

# Age-Period-Cohort Models in Cancer Surveillance Research: Ready for Prime Time?

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## Abstract

Standard descriptive methods for the analysis of cancer surveillance data include canonical plots based on the lexis diagram, directly age-standardized rates (ASR), estimated annual percentage change (EAPC), and joinpoint regression. The age-period-cohort (APC) model has been used less often. Here, we argue that it merits much broader use. Firstly, we describe close connections between estimable functions of the model parameters and standard quantities such as the ASR, EAPC, and joinpoints. Estimable functions have the added advantages of being fully adjusted for period and cohort effects, and generally more precise. Secondly, the APC model provides the descriptive epidemiologist with powerful new tools, including rigorous statistical methods for comparative analyses and the ability to project the future burden of cancer. We illustrate these principles using invasive female breast cancer incidence in the United States.

*Keywords:* Cancer surveillance research; Age standardized rates; Estimated annual percentage change; Age-period-cohort model.

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