population-based cohort to inform health care planners on trends in costs and resource needs related to fractures. **METHODS:** We used the Population Health Research Data Repository for the Province of Manitoba, Canada which is a comprehensive collection of databases including physician visits, hospitalizations and pharmaceutical prescriptions. Age and sex-adjusted fracture rates were calculated for men and women age fifty years and older from 1986 to 2006 according to fracture site (defined by ICD-9-CM codes) and mechanism (presence/absence of ICD-9-CM external injury codes). Generalized linear models with generalized estimating equations were used to derive adjusted annual rates and test the linear change overall, and for men and women separately. **RESULTS:** Osteoporotic fractures (non-traumatic fractures of the hip, forearm, spine and humerus) showed a significant linear decline (0.8% per-annum [95% CI 0.3–1.2%]), with a greater decline in women (1.0% [0.4–1.7%]) than in men (0.5% [0.0–1.3%], $P < .05$ for sex interaction). Similar trends were seen for all fractures sites: hip 0.9% (0.2–1.7%), forearm 0.8% (0.4–1.3%), humerus (0.7% [0.2–1.2%]) and spine (0.5% [0.0–1.0%]) A greater reduction in traumatic fractures was observed (1.8% per-annum [95% CI 1.0–2.6%]), with a greater decline in men (2.2% [1.3–3.1%]) than in women (1.3% [0.2–2.4%], $P < .05$ for sex interaction). Similar results were seen when testing the difference between the initial 5 years (1986–1991) and the final five years (2001–2006) of data. **CONCLUSIONS:** We observed a decrease in both non-traumatic (osteoporotic) and traumatic fracture rates over the study period. This decline was apparent in years prior to widespread osteoporosis testing or availability of modern pharmacotherapy.

PMS10

RECURRENT FRACTURES AFTER FIRST HIP FRACTURES POSHIP(PREVENTION OF SECOND HIP FRACTURES) STUDY

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OBJECTIVES: It has been reported that bone fracture the risk of developing increases for patients who had fractures once before, and and that such patients do not receive enough osteoporosis treatment. In this present study, we investigated incidence of recurrent fractures and the circumstances of pharmacotherapy for osteoporosis among patients who had experience first hip fracture. **METHODS:** Female patients 65 years and older who had experienced first hip fractures from January 1, 2006 to December 31, 2007 were enrolled at 25 hospitals.We reviewed their medical records and conducted a patient survey to collect information on surgical methods, osteoporosis treatments and prognosis for 1 year after first hip fracture.The questionnaires were filled out by either the patient or family member. This interim analysis was conducted for 477 patients of 7 hospitals out of 2,266 enrolled patients. **RESULTS:** The average age was 84.0 (66–103) years old. In terms of fracture type, we identified 237 cervical cases and 237 intertrochantric fractures, with 3 cases that were not specified. A total of 94.3 % of the patients received an operation. During hospitalization, 26.2% were on pharmacotherapy and 22.9% received no pharmacotherapy. For the observational period, 1 year after first fractures, 13.4% of the patients received pharmacotherapy, but 57.2% received no treatment. For the observational period, 44 patients (9.2%) experienced recurrent fractures and 18 (3.8%) out of those suffered hip fractures. **CONCLUSIONS:** In this study, the incidence of recurrent hip fractures among patients who have already experienced a first hip fracture was 3,800/100,000 person-year. This is 7.4 times the rate found in the general population of the same age group. Despite this increase in incidence rate, only 13% of patients had received osteoporosis treatment after the first hip fracture. Japanese patients who have already suffered from a first hip fracture must be considered high risk patients who should be treated with preventive action.

