SWE-REG Autumn web conference 2021
"How to conduct successful interdisciplinary research using national registers"
28ᵗʰ October: 09.00-15.30
On Zoom

Program

Forenoon session

Introduction
9:00 - Opening remarks from *Jonas Björk, Maria Brandén and Poorna Anand* (moderator)

Key-note talk
9:05 – 10:05

Title:
What is successful interdisciplinary research collaboration, why is it difficult, and how can it be easier?

Key-note speaker**:**
Gemma Carr, Coordinator: Vienna Doctoral Programme on Water Resource Systems, and TU Wien Water Risk and Security Research Cluster

Abstract:
Collaborative research is essential to solve real world problems. There are also an infinite number of exciting research questions out there, lurking between the disciplines. If we want to find them (and develop new research methods to address them), we need to explore the areas between the disciplines collaboratively. But interdisciplinary collaboration is challenging and time consuming. People with different specialisations have different priorities and ways of doing things and the basic concepts from one field often need to be explained from the beginning to people from other fields. Clarifications are continually needed to make sure that everyone understands each other, and often they might not agree with each, or they may find the different methods "wrong", or "unscientific". In this talk, we explore strategies for achieving positive collaborative outcomes, measuring success and addressing challenges. A systems based evaluation framework and data from the Vienna Doctoral Programme on Water Resource Systems will be presented. This highlights how successful interdisciplinary projects and programmes generate both tangible and intangible outcomes. Tangible outcomes are the new models that are built, the new understanding that is developed and the papers that are published. Intangible outcomes are the learning that each individual achieves through the collaboration process that enables them to interact with one another, the group practices that are developed, the connectivity between individuals and a shared understanding. Our experience suggests that intangible outcomes are essential to achieve tangible outcomes and paying attention to how they are generated helps identify areas for support and improvement. For example, allocating more time to individual interdisciplinary learning (learning about new fields and how to integrate new fields) and focussing on developing interdisciplinary group practices. Group practices are the, "way of doing things". In interdisciplinary work, they give structure to handling differences and in our experience include a culture of mutual respect and open-mindedness, clear communication, clarification and negotiation. Places and spaces (shared offices, shared field sites, regular meetings) for intensive interaction between diverse researchers are critical to the process.

(with discussions between participants about how the keynote talk topic can be applied in your research setting)

10:05 – 10:30

Oral presentations

10:30 – 10:50

Title:
Heterogeneous effects of a Swedish schooling reform: a GxE approach

Speaker:
Rafael Ahlskog, Uppsala University

Abstract:
Policymakers widely view education as a key element of the policy response to economic inequality. Indeed, an enormous literature studies the impact of educational reforms. A particularly informative natural experiment due to its staggered rollout is the introduction of compulsory nine-year schooling in Sweden during 1949-1962. This reform has previously been shown to affect outcomes like cognitive and non-cognitive skills, earnings, mortality, crime and political participation. In this paper, we expand and nuance the existing literature by testing the heterogeneity of the reform effect on a number of important life course outcomes across differences in genetic endowment. Using a recently released repository of polygenic indices for a large variety of phenotypes, we are able to test gene-environment interactions for not only socioeconomic outcomes like education, income and wealth, but also mental and physical health, health-related behaviors like smoking and drinking, and reproductive variables.

10:50 – 11:10

Title:
Cost-effectiveness for prostate cancer testing: bridging disciplines

Speaker:
Mark Clements, Karolinska Institutet

Abstract:
Background: Our aim is to contribute evidence to prostate cancer testing policy. For background, the prostate-specific antigen (PSA) test is an inexpensive screening test for prostate cancer, which results in many men without prostate cancer having a biopsy and many men with indolent disease being over-diagnosed. The STHLM3 and STHLM3-MRI diagnostic studies found that the reflex Stockholm3 test is more effective than PSA in reducing biopsies while maintaining the sensitivity for advanced prostate cancers. However, policy requires evidence on the effectiveness _and_ cost-effectiveness of the new test.

Methods: We re-implemented, extended, calibrated and validated a prostate cancer screening microsimulation model for Sweden. We then reviewed the costs for prostate cancer testing, diagnosis, treatment and management. We also reviewed the health state values for prostate cancer testing and downstream states. We then predicted lifetime cost-

effectiveness for a range of strategies.

