

GC-ICODA-010 The PRIEST (Pandemic Respiratory Infection Emergency System Triage) Study for Low- and Middle-Income Countries

Carl Marincowitz and colleagues at the University of Sheffield in the United Kingdom and the University of Cape Town in South Africa will develop a risk assessment tool to help emergency clinicians quickly decide whether a patient with suspected COVID-19 needs emergency care or can be safely treated at home to avoid overburdening hospitals particularly in low- and middle- income countries (LMICs). They will use their existing data on 50,000 patients with suspected COVID-19 infection who sought emergency care in the United Kingdom, South Africa, and Sudan to develop prediction models for specific health outcomes in each setting. These prediction models will be used to develop risk stratification tools together with patient and clinical stakeholders in each income setting. They will test the performance of their risk assessment tools for identifying high-risk patients with existing triage methods.

To ensure hospitals in low- and middle- income countries are not overwhelmed during the COVID-19 pandemic by developing a risk assessment tool for clinicians to quickly decide whether a patient needs emergency care or can be safely sent home.

GC-ICODA-009 The Impact of COVID-19 on Chronic Care Patients' Health Care Utilisation and Health Outcomes in Haiti, Malawi, Mexico and Rwanda

Dale Barnhart and colleagues at Harvard Medical School in the U.S. and Partners in Health of Haiti, Malawi, Mexico, and Rwanda will determine how the COVID-19 pandemic has impacted health care provision and utilization for patients with HIV, heart disease, and diabetes, and the health of these patients, in these four countries. They will pool existing electronic medical data on chronic patients collected from up to 30 health facilities in each country and create a harmonized database to identify the impacts of COVID-19 and any successful strategies used to improve care. They will also develop a predictive model to identify which patient populations are most at risk from care disruption during the pandemic, which can help identify clinical and geographic areas to prioritize for interventions. Finally, they will develop data visualization tools to facilitate the communication and interpretation of the data by chronic care managers across different countries.

To evaluate the impact of the COVID-19 pandemic on care provision and utilization, and the health of patients with chronic diseases like HIV and diabetes in Haiti, Malawi, Mexico, and Rwanda, by collecting and analyzing electronic medical records.

GC-ICODA-008 Routine Assessment of Infections, Prevention, and Control of SARS-CoV-2 on Unequal Populations

Juliane Foseca de Oliveira and colleagues at Fiocruz in Brazil will develop mathematical and statistical methods to model COVID-19 transmission across populations in Brazil to better inform local intervention efforts. Social and economic inequalities are known to shape the spread of diseases. They will integrate existing health data together with social and economic determinants for 5,570 Brazilian cities, as well as data on the effects of the mitigation strategies and social mobility patterns. These data will be used to develop and apply statistical analyses and nonlinear mathematical modelling to forecast disease outcomes that consider the specific socio-economic conditions, which influence transmission rates. The results will be presented on a user-friendly

surveillance platform that can be used by local governments and communities to identify the most effective control methods for their region.

To reduce the impact of a pandemic on an unequal population such as that in Brazil by applying mathematical and statistical methods to socio-economic and health data to predict COVID-19 transmission and health outcomes.

GC-ICODA-007 Incidence and Risk Factors for COVID-19 Amongst Pregnant and Lactating Women and their Infants in Uganda

Kirsty Le Doare and colleagues at the MRC/UVRI & LSHTM Uganda Research Unit and Makerere University John's Hopkins University in Uganda will develop a model using data collected in real-time to identify the risk factors for adverse pregnancy and infant outcomes caused by the COVID-19 pandemic that can be used to rapidly inform interventions. Lockdowns can severely impact women giving birth and access to maternal, neonatal, and child healthcare. They will apply a Bayesian multivariate network meta-analysis to electronic medical records, leveraging existing data on the effect of the lockdown on antenatal and delivery services for over 30,000 pregnancies, vaccination data, and information on COVID-19 infection in pregnancy and infancy. They will also build a user-friendly data dashboard to support decision-making on infection prevention and control at the Ministry of Health.

To improve maternal, neonatal, and child health in Uganda during pandemics by using a modelling approach on existing data from 30,000 pregnancies to identify risk factors for adverse outcomes.

GC-ICODA-006 Evaluating Effects of Social Inequalities on the COVID-19 Pandemic in a Low- and Middle-Income Country (LMIC)

Maria Yury Ichihara and colleagues at the Center for Data and Knowledge Integration for Health (Cidacs) at Fiocruz in Brazil will create a social disparities index to measure inequalities relevant for the COVID-19 pandemic, such as unequal access to healthcare, to identify regions that are more vulnerable to infection and to better focus prevention efforts. In Brazil, markers of inequality are associated with COVID-19 morbidity and mortality. They will develop the index using available COVID-19 surveillance data and build a public data visualization dashboard to share the index and patterns of COVID-19 incidence and mortality with the broader community. This will enable health managers and policymakers to monitor the pandemic situation in the most vulnerable populations and target social and health interventions.

To combat the effects of social and economic inequality in Brazil on the impact of COVID-19 by creating a social disparities index and visualization dashboard to help identify vulnerable populations and focus prevention efforts.

