

INVESTIGATING SPATIAL SIMILARITIES IN THE EPIDEMIOLOGY OF CHILDHOOD LEUKAEMIA AND DIABETES IN YORKSHIRE, UK, USING A SHARED SPATIAL-TEMPORAL COMPONENT MODEL

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Childhood acute lymphoblastic leukaemia and Type 1 diabetes share some common epidemiological features, including rising incidence rates and links with an infectious aetiology. Previous work has shown a significant positive correlation in incidence between the two conditions, both at the international and small-area level. For the latter, we considered a novel joint spatial analysis investigating the variation in the occurrence of these diseases across electoral wards in Yorkshire using data from two co-terminus population-based registers but limited to a period around the 1991 census (1986-1998).

We present an extension to this methodology, by including a time varying component to take into account both the increase in occurrence of leukaemia and diabetes and a more extensive dataset for individuals diagnosed from 1978-2003. This has been analysed using spatial-temporal effect variation of the risk of the two diseases within a shared-component model. This has enabled us to determine the extent of the variation exhibited through shared and specific unobserved spatial and temporal components, which act as surrogates for possible geographical and temporal variations in shared environmental risk factors such as deprivation, migration and population density.