

# Exercise for healthy body and healthy mind

**Terry YS Lum**

Department of Social Work and Social Administration, HKU  
Sau Po Centre on Ageing, HKU

Jun 15, 2015



香港大學

THE UNIVERSITY OF HONG KONG



香港大學秀圃老年研究中心  
Sau Po Centre on Ageing  
The University of Hong Kong

Life expectancy at birth, to

data.worldbank.org/indicator/SP.DYN.LE00.IN?order=wbapi\_data\_value\_2014+wbapi\_data\_value+wbapi\_data\_value-last&sort=desc

Check out the new World Bank Data site at <http://beta.data.worldbank.org> - we'd love your feedback.

Catalog Sources World Development Indicators

View in WDI Tables

TABLE MAP GRAPH METADATA

Search all indicators

Go

Featured indicators

Health

Adolescent fertility rate (births per 1,000 women ages 15-19)

Birth rate, crude (per 1,000 people)

Births attended by skilled health staff (% of total)

Cause of death, by communicable diseases and maternal, prenatal and nutrition conditions (% of total)

Cause of death, by injury (% of total)

Cause of death, by non-

	1981-1985	1986-1990	1991-1995	1996-2000	2001-2005	2006-2010	2011-2015	
Country name								
Hong Kong SAR, China					2011	2012	2013	2014
Japan					83	83	83	84
Spain					82	82	83	83
Switzerland					83	83	83	83
Italy					82	82	83	83
Singapore					82	82	82	83
France					82	82	82	82
Liechtenstein					82	82	82	82
Australia					82	82	82	82
Luxembourg					81	81	82	82
Korea, Rep.					81	81	82	82
Israel					82	82	82	82
Iceland					82	83	82	82
Canada					81	82	82	82
Sweden					82	82	82	82

Longest life expectancy in the world

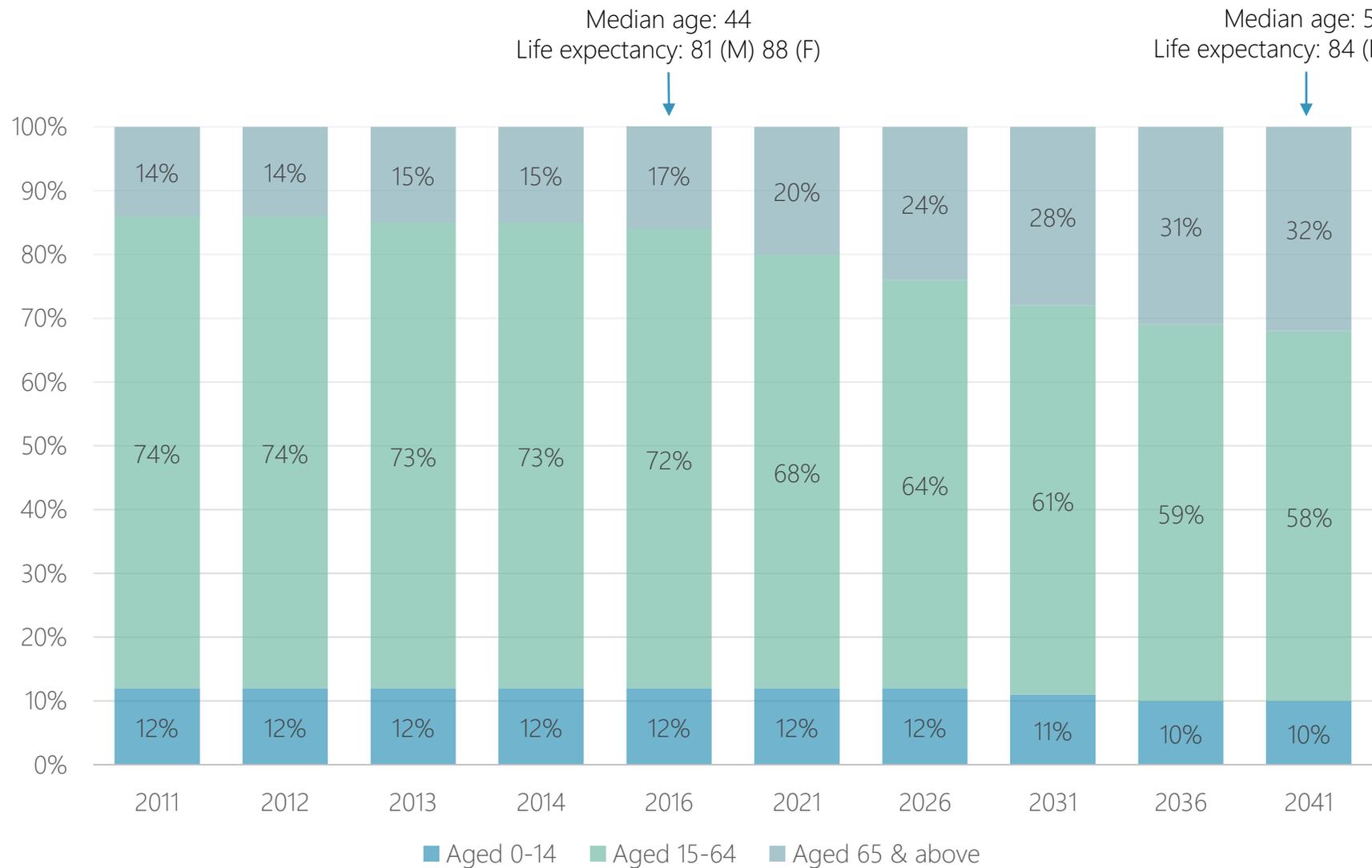
Help/Feedback

Search the web and Windows

6:34 AM 4/27/2016

Sources: the World Bank

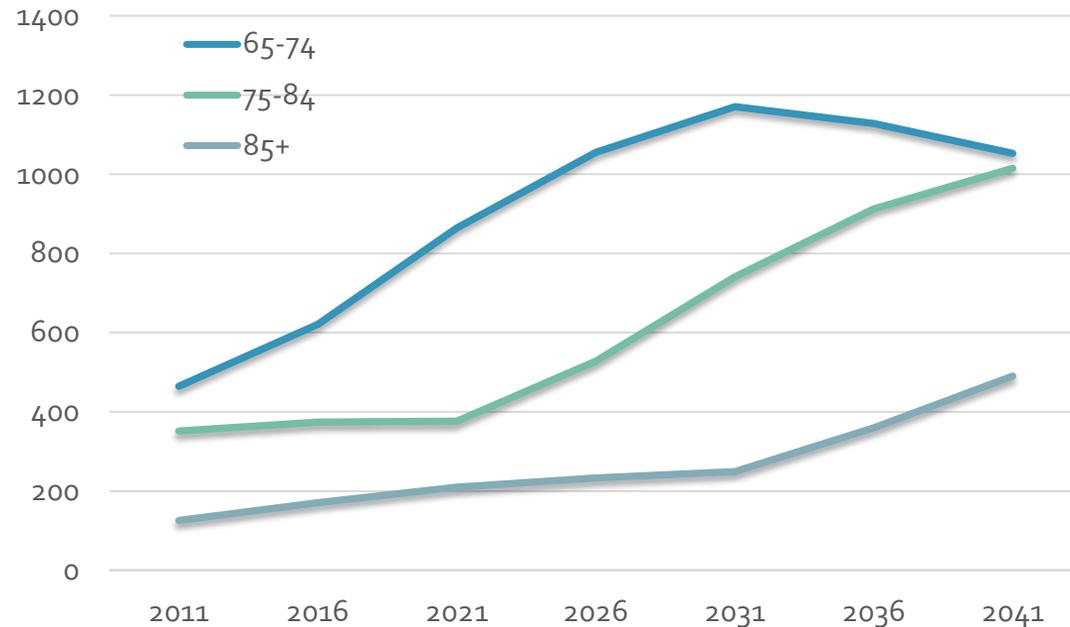
[http://data.worldbank.org/indicator/SP.DYN.LE00.IN?order=wbapi\\_data\\_value\\_2014+wbapi\\_data\\_value+wbapi\\_data\\_value-last&sort=desc](http://data.worldbank.org/indicator/SP.DYN.LE00.IN?order=wbapi_data_value_2014+wbapi_data_value+wbapi_data_value-last&sort=desc)



