

Older people are living longer than before, but are they living healthier?

Trajectories of Frailty among Chinese Older People in Hong Kong between 2001 and 2012:
An Age-period-cohort Analysis

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HK topped the charts for longevity (2016)

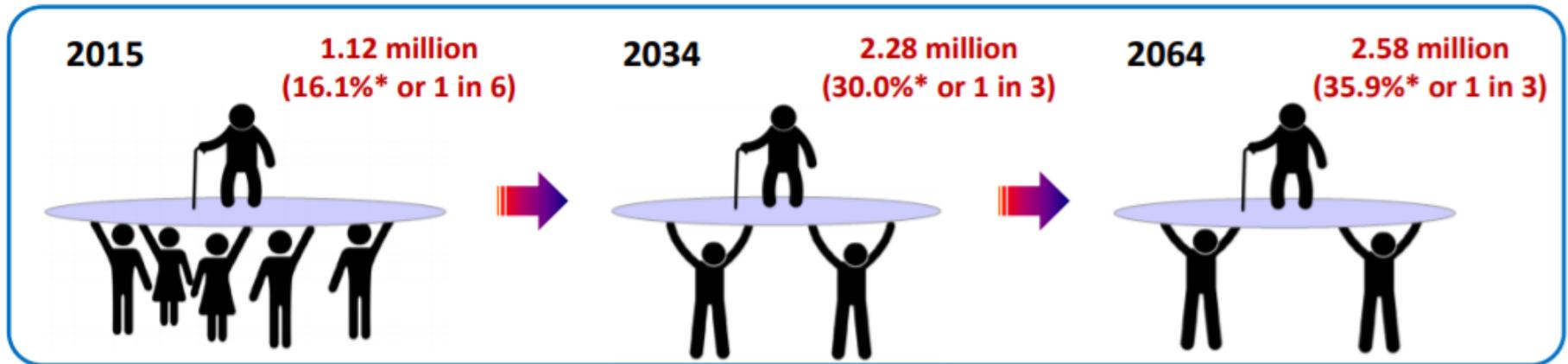
Rank	Country/State/Territory	Year of reporting	Life expectancy at birth (years)	
			Male	Female
1	Hong Kong	2016	81.32	87.34
2	Japan	2016	80.98	87.14
3	Cyprus	2014	80.9	84.7
4	Switzerland	2015	80.7	84.9
5	Iceland	2016	80.7	83.7
6	Norway	2016	80.61	84.17
7	Singapore	2016	80.6	85.1
8	Sweden	2016	80.56	84.09
9	Australia	2013 - 2015	80.4	84.5
10	Israel	2014	80.3	84.1

(Source: Ministry of Health, Labour and Welfare, <http://www.mhlw.go.jp/english/database/db-hw/lifetb14/dl/lifetb14-03.pdf>)

Why are people living longer?

- Improved medical treatments and technology in beating diseases like cancer
- Low smoking rates
- Falls in fertility

One in three in HK will be aged 65+ (2034)



Note: (*) The figures represent the proportions of elderly people in total population.
Data source: Census and Statistics Department.

(Source: Research Office, Legislative Council Secretariat,
<http://www.legco.gov.hk/research-publications/english/1516rb01-challenges-of-population-ageing-20151215-e.pdf>)

Is the ageing population a burden or an opportunity?

Burden?

- Higher levels of disease
- A decline in capability and independence
- Increased medical expenses and demands for health and social care services
- Challenged pension systems and welfare models

Opportunity?

- Well educated
- Workforce participation
- Opportunities for sharing wisdom, life experience and knowledge
- Working as carers and volunteers



A burden or an opportunity?

The key is health

Burden?

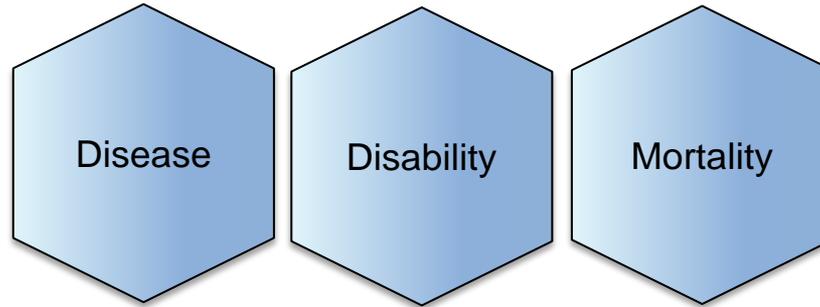
- If the added years are dominated by **declines in physical and mental capacities**, the implications for older people and for society may be negative (e.g., increased medical expenses and demands for health and social care services, increased pension fund and welfare spending)

Opportunity?

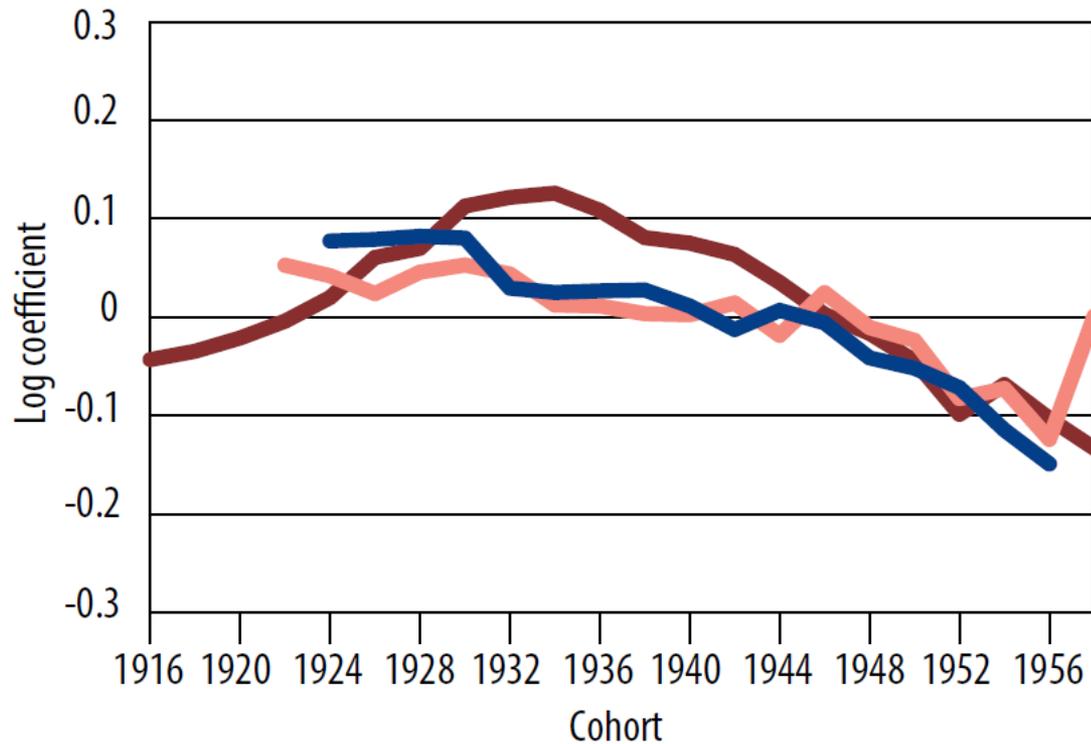
- If the added years are lived in **good health**, population ageing will be associated with a growing human resource that might be expected to contribute to society (e.g., longer working life, opportunities for sharing wisdom, life experience and knowledge, working as carers and volunteers)

