tive methods was same. There was only 9% of the illiterate workers were using while the usage compliance increased to 28%. Gender based analysis suggests that the women workers were less aware about silicosis disease and less educated - these could be reasons for women workers for less likely use protective methods. **CONCLUSIONS:** Awareness is important for the health safety, but the understanding and education level of workers is key factors, these data suggest that not just the awareness, but also the education level of workers plays a significant role in compliance toward the usage of protective methods.

PRS45

A LARGE-SCALE RETROSPECTIVE STUDY OF EMERGENCY DEPARTMENT VISITS OR HOSPITALIZATIONS FOR ANAPHYLAXIS AMONG PATIENTS WITH EMPLOYER- SPONSORED HEALTH INSURANCE

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OBJECTIVES: To examine characteristics of US patients with emergency department (ED) visits or hospitalization for anaphylaxis, and the cost drivers of these visits. **METHODS:** This retrospective study utilized the MarketScan® claims databases to identify patients enrolled in employer-sponsored health plans and visited EDs or hospital with anaphylaxis between 2002 and 2008. Patients had to have ≥1 year continuous health coverage pre- and post-index (first observed event date) and were excluded if immunocompromised, had pre-index cancer diagnoses or sepsis at index. Descriptive statistics were evaluated for patient characteristics during the pre-index period and for costs of index events. Multivariate analyses were conducted examining cost drivers of index events. **RESULTS:** A total of 11,972 patients were identified (mean age 42, children 19%; female 59%; Northeast 12%; triggers: unknown cause 66%, food 20%, venom 8%, medicine 6%), and the majority of events occurred in ED (78%). Compared to adult patients, children (<18 years) were more often male (56 vs. 38%), and had different pre-index comorbidities (4 vs. 1 of 5 most prevalent comorbidities were allergy-related). Mean index event costs were $1553 ± 1705 for ED visits and $14262 ± 36108 for hospital stays. Unadjusted ED costs for children did not differ across triggers (P=0.78), but hospitalization costs did (P<0.001). For adults both ED and hospital event costs differed by trigger (P<0.001). In multivariable analyses unknown and venom triggered event costs for adults were 1.13 (P=0.03) and 1.34 (P=0.01) times greater than those for children regardless of place of service. Overall, pre-index epinephrine auto-injection device (EAID) fill was associated with lower event cost (0.89 times; 95% CI 0.83-0.95). **CONCLUSIONS:** This study found significant differences in clinical characteristics and costs by age group, trigger, and treatment setting among patients with anaphylaxis. Pre-index EAID fill may be associated with lower ED/hospitalization cost, but needs confirmation in future studies.

PRS46

EVALUATING THE PREVALENCE ASSOCIATED WITH SMOKING BEHAVIOR AMONG UNIVERSITY STUDENTS IN PAKISTAN

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OBJECTIVES: To evaluate the prevalence of smoking behavior among university students in Pakistan. **METHODS:** The cross-sectional study was conducted in two provinces, KPK and Punjab of Pakistan. Only smoking students' population of the universities were included. Six univerties were included in the study from four cities of these two provinces. These cities were selected for study as they can provide ethnic mix of student response residing in these areas. A total of 750 questionnaires were administered out of which 524 questionnaire were received giving the response rate of 69.8% of which 419 were males and 105 were females from different universities. **RESULTS:** Among 524 respondents, 419 were male and 105 were female students. Students were recruited regarding socio-demographic factors, smoking history of students, their families, friends and class fellows/roommates and place of residence. Students having family history of smoking (23.87% of males; 34.29% of females), roommates (21% of males; 5.71% females), close friends (57.51% of males; 54.28% of females) and class fellows (37.23% of males; F=36.19% of females) were significantly associated with smoking. Public health awareness on media and warnings printed on tobacco products (*cigarettes and flavors*) had no statistically significant association with respondents' continuation, and cessation status. **CONCLUSIONS:** The Shisha smokers thought that shisha smoking is less harmful than cigarette smoking. It is suggested that the factors which influence Pakistani students to smoke may not be significantly different from counties with a broader evidence base. There is a need to adopt the provisions of the Framework Convention on Tobacco Control (FCTC) with respect to smoke free places, public education and treatment for tobacco cessation. Steps should betaken by the government to increase people's awareness on the health hazards of tobacco smoking (*Shisha and cigerretes*) and to prevent young generation from smoking.