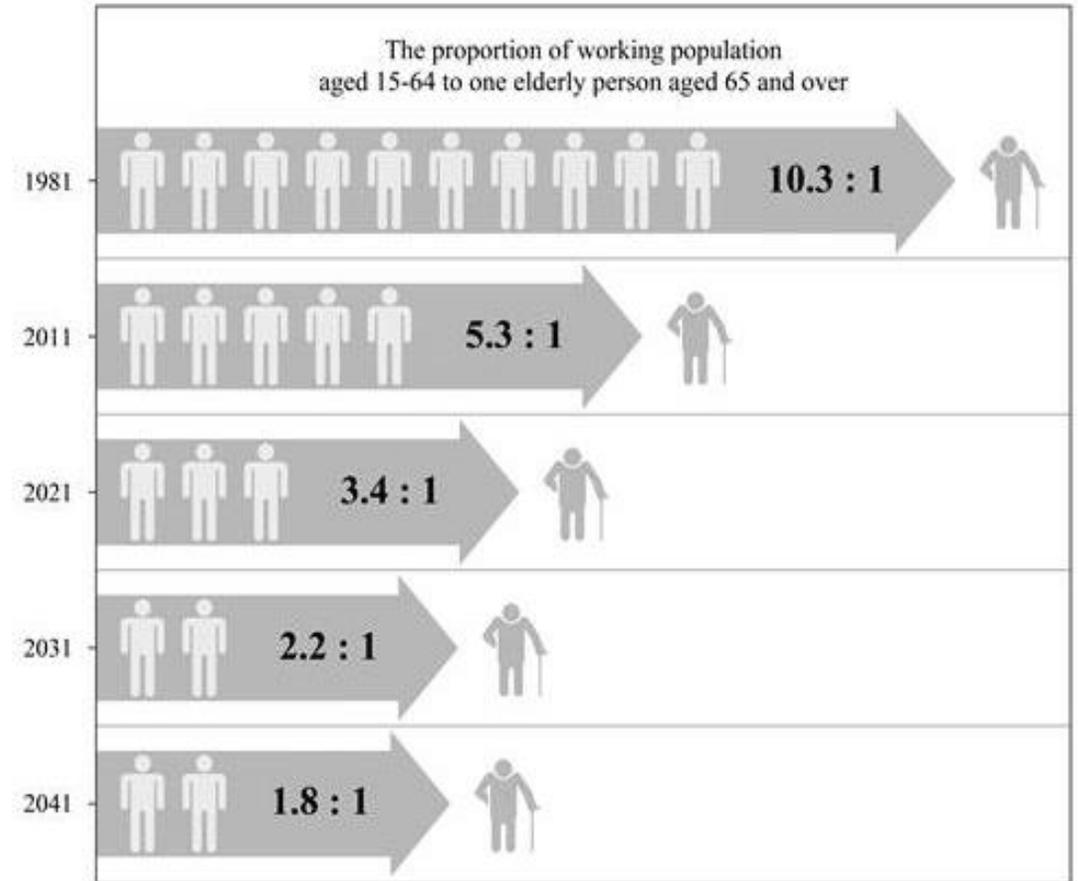
Older Adults  
will Make Up  
**1/3 of HK's  
Population  
by 2041**

Legislative Council  
Secretariat. (2015)  
Information Note:  
Population Profile of Hong  
Kong. IN07/14-15.

# Demand & Supply of Eldercare in Hong Kong



- Demand side: ageing of the aged, high institutionalization rate (6.8%)
- Supply side: rapidly shrinking eldercare workforce (import of foreign domestic helpers)

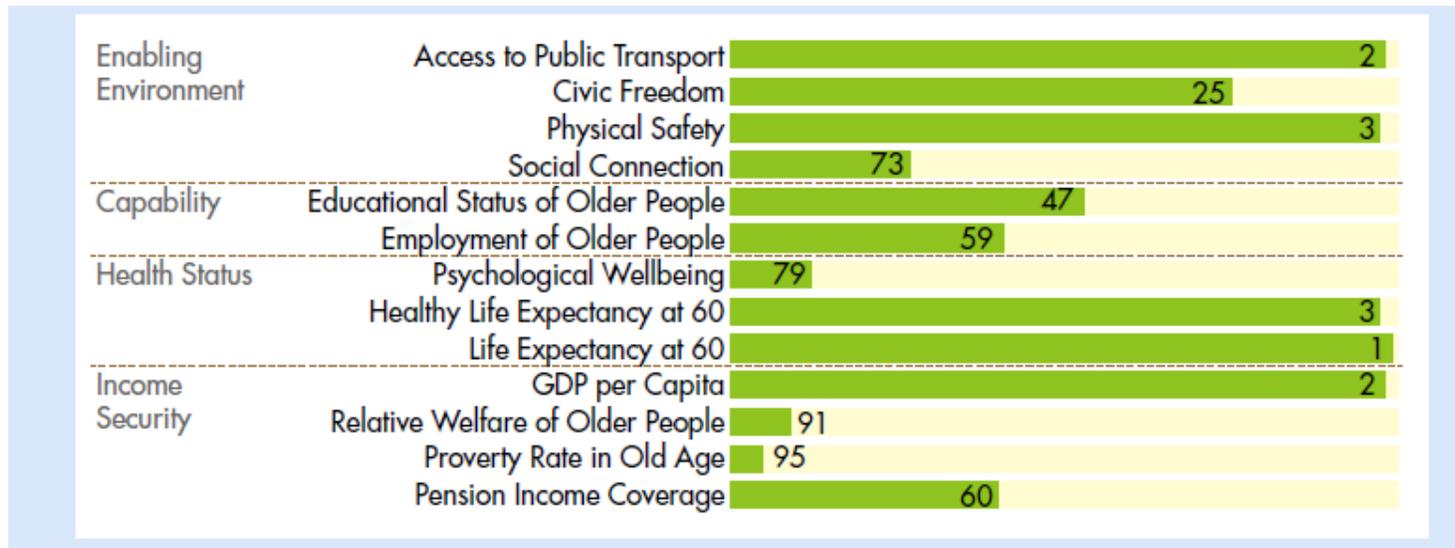


# Hong Kong's Ranking in Global AgeWatch Index 2014

Ranking	Country/Territory
1	Norway
2	Sweden
3	Switzerland
4	Canada
5	Germany
...	
22	Chile
23	Hungary
24	Hong Kong
25	Panama
26	Czech Republic
...	
93	Tanzania,United Republic of
94	Malawi
95	West Bank and Gaza
96	Mozambique
97	Afghanistan

Source: CUHK Jockey Club  
Institute of Ageing (2016)  
Report on AgeWatch Index of  
Hong Kong 2014

# Hong Kong's elders Ranked very low in psychological wellbeing



Source: CUHK Jockey Club Institute of Ageing (2016) Report on AgeWatch Index of Hong Kong 2014

# Frailty Screening

1. Fatigue
2. Resistance
3. Ambulation
4. Illnesses
5. Weight Loss

---

Fatigue: “How much of the time during the past 4 weeks did you feel tired?” 1 = All of the time, 2 = Most of the time, 3 = Some of the time, 4 = A little of the time, 5 = None of the time. Responses of “1” or “2” are scored as 1 and all others as 0. Baseline prevalence = 20.1%.

Resistance: “By yourself and not using aids, do you have any difficulty walking up 10 steps without resting?” 1 = Yes, 0 = No. Baseline prevalence = 25.5%.

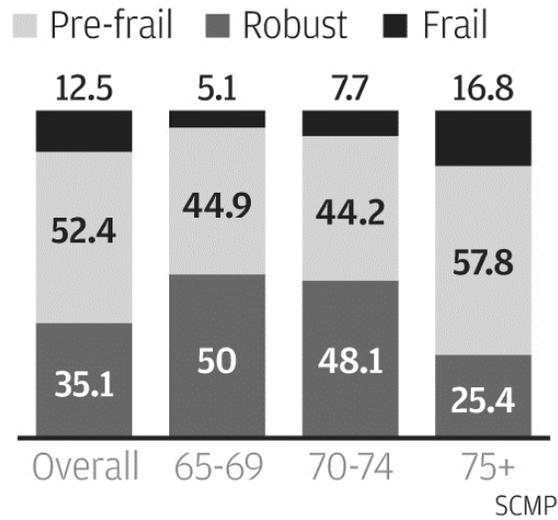
Ambulation: By yourself and not using aids, do you have any difficulty walking several hundred yards?” 1 = Yes, 0 = No. Baseline prevalence = 27.7%.

