030), alcohol consumption (OR=0.807, p-value=0.011) intravenous drug use (OR=0.676, p-value<0.001) and employment (OR=0.507, p-value<0.001) had statistically significant negative association with successful treatment outcome. **CONCLUSIONS:** Although more than three fourth (77.5%) patients were treated successfully but the treatment success rate is still behind the WHO target of 85%. In future more attention should be paid to patients with extra pulmonary TB, belonging to urban area, smokers, alcohol consumers, intravenous drug users and employees.

#### PIN18

##### RATES OF INFLUENZA COMPLICATIONS BY HIGH RISK GROUP

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**OBJECTIVES:** An unmet need remains for new effective treatments and/or management strategies for influenza in high-risk groups. Complications and mortality rates might differ among high risk groups, such as those who are aged 65 years and older compared with those with different chronic underlying medical conditions. **METHODS:** A literature review was performed using electronic database keyword searches, specific inclusion and exclusion criteria, quality rating of the reviewed full-text articles, and abstraction of data to evaluate the published evidence on the incidence, complication rates, and health service use associated with clinical influenza in different high-risk groups. **RESULTS:** Key findings for incidence rates of clinical influenza were that these rates are similar among people with chronic cardiovascular or respiratory comorbidity but may be higher in those with allogeneic stem cell transplants compared to those with autologous transplants. Rates of hospitalization and/or pneumonia or lower respiratory tract infection for those with chronic conditions or those who are immunocompromised (2.9% to 80%) are significantly higher than those in people over age 65 but without additional high-risk factors (0%). A person who is hospitalized and has a laboratory-confirmed influenza diagnosis has a probability of intensive care unit admission of between 11.8% and 28.6% and of death of between 2.9% and 14.3%. Most of the studies of hospitalized patients did not present outcomes data separately by high-risk group. In addition, the rates and outcomes of influenza complications in all high-risk groups are variable from year to year depending on the circulating influenza viruses. **CONCLUSIONS:** These findings indicate that the burden of influenza may vary by high-risk group although there are only limited data available to quantify these differences. This information could be used to evaluate new therapies, including better influenza vaccines, chemoprophylaxis, and/or treatment strategies for different high-risk groups.

#### INFECTION – Cost Studies

#### PIN19

##### A BUDGET IMPACT (BI) ANALYSIS OF VACCINATING THE ELDERLY AND AT-RISK ADULTS WITH THE 23-VALENT PNEUMOCOCCAL POLYSACCHARIDE VACCINE (PPV23) COMPARED TO NO VACCINATION (NOVAC) OR 13-VALENT PNEUMOCOCCAL CONJUGATE VACCINE (PCV13) IN THE UK

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**OBJECTIVES:** In the UK, PPV23 has been recommended in the elderly (aged 65 and over) and at-risk adults. In 2007, PCV was introduced in children, leading to a decrease in invasive pneumococcal disease (IPD) incidence associated with the PCV serotypes not only in vaccinated children but also in unvaccinated adults. The use of PCV13 in adults is currently under consideration pending data on efficacy in this population. This study aimed to assess the BI of PPV23 vs. NoVac or PCV13 in the UK, accounting for recent epidemiological changes. **METHODS:** The model was adapted from a previous population-based Markov model, consisting of five health states: no PD, IPD, NBPP (non-bacteraemic pneumococcal pneumonia), post-meningitis sequelae and death. Epidemiology and costs were estimated from UK sources. The analysis tracked cohorts of vaccinated and unvaccinated population between 2012 and 2016. Four scenarios were tested and equal market shares were assumed between PCV13 and PPV23. **RESULTS:** Over the study period, PPV23 vaccination led to a reduction in the number of IPD cases, ranging from 1,773 to 1,957 (vs. NoVac) or from -154 to 617 (vs. PCV13). The reduction in the number of NBPP cases ranged from -2 to 23,969 (vs. NoVac) or from -11,984 to 0 (vs. PCV13). When compared to NoVac, PPV23 vaccination was associated with a total cost of £63 million, whereas introducing PCV13 required an additional funds of £54 million. The net budget impact ranged between £36 million and £59 million (vs. NoVac) or between -£56 million and -£47 million (vs. PCV13). **CONCLUSIONS:** The model suggests that vaccinating with PPV23 significantly reduces the burden of pneumococcal disease despite the epidemiological changes. Introducing PCV13 is likely to impose a significant impact on the health care budget and assumptions around the efficacy of PCV13 are a substantial source of uncertainty in its public health benefits.

