SWE-REG Spring web conference 2022
"Collaborative registry-based research in the era of COVID-19"
11th May:09.00-15.30
On Zoom

Program

Forenoon session

Introduction
9:00 - Opening remarks Sven Oskarsson (Chair), Bright Nwaru (Co-chair) and Poorna Anand (national coordinator/moderator)

Keynote talk
9:05 – 10:05
Title: Collaborative registry-based research in the era of COVID-19 - opportunities and obstacles

Key-note speaker: Fredrik Nyberg, Professor of Register Epidemiology, School of Public Health and Community Medicine, Institute of Medicine, Sahlgrenska Academy, University of Gothenburg

Abstract:
As the novel SARS-CoV-2 virus burst on the world stage, the research world mobilised to respond. Ethics committees, funding agencies, data holders and research organisations introduced fast-track processes and prioritized COVID-19 research. This presented many opportunities, but also revealed many drawbacks. At the same time, deficiencies in the capability of research systems to respond rapidly and validly to urgent questions became more apparent.
I will discuss how register research was affected in Sweden, what positive and negative aspects became apparent, and what learnings for the future we can draw. Questions to be discussed will include ethics processes, data application procedures, variability in response time, obstacles to acquiring and linking data, legal issues and research dissemination and publication. Research collaboration and networking nationally and internationally will also be discussed. The presentation will be exemplified by experiences based on a large nationwide register-based study of COVID-19 and COVID-19 vaccination that was initiated in 2020 and is ongoing. The study links data from a number of registers at Socialstyrelsen, SCB, Folkhälsomyndigheten, Försäkringskassan, a range national quality registers as well as primary care data from the Stockholm and Gothenburg regions

Coffee break (25 minutes)
10:05 – 10:30 with discussions between participants about the keynote - 30 min in breakout rooms on *Zoom*

Oral presentations

10:30 – 11:00
Title: Real-time Epidemiology during the COVID-19 pandemic approach
Speaker: **Jonas Björk**, Division of Occupational and Environmental Medicine, Lund University
Abstract:
Background
The COVID-19 pandemic has stressed the importance of producing timely epidemiological results of high quality in order to inform policy making. The aim of the present study was to

set up a surveillance system for monitoring of vaccine effectiveness in relation to virus variants, age, sex and presence of comorbidities.
Methods
A closed cohort including all individuals residing in Skåne, southern Sweden, was established when vaccinations started on 27 December 2020. The cohort was linked regularly with national register data on vaccinations and positive tests, and with regional data on hospitalizations and disease severity. Routine sequencing data were used to identify dominating virus variants at different time points. Conditional logistic regression based on 1:10 case: control matched sets were used for weekly or monthly effect estimation. Findings were made public through a web site and social media and were disseminated regularly to the Public Health Agency of Sweden.
Results
Collaboration with the data provider at the County council was essential for the data linkage, as was the subscription systems for both national and regional data. The case-control design was a convenient way to monitor waning vaccine effectiveness, while avoiding bias due to time-varying patterns in, e.g., infection pressure, disease severity and testing recommendations.
Conclusions
Real-time register-based research has great potential to contribute with new knowledge of high societal relevance, not only during pandemics and other health crises in society, but also during more normal conditions. Further efforts should be made to increase efficiency in the entire data retrieval chain from applications to accessible data.

11:00 – 11:30

Title: BRIDGING THE GAP: Introducing “Andas Sverige” and “Breathe Sweden”–platforms for public dissemination of respiratory research and respiratory research collaboration
Speaker: **Bright I. Nwaru,** Krefting Research Centre, Institute of Medicine, University of Gothenburg University
Abstract:
Background
Much of respiratory research is conducted in a fragmentary way, with many research groups working relatively independently of each other. In addition, research outputs are rarely published in a way that is easily understood by the public. The Swedish Research Council is funding STELLAR, which is part of the SWE-REG network. STELLAR brings together three large respiratory cohorts (West Sweden Asthma Study, Obstructive Pulmonary Disease in Norrbotten, and Children of Western Sweden) to develop a common research environment and create a structure for collaboration with other researchers in Sweden and abroad. Two of STELLAR’s mandates are to create platforms that (1) translate respiratory research into popular science that the public can understand; and (2) bring respiratory researchers together in a fruitful and continuous collaboration.
Method
The platforms are implemented by creating websites, “Andas Sverige” and “Breathe Sweden”, for public alignment with respiratory research and respiratory research collaboration, respectively. With the public as focus, “Andas Sverige” gathers information in a continuous way about respiratory diseases and research results from the projects implemented by our groups and other sources. “Breathe Sweden” on the other hand provides a space through which respiratory disease investigators, nationally and internationally, young and experienced, can promote shared understanding, develop effective and reciprocal working relationships, and increase multidisciplinary capacity in undertaking respiratory research.
Results
Andas Sverige has now been launched and is available online at: www.andassverige.se. Creation of Breath Sweden is now in its final phase. The motivation, processes of development, and benefits to the society and research community will be presented at the conference.