Illnesses: For 11 illnesses, participants are asked, “Did a doctor ever tell you that you have [illness]?” 1 = Yes, 0 = No. The total illnesses (0-11) are recoded as 0-4 = 0 and 5-11 = 1. The illnesses include hypertension, diabetes, cancer (other than a minor skin cancer), chronic lung disease, heart attack, congestive heart failure, angina, asthma, arthritis, stroke, and kidney disease. Baseline prevalence = 2.1%.

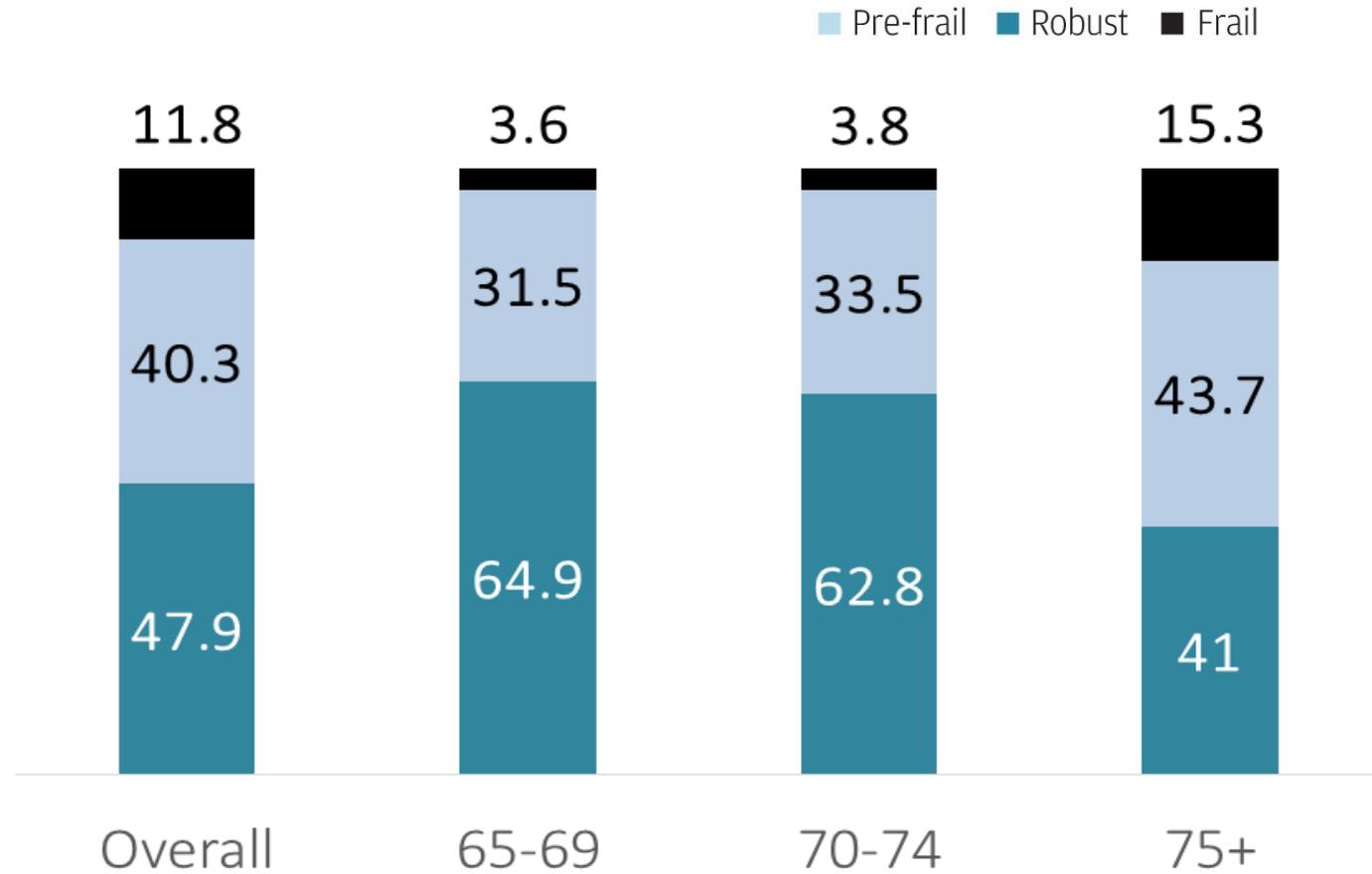
Loss of weight: “How much do you weigh with your clothes on but without shoes? [current weight]” “One year ago in (MO, YR), how much did you weigh without your shoes and with your clothes on? [weight 1 year ago]” Percent weight change is computed as:  $[(\text{weight 1 year ago} - \text{current weight}) / \text{weight 1 year ago}] * 100$ . Percent change > 5 (representing a 5% loss of weight) is scored as 1 and < 5 as 0. Baseline prevalence = 21.0%.

---

# Frailty in Hong Kong



Cadenza Hub 2015 (n=816)



Lum & Wong, unpublished data (n=1,892)

# Frailty & Ageing-in-Place Intention

## Frailty status and current ageing-in-place intention

Considering moving into elderly home	Frailty status		
	Robust	Pre-frail	Frail
No	91.5%	87.5%	77.6%
Yes	8.1%	12.5%	22.4%

$\chi^2=37.3$ ,  $p<0.001$

## Frailty status and ageing-in-place intention if health deteriorates

Considering moving into elderly home	Frailty status		
	Robust	Pre-frail	Frail
No	77.7%	71.1%	73.4%
Yes	22.3%	28.9%	26.6%

$\chi^2=9.3$ ,  $p=0.009$

# *The "Problem" of Population Ageing*



Old Age  
can be  
**Full of Life**

# Health in Old Age

▶ EVERY OLDER PERSON IS DIFFERENT



Some have the level of functioning of a 30 year old.

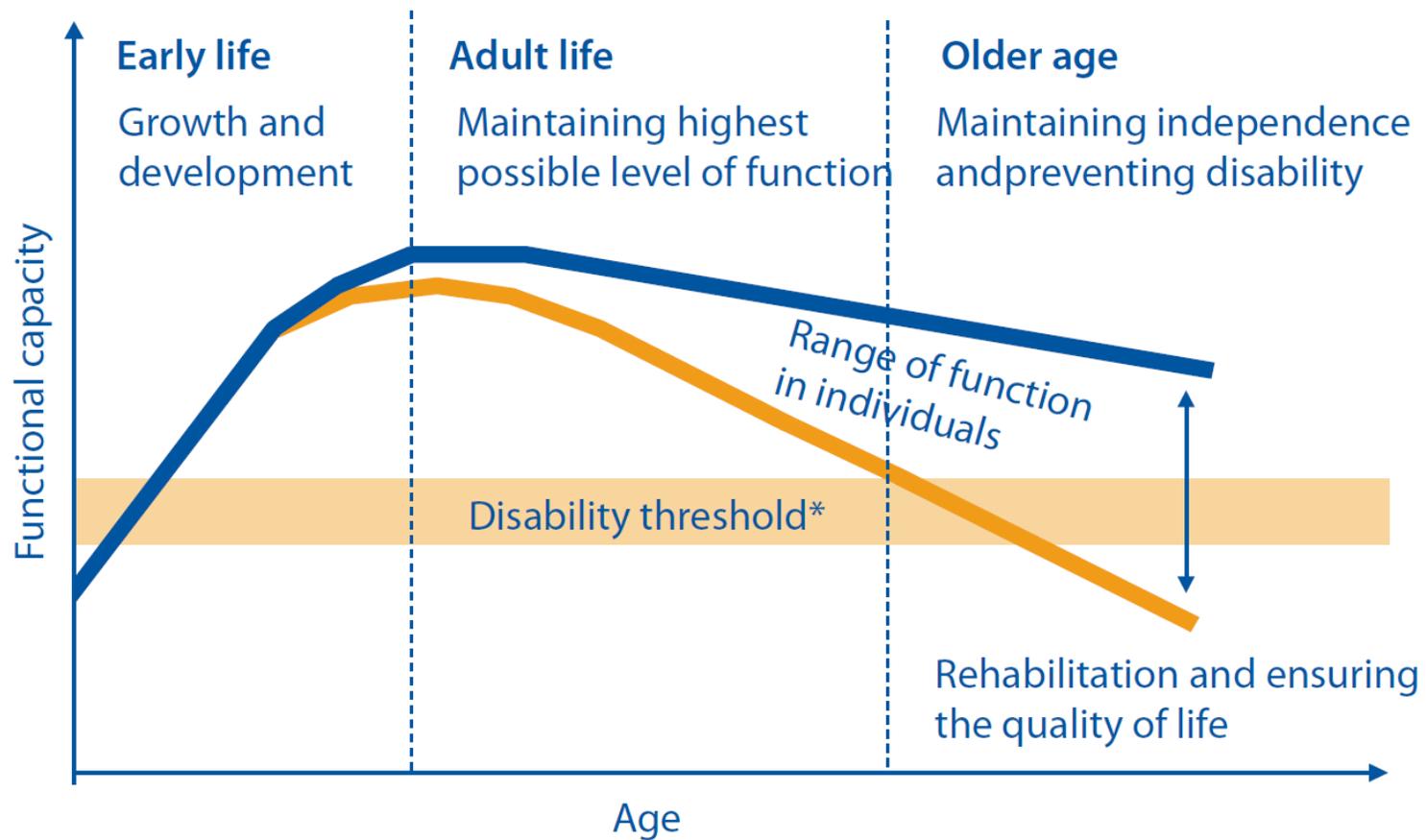


Some require full time assistance for basic everyday tasks.

