Healthy Life Expectancy in East Asia

Jersey Liang
University of Michigan
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Overview

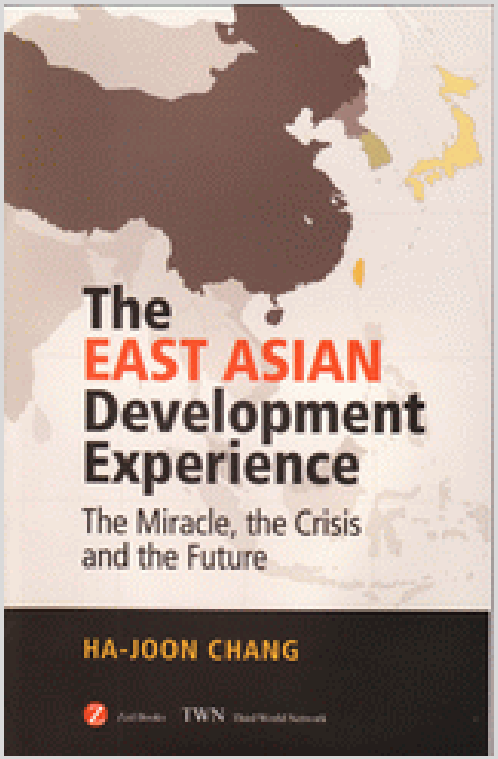
- Why HLE in East Asia?
- Current state of HLE research in East Asia
- An agenda for research and policy

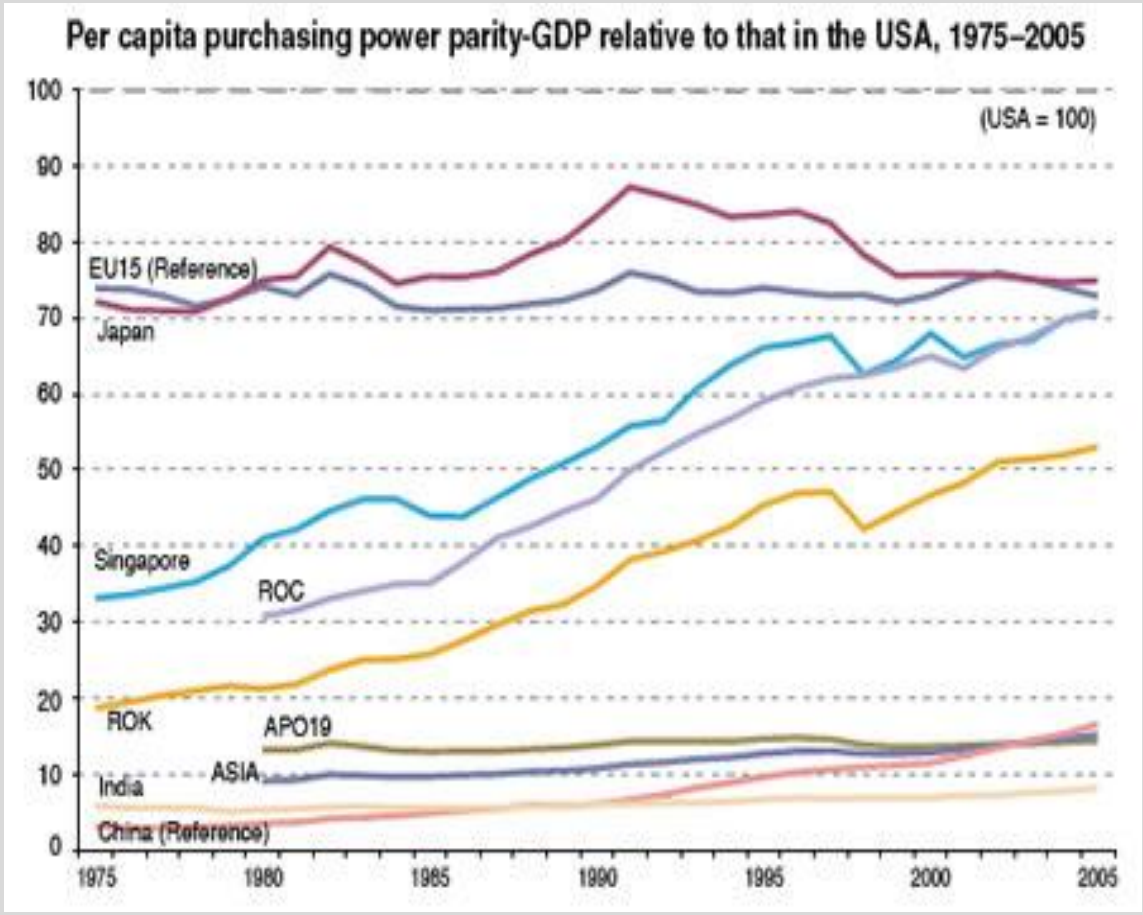
China, Taiwan, and Japan in contrast with U.S.

	China	Taiwan	Japan	U.S.
Population in millions	1,343	23	127	313
% 65+	8.9%	10.9%	22.9%	13.1%
Total fertility rate	1.55	1.16	1.39	2.06
Life expectancy at birth	74.8	78.5	83.9	78.5
Income per capita, PPP (2011)	$8,400	$37,900	$34,300	$48,100
Economic growth (2011)	9.2%	5.2%	-.5%	1.5%
Literacy (15 and over)	92%	96%	99%	99%
Urban population (%) (2010)	47%	69%	67%	82%
Religions	Buddhist, Taoist, Atheists	Buddhist, Taoist, Christian	Buddhist, Shinto	Protestant, Roman Catholic

CIA World Factbook, 2012

The East Asian miracle





Now No. 2, Could China become No. 1?