PMS11

LONG-TERM MORTALITY RATES AFTER INCIDENT FRACTURES IN A POPULATION-BASED COHORT OF MEN AND WOMEN

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OBJECTIVES: Osteoporosis is characterized by low bone mass and increased fracture risk. Increased mortality rates have been documented following fractures, particularly hip and vertebral. Our aim was to compare short-term and long-term mortality rates following an incident fracture in men and women at different sites (hip, wrist, spine, humerus and others). **METHODS:** We identified a population-based cohort of men and women with non-traumatic incident fractures between 1986 and 2006 within the hospital, physician and pharmacy administrative database repository of the Province of Manitoba, Canada. The cohort-entry date was the date of a first fracture (index fracture) after age 50 years. Two matched controls from the same databases were identified for each case. Crude and adjusted mortality rates for each fracture site were computed separately for men and women. Secular trends in fracture site-specific mortality rates over the study period were tested using generalized linear models. **RESULTS:** We identified 23,514 index fractures in men and 52,897 in women. The crude mortality rates were consistently higher in men compared to women. Highest first year mortality rates were noted after hip (women 20.1% vs. men 33.6%) followed by spine fractures (13.9% vs. 15.8%), with lower mortality rates after humerus (7.4% vs. 15.3%), wrist (3.4% vs. 5.3%) and other fractures (9.2% vs. 11.0%). Similar rankings by fracture site were seen for year five mortality: hip fractures (women 53.1% vs. men 66.7%) followed by spine (38.4% vs. 43.1%), humerus (26.6% vs. 41.2%), wrist (15.7% vs. 21.2%) and other fractures (26.5% vs. 29.3%). Post-fracture mortality rates were generally stable over the study period. **CONCLUSIONS:** Fractures at all sites are associated with significant mortality rates, particularly in men. Better understanding of factors associated with increased post-fracture mortality will inform the development of practice guidelines and improved clinical outcomes.

MUSCULAR-SKELETAL DISORDERS – Cost Studies

PMS12

PROBABILISTIC ANALYSIS OF BUDGETARY IMPACT: GLUCOSAMINE IN KNEE OSTEOARTHRITIS TREATMENT

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OBJECTIVES: To determine the financial impact of inclusion of glucosamine in the hospital formulary of Petchabun Hospital. **METHODS:** Conventional NSAIDs, celecoxib, glucosamine were included in the analysis. Hospital perspective was used and we considered only patients who failed to control pain by acetaminophen. Treatment cost of GI and CV event was calculated based on decision tree model in which cooperated with probability from the literature and local DRG cost data. Average cost of drug use per patient per year was calculated from the medical history and computerized dispensing data. Delphi technique with all treating orthopaedics was used to obtain the estimates of number of patient eligible for glucosamine use and effect on volume of other drugs' use in the following years. Probabilistic analysis was used to capture the certainties around estimations. We analyzed this data in a 5-year timeframe (2005–2009) as we assumed the steady penetration of glucosamine was reached. **RESULTS:** In 2005, we estimated there was an increase in drug budget for knee osteoarthritis treatment around 0.8 million baht (23,000 US$) which was growing from 2004 at 7%; it was similar to the growth rate in the ealier year. This was mainly due to the expected reduction in NSAIDs and coxib uses. The forecast budget impact in 2006–2009 were about 0.8, 0.6, 0.5, and 0.2 million baht at the growth rate 6.2%, 4.4%, 3.5% , and 1.5%respectively. Cost of glucosamine was found to be the most sensitive variable, followed by cost of celecoxib and number of patients using glucosamine. **CONCLUSIONS:** Hospital administrators found that glucosamine use resulted in an affordable financial burden to the drug budget for knee osteoarthritis in the hospital. However, to ensure the effective use of glucosamine, they developed the guideline for glucosamine use and also monitor the clinical and economic outcomes. Updated analyses were also recommended to obtain the reliable information for budget planning in the following years.