# Health in Old Age



World Health Organization.  
Ageing and Health.  
Geneva:  
World Health Organization.



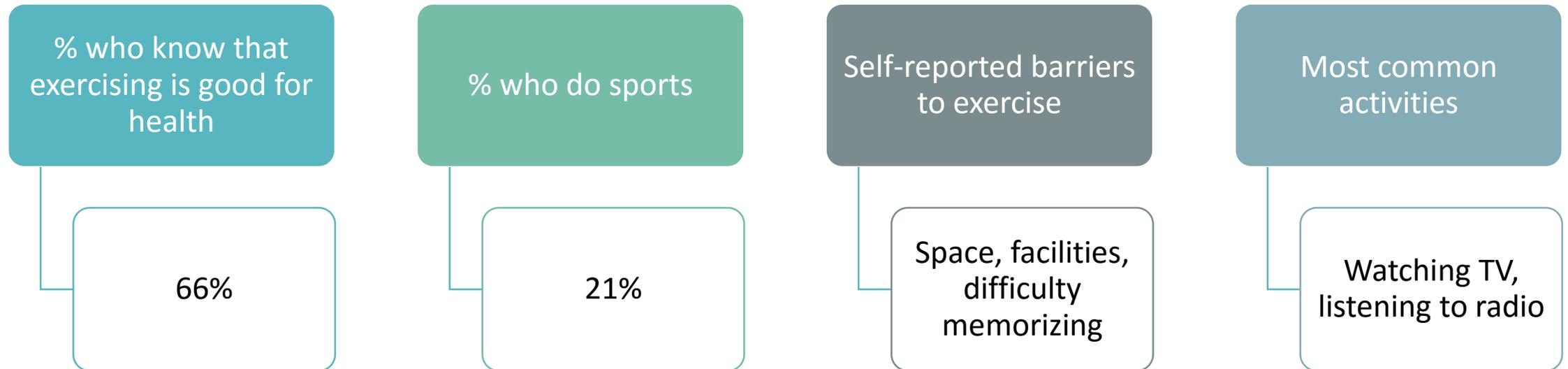
Source: Active Ageing: A Policy Framework, WHO, 2002

World Health Organization (2007). WHO Global Report on Falls Prevention in Older Age. Luxembourg: World Health Organization.

How to Tackle  
the Problem of **Frailty**  
in the Context of  
**Population Ageing** and  
**Shrinking Workforce?**

**Preventive Lifestyle Behaviour**

# Sedentary Lifestyle In HK Older Adults



# Exercising as Medicine for Frailty

*“Exercise programs that optimize the health of frail older adults seem to be different from those recommended for healthy older adults. There was a paucity of evidence to characterize the most beneficial exercise program for this population.... In conclusion, **structured exercise training seems to have a positive impact on frail older adults and may be used for the management of frailty.**”*

Theou O, et al. (2011). doi.: 10.4061/2011/569194

TABLE 5: Percentage of outcome measures that improved due to the exercise interventions.

	Physical & psychosocial determinants	Functional ability	Adverse health consequences	Reference
All studies	60%	71%	39%	[22–96]
<i>Age</i>				
71–79 years	43%	48%	23%	[22–29, 43, 44, 60–63, 65, 66, 72, 73, 84, 89, 92]
80–90 years	66%	76%	44%	[30–42, 45–59, 64, 67–71, 74–83, 85–88, 90, 91, 93–96]
<i>Sex</i>				
Women > men	61%	73%	39%	[22–60, 63, 64, 66–71, 74–80, 82–85, 87–96]
Men > women	53%	54%	—	[61, 62, 65, 72, 73, 81, 86]
<i>Living arrangement</i>				
Long term care	76%	78%	50%	[45–51, 68–71, 79–84, 87, 89, 90, 93–95]
Community	57%	77%	44%	[22–42, 60–66, 74, 75, 77, 86]
Retirement home	41%	53%	40%	[52–56, 67, 78, 91]
Hospital care	50%	64%	25%	[57–59, 72, 73, 76, 85, 92, 96]
<i>Include operational definition</i>				
Yes	50%	64%	30%	[22–40, 52–56, 60, 62–65, 74, 75, 77, 78, 80, 92]
No	68%	75%	48%	[41–51, 57–59, 61, 63, 66–73, 76, 79, 81–91, 93–96]
<i>Include moderate frail</i>				
Yes	62%	82%	50%	[30–40, 52–56, 62, 64, 80]
No	60%	68%	36%	[22–29, 41–51, 57–61, 63, 65–79, 81–96]
<i>Type of intervention</i>				
Multicomponent training	58%	75%	40%	[22–37, 41, 42, 45, 46, 57–61, 64, 66, 68–71, 74–78, 81, 85, 91, 93, 95, 96]
Resistance training	67%	61%	27%	[38–40, 43, 44, 49–51, 62, 63, 65, 67, 72, 73, 79, 82, 83, 92, 94]
<i>Frequency of intervention</i>				
2/week	51%	67%	35%	[22–29, 41, 42, 52–59, 74, 75, 79, 80, 86, 91, 93, 96]
3/week	62%	72%	39%	[30–40, 43, 44, 47–51, 60–65, 67–69, 71, 73, 76–78, 82–84, 90, 92, 94, 95]
<i>Duration of intervention</i>				
1–4 months	61%	70%	30%	[22–29, 41–51, 57–59, 61, 63–65, 67–69, 72–76, 81–84, 86, 88, 90, 92, 94–96]
5–18 months	59%	74%	52%	[30–40, 52–56, 60, 62, 66, 70, 71, 77–80, 85, 87, 89, 91, 93]
<i>Duration per session of intervention</i>				
30–45 minutes	60%	78%	43%	[22–29, 45–51, 63, 69, 75, 77, 79, 83, 85, 86, 88, 95]
60–90 minutes	49%	60%	38%	[41–44, 52–62, 66, 67, 71, 74, 78, 80, 89, 91, 96]
<i>Methodological quality</i>				
0–4 Jadad score	60%	69%	33%	[22–29, 38–44, 47–51, 57–59, 61–64, 67, 68, 74, 77–79, 81, 83, 85–88, 91, 93, 94, 96]
5 Jadad score	60%	72%	42%	[30–37, 45, 46, 52–56, 60, 65, 66, 69–73, 75, 76, 80, 82, 84, 89, 90, 92, 95]

# Exercising Habit In HK Older Adults

Which of the following exercises you undertake regularly in a typical week?	% (n=1,892)
Strength/power training	12%
Balance and mobility activities (e.g., walking)	42%
Cardiorespiratory activities (e.g., swimming, brisk walk)	29%
Flexibility (e.g., stretching)	37%
None of the above	29%