#### PIN20

##### BUDGET IMPACT OF BACKBONE CHOICE IN ITALIAN TREATMENT-NAÏVE, HIV-INFECTED PATIENTS

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**OBJECTIVES:** The gradual increase of persons living with HIV, mainly due to the reduced mortality achieved with effective antiretroviral therapies, calls for increased rationality and awareness in health resources consumption also during the early illness phases. Aim of this work is the estimation of the budget impact related to the variation in backbone prescribing trends in naïve patients. **METHODS:** Target population is the number of patients starting antiretroviral therapy each year, according to the Italian HIV surveillance registry, excluding patients receiving non-authorized or non-recommended regimens. We modeled 3-year mortality and durability rates on a dynamic cohort, basing on international literature. Current Italian market shares of triple regimens containing first-choice backbones (TDF/FTC, ABC/3TC, TDF+3TC, AZT/3TC) are compared to an hypothetical scenario in which all patients eligible to ABC/3TC treatment (HLA-B\*5701 negative patients with <100,000 HIVRNA copies/mL) start a regimen containing this backbone as first line strategy. Annual cost for each regimen comprises drugs acquisition under hospital pricing rules, and monitoring exams and preventive tests, valued basing on regional reimbursement tariffs. **RESULTS:** According to current prescribing trends, in the next three years about 13,000 patients starting HIV therapy will receive TDF/FTC (83% of the target population), and minor portions other regimens (9% ABC/3TC, 8% AZT/3TC). Patients that would be eligible to ABC/3TC are about six thousand more than those presently treated with this backbone, leading to a saving of 3.1 million Euro over the three-year period. Sensitivity analyses on different hypotheses of “third” drug market shares indicate savings ranging from 720 thousand to 3.9 million Euro. Most of this amount is due to reduced acquisition costs and, secondarily, to lower monitoring needs. **CONCLUSIONS:** Where patient features don't force the choice of the backbone, ABC/3TC prescription may induce substantial savings, allowing the release of resources needed to manage more complicated/advanced cases.

#### PIN21

##### ECONOMIC IMPACT OF HOSPITAL-ACQUIRED INFECTIONS IN MECHANICALLY VENTILATED PATIENTS IN INTENSIVE CARE UNITS: RETROSPECTIVE ANALYSIS FROM A UNITED STATES HOSPITAL DATABASE

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**OBJECTIVES:** To determine the economic impact of three different hospital-acquired infections (HAI) in mechanically ventilated (MV) patients in intensive care unit (ICU) and assess the attributable costs, hospital length of stay (LOS) and inpatient mortality in a U.S. hospital database. **METHODS:** A U.S. retrospective cohort study was undertaken using hospital database from the Premier Perspective of adults (≥18 years old) with a stay ≥ 48h in 2007. Three HAIs were followed: bloodstream infection (BSI), surgical site infection (SSI), and hospital-acquired pneumonia (HAP) including ventilator-associated pneumonia (VAP). From a previous analysis, MV device was identified as an impactful risk factor in ICU showing higher prevalence for HAP/VAP and BSI. Case subjects were defined as patients with HAI event among the MV population. Economic criteria were defined as hospital LOS, inpatient mortality and inpatient costs. **RESULTS:** Out of 463,491 patients meeting the entry criteria, 101,540 (21.9%) received a MV setting. Focusing on this MV population, 51,683 (50.9%) patients developed HAI: HAP/VAP: 33.2%, BSI: 29.4%, and SSI: 2.3%. Compared with control, patients with HAI were more elderly (54% vs. 49%), were more likely to be admitted via emergency room (86% vs. 78%), presented with more severe illnesses, higher risk of mortality, and with central catheter placements (67% vs. 39%). The inpatient mortality rate and mean LOS were higher in patients with HAI (32% vs. 18% and 21.2+22.3 vs. 11.8+11.4 days, respectively). Mean total costs were higher in HAI patients (\$6,751US\$) compared to non-HAI patients (\$4,032US\$). In MV population, HAI patients had higher consumptions of inpatient resources and inpatient mortality: extended LOS equal to 9.4 days, increased total inpatient costs equal to 22,719US\$ and extended mortality of 14%. **CONCLUSIONS:** These data illustrate the significant economic burden and mortality of HAI in a category of at-risk population on MV and request the needs for intervention.