PMS13

BUDGETARY IMPACT OF A NEW URATE-LOWERING THERAPY (ULT) FOR THE TREATMENT OF GOUT IN A US HEALTH PLAN FORMULARY

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OBJECTIVES: Gout is a chronic condition caused by hyperuricemia, a metabolism and excretion disorder characterized by intense pain "flares" in affected joints. The objective was to estimate budgetary impact of adding febuxostat to a US health plan formulary for gout treatment. **METHODS:** An interactive model was developed using decision analysis methods comparing expected annual number of gout flares and associated costs among members treated with febuxostat 40 mg/80 mg vs allopurinol 300 mg for 1 year. Underlying model data and default inputs were obtained from clinical trials, retrospective studies, and published literature. Gout prevalence was 1%, among which 34% were estimated to be treated. Average febuxostat 1-year market share was assumed to be 3.9%. Model outputs included total per-member per-month (PMPM) cost; gout-, tophi-, and flare-related medical costs and total pharmacy costs, and number needed to treat (NNT). Costs were adjusted to 2008 $US. User-modified sensitivity analysis on gout prevalence, ULT market share, and pharmacy cost was conducted. **RESULTS:** In a hypothetical 1-million-member health plan, adding febuxostat 40 mg/80 mg to the formulary is expected to increase total annual cost by $0.008 PMPM, reduce gout-related costs by $26,010, and increase pharmacy costs by $124,494. Model data projected a reduction of 22 flares when adding febuxostat to the formulary and NNT of 6.25 patients on febuxostat to prevent 1 gout flare. Sensitivity analyses indicate a positive relationship between febuxostat market share and gout flares avoided and gout-related medical costs. **CONCLUSIONS:** This robust model evaluates the 1-year pharmacy and medical cost offsets on total payer budget. Adding a new ULT to a US health plan formulary minimally impacts total payer budget as shown by the marginal PMPM cost increase and significant gout-related medical savings.

PMS14

MODELING THE PROGRESSION OF RHEUMATOID ARTHRITIS IN ITALY: BUDGET IMPACT ANALYSIS FOR BIOLOGIC AGENTS

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OBJECTIVES: Two simulation models were developed to analyze the cost and outcomes of the biological agents currently marketed in Italy vs disease-modifying antirheumatic drugs (DMARDs) that affect the progression of rheumatoid arthritis (RA). **METHODS: A Markov model over 10 years was constructed with four disease states** according to functional status (HAQ). Disease progression (transition probabilities between the states) was taken from clinical trial data and published literature. Patient

mortality depends on epidemiological evidence relating reduced risk to HAQ improvement.. Costs and utilities associated with different HAQ levels were based on data from cohort studies and cross-sectional surveys in Italy. **RESULTS: In the base case** scenario (10% of patients treated in each disease state) we estimated that treatment with any biologic **had an incremental cost of 26.4% over 10 years (including only** direct costs**). By analysing each disease state separately, costs vary from 22.3% to** 28.3%. **The inclusion of potential avoided nursing home admissions and indirect** costs/lost employment further improved the cost-effectiveness ratio. The model shows that a higher percentage of treated patients with a HAQ score between 1.1 and 2.6 improves the cost-effectiveness ratio. **The greater effectiveness of biological agents** contribute to maintaine patients in less severe disease states by favoring disease improvement and remission; this significant health benefit is also reflected on mortality rate. **Sensitivity analyses showed long-term HAQ progression with biologic therapies** and discounting as most sensitive variables. **CONCLUSIONS: Our results suggest that** biologic therapies are cost-effective when compared with DMARDs. The model is further suitable for use in a wide range of other cost-effectiveness questions in rheumatoid arthritis. It appears to accurately capture disease progression and its effects and can therefore be useful for estimating cost-effectiveness of new treatments in RA in different Italian health care settings.