Results: Using this model, we assessed the cost-effectiveness for: (a) the Stockholm3 test compared with PSA given systematic biopsies; (b) magnetic resonance imaging (MRI) compared with systematic biopsies given PSA; and (c) Stockholm3 test compared with PSA given MRI. The Stockholm3 test was cost-effective at a reflex threshold of 2ng/mL.

Conclusions: Microsimulation models combine evidence from different sources to predict long-term costs, effects and cost-effectiveness. Development of these models requires a multi-disciplinary team, including epidemiology, biostatistics, computer science, health economics and clinical medicine. This cost-effectiveness evidence is available to policy makers in Stockholm who are currently deciding how to roll out an organised prostate cancer testing pilot.

Leg stretcher

11:20 – 11:40

Title:
Introducing NordInt.net: combining network-science and register data in the study of ethnic integration in Denmark, Finland and Sweden

Speaker:
Carl Nordlund, Linköping University

Abstract:
Nordic research on ethnic relations, integration and various forms of segregation have benefited greatly from available register research data. Covering a broad range of topically relevant variables, these datasets constitute a unique and strategic resource for research and evidence-based policy making on ethnic relations and integration across several societal domains.

Corresponding to near-complete populations, each with rich sets of relational sociometric data of prime relevance for the study of ethnic relations and integration, existing register-based research is overwhelmingly done using conventional statistical frameworks that assume independence of observations. Consequently, the analyses and theories of ethnic integration seldom examine the detailed and complex networks data available in the registers, to decipher social relations, interactions and associations through which social systems typically are defined.

Bringing together Nordic scholars on integration and segregation with world-leading expertise on complex systems and network science, the project that will be presented here will build capacity and expertise in network-scientific register-based research on ethnic relations and integration. Within the scope of this project, three core topics in ethnic relations research will be approached from a network-scientific perspective: inter-ethnic family ties, labor market discrimination, and residential segregation. As an explicit interdisciplinary project, the project also aims at bringing together the scientific cultures of, respectively, the more social-scientific varieties of social network analysis and the more natural-science-based network science, thus constituting a large case study to explore and map how such interdisciplinary collaborations can be done.

11:40 – 12:00

Title:
Long-term survival after sleeve gastrectomy versus gastric bypass in a bi-national population-based cohort study

Speaker:
Dag Holmberg, Karolinska Institutet

Abstract:
Background: Bariatric surgery prolongs life expectancy in severely obese individuals, but it is uncertain which of the two dominating procedures, sleeve gastrectomy or gastric bypass, offers the best long-term survival. This study aimed to compare all-cause mortality following sleeve gastrectomy and gastric bypass.

Methods: This population-based cohort study included all adults with primary laparoscopic sleeve gastrectomy or gastric bypass in Sweden and Finland between January 1, 2007 and December 31, 2020. The risk of all-cause mortality was calculated using multivariable Cox regression, providing hazard ratios (HR) with 95% confidence intervals (CI) adjusted for age, sex, hypertension, diabetes, Charlson comorbidity index score, country, and calendar year.

Results: Among all 61,503 participants (median age 42 years; 75.4% women) followed for mean 6.8 person-years, 1,571 (2.6%) died during follow-up. Compared to patients who underwent gastric bypass (n=51,891, 84.4%), the sleeve gastrectomy group (n=9,612, 15.6%) had a similar risk of all-cause mortality during the entire study period (HR 0.98, 95% CI 0.81-1.20), but a decreased all-cause mortality in more recent years (HR 0.72, 95% CI 0.54-0.97, from 2014 onwards). Diabetes interacted with type of bariatric surgery and showed higher all-cause mortality after sleeve gastrectomy than gastric bypass (HR 1.54, 95% CI 1.06-2.24).

Conclusion: This study suggests that the overall survival following sleeve gastrectomy compares well with that of gastric bypass, and was even better during recent years. A tailored surgical approach in relation to patients' diabetes status may optimize survival, i.e. sleeve gastrectomy for non-diabetic patients and gastric bypass for patients with diabetes.

