Future Trends of Older Adults with Disability under the Demo-Socio-Economic Factors in China, 2006-2050

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Introduction

Background

- Population ageing, combined with the fact that disability is most common among the elderly, has focused attention on the future changing of ageing population with disability.
- China already has one of the largest ageing populations who met a big challenge on burden of disability

Objective

- This study predicted the future trend of ageing population with disability, and determines whether demographic, social, and economic factors could account for it.

Conceptual framework

Health outcomes can be divided into healthy, with disease, with disability and death [i], and the process of each outcomes change to the other is affected by the individuals' living conditions, which includes genetic, demographic, economic, social and natural environmental factors [ii], [iii], just like figure 1 shows. In China, all above factors have the regional characteristics because of the huge disparity between urban and rural environments. Same factor in different region may cause different health outcomes and different strength and direction on health outcomes[iv],[v].

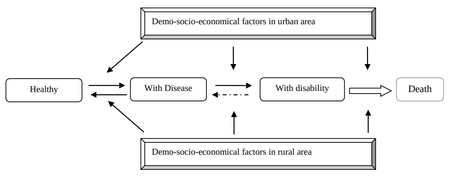

Fig.1 Conversion of health status dynamic

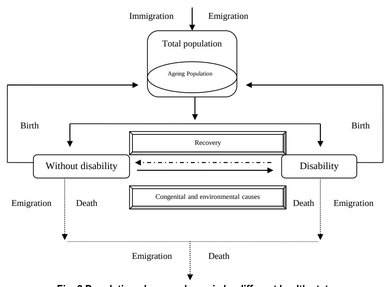

Fig. 2 Population changes dynamic by different health status

Methods

Sample and Data

- The data used in the analysis based on the Second China National Sample Survey on Disability, a population-based, nationally representative survey conducted from April 1, to May 30, 2006 in China. With the approval of the State Council of the People's Republic of China, the Leading Group of the Second China National Sample Survey on Disability conducted the survey. All participants completed informed consents given by the Chinese government.
- Only household residence people lived in the sampled community were interviewed, while institutionalized people were not included. The sample survey was a stratified, multiphase and cluster probability sampling design, and covered 31 provinces, autonomous regions and municipalities in China, which of four levels of sampling frame including county, town, village and community.
- 734 counties which accounts for 20% of all counties, were sampled. Then a total of 5964 communities from 2980 towns in 734 counties were sampled, with an average of 420 persons in each community. Post-survey quality checks showed that the omission rate of the resident population was 1.31‰, the omission rate of the disabled population was 1.12‰, and accuracy was greater than 95% .
- A total of 2,526,145 non-institutionalized people participated in the survey; 354,859 of them aged 60 and older; 161,479 people had been identified as disability, and among them 85,260 were aged 60 and older.
- All data were entered into a custom-designed database and analyzed using SPSS Version 16.0.

Variables selected

- In the analysis variables related to demographic, social and economic status were included, such as sex, age, education, marital status, place of residence, nationality, occupation, employment, income, and GDP per capita.

Risk factors associated with the occurrence of disability

- Dependent variable: with disability or not
- Independent variables including demographic, social and economic factors

Projection of ageing population with disability

- Binary logistic regression conducted for prevalence rate of disability forecasting.
- Prevalence rate of disability at all ages were drive from the following equation:

$$p = \frac{1}{1+\exp(-z)} = \frac{\exp(z)}{1+\exp(z)} \Longrightarrow \ln[\frac{p}{(1-p)}] = z$$

- z is a function of xi, which can be expressed as $a + b_1x_1 + b_2x_2 + ... + b_kx_k$
- Assumptions for prevalence rate of disability
  - Assumption I, prevalence rate of disability will keep constant in the same age with little affections by social economic and demographic factors.
  - Assumption II, prevalence rate of disability will have dynamically changes as social economic and demographic factors changes. Age, per capita household income and employment rate were the three key parameters for prevalence rate of disability forecasting.
- Combined the results of total population projection and prevalence rate forecasting, we would have population with disability of all the ages in the future years under different scenarios.

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Results conclusion and discussion

1.Results

Associated analysis of demo-socio-economic factors of older adults with disability.

Table 1 Associated analysis of demo-socio-economic factors of older adults with disability

Variables	B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B) Lower	Upper
Age	0.071	0.001	12575.475	1	0.000	1.074	1.072	1.075
Sex（male）	-0.210	0.009	571.104	1	0.000	0.811	0.797	0.825
Residence(rural)	-0.178	0.011	274.181	1	0.000	0.837	0.819	0.855
Educational level (without higher education)	-0.495	0.031	255.295	1	0.000	0.609	0.573	0.648
Marital status (without spouse)	-0.199	0.009	444.023	1	0.000	0.820	0.805	0.835
Employment (not be employed)	0.780	0.012	3998.285	1	0.000	2.183	2.130	2.236
INCOME (<684)								
684-944	-0.105	0.021	24.703	1	0.000	0.900	0.863	0.938
945-2948	-0.268	0.015	337.912	1	0.000	0.765	0.744	0.787
2949-7254	-0.527	0.016	1093.856	1	0.000	0.590	0.572	0.609
>7255	-0.759	0.020	1457.964	1	0.000	0.468	0.450	0.487
Provincial GDP per capita (<10000)								
10000-30000	-0.075	0.009	62.374	1	0.000	0.928	0.911	0.945
>30000	-0.134	0.017	63.384	1	0.000	0.874	0.846	0.904
Constant	-6.046	0.049	15380.498	1	0.000	0.002		