Physical Frailty  
**Project GrandMove**

# Physical Frailty Project GrandMove

## Organizers:



## Sponsor



## NGO Partners:



耆力無窮

年老~~≠~~體弱！

老  
年

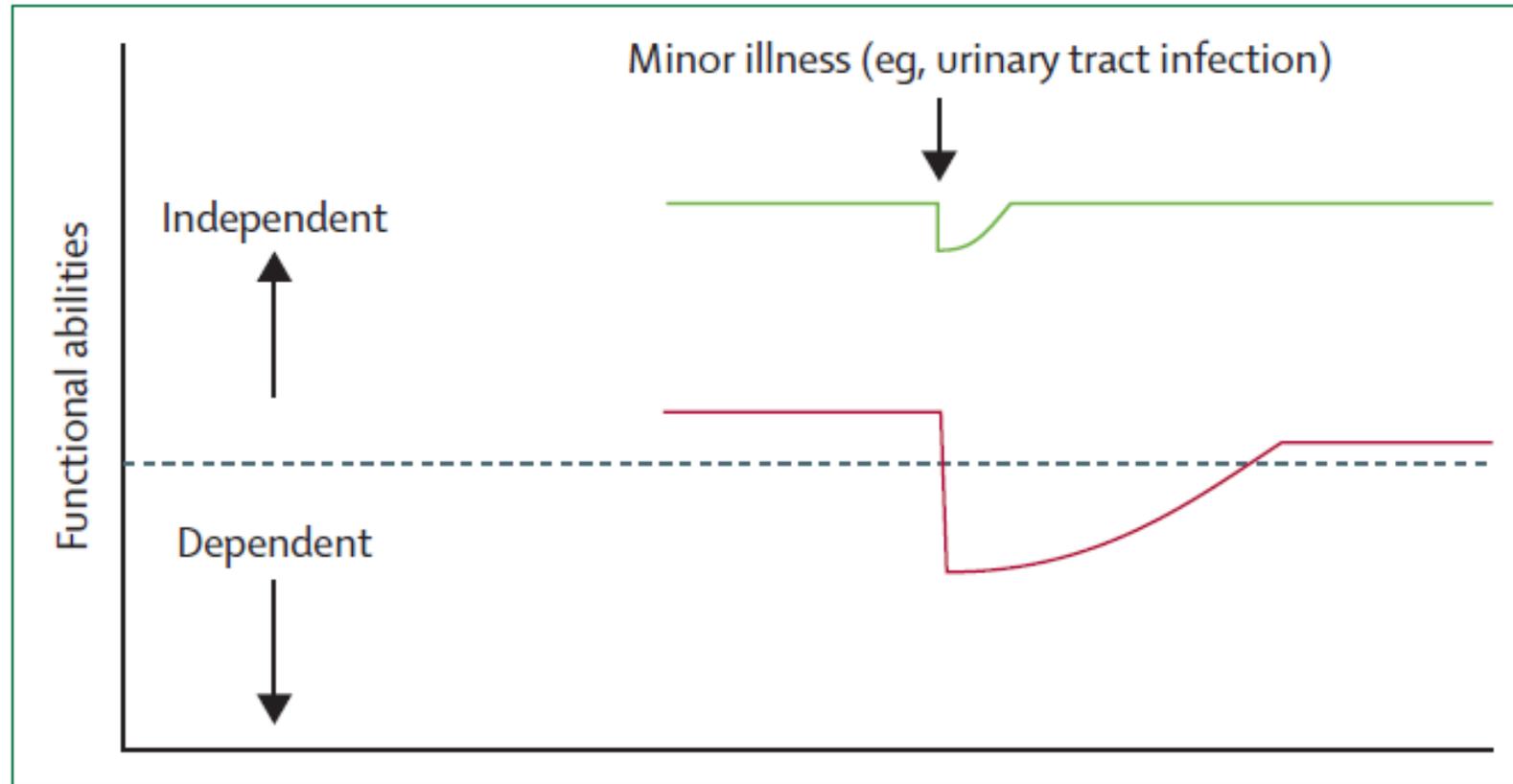
耆力無窮

# Project GrandMove

## Design Background

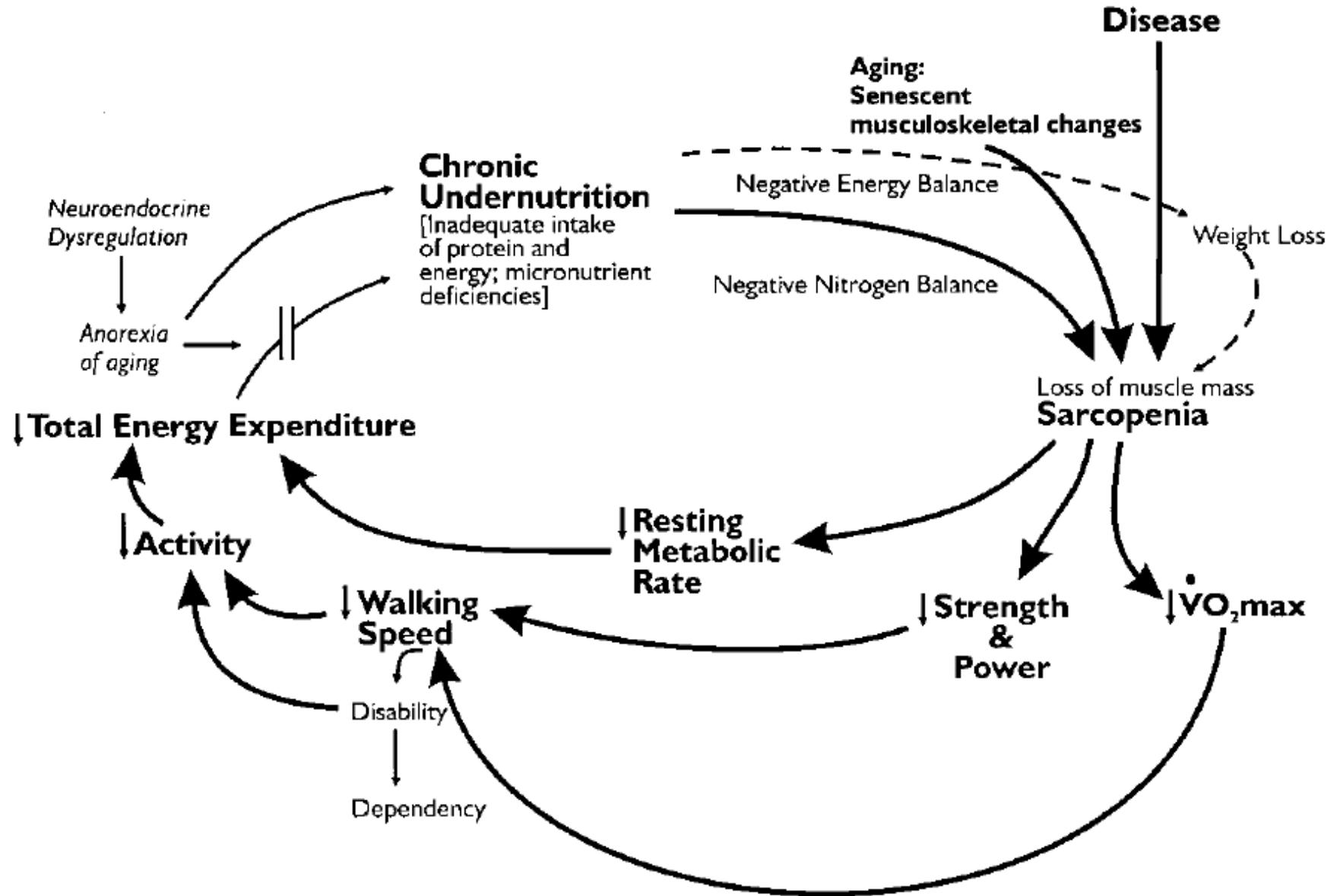
- Resistant and multicomponent exercise is effective intervention for frailty
- Hong Kong older adults understand the benefits of exercising but most have a sedentary lifestyle
  - 66% knows that exercising is good
  - Barriers: space, facilities, difficulty memorizing, inflexible; 88% reported few barriers
  - TV watching, walking, listening to radio, visiting elderly social centre; sports in only 21%

# Frailty



Clegg A, et al. Frailty in elderly people. *Lancet* 2013;381:752-762.