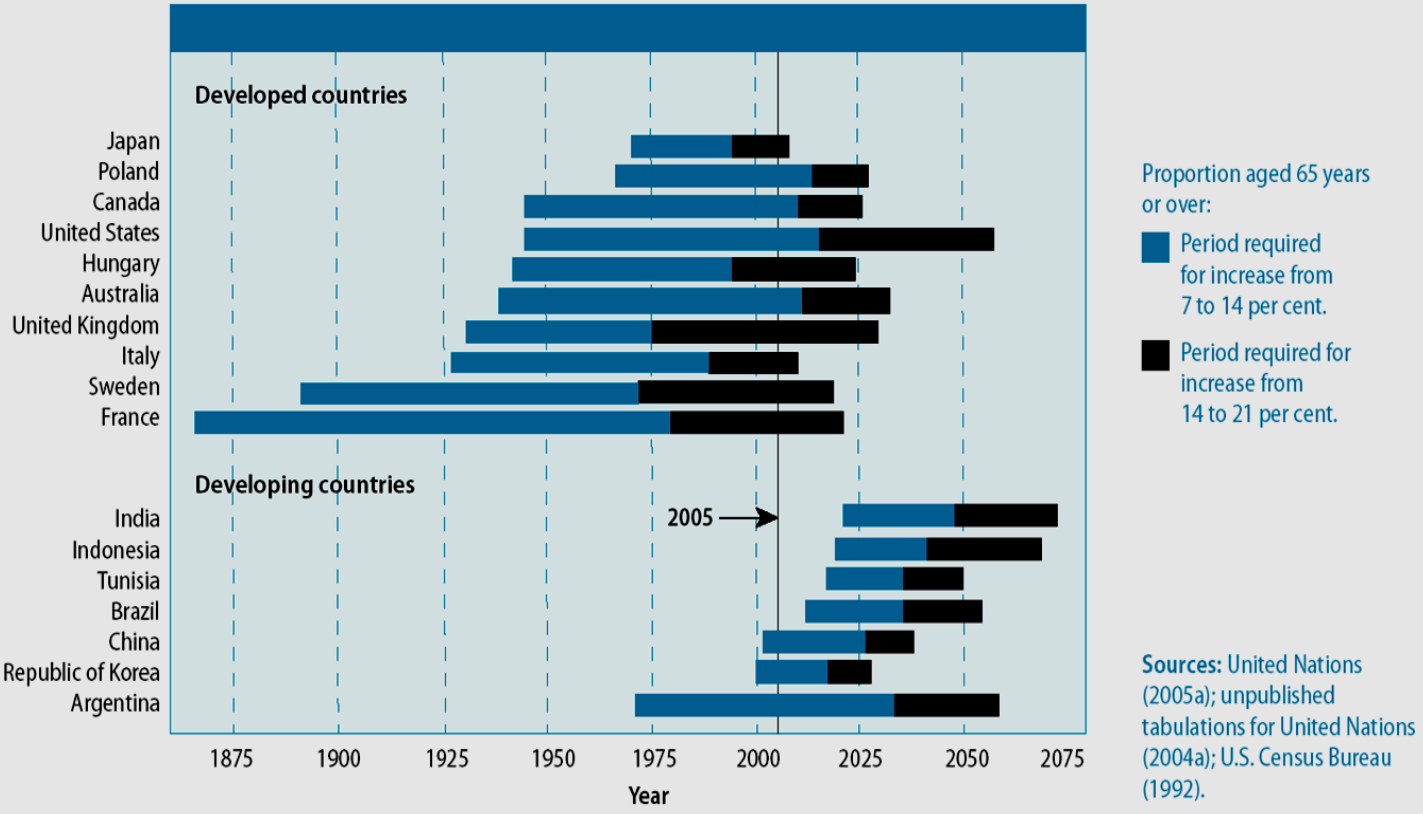
Market Exchange Rate (MER) rankings

MER 2009 Rank	Country	GDP at MER*	MER 2050 Rank	Country	Projected GDP at MET*
1	US	14256	1	China	51180
2	Japan	5068	2	US	37876
3	China	4909	3	India	31313
4	Germany	3347	4	Brazil	9235
5	France	2649	5	Japan	7664
6	UK	2175	6	Russia	6112
7	Italy	2113	7	Mexico	5800
8	Brazil	1572	8	Germany	5707
9	Spain	1460	9	UK	5628
10	Canada	1336	10	Indonesia	5358
11	India	1296	11	France	5344
12	Russia	1231	12	Turkey	4659
13	Australia	925	13	Italy	3798
14	Mexico	875	14	Nigeria	3795
15	South Korea	833	15	Canada	3322
16	Turkey	617	16	Spain	3195
17	Indonesia	540	17	South Korea	2914
18	Saudi Arabia	369	18	Vietnam	2892
19	Argentina	309	19	Saudi Arabia	2708
20	South Africa	286	20	Australia	2486

*(constant 2009 US$bn)
Source : World Bank estimates for 2009, PwC model estimates for 2050

Countries age at different points in history and speed

Figure II.2.
Time period required for the proportion of the population aged 65 years or over to increase from 7 to 14 per cent and from 14 to 21 per cent, selected countries



Sources: United Nations (2005a); unpublished tabulations for United Nations (2004a); U.S. Census Bureau (1992).

Aging and population decline

Nation	% 65+		Population decline is likely to begin
	2000	2025	
Italy	18.2	26.1	1995-2000
Japan	17.1	26.7	2005-2010
UK	16.0	21.2	2025-2030
France	15.9	21.7	2025-2030
US	12.5	18.8	After 2050 if at all
Russia	12.5	18.1	1990-1995
Taiwan	8.6	19.8	2020-2025
China	6.8	13.2	2040-2050

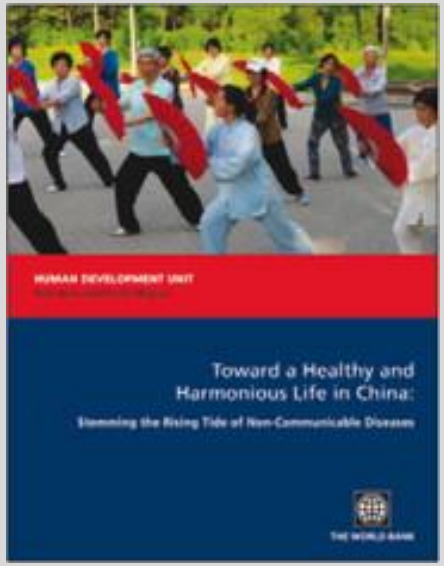
SES and health in old age in Japan

- Japan has the highest LE and HLE.
- The SES-health linkage is stronger in the U.S. and in Japan.
- Obesity is rare among older Japanese and the health consequences of overweight are much less serious than among older Americans.
- In Japan, there is no evidence of a link between SES and body-weight.

