

exposed users were similar to results for all users. **CONCLUSIONS:** Inappropriate prescribing in the elderly contributes to negative clinical and economic outcomes. Specific interventions have been utilized to decrease incidence of inappropriate prescribing, but there is little evidence on the long-term sustainability of such project effects. The significant reductions in PIM exposure after our intervention appear to have continued after its discontinuation, supporting the idea that the intervention concretely impacted GPs' prescribing behavior. Patient and GP characteristics did not contribute to the effect of the intervention.

PIH45

AGE-BASED OUTPATIENT ANTIBIOTIC PRESCRIBING IN THE UNITED STATES FROM 2000 TO 2010

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OBJECTIVES: During the 1990s, U.S. outpatient antibiotic utilization declined after the launch of national educational campaigns; however, it is unknown if these trends were sustained in the last decade. The purpose of this study was to describe U.S. antibiotic prescribing trends from 2000 to 2010. **METHODS:** This was a retrospective analysis of nationally representative data from the Medical Expenditure Panel Survey (MEPS) from 2000 to 2010. Trends in population-based prescribing were examined for overall antibiotics and for non-otitis media (non-OM) respiratory tract infections (RTIs) [bronchitis, pharyngitis, sinusitis, and upper-RTIs as defined by ICD-9-CM codes 460-463, 465, 466, 473, and 490]. Rates were reported for three age groups: children and adolescents (younger than 18 years), adults (18-64 years), and older adults (≥65 years). Antibiotic prescriptions were identified using the Lexicon Multum classification system. Population estimates were obtained from the U.S. Census Bureau, and annual rates were reported per 1,000 persons. **RESULTS:** The overall annual rate of antibiotic prescriptions decreased from 377 per 1000 persons in 2000 to 365 per 1,000 persons in 2010. Among children and adolescents, the overall and non-OM RTI antibiotic prescribing rates decreased by 19% and 12%, respectively. Both rates remained stable in adults. In contrast, the overall and non-OM RTI antibiotic prescribing rates increased by 16% and 7%, respectively, in older adults. This increase was attributed to a 30% increase in the use of fluoroquinolones and second-generation macrolides over the study period. **CONCLUSIONS:** Overall, antibiotic prescribing has decreased in the U.S. population over the last decade. This decrease has mostly occurred in children and adolescents while older adults have actually experienced an increase in antibiotic prescribing. Focused public policy initiatives are needed to promote the judicious use of antibiotics in older adults.

PIH46

INEQUALITIES OF THE INFANT MORTALITY RATE AND POVERTY IN COLOMBIA

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OBJECTIVES: The relationship between inequities in socioeconomic factors (i.e. poverty) and adverse health outcomes has been studied before, but most studies were aggregated by country. A further disaggregation may contribute to causality and may help explain the within country differences and lack of improvements of some health indexes. In order to assess inequalities in Colombia this study evaluate by geographical region (state) of the infant mortality rate in Colombia in 1993 and 2005, the two years where the census took place. **METHODS:** This ecological study measures regional inequalities in the infant mortality rate (IMR), using these indexes: Rate difference (RD), incidence rate ratio (IRR) and population attributable risk (PAR). Poverty was measured as the index of unsatisfied needs (Necesidades Básicas Insatisfechas, NBI). A linear regression was made for the association between IMR and NBI (poverty), and beta-coefficients with 95% confidence intervals (95%CI) were estimated. **RESULTS:** In 1993, the absolute difference between regions (states) with more and less poverty (Chocó: 80.4%; Bogotá, D.C.:17.3%) was 63.1%. In 2005, this difference was 70.4%. For these years, the IRR of IMR between those (Choco and Bogota) states was 2.9 y 4.2 and RD 56.4 y 59.2, respectively. The R-square between poverty and IMR was in 2005 63.8%, versus a R-square of 34.2% for 1993. The beta-coefficient of linear regression was 0.339 for 1993 (IC 95%, 0.167-0.552). For each perceptual point that decreases poverty in the states, a reduction of TMI by 0.339 for each 1,000 live births. In 2005, this reduction was 0.646 for each 1,000 live births (IC 95%, 0.468-0.823). **CONCLUSIONS:** Although Colombia has a trend of TMI reduction, health inequalities persist between states in the country. These inequalities increased between 1993 and 2005.