#### PIN22

##### ECONOMIC IMPACT OF 13-VALENT PNEUMOCOCCAL CONJUGATE VACCINE (PCV13) IN PERSONS OVER 50 YEARS OF AGE WITH UNDERLYING CHRONIC MEDICAL CONDITIONS IN FINLAND

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Pneumococcal diseases (PD), such as bacteremia, meningitis and pneumonia, are associated with substantial burden in adults (>50 years). Moreover, adults with underlying chronic conditions (i.e., vascular, metabolic, or respiratory diseases) have shown to have 3–6 times higher risk of PD compared with their healthy controls. These people at higher risk will likely benefit most of PCV13 vaccination in the new adult indication. **OBJECTIVES:** To estimate the expected 5-year economic impact of targeted PCV13 vaccination compared to no vaccination in Finnish adults (>50 years) at higher risk for PD. **METHODS:** A budget impact model applying a modified Markov-type structure was developed to predict the impact of PCV13 vaccination in terms of costs and PD events avoided. The model was built as a dynamic open-cohort model to allow the annual evolution of the size of prevalent target population with considered PCV13 indications. The results of model were

extrapolated for the years 2012-2016 by applying population forecasts from the official Finnish statistics. Health care resource use and Finnish unit costs (€2011, societal perspective) were obtained from published national sources. **RESULTS:** Approximately 35% of the 2.2 million Finns of over 50 years of age can be considered to be at moderate or high risk for PDs due to the underlying chronic medical conditions. The vaccination of these people with PCV13 could provide an estimated net budget savings of about €218 million compared to the current no-vaccination situation during the five years. Among the risk groups considered, the largest net savings (€66.2 million) could be expected to be obtained by vaccinating people with heart disease due to its high prevalence in the target population. **CONCLUSIONS:** The immunization of adults (>50 years) at higher PD-risk with PCV13 vaccine will potentially lead to substantial cost savings during the forthcoming years in Finland.

#### PIN23

##### ECONOMIC ANALYSIS OF ATAZANAVIR AS 1ST LINE TREATMENT FOR VIH PATIENTS, ON STABLE AND SEVER HEALTH STATE

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**OBJECTIVES:** To estimate the budget impact associated with use of Atazanavir as 1st line treatment in Spanish market of antiretroviral drugs for VIH patients, on stable and severe health state. **METHODS:** An economic Model was developed to evaluate the Budget Impact of using Atazanavir (ATV), as 1st line treatment, for VIH patients in the Spanish National Health System perspective, over a 10-year period. Therapies included in the analysis were Darunavir (DRV), Lopinavir (LPV) and Efavirenz (EFV). Patient data were obtained through microsimulation model, with a patient cohort simulated, statistically significant and representative (N= 40,000). The costs were obtained from local databases and were considered pharmaceutical and direct health care costs. An annual discount rate assumed was of 3%. The discontinuation rates after AEs assumed for all treatments were: 71.3% from diarrhea, 61.3% from nausea, 28.8% from jaundice, 82.5% from rash and 55% from CNS events. The results of BIM per patient were presented at annual and cumulative level. **RESULTS:** Atazanavir use led to differential annual costs per patient after 10 years of treatment of 595€, 209€ and 76€, with respect to DRV, LPV and EFV. The highest savings generated by ATV derived from durable health of 1<sup>st</sup> line treatment (807€ DRV, 909€ LPV and 1045€ EFV), followed by return to health and durable viral suppression. This savings offset ATV drug cost versus other antiretroviral drugs. **CONCLUSIONS:** This analysis showed that treatment with Atazanavir for VIH patients, on stable and severe health state, generates net savings for Spanish National Health System: 595€, 209€ and 76€, with respect to DRV, LPV and EFV, in terms of differential annual costs per patient after 10 years treatment.

