

Smart Ageing : From Ageless Employment to Gerontechnology

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Content

Introduction

Ageing Population – Challenges and opportunities

Part I : Ageless employment – Disruption of the concept of retirement

Part II : Gerontechnology – Interface with our ageing population

Introduction

Ageing Population

Implications

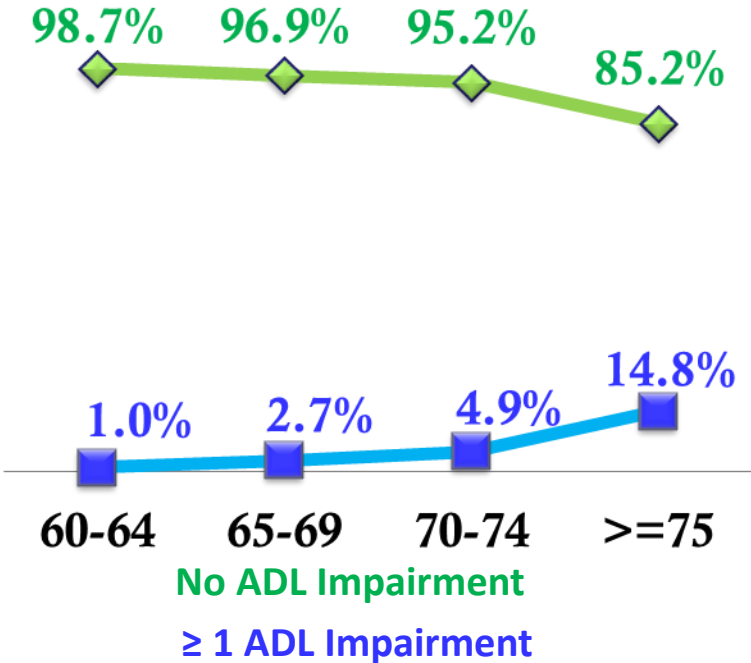
- **Decline in Physical Capacity**
- **Chronic Health Conditions**
- **Increasing number of Old-olds**
- **Increasing Dependency Ratio**
- **Increasing number of elders in households**
- **Family Caregivers burden**
- **High Institutionalization Rate in HK**

Resources

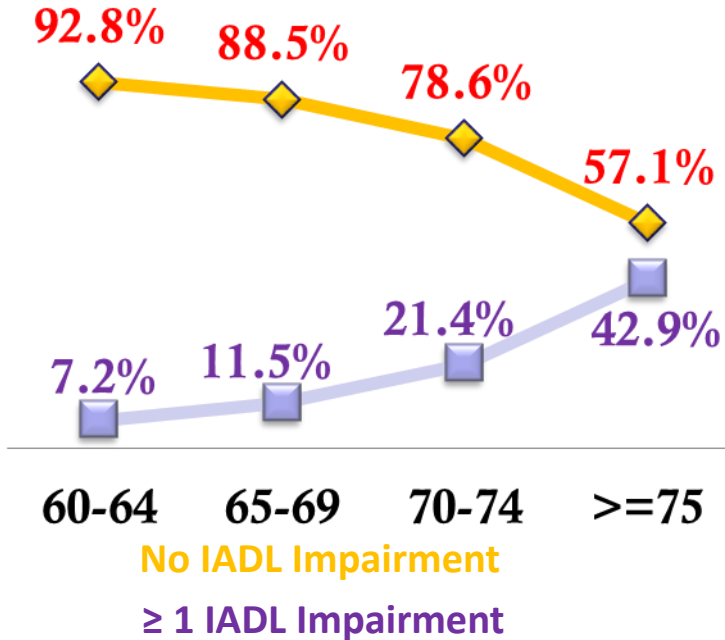
- **Financial Sustainability**
- **Manpower**
- **Land**
- **Healthcare Service**
- **Elderly and Long-term Care Service**

Implication : Decline in Physical Capacity

Older Persons by No. of ADL (Activities of Daily Living) Impairment(s) & Age



Older Persons by No. of Instrumental ADL Impairment(s) & Age

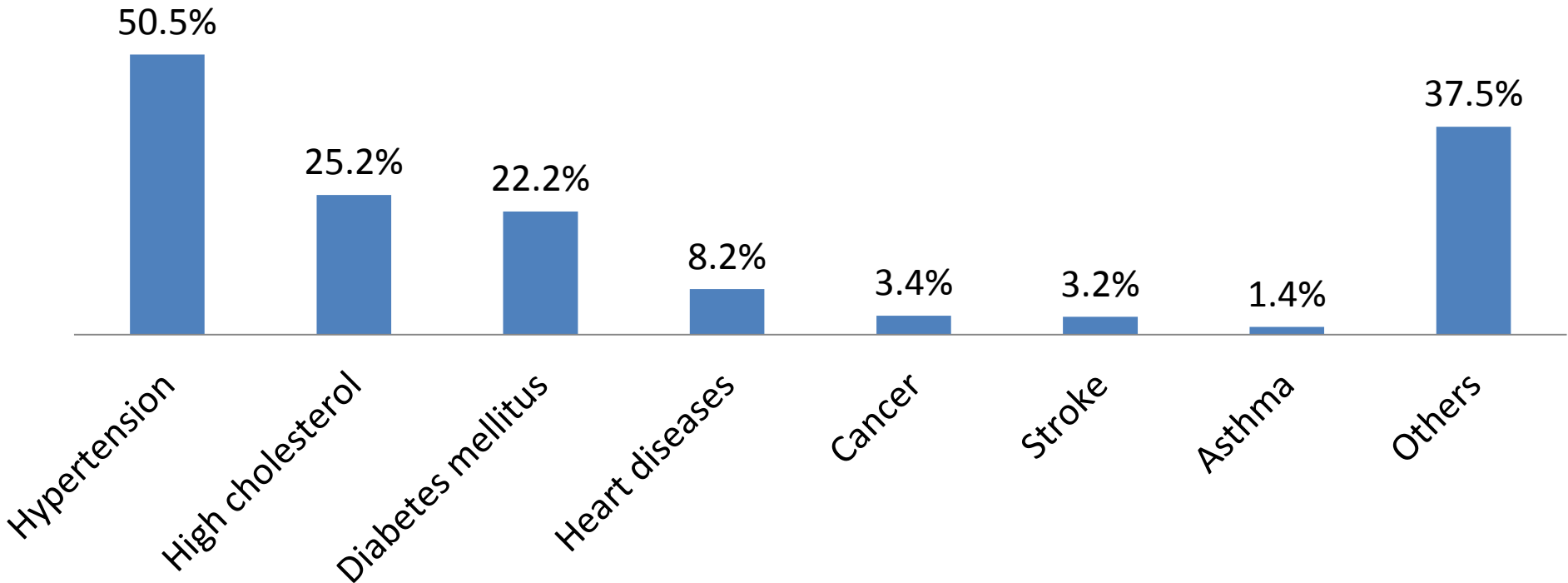


Sources: Census and Statistics Department; Yu et. al (2016). Trends in activities of daily living disability in a large sample of community-dwelling Chinese older adults in Hong Kong: An age-period-cohort analysis. *BMJ Open*, 6(12).

Implication : Chronic Health Conditions



Rate of people who aged 65+ and had chronic health conditions of total population



People aged 65+ and had chronic health conditions: **835,200**
(**74.3%** of the total population)

Sources: Census and Statistics Department (2017), Thematic Household Survey Report - Report No. 63

Implication: Chronic Health Conditions

Projected increase in number of patients with chronic conditions in 2024 compared to 2014

