

## PHS39

## DIRECT MEDICAL COST OF COMPLICATIONS IN PATIENTS WITH NON VALVULAR ATRIAL FIBRILLATION AT THE SOCIAL SECURITY IN PERU

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**OBJECTIVES:** Estimate direct medical costs of selected acute complications in patients with non-valvular atrial fibrillation (NVAF) at the Social Security (EsSalud) in Peru. **METHODS:** The electronic database of EsSalud's reference hospital: Hospital Nacional Guillermo Almenara Irigoyen (HNGAI) was used to identify the study population. International Classification of Diseases (ICD) 10 codes were used to identify patients with NVAF and select complications of AF. Complications of interest are: ischemic stroke, hemorrhagic stroke, systemic embolism and myocardial infarction. Stroke events were classified by severity as mild, moderate, severe or fatal. All cases from 2011-2012 meeting the inclusion criteria were reviewed. Patient level data from clinical charts was extracted to estimate resource utilization per patient per event. Costs were estimated using EsSalud's 2013 tariffs manual and expressed per patient in 2013 USD. **RESULTS:** Ischemic stroke costs were estimated at \$1,259, \$1,818, \$4,910, and \$2,829.19 for mild, moderate, severe and fatal events, respectively. Hemorrhagic stroke were estimated at \$1,707, \$2,419, \$11,991 and \$2,111 for mild, moderate, severe and fatal event, respectively. Systemic embolism and myocardial infarction were estimated to cost \$1,707 and \$1,703 respectively. **CONCLUSIONS:** For AF patients within EsSalud, hemorrhagic stroke costs are higher than those estimated for ischemic stroke. As expected, costs increase as the severity of the event increase. These cost estimates can be used as patient-level costs inputs for economic model analysis of AF and its complications, from the perspective of EsSalud in Peru.

## PHS40

## HEALTH CARE PATHWAY AND COST OF OSTEOPOROSIS IN AN ITALIAN POPULATION

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**OBJECTIVES:** To describe Health Care Pathway and cost evaluation of patients with osteoporosis. **METHODS:** From ARNO Observatory, an Italian population database which provides comprehensive data referred to patient as: drug prescription, hospital discharges, imaging, lab tests and diagnostic examination, we analyzed a cohort of 185,489 subjects with osteoporosis in year 2011. A group without osteoporosis, matched by age, gender and LHU was compared to estimate differences in health costs and burden of disease. **RESULTS:** On a population of 5,313,167 over 40 years, we identified 185,489 patients treated with osteoporosis drugs (prevalence 3.5%). Prevalence rate is higher in female than male (6.1% vs 0.1%), modal value on 70-79 years. The average yearly cost/patient is 2.329€, 53% more than pair-matched group. This cost is due for 38.4% to drugs (31% specific drugs, 69% others), 42.8% to hospitalization and 18.8% to lab tests and diagnostic examinations. Most common specific drugs are bisphosphonates (81%), strontium ranelatum (21%), parathyroid hormone (1.2%) and SERMs (0.9%). A considerable percentage (24.8%) did not received vitamin D supplements in association. Compared to control group, patients with osteoporosis received more drugs expression of higher comorbidity (corticosteroids +70%, nervous system drugs +42%, PPI +33%) and were more frequently hospitalized, beyond fractures, for arthritis (+99%, p<0.01) and chronic bronchitis (+52%, p<0.01). Less than 50% of patients controlled their serum calcium levels in the last three years, 32% performed a densitometry and less than a fifth a radiography. **CONCLUSIONS:** A big data infrastructure is a valid instrument to evaluate patient care pathways, monitor the good practice of treatment and estimate cost of illness. In a large community setting of osteoporotic patients, the lack of supplement of vitamin D undermines the effectiveness of the specific pharmacological treatment. Despite low diagnostic approach, patients cost as much to the National Health System especially due to their frequent co-morbidities.

