INVESTIGATING SPATIAL SIMILARITIES IN THE EPIDEMIOLOGY OF CHILDHOOD LEUKEMIA AND DIABETES IN YORKSHIRE, UK, USING SHARED COMPONENT AND PROPORTIONAL MORTALITY MODELS WITH TEMPORAL EFFECTS

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Childhood acute lymphoblastic leukemia and Type 1 diabetes share some common epidemiological features, including rising incidence rates and links with an infectious etiology. Previous work has shown a positive correlation in incidence between these diseases both at the international and small-area level. For the latter, we considered a novel joint spatial analysis investigating the joint correlation between these conditions across electoral wards in Yorkshire using data from two co-terminus population-based registers covering a period around the 1991 census (1986-1998). A univariate multiple membership model, which has similar characteristics to the intrinsic conditional autoregressive (CAR) model, was modified to include correlated spatial terms.

We will present an extension to this methodology by including a time varying component to take account both of the increase in disease occurrence and an extended dataset from 1978- 2003. Two alternative approaches will be considered within an ecological framework: sharedfactor and proportional mortality models. The former will enable us to determine the extent of the variation exhibited through shared unobserved environmental risk factors, whilst the latter will help to overcome the uncertainty in assigning population counts during intercensus years. These analyses will help determine the importance of shared environmental risk factors, e.g. census-derived indicators of deprivation/migration and differing etiological determinants.