



Designs for Health and Well-being: Tackling Non-communicable Disease Challenges in the 21st Century

Prof EK Yeoh

Director, The Jockey Club School of Public Health and Primary Care
Head, Division of Health System, Policy and Management

Outline

- Challenges of Non-communicable disease
- Ecological modes of health behaviour



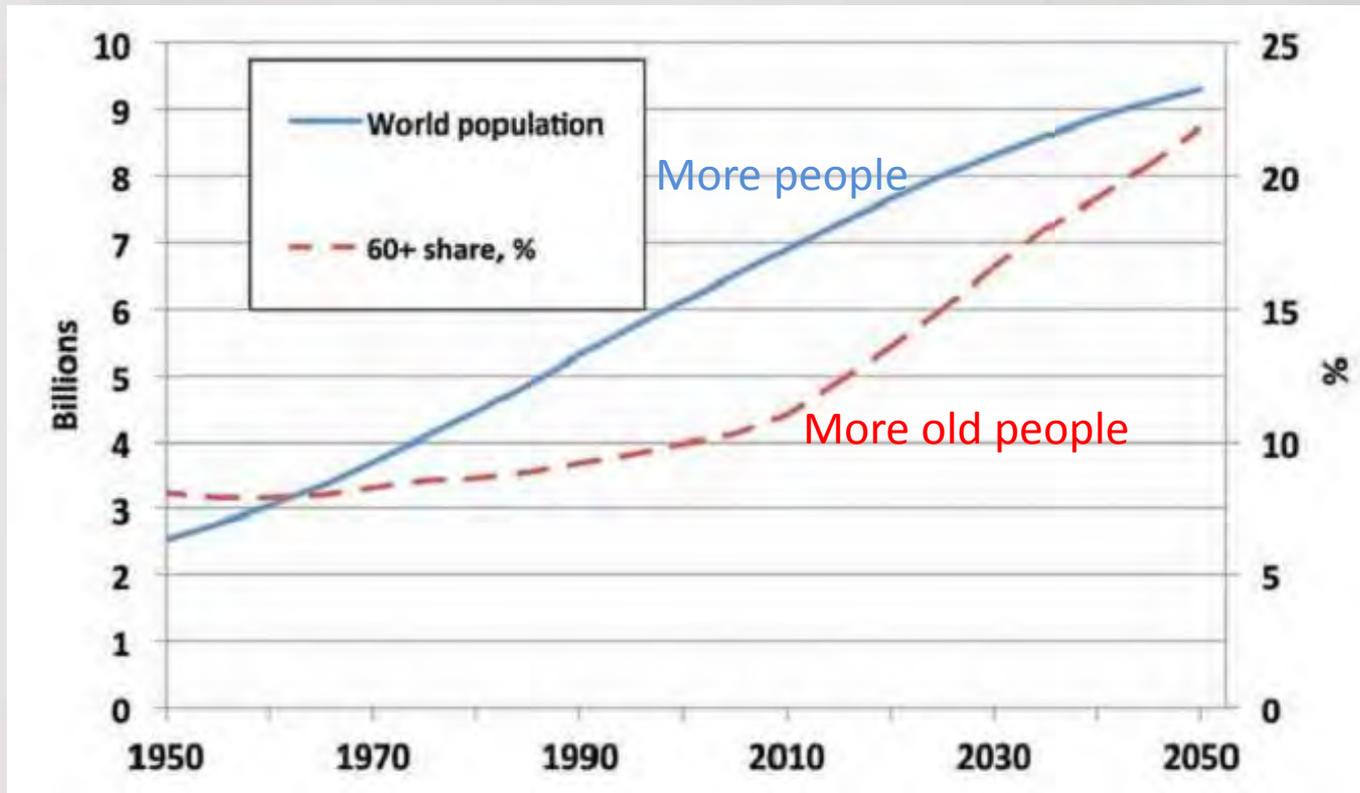
Health and Well-being

- “Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.” (WHO, 1948)
- There is no consensus definition of well-being, but in general:
 - “well-being can be described as judging life positively and feeling good” (CDC, 2013)

Preamble to the Constitution of the World Health Organization as adopted by the International Health Conference, New York, 19-22 June, 1946; signed on 22 July 1946 by the representatives of 61 States (Official Records of the World Health Organization, no. 2, p. 100) and entered into force on 7 April 1948.