Diabetes



↑53%

Stroke



↑47%

Hypertension



↑43%

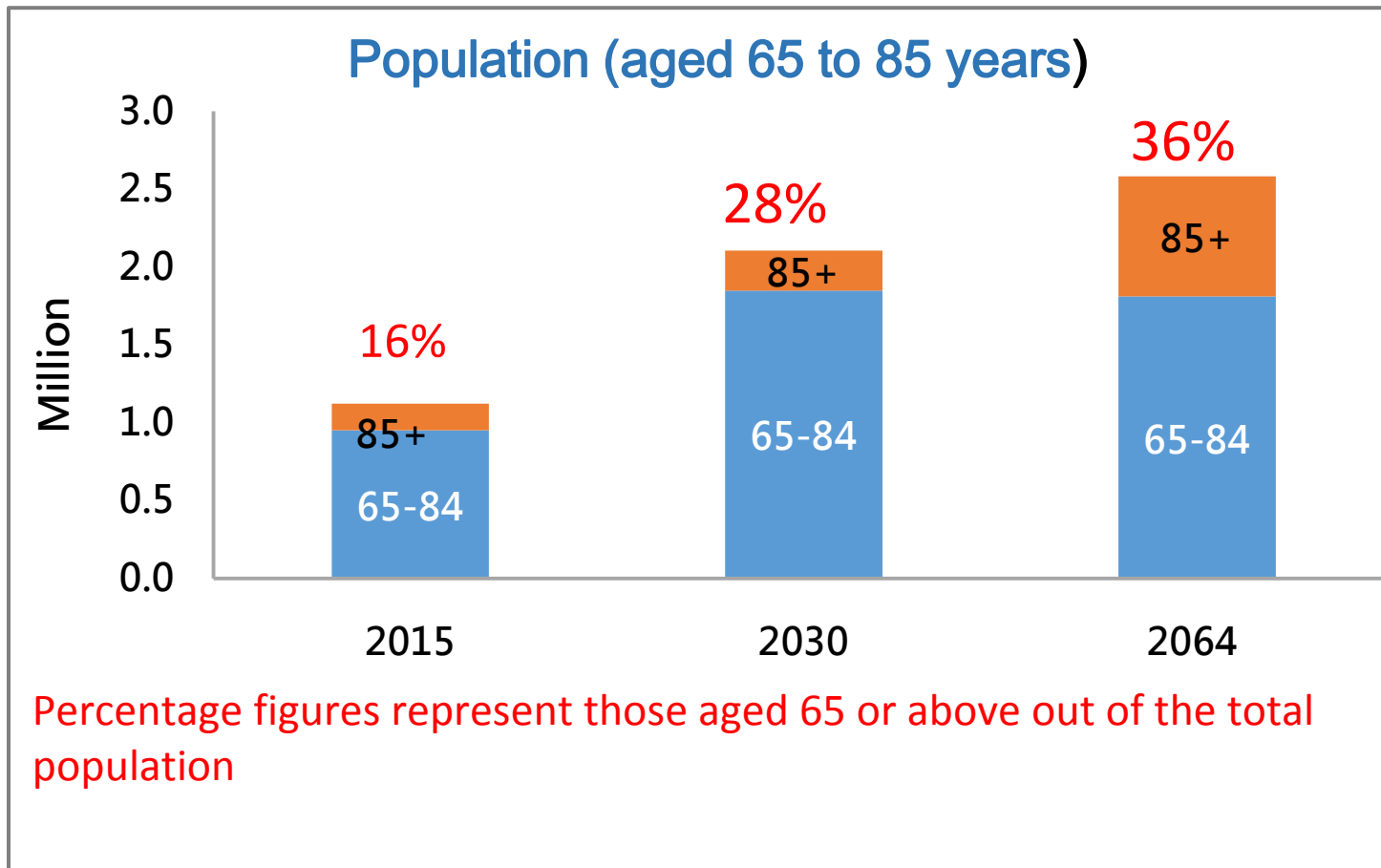
Coronary heart disease



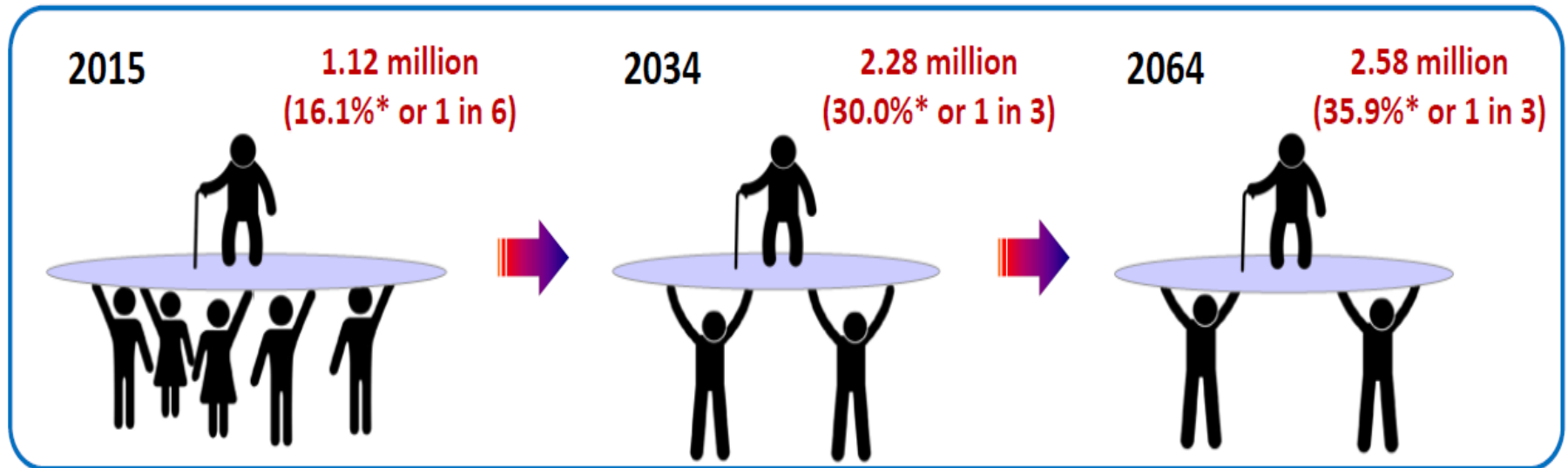
↑42%

Implications : Increasing number of Old-olds (85 years or above)

Increasing elderly population



Implication : Increasing dependency ratio



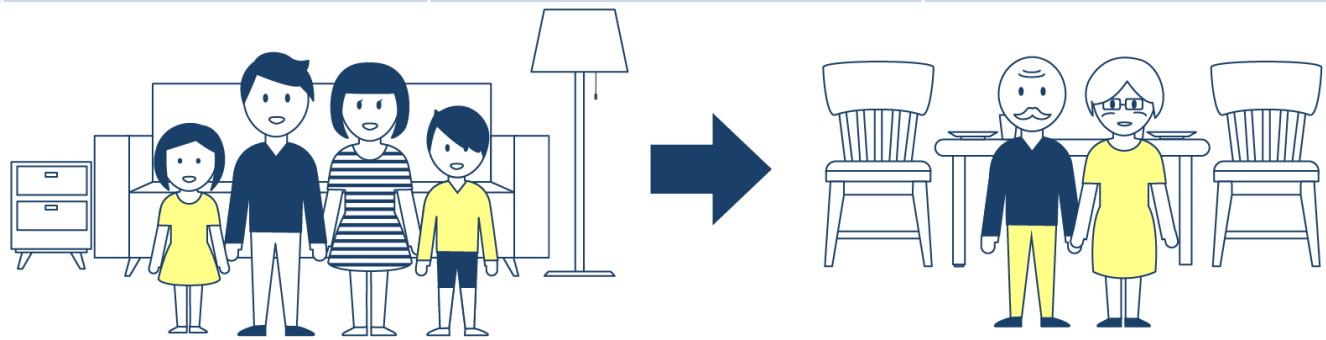
Note: (*) The figures represent the proportions of elderly people in total population.

Data source: Census and Statistics Department.

Implication : increasing number of elders in households

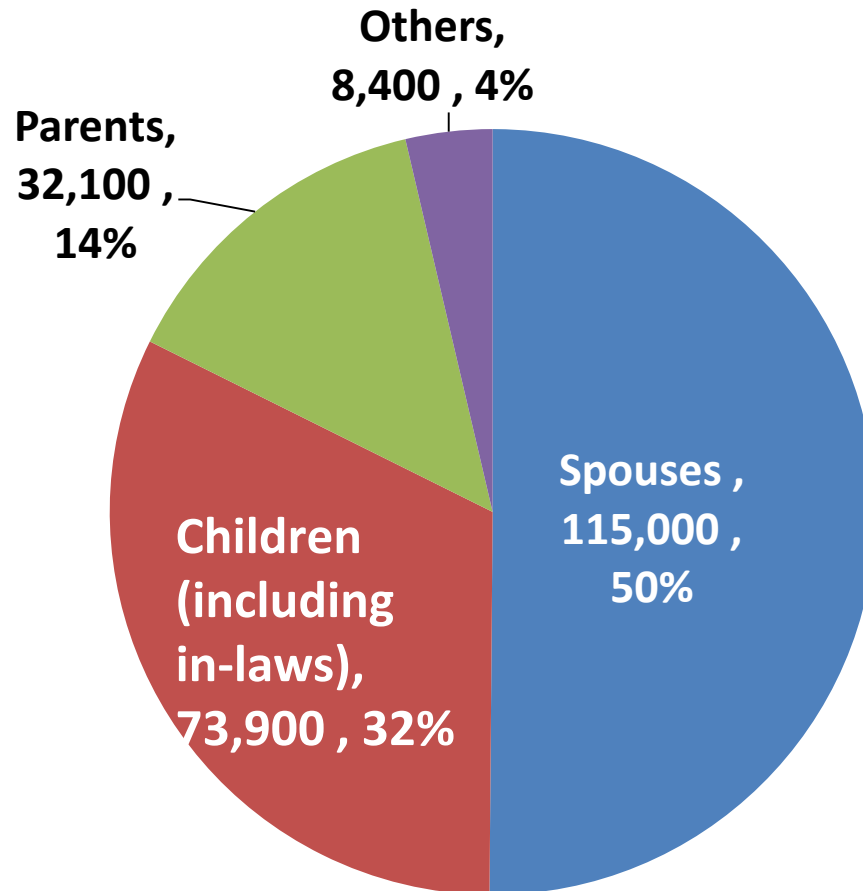
- Average number of household members decrease, less family caregivers
- Increasing number of households with only elders

Year	Ave. number of members in the household	% of elder-only household	% of households living with elders
1996	3.3	N/A	N/A
2016	2.8	16.4%	27.7%
2026	2.7	23.4%	30.8%



Implication : Family Caregivers burden

Number of family caregivers (2013)



- Increase in number of family caregivers
- Half of them are spouses of the care recipients
- **90%** are female
- Average **46.8 hours** spent on caregiving (i.e. 6.7 hours daily)

游佩珊(2018)·誰是照顧者?—本港照顧者人口及其需要·社聯政策報·;統計處(2008),《第四十號報告書—長者的社會與人口狀況、健康狀況及自我照顧能力》;香港婦女中心協會(2011)《照顧者生活狀況調查報告》

Implication : High institutionalization rate in HK

Country/City	Elderly institutionalization rate
Hong Kong	6% (2018)
Japan	3.0% (2006)
Singapore	2.3% (2006)
Taiwan	2.0% (2009)
China	1.0% (2008)
Australia	5.4% (2006)
UK	4.2% (2004)
Canada	4.2% (2003)
USA	3.9% (2004)

Resources : Financial Sustainability

- Standardised Care Need Assessment Mechanism for Elderly Services - Low service fee vis-à-vis ever growing cost



- Money-follow the user : Community Care Service Voucher, Residential Care Service Voucher

- Voluntary Health Insurance Scheme



Resources : Manpower

Manpower survey in 2017 - **vacancy rate** of frontline care staff in subsidised service units reached **18%**



2017 Policy Address

allowing greater flexibility for subsidised elderly service and rehabilitation service units to **import carers**

Additional resources allocated to **enhance remuneration of frontline care staff** in subsidised service units in 2018

Resources : Land

- 2019-20 : **45 projects** -> 6,200 residential care places & 1,500 day care places
- Hong Kong Planning Standards and Guidelines (2018) : population-based planning ratios

Jun 2019 : **HK\$20 billion** allocated to buy properties for welfare facilities -> 48 Neighbourhood Elderly Centres and 15 Day Care Centres



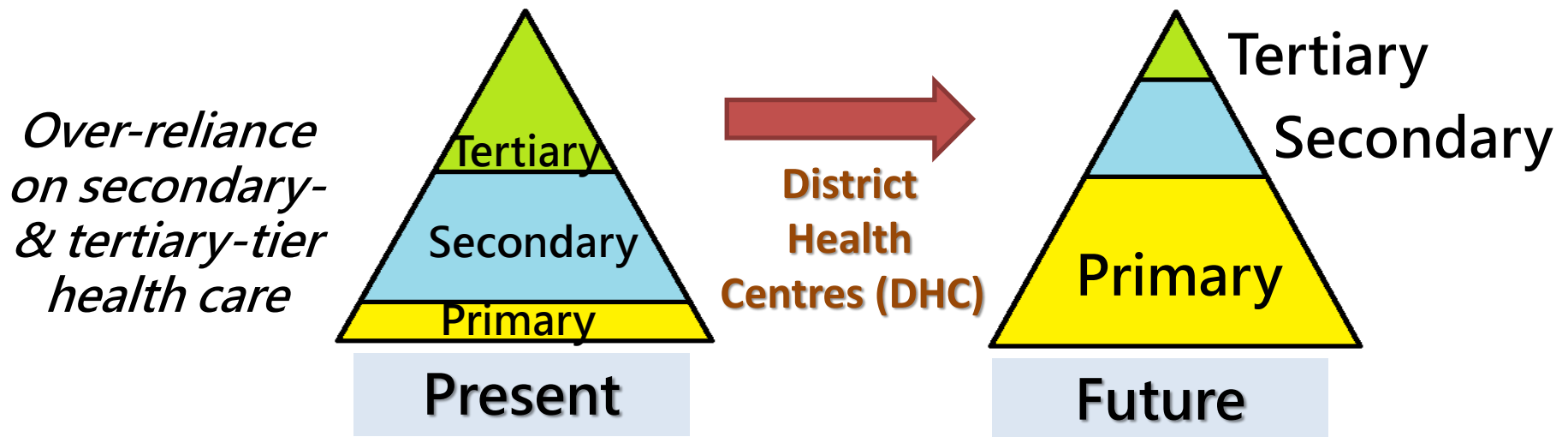
Special Scheme on Privately Owned Sites for Welfare Uses (Special Scheme) -> 7,600 residential care places & 1,700 day care places



