to fluconazole. The results remained unchanged in the scenario analyses with adjustment for the duration of treatment course, price of fluconazole, discount rate and so on. PSA showed that posaconazole was cost-effective when willingness to pay (WTP) was higher than ¥17,000. Posaconazole had a 87% probability of being cost-effective compared to fluconazole when WTP was higher than ¥193,932 based on 3 times per capita gross domestic product (GDP) of 2018 in China.

Conclusion: In China, posaconazole is a cost-saving prophylactic strategy compared with fluconazole in high-risk patients with AML or MDS.

280 | Impact of the pneumococcal conjugate vaccine in controlling antimicrobial resistance in China

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Introduction: Antimicrobial resistance (AMR) poses a serious threat to global public health. Vaccinations have the potential to hinder the progression of AMR by preventing bacterial infections and decreasing the need for antibiotic treatment. China has one of the world's highest rates of antibiotic use and low immunization coverage of the pneumococcal conjugate vaccine (PCV13).

Research Question or Hypothesis: What is the impact of PCV13 in slowing AMR accumulation for pediatric pneumococcal diseases in China?

Study Design: An agent-based DREAMR (Dynamic Representation of the Economics of AMR) model was developed to examine the impact of slowing AMR against Streptococcus pneumoniae through PCV13 childhood immunizations.

Methods: We simulated vaccinations, pneumococcal infections, antibiotic use, and AMR accumulation. Four commonly used antibiotics to treat pneumococcal diseases (penicillin, amoxicillin, 3rd generation cephalosporins, and meropenem) were modeled. Antibiotic utilization, pharmacokinetics, and pharmacodynamics were factored into predicting AMR accumulation. Three PCV13 coverage scenarios were simulated over a time-frame of five years: (1) status quo (no change in coverage), (2) accelerated (increase in coverage to 99% in five years), and (3) scaled (increase in coverage to 85% over two years, then increased to 99% coverage over three years).

Results: Our results showed that compared to status quo, over five years, AMR against penicillin, amoxicillin, and 3rd generation cephalosporins was significantly reduced by 0.31%, 7.63%, and 2.83% in the accelerated scenario and by 0.19%, 4.87%, and 1.73% in the scaled scenario. No significant change in AMR was identified for meropenem due to low incidence of pneumococcal meningitis. annual costs due to AMR, including direct costs and productivity losses, were reduced by $3.04 billion in the accelerated scenario and $1.87 billion in the scaled scenario compared to status quo.

Conclusion: Increasing PCV13 coverage in children would not only avert pneumococcal diseases but also slow the progression of AMR, prolonging antibiotic treatment effectiveness.

281 | Potentially inappropriate medication prescribing is associated with increased healthcare utilization and costs among older adults in the United States

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Introduction: Inappropriate medication use is an important public health issue especially as the U.S. population continues to age. Understanding how potentially inappropriate medications (PIMs) influence healthcare utilization is important in designing interventions to address this issue.

Research Question or Hypothesis: We hypothesize that exposure to PIMs is positively associated with healthcare utilization and expenditures.

Study Design: This is a cross-sectional analysis utilizing U.S. nationally representative data from the 2011 to 2015 Medical Expenditure Panel Survey (MEPS).

Methods: Respondents aged ≥65 years were identified within MEPS from 2011-2015. PIM exposure was operationalized using the 2019 Beers criteria. Outcomes included healthcare utilization (hospital admissions, emergency department (ED) visits, and outpatient provider visits) and related total expenditures. Negative binomial regression models were used to analyze rates of healthcare utilization and adjust for differences between groups. Survey weighted procedures were used to compare mean healthcare expenditures between groups (SAS version 9.4).

Results: PIMs were prescribed in 34.4% of our sample of ~218 million patients. Patients prescribed PIMs had significantly higher rates of healthcare utilization, including hospital admissions (33.5 vs. 19.3 per 100 patients, $P < 0.001$), ED visits (41.4 vs. 23.6, $P < 0.001$), and outpatient visits (160.4 vs 103.3, $P < 0.001$). In adjusted models, PIM prescribing was associated with a 46% increase in hospital admissions (incidence rate ratio [IRR], 1.46, 95% CI, 1.35-1.57, $P < 0.001$), 49% increase in ED visits (IRR, 1.49 95% CI, 1.39-1.59, $P < 0.001$), 41% increase in outpatient visits (IRR, 1.41 95% CI 1.37-1.46, $P < 0.001$). Adjusting to U.S. 2017 dollars, those prescribed PIMs had significantly

higher mean total expenditures for inpatient $1,769 ($P$ < 0.001), ED $140 ($P$ < 0.001), and outpatient $1,568 ($P$ < 0.001) care as well as prescribed drug costs $1,690 ($P$ < 0.001).