PIH47

PREVALANCE OF INAPPROPRIATE MEDICATION USE IN ELDERLY IN A COMMUNITY PHARMACY

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OBJECTIVES: An aging population translates into an increase in drug use, while medication management is challenged by the uniqueness of geriatric pharmacology. Our objective is to understand the most frequent IMUs dispensed from community pharmacies. **METHODS:** We used Beers' 2002 Criteria (regardless of diagnoses and conditions) in our analysis. The prescription repository from a downtown community pharmacy (Yalova, Turkey) with

a diverse socio-economic demographic profile was retrospectively monitored to identify IMU. The Social Security Institution (SGK)'s "Medula" database was utilized to identify patients to whom at least one prescription was dispensed in the month of October 2011. The patient records were tracked back to the period between September and November 2011 to analyze their prescriptions details. SGK-Medula prescriptions for 192 elderly patients (≥60 years-old) were identified (108 female and 84 male). **RESULTS:** From data analysis, 424 cases of IMU were identified. Each patient was exposed on average to 2.2 IMUs. The majority (61.8%) of all IMU cases involved non steroidal anti-inflammatory drugs (NSAID). The average use of NSAID per patient was 1.36. There was no statistically significant difference between female and male NSAID IMU. The second most IMU was chlorpheniramine usage, with 9% of all IMU cases; again no statistically significant difference was found between females and males. The third most frequently observed IMU involved nitrofurantoin in males (13.1%), and hydroxyzine in females (10.2%). Regardless of gender, ferrous sulphate (4.0%) was ranked the third overall most recorded IMU. Stimulant laxatives, alprazolam, doxazosin, and ticlopidine were also among the frequently observed IMU cases in this study. **CONCLUSIONS:** Prescriptions for the elderly should be systematically evaluated to check for IMU. NSAIDs, chlorpheniramine, nitrofurantoin, hydroxyzine, and ferrous sulphate may be especially worrisome due to high prevalence of exposure to these agents.

PIH48

IMPACT OF DOCTORS' RECOMMENDATIONS ON SEASONAL AND H1N1 FLU VACCINATIONS FOR MEDICAID/STATE CHILDREN'S HEALTH INSURANCE PROGRAM (SCHIP) CHILDREN DURING THE 2009 H1N1 FLU PANDEMIC

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OBJECTIVES: Seasonal flu vaccine uptake rates among socioeconomically disadvantaged children have been documented, but not much is known about the relationship between doctor's recommendation for seasonal and H1N1 flu vaccines. During the 2009-2010 flu season, persons had access to two separate influenza vaccines to prevent H1N1- and seasonal flu-related complications. The study explored the impact of doctor's recommendations for seasonal and H1N1 flu vaccines on Medicaid/State Children's Health Insurance Program (SCHIP)-covered children's seasonal and H1N1 flu vaccination. The hypothesis to be tested was that a doctor's recommendation increases vaccine uptake for both vaccines. The current study addressed different marginal effects estimates from the bivariate model identification to characterize this hypothesis. **METHODS:** This study used the Centers for Disease Control and Prevention National 2009 H1N1 Flu Survey and focused on the nationally representative subsample of 1794 Medicaid/SCHIP children between the ages of 6 months to 17 years old. A bivariate probit model was used to jointly estimate the effects of doctors' recommendations on seasonal and H1N1 flu vaccination. The model controlled for age, race, gender, household income, census region, number of household children, and past sickness. **RESULTS:** The choice framework resulted in a significant estimation of rho=0.532 (p=0.000) suggesting a positive correlation between the outcomes of seasonal and H1N1 vaccination. The average marginal effect from the bivariate probit model estimated that Medicaid/SCHIP children receiving a doctor's recommendation for both, seasonal, and H1N1 were 34.5% (p=0.000), 11.5% (p=0.000), 14.1% (p=0.000), respectively, more likely to acquire seasonal and H1N1 flu vaccinations versus a doctor's recommendation for neither. **CONCLUSIONS:** The results suggest a doctor's recommendation was influential for vaccine uptake for Medicaid/SCHIP covered children during the 2009-2010 flu season. The findings suggest doctor's recommendation should be an important factor in policy efforts to address barriers to flu vaccination.