Resources : Healthcare Service

Hong Kong: the most efficient healthcare system in the world, according to the Bloomberg Health Care Efficiency Index

Three-tiered healthcare system



Increasing demand
for gerontech
devices

**Self-health
management**

Increasing demand for cross-
disciplinary IT platform

Care Coordination

Advancing big
data analysis

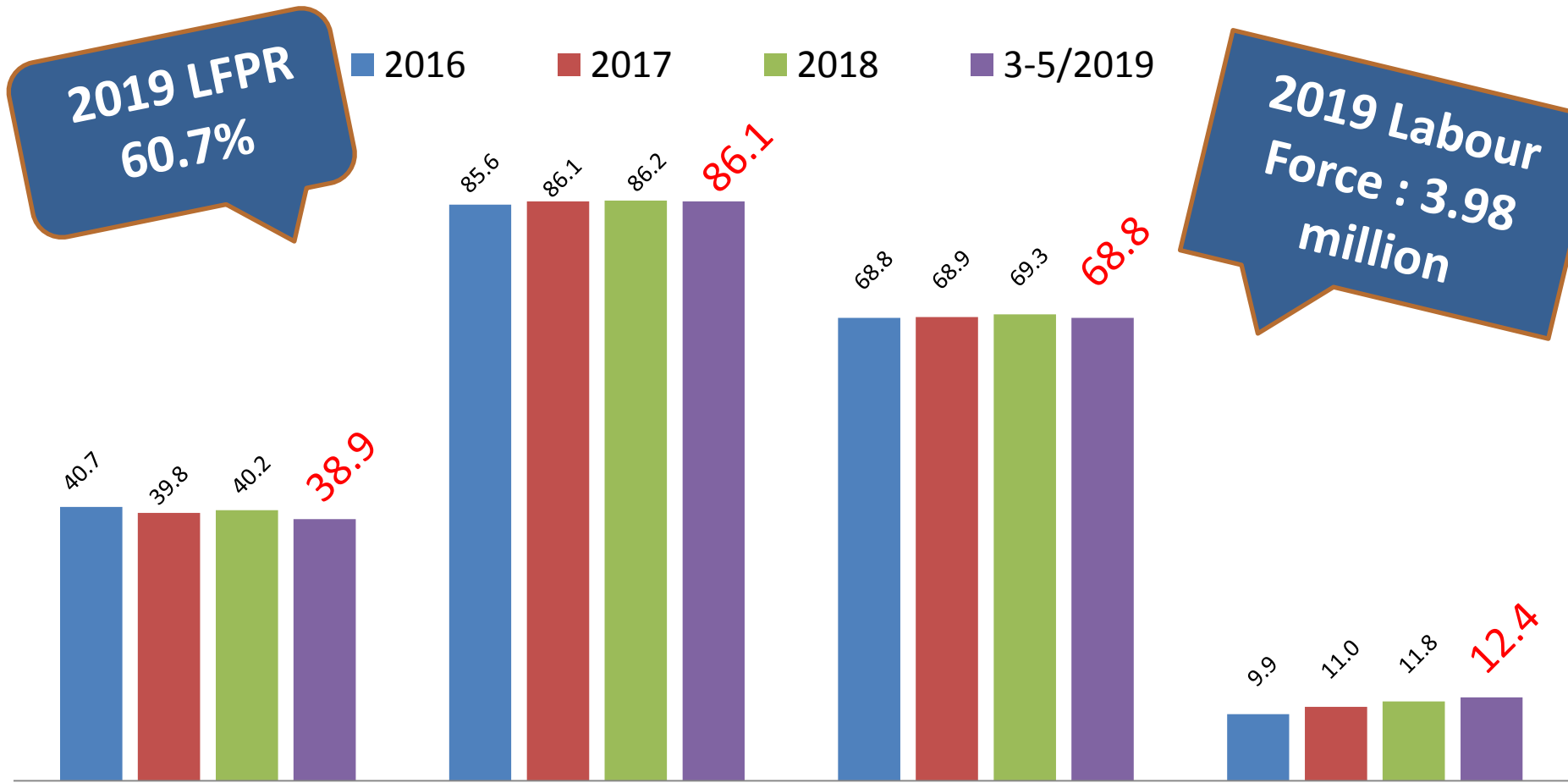
Case Management

Part I

Ageless employment – Disruption of the concept of retirementHK

- Labour Force Participation Rate
- Why Ageless Employment?
- Role of Government
- Volunteerism

HK Labour Force Participation Rate (LFPR)

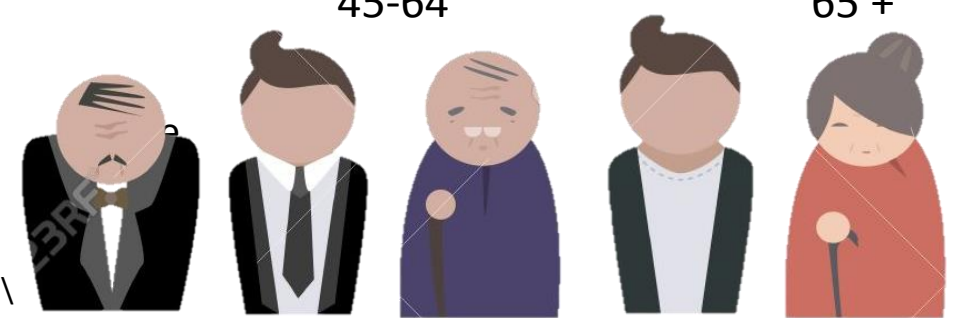


15-24

25-44

45-64

65+



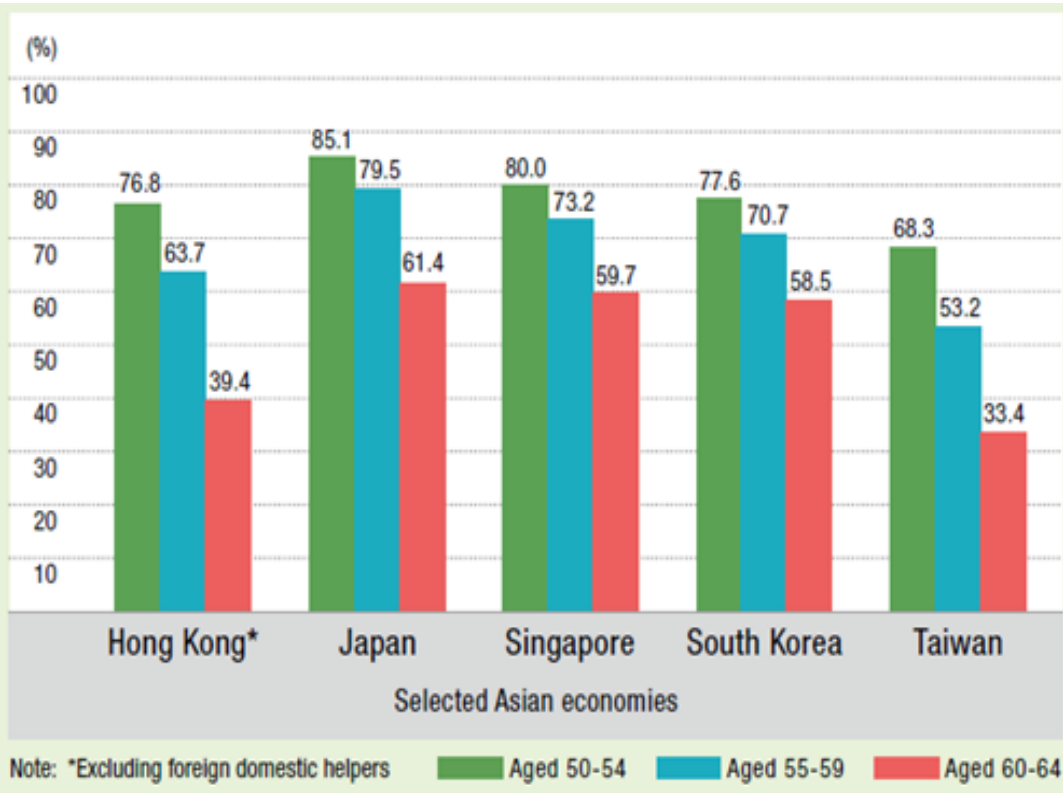
2019 LFPR
60.7%

2019 Labour Force : 3.98 million

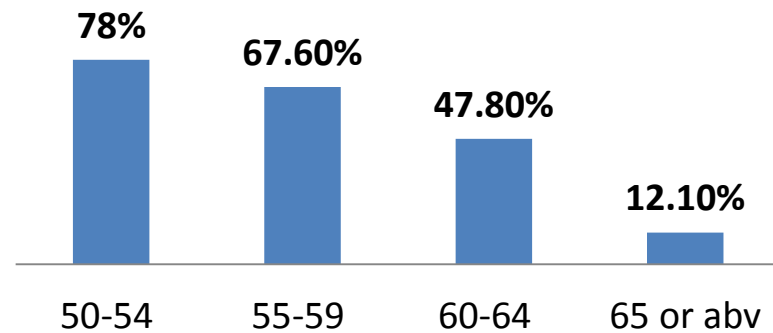
Sources : <https://www.censtatd.gov.hk/hkstat/sub/so200.jsp>

Labour Force Participation Rate

Mature Persons' LFPR in HK is lower than Japan, Singapore, etc (2013)



