Defining Optimal Health Indicators for Life Expectancy Analysis and Management

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Abstract

In pre-pandemic period (1999-2019), we analyzed mortality data for the Krasnoyarsk Territory (Central Siberia, Russia) with population about 2.9 million people. Causes of death affecting life expectancy at birth (LE) were analyzed based on cause-specific and age-specific indicators. Based on the cause-elimination life-table analysis, we estimated the mortality rate and the contribution of a specific cause of death to LE using an alternative approach (altPGLE) and included the contribution of a single case of death. In 2019, ischemic heart disease, cerebrovascular disease, and malignant neoplasms of digestive organs provided the most significant contribution to LE primarily due to its high mortality rate. Intentional self-harm, HIV, and tuberculosis provide the most outstanding contribution of a single case of death to LE since they affect younger people. Over the period, deaths from cardiovascular diseases shifted to the elderly groups, but from liver diseases became ten years 'younger'. However, circulatory diseases still provide the most significant impact on LE. Health policymakers should take into account and improve three leading indicators: mortality rate, the contribution of all death cases to LE (altPGLE), and the contribution of a single case of death to LE. The improvement can be achieved by preventing diseases that affect the younger population (in our case, intentional self-harm, HIV, tuberculosis, and liver diseases) and delaying death from diseases that are common in older people (circulatory system diseases and cancer). It is also important to identify and govern diseases that get 'younger' over time.

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