

INVITED TALK

Small area assessment of spatio-temporal infant mortality inequality: a Bayesian approach

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Summary: Inequalities in infant mortality have to be measured by evaluating heterogeneity of Infant Mortality Rates (IMR) between populations. Several statistical indicators (Gini coefficient, coefficient of variation, ...), initially proposed in the econometric literature based on sigma-convergence, have been subsequently applied in studies on mortality convergence and, more generally, health inequalities.

The core problem with measuring inequalities across small areas is that direct estimates of IMRs can be highly affected by random variability: the geographic inherent heterogeneity is confounded by sampling variability of small area direct estimates, i.e. estimates that are entirely based on data referred to the small area itself. As a consequence, all statistical indicators aiming at measuring heterogeneity across areas can be highly misleading. In order to smooth direct estimates of the IMRs, we adopt a Hierarchical Bayesian model that allows area-level estimates to borrow strength from each other both in space and time. Posterior distributions of the smoothed estimates are used to evaluate the spatio-temporal trend of inequalities by evaluating the above traditional statistical indicators, accompanied by uncertainty measures. In order to offer a spatial characterization of infant mortality inequality trend in Italy, an approach based on small area posterior ranking is proposed.