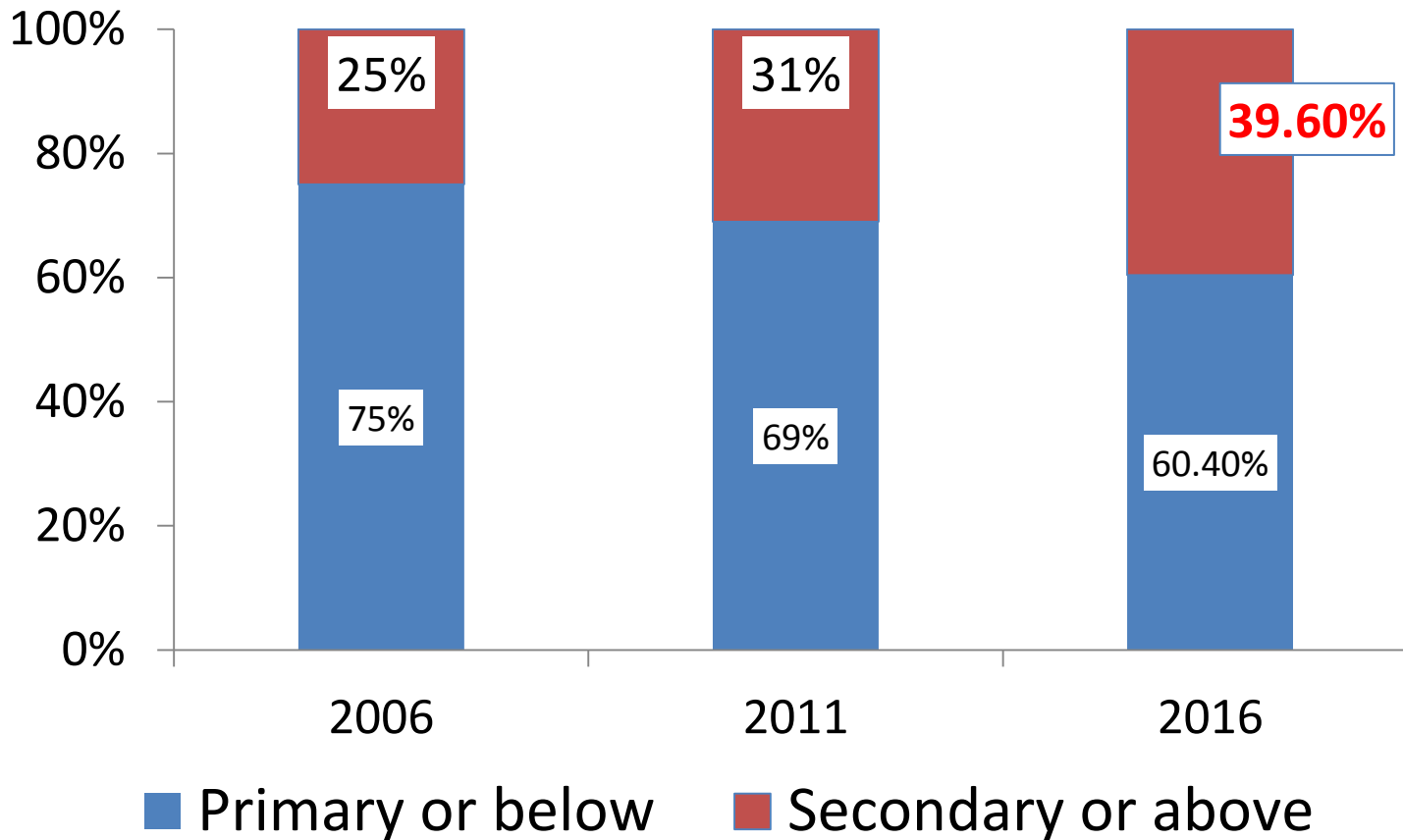
Older persons LFPR(1Q2019)



Sources : Census and Statistics Department

Population Policy – Strategies and Initiatives (Jan 2015)

Opportunities : Increasing education level of our older population



The proportion of older persons with secondary or higher education increased considerably **from 25.0% in 2006 to 39.6% in 2016.**

Why Ageless Employment ? **Health of the employees**

- Netherlands Interdisciplinary Demographic Institute (2007)
- Research period : 1995 – 2001, n=778
- Mean Age = 57, Avg retirement age : 60

“Older workers who perceived retirement as involuntary showed decreases in perceived health.”

- Reasons for involuntary retirement : About 30% of interviewee claimed : health reasons



Involuntary retirees believe that retirement has adverse effect towards health ($p < 0.01$)



Why ageless employment ? Overall Economy

- Unleashing the labour force : Labour force is expected to decrease by 200K by 2041
- Maintenance of health of older adults
- Maintain livelihood : *End-2017, average MPF benefits = \$197,000*



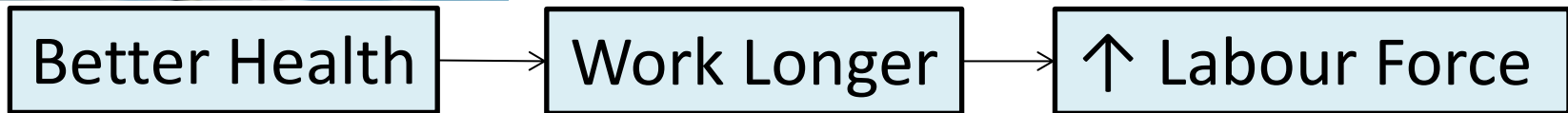
- Alleviate Elderly Poverty Rate:
2016 *employed elderly : 8.2%*
unemployed elderly : 34.1%

- Alleviate the overall burden on welfare expenses

Why Ageless Employment ? **Unleashing the potential of our labour force**



- No statutory retirement age in HK
- 40% “economically inactive” (age 15-69, including home-makers and retired persons) have retired



*99,100 persons economically inactive: **Willing to enter job market if being offered suitable employment (of which about 39,600, i.e. 40%, are 55-69 years old)***



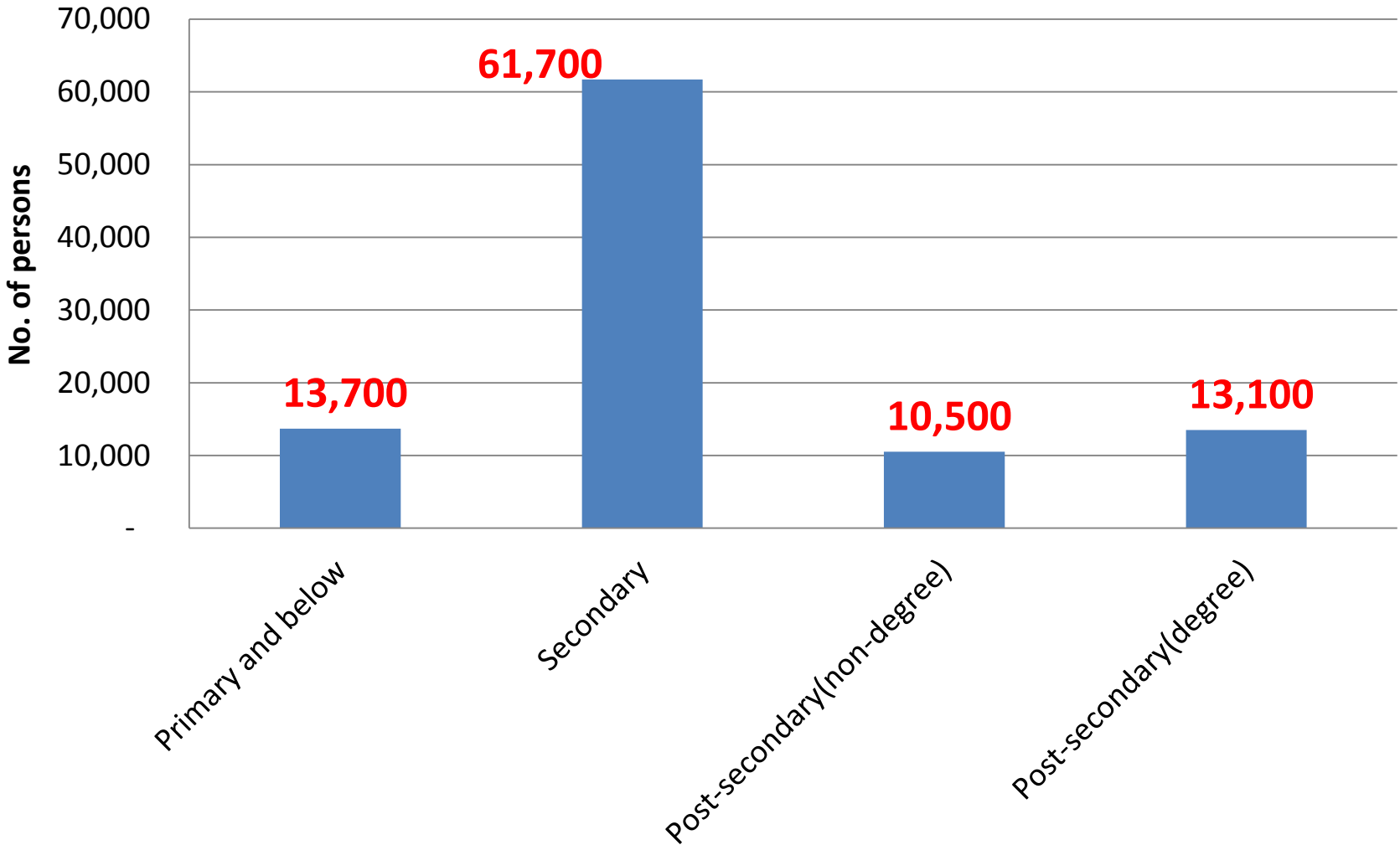
政務司司長 張建宗

Source : Population Policy – Strategies and Initiatives (Jan 2015)

Source : Census and Statistics Department, Thematic Household Report No. 66

<https://www.statistics.gov.hk/pub/B11302662019XXXXB100.pdf>

Economically inactive persons willing to take up jobs if being offered suitable employment (by educational attainment)



Source: Census and Statistics Department, Thematic Household Report No. 66

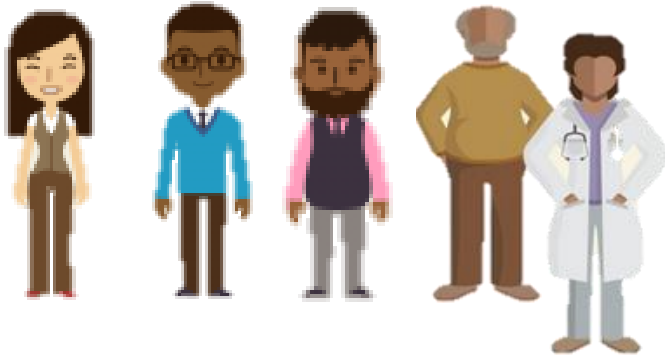
Main Considerations for taking up jobs

Considerations	Overall percentage
Flexible / convenient working hours	63.6%
Higher / reasonable salary	38.9%
Workplace near home	37.3%
Simple/comfortable/safe job available	28.2%
Work place with easy transportation available	24.6%
Children at home being taken care of	17.5%



Unleashing the Potential of Local Labour Force : **How ?**

- Raised retirement age
- Encourage employers to extend retirement age



- Enhance the employment support services for women, mature persons and the disadvantaged

- Promote more flexible employment patterns



Unleashing the Potential of **Matured** Labour Force : **Age-friendly workplace**



What other countries are doing ?