PRS47

PREDICTORS OF WILLINGNESS TO QUIT AMONG A COHORT OF ADULT SMOKERS IN INDIA

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OBJECTIVES: The study evaluated predictors of willingness to quit smoking among cigarette smokers in India. **METHODS:** A cross-sectional study using a self-administered questionnaire was conducted in a cohort of adults aged ≥18 years in India. The outcome variable, willingness to quit smoking was dichotomized. Independent variables included socio-demographic characteristics, behavioral and environmental determinants of smoking like past quit attempts, smoking status of peers and social pressure. SAS(9.2v) was used to determine frequencies and chi-square analyses followed by Fisher's exact test and stepwise logistic regression to determine predictors of willingness to quit. **RESULTS:** The study cohort consisted of 456 smokers (response rate 41.3%) among which 253 (54%) were willing to quit smoking. Almost 60% of smokers willing to quit were males, 53.3% had a bachelor's degree, 81.4% were married, 46.6% belonged to the >$10,000/yr-≤$20,000/yr income category and 43.8% to 30-39 years age category. More than 50% had non-smoking peers. Majority (88.8%) had very low addiction levels and 40% attempted to quit at least once in their lifetime. Bivariate analysis indicated that age (p=0.002), education (p=0.009), siblings' smoking status (p<0.0001), number of smoking friends (p<0.0001), age of initiation (p=0.03), past quit attempts (p<0.0001) and social pressure (p=0.006) were associated with willingness to quit. Fisher's exact test demonstrated that past quit attempts of 3 (p<0.0001; OR=2.55; 95%CI=1.59-4.06) or ≥4 (p<0.0001; OR=33.14; 95%CI=7.87–139.63), close friends (p=0.002; OR=1.86; 95%CI=1.24-2.75), siblings being non-smokers (p<0.001; OR=3.05; 95%CI=2.07–4.45), and few smoking friends (p<0.001; OR=2.81; 95%CI=1.73–4.56) were predictors of willingness to quit. Logistic regression indicated that smokers aged 40-49 (p=0.02; OR=2.06; 95%CI=1.13-3.75), 50-59 years (p=0.02; OR=9.43; 95%CI=1.13-79.87), and faced with social pressure (p=0.02; OR=2.05; 95%CI=1.07-3.9) were willing to quit. **CONCLUSIONS:** Research on interventions targeting smokers willing to quit such as those facing social pressure or older smokers, would prove beneficial for them to permanently quit smoking.

PRS48

THE TRENDS OF CHILD OBESITY AND THE EFFECT OF CHILD OBESITY ON ASTHMA IN YOUNG CHILDREN

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OBJECTIVES: The objectives of this study were to examine the trends of child obesity and changes in BMI over time and to analyze the effect of child obesity on asthma. **METHODS:** The Early Childhood Longitudinal Study Kindergarten Class of 1998-99 (ECLS-K) data from the U.S. Department of Education identified 14,188 children in the 3rd grade who were followed through 3 waves (3rd, 5th and 8th grade). Dichotomized weight group (obese vs. non-obese), based on body mass index (BMI) using the 2000 sex-specific CDC growth charts for the United States, was included in the sample weight-adjusted cross-sectional logistic analyses and a panel fixed effects (FE) model for having asthma. **RESULTS:** We detected a gradual increase in the mean BMI and prevalence of obesity over time. Significant differences were observed for obesity and asthma rate among male and female groups in the 3rd grade (p<0.05). In cross-sectional analyses, obesity and gender were significantly associated with having asthma for each grade level while adjusting for other demographic covariates (all p<0.05), indicating that children who are obese or male were more likely to have asthma. Approximately 70% of children stayed within the same weight category from 3rd to 8th grade. FE model showed a significant time effect where odds of having asthma increased 3.31 times from 3rd to 5th grade while controlling for child obesity (95% CI: 2.89-3.80). Child obesity and the interaction term between time effect and child obesity had no significant effect on asthma although the sign of estimate for child obesity indicated an increase in risk for asthma. **CONCLUSIONS:** We found a risk association between child obesity and asthma in cross-sectional analyses but the effect of obesity on asthma was not significant in a panel data FE model. Future research with a model using an instrumental variable is warranted to control for endogeneity associated with obesity.

