THE UNIVERSITY OF TOKYO

Impact of Inequality on the Future Elderly – Policy Tools and Actions

Ageing in Asia

Future projection of health trajectories and health disparity in the super-aged society of Japan

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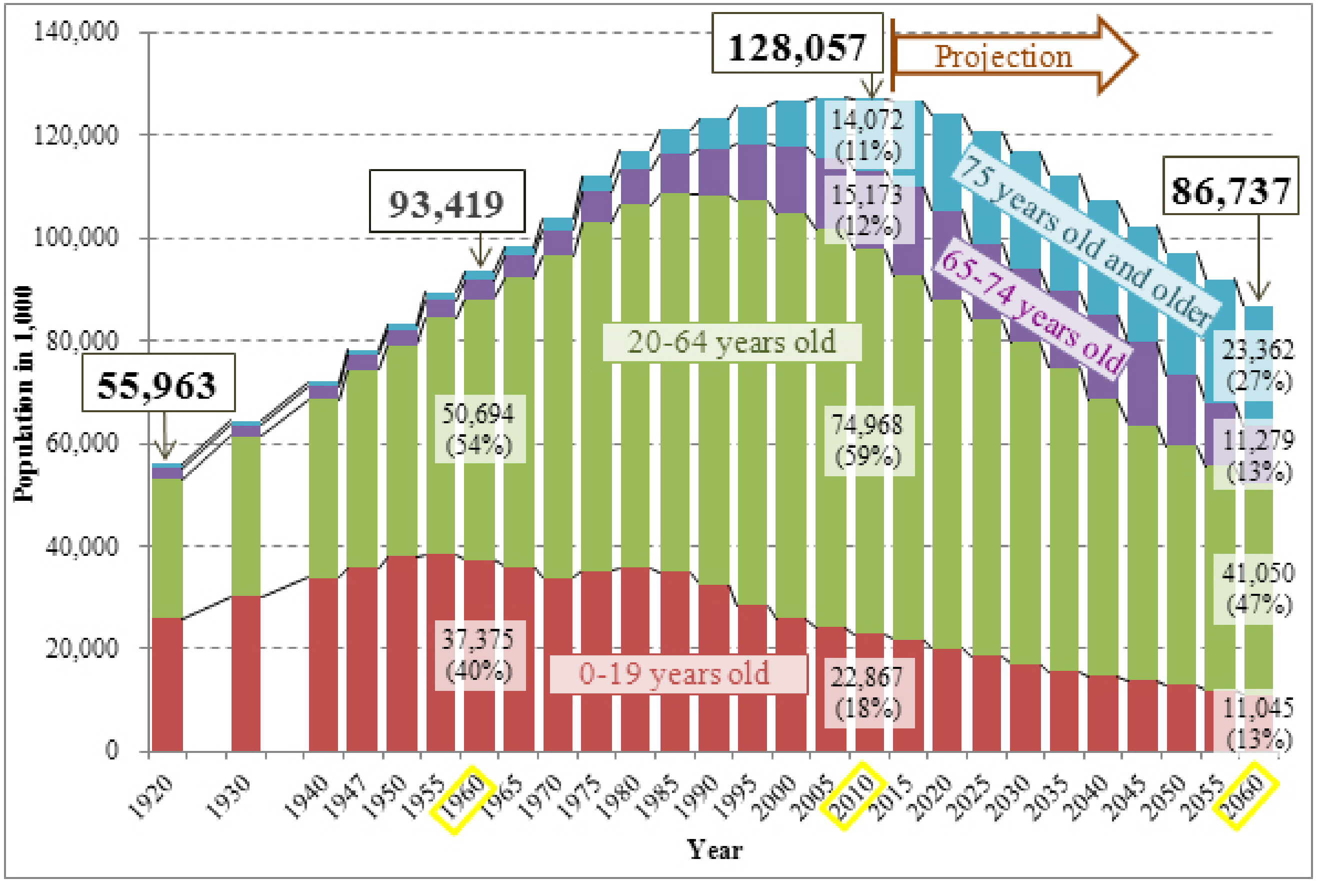
Japan

Frontline of shrinking and ageing society



2025 is the epoch when first baby boomers enters old-old (75+).
2035 will be the next epoch when baby boomer juniors enter age65+.