Centers for Disease Control and Prevention. Well-being concepts. Updated 6 Mar 2013; Accessed 8 Jul 2015. URL: <http://www.cdc.gov/hrqol/wellbeing.htm>

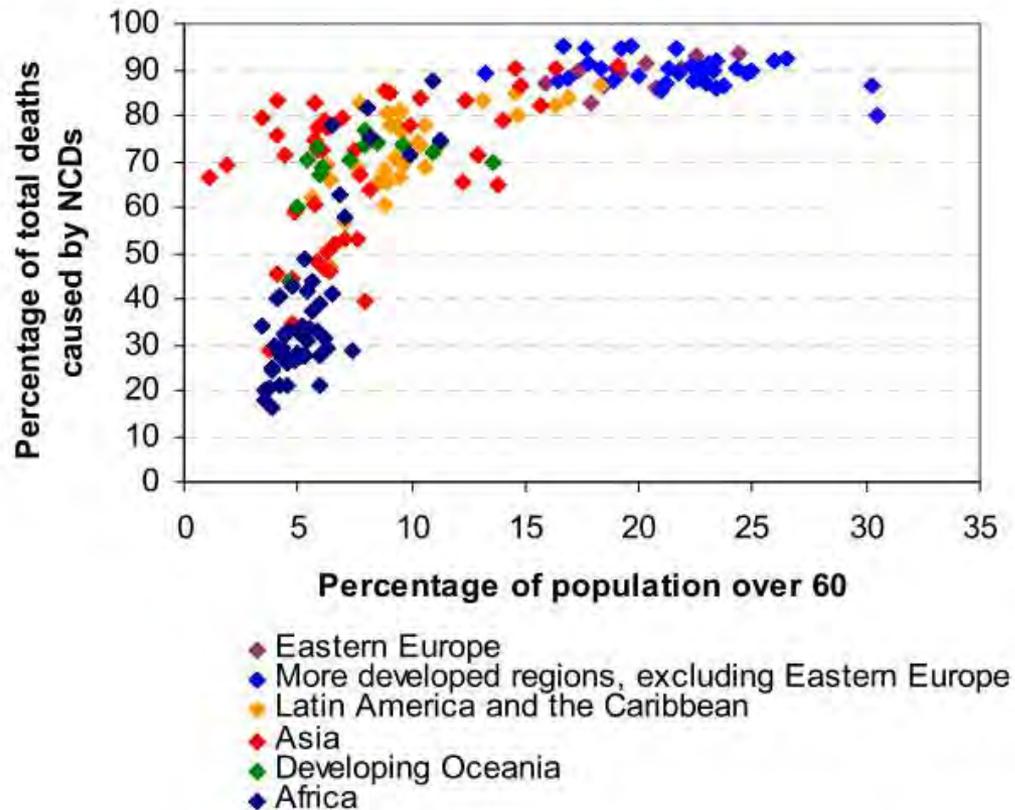
Ageing and increasing population



Bloom et al. The global economic burden of noncommunicable diseases. Geneva: World Economic Forum. 2011

Ageing and NCD mortality

In countries with a large percentage of population over age 60, the vast majority of deaths are caused by NCDs