Taiwan: Health in old age

- Since 1950s Taiwan has evolved from a agriculture economy to a newly industrialized society with high income.
- Relative to their counterparts in western nations, old Taiwanese are not well educated.
- Cancer, stroke, and heart disease less prevalent among older Taiwanese than their American counterpart.
- A general male advantage in clinical risk factors.

Health and health care in China



- Rapid economic transition from planned to market economy with high economic since the late 1970.
- Massive urbanization with a migrant work force of 200 million.
- Double burden of infectious and chronic disease
- Medical insurance coverage has increased from 29·7% in 2003, to 87·9% in 2008, and 95·7% in 2011.

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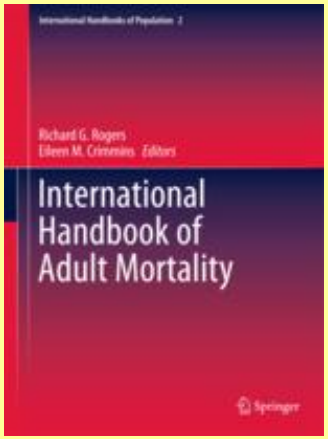
Healthy expectancy in Asian countries
(Saito et al., 2003: Jagger & Robine, 2011)



- Studies of HLE in Asia are relatively few.
- Sullivan method are most common in computing HLE in Asia. Longitudinal data required for multi-state life table method are relatively rare.
- Most HLE studies are based on ADLs in old age.
- HLE estimates available for 67 nations including Japan (51), China (29), and Taiwan (11).
- Harmonization of measures and methodology a research priority.

HLE in Japan (Liu et al., 1995)

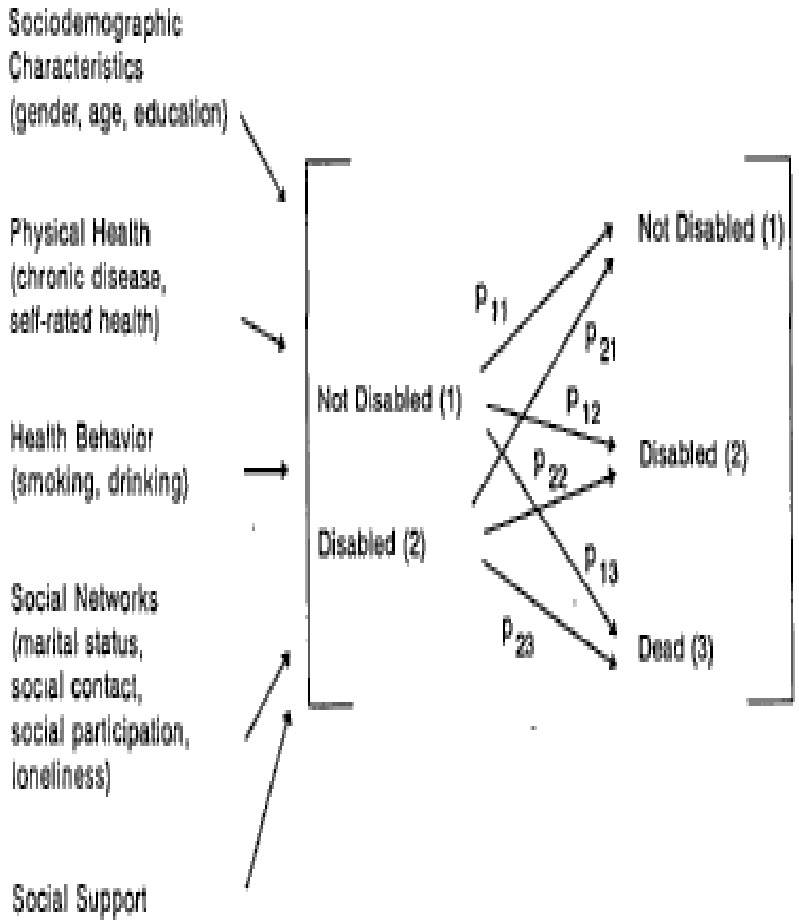


Table 6. Multivariate Increment-Decrement Life Table for Japanese Elderly Persons: 1987–90

	e(x)		ie(x)		de(x)	
Age	Sample	Population[a]	Years	%	Years	%
60	23.04	22.23	18.67	81.03	4.37	18.97
63	20.43	19.79	16.15	79.05	4.28	20.95
66	17.88	17.49	13.65	76.34	4.23	23.66
69	15.49	15.31	11.31	73.01	4.18	26.99
72	13.26	13.07	9.14	68.93	4.12	31.07
75	11.18	10.99	7.18	64.22	4.00	35.78
78	9.40	9.12	5.54	58.94	3.86	41.06
81	7.96	7.48	4.25	53.39	3.71	46.61
84	6.54	6.06	3.11	47.55	3.43	52.45
87	5.20	4.86	2.08	40.00	3.12	60.00
90	4.41	3.85	1.38	31.29	3.03	68.71
93	3.80	3.01	0.92	24.21	2.88	75.79
96	3.26	—	0.61	18.71	2.65	81.29

[a]This set of life expectancy at age x was derived from 1989 Japanese life tables both for males and for females, Ministry of Health, *Abridged Life Tables, 1989* (1990):12–15.

Exercise and HLE in Taiwan (Lin et al., 2009)