Source; http://www.ipss.go.jp/s-info/e/ssj2014/001.html

Japanese version of FEM; The first fruit

Forecasting Trends in Disability in a Super-Aging Society: Adapting the Future Elderly Model to Japan.

Journal of the economics of ageing

Chen, B. K., Jalal, H., Hashimoto, H., Suen, S., Eggleston, K., Hurley, M., Schoemaker, L., Bhattacharya, J. 2016; 8: 42-51

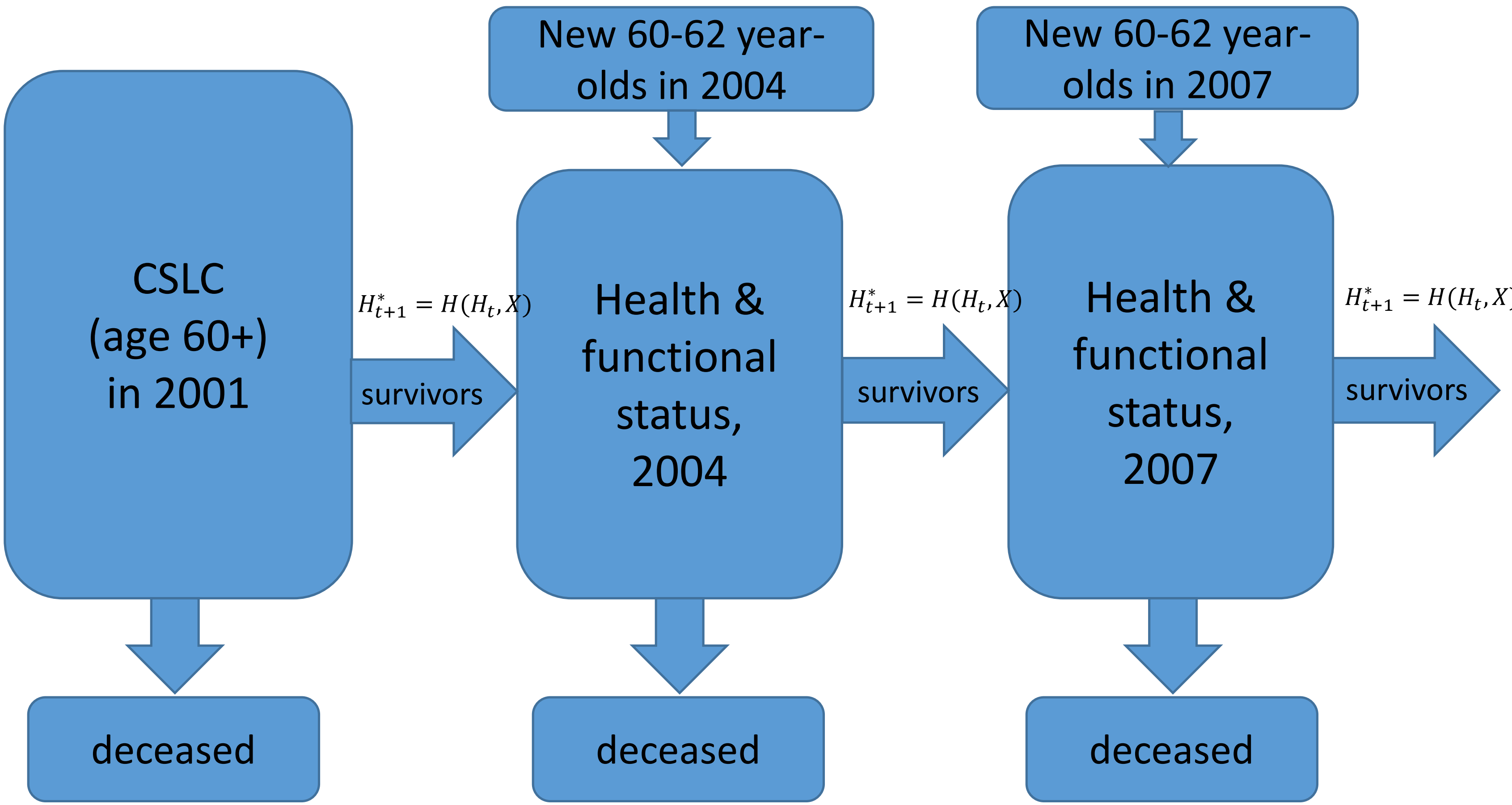
- Based on Japanese sister panel survey (JSTAR) with US HRS
- Problem; age range (lacking age +75) and selective attrition in older layer due to institutionalization