Older people are living longer than before, but are they living healthier?

Traditional ways to address health status in older age



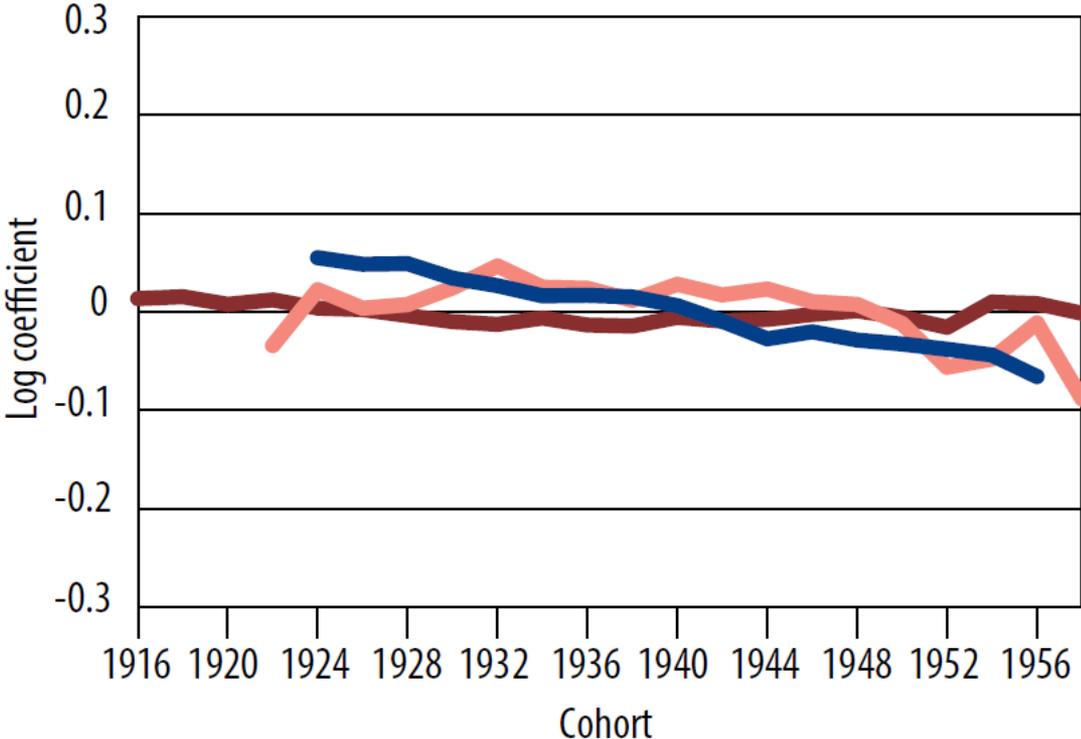
Prevalence of limitations in activities of daily living by year of birth, 1916–1958 (after controlling for age and period)



- Survey of Health, Ageing and Retirement in Europe
- Health and Retirement Study
- English Longitudinal Study of Ageing

(Source: WHO 2015 World Report on Ageing and Health)

Prevalence of limitations in instrumental activities of daily living by year of birth, 1916–1958 (after controlling for age and period)

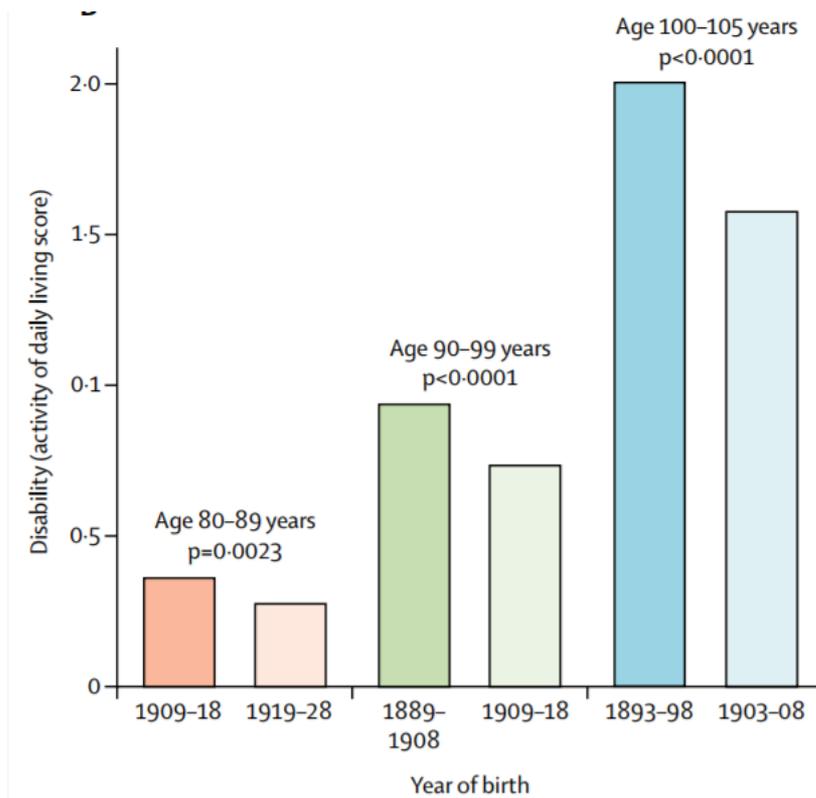


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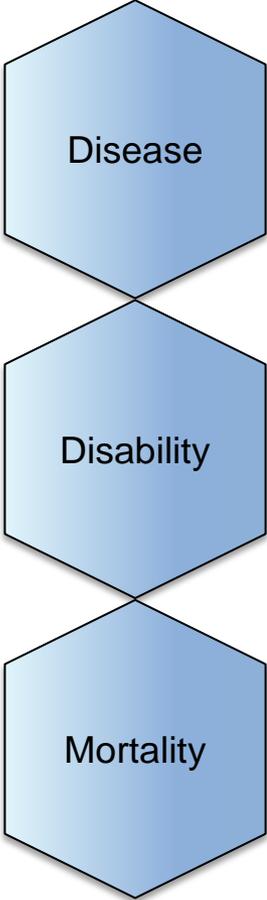
(Source: WHO 2015 World Report on Ageing and Health)