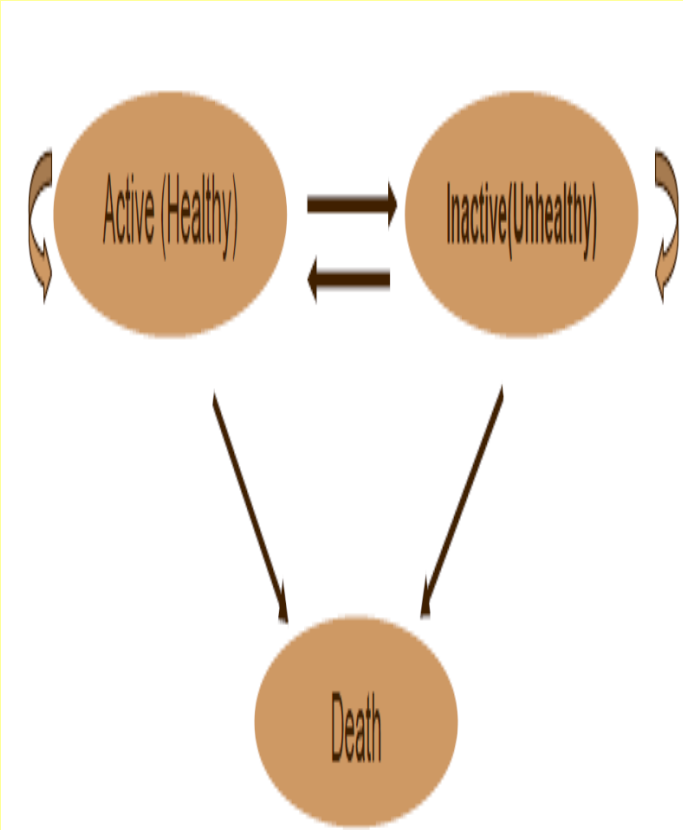
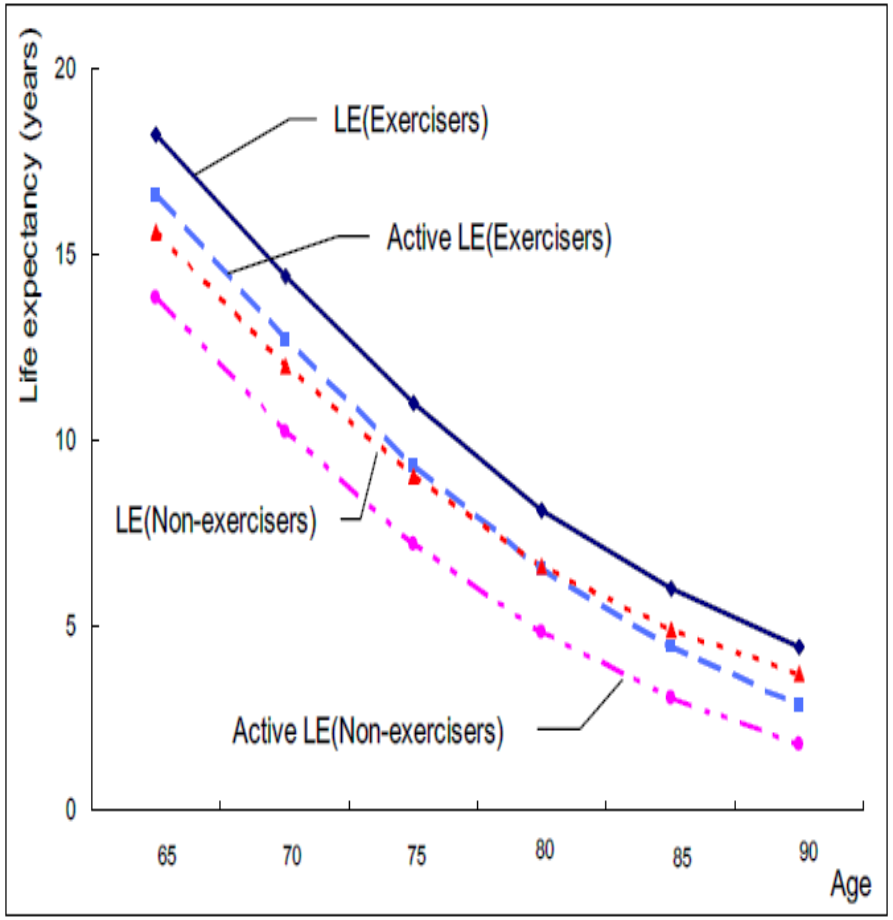
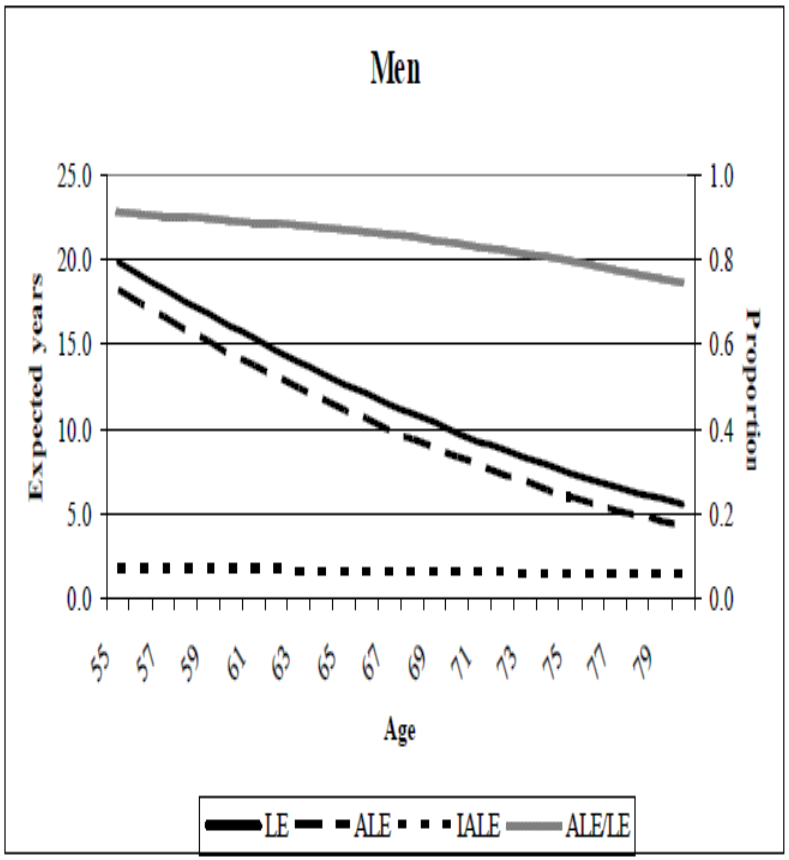