PIH49

VARIATION IN THE USE OF INHALED RESPIRATORY MEDICATIONS FOR PRETERM INFANTS WITH BRONCHOPULMONARY DYSPLASIA

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OBJECTIVES: To determine 1) between-hospital variation in bronchodilator (BD) and inhaled corticosteroid (ICS) use for preterm infants with bronchopulmonary dysplasia (BPD) including hospital-specific treatment frequency, and 2) demographic and clinical variables associated with diuretic administration. **METHODS:** A retrospective cohort investigation was conducted using the Pediatric Health Information System (PHIS) database to determine between-hospital variation in BD (Beta2-agonists; ipratropium) and ICS utilization, as well as variables associated with their administration, among infants with evolving BPD at 28 days of age, born at 35 U.S. children's hospitals between January 2007-June 2011. Inclusion criteria: <29 weeks gestation, <1.5 kgs birthweight, survived 28 days, and on oxygen, CPAP, and/or ventilation for ≥28 consecutive days. Between-hospital percent-use comparisons were limited to hospitals with >25 included infants to prevent overweighting of smaller-samples. **RESULTS:** During the 54-month study period, 1429 infants were identified with evolving BPD, of which 544 (38%) received bronchodilators (BDs) and 352 (25%) received ICS. Hospitals differed significantly in the use of BDs [intra-class correlation coefficient (ICC): 0.35] and ICS (ICC: 0.42) even after controlling for observed confounders with multilevel, multivariable logistic regression. By hospital (N=15), the percentage of patients that ever received these medications ranged from 5-81% (median:33; IQR:8%-56%) for BDs and from 0-60% (12; 2-35%) for ICS. At 3 hospitals (20%) no patients received ICS. Risk factors significantly associated with bronchodilator administration included: increasing length of mechanical ventilation, birth weight 500-749 grams (reference group: 1000-1499

grams), and male gender. Increasing length of mechanical ventilation and birth weight 500-999 grams were associated with ever receiving inhaled corticosteroids. **CONCLUSIONS:** Bronchodilator and ICS use are common for infants with BPD at U.S. Children's hospitals, although frequency of use varies significantly. The effectiveness and safety of their use in these infants needs to be determined, in order to develop evidence-based recommendations.

PIH50

EFFECTS OF ETHNICITY ON CAREGIVER BURDEN, SELF-EFFICACY, AND QUALITY OF LIFE AMONG WORKING CAREGIVERS OF OLDER ADULTS

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OBJECTIVES: Research has shown that employees caring for older adults may experience physiological and psychosocial effects and require family supports that may vary across different ethnic groups. The purpose of this study was to explore differences in caregiving skills; caregiver burden; self-efficacy; and quality of life, health and well-being of African-American and Caucasian caregivers who are providing care for an older adult. **METHODS:** A total of 153 Caucasian and African-American adults currently working and caring for an older adult were personally interviewed. **RESULTS:** The typical working caregiver was a 49-year-old woman caring for her 79-year-old mother with African-American caregivers more likely to be living in the same household. In the past six months, African-American caregivers were more likely to have taken off work more than twenty hours and used the telephone at work one to five times a week for caregiving responsibilities. Caregiver Self Efficacy was positively related to Caregiver Rewards ($r=0.424$, $p<0.001$) and negatively related to Burden ($r=-0.310$, $p<0.001$) for both groups. Regarding Caregiving Skills, African-American caregivers rated their skills in communicating with their older loved one more highly than Caucasian ($\beta=0.332$, $p<0.001$) and were more likely to have taken more than 20 hours off work ($\beta=0.201$, $p<0.05$). African-American caregivers were less confident of finding information and good resources for their elder care recipient and themselves than Caucasian caregivers ($\beta=-0.175$, $p<0.05$ and $\beta=-0.183$, $p<0.05$ respectively). Those caregivers with greater self-efficacy and greater caregiver rewards reported greater quality of life. There were significant differences in caregiver burden with African-Americans feeling a greater level of burden. **CONCLUSIONS:** The differing effects of elder caregiving among African-Americans and Caucasian caregivers may require different, more personalized caregiver interventions and supports to reduce the caregiver burden, increase feelings of rewards, and improve the quality of life for both ethnic groups.

