ANALYSIS GROUP

Analysis Group Symposium, Podium Presentation, and Posters

ICPE 2023 | AUGUST 23–27 | HALIFAX, NOVA SCOTIA, CANADA

Analysis Group's health care experts apply skills in epidemiology, biostatistics, clinical research, and regulatory strategy to questions across broad therapeutic areas.

This year, we are pleased to present a symposium, a podium presentation, and six research posters. Please find details below.

Please stop by and say hello to our team at Booth #406.

ICPE 2023 Analysis Group Symposium and Podium Presentation

SYMPOSIUM

Sunday, August 27 | 10:30 a.m.–12:00 p.m. ADT | Argyle 1

ABSTRACT #1459776 | PUBLICATION #238

Bias Introduced by COVID-19 Related Healthcare Disruptions in Safety and Effectiveness Studies: Proposing Methodological Solutions

Description: The symposium will begin by reviewing the drivers of healthcare disruption in the early stages of the COVID-19 pandemic. The impact on real-world treatment patterns, healthcare utilization, and adverse disease outcomes will be described using chronic obstructive pulmonary disease (COPD) and asthma examples. Potential bias introduced into comparative real-world evidence (RWE) studies spanning periods before and during the pandemic will be discussed with a focus on exposure and outcome misclassification and pandemic associated confounding. Methodological solutions will be explored including adjustments to existing treatment exposure and outcome algorithms to reduce misclassification, as well as the use of natural cubic spline regression and multilevel modelling to adjust for pandemic associated confounding. Approaches will be discussed using a treatment effectiveness example including an assessment of methods performance. Finally, the regulators' perspective will be explored discussing how pandemic associated methodological challenges are considered for regulatory decision-making. An interactive discussion with the audience and panel will further inform methodological approaches to strengthen the validity of RWE generated during the COVID-19 pandemic period and potential application for future health threat crises.

Speakers:
Kieran J. Rothnie, *Director of Epidemiology, GSK*
Mei Sheng Duh, *Chief Epidemiologist and Managing Principal, Analysis Group*
Ian Douglas, *Professor, London School of Hygiene & Tropical Medicine*
Catherine Cohet, *Pharmacoepidemiology/RWE Senior Specialist, European Medicines Agency*

Moderators:
Marianne Cunnington, *Vice President, Analysis Group*
Melissa Van Dyke, *Senior Director and Head, Research Epidemiology, GSK*

PODIUM PRESENTATION

Sunday, August 27 | 9:15–9:30 a.m. ADT | Argyle 1

ABSTRACT #218023 | PUBLICATION #205

Likelihood of Antimicrobial Resistance in Urinary E. coli Isolates Comparing Female Patients with Recurrent Versus Non-recurrent Uncomplicated Urinary Tract Infection in the United States

Objectives: The study objective was to assess the likelihood of antimicrobial resistance (AMR) in patients with recurrent uncomplicated urinary tract infection (uUTI) (RuUTI) versus those with non-recurrent uUTI (NRuUTI).

Methods: Data from female patients ≥12 years of age were assessed in the OPTUM de-identified Electronic Health Record (EHR) dataset between October 2015 and February 2020. Eligibility criteria included ≥1 culture-proven E. coli uUTI diagnosis and pyuria ±7 days of diagnosis (date of most recent uUTI diagnosis was defined as index date), treatment with ≥1 oral antibiotic of interest ±5 days of index date, susceptibility test results of the urinary E. coli isolate to ≥3 antibiotic classes of interest ±7 days of index date, and ≥12 months of EHR activity prior to index (baseline period). Patients were categorized into 2 cohorts: RuUTI (defined as ≥2 uUTI episodes in 6 months or ≥3 uUTI episodes in 12 months including index diagnosis) and NRuUTI. Multivariable logistic regression was performed to evaluate the relative odds of AMR in RuUTI versus NRuUTI.

Results: Of 80,267 patients with uUTI, 12,234 (15.2%) were included in the RuUTI cohort and 68,033 (84.8%) in the NRuUTI cohort. Mean (standard deviation) age was 51.2 (21.0) and 46.5 (19.5) years (standardized difference [std diff] 13.1%), and 45.5% and 34.6% had a history of acute or semi-acute infections (non-UTI related) at baseline (std diff 22.3%), respectively. Patients with RuUTI had 18% (95% CI 1.12, 1.24) higher odds of single drug resistance (SDR; p< 0.001), 53% (95% CI 1.41, 1.67) higher odds of resistance to 2 drug classes (MDR2; p< 0.001), and 70% (95% CI 1.48, 1.96) higher odds of resistance to ≥3 drug classes (MDR3) relative to patients with NRuUTI (p < 0.001).

