Can long-term care insurance system reduce health inequality among Japanese elderly ?

Yoshihisa Fujino, MD, PhD, MPH, and Shinya Matsuda, MD, PhD, FFPH

Department of Preventive Medicine and Community Health
University of Occupational and Environmental Health, Japan

Presentation topics

- Living arrangements and health among elderly
- Income inequality and health among elderly
- How dose long-term care insurance service affect these terms?

The increased life expectancy of Japanese

- The increased life expectancy of Japanese
  - 83 years (male 79, female 86) in 2006
  - the longest in the world
- Social problems related to the aging of the population

Declining fertility rate

- A declining fertility rate has increased the ratio of nuclear families among the elderly population
- families of two among elderly increasing
  - from 20% in 1988 to 30% in 2006
- elderly people living alone of all elderly aged 65 or over
  - from 15% in 1988 to 22% in 2006

Informal and formal care for the elderly

- an important public health concern
  - service delivery, care costs, care provision, and long-term care insurance
- Japan introduced long-term care insurance in 2000
  - elderly certified to receive long-term care
  - from of 1.5 million in 2000 to 3.2 million in 2005

Informal care and living arrangement

- Informal care from immediate family
  - Increasing elderly living alone or two family of elderly
- Living arrangement may be a good proxy of informal care for elderly
- Living arrangement may affect health of elderly

Methods

- Setting: Yukuhashi City, Fukuoka
- Sampling: randomly identified from resident registry data
- Subjects: 3000 elderly at home
  - 2773 (1178 males and 1595 females)
  - 27 subjects declined participation
  - 200 subjects were excluded owing to extended hospitalization or stay in a nursing home.
- Period: 2002-2007

Measurements

- face-to-face interview
  - Living arrangement
  - Mobility status
  - Medical status
- the municipal office data
  - the use of long-term care insurance
  - the vital status
  - Income level (taxation base)
- Information was collected annually from 2002 to 2007

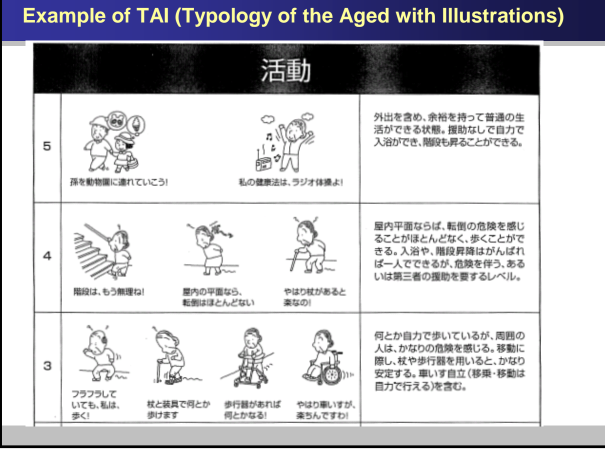
Living arrangement categories

Living with other(s)	Living with others who provide care throughout the day	Subject lives with other(s) who usually stay at home throughout the day and who is potentially able to provide care if needed.
	Living with others who cannot provide sufficient care due to illness or infirmity	Subject live with other(s) who usually stay at home but cannot provide sufficient care due to illness or infirmity.
	Living with others who cannot provide sufficient care due to a job	Subject lives with other(s) who works either full- or part-time. Subject ususally stays at home alone for a certain time per day.
	Living with another who is receiving long-term care insurance service	This category particularly indicates a "family of two", in which either a spouse or nonspouse is receiving long-term care insurance service, regardless of subject's receipt himself/herself of long-term care insurance service.
Living alone	Living alone with frequent support from family and friends	Family and friends frequently visit and provide support to a subject who lives alone.
	Living alone without support from family or friends	Subject lives alone, but is rarely visited by family or friends.

Mobility status

- Mobility status (Typology of the Aged with Illustrations)
- level 5, able to climb stairs without aid or assistive devices
- level 4, cannot climb stairs without aid but can walk on flat surfaces without aid or assistive devices
- level 3, cannot walk on a flat surface without aid, but can move around using assistive devices and change position independently while seated;
- level 2, cannot move around or transfer while seated using an assistive device or aid from others, but can sit up and maintain a seated position;
- level 1, cannot sit up or maintain a seated position but can roll over on bed without aid; and
- level 0, cannot roll over on a bed while lying without aid.

