stratified by the stage of disease. RESULTS: Annual outpatient costs per patient were €694,877, and US$1409 for Qingdao, Nanjing, and Beijing, respectively. Among outpatient expenses, western medications formed the bulk of these costs in Qingdao (58.9%) and Beijing (62.9%), but a lesser amount in Nanjing (46.9%). The use of anti-venom was high in Beijing and 17% in Qingdao of total western medications. TCM prescriptions for CHB varied across these different cities with the greatest usage in Nanjing (20.8%). For hospitalized patients, annual costs per patient were €1893, 2101, and US$2622 in Nanjing, Qingdao, and Beijing, respectively. The costs increased progressively in patients with compensated liver disease, (US$1983) decompensated liver disease (US$2802) and hepatocellular cancer (US$3019), respectively. Patients contributed around 50% towards outpatient costs and 30% towards inpatient care.

CONCLUSIONS: CHB exerts a significant health and financial burden which progressively increases as patients progress from early to late stages of the disease. While antivirals are associated with a reduction in disease progression, their use remains relatively low in urban areas in China. Further work is required to determine whether an early treatment with effective CHB medications can reduce the overall financial burden within China.

**BUNERD OF PEDIATRIC INFLUENZA IN EUROPE: A GAP ANALYSIS**

**Burcroft C,1 Beard S,1 Laugherkamp O,2 Morren S3**

RTI Health Solutions, Manchester, UK; 1Medtrum, Cambridge, Cambridgeshire, UK; 2Medtrum LLC. Gainesville, MD, USA

OBJECTIVES: Outbreaks of influenza often incur a substantial burden in terms of health care costs and societal costs. The aim of this study was to identify gaps in available data related to the economic burden of influenza in children in the UK, Germany, Italy, Spain, France, Sweden, The Netherlands, Finland, and Austria. METHODS: A structured literature search (1970-March 2009) involving PubMed, EMBASE, and the Cochrane Library framed the basis of the gap analysis. Articles were excluded if not related to influenza and not reporting resource use, cost, absenteeism or utility data in a country of interest for a group <18 years. A total of 171 articles were short-listed for full-text review, and data extracted from 43. RESULTS: Available published data suggests a significant burden of influenza in children. Most studies reporting health care utilization (31 of 32) focused on hospitalization, physician visits, and prescription of antibiotics, antipyretics, or analgesics. Regarding cost burden of influenza, the number of studies specifically related to the pediatric population was small, and rarely included a breakdown by age group and disease severity. Absenteeism data focused on missed days at day care/school or parental lost work days. Little information was reported on household contacts or on productivity. Studies reporting impact on quality of life were very limited. Burden information is fragmented and incomplete. Only for Italy, France, and Spain are data available from multiple studies specific to a pediatric cohort. CONCLUSIONS: Existing information suggests a significant burden of influenza in children. Burden information across reviewed EU countries is incomplete and fragmented. A multinational data collection initiative providing a complete and age-stratified picture of the burden of influenza in children appears warranted.