## PHS41

## ECONOMIC IMPACT OF RHEUMATIC DISEASES IN MEXICO

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**OBJECTIVES:** Juvenile Idiopathic Arthritis (JIA), Ankylosing Spondylitis (AS), and Psoriatic Arthritis (PA) are rheumatic diseases which destroy articulations and limit their functions. The evolution of these conditions cause important physical impairment, which leads to disability, work loss, self-sufficiency, and QoL deterioration, among others. The objective is to estimate the economic impact of three rheumatic diseases: Juvenile Idiopathic Arthritis, Ankylosing Spondylitis, and Psoriatic Arthritis during 2011 using registries of the main Social Security Institution in the country called Instituto Mexicano del Seguro Social (IMSS). **METHODS:** It was review all registries related to the indications mentioned at different settings of care: ambulatory visits to GP and specialist, emergency room (ER), and hospital discharge (HD) of IMSS from January 1st to December 31st, 2011. Based on this information it was calculated the cost of care using unitary cost published by the Institution according to the type of service and the hospital DRG implicated. **RESULTS:** In 2011 the IMSS provided 45,528 consultations for AS, 51% were for patients between 30-49 years-old. 28,716 (63%) were for GP, 16,257 (36%) specialist; 555 (1%) ER, and 91 HD. For JIA, there were 6,285 consultations; 1,766 (28%) were for GP; 4326 (69%) for specialist; 193 (3%) ER, and 103 HD. For PA there were 1,587 consultations; 619 (39%) for GP; 873 (55%) specialist; 95 (6%) ER, and 195 HD. The costs of the three diseases at IMSS during 2011 were: AS = US \$2.94 million, JIA = US \$0.68 million and PA = US \$0.37 million. The total cost of the three was US \$4 millions (ER 1US=13MXN). **CONCLUSIONS:** These diseases affect quality of life and ability to work, considerably. Therefore, the cost of the three diseases might be underestimated due to productivity loss which is not included in the cost.

## PHS42

## INCREMENTAL HEALTH CARE RESOURCE UTILIZATION ASSOCIATED WITH AUTOSOMAL DOMINANT POLYCYSTIC KIDNEY DISEASE BY END-STAGE RENAL DISEASE STATUS

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**OBJECTIVES:** Incremental health care resource utilization associated with autosomal dominant polycystic kidney disease (ADPKD) was estimated across two sub-groups; individuals with ADPKD and end-stage renal disease (ESRD) and those with ADPKD but without ESRD. **METHODS:** Study data were from a large administrative claims and enrollment database. Individuals 18 y/o or older, enrolled in tracked health plans for 12 months from April 1, 2011 through March 31, 2012, and with an ICD-9-CM diagnosis code for "polycystic kidney, autosomal dominant" (753.13) or for "polycystic kidney, unspecified type (753.12) were identified as having ADPKD, and linked one-to-one with individuals without ADPKD on age and gender. ESRD was identified by presence of ICD-9-CM code 585.6. Zero-inflated negative binomial models estimated incremental hospitalizations, hospital days, outpatient visits, and emergency room visits for each sub-group, adjusting for age, gender, Charlson co-morbidity index, cardiovascular disease, diabetes and geographical region. **RESULTS:** A total of 3,844 individuals with ADPKD who satisfied selection criteria were linked one-to-one with 3,844 individuals without ADPKD. Among persons with ADPKD, 644 had a diagnosis of ESRD. The sample was 53% female and 55% were between 45 to 64 years old. Incremental mean (standard error) resource utilization associated with ADPKD with ESRD as compared to persons without ADPKD was 0.35 (0.052) or 35 additional hospitalizations per 100 patients, 2.5 (0.42) or 250 hospital days per 100 patients, and 24.0 (1.2) or 2,400 outpatient visits per 100 patients. Incremental mean (standard error) resource utilization associated with ADPKD but without ESRD as compared to persons without ADPKD was 0.065 (0.028) or 6.5 additional hospitalizations per 100 patients, 0.5 (0.091) or 50 hospital days per 100 patients, and 4.4 (0.41) or 440 outpatient visits per 100 patients. **CONCLUSIONS:** ADPKD was associated with incrementally greater health care resource utilization even before patients reached ESRD.

