

systematic differences, and conformity to malaria treatment policy, in terms of the use of ACT, accuracy of diagnosis, concomitant medication and cost of medication. **RESULTS:** 2,171 patients' records were analyzed. 986 (46%) were sent for laboratory confirmation using microscopy, out of which only 45% tested positive. Majority of prescriptions, 54% was on the basis of presumptive treatment. 58% of slide negative results received antimalarials. Gender disparity was significant; 1207 (56%) females, 942 (43%) males. 93% of prescriptions contained ACTs with AL as the most frequently prescribed antimalarial drug. Monotherapy accounted for 7% of the prescriptions. 97% (1722) of prescriptions received at least one co-medication, mostly analgesics, vitamin preparations and antibiotics. Antibiotics were given to 50% of patients, with children under five most likely to be co-prescribed antibiotics. Overall, median cost of medication was US\$7.34 (US\$0.16 – 262.78) per case. There were significant variations in treatment practices between the two facilities. **CONCLUSIONS:** Evidence suggest high rate of compliance to policy on the use of ACT as first line treatment for uncomplicated malaria but there is significant scope for improved diagnosis and prescription to enhance accuracy of treatment and reduced wastages, especially at the medical center. Regular updates of providers on appropriate practices are needed to improve adherence to treatment guidelines for enhanced efficiency of malaria treatment in Nigeria.

#### PIN108

##### EARLY SWITCH/EARLY DISCHARGE OPPORTUNITIES FOR HOSPITALIZED PATIENTS WITH METHICILLIN-RESISTANT STAPHYLOCOCCUS AUREUS COMPLICATED SKIN AND SOFT TISSUE INFECTIONS: PROOF OF CONCEPT IN THE UNITED ARAB EMIRATES

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**OBJECTIVES:** To describe real-world treatment patterns, health care resource use, and opportunities for early switch (ES) from intravenous (IV) to oral antibiotics and early discharge (ED) for patients hospitalized in the United Arab Emirates (UAE) with methicillin-resistant *Staphylococcus aureus* (MRSA) complicated skin and soft-tissue infections (cSSTIs). **METHODS:** This retrospective observational medical chart review study enrolled physicians from four UAE sites to collect data for 24 total patients with documented MRSA cSSTI, hospitalized between July 2010–June 2011, and discharged alive by July 2011. Data include clinical characteristics and outcomes, hospital length of stay (LOS), MRSA-targeted IV and oral antibiotic use and ES and ED eligibility using literature-based and expert-validated criteria. **RESULTS:** For all patients, the actual length of MRSA-active treatment was 10.8±7 days, with 9.8±6.6 days of IV therapy, and mean LOS 13.9±9.3 days. The most frequent initial MRSA-active therapies used were vancomycin (33.3%), linezolid (16.7%), and clindamycin (16.7%). Five patients (20.8%) were switched from IV to oral antibiotics while inpatient. Eight patients were discharged with MRSA-active antibiotics, with linezolid prescribed most frequently (n=3; 37.5%). Fifteen patients (62.5%) met ES criteria and potentially could have discontinued IV therapy 8.3±6.0 days sooner. Eight patients (33.3%) met ED criteria and potentially could have been discharged 10.9±5.8 days earlier. Assuming an average cost of 2,691 dirhams (\$575)/bed day in the UAE, the total savings would be 29,332 dirhams (\$6,268) in bed-day cost savings realized per ED-eligible patient. **CONCLUSIONS:** While one fifth of patients were switched from IV to oral antibiotics in the UAE, there were clear opportunities for further optimization of health care resources. Over half of UAE patients hospitalized for MRSA cSSTI could be eligible for ES and one-third eligible for ED opportunities, resulting in the potential for a substantial reduction in IV days and bed days.