- Legislation : Must employ / re-employ until 65 years old
- Resource centre arrange temporary job
- Subsidy for enterprises which support elder employment (Max Yen 10M) (approx. HK\$700K)



Seoul : Centre for helping older adults in developing their second career by assisting them in starting their own business.



- Legislation : Must re-employ until 67 years old.
- Lower the employer's required CPF scheme contributions for older employees
- Enterprises which re-design workplace of older employees can receive subsidy up to S\$300K (HK\$1.69M)

Role of our government



Interactive Employment Service
Labour Department (HKSARG)

- Support
- Platform
- Information



Introduction

Employment programme for the Elderly and Middle-Aged



Insurance for older employers

Policy

Age-friendly employment measures



Job Seeker

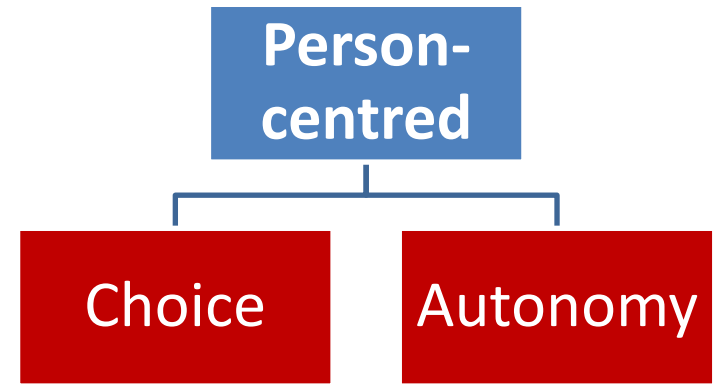
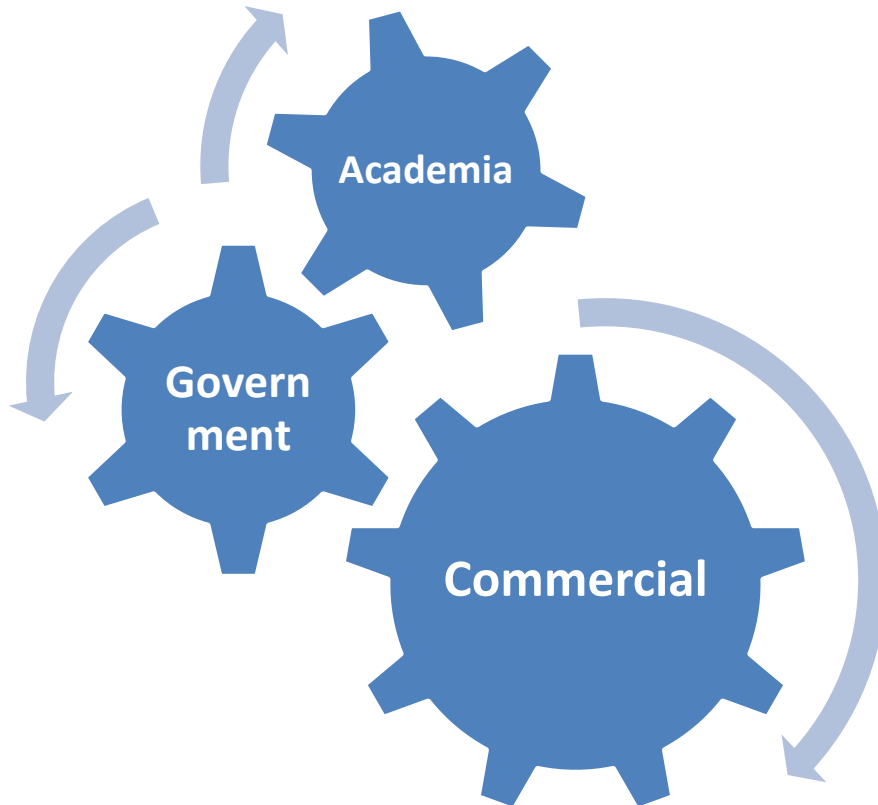
Job Fair



Employer

Ageless Employment : Essential elements

Cross-sectoral Collaboration



Age-inclusive

The illustration shows a red circle with a white 'X' on the left. To its right, the word 'AGEISM' is written in red. Below the text, five stylized human figures are shown holding signs with ages: 60, 20, 25, 50, and 40. A hand is visible on the right, holding a blue pen as if writing on the 40 sign.

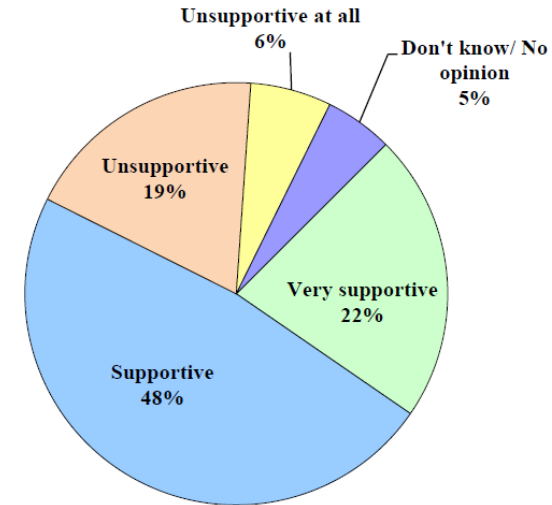
- *Productivity*
- *Knowledge & Skills*
- *Experience*

Recommendations : stakeholders involvement

Attitude towards legislating against age discrimination

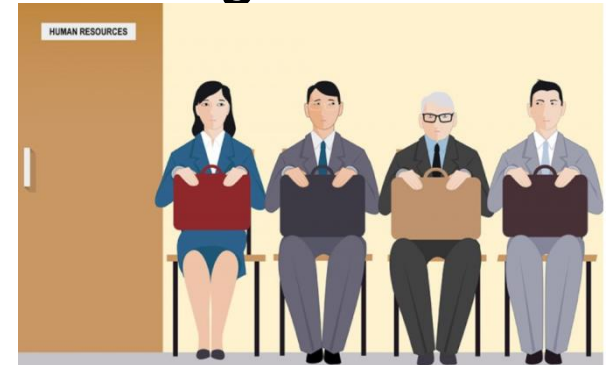
- **Subvented and commercial organizations : extending retirement age**
- **Policy research on eliminating age discrimination**

<http://www.eoc.org.hk/eoc/upload/ResearchReport/201616163452032905.pdf>



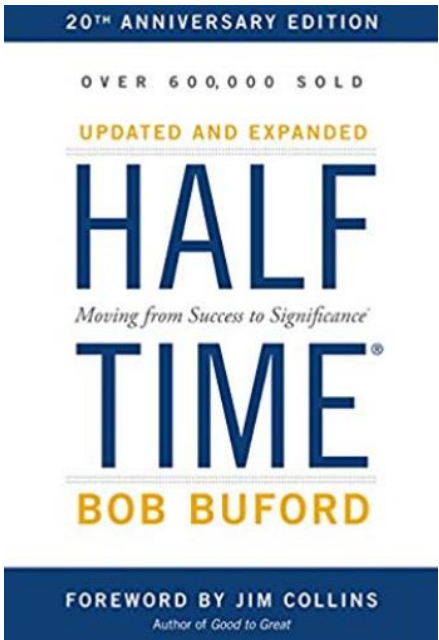
- **Review labour legislation on how to encourage older persons in reentering the work force**

- **Review by government and insurance sector on the premium policy for older workers**



<http://www.bauhinia.org/index.php/zh-HK/analyses/833>

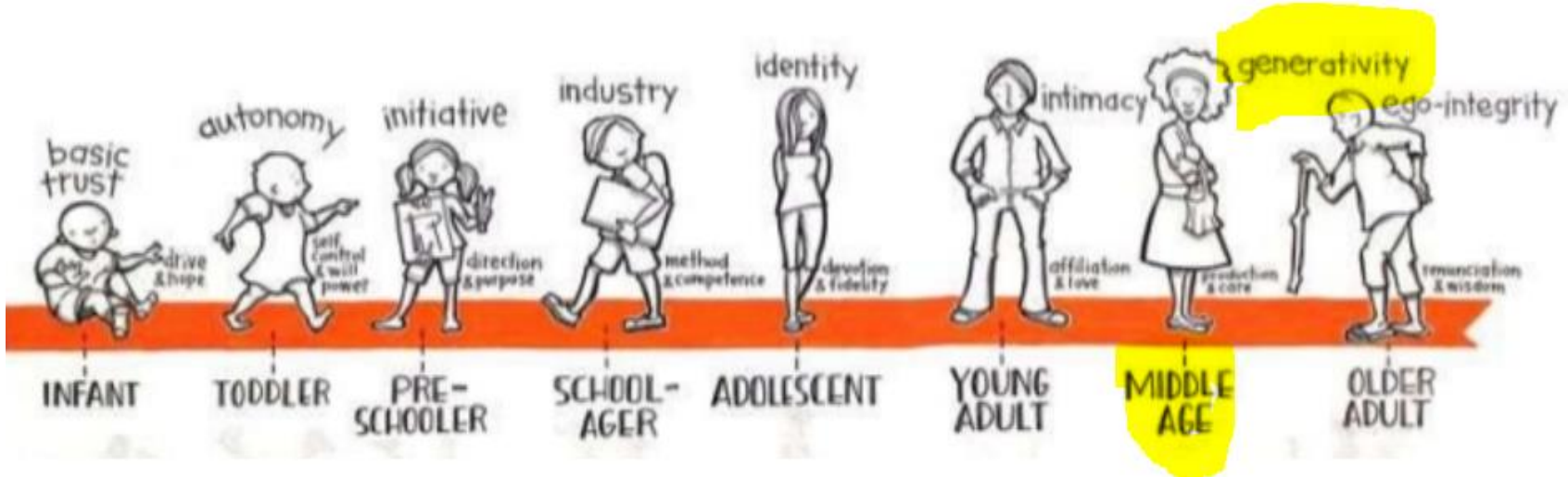
- **Involving matured persons in policy-making, e.g. Elderly Council**