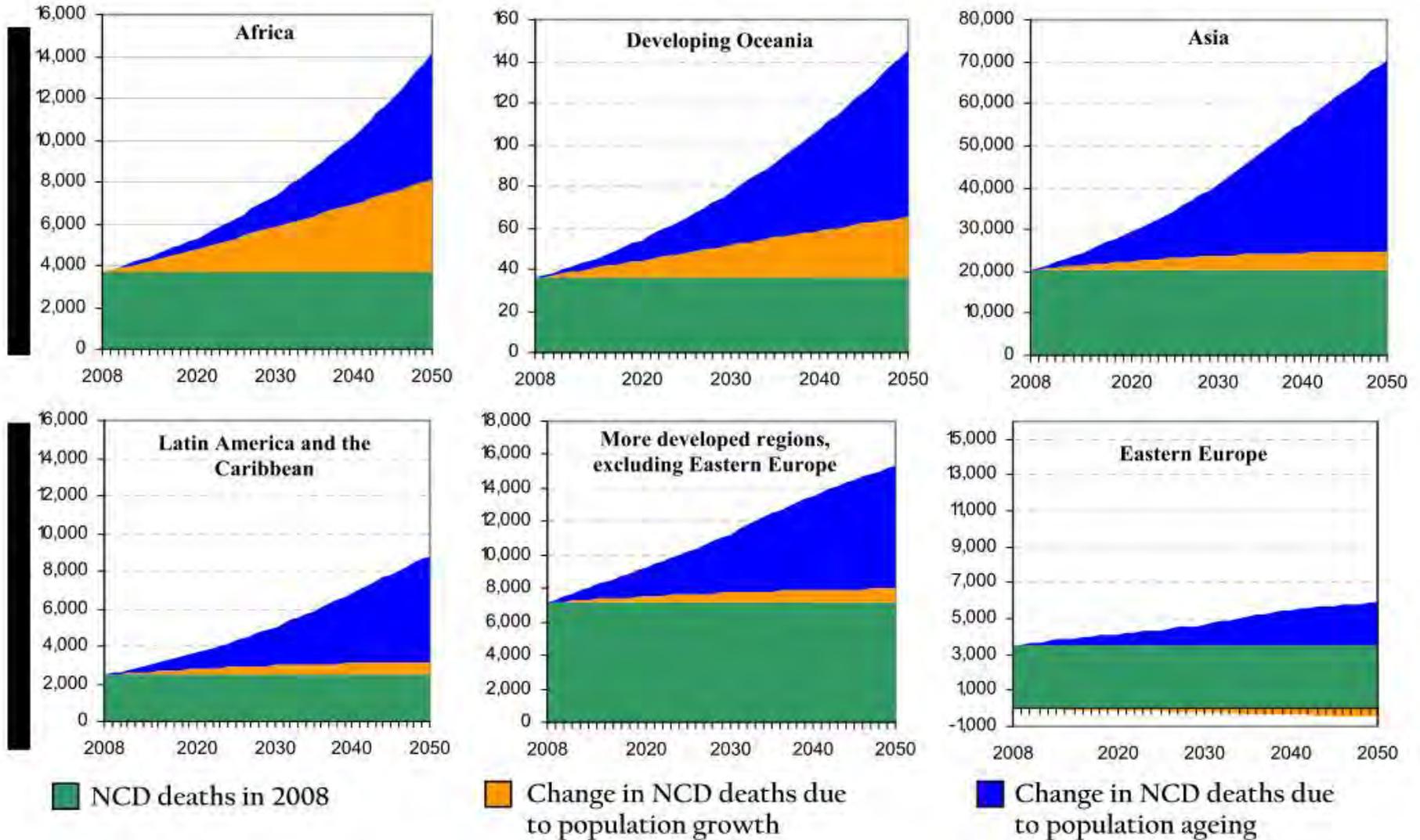
United Nations Department of Economic and Social Affairs, Population Division. Population Facts No. 2012/1. April 2012

香港中文大學醫學院

Faculty of Medicine

The Chinese University of Hong Kong

Even if no changes were to occur in the age-specific risks of dying due to NCDs into the future, population growth and ageing would still produce large increases in the burden of mortality due to NCDs