Alternative data sources

- National Comprehensive Survey of Living Conditions of People (CSLC)
  - Nationally representative with two-staged cluster sampling
  - Aprx 600,000 individuals from 295,000 households
  - Repeated cross-sectional every 3 years: 2001 – 2013
  - Comorbid condition, subjective health, functional status,
    and mobility status with demographic and socioeconomic variables
- Vital Statistics
  - Individual mortality records: 2000 – 2014
  - 1.2 million per year
- Population Census 2010

Pseudo panel approach basically following FEM frame

(1) First order Markov process
(2) Absorbing health statuses
(3) Additive assumption for multiple mortality causes



Exact estimation of dynamic equilibrium using contingency tables (Kasajima, et al. manuscript presented at 2018 iHEA at Boston)

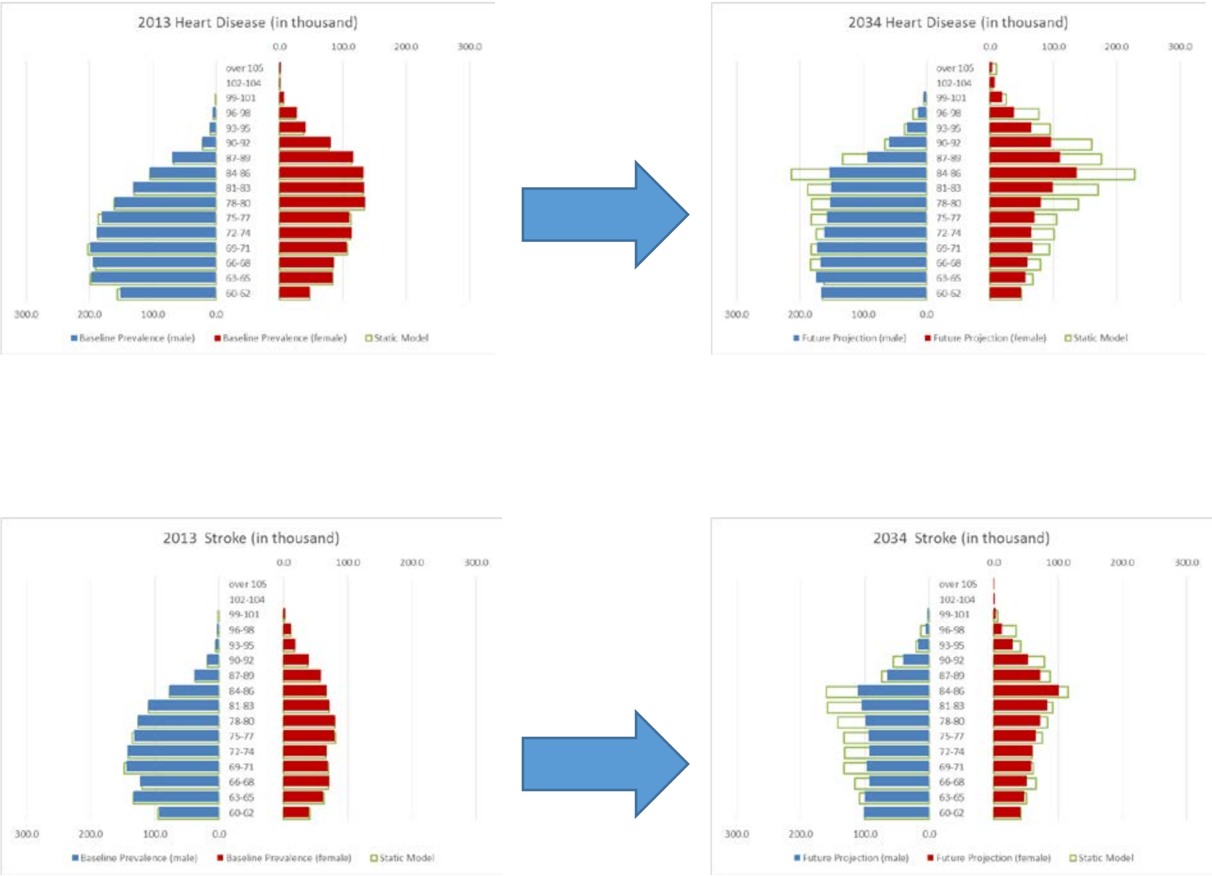
Assumptions