Conclusions: Patients with RuUTI due to E. coli had higher odds of AMR than patients with NRuUTI. The magnitude of the odds ratio increased from SDR to MDR3. The increased likelihood of AMR in RuUTI should be considered when treating patients empirically with antibiotics.

Authors: Chief Epidemiologist and Managing Principal Mei Sheng Duh, Vice President Wendy Cheng, Associates Chi Gao and Malena Mahendran, Senior Research Professional Annalise Hilts, and researchers from GSK and Hackensack University Medical Center

ICPE 2023 Analysis Group Research Posters

SESSION A

Friday, August 25 | 8:00 a.m.–6:00 p.m. ADT | Convention Hall

ABSTRACT #1459051 | PUBLICATION #603

Validation of Real-World Case Definitions for COVID-19 Diagnosis and Severe COVID-19 Illness Among Patients Infected with SARS-CoV-2: Translation of Clinical Trial Definitions to Real-World Settings

Background: As polymerase chain reaction (PCR) tests for coronavirus disease 2019 (COVID-19) diagnosis are becoming less frequently conducted and a standardized surveillance case definition of severe COVID-19 illness is lacking, it is important to establish the accuracy of codified COVID-19 case definitions for the analyses of real-world datasets.

Objectives: To assess the performance of the International Classification of Diseases 10th Revision, Clinical Modification (ICD-10-CM) code for COVID-19 diagnosis (U07.1) against PCR test results (Objective 1); to translate severe COVID-19 illness endpoints from clinical trials to real-world case definitions through validation of electronic medical record (EMR)-based codified algorithms against chart review (Objective 2).

Conclusions: COVID-19 diagnosis based on ICD-10-CM code U07.1 did not have adequate sensitivity; therefore, PCR test results may be required to confirm true COVID-19 cases in real-world datasets. The EMR-based case definition showed high positive predictive performance and can be used to identify cases of severe COVID-19 illness in real-world datasets. These findings highlight the importance of validating outcomes when conducting research using real-world data, and help orient researchers to COVID-19 patient data, especially in light of testing fatigue or increased home-based testing where PCR test results are not readily available.

Authors: President Pierre Cremieux, Co-founder Bruce E. Stangle, Chief Epidemiologist and Managing Principal Mei Sheng Duh, Vice President Maral DerSarkissian, Senior Associate Rose Chang, Associates Catherine Nguyen and Louise H. Yu, Senior Analyst Azeem Banatwala, and researchers from Pfizer and Mass General Brigham

ABSTRACT #1456151 | PUBLICATION #382

Post-Emergency Use Authorization (EUA) Active Safety Surveillance Study among Individuals in the Veterans Affairs Health System Receiving Pfizer-BioNTech Coronavirus Disease 2019 (COVID-19) Vaccine

Background: On January 29, 2021, Pfizer, in collaboration with the US Veterans Health Administration (VHA) and Analysis Group, initiated a study (C4591012) for EUA active surveillance among VHA enrollees.

Objectives: To assess whether the VHA population experience increased risk of safety events of interest after receiving Pfizer-BioNTech COVID-19 vaccine.

Conclusions: None of the safety events of interest were found to be associated with Pfizer-BioNTech COVID-19 vaccine based on the signal detection and evaluation analyses. Active safety surveillance is an essential part of pandemic response.

For myocarditis/pericarditis, adjusted analyses comparing events in the risk vs. comparison interval among vaccine recipients detected no signals, although the small sample size of young men in the VHA population provided limited statistical power.

Authors: President Pierre Cremieux; Chief Epidemiologist and Managing Principal Mei Sheng Duh; Vice Presidents Maral DerSarkissian and Marianne Cunnington; Associates Catherine Nguyen, Mu Cheng, and Angela Lax; Senior Analyst Tracy Guo; and researchers from Pfizer and the Edward Hines, Jr. Veterans Affairs Hospital

SESSION B

Saturday, August 26 | 8:00 a.m.–6:00 p.m. ADT | Convention Hall

ABSTRACT #214849 | PUBLICATION #888

Development of a Risk Categorization Framework to Quantify Antimicrobial Resistance Risk in Female Patients with Uncomplicated Urinary Tract Infection

Background: Patients with uncomplicated urinary tract infections (uUTIs) typically receive empiric antibiotic (Abx) treatment, which may not be effective if the uropathogen is resistant due to growing antimicrobial resistance (AMR). Data-driven approaches inform empiric prescribing by evaluating patient-level AMR risk for Abx prescribed for uUTIs.

