

HOW DYNAMICS OF PHYSIOLOGICAL STATE AFFECTS HEALTH AND SURVIVAL: NEW FINDINGS FROM LONGITUDINAL DATA

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The values of indices describing individuals' physiological state are important indicators of morbidity and mortality risks. These values as well as their effects on morbidity and mortality experience aging related changes during the life course. Evaluating regularities of these changes requires description of mechanisms regulating age dynamics of physiological indices. Such a description involves the notions of allostatic adaptation, physiological norm, adaptive capacity, stress resistance, as well as other variables capable of characterizing dynamics of physiological indices in aging humans. In this paper we performed analyses of longitudinal data on physiological state collected in the Framingham Heart Study (FHS) and investigated their connection with risks of onset of chronic diseases and death. We found that in addition to values of physiological indices, a number of new variables, describing dynamic properties of age trajectories of these indices also make important contributors to morbidity and mortality risks. These variables include the rate of changes in physiological indices, their variability characteristics, their maximum values, the ages when these variables reach their maximum values, and the rate of decline after reaching maximum. These new variables could be considered as targets for preventive and treatment interventions aiming to improve population health and longevity.