# Frailty



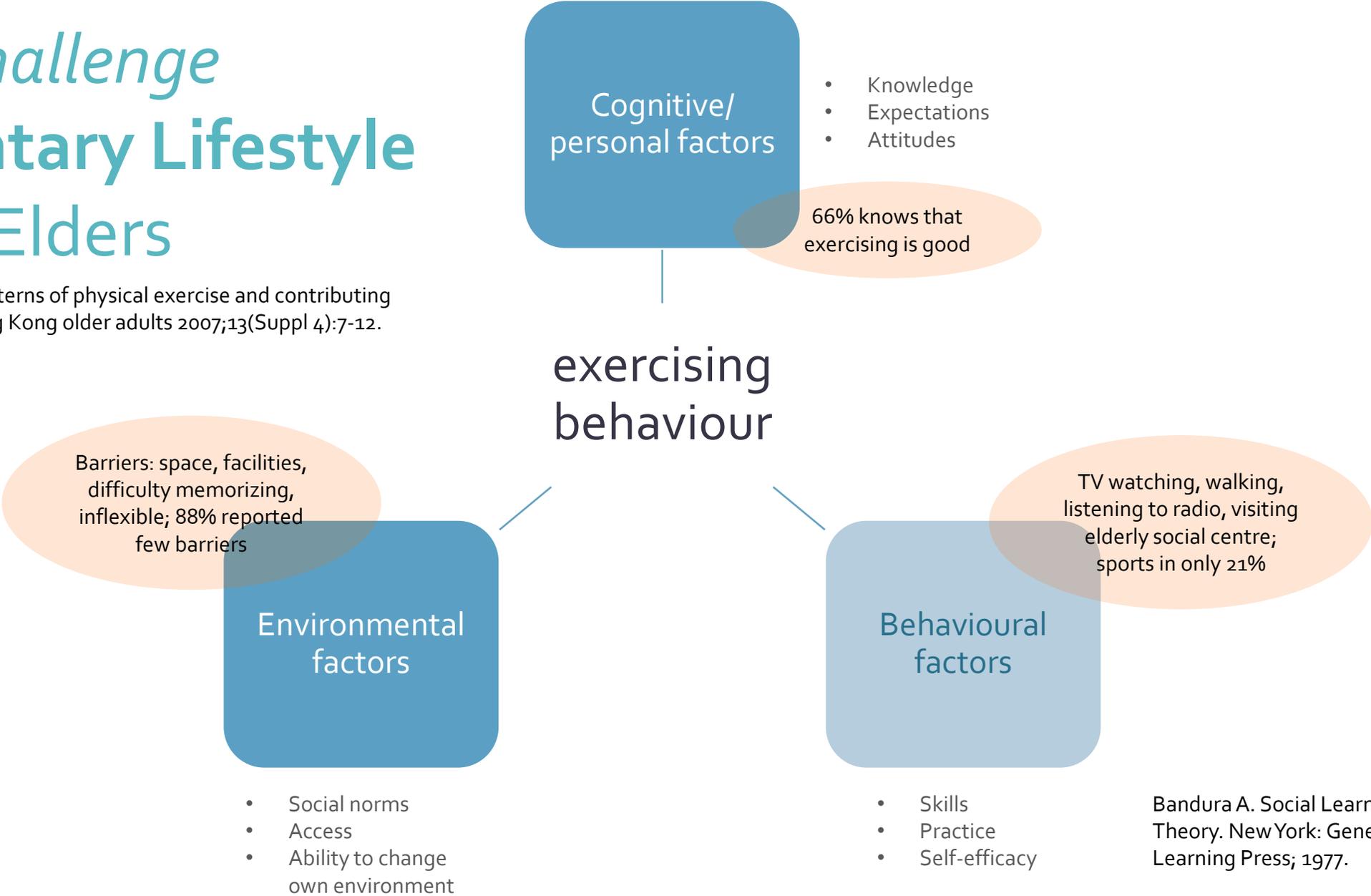
# Exercising *Best Medicine* for Frailty

Type	Duration	Frequency	No. of Sessions	Participant
<ul style="list-style-type: none"><li>• Resistance</li><li>• Multi-component</li></ul>	<ul style="list-style-type: none"><li>• At least 5 months</li></ul>	<ul style="list-style-type: none"><li>• 3 times per week</li></ul>	<ul style="list-style-type: none"><li>• 30-45 mins</li></ul>	<ul style="list-style-type: none"><li>• 71-90 years</li><li>• Both genders</li><li>• Community</li><li>• Long-term care facilities</li><li>• Pre-frail / frail</li></ul>

Theou O, et al. The effectiveness of exercise interventions for the management of frailty: A systematic review. *Journal of Aging Research* 2011. doi.: 10.4061/2011/569194

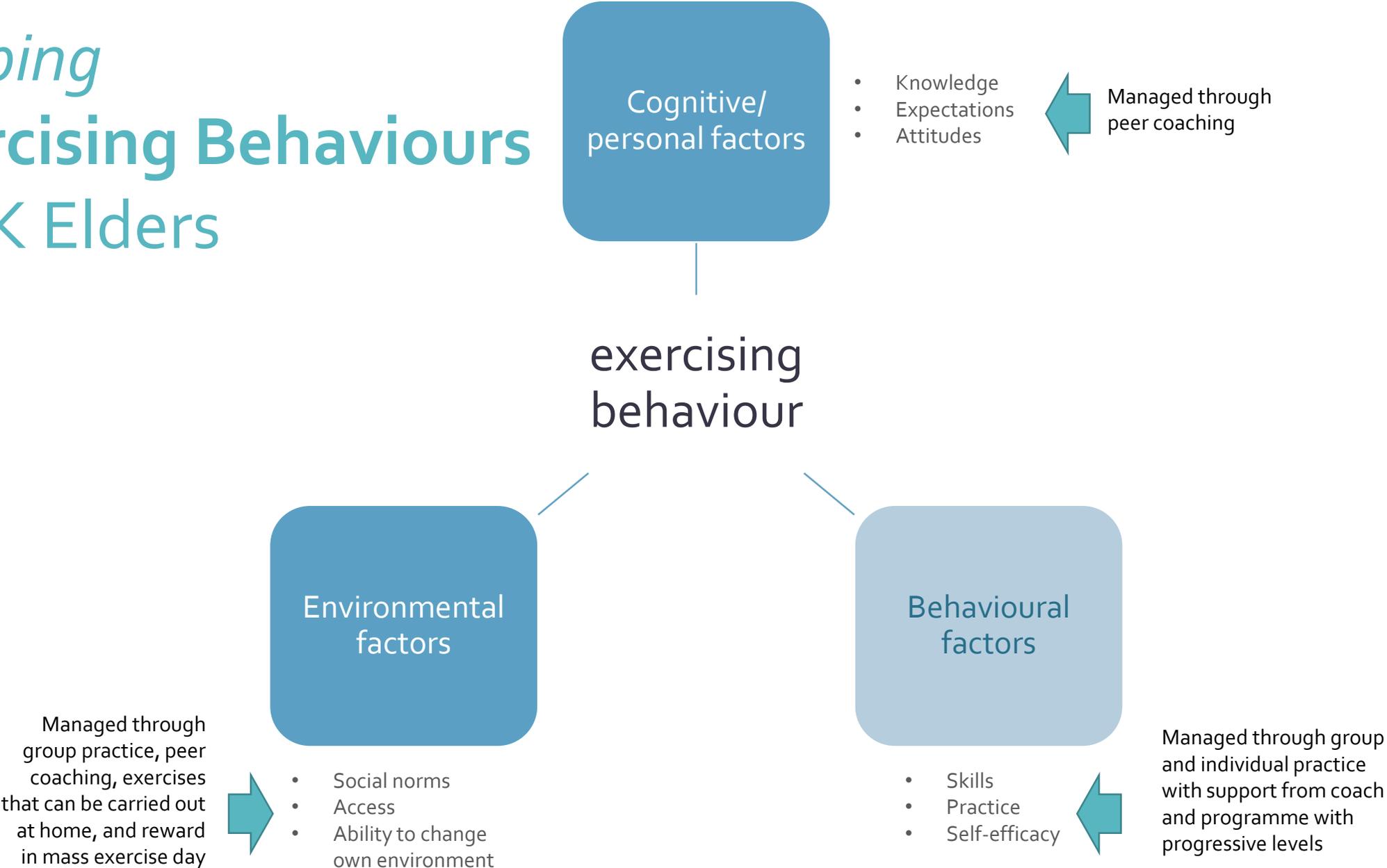
# The Challenge Sedentary Lifestyle In HK Elders

Cheng YH, et al. Patterns of physical exercise and contributing factors among Hong Kong older adults 2007;13(Suppl 4):7-12. (n=1,065)