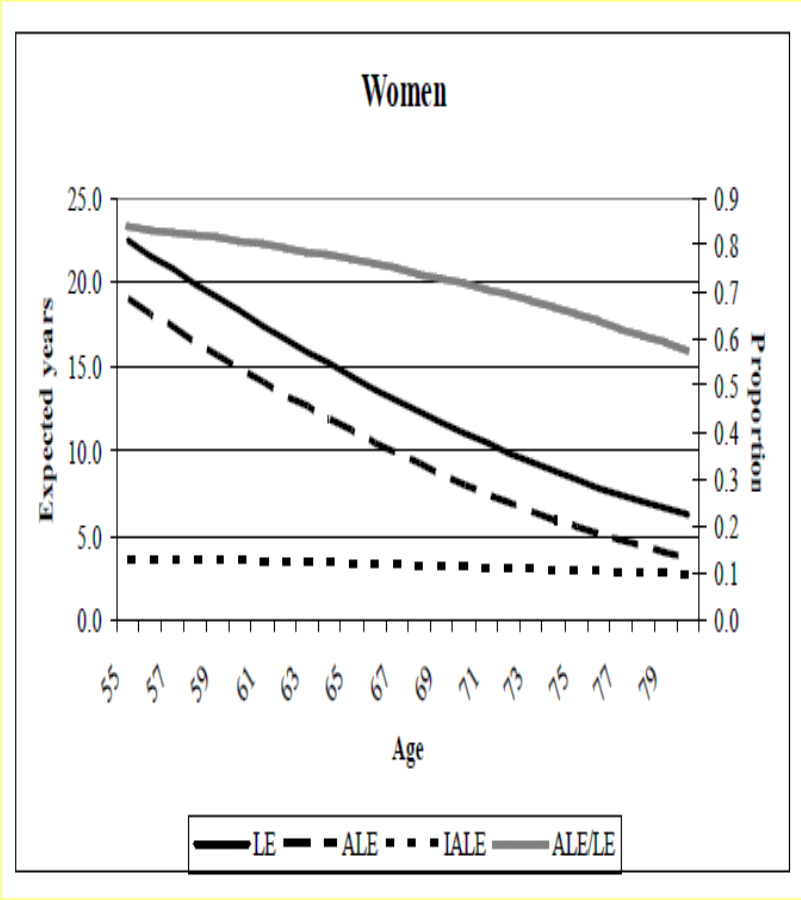
Figure 2 Life Expectancy and Active Life Expectancy between Exercisers and Non-exercisers



Socioeconomic differentials in HLE in China (Kaneda et al., 2005)

Figure 1 Expected Length of Total Life (LE), Active Life (ALE), and Inactive Life (IALE) and Ratio of Active Life Expectancy to Life Expectancy, by Age and Sex





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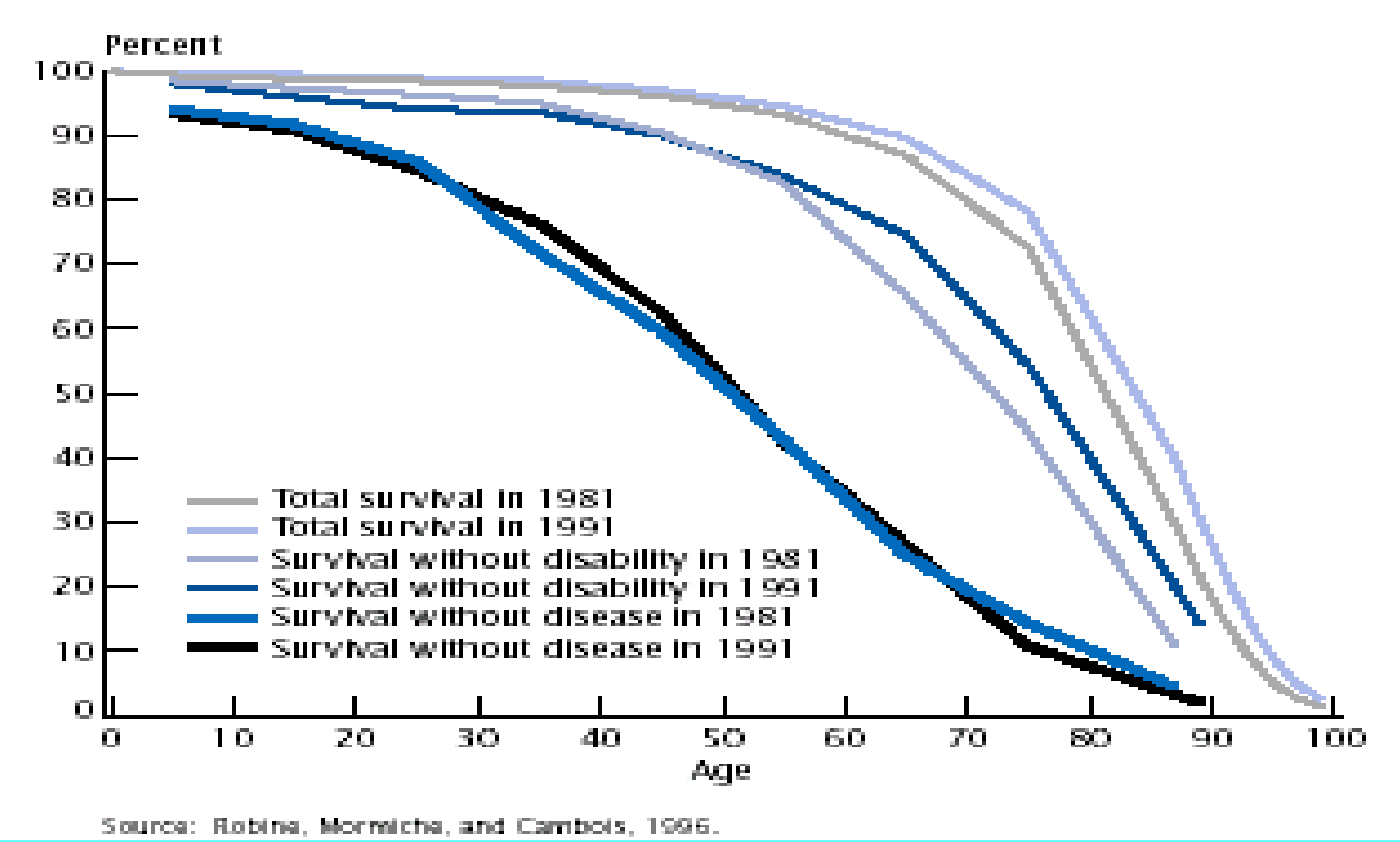
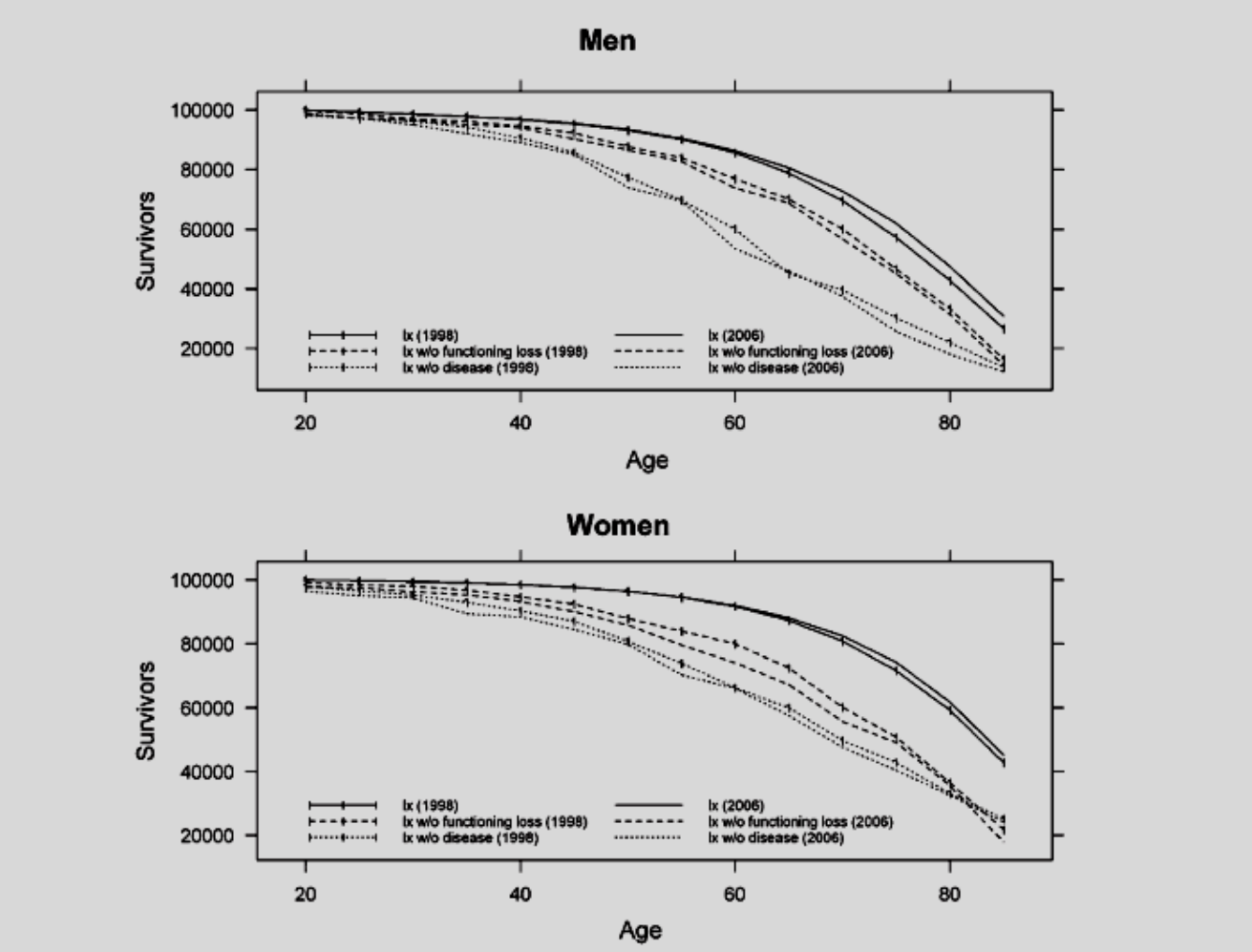
The relevance of HLE

