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## Algorithm for decomposition of differences between aggregate demographic measures and its application to life expectancies, healthy life expectancies, parity-progression ratios and total fertility rates

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### Abstract

A general algorithm for the decomposition of differences between two values of an aggregate demographic measure in respect to age and other dimensions is proposed. It assumes that the aggregate measure is computed from similar matrices of discrete demographic data for two populations under comparison. The algorithm estimates the effects of replacement for each elementary cell of one matrix by respective cell of another matrix. Application of the algorithm easily leads to the known formula for the age-decomposition of differences between two life expectancies. It also allows to develop new formulae for differences between healthy life expectancies. In the latter case, each age-component is split further into effects of mortality and effects of health. The application of the algorithm enables a numerical decomposition of the differences between total fertility rates and between parity progression ratios by age of the mother and parity. Empirical examples are based on mortality data from the USA, the UK, West Germany, and Poland and on fertility data from Russia.

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