INFECTION – Clinical Outcomes Studies

PIN1

MATCHING-ADJUSTED INDIRECT COMPARISON OF LIPID PROFILE AT 48 WEEKS AMONG TREATMENT NAÏVE HIV-1 PATIENTS TREATED WITH ATAZANAVIR/RITONAVIR VERSUS DARUNAVIR/RITONAVIR

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OBJECTIVES: This study estimates lipid profile changes and abnormalities in treatment naïve HIV patients initiating atazanavir/ritonavir (ATV/r) versus darunavir/ritonavir (DRV/r) using a matched indirect comparison. **METHODS:** Two similarly designed randomized trials were identified. Individual patient-level data were available for the CASTLE trial comparing ATV/r (n=430) and lopinavir/r (LPV/r) (n=438); published summary data were used from the ARTEMIS trial comparing DRV/r (n=343) and LPV/r (n=346). To adjust for cross-trial differences, CASTLE patients were re-weighted to match summary baseline characteristics in ARTEMIS. Lipid profile changes and serious (grade 2-4) lipid laboratory abnormalities (LA) at 48 weeks were compared between balanced trial populations after matching. If significant differences in LPV/r outcomes existed after matching, the differences between active treatments and LPV/r were compared across trials. **RESULTS:** Data from all patients in the two trials were included. Before matching, CASTLE patients at baseline had a higher proportion of HIV-1 RNA>100,000 copies/mL, a lower proportion CDC class C, and lower median CD4 cell count than ARTEMIS patients. An unadjusted cross-trial comparison at 48 weeks showed that ATV/r and DRV/r had similar changes in total cholesterol, low density lipoprotein (LDL), and triglycerides, but ATV/r had significantly lower rates of total cholesterol LA (7% vs.13%, $p=0.008$) and LDL LA (8% vs. 13%, $p=0.040$). After balancing mean baseline characteristics, ATV/r and DRV/r at 48 weeks had similar changes in total cholesterol, LDL, and triglycerides (adjusted difference [AD]= -7.19, -7.11 and 7.59 mg/dL, respectively) and similar percentages of grade 2-4 triglycerides and cholesterol LAs (AD=0% and 1%, respectively); however, ATV/r had a significantly lower rate of serious LDL LA (AD=-9%, $p=0.006$). **CONCLUSIONS:** While the overall lipid profiles of ATV/r and DRV/r were similar at 48 weeks in this matching-adjusted indirect comparison, ATV/r had a significantly lower rate of serious LDL LA.

PIN2

THE IMPACT OF CLOSTRIDIUM DIFFICILE INFECTION ON MEDICARE BENEFICIARY HEALTH CARE UTILIZATION AND OUTCOMES

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OBJECTIVES: Clostridium difficile infection (CDI) primarily occurs in elderly adults and contributes to excess patient mortality, readmissions, hospital costs, and post-discharge costs. Two-thirds of CDI hospitalizations are for patients with CDI as a secondary diagnosis ("secondary CDI"). This study assesses the

burden of illness of secondary CDI on outcomes and healthcare utilization for hospitalized Medicare beneficiaries. **METHODS:** Using a 5% random sample of Medicare claims from 2009-2010, patients with and without secondary CDI and no prior hospitalization within the previous 30 days were identified. Prior year claims data were used to describe case mix and baseline characteristics. Propensity scores were developed to match CDI and non-CDI patients on potential confounding factors. Outcomes of interest were: index episode length-of-stay (LOS), emergency department (ED) and ICU use, inpatient mortality, post-discharge mortality, readmissions, and acute care use. **RESULTS:** The final sample size after a propensity score match was 3262 patients in each patient cohort. Secondary CDI was associated with an 80% increase in hospital LOS, and a greater than 160% increase in ICU days, relative to patients without CDI. Secondary CDI was associated with an 80% increase in both inpatient and 30-day post-discharge mortality. Inpatient mortality for immunocompromised patients was 130% greater than like patients without CDI. Secondary CDI was associated with a 41% increase in 30-day CDI readmission rates and a 46% increase in the number of readmissions per admission. Immunocompromised patients with secondary CDI were associated with a 180% increase in post-discharge CDI-related ED visits and a 65% increase in post-discharge skilled nursing facility admissions. **CONCLUSIONS:** Secondary CDI in hospitalized Medicare beneficiaries is associated with considerable negative impacts on LOS, mortality, readmission rates, and post-discharge utilization compared to matched controls. Consequently, comprehensive CDI prevention and treatment strategies are needed to decrease resource utilization and burden in patients who develop secondary CDI.

