potential for refining our approach to making judgements about causal relationships in public health.

OP116 ASSOCIATION OF EPILEPSY WITH DEMENTIA: A RETROSPECTIVE NATIONWIDE DATA LINKAGE COHORT STUDY

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Background People with epilepsy (PWE) are reported to have higher risk of dementia. However, the magnitude of this association, whether it varies according to dementia subtypes and whether there are factors that modify the association is uncertain. We investigated the apparent association in a large population-based retrospective cohort study using routinely-collected linked health data from hospitalisation, mortality records and primary care consultations.

Methods We used linked health data from the Secure Anonymised Information Linkage (SAIL) databank to follow-up Welsh residents for whom linked primary care data were available from their 60th birthday to estimate dementia rate and associated risk factors. Disease (dementia), exposure (epilepsy) and covariates (medication, smoking, stroke and diabetes) were classified using previously validated code lists. We studied rate of dementia and dementia subtypes in people with and without epilepsy using (stratified) Kaplan-Meier plots and flexible parametric proportional hazard analyses.

The study population comprised 563,808 people of whom 19,807 (4%) had indications of epilepsy in the linked health data. 13,454 (68%) of PWE and 49,439 (9%) of people without epilepsy had at least one record for a prescription of an antiepileptic drug (AED). Compared to people without epilepsy, PWE had lower survival (median survival to age 79 years compared to 84), higher smoking risks (74% compared to 66%) and higher stroke risks (20% compared to 7%) before or during follow-up.

Results Between ages 60 and 70 years, 6% of PWE and 1% of people without epilepsy had a diagnosis of dementia; corresponding figures between ages 60 and 80 years were 23% and 8%. The difference in dementia rate between those with and without epilepsy was larger for vascular dementia than for Alzheimer's disease. The increased rate for PWE was modified by a history of stroke, smoking and, to a lesser effect, diabetes. PWE who were first diagnosed before age 25 years had a lower dementia rate than those diagnosed later in life. Compared to PWE not exposed, those exposed to sodium valproate were at higher risk of dementia (crude HR: 1.7; 95% CI: 1.5–1.9) while those exposed to a group of enzyme-inducing AED were at similar risk (crude HR: 1.1, 95% CI: 1.0–1.3).

Conclusion At least some of the increased risk of dementia in PWE can be attributed to increased vascular risk factors in PWE causing vascular dementia. Given the widespread use of sodium valproate in PWE, the association of the drug with higher dementia risk is concerning.

Rapid Fire Programme
Friday 6 September
Chronic Disease

RF01 EDUCATIONAL OUTCOMES AMONG CHILDREN WITH TYPE 1 DIABETES: WHOLE-OF-POPULATION STUDY

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Background Evidence about the impact of type 1 diabetes (T1D) on educational outcomes is mixed. Despite advances in clinical care and intensive insulin treatment regimens, achieving optimum metabolic control is a challenge in pediatric populations with T1D. Poor metabolic control leading to hyperglycemia or hypoglycemia can potentially have implications for children's educational outcomes. In the last decade, there has been substantial improvement in T1D management, therefore the objective of this study was to estimate to what extent T1D is linked to children's educational outcomes.

Methods This whole-of-population study (n=61,445) used de-identified, administrative linked data from the South Australian Early Childhood Data Project (births 1999–2013). This study examined the impact of T1D on reading, writing, spelling, grammar and numeracy scores of children in year 5 (age 10 years), assessed by the National Assessment Program-Literacy and Numeracy (NAPLAN) in 2008–2015. Children with T1D were identified from hospitalization data (2001–2014) using ICD-10-AM diagnosis codes (E10, E101-E109).

The effect of T1D on the five NAPLAN domains (continuous variables) was estimated by augmented inverse probability treatment weighting (AIPW). AIPW includes; 1) creation of weights and, 2) using those weights in the outcome regression in a way such that the final estimates of the treatment effect is unbiased, even if the weights regression or the outcome regression is incorrect. We explored two associations between T1D and educational outcomes; 1) T1D versus non-T1D, 2) time since diagnosis (≤2 years, 3–10 years) versus non-T1D. Additionally, to address the problem of missing data we used multiple imputation.

Results Among 61,445 children born in South Australia and who had undertaken NAPLAN assessments, 162 had been diagnosed with T1D. There was no difference in the mean reading, writing, spelling, and grammar and numeracy scores of children with and without T1D. For example, the crude mean reading score was 482.8 with a standard deviation of 78.9, and the average treatment effect was 6.84 (95% CI -6.25, 19.92), which reflects a negligible difference in the mean reading scores of children with and without T1D. There was also no difference in educational outcome between children who were recently diagnosed (exposed to T1D for ≤2years), or those who were exposed to T1D for 3–10 years at the time of NAPLAN assessment, compared with non-T1D.