Future trends of ageing population with disability under the demo-socio-economic factors, 2006-2050

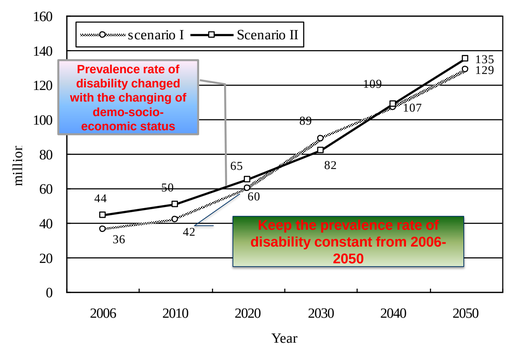


Fig.3 Population size of older adults with disability under two scenarios (2006-2050))

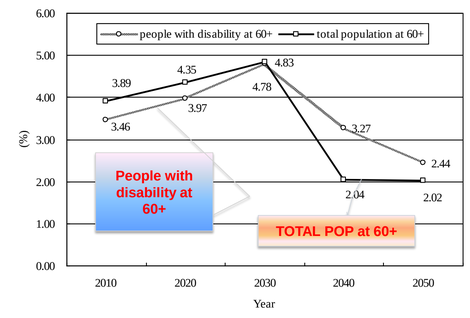
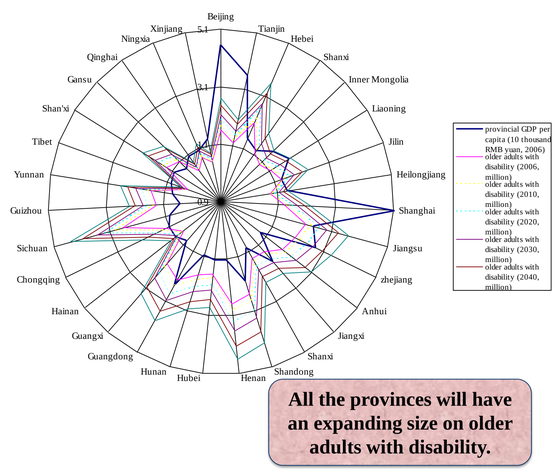
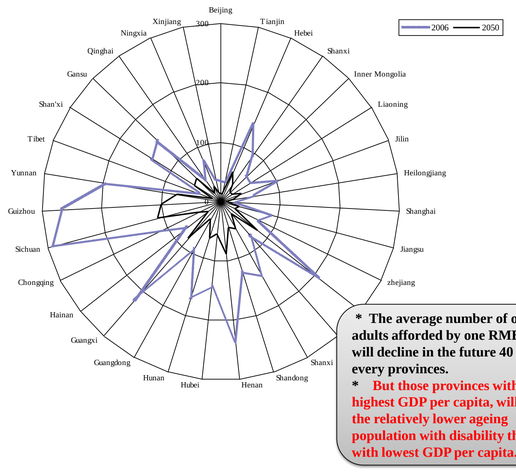


Fig.4 Annually average growth rate of older adults and older adults with disability (2006-2050)



All the provinces will have an expanding size on older adults with disability.

Fig 5. total number of older adults with disability for different provinces in China from 2006 to 2050
compare with their GDP per capita in the base year of 2006.



*** The average number of older adults afforded by one RMB yuan will decline in the future 40 years for every provinces.**
*** But those provinces with the highest GDP per capita, will afford the relatively lower ageing population with disability than those with lowest GDP per capita.**

Fig 6. Provincial average number of older adults afforded by one GDP per capita (RMB yuan) (2006, 2050)

2. Conclusion

Most of the socio-economic-demographic factors were significantly associated with disability among total population except nationality, and among ageing population except occupation. Total number of older adults with disability in 2050 is 3.05 times of 2006. Age, sex, residence, marital status, education, income, local GDP per capita are significantly affect the prevalence of disability among the older adults. The most far-reaching impact factor affect the development process of future changes is population aging.

3. Discussion

Compared with those countries emerging a declining tendency of prevalence rate for disability in older population over the past decade, such as the U.S.A [viii] and Japan [ix], The huge size of the population with disability in China will bring social economic environment and health care system a tremendous pressure and burden. And China's population will experience a process of population with disability aging and aging population disabling in the future.

Acknowledgments

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