Objectives: To construct risk categories for resistance to four common Abx classes recommended by prescribing guidelines for uUTI (nitrofurantoin [NFT], trimethoprim/sulfamethoxazole [SXT], beta-lactams [BLs], and fluoroquinolones [FQs]) based on probabilities of resistance derived from predictive models.

Conclusions: Our AMR risk categorization framework provides a useful approach to contextualize the probability of AMR to four common Abx classes used to empirically treat uUTIs. This framework could be used to build a tool to help physicians more effectively manage appropriate empiric Abx treatment options for patients with uUTI.

Authors: Managing Principal Lisa Pinheiro, Principal Jimmy Royer, Vice President Wendy Cheng, Manager Kalé Kponee-Shovein, Senior Research Professional Fernando Kuwer dos Santos, Associates Chi Gao and Malena Mahendran, and researchers from GSK, the University of Pittsburgh Medical Center, and the University of Maryland School of Medicine

ABSTRACT #1465353 | PUBLICATION #849

Identifying Cytokine Release Syndrome in Retrospective Databases: A Performance Assessment of a Claims-Based Algorithm

Background: Cytokine release syndrome (CRS) is an acute systemic inflammatory condition caused by an immune response to a treatment or an infection, for which the International Classification of Diseases (ICD-10) code was introduced in October 2020 with grading-level granularity. However, given the novelty of the code and the presence of an unspecified grade option, other means to identify CRS in retrospective databases, particularly severe CRS, may be warranted.

Objectives: To assess the performance of a published administrative claims-based algorithm (Keating et al., 2022) to identify CRS in two retrospective databases.

Conclusions: The algorithm published by Keating et al. performed well in identifying any grade CRS in retrospective databases, but few cases of severe CRS were identified in the diagnosed patients. Given the high proportion of CRS diagnoses with an ICD-10 code of unspecified grade, a modified algorithm may be warranted to better identify severity of CRS, potentially by adding procedures associated with the management of severe CRS to the algorithm.

Authors: Managing Principal Patrick Lefebvre, Vice President Marie-Hélène Lafeuille, Manager Philippe Thompson-Leduc, Research Professionals Anabelle Tardif-Samson and Bronwyn Moore, and researchers from Janssen and the Yale School of Medicine

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ABSTRACT #2433829 | PUBLICATION #811

Comparative Effectiveness of Pegcetacoplan (PEG) Versus Ravulizumab (RAV) and Eculizumab (ECU) in Complement Inhibitor-Naïve Patients with Paroxysmal Nocturnal Hemoglobinuria (PNH): A Matching-Adjusted Indirect Comparison

Background: Many patients with PNH treated with the complement component 5 (C5) inhibitors RAV and ECU experience persistent symptoms. PEG, an approved C3 inhibitor, is another therapeutic option.

Objectives: In the absence of head-to-head studies, this study compared treatment outcomes with PEG vs. RAV or ECU in complement inhibitor-naïve patients with PNH by matching-adjusted indirect comparison (MAIC).

Conclusions: PEG is associated with greater improvements in clinical, hematologic, and quality of life outcomes than C5 inhibitors and is a first-line treatment option for complement inhibitor-naïve patients with PNH.

Authors: Chief Epidemiologist and Managing Principal Mei Sheng Duh, Vice President Lynn Huynh, Associate Christopher Yee, Senior Analyst Abigail Zion, and researchers from the Sir YK Pao Centre for Cancer & Department of Medicine and Therapeutics; The Chinese University of Hong Kong; Prince of Wales Hospital, Hong Kong; Apellis; and the Swedish Orphan Biovitrum AB

SESSION C

Sunday, August 27 | 8:00 a.m.–1:30 p.m. ADT | Convention Hall

ABSTRACT # 209326 | PUBLICATION #1182

Development and Validation of a Claims-Based Definitional Algorithm for Moderate Asthma Exacerbations

Background: Moderate asthma exacerbations are symptom-driven events which are associated with poor outcomes. However, they are difficult to identify in retrospective real-world data sources, such as administrative claims data.

Objectives: The aim of this study was to develop a claims-based algorithm for identifying moderate asthma exacerbations in administrative claims data and assess its performance using electronic medical records (EMRs).

Conclusions: The relatively modest performance of the algorithm underscores limitations of using claims data to identify moderate exacerbations of asthma. The algorithm may show increased performance in identifying moderate and severe events combined together.

Authors: Chief Epidemiologist and Managing Principal Mei Sheng Duh, Vice President Wendy Cheng, Manager Philippe Thompson-Leduc, Associate Alexandra Greatsinger, and Senior Analyst Adina Zhang, with researchers from GSK and The University of New Mexico