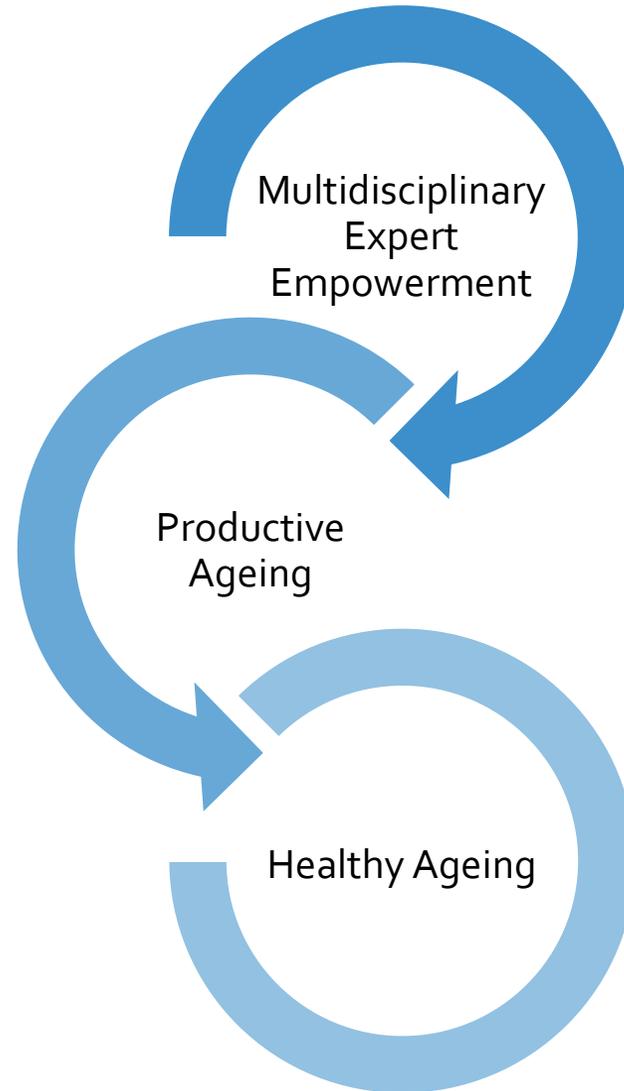


Bandura A. Social Learning Theory. New York: General Learning Press; 1977.

# Shaping Exercising Behaviours In HK Elders



# A Sustainable Model *for* Frailty Intervention



# Our Goal

To develop a feasible and sustainable model to address the issue of frailty in the ageing society of Hong Kong

1. To **increase physical fitness of older people** through resistance and aerobic exercises to prevent or improve frailty (exercise intervention).
2. To **promote lifestyle change for older people** to adopt resistance and aerobic exercises as their regular exercise routine through applying the principle of social learning theory (lifestyle intervention).
3. To **facilitate older persons in engaging in productive ageing activities** through training them as exercise coaches and provide employment opportunity for them to use the new skills in work or volunteer activities (train-the-trainer ambassador programme).

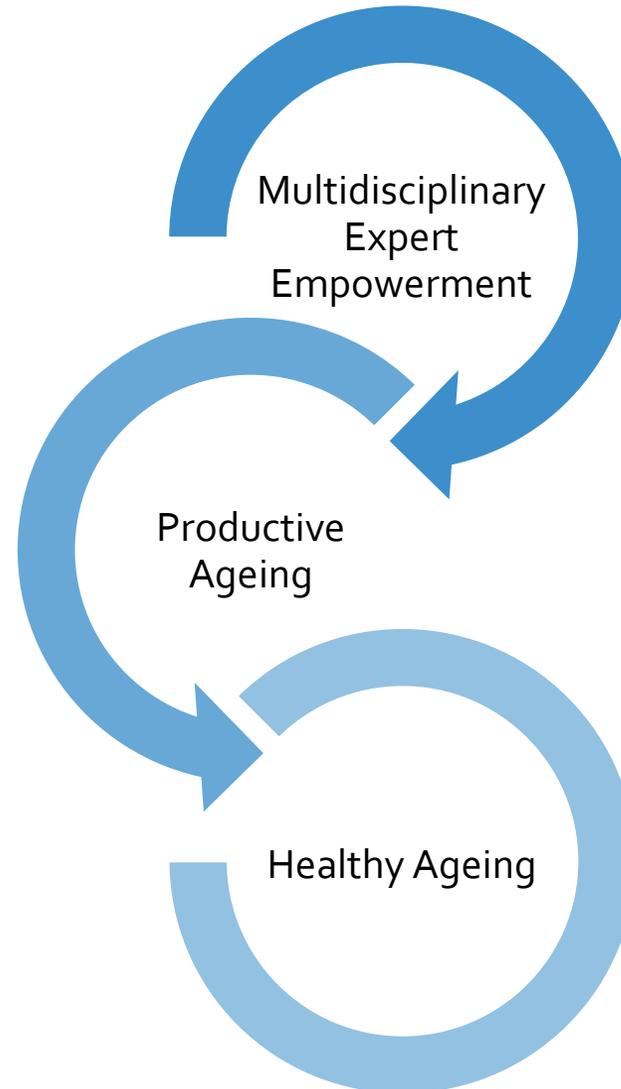
# Our Objectives

1. To **develop a structured exercise training** tailored for elders in Hong Kong.
2. To **develop a train-the-trainer ambassador programme** to engage older adults in productive activity as personal coaches for healthy ageing.
3. To **empower elders** in taking control of their health by improving their health literacy through involving as trainee or coach.
4. To **generate evidence of the effectiveness** of the aerobic and resistance training protocols in preventing and intervening in frailty among Hong Kong Chinese.
5. To **generate evidence of behavioural change and habit formation** through a model that combine social gerontological theories in healthy and productive ageing and psychological principle of social learning theory

# A Sustainable Model *for* Frailty Intervention

## 2. Productive Ageing

- Employment opportunity as exercise coaches tailored for young-olds with flexible arrangement, learning opportunity, good fit with their roles (peer) and life experience (coaching), and create meaning by helping other elders
- Competitive compensation provided by prestigious employer (HKU through the support of SKY Lee Foundation) to recognize the economic value and status of the job



## 1. Empowerment by Multidisciplinary Experts

- A team of HKU scholars with multidisciplinary background in gerontology, sports and human performance, geriatric medicine, nursing, and statistics to design and test the effectiveness of an exercise habit formation programme
- A train-the-trainer programme conducted by exercise specialists to provide the knowledge and skills, jointly offered by HKU and PolyU to provide recognition of the exercise coach qualification

## 3. Healthy Ageing

- Guided initiation of a healthy exercising habit with the help from a peer coach and social support from a peer group in the community
- Learning of exercise in the correct dosage for preventing and intervening frailty
- A simple yet progressive exercise programme with 2 protocols (5 levels each) for easy adoption at home/in the community while providing motivation
- A mass exercise day to introduce the concept of robustness in old age as a social norm

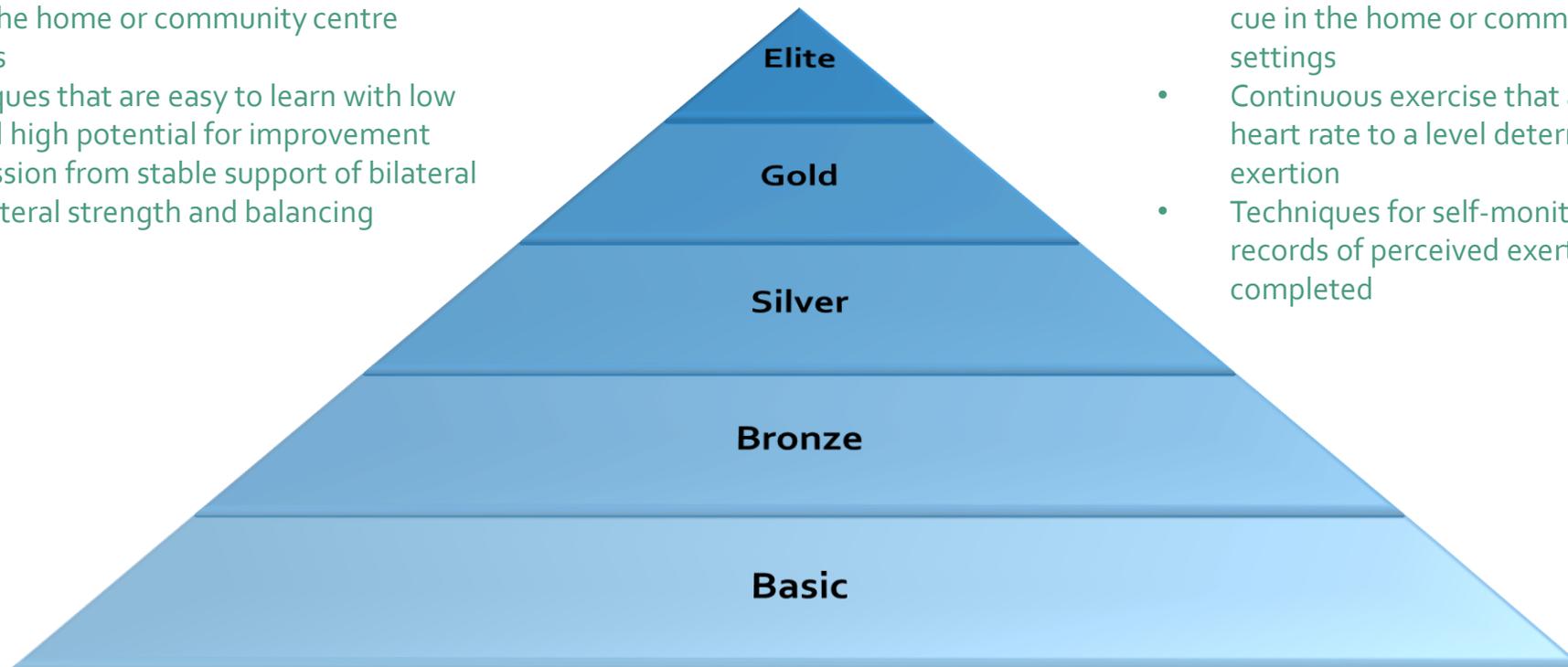
# Exercising Intervention GrandMove Protocols