Lunch (55 minutes)
12:00 – 12:55

Afternoon session

Group A
13:00 – 14:00

Flash presentation A1
13:00 - 13:15

Title:
Occupational risks, living conditions and lack of adequate information - An interview study among foreign-born workers in high-risk occupations for COVID-19

Speaker:
Mia Söderberg, Sahlgrenska Academy, University of Gothenburg

Abstract:
Background: The prevalence of COVID-19 is overrepresented in several occupations outside the health care sector, which are characterized by low wages, low training requirements and a high proportion of foreign-born workers, but risk factors for disease transmission are mostly unknown. This study aimed to investigate occupational and social risk factors for COVID-19 among foreign-born persons in occupations with a high prevalence of COVID-19.

Methods: We investigated the study aims in taxi drivers, cleaners, bus and tram drivers, pizza makers and property managers. Data was collected through semi-structured interviews and the content was analysed with systematic text condensation.

Results: Eleven persons from the chosen occupations were interviewed (10 men). Although not originally being a study focus, aspects of lack of information emerged as an important theme, resulting in one out of two overarching main themes, which were: "Infection risks at work" and "Insufficiently adapted information". Under the main theme "Infection risks at work", we identified the underlying sub-themes: Infected areas, Lack of protective equipment, Close social contacts, Lack of safety culture and Financial difficulties for sick leave. The main theme "Insufficiently adapted information" was categorized into the sub-themes: Lack of translated information, Lack of knowledge about information channels, Does not build trust and Lack of knowledge about specific protection needs.

Conclusions: There were several aspects of work, but also insufficient adapted crisis information, that increased risks of exposure to COVID-19. Many of the identified themes relates to structural disparities, illustrating that more and better adapted protective actions are needed.

Flash presentation A2
13:15 - 13:30

Title:
The effects of cash transfers on poverty, health and wellbeing: evidence from the Finnish basic income experiment 2017- 2018

Speaker:
Miska Simanainen, Stockholm University

Abstract:
Modern societies have tried to tackle poverty with a variety of policies and programs. These attempts range from complex policy programs combining different modes of intervention to simple cash transfer systems. In this study, I explore the potential effects of introducing an additional cash transfer policy in the context of a developed welfare state. The research questions are the following: What are the effects of an additional cash transfer policy on income and welfare dependency? What are the effects of an additional cash transfer policy on mental health and morbidity? What are the effects of an additional cash transfer policy on cognitive capabilities? In order to provide evidence on the above-mentioned questions, I utilise the randomised research design of a social security field experiment conducted in Finland in 2017-2018. In this two-year experiment, 2,000 minimum unemployment benefit recipients were made eligible for an unconditional minimum income of 560 euros per month that served also as an earnings-supplement of max. 560 euros per month if the participant found a job during the experiment. In the study, I make use of a large body of administrative registers related to income, take-up of social benefits, and use of drugs and health services. In addition, I combine survey data to administrative registers to rigorously assess self-reported outcomes of psychological well-being and cognitive capabilities. The research questions are analyzed both from short-term and long-term perspective. The study is a multidisciplinary project as it evaluates policy outcomes ranging from financial conditions to health and well-being.

Flash presentation A3
13:30 - 13:45

Title:
Understanding the relationship between education and attitudes toward immigration: evidence and implications from Swedish twin data

Speaker:
Qinya Feng, Uppsala University

Abstract:
Background: The educational divide in attitudes toward immigration among voters in Europe is well documented. But does it necessarily suggest that education can be an effective policy instrument to mitigate anti-immigration attitudes? Recent research has provided inconclusive evidence on this question.

Methods: This study uses two twin based methods, i.e., twin-pair fixed effects models and bivariate ACE decomposition models, to examine the relationship between education and immigration attitudes.

Results: Although higher educational attainment and some fields of education (relative to degrees in Social Sciences) are related with more positive attitudes toward immigration in the naïve models, generally over half of the magnitude of the coefficients are attenuated in the twin-pair fixed effects models where familial confounding factors shared between identical twins are taken into account. Nonetheless, relative to the group who received little

education, those with postgraduate level education are still significantly more pro-immigration, and those with secondary level education are more hostile to immigration, while fields of education do not exhibit identifiable patterns of effects. The bivariate ACE decompositions further suggest that the correlations between education and immigration attitudes might mainly be resulted from genetic and shared environmental factors.