The Chinese Longitudinal Healthy Longevity Study

Disability in activities of daily living compared within three pairs 1998-2008 (N = 19,528)



Limitations of traditional measurements



Disease

Many individuals may have one or more health conditions that are well controlled and have little influence on their ability to function

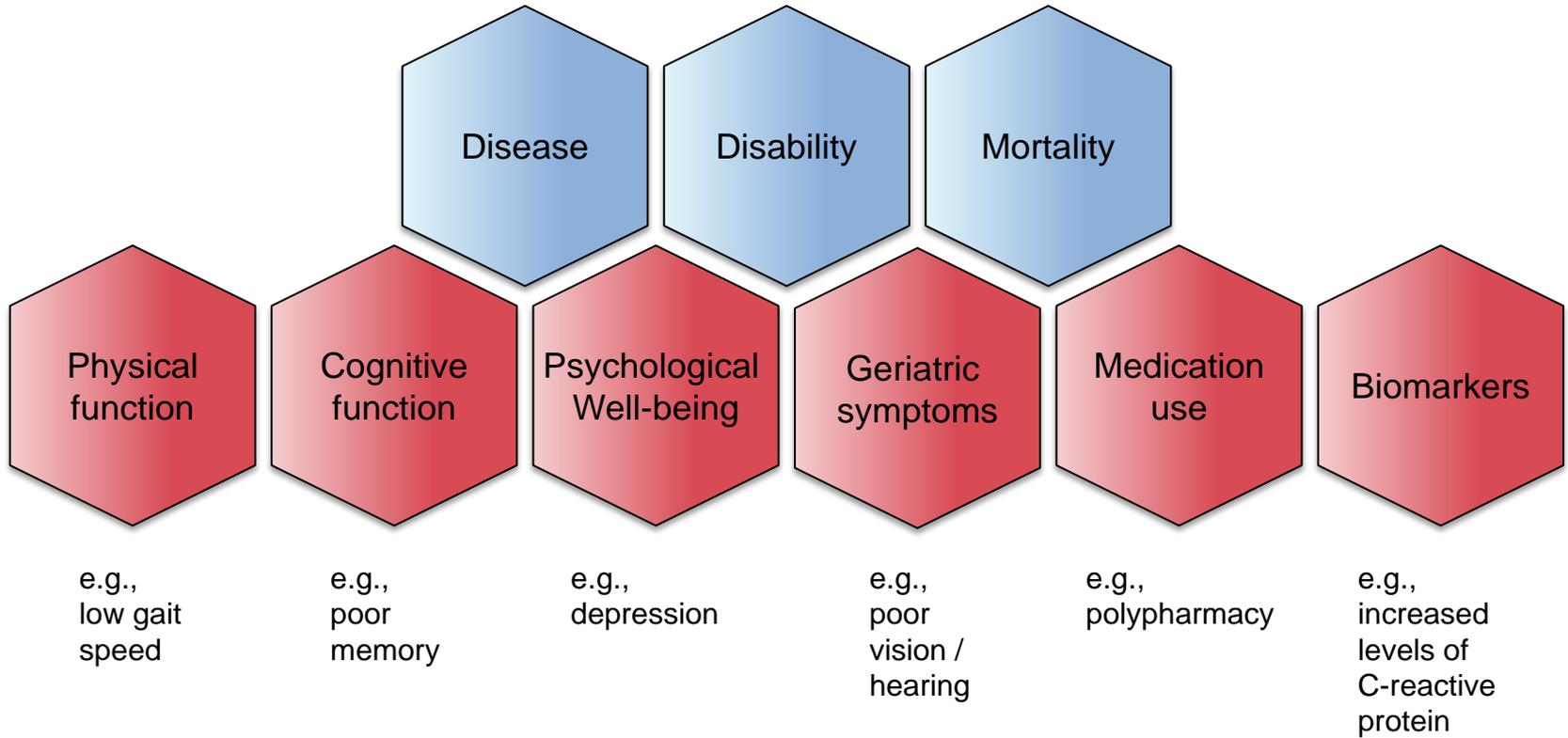
Disability

Disability as measured by self-reported activities of daily living depends not only on health status, but also on facilities to assist such activities

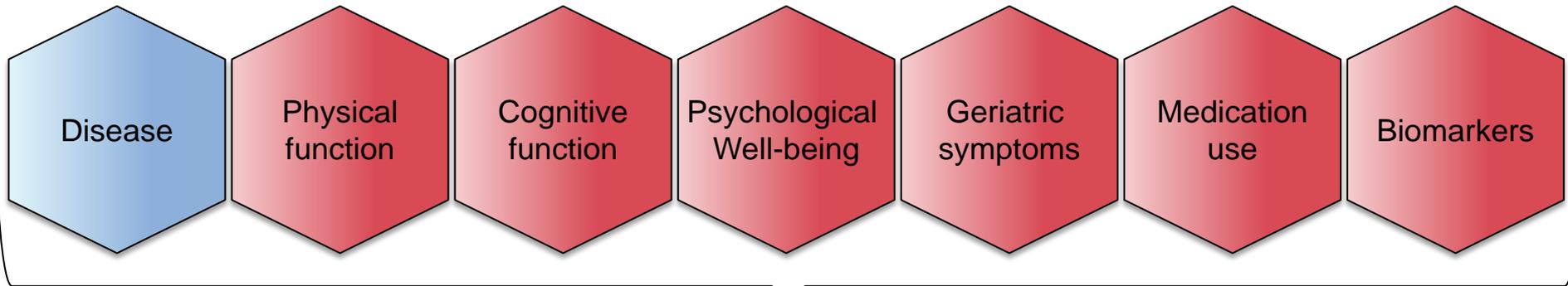
Mortality

Death rates do not capture non-fatal health outcomes

Any other measures of health status?