- Monitoring health trends and evidence on compression of morbidity
- Assessing equity between subgroups of the population
- Health care planning and linking interventions to outcomes

Health changes with age: French females, 1981-1991



Mortality and morbidity trends: 1998 and 2006, U.S. (Crimmins & Sanchez, 2010)



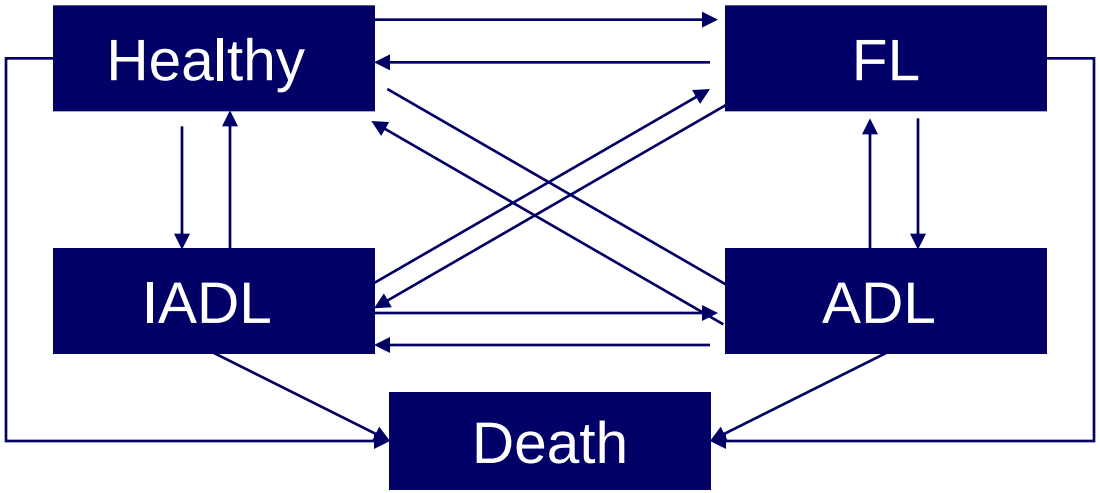
Disability-free life expectancy for Americans 70+ (Crimmins et al., 2009)

	Not disabled	ADL disabled	IADL disabled	Death
Not disabled				
ADL disabled				
IADL disabled				

- Increase in LE after 70 concentrated in LE without ADL and IADL. This is due to delay in disability onset and increase in likelihood in recovery.
- Mortality decline greater among ADL disabled than the IADL disabled and non-disabled.