**BUNERD AND COST OF SNAKEBITE ENVENOMING: ANTIVENIN OUT OF REACH?**

Aggarwal A,1 Pathak P,2 Thakur D2

Heron Health Private Ltd, Chandigarh, India

OBJECTIVES: Antivenin is the only specific treatment to prevent neurological disorders, amputation and death in snakebite envenoming, categorized as neglected tropical disease by WHO. Majority of victims are young and economically productive. Hence, the impact of their disability is considerable. We reviewed the burden and associated costs of snakebite envenoming: its incidence, morbidity and mortality and the access to anti-venom treatment. METHODS: The information was retrieved from 1985-2009 from MEDLINE, Google Scholar and WHO website with search terms including “snakebite”, “antivenin”, “cost of antivenin” and “snakebite morbidity and mortality”. RESULTS: Snakebite as a tropical disease causes considerable morbidity and mortality worldwide with global annual estimates for 2007 ranging from 1,200,000-5,500,000 for snakebite incidence to 42,1000-1,841,000 and 20,000-94,000 for envenoming and deaths respectively. South Asia (121,000) has the highest number of envenoming followed by Southeast Asia (>114,000) and east-Sub-Saharan Africa (43,000). The price of anti-venom has typically risen by 10 fold over the last 20 years. As an example, the costs to Australian hospitals of CSL polyvalent and taipan antivenoms were A$1833 and A$1577 in 2003 as compared to A$300 and A$245 in 2000, respectively. The number of anti-venom vials increases with severity (upto 5, 10 and 20 for mild, moderate and severe cases respectively) thereby increasing cost of treatment. Inadequate anti-venin supply further exaggerates this problem as when the current annual need amounts to 10,000,000 vials. Incidence is higher in rural areas, where incomes are generally lower. In Nepal, out-of-pocket expenses (US$69) equal several months of income as most people have a daily incomes of <1-2 US$. Besides 15 days of working incapacity period. CONCLUSIONS: The excessive cost and inadequate supply of anti-venin renders it inaccessible to most people in developing countries. Appropriate measures should be taken to prevent the clinical and economic impact of this neglected disease.

**ANNUAL COSTS OF CHRONIC HEPATITIS B DISEASE STATES IN PORTUGAL**

Rakis M,1 De Cock E1,2,4 Marinho RT1,3,4 Areias J1,5 Calhau F1, Carvalho A1,4,5 Matos U,6 Rodrigues V1,2,5 Macedo O,5 Valente J,5 Pereira RL1,2

1United BioSource Corporation, Barcelona, Spain, 2Hospital Santa Maria, Lisbon, Portugal, 3Hospital de Santo Antônio, Porto, Portugal, 4Hospital Santo Antônio dos Capuchos, Lisbon, Portugal, 5Hospital das Universidades de Coimbra, Coimbra, Portugal, 6Hospital Egas Moniz, Lisbon, Portugal, 7Hospital Público Valente, Lisbon, Portugal, 8Hospital de S. Marçal, Braga, Portugal

OBJECTIVES: Despite a significant decrease over the last 20 years, the prevalence of hepatitis B remains high in Portugal (an estimated 36,000 cases in 2002). Hepatitis B represents a relevant public health issue due to its dramatic consequences when it turns chronic, namely the associated risk of cirrhosis and hepatocellular carcinoma. The aim of this study was to estimate annual cost of disease states associated with chronic hepatitis B (CHB) from the perspective of Portuguese NHS. METHODS: We estimated the resource use to treat CHB and its disease states, namely Compensated Cirrhosis (CC), Decompensated Cirrhosis (DC), Hepatocellular Carcinoma (HCC) and Liver Transplantation follow-up (LT). A panel of 8 specialists from Portuguese NHS hospitals were surveyed using a modified Delphi technique. Data were collected for outpatient visits, laboratory tests, diagnostic and interventional procedures, drugs (excluding antivirals) and hospitalisations. RESULTS: The resource use for all categories increases with severity of disease. Estimated average annual costs are €1,125 for CHB, €1,761 for CC, €18,278 for DC and €26,388 for HCC. Cost for LT procedure within Portugal- GDRG is estimated at €100,785, while average post-LT costs are estimated at €368,000 and €24,780 for the first and subsequent years, respectively. Costs for CHB and CC are mainly due to outpatient visits and serology tests. By contrast, inpatient days are the main driver of costs for DC (79%), HCC (50%) and post-LT in the first year after treatment (71%). Drugs represent the second major component of costs for HCC (27%), and post-LT in the first year (78%) related to immunosuppressants and hepatitis B immunoglobulin respectively. CONCLUSIONS: Our study shows that annual costs of managing CHB disease states are high and increase substantially with disease severity. Both economic arguments and public health ones point to the necessity to control CHB infection and its progression.