- Disease (d_n) incidence holds in equilibrium with prevalence and mortality in the cohort within a period (month).
- Comorbidity of 14 health statuses as reflected in all possible combinations of two statuses
- Use of contingency tables for exact estimation of “transition probability” over time periods

d_ixd_j	d_i=0	d_i=1
d_j=0	$pop_t(0,0)$ $\alpha_{baseline}$	$pop_t(0,1)$ $\alpha_{baseline}+\alpha_{di}$
d_j=1	$pop_t(1,0)$ $\alpha_{baseline}+\alpha_{dj}$	$pop_t(1,1)$ $\alpha_{baseline}+\alpha_{di}+\alpha_{dj}$

Future Projection of disease burden 2013->2034

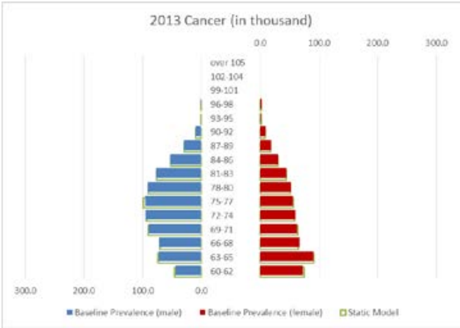
Coronary heart disease and stroke will reduce in absolute number despite of population ageing

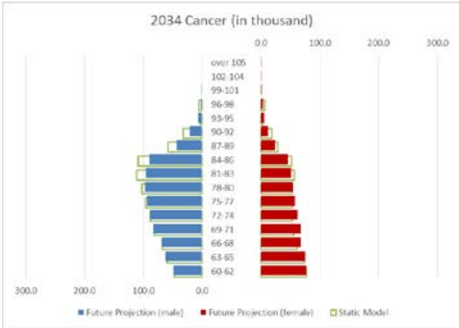


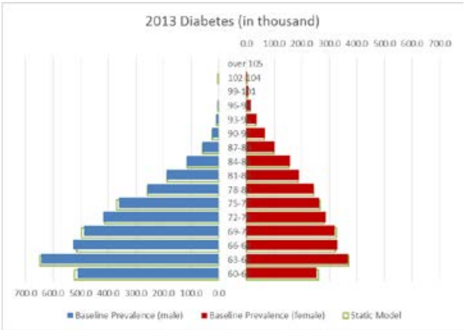
Source; Kasajima, et al. prepared for submission. Do Not cite without permission