#### PIN109

##### COST-EFFECTIVENESS ANALYSIS OF PROTEASE INHIBITOR MONOTHERAPY VERSUS ONGOING TRIPLE-THERAPY IN THE LONG-TERM MANAGEMENT OF HIV PATIENTS

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**OBJECTIVES:** To estimate the cost-effectiveness of a strategy of switching the antiretroviral therapy (ART) to protease inhibitor monotherapy (PIM) with prompt return to combination therapy in the event of viral load rebound compared to continuing the ongoing triple therapy (OTT) in the long-term management of HIV-1 infected patients. **METHODS:** Within trial cost-effectiveness analysis and modelling of life-time cost-effectiveness based on a randomised controlled trial of Protease Inhibitor monotherapy Versus Ongoing Triple-therapy (PIVOT). The setting was HIV outpatient care in the UK National Health Service and the trial involved 587 patients, aged 18 years or more, who achieved sustained virological suppression and have a CD4+ cell count >100 cells/mm<sup>3</sup>. Outcomes were NHS costs (2012 UK Pounds Sterling) and quality-adjusted life-years (QALY) with comparative results presented as incremental cost-effectiveness ratios (ICERs). **RESULTS:** Overall, PIM was cost-effective compared to OTT. PIM was cost-saving due to large savings in the ART drug costs while being no less effective in terms of QALYs in the within trial analysis and only marginally less effective with modelling. In the base-case within-trial analysis, the incremental total cost per patient was -£6,424.11 (95% confidence interval: -£7,418.84 to -£5,429.38) and the incremental QALY was 0.0051 (95% confidence interval: -0.0479 to 0.0582) making PIM dominant compared to OTT. Multiple sensitivity analyses were conducted to assess the importance of assumptions surrounding drug costs, missing data, trial protocol driven costs and mortality. In all sensitivity analyses, PIM was cost-saving and no marked difference in QALY was observed. Modelling of life time costs and QALYs showed significant cost-savings and marginally less effectiveness such that switching to PIM appeared cost-effective at accepted cost-effectiveness thresholds. **CONCLUSIONS:** The results

suggest that PIM is a cost-effective treatment strategy compared to OTT for HIV-1 infected patients who have achieved sustained virological suppression.

#### PIN111

##### COST OF ADVERSE DRUG REACTIONS (ADR) WITH PROTEASE INHIBITORS IN THE TREATMENT OF HEPATITIS C IN THE HEALTH SYSTEM OF EXTREMADURA (SES)

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**OBJECTIVES:** Evaluate the cost associated with the ADRs from the use of boceprevir (BOC) or telaprevir (TLP) in patients treated with protease inhibitors (PI) in the SES. **METHODS:** A multicenter observational study of cohort ITT, extracting the necessary data from the information systems of SES, from September 2012 to December 2013, for patients treated with TLP or BOC was performed. Those co-infected patients (HIV or HBV), in liver transplant or with history of hepatocellular carcinoma were excluded. ADRs assessed were alopecia, fever, retinitis, itching, weight loss, rash, thrombosis, neutropenia, hemorrhoids, stomach pain, amenorrhoea, arthralgia, anxiety and the number of infiltrated blood received by patients. To assess the pharmaceutical cost of ADRs the retail price + VAT at Official List were taken, and to other public health costs SSPE prices, the NHS and records of unit costs were taken also. **RESULTS:** Withdrawals caused by ADRs were higher for TLP (12.2% vs 8.1%, p = 0.09), frequency of pruriginous erythema (44.9% vs 4%, p < 0.001) and anemia (69.4% vs. 52%, p = 0.142). For BOC, there were higher percentages of dysgeusia (16% vs. 0%, p = 0.011), and neutropenia (52% vs. 24.5%, p = 0.018). The results showed a significant difference between the treatment cost per patient associated with ADRs caused by BOC (€ 5,896) compared to the TLP (€ 11,234), for 34.7 weeks (BOC) and 25.9 weeks (TLP). **CONCLUSIONS:** In view of the results obtained, it shows that means a lower costs for the health system in the treatment of ADRs due to the use of PI in patients with hepatitis C patients receiving BOC versus TLP. Postmarketing observational studies are needed to determine the actual efficacy and safety of new drugs.