Any new models to drive public health responses in older age?



What is frailty?

A multi-dimensional syndrome of loss of reserves that give rise to vulnerability

How to measure frailty?

Clinical phenotype model

- CHS Frailty phenotype
 - Slow mobility
 - Weakness
 - Weight loss
 - Decreased activities
 - Exhaustion
 - Individuals with two deficits are considered pre-frail, and those with three or more are considered frail

Fried et al., 2001;56 J Gerontol A Biol Sci Med Sci (3):M146-56

Multiple deficit model

- Frailty Index
 - The deficits present in an individual as a proportion of all potential deficits across multiple domains
 - 30 or more deficits are considered
 - An included deficit can be any symptom, sign, disease, disability, or abnormality associated with age and adverse outcomes

Mitnitski et al., Scientific World J 2001;1:323-326.

Searle et al., BMC Geriatr 2008;8:24.

Frailty concept: Is there clinical and public health utility?

Clinical perspective

- Frailty is crucial because it constitutes a condition of greater risk of adverse health outcomes, such as falls, hospitalization, disability and death

Societal perspective

- Frailty is important because it identifies groups of people in need of extra medical attention and at risk of high dependency

Financial care planning

- Frailty is also on concern when considering financial health care planning to better select management and prevention programs

Trajectories of frailty among Chinese older people in Hong Kong between 2001 and 2012: an age-period-cohort analysis

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RUBY LEE⁴, JEAN WOO¹

Data

18 EHCs of the Department of Health (2001-2012)

Sample

All residents of Hong Kong aged 65 years and older

Assessments

Standard medical examinations at baseline and subsequent years



Older people are living longer than before, but are they living healthier?

Posted on 17/11/2017 by BGS

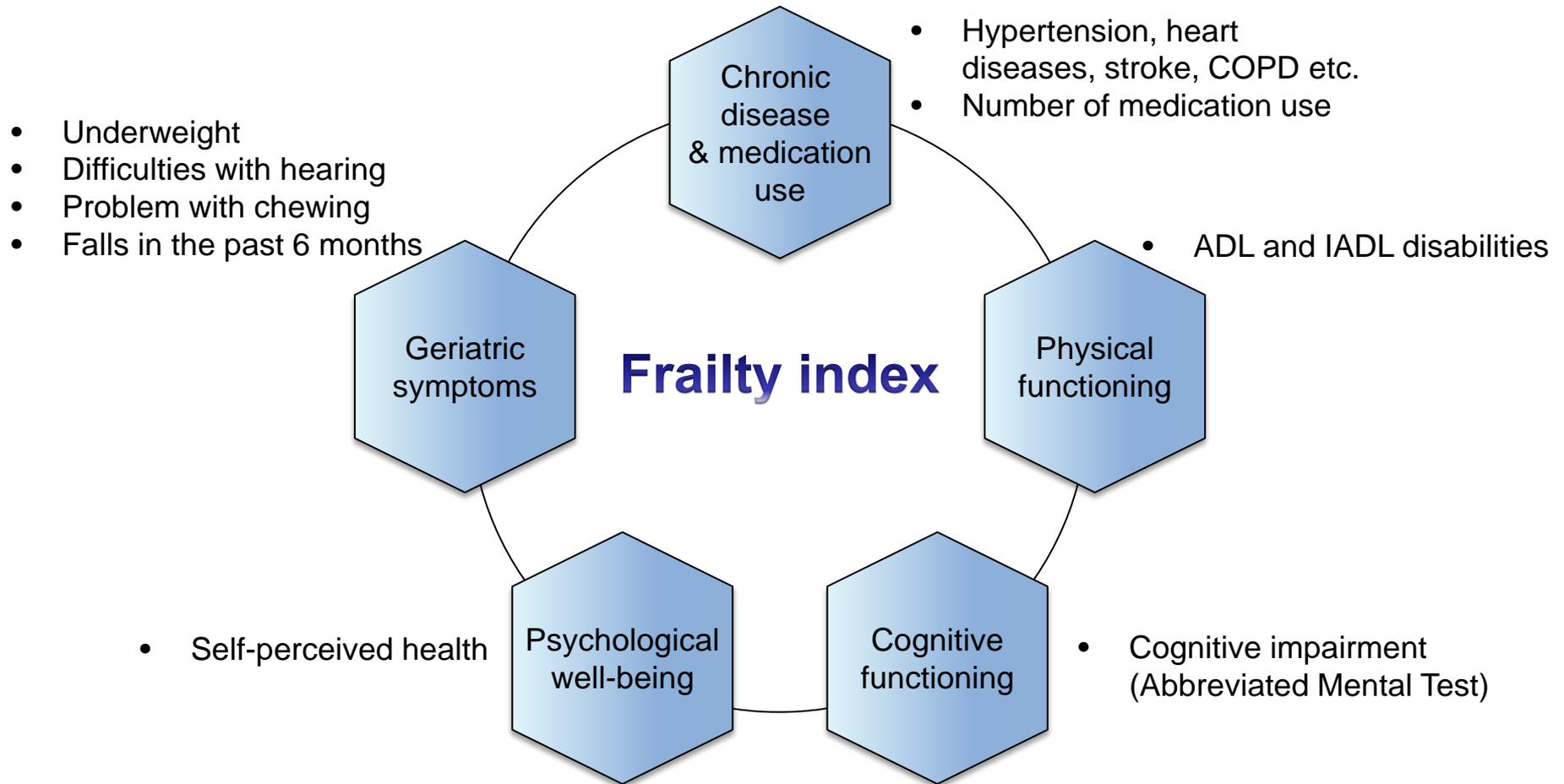
Ruby Yu is a research assistant at the Chinese University of Hong Kong (CUHK), specialising in gerontology and geriatrics. She is also a research fellow at the CUHK Jockey Club Institute of Ageing. Her recent paper [Trajectories of frailty among Chinese older people in Hong Kong between 2001 and 2012: An Age-period-cohort Analysis](#) was published today in *Age and Ageing* journal.

There is no doubt that people from countries all over the world are living longer, but there is little evidence to suggest that older people today are living healthier than their predecessors did at the same age. This is a major cause of concern for many governments around the world because if the added years of people today are dominated by chronic diseases and functional disabilities, there will be negative implications (e.g., extended treatment for older people which increases the health and social care cost to society).