United Nations Department of Economic and Social Affairs, Population Division. Population Facts No. 2012/1. April 2012

香港中文大學醫學院

Faculty of Medicine

The Chinese University of Hong Kong

Looking beyond deaths

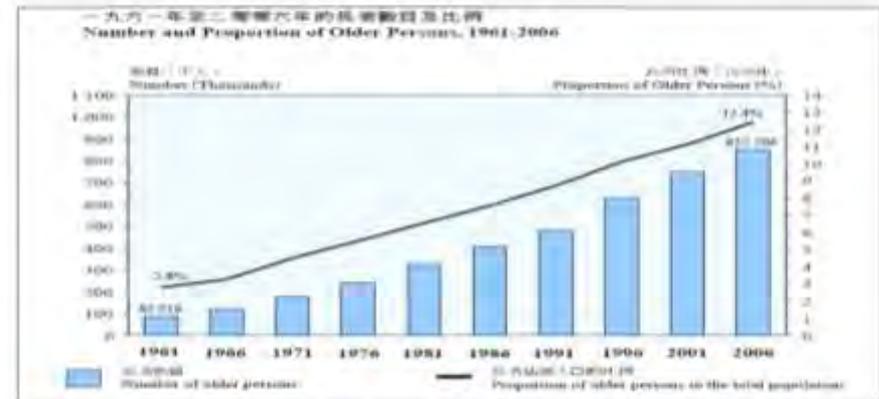
- Pain and suffering caused by treatment and surviving NCD
- Productivity costs are substantial
 - NCD requires long-term management
 - Work attendance affects by care-seeking and disability
 - Premature removal from workforce

Ageing and NCD in Hong Kong

- 59% of the 1.15 million people with NCDs in HK are elderly (>60 years)
- 75% of elderly >65 are suffering from ≥ 1 NCD (diabetes, CVDs, chronic bronchitis most common among elderly)
- >46% of the hospital day-beds are occupied by older persons while they represent only about 11% of the total population

Census & Statistics Department's updated population projection. The population trends show that there is a need to revise the provision of social services.

The population is expected to remain on an ageing trend. The population of those aged 65 and over is predicted to increase from 12% in 2006 to 26% in 2036. In 2006, the life expectancy was 79.5 years for men and 85.6 years for women. Over the next 30 years, it is expected that the life expectancy of men and women would be 82.7 years and 88.3% respectively.



Source from A Profile of Older Persons published by Hong Kong Census and Statistics Department 2006