#### PIN112

##### PRIMARY CARE PHYSICIANS IN AN INTERFERON-FREE WORLD: COULD SAFER, MORE EFFECTIVE ORAL HEPATITIS C THERAPIES LEAD TO IMPROVED OUTCOMES THROUGH EDUCATION AND PCP-PRESCRIBED TREATMENT?

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**OBJECTIVES:** Hepatitis C virus (HCV) treatments have been improved by the availability of highly effective and well-tolerated interferon-free therapies. This study probes the impact of such therapies on the role of primary care physicians (PCPs) in diagnosis, referral, and treatment of HCV patients who have historically been treated by gastroenterologists and hepatologists. **METHODS:** In the U.S., 100 PCPs, 51 specialists (44 gastroenterologists, 7 hepatologists), and 30 Managed Care Organization (MCO) pharmacy directors/medical directors (PDs/MDs) were surveyed to assess PCP knowledge of and involvement in HCV diagnosis and screening, referral patterns, and treatment options. **RESULTS:** Survey results identify referral to specialists as a notable barrier to accessing care. Some 77% of PCPs who follow-up with patients they refer to HCV specialists estimate that 24% are lost to follow-up. Similarly, 73% of specialists report having PCP-referred patients who missed their exam, and these specialists estimate that 15% of all PCP-referred patients "drop off". In anticipation of multiple new HCV therapies reaching the major markets, several professional societies have collaborated to develop expert-curated, regularly updated guidelines providing clinical recommendations for diagnosing and treating HCV patients ([www.hcvguidelines.org](http://www.hcvguidelines.org)). Among surveyed PCPs, 74% were unaware of these guidelines; however, once informed, 63% of all PCP respondents indicated greater comfort with prescribing treatments recommended by these guidelines. Furthermore, 63% of MCO PDs/MDs and 98% of HCV specialists surveyed reported feeling more comfortable with PCPs prescribing these recommended treatments. **CONCLUSIONS:** The substantial decline in the cascade of care from PCP referrals to specialists suggests that educating PCPs on new interferon-therapies presents an opportunity to maximize retention in care and accelerate efforts to identify undiagnosed cases. Survey responses from PCPs, as well as specialists, and MCO PDs/MDs suggest that practical, regularly updated clinical guidelines prepared by international experts could provide a common framework for educational outreach efforts to PCPs.

#### PIN113

##### COVERAGE OR EFFICACY: WHICH FACTOR IS THE MOST INFLUENTIAL FOR REDUCING VARICELLA WITH ROUTINE CHILDHOOD VACCINATION IN ITALY?

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**OBJECTIVES:** Policymakers may have a concern that a long time interval between two doses, partial efficacy and potential waning after the first dose of varicella vaccination would reduce the impact of a universal childhood varicella immunization program. The objective of this study is to determine the potential impact and relative weight of 2 key factors: (1) coverage and (2) vaccine efficacy (VE) of the first dose of varicella vaccination (VE-D1) in the context of long term interval between two doses on varicella epidemiology in Italy. **METHODS:** An age-structured dynamic transmission model is adapted and fitted to the seroprevalence of varicella in Italy in absence of vaccination. Vaccination is introduced with 1- and 2-dose VE, with long time interval between 2 doses (given at 13 months and 6 years of age). Several scenarios are tested including 2 levels of VE-D1 (65%/75%) and 3 coverage levels (95%/80%, 85%/70%, 75%/60%, respectively). Efficacy post-dose 2 is fixed at 95%. **RESULTS:** For a vaccine coverage of 95%/80%, the reduction in number of varicella cases compared with the absence of vaccination for 75% and 65% VE-D1 was respectively 89.2%/87.5% by year 30, and 78.9%/74.6% by year 80 after vaccination program initiation. For a vaccine coverage of 85%/70%, the reduction in number of

varicella cases for 75% and 65% VE-D1 was respectively 73.9%/71.3% by year 30 and 65.0%/61.6% by year 80. When coverage was 75%/60%, the reduction in number of varicella cases was 60.2%/58.1% by year 30 and 55.0%/52.5% by year 80 for VE-D1 of 75% and 65%, respectively. **CONCLUSIONS:** The coverage of varicella vaccination is an important factor affecting the number of varicella cases when long term interval between two doses is considered. This is a more influential factor on predicted cases than the first dose efficacy.

