

**P1-47 AN INNOVATIVE CASE-SPOUSE CONTROL DESIGN IN PRACTICE: AN EXPERIENCE IN ESTIMATING SMOKING AND ALL CAUSE DEATHS IN CHINESE ADULTS**

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**Introduction** We aimed to show that utilising information from a population-based, retrospective mortality survey for the main determinants of disease is feasible.

**Methods** During 1989–1991, a nationwide retrospective survey of mortality was conducted. To assess the effects of smoking on all cause mortality in Chinese adults, we used a new design within this survey. For all the deceased persons (cases) we sex-matched surviving spouses as controls. Smoking information for cases was provided by spouse or other informants, at the same time as providing their own smoking history.

**Results** For all cause mortality, the results revealed that tobacco use was associated with 11.2% of total deaths in 1987, and more than two-thirds of these excess deaths occurred between the ages of 50 and 74 years. Although life expectancies varied with region or sex, the years of life lost attributable to smoking was almost the same in each age group. Our study also confirmed that more than 50% of the sex difference in life expectancy was accounted for by smoking. With respect to the novel design, the results revealed consistency in the results using different control groups.

**Conclusion** This new case-spouse control design as an alternative for control selection in case-control studies is valid and feasible.

**P1-48 MATHEMATICAL MODELS TO INFORM THE DESIGN, ANALYSIS AND INTERPRETATION OF VACCINE TRIALS**

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**Background** When planning vaccine trials or interpreting results, it is not always clear which outcome measure best estimates the effect of the vaccine and at which time point it should be measured. We used a mathematical model to explore questions arising from the analysis of pneumococcal nasopharyngeal carriage data from conjugate vaccine trials, in which the acquisition-rate ratio (ARR) is the desired effect measure. We determine the time at which the prevalence ratio (PR) or prevalence POR, which are usually available, provide the best approximation.

**Methods** We created a hypothetical randomised controlled trial using a dynamic compartmental model which incorporated carriage of vaccine-type *Streptococcus pneumoniae* in vaccinated and unvaccinated groups. ARR was incorporated explicitly, linking the acquisition rate in the vaccinated to the acquisition rate in the unvaccinated and was assumed not to change for 2 years. Prevalence ratios and prevalence ORs for carriage were plotted over time.

**Results** The PR approximates the ARR well, after an initial period in which the PR decreases from one and stabilises. The length of this period is determined by the duration of carriage. During the period when the PR approximates the ARR, the POR overestimates the effect of vaccination. This is less marked when carriage is rare.

**Conclusions** This model illustrates the behaviour of outcome measures for pneumococcal carriage in a simple setting and can be elaborated to explore more complex situations. Mathematical models provide opportunities to explore study designs and analysis methods for both planned and completed vaccine trials.

**P1-49 SPATIAL EPIDEMIOLOGICAL MAPPING FOR DISEASE PREVALENCE MANAGEMENT IN AN URBAN COMMUNITY: SWINE FLU PREVALENCE MANAGEMENT IN SOUTH OF TEHRAN, IRAN**

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Epidemiology investigation uses multidisciplinary approaches to help decision makers in healthcare to control and foretell the phenomena of disease prevalence. In this study, we have applied spatiotemporal analysis and mapping to improve swine flu prevalence management in south of Tehran, Iran. We present a new pattern to monitor the swine flu pandemic in Iran in a more effective way. In this research we gathered 900 suspicious records of H1N1 from south of Tehran. We used spatial data mining and spatiotemporal analysis method to create a specific final pattern for a potential swine flu pandemic management and recovery. GIS and data mining tools have been used to calculate and visualise the results. The results of this research can be used by health policy makers and administrators to guide mitigation policies to minimise possible spread of the disease into the general healthcare setting.

**P1-50 SHOULD HEART FAILURE BE CONSIDERED AS CATEGORICAL OR DIMENSIONAL?**

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**Introduction** The categorical view dominates the traditional diagnostic approach to heart failure (HF) but ignores possible within-class heterogeneity such as individual differences in severity.

**Objective** To assess if HF should be considered as categorical or dimensional, and to validate a novel scale of severity for clinical HF.

**Methods** Cross-sectional evaluation of 1115 community participants aged  $\geq 45$  years in 2006–2008. We considered items related to troubled breathing and fatigue (4 items), volume overload (6 items) and objective evidence of cardiac structural /functional abnormalities (3 items). Bayesian Information criteria from latent class analysis (LCA) and latent trait analysis (LTA) were used to assess if HF could be considered as categorical or dimensional. BNP values and American College of Cardiology (ACC)/American Heart Association (AHA) stages of HF, classified by experienced clinicians with access to all data, were used to validate the scale.

**Results** Bayesian Information criteria suggested a 3-class solution for the LCA and a 2-factor solution for the LTA, with the best result being the last one. The first factor was associated with the items on troubled breathing/fatigue and cardiac abnormalities; the second factor was associated with the items about volume overload. The prevalence of  $\text{BNP} \geq 30$  pg/ml,  $\text{BNP} \geq 100$  pg/ml and stage C/D of clinical HF was significantly higher in the group of individuals with high scores for all factors than in that of individuals with low scores.

**Conclusions** The use of latent models applied to HF provided evidence for considering HF as dimensional rather than categorical as traditionally considered.