Conclusion: Our vision is that STELLAR will strengthen collaboration in respiratory research and increase information to the public outside the research community.

Leg stretcher (10 minutes)
11:30 – 11:40

11:40 – 12:10
Title: WSAS-COVID study: Longitudinal clinical and registry follow-up of Covid-19 survivors for respiratory, cardiac and neuropsychological outcomes in West Sweden
Speaker: Hannu Kankaanranta, Krefting Research Centre (KRC), Department of Internal Medicine and Clinical Nutrition, Institute of Medicine, University of Gothenburg
Abstract:
Background
The clinical picture of COVID-19 can range from mild flu-like symptoms to severe disease. COVID-19 infection has been associated with respiratory, cardiac and neurological long-term outcomes. Whilst follow-up studies of COVID-19 disease are already ongoing, most of these studies involve only patients who have been hospitalized due to severe disease. In this study we aim to assess the long-term respiratory, cardiac and neuropsychological effects of COVID-19 infection at population level.
Methods
Participants from the West Sweden Asthma Study (WSAS) were evaluated for previous COVID-19 infection from SmiNet (PCR) or Västra Götaland Region (clinical diagnosis). We will invite a sample of 360 COVID-cases and 720 age- and sex-matched non-COVID cases to clinical visits at 1 and 3 years after COVID-19 disease. An integrated registry follow-up up to 10 years using SCIFI-PEARL database will be performed. In addition to structured symptom questionnaires and laboratory tests, visits include evaluation of respiratory (spirometry, diffucing capacity), cardiological (ECG, 24h holter-ECG, cardiac enzymes) and neuropsychological (examination of processing speed, executive, and memory function) outcomes.
Results
Out of the 42,621 participants of the WSAS cohort, 6560 (15.4%) were found to have either PCR-positive COVID-19 and/or clinical diagnosis of COVID-disease, thus offering a large population to be invited to the clinical study.
Conclusions
By combining clinical and registry data, the WSAS-COVID study will offer a unique possibility to assess the long-term respiratory, cardiac and neuropsychological consequences of COVID-19 infection at population level and has the potential to improve our understanding of the long-term outcomes of COVID-19 infection.

Lunch (45 minutes)
12:10 – 12:55

Afternoon session

Panel discussion
13:00 – 14:00
Title: Collaborative registry-based research in the era of COVID-19

Moderator
Sven Oskarsson, Professor at Department of Government, Uppsala University (Chair, SWE-REG)

Panel
Fredrik Nyberg, Professor of Register Epidemiology, School of Public Health and Community Medicine, University of Gothenburg
Annika Rosengren, Professor of Medicine, Sahlgrenska Academy, University of Gothenburg
John Östh, Professor at Department of Social and Economic Geography, Uppsala University
Tove Fall, Professor in Molecular Epidemiology, Department of Medical Sciences, Uppsala University

Coffee break (20 minutes)
14:00 – 14:20

Flash presentations (posters)
14:25 – 15:25

Group A

Flash presentation 1
14:25 – 14:45
Title: Socioeconomic factor, environmental exposure and Nonsteroidal anti-inflammatory drugs (NSAID) exacerbated respiratory disease - Results from Swedish population-based study
Speaker: ***Muwada Bashir***, Krefting Research Centre, Institute of Medicine, University of Gothenburg, Gothenburg, Sweden.
Abstract:
Background: NSAID-exacerbated respiratory diseases (NERD) refers to respiratory symptoms associated with asthma or chronic rhinosinusitis with or without nasal polyposis that are triggered by NSAID intake. Population-based studies on NERD are scarce with few investigating how socioeconomic status (SES) and environmental exposures influence NERD risk.
Objective: To determine the role of SES and environmental exposures in NERD.
Methods: We analyzed data from West Sweden Asthma Study 2016. Of 24 534 who were randomly selected to answer questionnaire on respiratory outcomes and exposures, 18 908 adults (≥20 years) were included. NERD was defined as reporting of drug induced respiratory dyspnea when using NSAID and having asthma or/and rhinitis.
Results: Risk factors for NERD were female gender (odd ratio (OR) 3.2; 95% CI 1.2-4.6), BMI >30 (OR 2.5; 95% CI 1.4-4.5) and familial allergy (OR 2; 95%CI 1.3-3.1). House exposure to mold (OR 2.8; 95% CI 1.1- 4.8), dented or yellow plastic carpets or blackened parquet (OR 2.8;95% CI 1.1-6.6), vapor, gas, dust and fumes exposure at work (OR 2.1;95% CI 1.2-3.5), and high education: secondary (OR 2.2;95% CI 1.2-4.6), tertiary (OR 2; 95% CI 1.1- 4.2) were associated with higher odds of NERD. Smoking and childhood exposure to

farming did not predict NERD. Obesity-induced risk was not modified by parental allergy, education or environmental exposures.
Conclusion: Risk factors for NERD include high educational level and environmental exposures in household and working environment. Obesity effect on NERD was not modified by parental allergy, SES or irritants' exposure at work or home.

