were classified by residential location (urban, suburban, rural). Massachusetts has 351 cities and towns; 10% urban, 19% rural, and 71% suburban. Hospital charges, adjusted by a 0.517 cost-to-charge ratio, medical inflation and geographic factors are reported in 2007 US$. RESULTS: The cohort (n = 53,604) had 92,776 asthma-related encounters (65% ED visits) during the year. The proportion of ED visits for suburban patients was significantly (p < 0.05) lower. On average, rural patients (2%) had 1.7 encounters (range: 1–11), 5.2 asthma-related care days and accrued $5280 per patient. Suburban patients (46%) averaged 1.6 encounters (range: 1–29), 5.5 care days and $9325 per patient. Urban patients (52%) had 1.8 encounters (range: 1–50), 5.9 care days and $8736 per patient, on average. Over the year, rural patients used 2768 inpatient days and 1582 ED hours accruing $4.9 million in asthma-related care costs. Suburban patients accrued 66,823 hospital days, 45,954 ED hours and $116.6 million. Urban patients used 74,359 hospital days and 46,196 ED hours in one year, accruing $116.1 million. CONCLUSION: Most patients were from urban locations; however those from suburban areas had a higher ratio of inpatient stays to ED visits, which contributed to the higher average asthma-related cost per suburban patient.

**Abstracts**

**ECONOMIC EVALUATION OF SECOND-LINE THERAPIES IN ADULT PATIENTS WITH ASTHMA WHEN CONSIDERING COMPLIANCE—AN ANALYSIS FROM A SWEDISH HEALTH CARE PERSPECTIVE**

**PAA11**

**Petersson B1, Soronz-Szabo T1, Ekman M1, Taylor SD1**

1MSSD, Solleluna, Sweden, 1MSSD Hungary Kft, Budapest, Hungary, 2Stockholm Health Economics, Stockholm, Sweden, 4Merck & Co, Inc, West Point, PA, USA

**OBJECTIVES:** The objective of this study was to compare costs and effects of montelukast (MON) as add-on to inhaled corticosteroids (ICS) with long-acting $\beta_2$ agonist (LABA) as add-on to ICS in adult patients with asthma when compliance is taken into consideration and from a Swedish health care sector perspective. **METHODS:** A health economic model was developed to calculate the incremental cost utility ratio of MON compared to the LABA salmeterol (SAL). Head-to-head data from IMPACT, a two-year 48-week clinical study (N = 1490) of patients with moderate asthma, was used in the model to estimate the relative effectiveness of the two regimens. The relative compliance for SAL was assumed to be 0.8 vs 1.0 for MON in the base case scenario. The analysis included costs for drugs, asthma events and adverse events. Event rates and asthma specific quality of life data for MON and SAL treated patients were collected from the IMPACT trial, while resource utilization and unit costs to treat the events were collected from local sources. **RESULTS:** In comparison with SAL, MON is associated with somewhat higher cost, but has, due to similar efficacy and better compliance, better effectiveness (more prevented attacks and more QALYs gain), less asthma-related hospitalization, and less serious drug-related side effects. The incremental cost per QALY for MON + ICS compared to SAL + ICS after adjusting for relative compliance was 7,000 EUR per QALY in the base case. **CONCLUSION:** When added to ICS, MON compared to SAL shows a favorable cost-utility in Sweden. This conclusion was stable for reasonable variations in the modelling assumptions.

**EXCEPT OF UNCONTROLLED DISEASE AND ASSOCIATED MEDICAL COSTS IN SEVERE ASTHMA IN THE NETHERLANDS**

**PAA12**

**Breekvelds-Postma NS1, Erkens JA1, Aalbers R2, van de Ven MJ3, Lammers JW4, Herings RMC4**

1PHARMO Institute, Utrecht, The Netherlands, 2Martini Hospital, Groningen, The Netherlands, 3Rijnstate Hospital, Arnhem, The Netherlands, 4University Medical Center Utrecht, Utrecht, The Netherlands