GC-ICODA-005 Data Descriptor, Reference Coding, and Characterisation of the Systemic Complications of Critical Care Patients Included in the ISARIC COVID-19 Dataset

Luis Felipe Reyes at the Universidad de La Sabana in Colombia and colleagues will develop a standardized strategy for researchers to better utilise the ISARIC-COVID-19 dataset, which consists of over 520,000 hospitalized patients from more than 62 countries, and identify the causes and health impacts of severe complications. The dataset is particularly valuable because it covers varying standards-of-care around the world

and could be used to study the geographic and temporal variability of the disease. They will develop a standardized strategy to reformat and clean the ISARIC-COVID-19 dataset by producing data descriptors and reference codes. They will use this strategy to identify the risk factors and clinical characteristics of COVID-19 complications, such as cardiovascular complications, which are a major contributor to long-term morbidity and mortality, so that vulnerable patients can be better treated.

To reformat and clean up the ISARIC-COVID-19 dataset, which is one of the largest and richest datasets consisting of over 520,000 hospitalized patients from more than 62 countries, so it can be better utilized by researchers.

GC-ICODA-004 Characterising COVID-19 Transmission Chains for Precision Mitigation Using Epidemiological Survey Data

Xiaofan Liu at the City University of Hong Kong and colleagues will reconstruct COVID-19 transmission chains between individuals in communities and households using statistical methods applied to existing datasets to more reliably estimate COVID-19 transmission properties, such as reproduction rates, that are critical for planning effective control measures. Currently, transmission properties are estimated using aggregated-level data, which leads to inaccuracies. Ideally, data on how COVID-19 is transmitted between individuals are needed. They will curate an existing collection of datasets containing over 40,000 COVID-19 cases in five Asian countries with interpersonal transmission evidence to reconstruct transmission chains. They will then apply statistical tests and regression analysis to identify the most important transmission risk factors, which may include virus strain, transmission media, population density, and climate conditions.

To improve control measures for COVID-19 by applying statistical methods to existing datasets containing over 40,000 COVID-19 cases from five Asian countries to reconstruct transmission chains between individuals in households and communities.

GC-ICODA-003 Addressing Critical Covid-19 Questions Through Research Using Linked Population Data (ACCORD)

Andrew Boule and colleagues at the Western Cape Government Health Department and the University of Cape Town in South Africa will use a data science approach applied to anonymized COVID-19 health data, including over one million tests and 60,000 hospital admissions, to study the clinical epidemiology and evolution of a new variant of SARS-CoV-2 that emerged in South Africa and the impact on patients with existing health conditions. They will conduct a case-control study to determine the clinical severity of the variant and use a cross-sectional design to explore the evolution of viral load. They will also analyze the impact of COVID-19 on pregnancy by evaluating birth weight and other birth outcomes, such as still births, and use death registries to determine mortality rates in patients with HIV, TB, and diabetes.

To understand COVID-19 evolution and impact, also on pregnancy and chronic diseases, by applying a data science approach to health data to study the clinical epidemiology and evolution of a new SARS-CoV-2 variant, which emerged in South Africa.

GC-ICODA-002 Impact of COVID-19 on Health Service Delivery and Institutional Mortality: A Multi-Country Consortium

Catherine Arsenault at the Harvard T.H. Chan School of Public Health in the U.S. and colleagues will measure the effect of the COVID-19 pandemic and associated containment policies such as curfews on the quality of health care in seven countries and the rates of mortality from non-COVID conditions. They have extracted data from health management information systems spanning two years from Ethiopia, Ghana, Haiti, Laos, Mexico, Nepal, and South Africa. They will first clean the data and then apply segmented regression analysis to assess the effect of the pandemic on health service delivery, such as the provision of certain preventive and curative services, and use difference-in-differences estimations to assess the effect of containment policies on healthcare demand, such as patient appointments. This will help countries to address gaps in their health care systems and plan recovery strategies for missed health care.

To measure the effect of the COVID-19 pandemic and associated containment policies such as curfews on health care in seven countries by using health management information systems to evaluate the quality of care and mortality rates from non-COVID conditions.

GC-ICODA-001 Effectiveness of COVID-19 Vaccination in Brazil Using Mobile Data

Fernando Bozza at Fiocruz in Brazil and colleagues will quantify the real-world value of COVID-19 vaccines in Brazil for protecting individuals from severe disease and for protecting the entire population from being infected. Knowing how effective vaccination is, and how durable the response in the real world is, particularly in low- and middle-income countries, is critical for ending the pandemic. They will determine the effectiveness of the vaccine for protecting individuals using a test-negative design together with statistical and machine learning approaches to compare the severity of respiratory disease in COVID-19 patients from 43 hospitals. At the population level, they will perform an ecological study, and use regression analysis accounting for inequities to vaccine access, to measure the effect of vaccinations on COVID-19 cases, hospitalizations, and deaths.

To quantify the real-world value of COVID-19 vaccines in Brazil for protecting the individuals and the whole population by using statistical and machine-learning approaches on data from patients and from an existing COVID-19 mobile application.