PIN3

USING CLAIMS DATA FOR SURGICAL SITE INFECTION SURVEILLANCE AFTER HERNIORRHAPHY

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OBJECTIVES: Billing and claims data can potentially be used to identify surgical site infections (SSIs) for quality improvement initiatives. We investigated the effect that variation in procedure coding by providers and facilities has on the calculated SSI incidence. **METHODS:** We established a retrospective cohort study of individuals aged 6 months - 64 years with ICD-9-CM procedure or CPT-4[®] codes from facility and/or provider claims for umbilical, femoral/inguinal, or incisional/ventral herniorrhaphy from 1/1/2004-12/31/2010 using private insurer claims data. SSIs within 90 days were identified by ICD-9-CM diagnosis codes, with censoring for other surgeries within 90 days. Complex surgeries with additional procedures performed on or before the herniorrhaphy date during a hospitalization were excluded. **RESULTS:** 155,748 non-complex herniorrhaphy procedures were initially identified based on distinct procedure dates >7 days apart. The number of distinct procedures was reduced to 144,220 after removing procedures with no supportive evidence for operation (e.g., anesthesia, operating room revenue codes, pathology; n=4,609) and surgeries coded for >1 hernia site or unclassified (n=6,919). The percentage of procedures complicated by SSI was compared according to the stringency of identification of hernia site. Using all claims coded for herniorrhaphy (facility and/or provider), 1.23% (363/29,582) of umbilical, 0.48% (433/90,231) of femoral/inguinal, and 4.00% (976/24,407) of incisional/ventral procedures were complicated by SSI within 90 days. In contrast, the percentages of procedures complicated by SSI were 1.17% (297/25,323) for umbilical, 0.46% (367/79,063) for femoral/inguinal, and 4.18% (752/17,981) for incisional/ventral herniorrhaphy when agreement between the provider and facility procedure coding was required to define the hernia site. **CONCLUSIONS:** Use of claims data to determine SSI rates requires careful classification of procedures, particularly when characteristics of the surgical procedure are important risk factors for infection.

PIN4

MULTIPLE SCLEROSIS INCREASES THE RISK OF INFECTIONS RESULTING IN A HOSPITALIZATION AMONG VETERANS

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OBJECTIVES: Multiple sclerosis (MS) is characterized by autoimmune mediated demyelination of the central nervous system, and affects nearly 300,000 individuals in the United States (US). Immunosuppressive MS therapy often leads to infections, which in turn may cause relapse or exacerbation of MS symptoms. This study is the first to evaluate the magnitude of the association between MS and serious infections in a US population. **METHODS:** Adult patients with MS, within the US Veterans Health Administration (VHA) system from 1999-2010 were identified. Those without encounters 6 months or more before the first diagnosis were excluded. Each MS patient was matched, on age and sex, with up to 4 non-MS patients. Cox Proportional Hazards regression models were developed to assess the influence of MS on serious infections identified by ICD-9 code. An infection was considered serious when listed as a hospital admission diagnosis in the VHA inpatient setting. Our regression models controlled for patient demographic characteristics, comorbid conditions, drug exposures, disability status, and health care utilization. **RESULTS:** Our analysis cohort consisted of 7,743 MS and 30,972 non-MS patients. Mean age was 53.8 (SD 13.4) years and 80.7% were male. Race was known in 40.8%; of which 80.2% were white, 16.0% black, and 3.8% variant ethnicities. The incidence of overall serious infections was 18.7 (95% CI=17.2-20.3) and 10.0 (95% CI=9.5-10.6) per 1,000 person-years for MS and non-MS patients, respectively. Regression models revealed that MS patients were at greater risk for overall serious infections (HR=1.54, $p<0.001$) as well as serious respiratory (HR=1.31, $p=0.01$), urinary tract