#### PIN114 HERPES ZOSTER-RELATED HEALTH CARE RESOURCE UTILIZATION IN CANCER PATIENTS IN 5 EUROPEAN COUNTRIES

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**OBJECTIVES:** To examine herpes zoster-related health care resource utilization in hematologic (HM) or solid tumor malignancy (STM) patients seeking care at primary-care practices in 5 European countries. **METHODS:** Longitudinal primary-care EMR databases (Cegedim Strategic Data) in France, Italy, Germany, Spain, and United Kingdom (UK) were analyzed retrospectively (2007-2012). Patients with HM or STM diagnoses were followed for a subsequent first herpes zoster (HZ) diagnosis (index event). HZ patients were matched with non-HZ (HM and STM) patients using propensity scores based on demographics and relevant clinical characteristics. Patients were observed for 6 months pre-index (baseline) and 6 months post-index. Demographics, comorbidities, pharmacotherapy, and health care resource utilization (office visits, specialty referrals, laboratory tests, and prescriptions) were reported with statistical significance set at  $p < 0.05$ . **RESULTS:** HZ patients meeting selection criteria across all 5 countries included 907 HM and 4317 STM. Mean ages ranged 64.8±15.5 (Italy-HM) to 71.8±11.5 (France-STM); female gender varied for HM from 49% (UK) to 58% (Germany), and STM 56% (UK) to 63% (France). Case and control populations were well balanced at baseline. Office visits per patient were significantly higher post-index for HZ cohorts across all countries and malignancy types (except Spain HM), ranging from 0.5 more visits (Spain-STM,  $p=0.009$ ) to 2.8 more (UK-HM,  $p<0.001$ ). Significantly more HZ patients had post-index specialty referrals (France-STM, 2.6% more,  $p=0.05$ ; Germany-STM, 4.8% more,  $p=0.012$ ), and significantly more HZ patients received prescriptions post-index in all cohorts across all countries, varying from 19.2% more patients (Spain-STM,  $p<0.001$ ), to 47.3% (UK-HM,  $p<0.001$ ). Significantly more HZ patients received laboratory testing, ranging from 3.2% more patients (Italy-STM,  $p=0.006$ ), to 11.4% (UK-HM,  $p=0.003$ ). **CONCLUSIONS:** Significantly higher health care resource use was incurred by HZ-afflicted HM and STM patients within 6 months of HZ diagnosis for office visits, specialty referrals, laboratory testing, and outpatient prescribing compared with matched controls across 5 European countries.

#### PIN115 USE OF HOSPITAL SERVICES BY HIV PATIENTS, 2012

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**OBJECTIVES:** Information on the pattern of health services use by HIV patients is required to effectively plan services, particularly in light of increasing non-infectious chronic diseases in this population. This study examined the use of inpatient, outpatient, and emergency department (ED) services by HIV positive patients who attended Cork University Hospital (CUH) for HIV care in 2012. **METHODS:** All public HIV patients who attended CUH for inpatient or outpatient care in 2012 were identified using an existing clinical database. Data on outpatient appointments by speciality (excluding dialysis), ED visits and inpatient episodes were extracted from the hospital information system. Patients with no attendance between Jul-Dec were censored at the month of last visit. **RESULTS:** Data were extracted on 328 patients (3642 patient-months), 1434 outpatient visits (1180 Infectious Disease (ID), 254 other), 100 ED visits (58 patients) and 74 inpatient episodes (51 patients). Patients had a median of 3 ID outpatient visits (range 0-12), 26% of patients also attended other outpatient specialties (median 2, range 1-22). On multivariate analysis being more recently diagnosed, and being on ART but not suppressed, or starting/stopping ART in 2012 were associated with increased outpatient ID visits, while age >50 years was associated with fewer outpatient ID visits. Those diagnosed 2003-2007 and 2008-2011 had significantly more outpatient non-ID visits while late diagnosis was associated with fewer non-ID visits. Use of ED services was positively associated with unknown risk factor and being diagnosed in 2012. Use of inpatient services was positively associated with diagnosis in 2012 and negatively associated with a minimum CD4 count  $\geq 350$  cells/ $\mu$ l. **CONCLUSIONS:** These data provide baseline information on the utilisation rates of ID and other specialties by HIV positive patients. Such data are useful for identifying factors which could be targeted for quality improvement interventions as well as for estimating future service requirements.