Conclusion: Our results suggest that patients' receipt of PIMs is associated with higher rates of healthcare utilization and increased costs across the continuum of care. Efforts to deprescribe PIMs may help reduce healthcare utilization and costs.

282 | Agreement of ICD-10 and pharmacy claims data coding of adherence among patients with diabetes or hypertension

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Introduction: ICD-10 codes exist that facilitate provider designation of patients as nonadherent to therapy; however, it is unclear whether this label accurately reflects patient behavior according to widely-accepted medication adherence metrics.

Research Question or Hypothesis: To what extent are patients both accurately coded for and have calculated rates of nonadherence using ICD-10 codes and claims, respectively?

Study Design: Retrospective cohort study

Methods: Patients were identified using 2015-2016 IBM MarketScan Commercial Claims and Medicare Advantage data. To be included, patients must have been coded nonadherent according to ICD-10 codes in outpatient encounter data (Z53.2, Z53.20, Z53.29, Z91.11-Z91.14) and have a primary diagnosis for either diabetes and/or hypertension, at least one oral antidiabetic or antihypertensive medication fill, and continuous enrollment 6 months before and after the initial nonadherence code. Tests of proportion, Chi-squared tests, generalized linear models, and logistic regression examined characteristics related to diagnosis concordance and changes in adherence (by proportion of days covered [PDC]) before and after the initial non-adherence code, respectively.

Results: A total of 2,387 patients coded nonadherent were identified, the majority of which were at least 45 years of age (81.5%), female (52.5%), resided in the South (56.2%), and lived in an urban area (85.1%). Among those coded nonadherent, 51.4% (diabetes) and 55.1% (hypertensive) had PDCs prior to the nonadherence code that would deem them adherent. The odds of being correctly labeled non-adherent when claims also indicated nonadherence decreased with age for diabetes (OR: 0.81 95% CI: 0.760-0.862) and hypertension (OR: 0.96; 95% CI: 0.951-0.966); consistent misclassifications were observed among those 55 years of age and older. PDCs and the proportion adherent increased significantly among both conditions following the nonadherent code (all P < 0.05).

Conclusion: Providers may be misclassifying patients as nonadherent using ICD-10 codes, but changes in adherence following the initial code indicate efforts to improve medication use may be put in place following such an encounter.

283 | Accuracy of estimated control group binomial event rates for medication related randomized controlled trials

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Introduction: Accurate estimates for sample size calculations can be difficult. For clinical trials with dichotomous outcomes the estimated event rate (ER) in the control group is necessary for sample size calculation. Investigators often estimate this ER based on published reports, despite differences in trial location, eligibility criteria, and endpoints. Significantly underestimating the ER could contribute to underpowered studies.

Research Question or Hypothesis: To evaluate the accuracy of the predicted control group ER (for the primary outcome) compared to the observed rate in randomized controlled trials (RCTs) involving medications or medication devices.

Study Design: Secondary analysis of published RCTs.

Methods: A literature review and data extraction were performed for RCTs involving a medication or medicated device from the journals New England Journal of Medicine, JAMA, and Lancet from 2015-2017, inclusive. Additional study inclusion criteria included: human subjects, anticipated control ER articulated in study methods, primary outcome of dichotomous event or composite of dichotomous events, and a lower rate of the primary outcome reflected greater drug effectiveness.

Results: There were 1685 studies reviewed. Sixty-seven studies met criteria for inclusion (NEJM 35, JAMA 13, Lancet 19). There were 29 studies (43.3%) with actual control ERs below predicted vs. 38 studies (56.7%) with rates above predicted. Range for the relative difference (actual - predicted / actual) in control ERs was -3.348 to 0.879. Only 21 studies (31.3%) achieved a control ER which was within 20% of the predicted rate, relatively. Study characteristics associated with improved accuracy were studies with larger enrollment and inclusion of mortality among outcome events (P < 0.05 for each).

Conclusion: Significant variation exists regarding accuracy of control group ER predictions. Such variation may lead to underpowered studies which may contribute to type 2 error. Larger study enrollment and inclusion of mortality were each associated with improved accuracy.