Flash presentation 2
14:45 – 15:05
Title: The Nordic Helicobacter Pylori Eradication Project (NordHePEP): A Nordic Registry-Based Cohort
Speaker: ***Anna-Klara Pettersson,*** Upper Gastrointestinal Surgery, Department of Molecular Medicine and Surgery, Karolinska Institutet
Abstract:
Background: The bacterium Helicobacter pylori (HP) infects the stomachs in >50% of the global population. HP-infection is causally associated with gastric adenocarcinoma and might influence risk also of other gastrointestinal tumours of the tract in different directions. Whether HP-treatment changes cancer risk is unknown for most tumours. This question requires a very large cohort with long follow-up which has not been possible before, but the drug registries in the Nordic countries have now been available long enough to help provide answers.
Methods: The Nordic Helicobacter Eradication Project (NordHePEP) is a population-based cohort of all patients having had HP-eradication treatment in any of the national prescribed drug registries in Denmark, Finland, Iceland, Norway or Sweden. Additional data came from the national registries of cancer, patients, death and population. The comparison group is the background population of the corresponding age, sex and calendar year. We will calculate standardised incidence ratios with 95% confidence intervals to assess cancer risk.
Results: After 3 years, all cohort data for NordHePEP have been collected and merged. NordHePEP includes 607,937 HP-eradicated individuals. During up to 27 years of follow up, 55,886 participants developed any cancer, including 19,539 with a gastrointestinal cancer.
Conclusions: It requires much time end efforts, but it is possible to retrieve and merge data, including drug use, from all Nordic countries for population-based registry-based cohorts. NordHePEP has the prerequisites for providing valid and robust results regarding how HP-eradication influences cancer risk.

Flash presentation 3
15:05 – 15:25
Title: Impact of treatment with inhaled corticosteroids on COVID-19 risk and outcome – a potential protective effect on severity of disease and survival
Speaker: ***Marina Labor,*** University hospital Linköping - Linköping
Abstract:
Background: Inhaled corticosteroid therapy (ICS) is an important therapeutic modality in chronic respiratory diseases, and patients with chronic obstructive pulmonary disease (COPD) are severely affected by COVID-19. The role of ICS in COVID-19 has been studied, however, ambiguities remain, especially for COPD patients. Aim was to investigate whether ongoing regular exposure to ICS affects risk, severity or survival in SARS-CoV-2 infection, using a large linked Swedish population register database.
Methods: From January to December 2020, we studied in two study populations (general population and COPD patients) three different study cohorts: 1. the whole group, 2. COVID-19-diagnosed individuals, and 3. hospitalized COVID-19 patients. Ongoing regular exposure to ICS was defined as ≥1 ICS prescriptions during the year before the index date. Studied outcomes were: COVID-19 diagnosis, hospitalization, intensive care and death.
Results: After matching, in the general population ICS therapy was not associated with an increased onset or COVID-19, hospitalization, ICU admission or fatal outcomes, both in the

general cohort and COPD patients group. Similarly, in patients who acquired COVID-19, ICS therapy was not associated with hospitalization, ICU admission or death in both groups. A slight increase for ICU admission was observed in the hospitalized general patients cohort who received ICS therapy (H.R. 1.22 [1.05, 1.42]), however, COPD patients did not have an increased risk for adverse outcomes.
Conclusion: Patients receiving ICS therapy did not have an increased risk for acquiring Covid 19, hospitalization, ICU admission or fatal outcomes.

