

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 antivirals is 20% in Nanjing and 37% 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.

PIN20

BURDEN OF PEDIATRIC INFLUENZA IN EUROPE: A GAP ANALYSIS

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OBJECTIVES: Outbreaks of influenza often incur a substantial burden in terms of health care utilization, health care costs and societal costs. The aim of this analysis 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 formed 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, clinician 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 reductions in 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.

PIN21

BURDEN AND COST OF SNAKEBITE ENVENOMING: ANTIVENOM OUT OF REACH?

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OBJECTIVES: Anti-venom 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 economic impact of their disability is considerable. We reviewed the burden and cost of snakebite envenoming: its incidence, morbidity and mortality rates, 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”, “antivenom”, “cost of antivenom” 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 (111,000) and east-Sub-Saharan Africa (43,000). The price of anti-venom has typically risen by 10 fold over the last 20 years. For 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 1985, 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-venom supply further exaggerates this problem as 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-venom 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.

PIN22

ANNUAL COSTS OF CHRONIC HEPATITIS B DISEASE STATES IN PORTUGAL

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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 therapeutic 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 Portuguese DRG is estimated at €100,785, while average post-LT costs are estimated at €30,540 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 (18%), and post-LT in the first (23%) and second (72%) year, 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.

PIN23

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

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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 database. 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 $\geq 80\%$) versus non-adherent patients (MPR < 80%), controlling for age, gender and baseline costs. **RESULTS:** A total of 1173 patients met study inclusion criteria (adherent, n = 319; 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; 553–5,494) 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.

PIN24

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

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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 (PCV-7) 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-compartmental, one-year cross-sectional, vaccine steady-state, population-based model assessing the