P1-524 COMPARATIVE STUDY OF THE INFLUENZA PANDEMIC OF 1918–1919 IN TWO ISLAND NATIONS: ICELAND AND NEW ZEALAND

doi:10.1136/jech.2011.142976h.12

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Introduction Nations varied in their response to the 1918–1919 influenza pandemic; however, certain epidemiological characteristics of this pandemic were repeated in many locations. We aimed to compare the epidemiology and public health response to this pandemic in two island nations, on opposite sides of the globe: Iceland and New Zealand.

Methods Historical accounts in both nations were reviewed, along with more recent analysis of the pandemics impact and course.

Results Both nations experienced three pandemic waves from late 1918 onwards. The second wave exacted the largest toll in terms of mortality and peaked in 3 weeks at roughly the same time in mid-November 1918. Iceland and New Zealand had similar pandemic mortality rates (5.4 vs 5.5 per 1000) among individuals of European ethnicity. Disproportionately high pandemic mortality rates among young adults compared to pre and post pandemic years was experienced by both nations. While influenza was a notifiable disease in Iceland before the pandemic, unlike New Zealand (who delayed until mid-pandemic), officials in both nations delayed in enacting response and quarantine measures. However, there is evidence that early public health control measures in specific areas of both nations resulted in lower mortality rates.

Conclusions Our study demonstrates the consistent epidemiological characteristics of the 1918–1919 influenza pandemic; in particular the similar patterns of pandemic waves and mortality, by comparing two geographically diverse island nations. These findings highlight the importance of an early public health response and the impact it can have on the outcome of a pandemic, regardless of its virulence.

P1-525 RELATIONSHIP BETWEEN SERUM ANTIOXIDANT VITAMINS AND N-TERMINAL PRO-B-TYPE NATRIURETIC PEPTIDE IN A GENERAL JAPANESE POPULATION

doi:10.1136/jech.2011.142976h.13

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Introduction Several epidemiological studies have demonstrated that carotenoid relate inversely to cardiovascular disease incidence. However few studies have been conducted on the relationship between circulating antioxidant vitamins and N-terminal pro-brain natriuretic peptide (NT-proBNP), a biomarker of cardiac function and heart failure, in the general population. The aim of this study was to investigate whether circulating antioxidant vitamins were independently related to NT-pro-BNP in a general Japanese population.

Methods Subjects were 1056 inhabitants (390 men and 666 women, mean age: 60.3±10.5 years) of Japan, who attended health check-up examinations from 2003 to 2004. Serum levels of carotenoids, retinol and tocopherols were separately determined by high-performance liquid chromatography. Serum NT-proBNP levels were measured by electrochemiluminescence immunoassay.

Results Geometric mean of serum NT-proBNP was significantly higher in women than in men (53.1 vs 39.1 pg/ml, $p<0.001$). Partial correlation analysis, adjusting for age, smoking habits, drinking habits, serum triglyceride levels, haemoglobin A1c, body mass index, systolic blood pressure, and estimated glomerular filtration rate, revealed a significant association between serum NT-proBNP levels and serum levels of retinol ($r=-0.157$, $p<0.001$), canthaxanthin ($r=-0.142$, $p<0.001$), lycopene ($r=-0.106$, $p=0.007$), α -carotene ($r=-0.103$, $p=0.009$), and β -carotene ($r=-0.086$, $p=0.028$) in women. In men, serum levels of antioxidant vitamins were not significantly related with serum NT-proBNP levels.

Conclusion Serum levels of retinol and several carotenoids were inversely associated with serum NT-proBNP levels even after adjustment for possible confounding factors in Japanese women, whereas no significant association was observed in Japanese men.

P1-526 INCIDENCE OF VENOUS THROMBOEMBOLISM IN RELATION TO BODY MASS INDEX, POSTOPERATIVELY AND WITHOUT SURGERY

doi:10.1136/jech.2011.142976h.14

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Introduction Surgery is a major risk factor for venous thromboembolism. The incidence of venous thromboembolism is also known to increase with increasing body mass index (BMI). We describe the risk of hospital admission for (or death from) venous thromboembolism in relation to BMI, both in the absence of surgery and in the 12 weeks after surgery.

Methods Women in the UK were recruited into the Million Women Study in 1996–2001 and followed by record linkage to routinely collected inpatient and day case NHS hospital admissions and deaths. The incidence of hospital admission or death for venous thromboembolism was estimated in relation to BMI both with and without surgery.

Results 1.2 million women with an average BMI of 26.2 kg/m² were included in these analyses, 55% of whom had at least one hospital admission for surgery during follow-up. The RR of venous thromboembolism increased with increasing BMI both with and without surgery. In the absence of surgery those of BMI ≥ 35 kg/m² were 3.5 times more likely to be diagnosed with venous thromboembolism than those of BMI 22.5–24.9 kg/m² [RR 3.5 (95%CI 3.1 to 3.9)]. A similar relationship was observed in the 12 weeks following day or inpatient surgery, but the absolute risks associated with BMI were much greater following surgery.

Conclusions The risk of venous thromboembolism increases with increasing BMI and the associated excess risk is much greater in the 12 weeks following surgery than without surgery.

P1-527 STABILITY AND VARIATION IN ALCOHOL HABITS FOR DEMOGRAPHIC SUBGROUPS IN STOCKHOLM COUNTY, SWEDEN: A LONGITUDINAL STUDY 1998–2010

doi:10.1136/jech.2011.142976h.15

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Introduction The typical drinking pattern over the life course begins with a debut in the teenage-years, followed by increased consumption until early adulthood, and thereafter gradually decreased consumption. However, more recent cohorts show a slower decline in alcohol habits with increasing age. Given the progressing ageing of the population there is a need to understand

how alcohol habits change with age and in different subgroups. The aim is to study stability and variations in alcohol habits for demographic subgroups over time.