Active Life Expectancy

STEP 1: Define State Space (16 possible transitions)

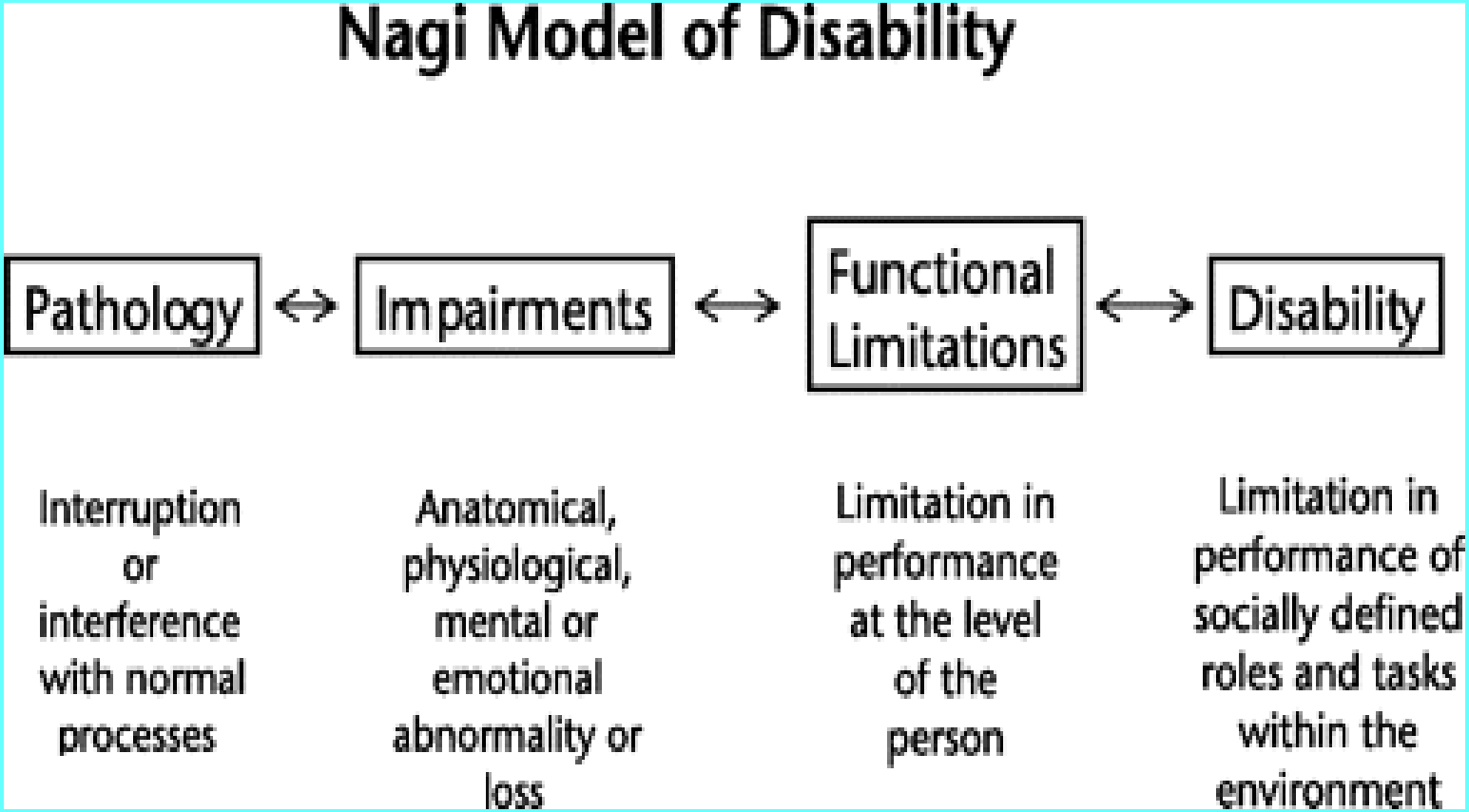


ADL: difficulty with 1+ of 6 ADLs (e.g., bathing, eating, dressing)
IADL: no difficulty with ADLs, but difficult with 1+ of 5 IADLs (e.g. shopping)
FL: no difficulty with ADL or IADS, but difficulty with 1+ of 11 functions
Healthy: no difficulty

Transitions among disease, disability, and mortality

	Not ill/not disabled	Ill/not disabled	Not ill/ disabled	Ill/ disabled	Death
Not ill/not disabled					
Ill/not disabled					
Not ill/disabled					
Ill/disabled					

Disablement model



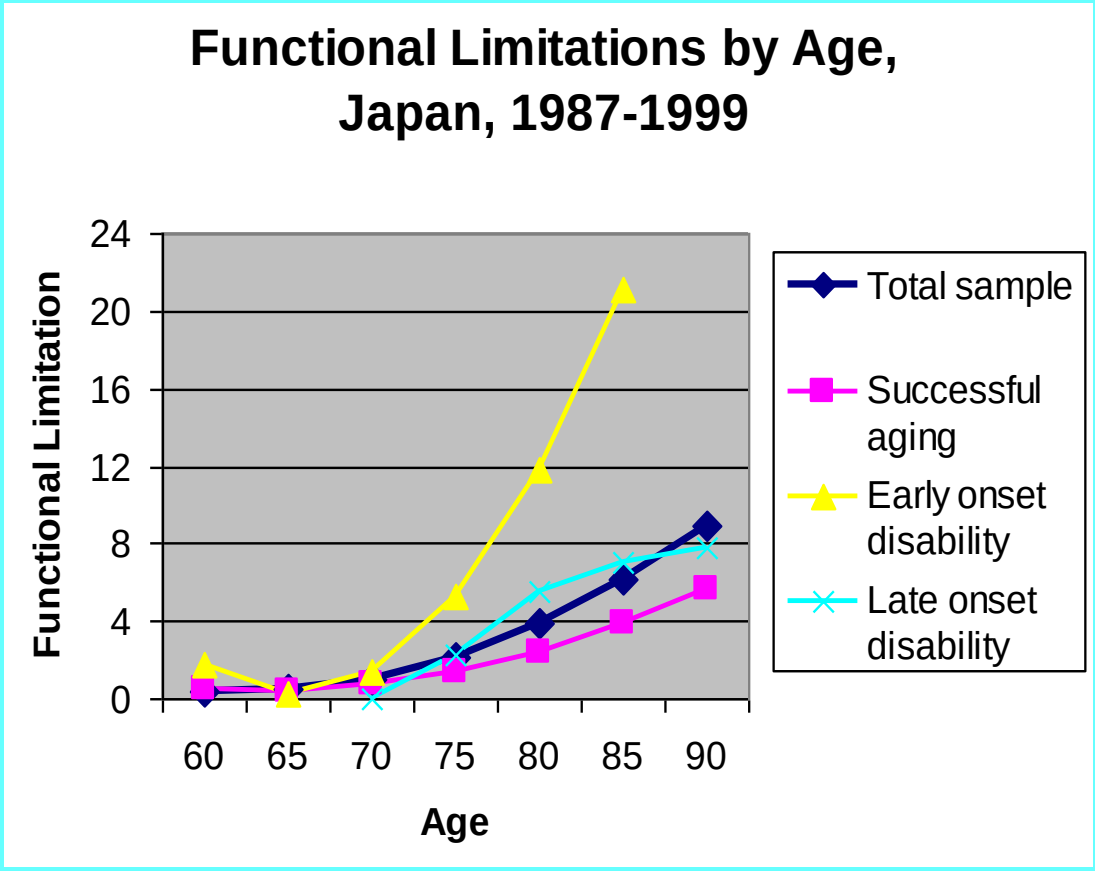
Socioeconmic gradient of HLE
(Kaneda et al., 2005; Li et al, 2004)