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Construction of the frailty index



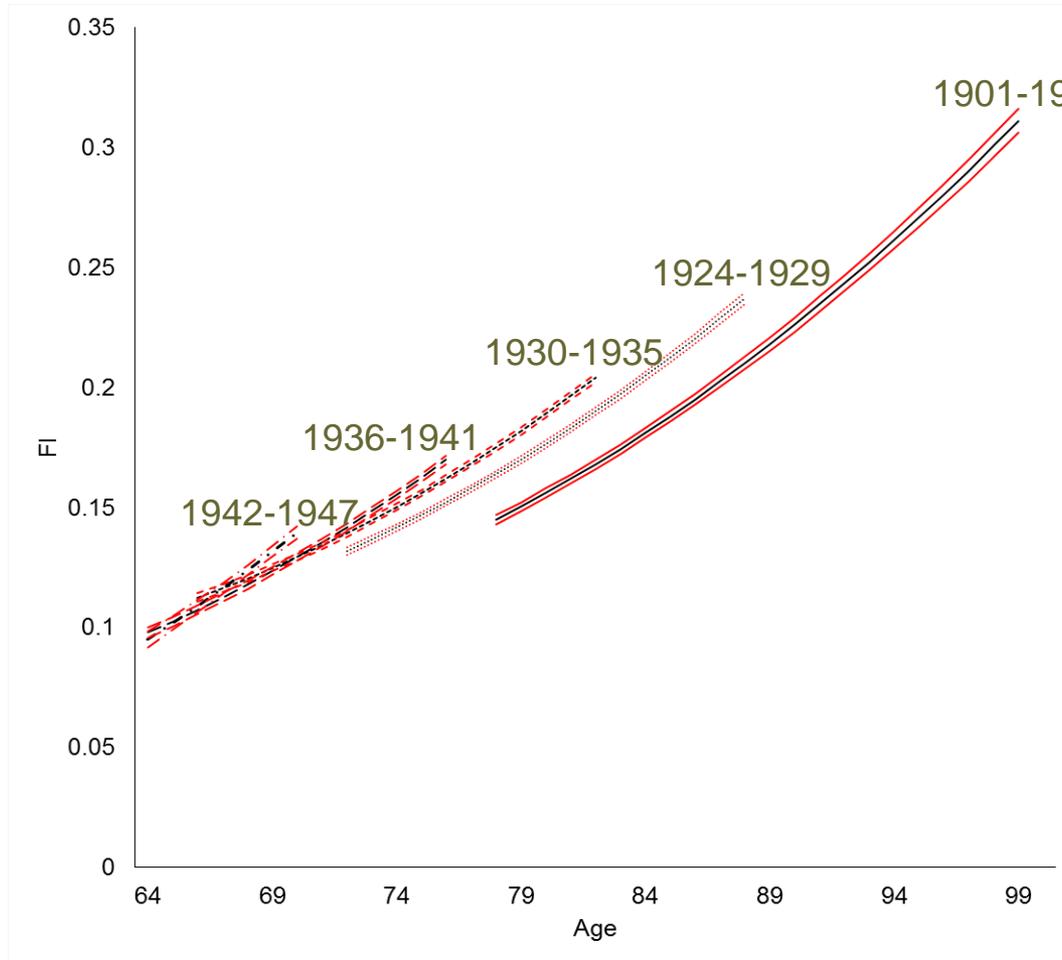
Descriptive statistics of the study sample

Variables	All birth cohorts (N = 94550)
Frailty index	0.14 ± 0.07
Age, years	72 ± 5.0
Female, %	64.3%
Married, %	64.4%
Secondary or above, %	26.2%
Unemployed or retired, %	95.2%
Recipient of social assistance, %	12.1%
Daily smoker, %	6.7%

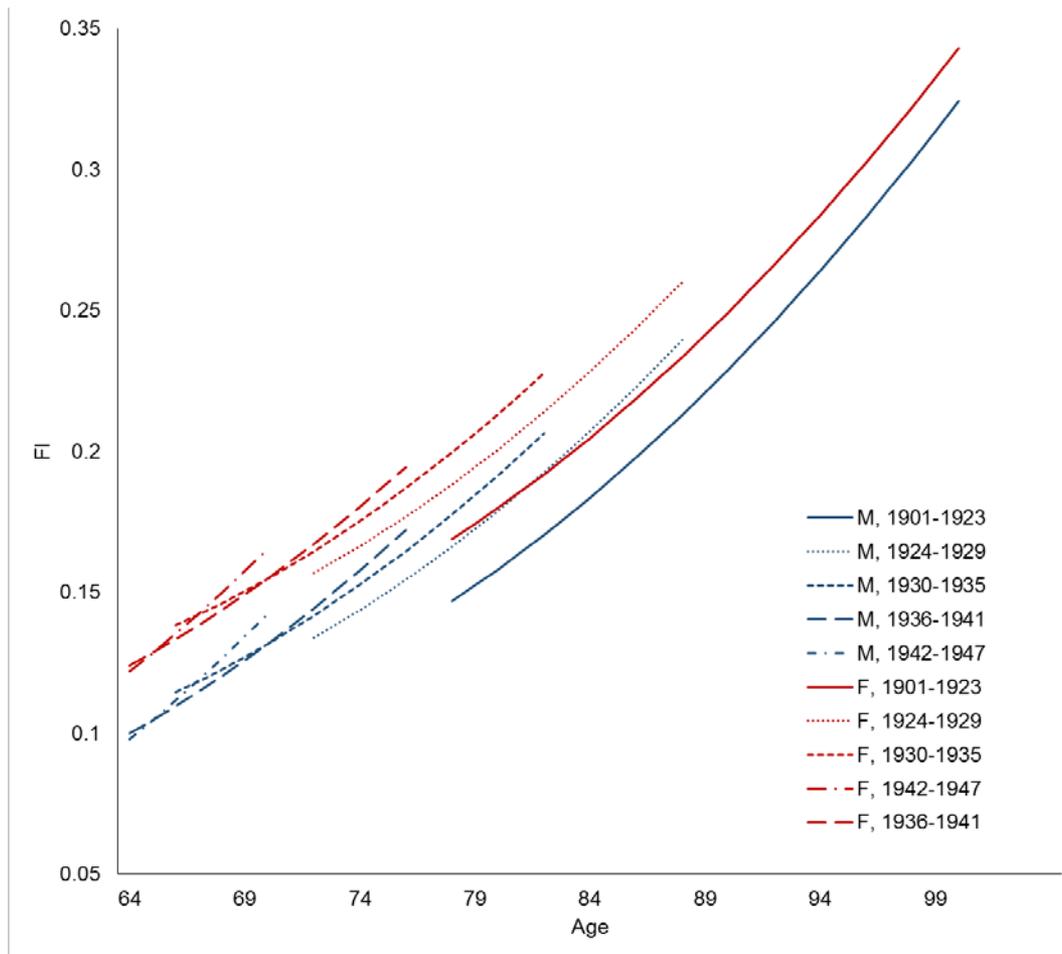
Descriptive statistics of the study sample