## PHS43

## TREATMENT PATTERNS AND COST OF CARE FOR PATIENTS WITH PANCREATIC CANCER

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**OBJECTIVES:** This study evaluated treatment patterns and costs among patients with pancreatic cancer (PC). **METHODS:** A retrospective study analyzed data spanning January 2008-June 2012 from 3 large integrated claims databases. Adult patients with a diagnosis of PC (ICD-9 157.xx) were included if they had a minimum eligibility of 12 months prior and 3 months following their first PC diagnosis and had no diagnosis of cancer in the pre-period. Patients were categorized as having exocrine PC (ICD-9 157.0-157.3; 157.8-157.9), endocrine PC (ICD-9 157.4), or metastatic-exocrine PC (ICD-9 157.0-157.3; 157.8-157.9, 196.xx-199.xx). Treatment patterns, health care resource use, and all-cause costs (2012 USD) were evaluated after cancer diagnosis. **RESULTS:** There were 2901, 6119, and 464 patients in each of the 3 databases meeting all inclusion criteria, respectively. The majority of patients had exocrine PC (97%-98%), with 40%-76% having metastatic disease. Patients were on average 60.3-64.5 (±11.3-14.0) years of age and 43%-52% were female. No treatment was received by 35%-55% of patients, 36%-55% of patients received chemotherapy ± radiation and/or surgery, and 9%-10% received radiation and/or surgery without chemotherapy. Second and third-line chemotherapy was received by 17%-32% and 9%-17% of patients, respectively. Among those with exocrine PC, patients with metastatic disease experienced an average of 0.25-0.31 inpatient, 2.3-2.9 office, 3.0-4.0 other outpatient visits and received 4.2-5.1 prescriptions per month vs 0.09-0.11 inpatient visits, 1.3-1.7 office visits, 1.3-1.9 other outpatient visits and 3.2-4.1 prescriptions per month in those without metastatic disease. Total monthly costs averaged \$9,478-\$12,042 and \$1,022-\$3,084 in patients with and without metastatic disease, respectively. The majority of costs were attributable to medical services (\$7,977-\$11,212 and \$697-\$2,852, respectively), with pharmacy costs contributing to a small proportion of the total costs (\$830-\$1,501 and \$232-\$326, respectively). **CONCLUSIONS:** Health care resource utilization and costs are highest among those with metastatic PC, totaling as much as \$12,042 per month.

## PHS44

## COST OF PATIENT CARE AT DIFFERENT STAGES OF TREATMENT WITHIN THE PUBLIC HEALTH MODEL OF HIV CARE; ANALYSIS FROM AN URBAN HIV CENTRE IN UGANDA

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**OBJECTIVES:** In 2013 a change in WHO guidelines increased the number of people recommended to start antiretroviral treatment (ARVs) from 16 to 28 million worldwide; at present around 10 million are enrolled in care. Additionally the number of people requiring second line antiretrovirals (ARVs) is increasing. Much of this burden is in Sub Saharan Africa (SSA). The Infectious Diseases Institute (IDI) in Kampala, Uganda runs a clinic of 8000 patients; some of these have been on ARVs for >10 years. The objective of this study was to analyze actual costs of different patient subgroups per year at IDI. **METHODS:** We use a fully digitalized electronic patient management system (ICEA), which records individual patient data including all visit information. We linked ICEA to Navision accountancy software, in order to determine the actual cost of patient care from October 2012-October 2013. The analysis was conducted from a provider perspective. We calculated the average cost

of care for different categories of patients including cost of health care provider time per visit, lab tests, ARV drugs and non ARV drugs. **RESULTS:** The cost of treatment for an HIV positive patient with a CD4 count > 350 cells/ uL who has not started ART was \$51/year. The cost of treating a patient on first line therapy in the first year of ART was \$218, and thereafter \$284/yr. The cost of a patient on second line ART was \$1393/year. The cost of treatment of pregnant and patients co-infected with *M. tuberculosis* was \$229/year and \$413/year respectively. The costs are driven predominantly by ARV costs. **CONCLUSIONS:** This analysis shows the actual costs of HIV care at a larger urban HIV clinic in SSA. The increasing number of patients on second line ARVs is likely to dramatically increase the financial burden on health services in SSA in the future.

#### PHS45 PREDICTING HIGH COST ACCUMULATION: APPLICATION OF A GROUPING ALGORITHM FOR SURVIVAL DATA

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**OBJECTIVES:** Approaches for predicting cost accumulation for heterogeneous samples are limited. We employ the Grouping Algorithm for Cancer Cost Data (GACCD) to investigate cost accumulation over time and identify 'high cost' patients. **METHODS:** Two-fold cross validation was used to evaluate survival and cost accumulation using linked prostate cancer (PCa) registry and Medicare claims data from 1999-2009. Patients were grouped according to a refined similarity metric using five patient characteristics (cancer stage, age, Charlson Comorbidity Index (CCI), performance proxy indicator, race). Cost accumulation was evaluated in the test dataset for the GACCD groups identified in the training data. Curves using the test data plotted inverse probability weighted cumulative average total monthly costs (CATMC) for the post-diagnosis period and the proportion of people who were deemed to be 'high cost'. **RESULTS:** Application of the inclusion criteria resulted in 110,824 patients. Median (mean) follow up was 48 (51) months and the mortality rate was 27.3%. The five GACCD groups had distinguishing characteristics e.g., group2 patients were typically older, with CCI above 2 and/or diagnosed with either later stage or unstaged PCa; group3 patients were typically younger, with CCI=0 and diagnosed with early stage PCa. Cost accumulation within the first three years varied across the groups, with the lowest (highest) rate in group3 (group2) in the training dataset. Using the test data: at a threshold of \$10,000 in CATMC, the proportion of patients that was high cost within three years following diagnosis ranged from 82% in group3 to 90% in group2; proportions ranged from 45% in group3 to over 60% in group2 at a threshold of \$25,000; proportions ranged from 15% in group3 to over 30% in group2 at a threshold of \$50,000. **CONCLUSIONS:** A grouping algorithm with a refined similarity metric can identify patient subgroups that will accumulate higher costs over time.