#### PIN116 THE IMPACT OF INFLUENZA LIKE ILLNESS (ILI) IN CHILDREN ON WORKING ADULTS

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**OBJECTIVES:** To evaluate the impact of child ILI on working adults' health, productivity and health care resource use (HCRU); and to evaluate ILI's impact on the children. **METHODS:** Participants  $\geq 18$  years, full or part time working and with minimum one child  $\leq 17$  years residing in household were recruited nationally (UK) for this online survey between October 2012 and May 2013. Demographics, employment status, morbidities and influenza vaccination history were collected for all household members. During follow-up, households were surveyed fortnightly

for influenza vaccination, ILI symptoms, time off work/education, and HCRU. Transmission of ILI from children to adults was estimated. Descriptive statistics were used. **RESULTS:** Across 938 participants/households there were 1895 adults mean age 40.6 years, 52.7% females; 1695 children mean age 8.7 years, 46.8% females. 91/306 adult ILI incidences were related to a child ILI (29.7%, 95%CI:26.5%-33.0%). 69 of these (75.8%, 95%CI:60.3%-91.3%) had symptom duration  $> 3$  days, 31/86 employed (36.0%; 95%CI:28.5%-43.6%) reported taking time off work with 22/31 (71.0%; 95%CI:46.2%-95.8%) taking  $\geq 2$  days off. 13/91 (14.3%; 95%CI:11.5%-17.1%) had general practice (GP) visits, 5/91 (5.5%; 95%CI:4.5%-6.5%) had GP telephone consultations, 6/91 (6.6%; 95%CI:5.3%-7.8%) received prescriptions, 76/91 (83.5%; 95%CI:66.5-100.6%) used over the counter (OTC) medications because of their ILI. 67 adults reported time off because of child ILIs (310 incidences); 30/67 (44.8%; 95%CI:34.2%-55.4%) taking  $\geq 2$  days. This represents 67 adults/152 working adults (44.1%; 95%CI:37.2%-51.0%) in the child ILI households. 180/310 (58.1%; 95%CI:51.7%-64.5%) of total child ILIs had time off education, 81/180 (45.0%; 95%CI:38.5%-51.5%) taking  $\geq 3$  days. 59/310 (19.0%; 95%CI:17.0%-21.1%) had GP visits, 22/310 (7.1%; 95%CI:6.4%-7.8%) had GP telephone consultations, 48/310 (15.5%; 95%CI:13.8%-17.2%) received prescriptions, 234/310 (75.5%; 95%CI:67.1-83.8%) used OTC medications. **CONCLUSIONS:** Based on survey, approximately 1/3 of adult ILIs were related to prior household child ILI. ILI in a household often required absence from work and ILI in children often resulted in time off education. GP visits were the most frequent burden to the National Health Service.

#### PIN117 COPING WITH METHICILLIN RESISTANT STAPHYLOCOCCUS AUREUS (MRSA) IN GERMAN REHABILITATION CENTERS – ARE THE INCENTIVES APPROPRIATE?