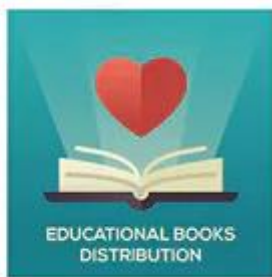
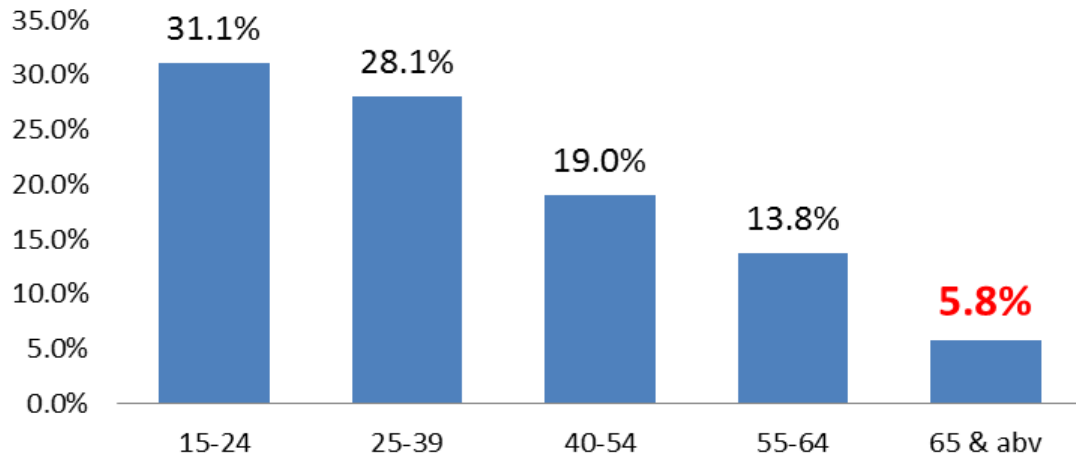
<https://www.cup.com.hk/2019/07/30/hongkongdigest-lamleung/>



Generativity Vs Self-centred / Stagnant



Volunteerism - Rate of participation by different age groups



Sources :

Survey on Volunteering in Hong Kong: Survey of NGOs and NGO Volunteers (2010)

Social Welfare Department, https://www.volunteering-hk.org/aboutvs/vs_intro/vs_stat

Volunteerism



Strengths of Older volunteers :

- ✓ Committed and serious
- ✓ Tough and would not easily give up
- ✓ Experienced and might teach staff how to improve team spirit



For the more educated volunteers, they volunteer because:

- ✓ Add meaning to life.
- ✓ A way of lifelong learning
- ✓ Develop communication skill and be more considerate and detailed minded

Haven of Hope Christian Service Corporate Volunteer Framework



榮譽委任
(Honorary Appointees of HOH)



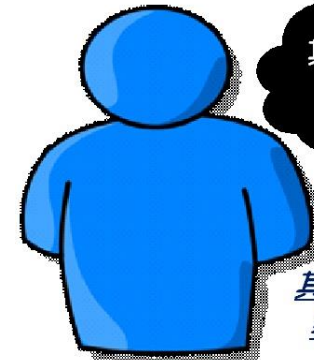
靈實戰友
(Comrades of HOH)



靈實之友
(Friends of HOH)



義工招募



其實咩人適合
做義工呢？

← 任何人

*其實任何人都可以
報名成為義工！*

請將您的姓名及「我想做義工」

Whatsapps至 **52371757** 報名。

查詢電話：27033328 (基督教靈實協會義務工作發展主任吳先生)



Volunteering for Haven of Hope Christian Service



- Moving and transportation
- Data processing
- Docent Service for guided tours
- Photography
- Repair of electric wheelchair
- Assistance in daily / outdoor activities



社職的義工配對app。
The Social Career app for volunteer matching.

Part II

Gerontechnology – Interface with our ageing population

- Challenges and Opportunities of Ageing Population in Gerontechnology Development
- Gaps in Gerontechnology Development
- Role of Government
- Challenges and Opportunities in Gerontechnology Development

The background features a glowing blue brain on a circuit board, with a white text box overlay. The brain is positioned in the center, and the circuit board is illuminated with a bright blue light. The text box is a semi-transparent white rectangle that contains the title text.

***Challenges and Opportunities of Ageing
Population in Gerontechnology Development***

(1) Challenge of Ageing Population : **Chronic Health Conditions**

Opportunity: Chronic Disease Management by **Tele-medicine & Self-management**

- Tele-monitoring-based interventions
- Elderly-friendly clinical decision support system
- Tele-medication systems
- Tele-rehabilitation (TR)



(1) Challenge of Ageing Population : **Chronic Health Conditions**

Opportunity: Chronic Disease Management by **Tele-medicine & Self-management**

Tele-medicine / Internet of Things (IoT)

Blood Pressure Monitoring Device



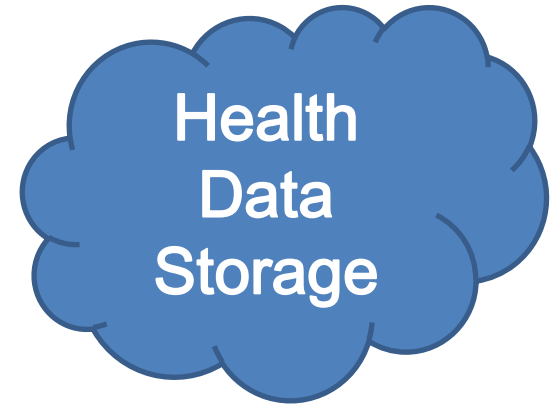
Bluetooth Low Energy (BLE)

Oximeter



Wifi

Health Data Storage



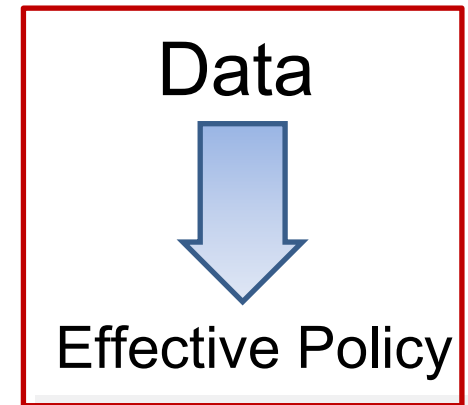
Auto Data Upload



(1) Challenge of Ageing Population : Chronic Health Conditions

Opportunity: Chronic Disease Management by Big Data Analytics

1. Efficient healthcare management
2. Disease prevention (e.g. infectious disease)
3. Public-Private collaboration :eHealth, quick assessment and treatment
4. Immediate alert, prompt treatment, prevent A&E visits
5. Patient engagement and understanding of health condition
6. Reduce cost of treatment
7. Increase quality of life