Source B The Social and economic background of Hong Kong's elderly

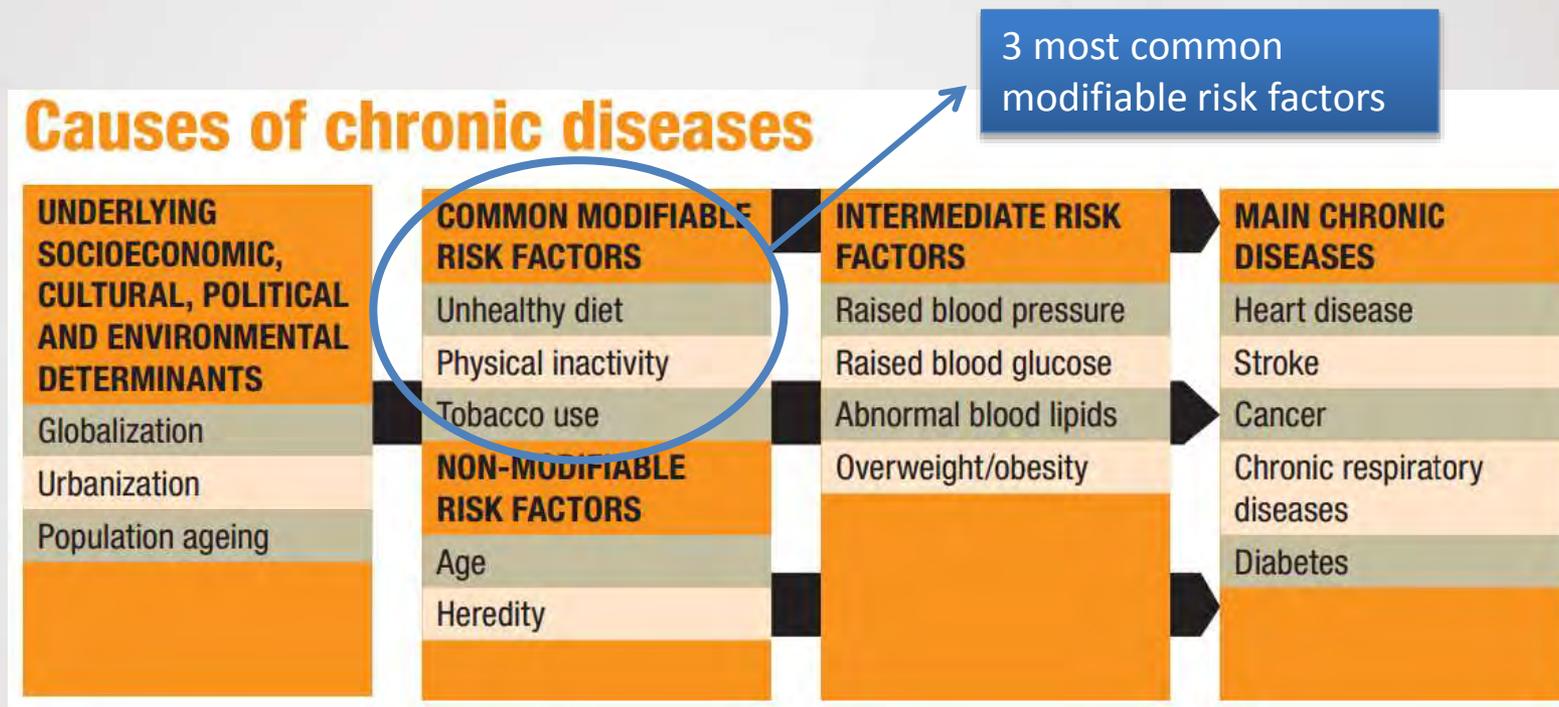
Total Number of Elderly: 1,129,900 % of elderly in the total population: 16.2%

Living arrangements	Elderly employment and income
78.4% (Total Elderly: 1,129,900)	44.0% (Total Elderly: 1,129,900)