Conclusions: The effects of education per se on immigration attitudes are much more modest than the correlations suggest. Genetic factors and familial socialisation might be the sources of confounding that belie the effects of education.

Flash presentation A4
13:45 – 14:00

Title:
Assessing the impact of including variation in general population mortality on standard errors of relative survival and loss in life expectancy

Speaker:
Yuliya Leontyeva, Karolinska Institutet

Abstract:
Background: A relative survival approach is often used in population-based cancer studies, where other cause (or expected) mortality is assumed to be the same as the mortality in the general population, given a specific covariate pattern. This is assumed to be known (fixed), i.e. measured without uncertainty. This could have implications for the estimated standard errors (SE) of any measures obtained within a relative survival framework. We evaluated the existing approach to estimate SE of relative survival (RS) and the loss in life expectancy (LLE) in comparison to if uncertainty in the population mortality was taken into account.

Methods: The uncertainty from the population mortality was incorporated using parametric bootstrap approach. The analysis was performed with different levels of stratification and sizes of the general population used for creating expected mortality rates.

Results: Ignoring uncertainty in the general population mortality rates has negligible impact on the SEs of 5-year RS and LLE, when the expected mortality rates are based on the whole general population, i.e. all people living in a country. However, the smaller population used for creating the expected mortality rates, the larger impact. The impact is also larger for LLE than RS, and for marginal estimates.

Conclusions: When the general population mortality rates are based on the whole population, the uncertainty in the estimates of the expected measures can be ignored. However, when based on a smaller population, this uncertainty should be taken into account, otherwise SEs may be too small, particularly for marginal values.

Group B
13:00 – 14:00

Flash presentation B1
13:00 - 13:15

Title:
Life expectancy in patients cured for oesophageal cancer compared to the background population

Speaker:
Ellinor Lundberg, Karolinska Institutet

Abstract:
Background: It is unknown whether the survival of patients cured from oesophageal cancer differs from the expected survival.

Methods: This population-based cohort study included all patients who underwent surgery for oesophageal cancer in Sweden in 1987-2015 and survived for at least 5 years after surgery (study period 1987-2020). The relative survival rates with 95% confidence intervals (CIs) were calculated by dividing the observed with the expected survival, assessed from the entire Swedish population of the corresponding age, sex, and calendar period. Relative survival rates were calculated for each of the 5 years between 6 and 10 years after surgery.

Results: Among all 762 included patients, the relative survival decreased from 96.1% (95% CI 94.3-97.9%) in year 6 to 83.5% (95% CI 79.5-87.6%) in year 10 after surgery. The drop in relative survival from 6 to 10 years post-surgery was more pronounced in patients with a history of squamous cell carcinoma (from 94.5% [95% CI 91.2-97.8%] to 70.8% [95% CI 64.0-77.6%]) than those with adenocarcinoma (from 96.9% [95% CI 94.8-99.0%] to 91.5% [95% CI 86.6-96.3%]) and in men (from 96.0% (95% CI 93.8-98.1%] to 81.8% [95% CI 76.8-86.8%]) than in women (from 96.4% [95% CI 93.4-99.5%] to 88.1% [95% CI 81.5-94.8%]). The relative survival improved over calendar years, while no major differences were found for age groups.

Conclusion: The survival of oesophageal cancer survivors seems distinctly poorer than that of the corresponding general population, particularly for patients with a history of squamous cell carcinoma of the oesophagus.

Flash presentation B2
13:15 – 13:30

Title:
Modelling multiple time-scales with flexible parametric survival models

Speaker:
Nurgul Batyrbekova, Karolinska Institutet

Abstract:
Background: There are situations when we need to model multiple time-scales in survival analysis. A usual approach in this setting would involve fitting Cox or Poisson models to a stacked time-split dataset. However, this leads to large datasets and can be computationally intensive, especially if interest lies in displaying how the rate or survival changes along both time-scales continuously.

Methods: We propose to use flexible parametric survival models on the log hazard scale as an alternative method when modelling data with multiple time-scales. By rewriting one of the timescales as a function of the other, there is no need to split the data in categories of time along one or both of the time-scales.

Result: Through case-studies we demonstrate the usefulness of the method and provide examples of graphical representations of estimated hazard rates and survival proportions. The model gives similar results to using a Poisson model, without requiring time-splitting.