PMS15

ECONOMIC IMPACT OF BIOTHERAPIES FOR THE TREATMENT OF RHEUMATOID ARTHRITIS (RA) IN FRANCE

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OBJECTIVES: To evaluate the annual economic impact of biotherapies for the treatment of RA patients. **METHODS:** Target population was defined as adults belonging to RA medical Diagnosis Related Group (DRG) in the French national database of the Information System Program Management (PMSI) in hospital. The total direct costs considered were: treatment costs (current published prices, April 2009), hospitalization costs including administration cost in hospital (DRG, V11 March 2009), and for ambulatory patients the rheumatologist follow-up and subcutaneous injection costs. Treatment cost was calculated according to treatment dose, length and duration as reported in real life data. Real life data were based on a registry (AIR PR) and record from market analysis (A + A panel study March 2008). Biotherapies market share data were issued from the GFK Performance Tracker (Q3 2008). **RESULTS:** A total of 15,873 patients were identified in 2007 with biotherapies of Abatacept: 952 (6), €19,618 (81), €18,676,336 (8); **Adalimumab: 4762 (30),** €14,950 (patient injection) (99), €15,464 (nurse injection) (98), €71,252,500 (32); **Etanercept: 5873 (37),** €14,693 (patient injection) (99), €14,849 (nurse injection) (98), €86,575,567 (39); Infliximab*: 2381 (15), € 12,144 (84), €28,914,864 (13); **Rituximab**: 1905 (12),** € 6,451 1 cycle (89) €12,789 2 cycles (90), €16,029,434 (7); Total: **15873 (100), NA, €221,448,701 (100)** for **Patients N (%), Annual costs / patient (% acquisition costs),** Total annual costs (%).**CONCLUSIONS:** In real life setting annual RA treatment costs/patient in France varies from €6,451 to €19,618 depending on the biotherapy used. Drug acquisition cost represents the major part of the annual costs. The global annual cost is €221, 448, 701.

PMS16

BUDGET IMPACT ANALYSIS OF TOCILIZUMAB UNDER THE PRIVATE PAYER PERSPECTIVE IN BRAZIL

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BACKGROUND: Rheumatoid arthritis (RA) is a systemic autoimmune disease which affects about 0.5% of the population in developing countries. The current biologic DMARDs approved in Brazil as 1st line therapy are: infliximab, etanercept, adalimumab (anti-TNF therapies), abatacept (T-cell co-stimulation therapy) or tocilizumab (IL-6 receptor antagonist). **OBJECTIVES:** To assess the budget impact of offering tocilizumab as an option to a pool of patients with rheumatoid arthritis (RA) in Brazil. **METHODS:** The perspective is private payer in Brazil. Only direct costs were considered which comprised of: drug, management and administrations costs [Scheinberg et al. 2005]. Drug costs were taken from public sources [Kairos magazine. May, 2009]. Base case dosages considered were: tocilizumab (8 mg/kg dosage each 4 weeks) and infliximab {4.3 mg/kg (Ollendorf et al. 2005) at weeks 0, 2, 6 and every 8 weeks}, assuming a 70 kg patient, adalimumab (40 mg every other week), etanercept (50 mg every week) and abatacept (750 mg at weeks 0, 2, 4 and then every 4 weeks). The discount rate taken was 5% according to the Brazilian guidelines for Health Technology Assessment (HTA) [Vianna et al. 2007] since a 5-year horizon was taken for this analysis. Both the treatment mix forecast and the tocilizumab penetration change were projected based on market research data. The results are expressed in 2009 Brazilian Reais (US$1 ≈ $Brz2.5). **RESULTS:** Total annual costs were $Brz81,021 for tocilizumab, $Brz92,789 for etanercept, $Brz98,541 for adalimumab, $Brz105,283 for infliximab and $Brz 85,020 for abatacept. Based on the change in the forecast;, a total savings for a period of 5 years were $Brz1,573,902 for each 100 treated patients, when comparing the group of patients received tocilizumab to the group of patients that did not receive tocilizumab. **CONCLUSIONS:** Findings suggest tocilizumab offers potential costs reductions in the private health care system in Brazil.

PMS17

BUDGET IMPACT ANALYSIS OF REIMBURSEMENT OF ARAVA® (LEFLUNOMIDE) IN THE TREATMENT OF RHEUMATOID ARTHRITIS IN POLAND

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OBJECTIVES: The aim of the analysis was to assess the impact on the Polish health care budget the financing of Arava® within ambulatory reimbursement list compared to Arava® financing within the National Health Fund rheumatoid arthritis therapeutic program; all costs were calculated from public payer's perspective in Poland in a one-year time horizon. **METHODS:** Direct medical costs regarding drug costs, diagnostic costs, ambulatory and hospital treatment valid from a public payer's perspective were taken into account in the analysis. Official retail price of Arava® was obtained from Sanofi-Aventis from Poland. Five reimbursement scenarios were taken into consideration depending on reimbursement limits and levels of coverage by public payer. **RESULTS:** Introduction of Arava® on ambulatory reimbursement list results in incremental savings between 4.4 million PLN and 6.4 million PLN (depending on reimbursement scenario) comparing to continuation of Arava® treatment within the rheumatoid arthritis therapeutic program from public payer's perspective. Financing Arava® within reimbursement list could increase number of patients treated with a Arava® from around 4.3 thousands to 5,3 thousands (at present 3 thousands of patients are treated with leflunomide within therapeutic program) or extend duration of treatment with additional from 5 up to 9 months. **CONCLUSIONS:** Financing Arava® within ambulatory reimbursement list generates substantial savings for the public payer in Poland compared to financing within a therapeutic program and provides treatment with Arava® for a greater number of patients with rheumatoid arthritis or extends the duration of treatment.