Birth cohorts	Number (%)
1901 – 1923	9783
1924 – 1929	20561
1930 – 1935	34646
1936 – 1941	20316
1942 – 1947	9244

More recent cohorts had higher levels of frailty than did earlier cohorts at the same age



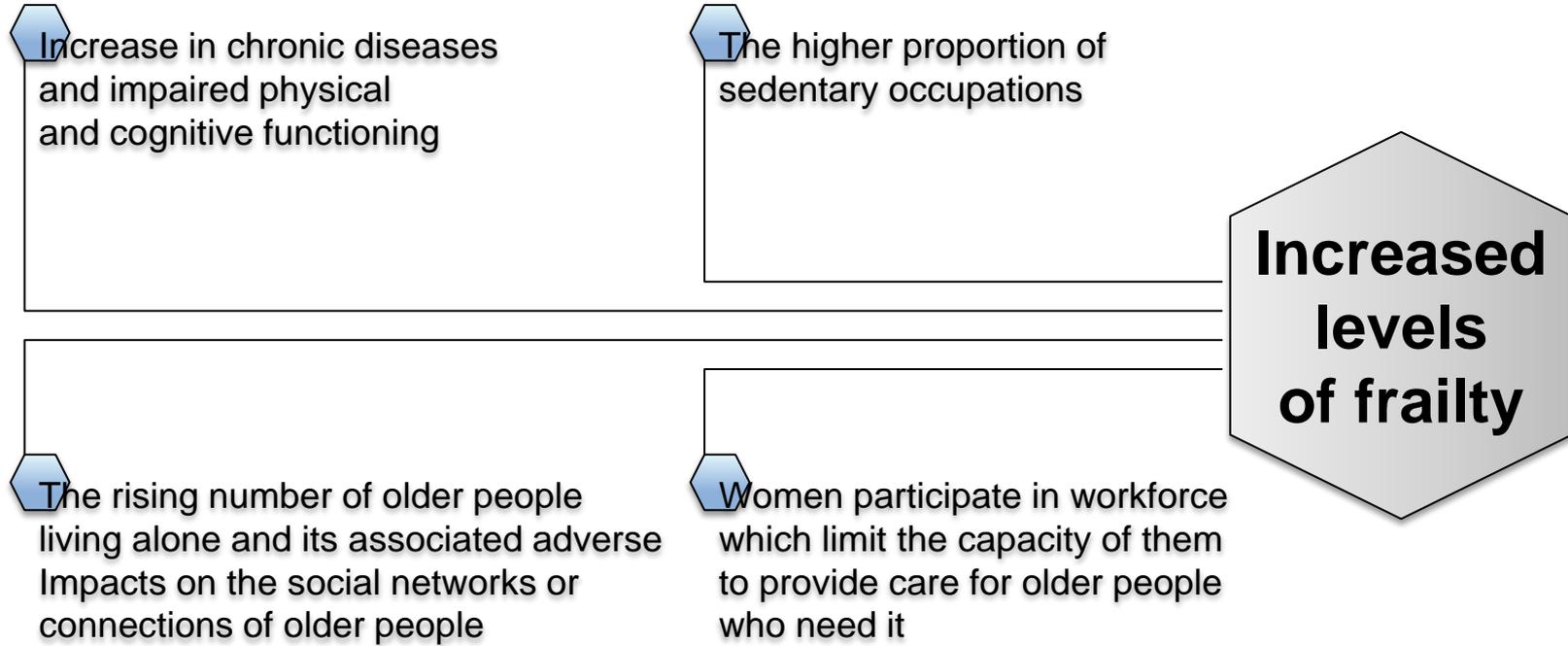
At the same age, recent cohorts were at a higher risk of having an increased FI that did earlier cohorts in both men and women



Older age, being female, widowhood, lower education and smoking were associated with higher levels of frailty

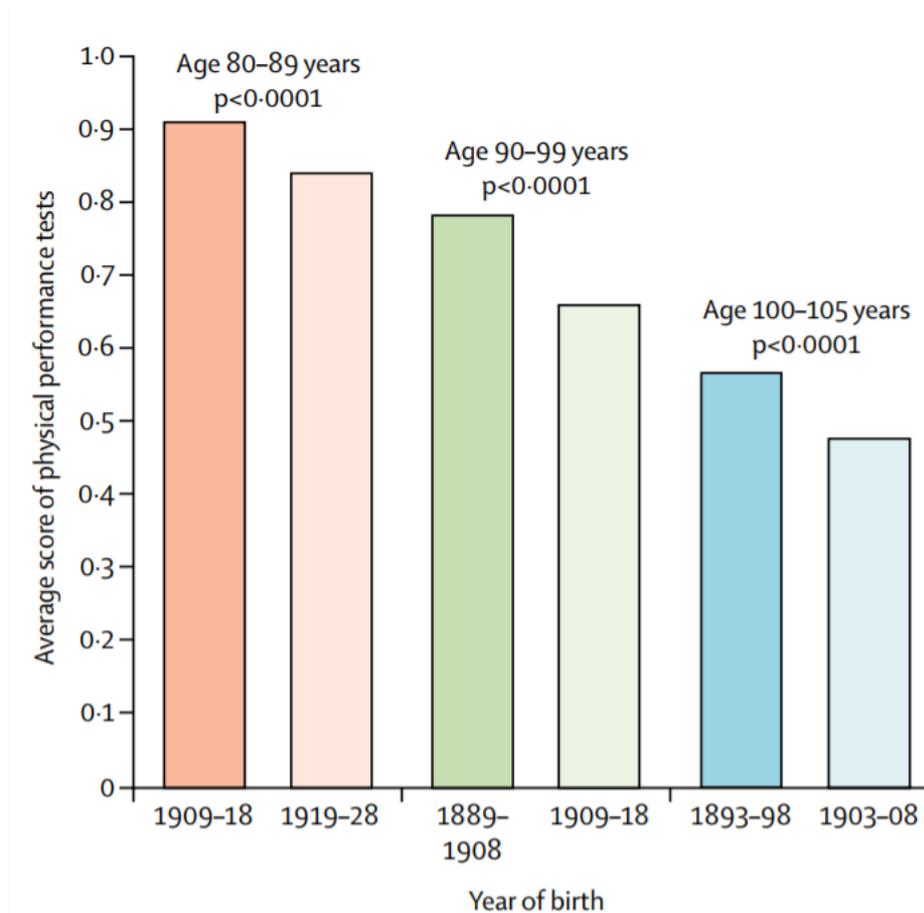
Variable	OR (95% CI)
Marital status (Reference: Married)	
Never married	-0.0005 (-0.0027, 0.0017)
Widowed, separated, divorced	0.0015 (0.0009, 0.0022)
Educational level (Reference: no education)	
Primary	-0.0012 (-0.0018, -0.0006)
Secondary or above	-0.0029 (-0.0038, -0.0021)
Working full-time or part-time	-0.0051 (-0.0062, -0.0039)
Living in private housing	-0.0005 (-0.0010, 0.0001)
Recipient of social assistance	0.0082 (0.0074, 0.0091)
Smoker	0.0036 (0.0027, 0.0045)
Drinker	-0.0022 (-0.0033, -0.0010)
Regular exercise	-0.0047 (-0.0054, -0.0040)
Participation in social activities	-0.0023 (-0.0027, -0.0019)