#### PIN24

##### CLINICAL AND ECONOMIC EVALUATION OF AN ADULT PNEUMOCOCCAL VACCINATION PROGRAMME AIMED AT THE SPANISH HIV POPULATION

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**OBJECTIVES:** Recently, 13-valent Pneumococcal Conjugate Vaccine (PCV13) has been approved for adults 50 years of age and older for the prevention of invasive pneumococcal disease (IPD) caused by the vaccine serotypes. This study was aimed to assess the clinical and economic impact of PCV13 use in adults with immunocompromising conditions based on HIV published data. **METHODS:** A budget impact model for the whole HIV population was designed under the Spanish National Health System with a 4-year time horizon. Calculations of cases were based on the published IPD incidence (0.74%) and recurrent IPD ratio in this population. From total IPD cases, 92% were considered bacteraemia originating from pneumonia, 5.5% bacteraemia without apparent focus and endocarditis and 2.5% meningitis. PCV13 efficacy, serotype coverage, IPD mortality and disease related costs were based on published data. Model was built up assuming full vaccination coverage and no indirect effect. All costs were expressed in €2012. **RESULTS:** There would be 2,392 IPD cases in Spanish HIV patients over 4-year time horizon (598 annual cases). The model predicts that the implementation of a PCV13 vaccination program for HIV population would be a cost saving measure due to IPD cases averted. Over the study period, PCV13 would prevent 646 IPD cases and 162 related deaths. **CONCLUSIONS:** Based on this health economic evaluation, the inclusion of a PCV13 vaccination program for HIV population would be an efficient measure. PCV13 vaccination would have a high impact on pneumococcal disease prevention, avoiding deaths and saving costs.

#### PIN25

##### HEALTH AND ECONOMIC BENEFITS OF AVOIDING HOSPITAL PEN MOVES FOR DAIRY CATTLE IN THE UNITED STATES

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**OBJECTIVES:** Separation of sick dairy cows to hospital pens, isolated from healthy cows, is frequently used to manage risks of inadvertently meat and milk residue violations associated with use of certain antimicrobials. However, drawbacks of hospital pen moves are frequently overlooked. Our objective was to develop a model 1) to quantify health and economic burden associated with hospital pen moves, and 2) to compare the economic impact associated with choice of antimicrobials requiring a hospital pen move because of milk withholding (standard: ampicillin, penicillin, oxytetracycline) to those not requiring milk withholding

(comparator: three ceftiofurs) and therefore avoiding hospital pen moves. **METHODS:** A decision tree was developed in MS Excel to 1) estimate the impact of hospital pen moves by considering extra labor, stress-induced reduction in milk yield and immunity, risk of secondary diseases and associated treatment/culling/replacement costs, and 2) compare standard and comparator treatments by considering treatment duration, milk withholding-associated revenue losses (based on product labels) and impact of hospital pen moves. Costs and prices (\$US, 2010: producer's perspective), risk data, and labor data were derived from published sources. **RESULTS:** The economic burden of a hospital pen stay of 5 days was estimated at \$111.85/cow, mainly attributable to risk and costs of secondary diseases. Ceftiofur prices (\$29.33 to \$107.99/cow) were generally higher than standard antibiotics (\$2.00 to \$30.95/cow). However, incremental net income with ceftiofurs compared to standard antibiotics ranged from \$85.81 to \$208.21/cow, the result of withholding-associated reduced saleable milk (\$51.00 to \$71.40/cow) and additional costs of hospital pen moves (\$111.85 to \$156.34/cow) with standard treatment. **CONCLUSIONS:** Compared to therapeutic treatments requiring milk withholding and a hospital pen move, ceftiofurs' higher prices were more than offset by higher returns resulting from increased saleable milk and no additional costs associated with hospital pen moves, and overall resulted in higher net income for producers.

