

between LLTI and mortality when no such influence is present in the simulated data. A DAG aids comprehension of this issue from a causal inference perspective and, depending upon the exact nature of the MC present, the DAG can also point to alternative analytical strategies that are discussed.

Conclusion Mathematical coupling of ratio variables has been recognised and reported on in the past, yet its problems remain pervasive. By setting the problem within a causal framework, we provide a means by which the issue might be more readily identified. Furthermore, using DAGs can help direct alternative analytical strategies to remove bias due to MC from future health research.

P83 EXPLAINING THE FALL IN CORONARY MORTALITY IN ARGENTINA BETWEEN 1995 AND 2010: IMPACT MODELLING ANALYSIS

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Background Coronary heart disease (CHD) mortality has declined substantially in Argentina in the last decades. However, the contributory factors remain unclear because major CHD risk factor levels have paradoxically increased, notably physical inactivity, obesity and diabetes.

our objective is to quantify the contributions of prevention and treatment to the coronary heart disease mortality trends in Argentina between 1995 and 2010.

Methods We used the previously validated IMPACT model to analyse mortality trends between 1995 and 2010 in the Argentinean population aged 25 years and over. This model integrates data on changes in population size, CHD mortality, risk factors, and uptake of evidence-based cardiac treatments. Main data sources included official vital statistics, national health surveys, and published papers in the scientific literature. If none of these were available, we used expert judgement. Relative risks and regression coefficients came from the published meta-analyses. The difference between observed and expected CHD deaths in 2010 was then partitioned among treatment benefits and risk factor changes. We also performed probabilistic sensitivity analyses to quantify the potential effects of parameter uncertainty.

Results From 1995 to 2010, age-adjusted CHD mortality rates in Argentina fell by 24.1%, resulting in 8500 fewer CHD deaths in 2010 had mortality rates remained unchanged. Improvements in medical and surgical treatments were associated with 53.8% (95% uncertainty interval, 46.2%–61.8%) of the total mortality decrease. Major contributions came from heart failure therapies (15.1%), antihypertensive medication (11.9%), and secondary prevention following acute myocardial infarction (8.2%).

Risk factor changes accounted for 40.4% (9.5% to 65.6%) of the mortality fall. Decreases in systolic blood pressure accounted for 34.6%; in cholesterol levels, 19.9%; and in smoking prevalence, 6.7%. However, rises in diabetes, BMI and physical inactivity negated some of these benefits, potentially increasing mortality by 9.4%, 6.4% and 5.0%, respectively. Approximately, 6% of the deaths prevented or postponed could not be explained in our model.

Results Approximately 54% of the CHD mortality fall in Argentina between 1995 and 2010 was attributable to increases in evidence-based medical treatments, and 40% to falls in population risk factors. However, the substantial contributions from falls in blood pressure, cholesterol and smoking were offset by adverse trends in diabetes, obesity and physical inactivity. Our results highlight the potential for further improvements in cardiovascular

P84 DEFINING A PRIMARY COMPOSITE OUTCOME FROM HOSPITAL EPISODE STATISTICS DATA TO TEST THE BENEFIT OF CARDIAC MAGNETIC RESONANCE (CMR) IMAGING AFTER PRIMARY PERCUTANEOUS CORONARY INTERVENTION (PPCI)

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Background We researched the feasibility of using routinely collected data to establish a registry to document the use of cardiac magnetic resonance imaging (CMR) in patients with suspected heart attack who activate the primary percutaneous coronary intervention (PPCI) pathway. To compare outcomes between patients having CMR or not, we aimed to define a primary composite outcome, representing clinically important changes in management resulting from CMR, using data from Hospital Episode Statistics (HES) or the Patient Episode Database Wales (PEDW). Clinically important changes in management, and patient subgroups to which these related, were defined by formal consensus.

Methods Patients at four UK sites were prospectively consented. We assembled a database by linking hospital-collected data about the index PPCI admission (demography, clinical, biochemistry and imaging) and CMR 'exposure' within 10 weeks with HES/PEDW data for the following 12 months. An experienced medical coder identified ICD10 diagnostic codes and OPCS procedure codes that the pre-defined clinically important changes in management achieved by CMR were hypothesised to influence. Episodes in HES/PEDW inpatient, outpatient and accident and emergency datasets with these codes were identified. This process was applied to key patient subgroups: i) PPCI; ii) multivessel coronary disease; iii) out-of-hospital cardiac arrest; iv) coronary angiogram showing unobstructed arteries.

Results Of the 1670 patients consented, 1476 (88%) had PPCI; 682 (41%) had multivessel disease, and 194 (12%) had unobstructed arteries. 189 (11%) had CMR within 10 weeks of the index admission. 1612 (97%) had their index event identified in HES/PEDW and 985 of these (61%) had a full year of follow-up available. Focusing on important changes by patient subgroup avoids creating a composite outcome based on diverse changes. Frequencies of relevant health episodes will be reported for patient subgroups and by CMR exposure. Comparing frequencies is straightforward but identifying better targeting of care to patients' needs without a change in frequency, e.g. due to better diagnostic accuracy of CMR, is complex.

Discussion Clinical events relating to important changes in management resulting from CMR can be identified in HES but CMR may not alter the frequency of these events. This case study demonstrates the promise of using routinely