Why are our older people today frailer?



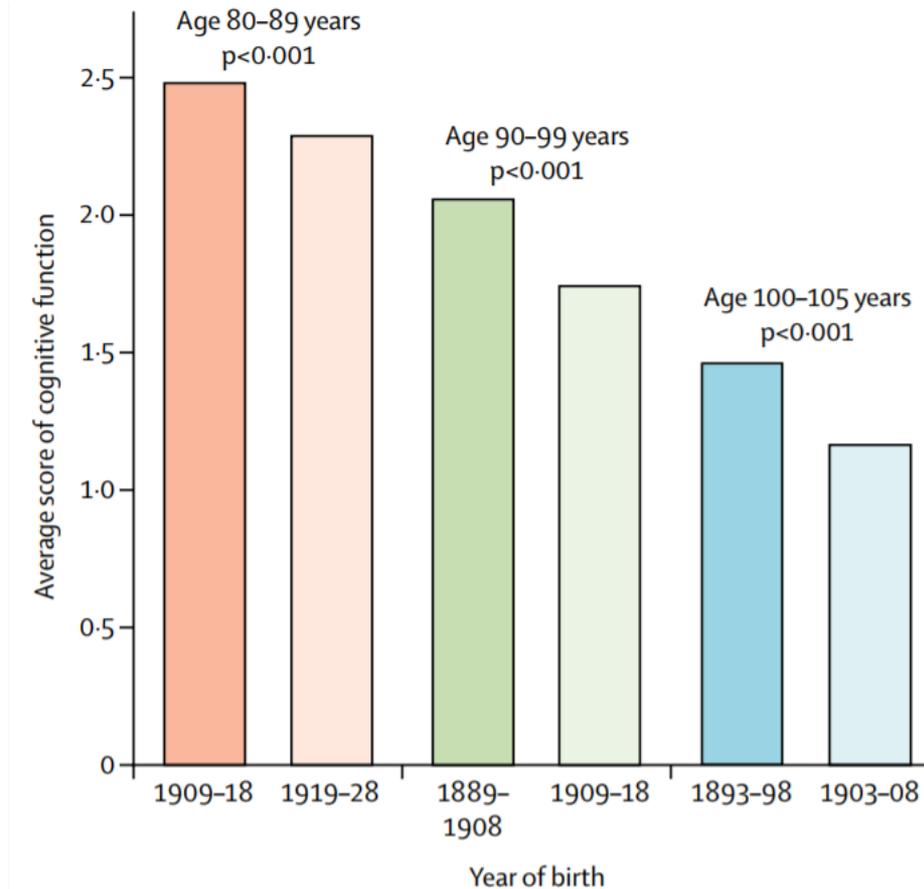
The Chinese Longitudinal Healthy Longevity Study

Physical performances were significantly worsened in the later cohorts compared with the earlier cohorts (N = 19,528)



The Chinese Longitudinal Healthy Longevity Study

Cognitive function was significantly worsened in the later cohorts compared with the earlier cohorts (N = 19,528)



The Cognitive Function and Ageing Studies (CFAS)

There were significant increases in years lived from age 65 years with dependency between 1991 and 2011 (CFAS I, N = 7,635; CFAS II N = 7,796)

	1991	2011	Difference
Men			
Life expectancy	12.9	17.6	4.7
Independent	9.5 (9.3 to 9.7)	11.2 (10.8–11.5)	1.7 (1.2 to 2.1)
Low dependency	2.3 (1.9 to 2.7)	4.0 (3.5–4.5)	1.7 (1.0 to 2.4) ↑
Medium dependency	0.7 (0.3 to 1.2)	1.1 (0.5–1.7)	0.3 (–0.4 to 1.1)
High dependency	0.4 (–0.1 to 0.8)	1.3 (0.7–1.9)	0.9 (0.2 to 1.7) ↑
Proportion of life expectancy spent			
Independent	73.6% (71.8 to 75.4)	63.5% (61.4–65.6)	–10.1% (–12.9 to –7.3)
Low dependency	17.8% (14.5 to 22.2)	22.9% (19.9–25.8)	5.1% (0.6 to 9.5)
Medium dependency	5.8% (2.2 to 9.3)	6.2% (2.9–9.5)	0.4% (–4.4 to 5.2)
High dependency	2.9% (–0.7 to 6.5)	7.4% (4.2–10.7)	4.5% (–0.4 to 9.3)
Women			
Life expectancy	16.5	20.6	4.1
Independent	9.5 (9.2 to 9.8)	9.7 (9.3–10.2)	0.2 (–0.4 to 0.7)
Low dependency	5.3 (4.9 to 5.7)	7.8 (7.3–8.3)	2.4 (1.8 to 3.1) ↑
Medium dependency	1.0 (0.5 to 1.5)	1.1 (0.5–1.8)	0.2 (–0.6 to 1.0)
High dependency	0.6 (0.1 to 1.1)	1.9 (1.3–2.6)	1.3 (0.5 to 2.1) ↑
Proportion of life expectancy spent			
Independent	58.0% (56.2 to 59.9)	47.3% (45.0–49.5)	–10.7% (–13.6 to –7.8)
Low dependency	32.4% (29.9 to 34.9)	37.8% (35.3–40.2)	5.4% (1.9 to 8.9)
Medium dependency	5.9% (3.0 to 8.8)	5.6% (2.6–8.6)	–0.4% (–4.5 to 3.8)
High dependency	3.7% (0.8 to 6.7)	9.3% (6.3–12.4)	5.6% (1.4 to 9.8)
Data are years (95% CI), unless specified.			
Table 2: Life expectancy and years spent in different states of dependency at age 65 years in 1991 and 2011, and differences between 1991 and 2011			