Future Projection of disease burden 2013-> 2034

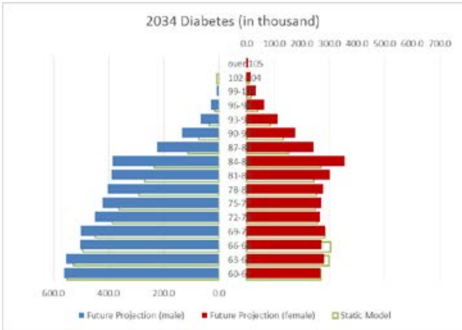
Cancer incidence and case fatality will be lowered, while the size of population at risk will grow due to population ageing, resulting in similar prevalence in number with older age distribution (longer survival!)







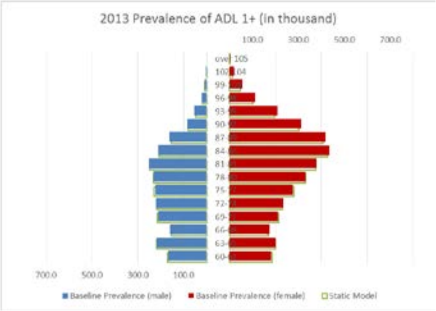
Diabetes will increase in number and with older distribution

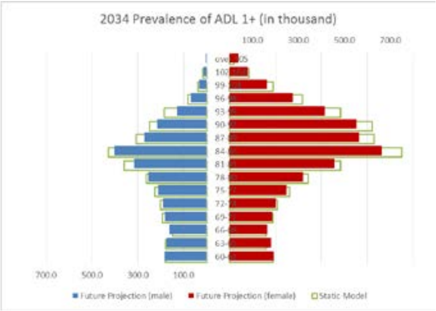


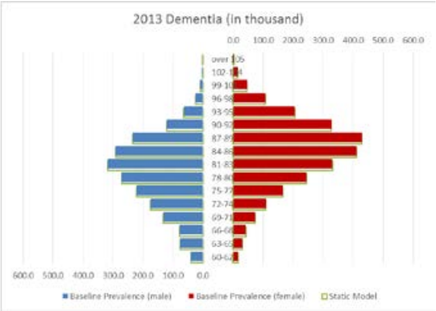
Source; Kasajima, et al. prepared for submission. Do Not cite without permission

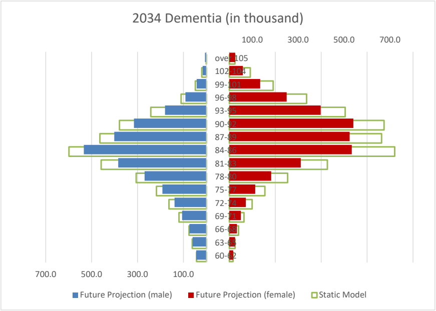
Future Projection of disease burden 2013-> 2034

Those with difficulties in daily activities and cognitive dysfunction will increase in number (though less than originally expected thanks to improvement in cardiovascular morbidity), and shifted toward older range.









