



Oral Presentations

(In order of appearance)

P1 PRACTICAL ISSUES IN USING MULTIPLE IMPUTATION FOR MISSING DATA IN LONGITUDINAL STUDIES

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A major analytic challenge in large cohort studies is the threat to validity and precision that is created by missing data. In longitudinal studies with multiple measurement occasions, overall cohort retention is often strong but participants rarely complete all waves of data collection. It is still commonly accepted practice to analyse such data by “complete-case” methods, where entire individuals are omitted from the analysis if they have a missing value on any of the variables of interest. This approach can lead to biases in conclusions, and to loss of precision due to the reduction in sample size available for analysis.

Multiple imputation is a flexible general strategy for handling missing data problems. It involves the production of multiple complete datasets based on a statistical model for the missing values given the observed data. Each of the imputed datasets is analysed using standard methods, and valid inferences are obtained by appropriate combination of the results. Implementation requires tools for (a) imputing the missing values, and (b) analysing the multiple imputed datasets. Currently available tools for task (a) range from fully model based methods to more pragmatic but flexible techniques such as the use of chained equations. For task (b) we have recently published a flexible package of commands in Stata, which allows a wide range of data manipulations as well as combined analyses to be performed on multiple imputed datasets.

We have used multiple imputation to address missing data problems in the Victorian Adolescent Health Cohort Study, which began in 1992 with participants aged 15 and has recently completed an 8th wave of data collection. Analyses from this study will be used to illustrate the flexibility of the method and highlight outstanding issues related to the robustness of conclusions to model assumptions, and practical challenges that face investigators when setting up and using imputations.

P2 PRE-AND POSTNATAL DOCOSAHEXAENOIC ACID EXPOSURE AND VISUAL OUTCOMES AT 7 YEARS OF AGE

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Background:

There is increasing evidence that docosahexaenoic acid (DHA) is an important factor in foetal and infant nutrition. However, the medium and long-term consequences of early DHA exposure are not well characterized.

Objective:

To investigate whether previously described associations between proxies for DHA exposure (maternal oily fish intake in pregnancy and a history of breast-feeding) and visual development at age 3 were still present at the age of 7 years.

Subjects and methods:

Approximately 8000 child participants in an ongoing birth cohort study were examined. Visual function data were compared with prospectively collected data from their mothers.

Results:

Best-eye visual acuity was significantly associated with both previous breast-feeding (BF) and previous maternal oily fish intake (OF); $p = 0.006$ and $p = 0.01$ respectively after adjustment for maternal education, sex, birthweight, gestation, SCBU admission and a family history of eye problems. Stereopsis was not significantly associated with BF, but was with OF; trend $p = 0.006$ and this persisted after adjustment in logistic regression, $p = 0.019$. For approximately half the children, the proportion of DHA in their mothers' antenatal red blood cell membrane samples was available and was associated with better stereopsis at 7: adjusted OR per unit change in RBC DHA proportion was 1.07 (1.01 – 1.14), $p = 0.018$.

Conclusions:

The inclusion of oily fish in a pregnant woman's diet was associated with a sub-clinical but statistically significant enhancement of visual function in the children at age 7. Antenatal maternal RBC membrane DHA concentrations were also associated with better stereopsis at 7 years, supporting the hypothesis that DHA is important for aspects of neurological development that persist at least 7 years. These data may have implications for the advice given to women regarding optimal diet in pregnancy.



P3 LIFECOURSE DETERMINANTS OF INSULIN RESISTANCE AND INSULIN SECRETION AT AGE 49-51 YEARS: THE NEWCASTLE THOUSAND FAMILIES STUDY

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Background:

Suboptimal maternal and infant nutrition has been suggested to increase insulin resistance in later life. However, in order for this to be fully investigated the antecedents of impaired insulin resistance should be studied across the whole lifecourse.

Objective:

To estimate the relative influences of factors operating at different stages of life (family history, fetal life, infancy and childhood, adulthood and adult body size) on insulin resistance and secretion at age 50 years.

Methods:

All 1142 babies born in the city of Newcastle upon Tyne in May and June 1947 were recruited into a cohort study and detailed information collected prospectively throughout childhood. At age 50, 412 study members attended for clinical examination. Fasting and 30min serum insulin and glucose levels were determined and HOMA-IR and insulin secretion derived.

Results:

Duration of breast feeding showed a significant negative association with HOMA-IR in men. No other factors in early life were significant. For both men and women, fetal life explained directly little of the variation in either of the outcome variables (0.1-5.4%). The overall effect of early life, including indirect effects mediated through adult lifestyle and adult body size, was to explain 7.9% and 3.5% of the variation in HOMA IR for men and women respectively and 6.4% and 2.8% of the variation in insulin secretion for men and women respectively. Compared to early life, adult lifestyle and body size (impedance and waist:hip ratio) directly explained larger proportions of the variances for men (10.0% and 20.1% for insulin secretion and HOMA-IR respectively) and women (4.8% and 32.8%).

Conclusions:

Promotion of a healthier lifestyle throughout life would appear to be the public health interventions most likely to reduce insulin resistance in middle age.

P4 CHANGES IN DIETARY INTAKE IN DUTCH MEN FROM MIDDLE TO OLD AGE - THE ZUTPHEN STUDY

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Background:

The role of diet in chronic disease etiology, such as coronary heart disease is widely recognised. In this context, a clear understanding of how dietary habits develop throughout life is essential.

Objective:

To determine the longitudinal changes in dietary intake in men from middle to old age and to distinguish possible age and period effects. In addition, we will study the effects of major life events on changes in dietary intake.

Subjects and Methods:

The Zutphen Study, the Dutch contribution to the Seven Countries Study, was carried out in men born between 1900 and 1919. In the period 1960- 2000, data on food intake was collected 7 times using a cross-check dietary history method.

Results:

Preliminary results show that, during follow-up, the intake of bread, potatoes and vegetables in gram per day decreased by 50%, 68% and 35%, respectively, while the intake of cereals and fruit increased by 50% and 125%, respectively. Furthermore, the intake of meat, fish and edible fats decreased by 8%, 9% and 56%, respectively, and the intake of alcoholic beverages increased by 42%. Detailed analyses showed period effects for these foods groups, while ageing effects were only present for cereals, vegetables, fish and alcoholic beverages.

Conclusions:

Our results show significant changes in food intake. In spite of a substantial decrease in energy intake during 40 years of follow-up, the intake of cereals, fruit and alcoholic beverages increased.