Example of TAI (Typology of the Aged with Illustrations)



Medical status

- Medical status
  - not receiving medical care
  - receiving periodic outpatient treatment
  - hospitalized

Income levels

Level 1	non-taxed household	Welfare recipient
Level2		a participant and all family members who are exclusion from
Level3	taxed household	a participant who is exclusion from taxation, but some other family members are subject to taxation
Level4		a participant who is subject to taxation and whose income is USD
Level5		a participant who is subject to taxation and whose income is over

Income levels were adopted from taxation base for long-term care insurance premiums for those aged 65 and over

Follow up

- 5 years of follow-up (2002-2007)
- 11639 person-years
  - 4830 males and 6810 females
- 381 deaths
  - 225 males and 156 females

Main Findings

- Living arrangement as classified by the ability to receive informal care affects survival among elderly men
- Higher mortality were seen among
  - Elder-to-elder care
  - Men living with others who cannot provide sufficient care
  - Men living alone without support
- LTCI did not reduce the difference in mortality between the groups of living arrangements

Age-adjusted HR for men

Hazard ratios of living arrangement for mortality among men

	HR	95% CI		p
Living with others who provide care throughout the day	Reference			
Living with others who cannot provide sufficient care due to illness, or infirmity	1.5	1.0	2.2	0.04
Living with others who cannot provide sufficient care due to job	1.4	0.8	2.6	0.25
Living with another who is receiving long-term care insurance service	1.9	1.1	3.2	0.03
Living alone with frequent support from family and friends	1.1	0.6	2.1	0.68
Living alone without support from family or friends	6.4	2.6	15.6	<0.01

Adjusted for mobility and medical status

Hazard ratios of living arrangement for mortality among men

	HR	95% CI		p
Living with others who provide care throughout the day	Reference			
Living with others who cannot provide sufficient care due to illness, or infirmity	1.4	0.9	2.1	0.10
Living with others who cannot provide sufficient care due to job	1.3	0.7	2.4	0.36
Living with another who is receiving long-term care insurance service	1.9	1.1	3.3	0.03
Living alone with frequent support from family and friends	1.1	0.6	2.0	0.79
Living alone without support from family or friends	5.8	2.2	15	<0.01

Living alone without support

Hazard ratios of living arrangement for mortality among men

	HR	95% CI		p
Mobility* ≥ level4				
Living with others who provide care throughout the day	Reference			
Living with others who cannot provide sufficient care due to illness, or infirmity	1.3	0.8	2.0	0.32
Living with others who cannot provide sufficient care due to job	1.3	0.6	2.7	0.45
Living with another who is receiving long-term care insurance service	0.9	0.4	2.0	0.79
Living alone with frequent support from family and friends	0.9	0.4	2.0	0.86
Living alone without support from family or friends	4.2	1.3	13.2	0.02

Living alone without support

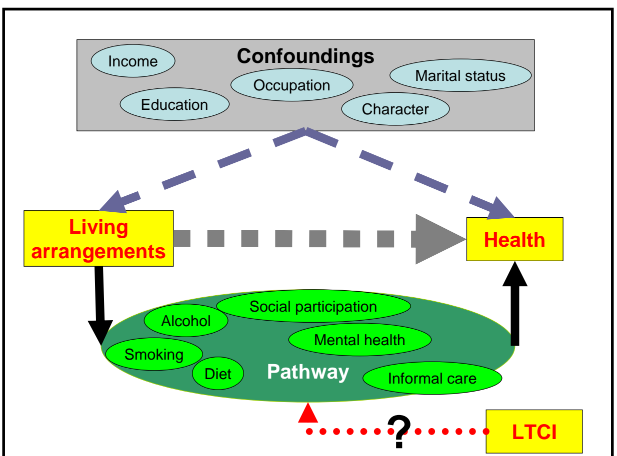
Hazard ratios of living arrangement for mortality among men

	HR	95% CI		p
Mobility* ≤ level 3				
Living with others who provide care throughout the day	Reference			
Living with others who cannot provide sufficient care due to illness, or infirmity	2.1	0.9	4.8	0.09
Living with others who cannot provide sufficient care due to job	2.0	0.6	6.4	0.26
Living with another who is receiving long-term care insurance service	5.0	2.0	12.7	0.00
Living alone with frequent support from family and friends	2.7	0.8	8.6	0.10
Living alone without support from family or friends	12.0	2.4	63	<0.01

Elder-to-elder care

Hazard ratios of living arrangement for mortality among men

	HR	95% CI		p
Mobility* ≤ level 3				
Living with others who provide care throughout the day	Reference			
Living with others who cannot provide sufficient care due to illness, or infirmity	2.1	0.9	4.8	0.09
Living with others who cannot provide sufficient care due to job	2.0	0.6	6.4	0.26
Living with another who is receiving long-term care insurance service	5.0	2.0	12.7	<0.01
Living alone with frequent support from family and friends	2.7	0.8	8.6	0.10
Living alone without support from family or friends	12	2.4	63	<0.01



Adjusted for use of Long-term care insurance

Hazard ratios of living arrangement for mortality among men

	HR	95% CI		p
Mobility* ≤ level 3				
Living with others who provide care throughout the day	Reference			
Living with others who cannot provide sufficient care due to illness, or infirmity	2.6	1.1	6.5	0.04
Living with others who cannot provide sufficient care due to job	2.1	0.6	6.9	0.24
Living with another who is receiving long-term care insurance service	4.3	1.5	12	0.01
Living alone with frequent support from family and friends	2.2	0.6	7.9	0.23
Living alone without support from family or friends	15.3	1.8	132	0.01

Function of LTCI

- LTCI may not directly affect health of elderly
- Health of elderly much depends on biomedical condition and ageing rather than LTCI service.
  - we never be “Forever young”!
- It is expected that if LTCI helps elderly health, it may exert its effects via pathway variables.
- Unfortunately, however, benefits from informal care cannot substitute for those from formal care service under the current LTCI system.