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**OBJECTIVES:** Patients colonized with multidrug-resistant organisms, especially Methicillin resistant *Staphylococcus aureus* (MRSA), impose a risk on other patients and on health care professionals. In addition, they will suffer from substantial health problems when getting an infection. This contribution examines the incentives of German rehabilitation centers to implement screening strategies to stem nosocomial infections and the spread of MRSA. **METHODS:** Relying on a decision tree analysis, the expected health care cost per capita is calculated for three strategies: (i) general screening, (ii) risk-based screening, both on admission, and (iii) no screening at all. Parameters are taken from the published literature. To handle uncertainty, multivariate sensitivity analyses are performed. **RESULTS:** From the perspective of a rehabilitation center, the third strategy yields the lowest expected cost while the first one causes the highest cost. This ordering is robust with respect to sensitivity analysis. Thus, cost savings due to a lower number of MRSA infections are not sufficient to offset the cost of the test and further prevention measures applied to individuals with a positive result. **CONCLUSIONS:** In Germany, rehabilitation centers are reimbursed by daily rates. In particular, they receive no extra fees for prevention measures. As our analysis demonstrates, this implies the incentive to implement MRSA screening to be too weak. Hence, MRSA prevention measures that would be beneficial to society will not be undertaken. However, our results can be used to indicate changes in the remuneration system that would provide rehabilitation centers with an appropriate incentive for MRSA prevention. Moreover, hygiene regulations enacted very recently (MedHygVO), in the light of our analysis, can be interpreted in a similar manner due to the requirement of a stricter hygiene regimen.

#### PIN118 ESTIMATING THE DIRECT MEDICAL COST, LENGTH OF STAY AND IMPACT OF REIMBURSEMENT CHANGE ON HEALTH CARE ASSOCIATED INFECTIONS

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**OBJECTIVES:** In 2008, the Centers for Medicare and Medicaid Services discontinued reimbursement for health care associated infections (HAIs) not reported to be present-on-admission (POA). The study objectives were to examine: (1) the impact of this reimbursement change on hospital-level HAI rates; and (2) the differences in total direct medical costs and length of stay (LOS) between patients with HAI (cases) and without HAI (controls). **METHODS:** We conducted a retrospective, interrupted time series analysis using the Nationwide Inpatient Sample obtained from the Health Care Cost and Utilization Project database for years 2006 to 2010. The primary outcome was diagnosis of HAI, identified based on ICD-9-CM codes for sepsis, pneumonia, surgical site infections, catheter-associated urinary tract infections or blood stream infections from a pool of "at-risk" patients defined as  $\geq 18$  years of age, without a diagnosis of cancer, HIV/AIDS or immunocompromised condition. Patients with an LOS  $\leq 2$  days were excluded to avoid inclusion of patients with pre-existing infections. Differences in total direct medical costs and LOS of propensity score-matched cases and controls were assessed using Wilcoxon signed-rank tests. **RESULTS:** The HAI rate was higher in the "at-risk" population (12.95 vs. 2.83 per 100 admissions) than in the total inpatient population,  $\geq 18$  years of age. Discontinuation of reimbursement for HAI was associated with a 0.37 point (-0.375,  $p = 0.0064$ ) decrease in HAI rate per 100 admissions for "at-risk" patients. Compared to controls, cases had significantly higher mean annual total direct medical costs (\$15,313  $\pm$  17,470 vs. \$21,561  $\pm$  31,718,  $p<0.0001$ ) and a higher mean LOS (7.1  $\pm$  6.5 vs. 10.2  $\pm$  11.3 days,  $p<0.0001$ ). **CONCLUSIONS:** Total direct medical costs and LOS are higher for patients with HAI compared to those without HAI. Policy changes in the reimbursement of HAI cases made in 2008 showed a reduction in the rate of HAIs in the "at-risk" population.

#### PIN119 EVALUATION OF THE EFFECTIVENESS OF IMPLEMENTING AN ANTIMICROBIAL STEWARDSHIP PROGRAM IN A MEDICAL CENTER IN TAIWAN

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