**POOR ADHERENCE TO TREATMENT WITH PEGYLATED INTERFERON AND RIBAVIRIN IN PATIENTS WITH CHRONIC HEPATITIS C INFECTION IS ASSOCIATED WITH GREATER HEALTH CARE COSTS**

Baran KW1, Bhor M2, Laitinen D2, Ducic B2

1Abbott Laboratories, Inc, Abbott Park, IL, USA, 2Abbott Laboratories, Abbott Park, IL, USA

OBJECTIVES: Poor adherence is a serious issue in the management of patients with chronic hepatitis C (CHC) owing to the difficulty of treatment with pegylated interferon/ribavirin ( Peg-IFN/RBV). Future small molecule treatments may obviate difficulties of Peg-IFN/RBV therapy. We analyzed cohorts of CHC patients treated with Peg-IFN/RBV to quantify the impact of medication adherence on health care costs over 4 years follow-up. METHODS: A retrospective claims analysis was performed from January 1, 2001 through December 31, 2007 using the Medstat MarketScan data base. Inclusion criteria: 1) CHC patients greater than 18 years; 2) who initiated Peg-IFN/RBV treatment in 2002 (index); and 3) continued for greater than 24 weeks from index. Continuous enrollment from 6 months prior to index (baseline) to 48 weeks after index (follow-up) was required. Patients were excluded if they had a diagnosis of HIV or HBV. Adherence was defined by medication possession ratio (MPR), days with Peg-IFN/RBV divided by 336 days or 48 weeks. Overall Medical and Pharmacy costs were compared between adherent (MPR > 80%) versus non- adherent patients (MPR < 80%), controlling for age, gender and baseline costs. RESULTS: A total of 1,173 patients met study inclusion criteria (adherent, n = 351; non-adherent, n = 854). The majority of patients were male (64.5%); the mean age was 47 years. Univariate analysis revealed that Overall Medical, ER, Inpatient and Outpatient Hospitalizations, and Pharmacy costs were significantly greater (P ≤ 0.05) in non-adherent compared to adherent patients. Multivariate analysis confirmed these results (difference in mean; 95% CI) for Overall Medical ($10,006; 1530-18,482) and Outpatient Hospitalization ($3,024; 535-5,494) costs. CONCLUSIONS: Medication non-adherence to Peg-IFN/RBV treatment was associated with greater health care costs. These results may be due to decreased Sustained Viral Response associated with low adherence. Treatment with future small molecules may potentially improve adherence and reduce costs.

**DIFFERENT APPROACHES FOR ESTIMATING INDIRECT COST IN THE ECONOMIC ASSESSMENT OF PNEUMOCOCCAL VACCINES IN GERMANY**

Lohndorf D, Knoll S

GlasnSmidtKine GmbH & Co. KG, Munich, Bavaria, Germany

OBJECTIVES: To quantify and compare the impact of using different methods for measuring indirect cost on the total disease cost in the economic assessment of 7-valent pneumococcal conjugate vaccines (PCV7) versus pneumococcal non-typeable Haemophilus influenzae protein D conjugate vaccine (PHiD-CV) in Germany. METHODS: Five different ways of using the human capital (HCM) and friction cost method (FCM) for estimating indirect cost have been incorporated into an age-compassmental, one-year cross-sectional, vaccine steady-state, population-based model assessing the
economic benefit between two different pneumococcal vaccines. Indirect costs were estimated for both vaccines according to the five approaches to assess the methodological influence on the total disease cost difference between PCV-7 and HDM-VC. Baseline indirect cost estimates include the cost of productivity losses of paid workers due to disease, sequelae, and early death. Some of the approaches include in terms of cost: children's future productivity losses, unpaid work loss and parents' work loss, when looking after their sick children. RESULTS: Compared to FCM, HCM based approaches constantly generated higher estimates of indirect cost. Results of HCM ranged between €1.1bn (PHID-VC) and €1.2bn (PCV-7) and €1.9bn (both vaccines), while for FCM they ranged between €0.2bn and €0.9bn (both vaccines). Cost attributed to earlier death varied with a factor of 35; indirect cost due to earlier death as a proportion of total indirect cost varied between 16% (conservative FCM) and 79% (conservative HCM). The overall impact on total disease cost differences between the two vaccines did not alter with any approach selected (PHID-VC always dominates PCV-7), but the amount of savings significantly differs depending on the used method. CONCLUSIONS: Although different approaches for estimating indirect cost have a big impact on the final economic evaluations, the difference in Germany, the rating of these vaccines (PCV-7 dominated by PHID-VC) stays unaffected. FCM always generates lower estimates than HCM.