**OBJECTIVES:** Asthma is a major public health problem with considerable economic impact. The aim of this study was to assess the extent of uncontrolled disease and associated medical costs in severe asthma. **METHODS:** Data were obtained from the PHARMO Record Linkage System (PHARMO RLS) which includes drug dispensing and hospitalizations for 2 million subjects in The Netherlands. Severe asthma patients (12–49 years) were defined as those who had used long-acting beta-agonists and inhaled corticosteroids for over 200 days and short-acting beta agonists for at least 100 days in 2004. Uncontrolled asthma was defined as a hospitalization for asthma or use of multiple, short (<30 day) courses of oral corticosteroids. Reimbursed costs of asthma drugs and hospitalizations were calculated. A matched case-control analyses was performed to compare asthma treatment of cases (hospitalized for asthma or multiple courses of oral corticosteroids) and controls. **RESULTS:** A total of 4.7% of patients receiving at least 2 asthma preparations in the previous year had severe asthma. A total of 17.4% of these were defined as having uncontrolled asthma. Excess drug costs for uncontrolled asthma with hospitalization were €664 per patient per year and €282 per patient per year for patients without hospitalization. Including hospital admission costs, excess costs were over €10,000 per patient per year. Lack of control did not seem to be caused by under-treatment. **CONCLUSION:** Poor control of severe asthma leads to disproportionately increased direct costs compared to controlled severe asthma, especially when hospital admission is required. Hospitalized patients representing 2% of the patients with severe asthma are responsible for 23% of the total direct costs.

**THE MONTREAL PROTOCOL: CONCERNS OVER THE FUTURE TREATMENT OF ASTHMA**

**Walters E1, Osborne M1, Ling C2, Johnson KI2**

1Teva UK Ltd, Harlow, Essex, UK, 2Evidence Research Unit, Macclesfield, UK

**OBJECTIVES:** It is estimated that over 4.6 million people suffer from asthma in England and Wales at an estimated annual cost to the National Health Service (NHS) of more than £889 million. Beclomethasone dipropionate (BDP) is the current mainstay of inhaled corticosteroid (ICS) therapy for asthma, and approximately 80% of patients who are prescribed an ICS receive BDP. However, chlorofluorocarbons (CFC), which are used as propellants in the majority of BDP formulations, are now being phased out in accordance with the Montreal Protocol, a global initiative to reduce global warming. QVAR (BDP) utilises environmentally safe hydrofluoroalkane (HFA) in its delivery system. It has equivalent therapeutic effect at about half the daily dose of CFC BDP due to superior lung penetration. The UK National Institute for Health and Clinical Excellence (NICE) are currently appraising a broad number of ICS licensed for the treatment of chronic asthma. At the time of the enactment of the Montreal Protocol, when CFC-based BDP will no longer be manufactured, only HFA based alternatives will be available. We wished to explore the
impact of this on the treatment of asthma. METHODS: Our submission to NICE, reviewing the relative value of alternative products, utilised a cost-minimisation approach, recognising that there was little evidence of clinical differentiation between the ICS. RESULTS: It was estimated that a total switch to QVAR upon withdrawal of CFC based BDP, would result in only a modest 6% increase in costs to the NHS, but could result in overall cost savings if it were substituted for more costly ICS alternatives, such as fluticasone propionate or budesonide. CONCLUSION: There remain concerns that NICE may overlook the current political and socioeconomic imperatives and provide Guidance that does not consider appropriate BDP dosing or recognise that the environment will change over its period of jurisdiction.

**PAA14**

**PHYSICIANS EDUCATIONAL EFFORTS: A TOOL FOR IMPROVING MANAGEMENT OF ASTHMA IN THE COMMUNITY**

Cohen R, Triki N, Kokia E, Mossinson D

1Maccabi Healthcare Services, Rishon-LeZion, Israel, 2Ben Guryon University of the Negev, Beer Sheva, Israel, 3Maccabi Healthcare Services, Tel-Aviv, Israel

OBJECTIVES: Frequent use of short-acting beta agonists (SABA) inhalers, along with insufficient use of concurrent steroid inhalers, is often the cause of suboptimal management of the disease. The aim of the study is to identify the heavy purchasers of SABA and improve the management of there disease. METHODS: All Maccabi Healthcare Services (MHS) patients in two areas in the Shfela district who consumed at least 4 SABA inhalers during 2005 were identified using MHS’s computerized database. The patients’ primary care physicians (PCP) were briefed with the findings and where presented the current evidence based medicine (EBM) clinical guidelines for proper asthma treatment in a group meetings with pulmonologist. Later the PCP attend to two days workshop dealing with appropriate asthma treatment, patient’s adherence and practicing clinical scenarios with professional actors. A 3rd meeting included case presentations and further discussions with a pulmonologist. A control group consisted of patients of PCPs in other areas in the Shfela district which didn’t participate in the study. RESULTS: One hundred six patients were in the intervention group. 85 required more than 2 SABA inhalers in the first 6 month after intervention (decrease of 20%). In the control group there was a 4% increase in patients using more than 2 SABA inhalers during the same period (185 to 193). CONCLUSION: We have observed a significant improvement in SABA consumption. This improvement applies that educational efforts on applying EBM clinical guidelines for proper asthma treatment and providing simple tools for dealing with patients’ adherence, can improve management and control of asthma and can lower asthma’s treatment expenses. We suggest similar interventions on other chronic diseases.