Income and Health

Income and Health

- It is believed that income inequality is relatively narrow among Japanese society
- However, recent evidence shows that income inequality among Japanese is increasing
  - Gini coefficient is 0.25 to 0.4
- Income is a significant determinants of health
- Very few evidence about Japanese elderly

Income levels

Level	Household	Description
Level 1	non-taxed household	Welfare recipient
Level2		a participant and all family members who are exclusion from
Level3	taxed household	a participant who is exclusion from taxation, but some other family members are subject to taxation
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Income levels were adopted from taxation base for long-term care insurance premiums for those aged 65 and over

Income and Health

- No association was found in women
- The highest mortality in the poorest men

Income level and use of LTCI

	Income level				
	1	2	3	4	5
n	110	1,814	904	2,602	1,016
use of LTCI	36	266	166	284	49
%	33	15	18	11	5

People with low income are more likely to use LTCI

Income and Health

	HR	95% CI		*p*	HR	95% CI		*p*
Income_1	2.2	1.1	4.4	0.04	1.7	0.8	3.6	0.14
Income_2	1.3	0.8	2.0	0.27	1.1	0.7	1.7	0.75
Income_3	1.3	0.8	2.1	0.30	1.0	0.6	1.7	0.97
Income_4	1.0	0.6	1.5	0.95	0.9	0.6	1.4	0.69
use of LTCI					4.0	2.9	5.5	0.00

Stratified by mobility status

	Good mobile				Less mobile			
	HR	95% CI		*p*	HR	95% CI		*p*
Income_1	3.8	1.3	10.9	0.02	0.5	0.1	2.9	0.41
Income_2	1.2	0.7	1.9	0.48	0.7	0.2	3.0	0.61
Income_3	1.2	0.7	2.1	0.54	0.5	0.1	2.4	0.38
Income_4	1.0	0.6	1.6	0.95	0.5	0.1	2.2	0.35

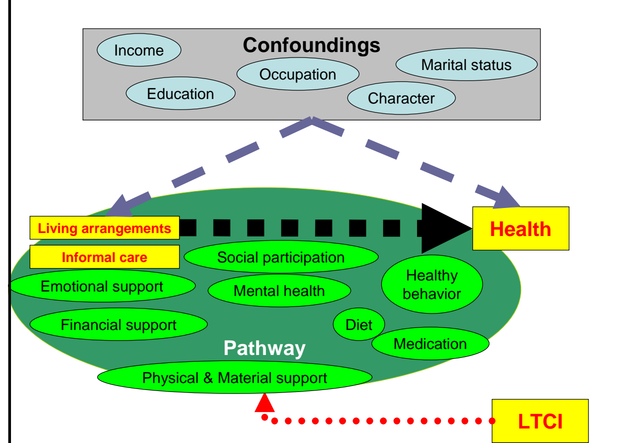
Adjustment of use of LTCI among men with good mobile

Men with good mobile

	HR	95% CI		p	HR	95% CI		p
Income_1	3.8	1.3	10.9	0.02	3.3	1.1	9.7	0.03
Income_2	1.2	0.7	1.9	0.48	1.1	0.6	1.7	0.84
Income_3	1.2	0.7	2.1	0.54	1.1	0.6	1.9	0.85
Income_4	1.0	0.6	1.6	0.95	1.0	0.6	1.5	0.85
use of LTCI					3.0	1.9	4.7	0.00

Aim of LTCI

- The 1st
  - LTCI may improve and maintain independency of elderly compared with not using LTCI.
  - It is difficult to examine this because LTCI has already implemented in Japan.
  - LTCI can never satisfy needs
  - LTCI must follow infinite needs
  - LTCI creates needs – People feel LTCI service is convenient
- The 2nd
  - LTCI can improve elderly health
  - There is no evidence, and far more ambitious, although there is social anticipation.
  - This is probably impossible – aging is inevitable
- The 3rd
  - LTCI can reduce health inequality related to individual's capacity of receiving care.
  - Income, living arrangement, marital status, education,
  - However, current LTCI can not reduce health inequality in these terms.
- The 3rd aim is the most promising if LTCI is designed appropriately.



Discussion

- Living arrangement and capacity of informal care are associated with elderly health.
- Income inequality affects elderly health
- LTCI dose not reduce health inequality in regard to living arrangement and income.
- The role of LTCI is an open question
  - Improve/maintain independency?
  - Improve elderly health/QOL?
  - Reduce health inequality?