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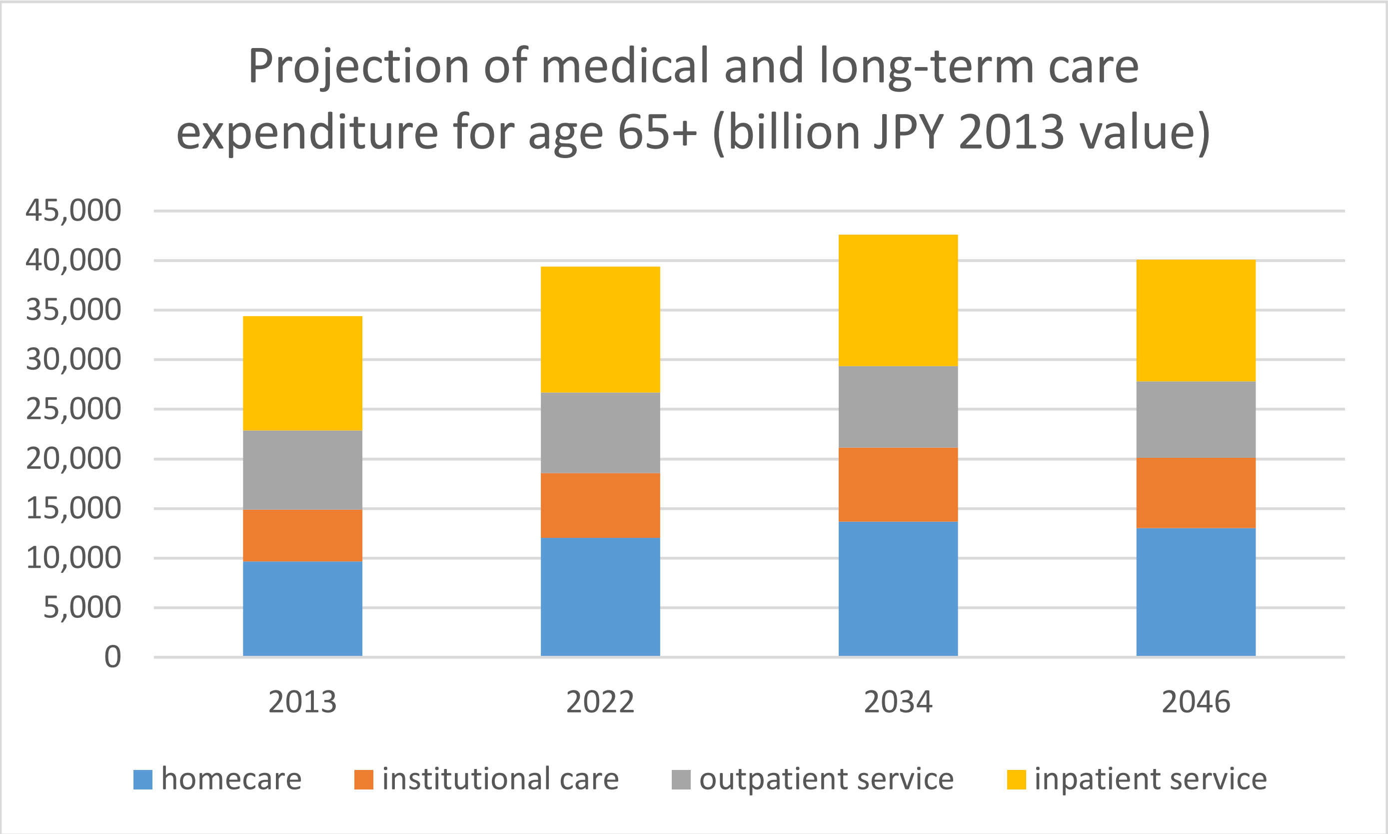

Note1; effects of price inflation and innovative technology are not considered.

Note2; Age-sex-condition specific expenditure based on regression results from national claim database (3% sample) and long-term care claim database was multiplied by the estimated number of comorbidity conditions.

Note3; long-term care utilization as expected from comorbidity (currently about 30% are replaced by informal care)

Source; Prepared by Hashimoto, et al. for Report 2018 March for Ministry of Industry, Economics, and Trade.
Do Not cite without permission

Conclusion

- Japan in the frontline of population shrinkage and ageing needs detailed future projection using Future Elderly Model framework.
- Complementary use of pseudo panel method could provide stable and convergent estimation of older-old population.
- Compared to traditional static average-out projection, a new projection provides different views of future burden of disease/disability, implying different messages for health policy makers to prepare future challenge.
- Socioeconomic disparity in disease prevalence in older-old is complicated due to balance between improved incidence and case fatality. Microsimulation could be used as an experimental tool for searching the mechanism of health disparity, as well as for evaluating future policy impact among older-old population.