## Resistance Exercise

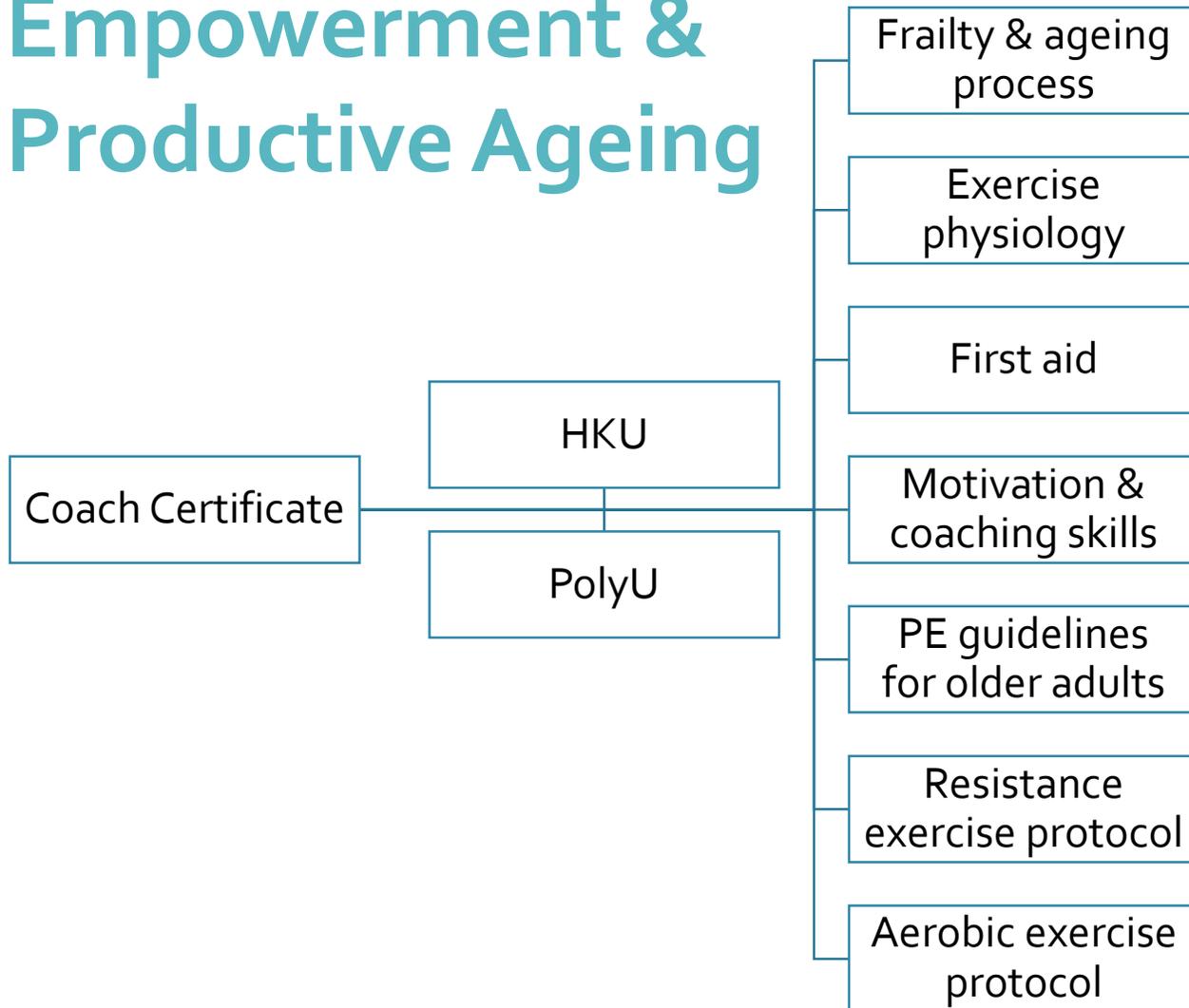
- Can be carried out at home any time
- Linked with daily routine or environmental cue in the home or community centre settings
- Techniques that are easy to learn with low risk and high potential for improvement
- Progression from stable support of bilateral to unilateral strength and balancing

## Aerobic Exercise

- Can be carried out at home any time
- Linked with daily routine or environmental cue in the home or community centre settings
- Continuous exercise that allow elevation of heart rate to a level determined by perceived exertion
- Techniques for self-monitoring and keeping records of perceived exertion and exercise completed



# Project GrandMove Empowerment & Productive Ageing



# Shaping Exercising Behaviour in Frail Older Adults

## 2. Progressive Levels

	Resistance Exercise Protocol	Aerobic Exercise Protocol
Features	<ul style="list-style-type: none"><li>• Can be carried out at home any time</li><li>• Linked with daily routine or environmental cue in the home or community centre settings</li><li>• Techniques that are easy to learn with low risk and high potential for improvement</li><li>• Progression from stable support of bilateral to unilateral strength and balancing</li></ul>	<ul style="list-style-type: none"><li>• Can be carried out at home any time</li><li>• Linked with daily routine or environmental cue in the home or community centre settings</li><li>• Continuous exercise that allow elevation of heart rate to a level determined by perceived exertion*</li><li>• Techniques for self-monitoring and keeping records of perceived exertion and exercise completed</li></ul>
Levels		Basic
		Bronze
		Silver
		Gold
		Platinum elite

# Habit Formation Intervention Design

Months	Times per week		
	Group Practice	Home Visit	Phone Call
1	●	●●	-
2	●	●	●
3	●	-	●●
4	-	-	●●
5	-	-	●
6 (weaning)	-	-	-



# Project GrandMove Promoting Physical Robustness as a Social Movement



# Sustainability & Scalability

1. An established train-the-trainer scheme
2. A pool of trained coaches with experience for continued programme delivery
3. A structured exercise training programme
4. A pool GrandMove ambassadors who can be mobilized for continued community impact
5. A field-tested model of healthy and productive ageing ready for further rollout

# Thank You

Project Sponsor:



Simon K.Y. Lee  
Elderly Fund  
李國賢長者基金

Training Organizers:



香港大學秀圃老年研究中心  
Sau Po Centre on Ageing  
The University of Hong Kong



INSTITUTE OF  
HUMAN  
PERFORMANCE  
THE UNIVERSITY OF HONG KONG  
RESEARCH  
TEACHING  
ACTIVE HEALTH  
SPORT



THE HONG KONG  
POLYTECHNIC UNIVERSITY  
香港理工大學

Institute of  
Active Ageing  
活齡學院



Investigators: Terry YS Lum (PI)  
MW Cheung  
Joseph Kwan  
Angela YM Leung  
Hao Luo  
Jennifer YM Tang  
Michael Tse  
Teresa BK Tsien Wong

Project Team: Mavis Fan  
Chi Wah Lau  
Dora Lau  
Mandy Lau  
Jessica Law  
Annie Tai

NGO Partners:



基督教家庭服務中心  
Christian Family Service Centre



基督教香港信義會  
長者綜合服務



HONG KONG  
HOUSING SOCIETY  
香港房屋協會