PRS49

ALL-CAUSE 30-DAY READMISSIONS FOR MATCHED INPATIENTS WITH COPD RECEIVING NEBULIZED SHORT-ACTING OR LONG-ACTING BETA AGONISTS

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OBJECTIVES: Chronic Obstructive Pulmonary Disease (COPD) is a major public health issue and a leading cause of morbidity and mortality in the United States. High frequency of exacerbations can lead to rapid decline in lung function in COPD patients. The study objective was to evaluate 30-day readmission rates among COPD patients who received arformoterol, a nebulized long-acting beta agonist, or nebulized short-acting beta agonists (neb-SABA) during an inpatient stay. **METHODS:** Data from the Premier Database, a US nationally representative hospital database, were used. The study included adult inpatients aged 40 and older, discharged between January 2006 and March 2010, having a principal diagnosis code for COPD (ICD-9-CM 491.xx, 492.xx, 496) or secondary COPD diagnosis with a principal respiratory diagnosis. Patients receiving arformoterol daily on ≥80% of days following initiation were compared to patients receiving only neb-SABA during hospitalization. Arformoterol patients were matched 1:2 with Neb-SABA patients on age, gender, severity of illness, and principal/secondary COPD diagnosis. Chi-square tests were used to evaluate differences in unadjusted readmission rates. Multivariate logistic regression was performed, adjusting for age, gender, race, admission type, severity, principal/secondary COPD diagnosis, use of other respiratory drugs and respiratory therapy, oxygen use, and hospital size and teaching status. **RESULTS:** The final sample included 812 arformoterol patients and 1651 Neb-SABA patients who had not died during the initial COPD visit. ICU use, which was not a match criterion, was greater among arformoterol patients (35.5% vs. 19.9%, p<0.0001), possibly indicating greater disease burden. Unadjusted readmis-

sions were significantly lower for arformoterol patients than Neb-SABA patients (8.7% vs. 12.1%, p=0.0169). Adjusted odds of readmission were estimated to be 44% less for arformoterol patients (OR 0.56, 95% CI 0.41-0.78). **CONCLUSIONS:** All-cause 30-day readmissions were significantly fewer for arformoterol patients than neb-SABA patients, both before and after adjusting for patient and hospital factors such as ICU care.

RESPIRATORY-RELATED DISORDERS – Research on Methods

PRS50
IS IT APPROPRIATE TO MEASURE ASTHMA CONTROLLER ADHERENCE USING PHARMACY CLAIMS DATA?

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While possession-based adherence measures are typically used to compare medication adherence using pharmacy claims, these measures are difficult to verify for inhaled asthma medications because the claim-reported days' supply may not reflect the actual duration of use. **OBJECTIVES:** To compare medication adherence to all asthma controllers to that in subsets of patients using Flucitasone/Salmeterol disk with inhalation device (combination inhaler, CI) or leukotriene inhibitors (LT) which are more likely to accurately reflect days' supply in the claim, across pharmacy dispensing channels. **METHODS:** Commercially insured US patients aged 12-63 and medically diagnosed for asthma were followed for one year after initiation of an asthma controller using a retrospective, claims-based design. Adherence was defined using Medication Possession Ratio (MPR). CI and LT subsets included all patients using one of these as the index medications. The multivariate-adjusted relationship between adherence and channel was evaluated using a generalized linear model. **RESULTS:** A total of 6014 patients were included in the overall study cohort, with 2222 in the CI subgroup and 1884 in the LT subgroup. The adjusted MPR for asthma controllers in the retail pharmacy cohort was 39.70% (95% CI 37.08-42.52%) compared to 62.43 (95% CI 58.19-66.97%) in the mail-order cohort. In comparison, the adjusted MPR for retail and mail-order pharmacy cohorts were 38.33% (95% CI 34.58 - 42.49%) and 57.85 (95% CI 52.13-64.20%) in the CI subgroup and 49.01% (95% CI 43.83-54.79%) and 69.25 (95% CI 52.13-77.56%) in the LT subgroup, respectively. **CONCLUSIONS:** In a large, nationally representative cohort, adherence to asthma controllers and differences in adherence across dispensing channels were similar in magnitude to those in two subgroups with more accurate days supply information. It may be reasonable to use possession-based asthma adherence measures derived from pharmacy claims, despite potential errors in capturing days' supply.

