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*Characterizing influenza epidemiology using GP surveillance data*

**Abstract**

Understanding seasonal circulation of influenza is critical for effective health-care resource allocation, prediction of future seasons, and early detection of anomalous seasons. However, influenza is difficult to confirm without expensive PCR testing, so data is limited, and many aspects of influenza epidemiology are poorly understood. We use a new dataset of confirmed weekly influenza cases from a subset of GPs (in the ASPREN network) to model seasonal influenza dynamics in Sydney, Australia. We apply state of the art Bayesian model selection and parameter estimation methods, with a hierarchical observation process and using high-quality denominator data, to draw insights into population level dynamics of influenza. We highlight the impact of assumptions around parameter values such as  $R_0$  and the duration individuals remain immune, and note that the results of many previous studies can be contextualised around their chosen assumptions.