

Explaining spatial inequalities in cancer: A Bayesian framework with colorectal cancer as a case study

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Abstract.

Geographical variation in observed colorectal cancer incidence may reflect not only differences in the underlying risk of developing the disease, but also inequalities in screening participation, access to healthcare, diagnosis, and registration. Distinguishing these mechanisms is essential for interpreting disease maps and identifying the factors associated with cancer inequalities.

This talk introduces a Bayesian spatial framework currently under development to investigate these different sources of variation using area-level data. The proposed approach will combine cancer registry data with information on behavioural risk factors, socioeconomic conditions, colorectal cancer screening, and access to healthcare. National health survey data will be used to estimate behavioural factors, such as dietary patterns, physical activity, alcohol consumption, and obesity, in small areas. By integrating these different sources of information, the framework aims to account for their uncertainty and explore the extent to which geographical patterns in observed incidence are associated with differences in underlying risk or in screening and diagnostic pathways.

A central methodological challenge is the separate identification of underlying incidence and detection, since the observed data may be compatible with different combinations of these processes. Rather than presenting definitive results, this talk discusses the main ideas behind the proposed framework and the statistical and practical challenges involved in moving beyond maps of observed cancer incidence towards a better understanding of geographical inequalities.