PRS51
COMPARISON OF RISK ADJUSTMENT MODELS IN PREDICTING DISEASE SPECIFIC AND TOTAL HEALTH CARE EXPENDITURE FOR COPD

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OBJECTIVES: To compare and determine the best risk adjustment model for predicting disease specific and total health care expenditure associated with Chronic Obstructive Pulmonary Disease (COPD). **METHODS:** Data from 2005-2008 Medical Expenditure Panel Survey, involving adults ≥18 years with COPD diagnosis were used to evaluate risk adjustment measures. The outcomes of COPD specific health care expenditure, total inpatient expenditure, total outpatient expenditure and total health care expenditure were modeled using linear regression. Baseline characteristics included age, gender and race. The six different risk adjustment measures compared were total number of medications, total number of respiratory medications, D'Hoore-Charlson, Deyo-Charlson, modified Elixhauser and General Health Status (GHS). Different combinations of these measures were used to derive the best risk-adjustment model having the highest Adjusted-R2. Validation of the risk adjustment measures was performed on 2009 MEPS data. **RESULTS:** Of the six risk adjustment measures, the total number of respiratory medications performed best for predicting COPD specific expenditure (Adj. R2: 24.62%). The total number of medications best predicted inpatient, outpatient and total health care expenditures (Adj. R2: 17.71%, 6.44% and 32.71% respectively). No combination of risk adjustment models led any improvement in predicting COPD specific health care expenditures. The combination of count of all medications with modified Elixhauser index performed best in predicting inpatient, outpatient and total health care expenditure (Adj.R2: 18.44, 7.91 and 34.87 respectively). **CONCLUSIONS:** Number of respiratory medications may be an indicator of severity of the disease, thereby best predicting the disease specific health care expenditure, where as simple construct of count of all medications used is the best predictor of total health care expenditure. Medication-based measures can be effective and easy to use in risk-adjusting health care expenditures.

PRS52
THE STABILITY OF ADDITIVE TREATMENT EFFECTS IN MULTIPLE TREATMENT COMPARISON META-ANALYSIS: A SIMULATION STUDY

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OBJECTIVES: Medical interventions are often administered as treatment combinations (e.g., drug A + drug B). Models for effects of treatment combinations in multiple treatment comparison meta-analysis (MTCs) have previously been proposed. The objective of this study was to evaluate the comparative statistical performance of the conventional MTC model and an 'additive effects' MTC model, in scenarios where 'additivity' holds true (i.e., where the effect of effect of treatment A and B combined is equal to the sum of the individual effects of treatment A and treatment B) and in scenarios where 'additivity' is mildly or strongly violated. **METHODS:** We simulated MTC scenarios where additivity held true or was violated. We applied conventional and additive effects Bayesian MTC models to the simulated data. We measured the proportion of over- and underestimated treatment effects, the coverage of the 95% credible intervals, and the statistical power. **RESULTS:** Under true additivity, the additive effects model is superior to the conventional model. Under mildly violated additivity, the additive model is less accurate (more over- and underestimates), but more precise (comparable coverage and greater power). Under strongly violated additivity, the additive model performs worse in terms of accuracy and coverage. **CONCLUSIONS:** The additive model may readily be used in practice when approximate additivity can be assumed.