電子健康紀錄互通系統

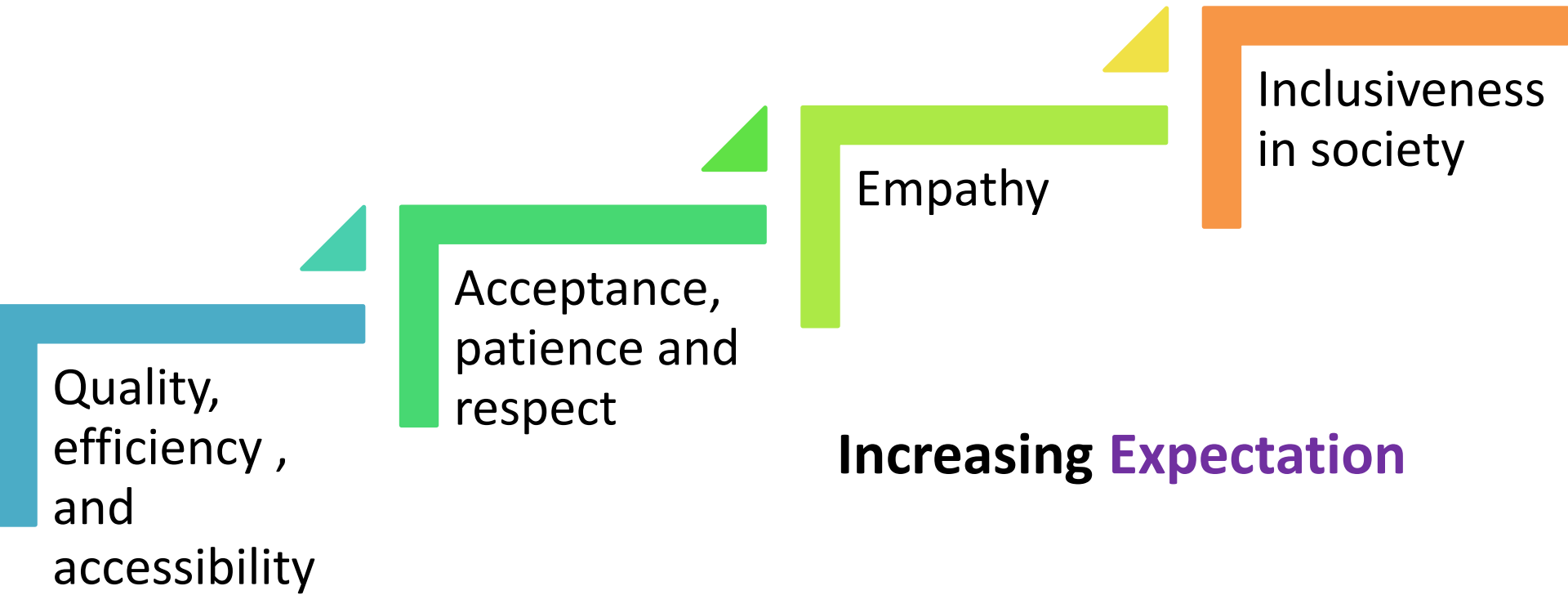
醫健通
ehealth
香港特別行政區政府 HKSAR GOVT

系統安全 保障私隱
自願登記 費用全免
減少失誤及 重複檢驗
即時取閱紀錄
更全面、 終身紀錄

歡迎參加

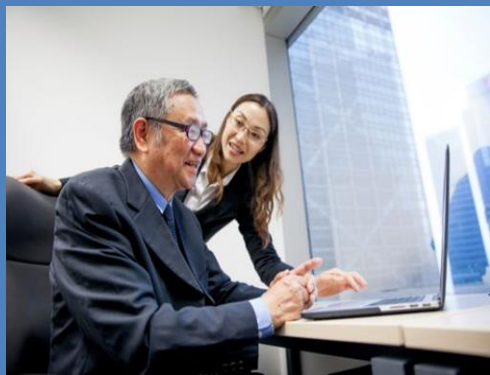
食物及衛生局
www.ehealth.gov.hk
3467 6300

(2) Challenge of Ageing Population : Increasing Needs and Wants



(2) Challenge of Ageing Population : Increasing Needs and Wants

Opportunity : Technology Penetration in Elderly Population



0.6% in 2000



31.1% in 2017

% of elderly who have used personal computer in the past year



0.2% in 2000



51.2% in 2017

% of elderly who have used the internet in the past year



14.7% in 2012*



52.1% in 2017

% of elderly who have smartphones

(2) Challenge of Ageing Population : Increasing Needs and Wants

Opportunity: Automation / Personal Devices

- **Autonomy**

- Auto guided wheelchairs

- **Ageing-in-place**

- Mobile hoists for home environment

- **Safety**

- Non-invasive blood glucose monitoring system



(2) Challenge of Ageing Population : Increasing Needs and Wants

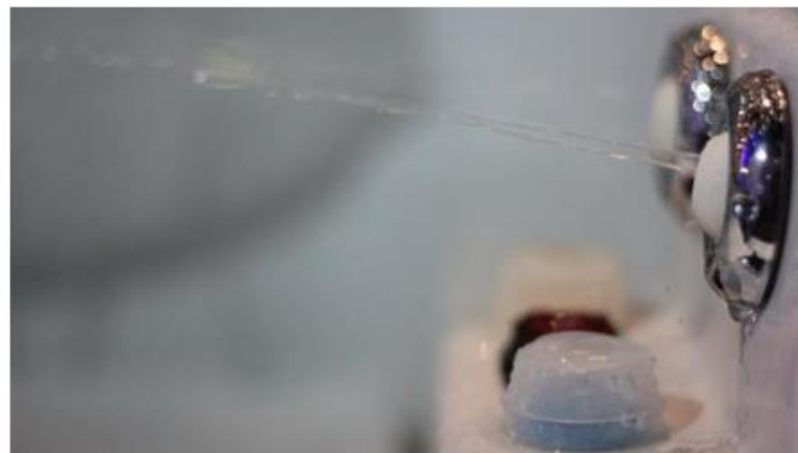
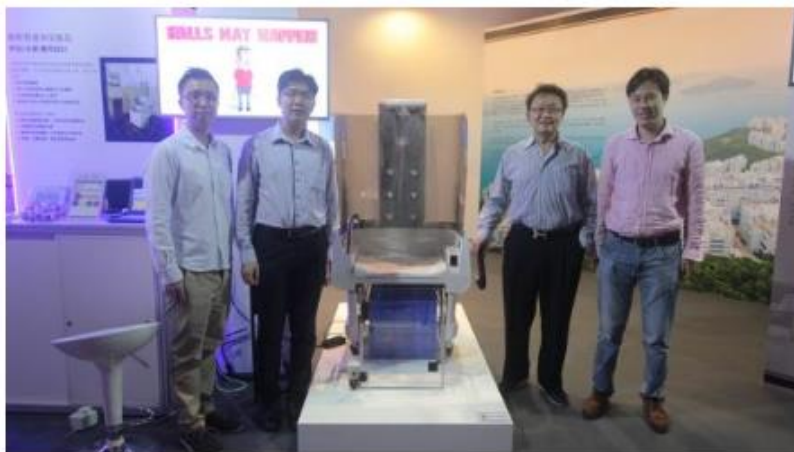
Opportunity: IT / Engineering

- **Continuous learning**
 - Information technology
- **Dignity**
 - 3D food printing



(2) Challenge of Ageing Population : Increasing Needs and Wants

Opportunity: **Assisted Technologies**



<https://www.ust.hk/news/research-and-innovation/bathing-elderly-made-easy>

(2) Challenge: Increasing Needs and Wants

Opportunity: Assisted Technologies



Robot assists lifting



Rehabilitation



From Bed to Wheelchair

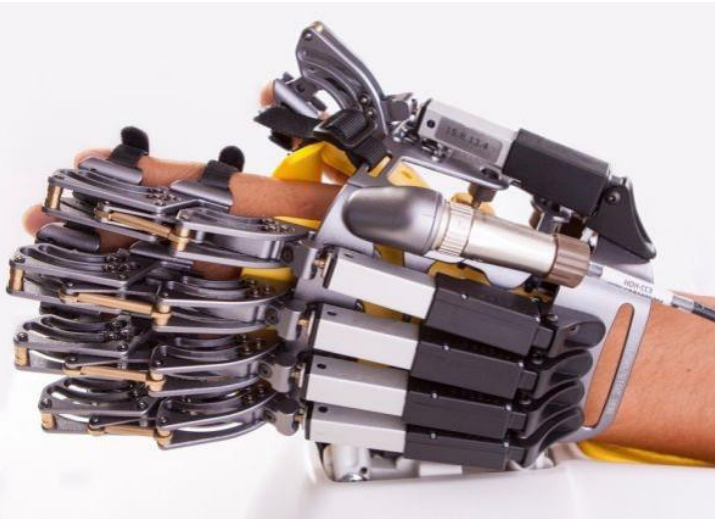


- avoid occupational and health hazards
- increase work effectiveness
- perform value-added task
- not to replace care workers
- reduce manual labour

Radio Frequency Identification (RFID) and GPS
Tracking Vest – Prevent Wandering

(2) Challenge of Ageing Population : **Increasing Needs and Wants** Opportunity: **Assisted Technologies**

Fully automatic bathing machine - the older person can bathe with little assistance from others -- >
Independence is important



Hand of Hope, a robotic hand used for stroke rehabilitation



(3) Challenge of Ageing Population : **Loneliness**

An epidemic of loneliness and social isolation

- Spark inflammation
- Change in the immune system
- More dangerous than obesity
- As deadly as smoking
- Dementia

No. of Singleton Elderly

2016: 152,536 (13% of total elderly population)

54.3%

2006: 98,829 (11% % of total elderly population)

Social Support

Connect people to build relationship networks

(3) Challenge of Ageing Population: **Loneliness**

Opportunity: **Robotics / Artificial Intelligence (AI)**

- **Intimacy**

- Cantonese/Mandarin speaking robots

- **Human touch**

- Computerized therapeutic training devices that can enhance human touch
- Computerized home assessment tool with age-related degeneration



(4) Challenge of Ageing Population : **Carers' Stress**



On a good night, Mrs Yu, 70, can get about three full hours of sleep.

That's if her husband, 75, who suffered a debilitating stroke in 2007, manages to get through the night without soiling himself or crying in pain from backache.

“It's a lot – a lot – of pressure. No one can imagine.”

(4) Challenge of Ageing Population : Carers' Stress

Opportunity: Internet of Things (IoT) / 5G

- Intelligent sensors for health and safety monitoring
- Fall detection > Fall prevention
- Indoor/outdoor location tracking
- 5G





Gaps of Gerontechnology Development in Hong Kong

Gaps of Gerontechnology Development in HK

Lack of awareness

Gerontechnology seen as supplementary rather than core

Lack of collaboration

Stakeholders like universities, research institutes, NGOs and government rarely cooperate

Valley of death

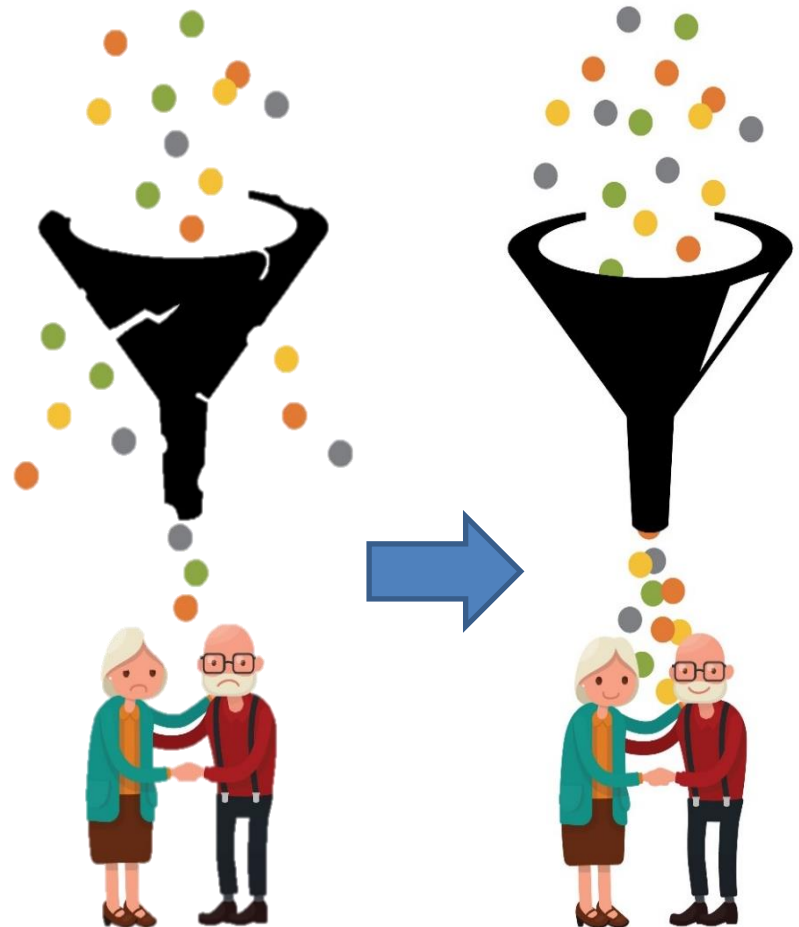
Hindrance faced by startups in ongoing research or commercialization of products

Lack of localized adaptability

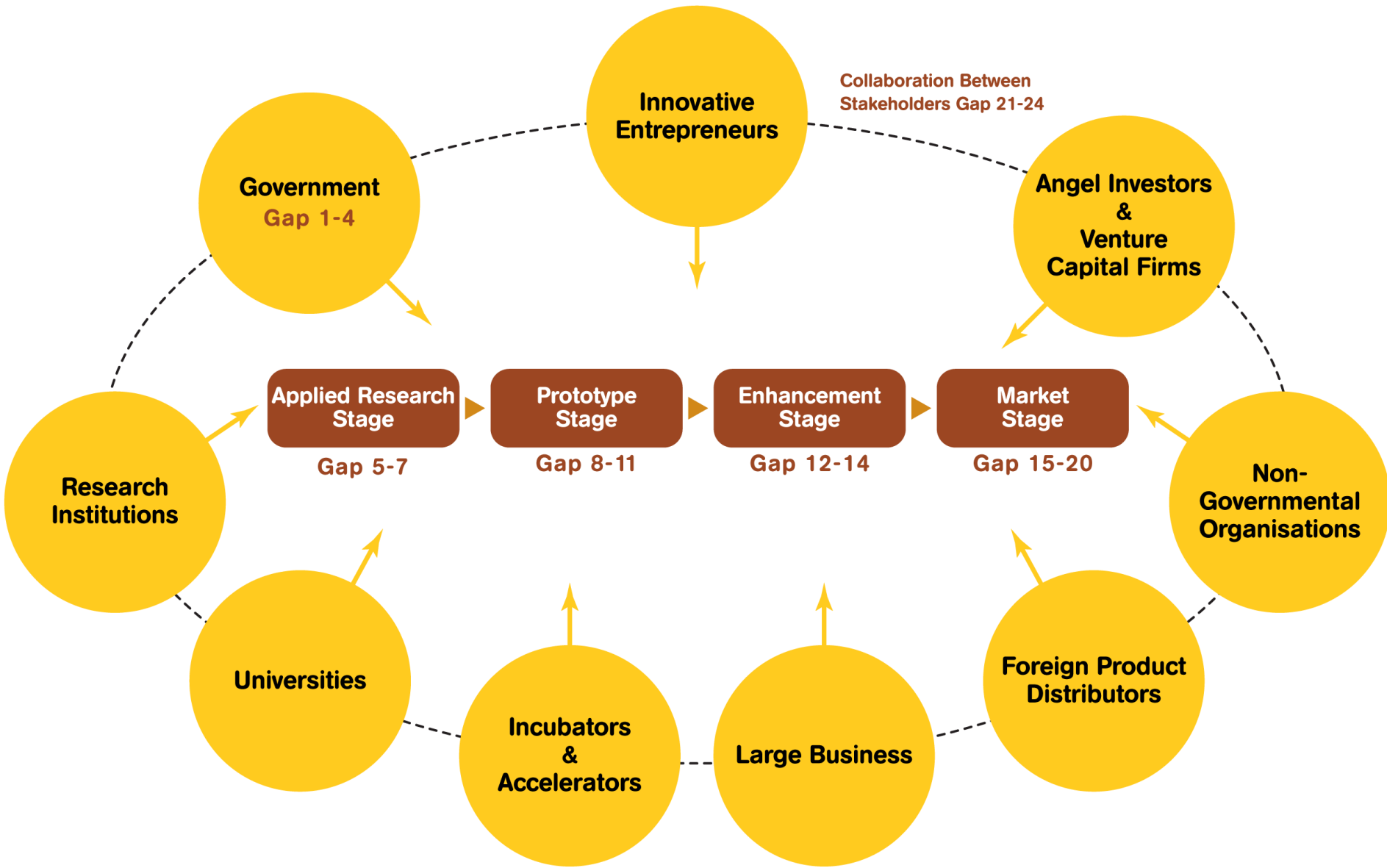
Due to cultural difference, products need to be locally adapted, but small market size deters such investment