Limitations and strengths

Limitations

- The earliest and latest cohorts did not capture a full age distribution
- Information on risk factors in early- and midlife that may affect frailty at older ages was not available
- Study participation was voluntary which could result in selection bias
- The design of the study is subject to survival bias

Strengths

- This study include the large sample size
- The FI obtained using the described methods were in line with age-specific/overall FI obtained in other studies
- The adjustment of multiple potential confounders

Summary of key findings

- More recent cohorts had higher levels of frailty than did earlier cohorts at the same age
- Difference was also observed in both men and women
- The cohort effects are independent of age, period, gender, marital status, education level, demographics, socioeconomic status, lifestyle and social factors
- Older age, being female, widowhood, lower education and smoking were associated with higher levels of frailty

Implications

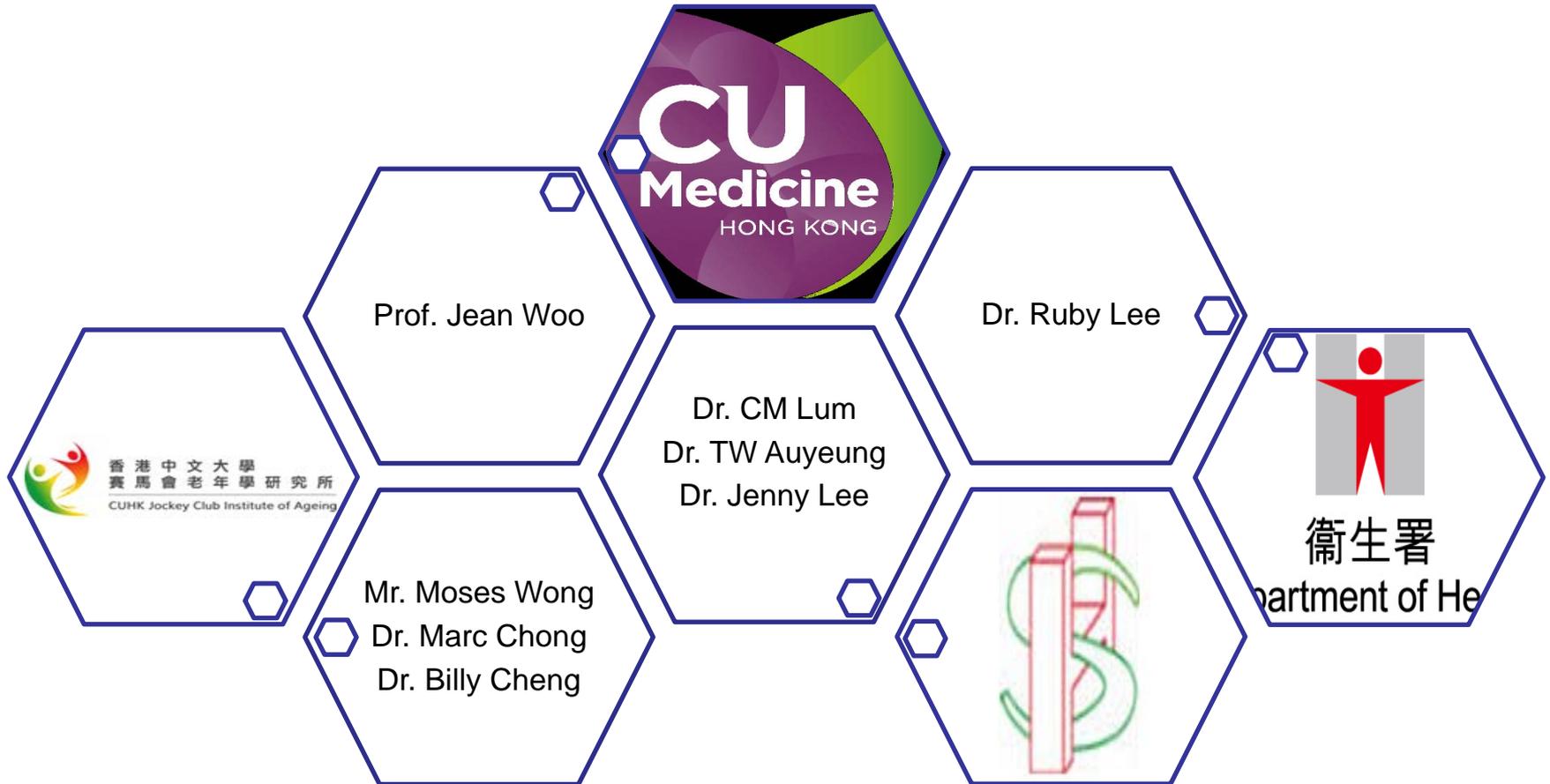
- The health of older people is not keeping up with increasing longevity, as reflected by the concurrent increases in levels of frailty
- The increases in levels of frailty will bring additional costs for medical care, social services and long-term care

Current public health approaches to population ageing may be ineffective

Urgent planning and action is required

- Frailty interventions, coupled with early detection, should be incorporated into primary care to combat the increasing rates of frailty
- In hospital and residential care settings, frailty assessment provides a quick guide to individualizing management strategies for various disease states
- Comprehensive Geriatric Assessment (CGA) is the cornerstone of looking after the older adult. Medical specialties should adopt a holistic approach to care of their older patients
- Supportive environment (e.g., well-designed living condition, walkable neighborhoods, neighborhoods with more green space) is needed

Acknowledgments





Thank you

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