#### PHS46 MONTHLY COST OF THERAPY FOR PALLIATIVE TYPE II DIABETES IN MUMBAI: A SURVEY

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**OBJECTIVES:** (1)Survey to estimate the monthly expenditure of a Type II Diabetes patient in Mumbai. (2)To project the fact that even in absence of health insurance policies by government for its citizens, patients receive free or cost subsidized treatment in the government hospitals. (3)Explore government initiatives in regulating the price of the Diabetes II drugs. **METHODS:** Three sets of structured questionnaires were designed which captured the patient demographics, prescription trends of type II Diabetes patients in Mumbai, India. The survey through questionnaires targeted three government secondary hospitals, two government tertiary hospitals, 35 General Practitioners, 50 Drug stores. **RESULTS:** (1) 46% of the patients detected with type II Diabetes lie in the age group of 50-60 years. (2) Amongst them the population of males affected is little more than females ie. 51% males vs 46% females. (3) The trend of drugs as prescribed by the General Practitioners is same as that of drug prescriptions received by drug stores. The Metformin containing generic brands which fall under The Drug Price Control Order (DPCO) 2013 (cap price removed) is majorly prescribed followed by glipizides, acarbose and pioglitazone containing generic brands. **CONCLUSIONS:** (1) The monthly expenditure of a Type II Diabetes patient in Mumbai is Rs.300 (USD 4.8) when the patient is treated by GP and purchases the drug from the drug stores. (2) The patients are either treated free or in subsidized rates in government hospitals. ie. in 2.4USD per month. (3) The metformin category drugs coming under DPCO 2013 are the majorly prescribed drugs. Thus it is very easy and convenient for type II Diabetes patients in Mumbai to suffice their medical needs in the most reasonable and affordable price and also get free treatment from tertiary government hospitals. Although a federal/government health insurance policy does not exist in India the government through its subsidies or free treatments rightly makes this therapy accessible to the common man of the city.

#### PHS47 UTILIZATION, COSTS AND REIMBURSEMENT OF INPATIENT AND AMBULATORY TREATMENT OF ACUTE BACTERIAL SKIN AND SKIN STRUCTURE INFECTIONS AMONG THE MEDICARE FEE-FOR-SERVICE POPULATION

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**OBJECTIVES:** Recent clinical trials of antibiotics targeted to ABSSSI have included large proportions of patients treated in the ambulatory setting. An objective of this study of real-world patient transaction data was to analyze differences between Medicare patients treated in the inpatient versus the ambulatory setting. **METHODS:** Analysis used Medicare 5% Limited Data Set (LDS) files containing claims for 27,607 patients age ≥18 with a principal diagnosis of ABSSSI between Q4, 2007 - Q3, 2010 from a 5% sample of Medicare beneficiaries, including patients

hospitalized for ≥2 days (hospitalized patients; HPs), or using emergency room (ER) or observation for 1 day (emergency room patients; ERPs). Reimbursements were based on claims and inflated to 2010 USD; costs were derived from 2010 Premier data. Net reimbursement was analyzed by MS-DRG and length of stay (LOS). The risk of all-cause hospitalization and factors correlated with LOS were determined using regression modeling. **RESULTS:** Across all study years, the median age was 71 for HPs, 65 for ERPs. Median Charlson Comorbidity Index (CCI) was 4 for HPs and 2 for ERPs. HPs had more cellulitis on the leg or surgical infection; ERPs had more cellulitis on the face, trunk, or arm. Median HP LOS was 4 days; 33% of patients had LOS >6 days. Age, race, and history of bacterial infection were correlated with LOS. Median all-cause, ABSSSI-related and index event costs during the index quarter for patients with a principle ABSSSI diagnosis were \$9,930, \$6,123 and \$5,604 for HPs and \$1,127, \$108 and \$100 for ERPs respectively. **CONCLUSIONS:** HPs were older and sicker than ERPs, with more cellulitis on the leg and post-operative infections. Further research and analysis may help determine whether treating some hospitalized patients with less comorbidity in the ambulatory setting might result in lower costs per patient after controlling for these factors.