PRS53
TEST-RETEST RELIABILITY OF THE URTICARIA PATIENT DAILY DIARY IN ELECTRONIC FORMAT AMONG ADULTS AND ADOLESCENTS

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OBJECTIVES: The Urticaria Patient Daily Diary (UPDD), originally developed in paper format, has been migrated to an electronic version. This study was designed to assess the test-retest reliability of the electronic version (ePRO) of the UPDD. **METHODS:** The UPDD includes a morning component, assessing CIU symptoms and impact on sleep, and an evening component, assessing symptoms, impact on daily activities, rescue medication use, and contacting a health care provider. Adults and adolescents with moderate to severe chronic idiopathic urticaria (CIU) completed the morning and evening ePRO UPDD once, engaged in an hour-long filler task (Sudoku puzzles), and then completed the UPDD again. Test-retest reliability between the two UPDD completions was assessed by item using a weighted Kappa, a simple Kappa for a dichotomous item (angioedema), and McNemar's test for one item (calling a doctor/nurse). Intraclass correlation coefficients (ICCs) assessed the reliability of the Urticaria Activity Score (UAS), which is the sum of the 'itch severity' and 'number of hives' item scores. **RESULTS:** Forty-five patients aged 13 to 74 years (mean 43.6 years) with stable symptoms at time of diary completion participated. Kappa values ranged from 0.83 to 1.00 for the ePRO UPDD items. The McNemar's test yielded a non-significant p-value (p = 0.317). For the UAS, ICC was 0.83 for the morning ePRO UPDD and .96 for the evening ePRO UPDD; each of the Wilcoxon p-values was greater than 0.05. **CONCLUSIONS:** All Kappas were above the 0.74 threshold (Coons et al, 2009), indicating excellent test-retest reliability. No significant differences were found between test and retest scores on the UAS or the 'contacting health care provider' item. In summary, the ePRO UPDD showed excellent test-retest reliability in a sample of CIU patients whose symptoms were stable at time of UPDD completion.

PRS54
ACCEPTABILITY OF THE SELF-ADMINISTERED COMPUTERIZED (SAC) VERSIONS OF THE BASELINE/TRANSITION DYSPNEA INDEXES (BDI/TDI) FOR PATIENTS WITH COPD FROM SEVEN COUNTRIES

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OBJECTIVES: The original interviewer-administered versions of the Baseline/Transition Dyspnea Indexes (BDI/TDI) were modified by the originator to create self-administered and computerized (SAC) versions. The rationale for the development of the SAC versions was to offer a standardized method for patients to report the impact of activities of daily living on the severity of their breathlessness. The objective of this study is to present the acceptability of the SAC versions of the BDI/TDI to patients with COPD from seven countries including eight different languages [Dutch (The Netherlands), English (Canada, UK), Flemish (Belgium), French (Belgium, Canada), German (Germany), and Spanish (Spain)]. **METHODS:** A standardized methodology was followed to translate the SAC BDI/TDI (e.g., forward/backward step, review by author). The test on 5 COPD patients in each country was conducted in form of in-depth interviews to evaluate 1) comprehension, and 2) acceptability using laptop computers. **RESULTS:** Overall, most patients liked the SAC versions, and about half preferred it to a interviewer-administered questionnaire. Only four of 35 patients had problems using the mouse to click on the right answer for the BDI (e.g., difficulties of coordination, or in using the left button). The items were understood with no difficulties; the main challenging issue was ease in understanding the equivalents of "Baseline" and "Transition". At first, 42% of the patients, especially in Germany (4/5 patients), Spain and UK (3/5 patients), had difficulties with the instructions to select answers on the TDI using the up-and-down elevator buttons. These difficulties did not persist after the practice question designed to help the patients to become familiar with clicking an "X" (BDI), and using the up-and-down arrows (TDI). **CONCLUSIONS:** The SAC versions of the BDI/TDI were well accepted by patients from seven different countries. Special attention and supervision should be given to patients not familiar with computer use.

PRS55
A NEW CONCEPT OF PATIENT REPORTED OUTCOME ON QUALITY INDICATORS FOR PHARMACEUTICAL CARE

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OBJECTIVES: A new concept of Patient-Reported Outcome (PRO) on quality indicators for pharmaceutical services is presented. It aims to supplement postmarketing surveillance tools. It is based on research findings from a patient survey instrument designed at Harvard and applied to a Primary Care Group in Warwickshire, as a quality improvement tool (Value in Health, vol 5, issue 3, 2002). AHRQ considers the