Methods The data derives from the longitudinal population-based study of mental health (the PART-study) in Stockholm County, Sweden. The data were gathered using postal questionnaires and register data, including three measure points 1998–2000 ($n_{t1}=10\,441$), 2000–2003 ($n_{t2}=8\,613$ persons), and 2010 (tentative $n_{t3}=5\,776$) with ages ranging between 20 and 64 years at t_1 . The Alcohol Use Disorders Identification Test (AUDIT) was used to measure alcohol habits. Intra-class correlations over the three time points are used as measures of stability, calculated from the AUDIT-scores for different subgroups.

Results The results will be presented for subgroups, comparing the intra-class correlations. The findings and the contextualisation of the results will be discussed for the subgroups with stable and high variation in alcohol habits.

Conclusion While a vast number of studies have described the stability of alcohol habits for whole cohorts, the literature on stability and variation in specific subgroups is sparse. The findings will add to the knowledge about alcohol habits in demographic subgroups.

P1-528 STATISTICAL MODELS IN LONGITUDINAL EVALUATION OF CHANGES IN HEALTH BEHAVIOURS

doi:10.1136/jech.2011.142976h.16

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Introduction During long-lasting intervention program, the socio-demographic structure of the target population may change and influence the results of the overall evaluation. The Primary Prevention Program of Neural Tube Defects in Poland which was carried out in 1997–2007 in the whole country, gives the opportunity to discuss application of different statistical models in this context.

Methods Three surveys were conducted on representative samples of women aged 18–35 years during the Program activity. The samples were drawn from patients of the same randomly selected primary health centres in five chosen main administrative regions in 2001 ($n=775$), 2003 ($n=756$) and 2007 ($n=756$). Relative changes in women's knowledge and behaviour concerning folic acid were analysed by Poisson regression and generalised estimating equation models.

Results The proportion of women taking folic acid during the pregnancy increased from 52% in 2001 to 68% in 2003 and 86% in 2007 and the proportion of women beginning supplementation before the pregnancy increased from 11% to 15% and 29%, respectively. The behaviours towards folic acid strongly differentiated according to socio-demographic characteristic, which was also not stable during the period of program implementation. For example, the proportion of post-secondary educated women increased from 20.4% in 2001 to 23.1% in 2003 and 41.7% in 2007. These changes influenced slightly, although not significantly and depending on statistical approach chosen, the overall magnitude of effects.

Conclusions Time-dependending socio-demographic structure of the target population has to be considered in evaluation of health promotion programs.

P1-529 THE RELATIONSHIP BETWEEN THE WEIGHT IN EARLY CHILDHOOD AND THE FOLLOWING GROWTH CURVE IN WEIGHT

doi:10.1136/jech.2011.142976h.17

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Introduction To prevent the young overweight is an important public health issue for healthy growth and the avoidance of future obesity-related diseases. However, the growth pattern varies among individuals, and it is little known whether or not the patterns depend on the weight in early childhood. The objective of this study is to clarify it.

Methods Subjects were 913 students of 15–18 years old (396 males and 517 females) of high schools in three prefectures in 2006–2008. Height and weight at birth, their 1.5, 3, 6, 9, 12 years and the current were obtained with a questionnaire asked to refer to mainly one's maternal and child health handbook. BMI z-score was defined as (one's BMI minus the mean BMI in population) divided by its population SD. Sex-specific latent growth curve models consisting of 2, 3 and 4 groups with up to the third power for the curve fitting were estimated by using seven BMI-scores at the ages, and the relationship of the weight status at birth and 1.5 years old to the curves were tested with the statistical software SAS 9.1.3.

Results Distinguished patterns were found for all the group models in males and only the 2 group model in female. The weight at birth and 1.5 years was significantly related to all the patterns in males, and to only the patterns of the 2 group model in female.

Conclusion The weight in early childhood related to the growth patterns in weight.

P1-530 BLOOD PRESSURE CATEGORIES AND LONG-TERM MORTALITY RISK OF TOTAL AND COMPONENTS OF CARDIOVASCULAR DISEASES AMONG JAPANESE: A 24 YEAR FOLLOW-UP OF REPRESENTATIVE JAPANESE (NIPPON DATA80)

doi:10.1136/jech.2011.142976h.18

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In Western population, blood pressure (BP) was reported to predict long-term (over 20 years) future mortality of cardiovascular diseases (CVD). However, there is few reports based on long-term follow-up studies in Asian population where stroke is dominant among CVDs. We investigated the association between BP and 24 year mortality risk of total and components of CVD in a representative Japanese population.

Methods A cohort study of nationwide representative Japanese samples, a total of 8592 men and women age 30 and over without history of CVD and anti-hypertensive medication was followed for 24 years (mean follow-up, 21.3 years). Multivariate-adjusted HRs of total and components of CVD death according to the BP categories (Seventh Report of the Joint national Committee criteria) were calculated using the Cox proportional hazard model.

Results During the follow-up period, 689 participants died from CVD. Multivariate-adjusted HR of total and components of CVD mortality was progressively and significantly greater from the lowest BP group. Compared with normal BP, adjusted HRs in stage 2 hypertension was 2.45 for total CVD death and 5.99 for cerebral haemorrhage death. An adjusted HR for total CVD were higher in younger participants aged 30 to 59 years than that in elder aged 60 years and over at baseline.

Conclusion Blood pressure in general Japanese retain a strong association with total and components of CVD death during next 24 years. The association was steeper in younger participants.