Group B

Flash presentation 4
14:25 – 14:45
Title: Weekday of gastrectomy and long-term survival in gastric adenocarcinoma
*Speaker**: Wille Leijonmarck***, Upper Gastrointestinal Surgery, Department of Molecular Medicine and Surgery, Karolinska Institutet
Abstract:
Background: Cancer surgery conducted late during the working week might decrease long-term survival for some tumours. Studies on how weekday of gastrectomy influences long-term survival following gastric cancer are few and show conflicting results, which prompted the present investigation.
Methods: This population-based cohort study included almost all patients who underwent gastrectomy for gastric adenocarcinoma in Sweden between 2006-2015, with follow-up throughout 2020. Associations between weekday of gastrectomy and 5-year all-cause mortality (main outcome) and 5-year disease-specific mortality (secondary outcome) were analysed using multivariable Cox regression. The hazard ratios (HR) with 95% confidence intervals (CI) were adjusted for age, sex, education, comorbidity, pathological tumour stage, tumour sub-location, neoadjuvant therapy, annual surgeon volume of gastrectomy, and calendar year.
Results: Among 1678 patients, surgery on Thursday-Friday was not associated with any statistically significantly increased risk of 5-year all-cause mortality (HR 1.05, 95% CI 0.91-1.22) or 5-year disease-specific mortality (HR 1.04, 95% CI 0.89-1.23) compared to Monday-Wednesday. No associations were found when each weekday was analysed separately, with point estimates close to 1.00 (range 0.98-1.00) Monday-Thursday, but increased for Friday (HR 1.22, 95% CI 0.89-1.68) when fewer patients underwent surgery (4% of all). Stratified analyses by age, comorbidity, tumour stage, chemotherapy, surgeon volume, and tumour sub-location did not reveal any associations between weekday of surgery on Thursday-Friday compared with Monday-Wednesday and risk of 5-year all-cause mortality.
Conclusions: Weekday of gastrectomy from Monday to Thursday might not influence the 5-year survival in patients with gastric adenocarcinoma, while the results for Fridays are more uncertain.

Flash presentation 5
14:45 – 15:05
Title: Clustering of respiratory symptoms in the general population
*Speaker: **Daniil Lisik,*** Krefting Research Centre, University of Gothenburg
Abstract:
Background: Chronic respiratory symptoms, such as cough and wheezing, are associated with increased risk of various types of morbidity and mortality. However, few studies have performed computation phenotyping of respiratory symptoms in a population-representative selection of adults.
Method: We gathered survey data on respiratory health and symptoms, as well as associated comorbidities, from population-based cohorts in Northern and Western Sweden. The initial selection of 50 variables was reduced to 10 using principal component analysis (PCA). Four algorithms (K-means, deep embedded clustering (DEC), Dip-based deep embedded clustering (DipDeck), and Kingdra) were used for clustering. Internal validation

was assessed with Silhouette score. Categorical variables in the derived clusters were compared using Chi-square test, while numerical variables were compared using Kruskal-Wallis test.
Results: The study population consisted of 61,530 adults. The strongest clusters were found using K=5 with DEC. Cluster 1: asthma with few symptoms, history of asthma/allergy; cluster 2: late-diagnosed asthma, more (particularly nightly) symptoms; cluster 3: respiratory symptoms from exercise/tobacco smoke, fatigue; cluster 4: middle-age, few respiratory symptoms and comorbidities; cluster 5: senior age, few respiratory symptoms, common comorbidities of age (e.g., hypertension).
Conclusion: Clustering of self-reported respiratory symptoms has potential, but involves substantial challenges, particularly for identifying novel phenotypes. Further optimization and development of new embedding and machine learning models is needed to improve robustness and resolution in clustering.

Flash presentation 6
15:05 – 15:25
Title: Class, Genes and Rationality: A GxE Approach to Economic Ideology
Speaker: ***Rafael Ahlskog,*** Department of Government, Uppsala University
Abstract:
Aristotle famously said that man is, by nature, a political animal. While we share a common political core, we also differ tremendously in what we think the state should do - how much taxation, redistribution, public investment and regulation do we prefer? To explain these differences, in addition to upbringing, economic factors and environments, some studies point to genetic influences. Yet, it is poorly understood what these genetic influences actually consist of: what are the underlying endophenotypes and mechanisms for the observed heritability in political attitudes? In this study, I propose a gene-by-environment interaction (GxE) hypothesis to explain part of this puzzle. By combining classical models of rational preferences with research on the ambiguous relationship between intelligence and political ideology, I argue that we should expect genetic factors linked to cognitive performance to cause more left-wing economic preferences among people who grew up under socioeconomic deprivation, but more right-wing economic preferences among those who grew up rich. To test this empirically, I utilize a comprehensive survey of political preferences from the Swedish Twin Registry. Using within-pair variation in a polygenic index of cognitive performance in a large sample of DZ twins, combined with fine-grained register data on both parental, contextual and individual socioeconomic conditions, I show that this pattern does indeed emerge in the data, and is robust to a number of alternative explanations. Cognitive performance-linked genetics thus appears to have opposite effects depending on environmental factors. The overall conclusion is that genetic influences on political ideology cannot be understood in isolation but are likely strongly moderated by non-genetic factors.

Summary and Wrap-up

15:25 – 15:30 - Sven, Bright and Poorna