A general framework for long-term care policy evaluation from a micro perspective

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概要― As a computational population base for such simulation, this paper proposes a three-level artificial population consisting of details on individual, household and community. The first wave of China Health and Retirement Longitudinal Study (CHARLS), a national representative and comprehensive survey on Chinese health issues, is analyzed and converted to corresponding computational agents with preferred details. Details of individual information, household structure with family relations, and community composition are summarized and compared with national census 2000 and 2010 to demonstrate CHARLS's validity to population construction.

Keywords: Artificial population, healthcare system simulation

1 Introduction

This work aims to construct a representative three-level artificial population to support further micro-simulation or agent-base simulation in LTC studies. This artificial population holds the basic structure and information at individual, household and community level as embracing both the exogenous and endogenous factors. Characteristics of individuals, households and communities, especially of the elderly and disabled population, are first summarized by analyzing one recent national-level longitudinal survey on Chinese health issues. The extracted records are then converted to a set of computational agents (integrated individuals and households) with details profiled from above.

2 Conceptual framework

We propose a three-layer artificial population capturing the characteristics of individuals, households, and communities respectively yet holistically, as depicted in Fig. 1. More specifically, we focus on the demographics and health-related information of individuals, structures and family relations of households, and health-related facilities of communities.
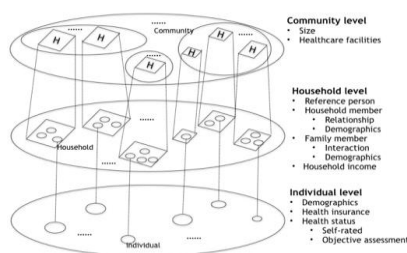

Fig. 1: Conceptual framework

3 Data analyses

The first wave of China Health and Retirement Longitudinal Study (CHARLS) is used to construct the proposed artificial population [1]. Health and family related survey questions of each individual, household and community are extracted and categorized to create the corresponding layer. The summarized results on household structure and elderly living arrangement are compared with the national census 2000 and 2010 [2].
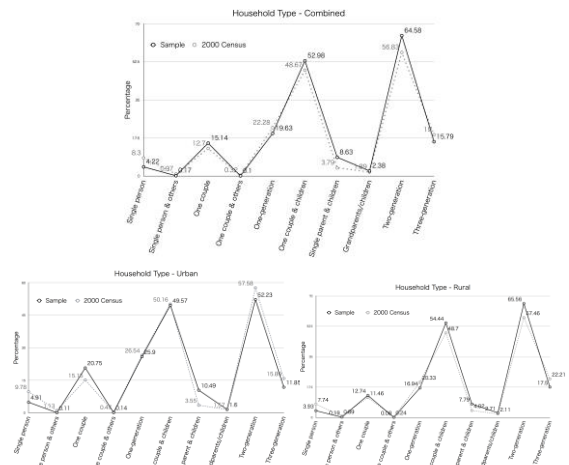

Fig. 2: Household comparison with 2000 Census

We extract the basic information including co-residence status of respondents' children aged between 20 and 44, and model them with their co-residence family as households as well. The overall household structure and size are therefore summarized considering both the surveyed household and their children's households, in comparison with national census 2000, as shown in Figure 2.

4 Conclusion

Drawn from the data analysis, we could observe the difference between urban and rural with regard to household structures and family relations, also of the health status per age groups. Embedding health-related information, family relations and external social context, we argue that this constructed artificial population is particularly useful for future microsimulation to assess LTC systems.

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