**PAA15**

**EFFECT OF IMMUNOTHERAPY ON DRUG USE AND COST IN RAGWEED POLLEN ALLERGIC DISEASE IN LOMBARDIA**

Ortolani C, Bertoni P, Frati P, Aiello A, Bertani G

1Istituto Allergologico Lombardo Onlus, Cesano Boscone, Italy, 2PCP Consulting, Verona, Italy, 3Stallergenes Italia, Milan, Italy, 4General Health Directorate—Regione Lombardia, Milan, Italy

OBJECTIVES: Clinical efficacy and cost-effectiveness of immunotherapy in allergic disease caused by various allergens is demonstrated by several published studies, but economic value is still far from being appreciated by local decision makers. Scope of this work was to provide the Regional decision makers with real world information on the use and impact of immunotherapy in terms of efficacy on symptoms, use and cost of drugs in patients affected by rhinoconjunctivitis (RC) with or without asthma (A), caused by ragweed seasonal allergy. METHODS: Observational study, of preseasonal sublingual (SLIT) or preseasonal subcutaneous immunotherapy (SCIT) versus non-immunotherapy (NSIT). Patients enrolled by a network of specialist centres from Lombardia, were randomly assigned to one of the study groups and were allowed to take any additional medication needed to control RC and A symptoms; effectiveness was measured as global symptom score rated by the patient on a VAS at last visit; drug consumption was measured as days of medication recorded by the patient on a weekly diary card during the peak season; drug cost was calculated by applying Italian NHS prices.

RESULTS: For the first year of immunotherapy, 163 adults were analyzed (SLIT N = 67 M = 48%, age 39±9.1; SLIT N = 34 M = 62%, age 41±8.1; NSIT N = 62 M = 53%, age 36±9.2); 25% of SLIT patients were affected by A as compared to 47% of SCIT and 37% of NSIT patients; 55% of SLIT patients were treated with high dose SLIT. The mean number of drug treatment days/patient was lower for SLIT patients 26.15+/−30.1 vs. NSIT 58.7+/−43.4 (p < 0.0001) and for SCIT patients 33.0+/−45.7 vs NSIT 58.7+/−43.4 (p < 0.05); similarly the mean total cost/patient of drug treatment was lower with SLIT €28.19 vs SCIT €33.9 and NSIT €59.2. CONCLUSION: SLIT and SCIT can effectively reduce use and cost of drug treatment in adults affected by rhinoconjunctivitis with/without asthma caused by ragweed in Lombardia.

**PAA16**

**A RETROSPECTIVE STUDY COMPARING TREATMENT PATTERNS, OUTCOMES, AND RESOURCE USE BETWEEN TWO FIXED COMBINATIONS OF INHALED CORTICOSTEROIDS AND LONG-ACTING β-AGONIST (ICS/LABA) IN ASTHMATIC PATIENTS IN GERMANY**

Abaléa S, Cure S, Vogelmeier C, Wirén A

113 Innovus, Uxbridge, Middlesex, UK, 2University of Marburg, Marburg, Germany, 3AstraZeneca, Lund, Sweden

OBJECTIVES: Formoterol/budesonide (BUD/FORM) and salmeterol/fluticasone propionate (SAL/FLU) have been shown to be effective in the treatment of asthma. This retrospective, observational study compared characteristics of patients initiating treatment with BUD/FORM or SAL/FLU in routine clinical practice, subsequent treatment outcomes and resource utilisation. METHODS: A cohort of German patients diagnosed with asthma, followed from 12 months before to 12 months after treatment initiation with BUD/FORM or SAL/FLU, was extracted from a longitudinal, primary care database of records collected from June 2000 to June 2006. The primary outcome was the proportion of successfully treated patients defined according to utilisation of short-acting beta-agonists (SABA) and switches or addition of controller medications during the post-index year. Secondary outcomes included resource utilisation and acute exacerbations, defined as at least one oral corticosteroid (OCS) prescription and/or hospitalisation related to asthma. Regression models were used to adjust for patient characteristics, including treatment history. RESULTS: The BUD/FORM and SAL/FLU groups included 1,436 and 982 patients, respectively. Prior to treatment initiation, patients in the BUD/FORM group received less asthma-related OCS prescriptions (mean difference: −0.049, p = 0.0328) but utilisation of SABA, ICS and LABA was similar. In the year following treatment initiation, patients initiating on BUD/FORM had a greater probability of treatment success (OR = 1.34, p = 0.0001), fewer acute exacerbations.