Conclusion This whole-of-population study demonstrated that children with T1D are not performing poorly on literacy or

numeracy at year 5. This could be due to improved T1D management in South Australia

RF02 EXPLAINING THE FALL IN CORONARY HEART DISEASE MORTALITY IN THE REPUBLIC OF IRELAND BETWEEN 2000 AND 2015 – AN IMPACT MODELLING STUDY

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Aim To investigate the proportional contributions of coronary heart disease (CHD) determinants to the observed CHD mortality rates in Ireland between 2000–2015.

Methods The validated IMPACT model on CHD mortality, which has been developed with the purpose of merging epidemiological data that is available for each country, was utilized for the estimations. Data on population statistics, CHD patient numbers, treatment uptakes and population trends on key risk factors (eg. smoking, total cholesterol, hypertension, obesity, DM and physical inactivity) were sourced from national registries, hospital administration systems, national health surveys, large cohort studies, international registries and meta-analyses. CHD Deaths Prevented or Postponed (DPPs) were used as outcome measurement.

Results CHD mortality in Ireland fell by 56% (4060 fewer deaths), faster in women than in men (63% vs 53%), in the period 2000–2015 in those aged 25–84 years. Improvements in CHD risk factors, ie decrease in smoking prevalence (5%), population systolic blood pressure (-25%) and mean cholesterol serum levels (-11%), contributed to 30% of the decline with 785 DPPs in men vs 425 in women. In women, both systolic blood pressure reductions and cholesterol reductions contributed equally (200 DPPs each), and decreased smoking prevalence contributed to 80 DPPs. Likewise, DPPs in men followed a similar trend (SBP - 825; total cholesterol- 250; and, smoking-110).

Improvements in cardiological treatments, specially in secondary prevention and heart failure treatments, contributed to approximately 60% of the observed decline (1620 DPPs in men and 825 in women). Both males and females benefitted the most DPPs from improvements in secondary prevention (850 and 355 DPPs, respectively). These gains were offset by increases in physical inactivity (2%), diabetes prevalence (6%) and BMI (4%). Overall, improvements in CHD treatments were more beneficial to men whilst better risk factor contribution were higher in women. Advancements in CHD treatments were more beneficial than risk factors in all age groups. These proportions remained relatively consistent across a wide range of assumptions and estimates in a sensitivity analysis except for physical inactivity which has transcended the null line.

Conclusion The CHD mortality decline has continued between 2000–2015 of which 90% can be explained by improvements in cardiological treatments and population risk factors with the IMPACT modelling study. However, worsening trends in diabetes prevalence, obesity and physical inactivity have reversed the gains. Investments in improving CHD death determinants and targeted policies are necessary to sustain a further decline in CHD mortality rates in Ireland.

RF03 ESTIMATING THE OCCURRENCE OF DIABETES AT THE END OF LIFE USING MULTIPLE CAUSE OF DEATH DATA LINKED WITH PRIMARY CARE, HOSPITAL CARE AND MEDICATION PRESCRIPTION DATA

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Background Cause-of-death statistics underestimate the end-of-life occurrence of many diseases, including diabetes. Our aim is to estimate the end-of-life occurrence of diabetes by combining multiple cause of death data with register data covering primary care, hospital care and medication prescriptions. We investigate the added value of each medical register and assess the extent to which reporting of diabetes as a cause of death is associated with disease severity.

Methods Our study population consisted of all deaths in the Netherlands (2015–2016) included in the Dutch primary care database (NIVEL-PCD; N=18.162). The proportion of deaths with diabetes (type I or II) within the last two years of life was calculated using cause of death and medical register data in isolation and combined. We assessed whether the proportion of diabetes reported in the causes of death registries varied according to disease severity as defined by medication prescriptions.

Results Of all deaths, 2.2% had diabetes reported as the underlying cause of death, while 7.7% of the death certificates mentioned diabetes. Primary care registration yielded the highest rate in isolation (27.1%), followed by the medication (22.4%) and the hospital-any diagnosis (17.1%) data, while hospital-main diagnosis was limited (1.1%). According to all data sources combined, 28.7% of the study population had diabetes at the end of life. Of all deaths among those who were prescribed insulin (indicating severe diabetes), 11.9% had diabetes recorded as the underlying cause of death and 35.8% of the death certificates mentioned diabetes as a cause of death. For patients using oral antidiabetic medication, these proportions were only 5.7% and 24.2%, and for patients not using antidiabetic medication 4.2% and 16.7%.

Conclusion More than one fourth of the Dutch population has diabetes at the end of life. Only a minority of this end-of-life diabetes occurrence is recorded as a cause of death, even for persons with severe diabetes. In the Netherlands, combining primary care data with multiple causes of death allows to find most cases with diabetes at the end of life.

RF04 RISK OF BREAST CANCER AND OCCUPATIONAL EXPOSURE TO ORGANIC SOLVENTS: RESULTS OF THE CECILE STUDY, A POPULATION-BASED CASE-CONTROL STUDY IN FRANCE

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Background Breast cancer is the leading cause of cancer death in women worldwide. Besides reproductive and hormonal