- Those with higher SES can expect to live more healthy years and fewer unhealthy years.
- Current multi state models have limited capacity in incorporating covariates.
- More elaborated conceptualization of covariates (e.g. SES) is required.
  - Individual level SES (e.g., education, occupation; income; wealth); Childhood SES
  - Household, community, provincial, and national SES and income; disparities
  - Trajectories of changes in SES
  - Cohort differences in association between SES and HLE

Demographic methods to calculate health expectancies

- Major methods (Laditka & Hayward, 2003)
  - Sullivan approach; multi-state life table and microsimulation
- HLE is essentially a property derived from a simulation model (i.e. life table)
  - A key advantage of life table is to integrate information from a variety of sources.
  - Important to explicate the linkages between processes at the individual level and those at the population level.

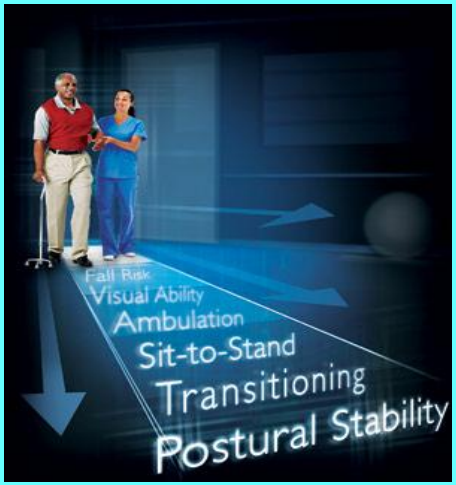
Trajectories of functional limitations among older Japanese



Liang et al. (2003). *Psychology and Aging*, 18(4), 684-695.

Measurement comparability

- Self-reported and performance based measures should be considered
- Performance based measures (e.g. grip strength, balance, and gait speed)
  - Less self-report bias; more objective and comparable
  - Less ceiling effects, particularly among those with better functioning



HLE and health policy

- Quality adjusted life years (QALY)
  - Randomized trial and cost-effectiveness analysis
- Policy evaluation
  - Tobacco control
  - alcohol and substance abuse
  - Diet, exercise, and obesity control
  - Chronic disease management and treatment
  - Palliative and hospice care

Lifetime hospital and nursing home use in U.S. (Liang et al., 1996)

	Community			Hospital			Nursing Home		
Age (yr) (x)	l_x	T_x	e_x	l_x	T_x	e_x	l_x	T_x	e_x
0	100,000	7,234,559	72.3456	0	16,299	0.1630	0	227,618	2.2762
5	98,680	6,740,704	68.2734	51	15.787	0.1599	0	227,618	2.3054
10	98,583	6,247,548	63.3574	25	15,621	0.1584	0	227,618	2.3083
15	98,403	5,755,126	58.4436	70	15,273	0.1551	0	227,618	2.3115
20	98,000	5,264,039	53.6730	76	14,894	0.1519	0	227,618	2.3208
25	97,171	4,776,288	48.9666	86	14,463	0.1483	285	226,729	2.3244
30	96,485	4,291,827	44.2506	94	13,991	0.1443	410	225,323	2.3232
35	95,646	3,810,993	39.5574	129	13,336	0.1384	566	223,436	2.3192
40	94,557	3,334,623	34.9137	140	12,623	0.1322	814	220,786	2.3116
45	93,004	2,864,407	30.3700	175	11,726	0.1243	1137	217,146	2.3023
50	90,700	2,403,160	25.9907	188	10,756	0.1163	1574	212,077	2.2937
55	87,195	1,955,229	21.8366	225	9,580	0.1070	2119	205,661	2.2969
60	82,022	1,527,951	17.9565	235	8,337	0.0980	2835	196,898	2.3139
65	74,637	1,129,790	14.3586	260	6,941	0.0882	3786	186,196	2.3664
70	64,992	773,535	11.0355	265	5,494	0.0784	4838	170,930	2.4386
75	52,522	476,948	8.1248	269	3,982	0.0678	5912	145,954	2.4863
80	37,532	244,482	5.4433	243	2,575	0.0573	7139	119,906	2.6697
85	21,988	88,975	3.0383	197	1,368	0.0467	7100	90,602	3.0938
90	9,616	20,490	1.3542	117	568	0.0376	5398	49,767	3.2891

l, total population at selected ages; T, total cohort person-years lived beyond these ages; e, life expectancy.

Database development for HLE

- Further investment in the collection of longitudinal data involving SES and health (self-reported and performance based) from population based sample
  - Japan: JPAHEAD, Nihon University study; community based epidemiological studies (e.g. Kusatsu; TMIG/LISA)
  - Taiwan: Longitudinal study of health and aging; SABET…
  - China: CHARLS and SAGE
- Supplemented by data at the community and provincial levels
  - US/HRS; SAGE; JPAHEAD
- Supplemented by data derived from chronic disease registries
  - E.g. Tianjin CDC; Shanghai CDC
- Medical care claims database (Japan, Taiwan)
- Long-term care claims (Japan)

Summary

- East Asia is distinct in the path of development.
- Major advancement has been made in research on HLE in East Asia .
- Future directions
  - Dynamics in morbidity. disability, and mortality
  - Elaboration of effects of SES
  - Performance based measures in HLE
  - HLE and health policy
  - Database development for HLE

Thank you for your attention

Questions and comments?