CLINICAL AND ECONOMIC IMPACTS OF BACTERIA CAUSED BY EXTENDED-SPECTRUM BETA-LACTAMASES PRODUCING ESCHERICHIA COLI IN HONG KONG

Mas SS, Chung CC, M in Yau PI
The Chinese University of Hong Kong, Shatin, N.T., Hong Kong

OBJECTIVES: To evaluate the clinical and economic impact of bacteria caused by extended-spectrum beta-lactamases (ESBL) producing Escherichia coli. METHODS: A retrospective case series was conducted in a teaching hospital in Hong Kong. Patients who had blood cultures positive for ESBL-producing E. coli were matched with patients who had bacteria caused by non-ESBL-producing E. coli from January 2002 through December 2004. Demographic data, clinical factors and health care resource utilization for bacteremia were retrieved from medical records. Case-mortality measurements included mortality, infection-related cost and infection-related length of stay. RESULTS: Thirty-five case patients with ESBL-producing E. coli bacteremia were matched with 35 control patients without ESBL-producing E. coli bacteremia. The mortality rates were 8/35 (22.9%) in cases and 3/35 (9%) in controls. The average total cost for cases and controls were HK$51,100 ± $44,292 and HK$30,300 ± $19,427 (USD1 = HKD7.8), respectively. Mean infection-related length of stay in cases was 11.5 ± 4.9 days and 8.4 ± 5.2 days in controls. Multiple regression analysis showed that ESBL production was not significantly associated with mortality, but it was a significant predictor of infection-related cost (ME: 1.32; 95% CI = 1.04-1.69; P < 0.001) and infection-related length of stay (ME: 1.42, 95% CI = 1.16-1.73, P = 0.001). CONCLUSIONS: ESBL-production was associated with increased length of stay and direct medical cost for treatment of E. coli bacteremia.

COST-EFFECTIVENESS OF COMBINATION ANTIVIRAL THERAPY WITH VALGANCICLOVIR AGAINST INFECTION FROM CITOMEGALOVIRUS IN PATIENTS WITH RENAL TRANSPLANTATION

García-Tellez I1, Alberú J2, Sierra-Madero J3
1Roche México, Mexico D.F, Mexico, 2National Institute of Medical Sciences and Nutrition, Mexico D.F., Mexico

OBJECTIVES: Compare the economic impact of prophylaxis with valganciclovir against cytomegalovirus (CMV) infection versus non-prophylactic decision, in renal transplantation recipients, for analysing cost of treatment. METHODS: Economic evaluation through a theoretical analysis cost to assess the impact of using prophylaxis with valganciclovir (450 mg every 12 h for 100 days) compared with no prophylaxis, in patients receiving a renal transplantation with high (DR+/R-) and intermediate (R+) risk of CMV disease. Outcomes evaluated were secondary morbidity due to CMV infection, including organ rejection. Calculations about the referred complications were based on informed frequencies from medical literature. Costs were evaluated from the service provider perspective, in US dollars and include the resources used for prophylaxis and complications. Cost analysis results from the difference between symptomatic disease due to CMV, the cost of treating an acute rejection and the financial pressure regarding both situations. The number of patients needed to treat (NPT) for achieving clinical success was calculated. RESULTS: Based on a hypothetical scenario of 1 thousand patients, equally distributed in each group, the frequency of symptomatic infection in the valganciclovir group would be 1% against 31% in the non-prophylaxis group. The same tendency is kept regarding development of symptomatic infection (4% vs. 32%) as well as organ rejection (1.5% vs. 16.1%). CONCLUSIONS: With this theoretical pharmacoeconomic evaluation it is demonstrated that the use of prophylaxis with valganciclovir might be a cost-saving alternative for a medium-term perspective, derived from reduction in the frequency of infections and indirect events related well as a lower percentage of patients with intermediate risk (R+), a comparison must be established between costs of prophylaxis and pre-emptive intervention, because the last might reduce medications consumption but increasing diagnosis and monitoring costs, as well as not avoiding indirect events related to viral replication.