PMS18

MANAGEMENT AND COST OF SCIATICA IN-HOSPITAL

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OBJECTIVES: To describe the disease management and the cost of patients presenting a diagnosis of sciatica in the hospital perspective. **METHODS:** We performed a local data base request from the medical information system (PMSI) of the University Hospital of Montpellier. We considered three consecutive years (2006, 2007, 2008) which allowed us to get a follow-up and a traceability of patients over this period. We analyzed a group of patients 18–50 years old admitted across acute care, day care or mid-term care sectors with the following diagnosis codes M 54, M 5415, M 5416 and M 5417 of the ICD-10. **RESULTS:** A total of 232 patients were selected over the period representing a total of 541 admissions (i.e. 2.3 admissions per patient). The mean ± SD age was 39 ± 8 years female represent 45% of the patients. We observed 175 admissions in acute care ("less than 24 h" admissions excluded) with a mean length of stay of 7 ± 5.2 days. Day-care represents 15.4% of admission in acute care sector. We observed 38 admissions in mid-term care with a mean length of stay of 3 ± 4.8 days. Few patients (3 %) were admitted consecutively in acute care and in mid term care thereafter. Surgery was the reason of first admission for six patients. The cost is estimated at €2055 per patient admitted in an acute care sector. **CONCLUSIONS:** In our sample, we noted a high rate of admission per patient for diagnosis, medical treatment or physical therapy reasons as the main pattern of sciatica management in-hospital. Admissions for surgery were marginal. Our figures are key information to specify management of sciatica and transition probabilities in decision tree models. Thus, we would simulate the impact of innovative medical device on the burden of disease and disclose where are the most prominent societal benefits.

PMS19

BUDGET IMPACT ANALYSIS OF TOCILIZUMAB UNDER THE PUBLIC PAYER PERSPECTIVE IN BRAZIL

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BACKGROUND: Rheumatoid arthritis (RA) is a systemic autoimmune disease which affects 0.5% of the population in developing countries. The current biologic DMARDs approved in Brazil as 1st line therapy are: infliximab, adalimumab, etanercept, (anti-TNF therapies) and abatacept (T-cell co-stimulation therapy) or tocilizumab (IL-6 receptor antagonist). **OBJECTIVES:** To assess the budget impact of offering tocilizumab as an option to a pool of patients with RA in Brazil. **METHODS:** The perspective was from a public payer. Only direct costs were considered which comprised: drug, management and administrations costs [Scheinberg et al. 2005]. Base case dosages considered were: tocilizumab (8 mg/kg dosage each 4 weeks) and infliximab [4.3 mg/kg (Ollendorf et al. 2005) at weeks 0, 2, 6 and every 8 weeks], assuming a 70 kg patient, adalimumab (40 mg every other week), etanercept (50 mg every week) and abatacept (750 mg at weeks 0, 2, 4 and then every 4 weeks). We took the maximum price to government as a basis to all therapies [Jun, 2009]. The discount rate taken was 5% according to the Brazilian guidelines for (HTA) [Vianna et al. 2007] and a 5-year horizon was assumed. Both the treatment mix forecast and the tocilizumab penetration change were projected based on market research data. The results are expressed in 2009 Brazilian Reais (US$ 1 ≈ $Brz2.5). **RESULTS:** Total annual costs were $Brz47,566 for tocilizumab, $Brz50,785 for etanercept, $Brz53,909 for adalimumab, $Brz58.603 for infliximab and $Brz50,048 for abatacept. Based on the change in the mix of treatment forecast, a total savings for a period of 5 years