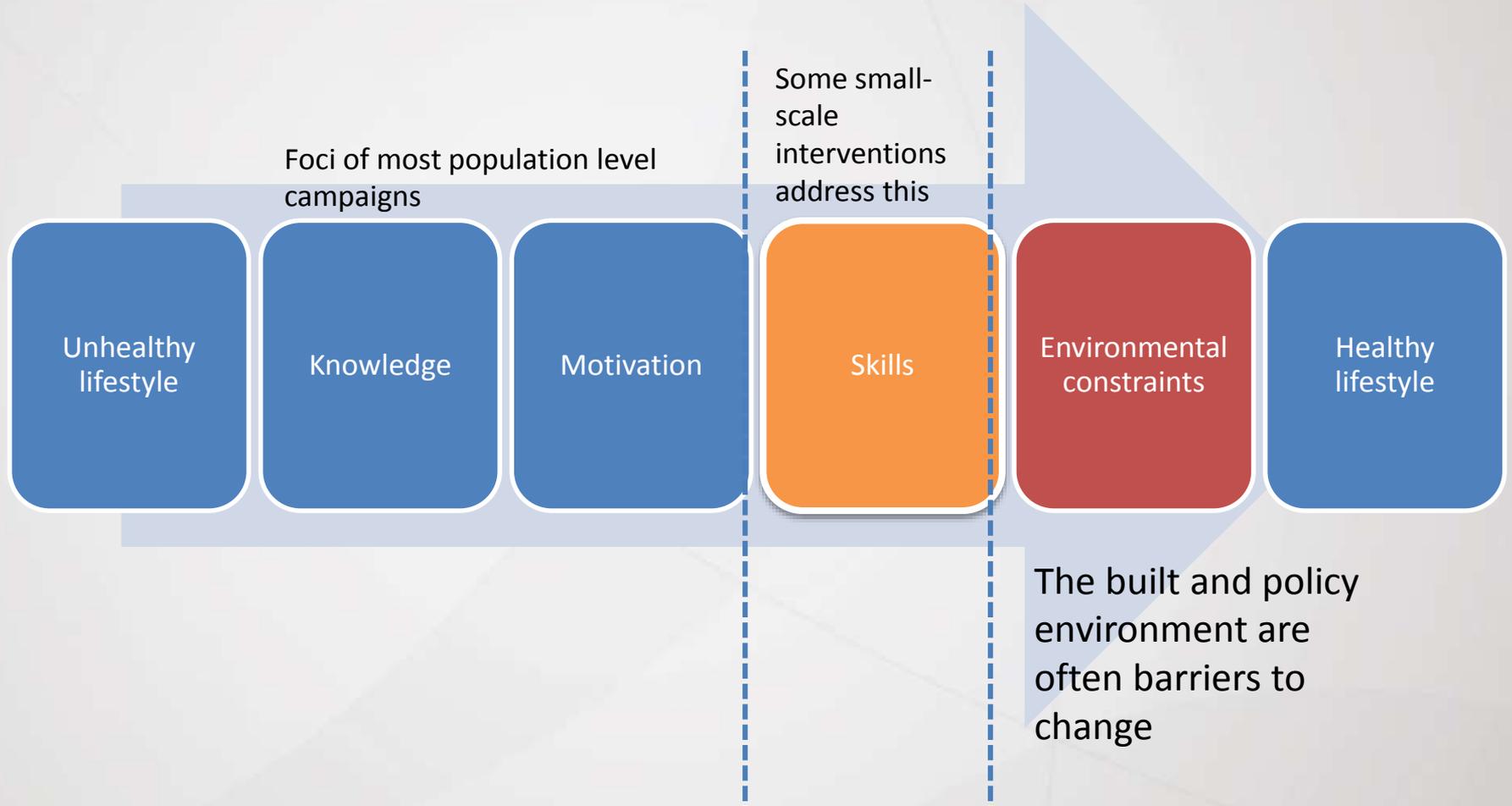
NCD is not the end

- NCD is a serious social problem, but it is not the end
 - People who manage their NCD properly can enjoy health and have good quality of life
 - People who have severe NCD can have well-being

Lifestyle change is necessary



Barriers to change



Ecological perspective



Ecological models of health behavior

- There are many different ecological models, but they can be summarized into **4 core principles**
 - Multiple levels of influences
 - Influences interact across levels
 - Behavior specific
 - Intervention needs to target multiple levels
- From the ecological perspective, in order to achieve the desired outcomes(s), one need to systematically target factors across multiple levels (eg individual, community, organization, and socio-economic) that are important for the specific behavior

Sallis JF, Owen N, Fisher EB. Ecological models of health behavior. In: Glanz K, Rimer BK, Viswanath K, editors. Health behavior and health education: theory, research, and practice. 4th ed. Jossey-Bass. 2008