Lack of test beds

Products can only be tested in laboratory environment, without practical trial at real life settings



Stakeholders within the Gerontech Ecosystem





***Role of Government in Gerontechnology
Development***

Role of government



- Provide service
- Provide financial assistance
- Encourage community-initiated organizations
- Promote social capital network

*Government is not always the best provider
In some areas, the community are better positioned to make it happen.*

What other countries are doing ?



UK

- **Technology Enabled Care Services**
- Telecare technology



Norway

- Nation-wide measures
- Welfare technology is a crucial part of care services
- E.g. GPS for dementia patients, electronic pharmacy



Japan

- 5-year programme to develop robotic care
- Research on affordable assistive robots

Hong Kong Smart City Blueprint

Smart Government

Smart Living

Smart People

Smart Mobility

Smart Environment

Smart Economy

Hong Kong
Smart City
Blueprint



Major directions in Govt ICT Policy



R&D additional tax deduction



Review relevant legislation



Local ICT talents



Open up data by government departments



Provide support on investment capital



Pro-innovation govt procurement policies



ICT infrastructure



STEM

Elderly Services Programme Plan (ESPP) Recommendations

Resource allocation : for service providers and service users

-> improved quality of life and service quality

- An **integrated service provider interface** with the LDS built on the LDS database with enhanced SCNAMES functions is to be explored.
- Enhance elderly persons to effectively use ICT to enhance **digital inclusion** and enable them to have better **health management**.
- Use of ICT to enhance **quality of care delivery**



Explore the use of technology and digital equipment to promote occupational health and safety -> reduce risk of injury at work

Social Service Sector : Gerontechnology development milestones



- ICT strategic plan for social service sector
- Established “Jt Comm on IT Technology for the Social Welfare Sector”
- Established \$1 Bil Social Welfare Development Fund”
- Review of the IT Strategy for the Social Welfare Sector



- Midstream Research Programme for Universities



- GeronTech Cluster “Glink”
- Innovation and Technology Fund for Application in Elderly and Rehabilitation Care

90's



2000 - 2015



2016



2017



- Innovation and Technology Fund for Better Living
- Gerontech and Innovation Expo cum Summit
- The First Landscape Study of Gerontechnology in Hong Kong



2018

Way forward



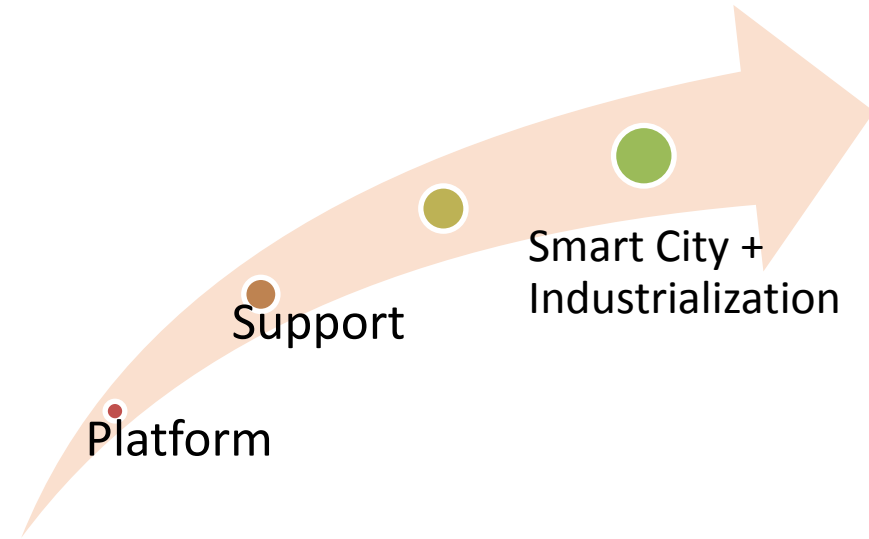
2019

- Subvented organizations provide WIFI service

- Social service sector started using information technology
- “Call & Care” Service

Social Service Sector : Innovation and Technology Fund for Application in Elderly and Rehabilitation Care

- The Government has earmarked \$1 billion to subsidise elderly and rehabilitation service units to procure, rent and trial use technology products, so as to improve the quality of life of service users as well as reduce the burden and pressure of care staff and carers.



- Grants will be issued in five years from 2019-20
- More than 1,260 service units will benefit

Healthcare Sector : Hospital Authority (2017-2022 Strategic Plan)

- **Next Generation Clinical Management System**
- **Enhance Patient Experience and Outcome**
- **Digital Workplace and Collaboration**
- **Advanced Process and Infrastructure**
- **Resource Centralisation and Specialisation**



A nighttime photograph of a city skyline, likely Hong Kong, with numerous skyscrapers illuminated. A semi-transparent white rectangular box is overlaid on the upper portion of the image, containing the title text. The background shows the dense urban landscape with lights reflecting on the water in the foreground.

Challenges and Opportunities in Gerontechnology Development

(1) Challenge and opportunity : **Market Size**



Internal opportunities: Baby boomers

Lack of Localized Products and Local Distributors

- **Small living spaces:** Compact size of genrotech products
 - The median floor area of accommodation of domestic households: **430** sq ft
 - The median per capita floor area of accommodation: **161** sq ft
- **Language:** Communication robots
 - Cantonese/Mandarin as medium

(1) Challenge and Opportunity : **Market Size**

Market Size

Elderly average expenditure: HK\$6325.8 per month

Elderly population: 1.22m

Elderly residential care homes: around 930

Mainland China: around 28,000 elderly residential care homes (30 times that of HK); 131m elderly (107 times that of HK)

Hong Kong: an entry to Mainland China

Hong Kong's Unique Role

- One country two system
- Rule of law
- Intellectual property rights
- Connectivity with global Market
- Largest Initial Public Offering (IPO)
- Share the same Chinese culture
- Strengthen alliance in the Greater Bay Area

(1) Challenge and Opportunity : **Market Size** → **Research and Development Infrastructure**

External opportunities: The Greater Bay Area

- 56 100 km²
- 68million population
- **US\$1.5 trillion** GDP

The Hong Kong-Shenzhen I&T Park at the Lok Ma Chau Loop

- To establish **centres of R&D** excellence in support of I&T development
- **87-hectare** site adjacent to Shenzhen
- **1.2 million square metres** total gross floor area

(2) Challenge and Opportunity : **Collaboration between Stakeholders**

**Insufficient
Collaboration**



(2) Challenge and Opportunity : Collaboration between Stakeholders

→ Public Awareness and Cross-sectoral Collaboration

The Gerontech and Innovation Expo cum Summit (GIES)

on 22-25 Nov 2018

- Number of exhibitors of GIES in 2017: 116
- Number of attendees of GIES in 2017: over 43,000
- **Japanese speakers and exhibitors**



Gerontech Platform by the Social Innovation and Entrepreneurship Development Fund (SIE Fund)

- Involvement: the private sector, NGOs, the government, universities and the public



(2) Challenge and Opportunity : Collaboration between Stakeholders

→ SIE Fund Gerontechnology Platform



- *collaborations across different initiatives or platforms*
- *encourage gerontechnology development and application*

- to engage one intermediary to design, develop and operate an inclusive platform so as to facilitate the development of the gerontechnology ecosystem in Hong Kong
- This is a one-off grant.
- The intermediary is required to devise a business model which will be financially sustainable for the scope of services set out in the invitation brief

The gerontechnology platform will comprise 4 basic elements:

- knowledge hub;
- network and capacity building;
- consultancy, localisation and testing support; and
- impact assessment.

(2) Challenge and Opportunity: Collaboration between Stakeholders → Testing Ground

Testing ground: Universities / NGOs

- Facilitate the application of technology in elderly care industry in Hong Kong

Opportunities for gerontech companies:


- Develop localized products
- Build network



Testing new products
may increase
workload



Prefer to use
reputable mature
products



Prefer to use
funding to hire
more employees
instead

(3) Challenge and Opportunity: **Valley of Death**



(3) Challenge and Opportunity: **Valley of Death** → **Government's Support and Funding**

Government's support and funding for I&T and R&D:

- **Smart City Blueprint:** Smart Hong Kong
- Support for I&T and R&D in **Policy Address** 2018
 - Additional **HK\$20 billion** to strengthen the research capabilities of our universities
 - **HK\$10 billion** to develop healthcare technology e.g. artificial intelligence and robotics technology
- Government's support and funding for gerontech: **HK\$1 billion**
Innovation and Technology Fund for Application in Elderly and Rehabilitation Care
- **Hong Kong Science and Technology Parks (HKSTP)**
 - Create a vibrant innovation and technology ecosystem to deliver social and economic benefits to Hong Kong and the region

Gerontechnology : what makes it works

1. High-tech and high-touch: Technology enables human to **spare time for work with value**
2. Engagement of end users: **User experience** is of utmost importance of a successful smart ageing solution




High Touch



High Tech

High Touch

Co-creation of products, services and policy

- Gerontech will not replace **human touch**
- Older adults value self-care, **“Ageing in Place”**
- More **opportunities** of older persons 
 - ✓ *Decision making, Design,*
 - ✓ *Product development, Assessment*
- Understanding the **needs and preferences** of older users, consider their living environment
- Prevent investing in things not suitable for elders’ use
- **Collaborations** with different stakeholders

Concluding remarks



Thank you