#### PIN26

##### REAL LIFE EFFECTIVENESS OF ANTIBIOTICS

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**OBJECTIVES:** Antimicrobial resistance is a growing problem associated with many bacterial infections. The problem of resistance is related to the use of antibiotics. There is a causal relationship between antibiotic use and resistance which results in decreased antibiotic effectiveness. Antimicrobial resistance varies among hospitals significantly and results in a different financial burden due to cost-drivers related to treatment failure including all medication costs, increased length of hospital stay and additional medical resource consumption. Our objective was to estimate the real life effectiveness of using different antibiotics in a certain hospital by analyzing the total cost of therapy during hospitalization. **METHODS:** A cost-offset model was developed to support the individual therapeutic decisions of hospitals. We analyzed a 6 months time period and a number of 59 complicated intra-abdominal infection (IAI) episodes in a Hungarian county hospital retrospectively. Based on the first antibiotic choice we defined different treatment pathways to compare the length of stay and the total cost of the hospitalization in each treatment arm. **RESULTS:** The average length of stay (LOS) with complicated IAI was 5 days and increased to 8.6 days due to any adverse events. If the first antibiotic treatment was not effective - means that the patient had to switched to another antibiotic drug - the average LOS increased to 9.5 days. The cost difference of the different antibiotic drugs ranged from 121% to 391% compared to the cheapest treatment. The total hospitalization cost in case of the most expensive antibiotic treatment was higher by an average of 8% compared to the total cost of the cheapest antibiotic drug treatment. **CONCLUSIONS:** In long term the impact of resistance, the choice of adequate antibiotic therapy, the infection-control and the need for real-life effectiveness analysis because of budgetary reasons are increasingly important for hospitals.

#### PIN27

##### COST ANALYSIS OF VORICONAZOLE VERSUS LIPOSOMAL AMPHOTERICIN B FOR PRIMARY THERAPY OF INVASIVE ASPERGILLOSIS AMONG HEMATOLOGIC PATIENTS IN GERMANY

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**OBJECTIVES:** We performed an economic evaluation of voriconazole vs liposomal amphotericin B as first-line antifungals for invasive aspergillosis (IA) among patients with prolonged neutropenia or undergoing bone marrow or hematopoietic stem-cell transplantation from a German hospital perspective. **METHODS:** A decision analytic model was constructed to estimate potential treatment costs of voriconazole vs liposomal amphotericin B. Each pathway was defined by probabilities of an event and costs of clinical outcomes. Probabilities and costs were derived from literature, clinical trials, and expert panels. In the base case, patients who failed first-line therapy were assumed to experience a single switch between comparator drugs or add on the other drug as second-line treatment. Base-case evaluation included drug management costs and additional hospitalization costs due to severe adverse events. Sensitivity analyses were conducted to assess robustness of results. All costs were inflated to 2011 Euros. **RESULTS:** Based on clinical trial success rates of 52.8% (voriconazole) and 50% (liposomal amphotericin B), and length of treatment (LOT) = 10-day intravenous (IV) + 5-day oral for voriconazole and 15-day IV for liposomal amphotericin B, voriconazole had a lower total treatment cost than liposomal amphotericin B (€12,256 vs €18,133). Assuming the same efficacy (50%) in first-line therapy, voriconazole still had a lower total treatment cost than liposomal amphotericin B (€12,837 vs €18,133). Assuming the same LOT (10 or 15 days) in both arms, voriconazole maintained a lower cost. Cost savings were primarily due to lower drug costs and shorter IV LOT associated with voriconazole. The model was sensitive to drug prices and hospital per day costs. **CONCLUSIONS:** This study suggests that voriconazole is likely to be cost-saving compared to liposomal amphotericin B in the treatment of IA from the German hospital perspective.