#### PHS49 COSTS AND CONSEQUENCES OF ORAL ANTICOAGULATION IN ATRIAL FIBRILLATION AT THE SOCIAL SECURITY IN PERU

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**OBJECTIVES:** The aims of this study were to determine the clinical consequences and non-pharmacological costs of the usage of oral anticoagulation (OAC) therapy for the treatment of atrial fibrillation (AF) at EsSalud in Peru. **METHODS:** A markov model was adapted to evaluate the clinical and economic impact of OAC on a cohort of 1,000 patients among the AF vitamin K antagonists (VKA) suitable population at EsSalud in Peru. Comparators for the analysis are: apixaban 5mg BID, warfarin 5mg and aspirin 150mg. A lifetime horizon and EsSalud's perspective were used. A discount rate of 3.5% was applied to both costs and outcomes. Efficacy data was taken from the clinical trials for apixaban, ARISTOTLE and AVERROES, which directly compared apixaban with warfarin and apixaban with aspirin, respectively. Resource utilization for each event was collected from a clinical chart review at a specialized care center of EsSalud. All costs were taken from EsSalud's 2013 tariffs and are expressed in 2013 US dollars. Results were validated by an expert panel of clinicians from EsSalud. **RESULTS:** The number of events associated with each anticoagulant therapy (apixaban, warfarin and aspirin respectively) were: stroke (ischemic and hemorrhagic) and systemic embolism 309, 352, 352, major bleedings 116, 149, 102; and event related deaths 401, 447, 445, respectively. Apixaban was associated with a reduction of the non-pharmacological costs when compared with warfarin and aspirin in the range of \$245 - \$1,282. **CONCLUSIONS:** Over a lifetime horizon apixaban demonstrates a reduction in the number of AF complication events and reduction in non-pharmacological costs at EsSalud.

#### PHS50 ECONOMIC BURDEN OF EPIDEMIOLOGICAL CHANGES IN CHRONIC DISEASES IN MIDDLE INCOME COUNTRIES: THE MEXICAN CASE

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**OBJECTIVES:** To assess the costs and financial consequences of epidemiological changes for chronic diseases (HYPERTENSION AND DIABETES) in a middle-income country. **METHODS:** An evaluative approach based on a longitudinal design was used. Direct costs were determined for the functions of production, standards of quality and the estimation of inputs costs. Indirect costs were determined by using a human capital model for Latin America which uses indicators of premature mortality and disability (temporary or permanent). Probabilistic models were developed to estimate epidemiological changes during 2010-2012 by using the Box-jenkins technique. Finally, the economic burden was obtained for disease by applying an econometric adjustment factor. **RESULTS:** Taking hypertension results, comparing the economic impact in 2010 versus 2012 ( $p < 0.05$ ), there is a 24% increase in financial requirements. The total amount for hypertension in 2011 (US dollars) was \$ 5733,350,291. It includes \$ 2718,280,941 in direct costs and \$ 3015,069,350. Costs for hypertension are permanently increasing in regards to economic burden, showing an increase of 33%. This average has differences for insured and uninsured populations. **CONCLUSIONS:** Health care systems and society in middle income countries will face important challenges on health financing, universal effective coverage and financial protection for the uninsured, if the risk factors and the health care model remain as currently are. The major economic impact of chronic diseases will be in users out of pocket expenditures because of indirect costs. We suggest an important reorganization of the planning process, the health care model and the allocation of resources mechanisms, in order to strengthen health care and access to hospital and outpatient services for patients suffering a chronic disease.

#### PHS51 COST-EFFECTIVENESS ANALYSIS OF GOVERNMENT INSURED ROUTINE EYE EXAMINATION: EVIDENCE FROM PRINCE EDWARDS ISLAND, CANADA

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**OBJECTIVES:** Visual loss is significantly associated with increased risk of mortality and decreased quality of life. In Prince Edward Island (PEI), Canada, eye examination and cost of eyeglasses are not covered by provincial health insurance. This study aimed to assess the cost-effectiveness of insured eye examination compared to non-insured eye examination for PEI residents. **METHODS:** A cost-effectiveness analysis was conducted from a perspective of Canada's health care system. A target population was a PEI resident aged 42 years or older. Risk of vision loss and utility data were