Estimating all cancers incidence with the MIAMOD model: a new method to include multiple tumors

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ABSTRACT

Aims and background. The MIAMOD method has been widely applied to derive regional and national cancer burden estimates. The method is based on a back-calculation approach using cancer-specific mortality and relative survival to derive expected incident and prevalent cases. Multiple tumors occurring in the same site for the same person (for example colon-colon) can be estimated just once. This has little effect on cancer-specific estimates, whereas it limits all cancers-combined estimates, where only cancer *cases,* rather than cancer *diagnoses*, can be accounted for by the method. The aim of this article is to present a specific strategy of application of the MIAMOD method to all cancers sites, which better approximates an estimate of 'cancer diagnoses'.

Methods. The strategy consists of breaking down the estimation process in separate applications to the most frequent cancer sites and to a 'remainder-site', given by all malignant sites except the previous ones. The separate estimates are then summed up to derive the overall quantities for all cancers combined. Cancer-specific mortality in the years 1985-2004 in the Tuscany cancer registry area (about 1,200,000 inhabitants) and relative survival data in the same area and periods (end of follow-up, 31 December 2006) were used to produce the estimates, which were then tested using observed incidence data in the same area and period.

Results. The standard application of the MIAMOD method underestimates all cancer incidence for both sexes. The mean relative difference between observed and expected incident cases is -14.8% for males and -17.2% for females. With the alternative method, the same mean relative difference drops to -8.2% for males and -6.1% for females.

Conclusions. The study provides a strategy to reduce a structural limit of the MIAMOD method in estimating the total burden of cancer disease.