Conclusion: Flexible parametric survival models are a powerful tool for modelling multiple timescales. This method does not require splitting the data into small time-intervals, and therefore saves time, helps avoid technological limitations and reduces room for error.

Flash presentation B3
13:30 - 13:45

Title:
THE STROKE-PARADOX - Patients decision making processes to seek emergency medical care for symptoms of stroke

Speaker:
Jenny Andersson, Sahlgrenska Academy, University of Gothenburg

Abstract:

Background: Previous studies have shown that rapid treatment, especially in ischemic stroke, reduces mortality and disability in patients with stroke. The focus has been on reducing the time from arrival to hospital to the start of treatment, but the main reason for the delay is time from symptom onset and arrival in hospital.

Aim: To explore the decision-making process from onset of symptoms to hospitalization in patients experiencing symptoms of stroke.

Methods: We included 36 patients (17 women and 19 men) aged 35-94 years, hospitalized with a first-time stroke between October 2018 and April 2020. All interviews were conducted in a stroke department before hospital discharge. The data was analysed and collected according to Grounded Theory methodology.

Results: The main concern for the interviewees was how onset of stroke symptoms resurrected fear. The common dominator of fear led to varied decisions where different actions were taken, in an attempt to overcome the fear that the event had created. Some understood being hit by stroke and therefor sought for prompt care based on pre knowledge of stroke. Others felt reluctant to seek emergency care despite that they implicitly understood suffering a stroke. They consequently awaited to seek emergency medical care in fear medical service would verify a stroke. Whereas others were confused with no thinking of stroke. They were scared by the situation, searching for an answer, but not necessarily from health care.

Conclusion: More knowledge of subtle stroke symptoms can help the persons experiencing on set of stroke symptoms to seek faster medical care.

Flash presentation B4
13:45 – 14:00

Title:
Deep learning prediction models based on EHR trajectories: A systematic review

Speaker:
Ali Amirahmadi, Halmstad University

Abstract:
Background: Electronic health records (EHRs) are generated at an ever increasing rate. EHR trajectories, the temporal aspect of health records, facilitate predicting patients' future health-related risks. It enables healthcare systems to increase the quality of care by early identification and primary prevention. Deep learning techniques have shown great capacity for analyzing complex data and have been successful for prediction tasks using complex EHR trajectories. This systematic review aims to analyze recent studies to identify challenges, knowledge gaps, and ongoing research directions.

Methods: For this survey, we searched Scopus, PubMed, IEEE Xplore, ACM databases from Jan 2016 to June 2021 using search terms centered around EHR, deep learning, and trajectories. The publications were then analyzed according to different axes, such as, model's capacity to deal with long-term dependencies, data representation, model architecture, visit irregularity, intra visit relations, and explainability.

Results: After removing duplicates and out-of-scope papers, 51 papers were selected. The analysis showed that recurrent neural networks and the attention mechanism were used for modelling long-term dependencies. Various methods were used for data representation (e.g. MLP, auto-encoder and LDA), where graph neural networks represent a promising approach. Furthermore, self-attentions, CNNs and graphs for representing intra visit relations, together with attention scores for explainability, were frequently used among the reviewed publications.

Conclusions: Few of the proposed approaches can fully handle all aspects of EHR data and the expected requirements of the models. There is a need for further research on incorporating different modalities of EHR data, effective data representation, and how to deal with explainablity for the prediction models.

Coffee break (25 minutes)
14:00 – 14:25

Panel discussion
14:25 – 15:25

Title: How to conduct successful interdisciplinary research

Moderator: Maria Brandén, Deputy-chair SWE-REG, Associate Professor, Director, Institute for Analytical Sociology

Members:
Gemma Carr, Coordinator: Vienna Doctoral Programme on Water Resource Systems, and TU Wien Water Risk and Security Research Cluster
Fredrik Liljeros, Professor of Sociology at Stockholm University
Karin Modig, Research group leader and an Associate Professor at the division of Epidemiology at IMM, KI
Anita Berglund, Ass. Professor of Epidemiology Unit of Epidemiology, SINGS

Summary and Wrap-up
15:25 – 15:30 - *Jonas Björk, Maria Brandén and Poorna Anand* (moderator).