COST OF DIABETIC FOOT INFECTIONS DUE TO MRSA: AN ECONOMIC ANALYSIS OF DATA FROM PATIENTS TREATED WITH LINEZOLID IN SPAIN

Zaragoza R1, García M2, Blanes L1, Flores J2, Clacón A1, Hernández P3, Escuder E2
1Servicio de Medicina Intensiva, Hospital Universitario Dr. Peset, Valencia, Spain, 2Pfizer, Pfizer Nippon, Spain, Servicio de Angiología y Cirugía Vascular. Hospital Universitari Arnau de Vilanova, Valencia, Spain, 3Servicio Medicina Intensiva-UI. Hospital Universitari Arquitecta México D.F., Mexico, 4Servicio de Cirugía Cardiovascular. Hospital Reina Sofia, Córdoba, Spain

OBJECTIVES: The aim of this study is to calculate direct cost of management diabetic foot infection (DFI) due to MRSA in diabetes mellitus (DM) patient-population treated with linezolid and to identify the most important factors related to treatment costs. METHODS: A cost-study was performed with data from 70 prospectively patients with DM treated with linezolid from 2006-2008 in 10 Spanish Hospitals included in a non-comparative clinical trial. Cost for in-patient-stay, and outpatient management were calculated retrospectively from diagnosis until healing or death in those patients where the cost data could be estimated. Cost for linezolid treatment (IV, oral), Wound debridement and monitoring were also estimated. Resource utilization not collected during the study was based on published literature. Cost data derived from literature and Spanish database. Mean values for each item were used to calculate cost average. All costs are expressed in Euros 2007. RESULTS: Mean age was 63.2 years old (SD 13.0), being 68.1% males. Duration of DM was 16.5 years. A total of 55 patients healed without amputation (78.6%) and 9 (12.9%) healed after amputation. Total cost for a patient without amputation was €9429.7 (95% CI 8404.2–10453.3), while corresponding cost for a patient with amputation was €9949.9 (95% CI 8034.3–13845.6). Hospitalisation accounts for 54% of cost of treating DFI in patients without and amputation, respectively. CONCLUSIONS: These are the first cost data results for DFI due to MRSA in Spain. Amputations were associated with high cost mainly due to surgery and long-term cost. These findings suggest the potential efficiency of a targeted approach program to prevent amputations in patients with DFI.

USE OF NET-BENEFIT REGRESSION FRAMEWORK TO INVESTIGATE THE COST-EFFECTIVENESS OF COMBINATION ANTIVIRAL THERAPY AMONG HCV-INFECTED PATIENTS ENROLLED IN A MANAGED CARE ORGANIZATION

Hsu SC1, Kauf TL2
1University of Florida, Gainesville, FL, USA

OBJECTIVES: Whether combination antiviral therapy is cost-effective for patient with HCV in the real-world setting has not yet to be shown. This study is to compare the cost-effectiveness of combination antiviral therapy with no treatment in cirrhotic patients with ≥1 doses of combination prescriptions (base case), and with ≥48 weeks