

# Population Decline in Japan from the Perspective of Type Reproduction Number

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This paper introduces a generalized Leslie matrix that considers migration and analyzes the structure of population decline in Japan using the type reproduction number, one of the thresholds to evaluate the increase or decrease of its maximum eigenvalue. The type reproduction number is the number of women from a specific prefecture who reproduce in the same region and the total number of their offspring who return to the same region and reproduce. The higher type reproduction number means that the prefecture has the higher recursivity of reproductive-age women. First, this study attempts to analyze the population decline of regional characteristics using this index. Then, we will examine the effects of interregional migration and prefecture-specific fertility rates on Japan's declining population using the interpretation of the type reproduction number.

Keywords: declining birth rate, Leslie matrix, data analysis, Markovian process