香港中文大學醫學院

Faculty of Medicine

The Chinese University of Hong Kong

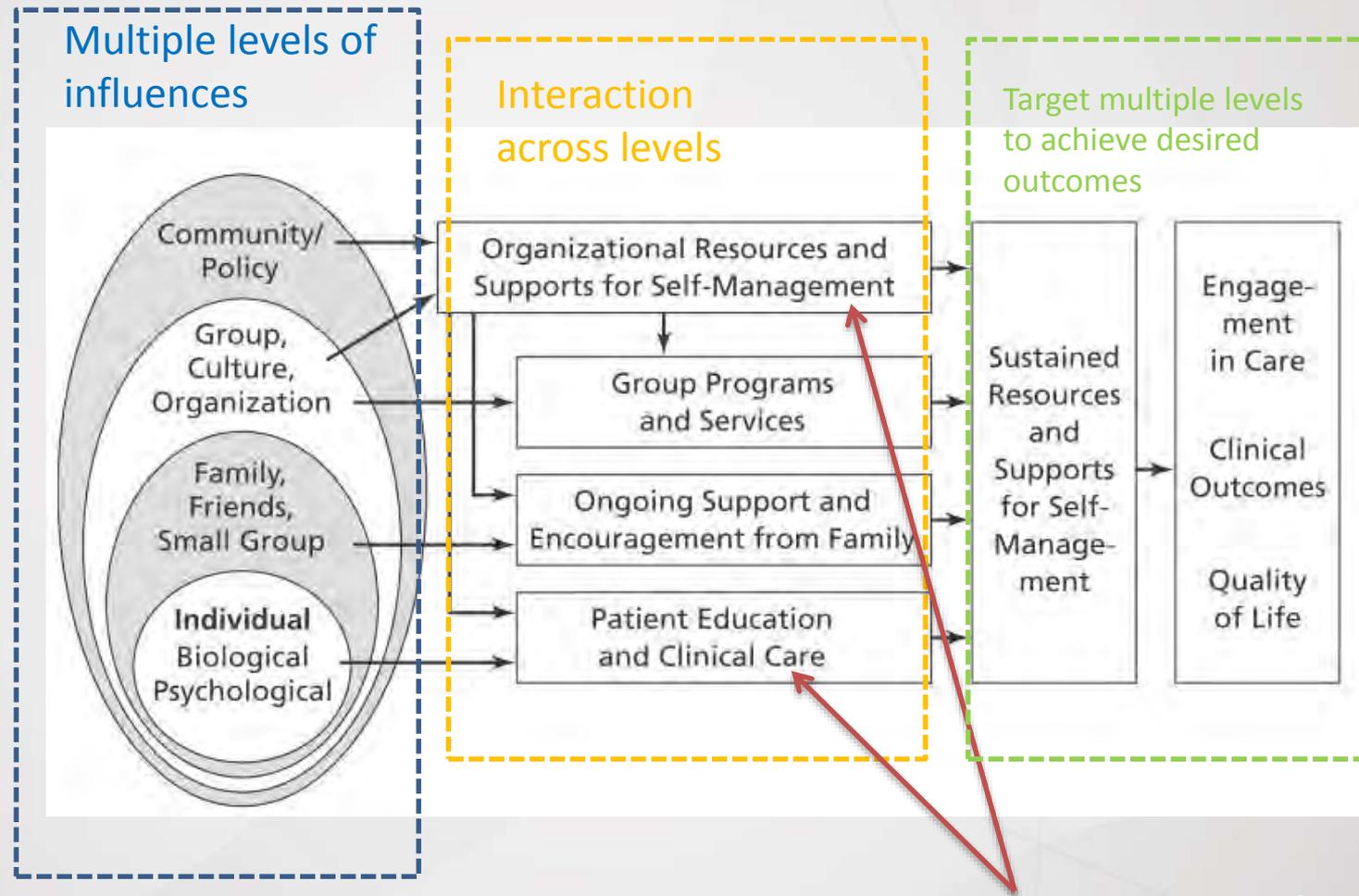
Ecological models of health behavior

- **Multiple levels of influences**
 1. Intrapersonal (biological, psychological)
 2. Interpersonal (social, cultural)
 3. Organizational
 4. Community
 5. Physical environmental
 6. Policy

Sustainable behavior change

- **Consistent healthful choices require:**
 1. Motivated and educated individuals
 2. Conducive environments and policies support
 3. Social norms and social support

Diabetes self-management example



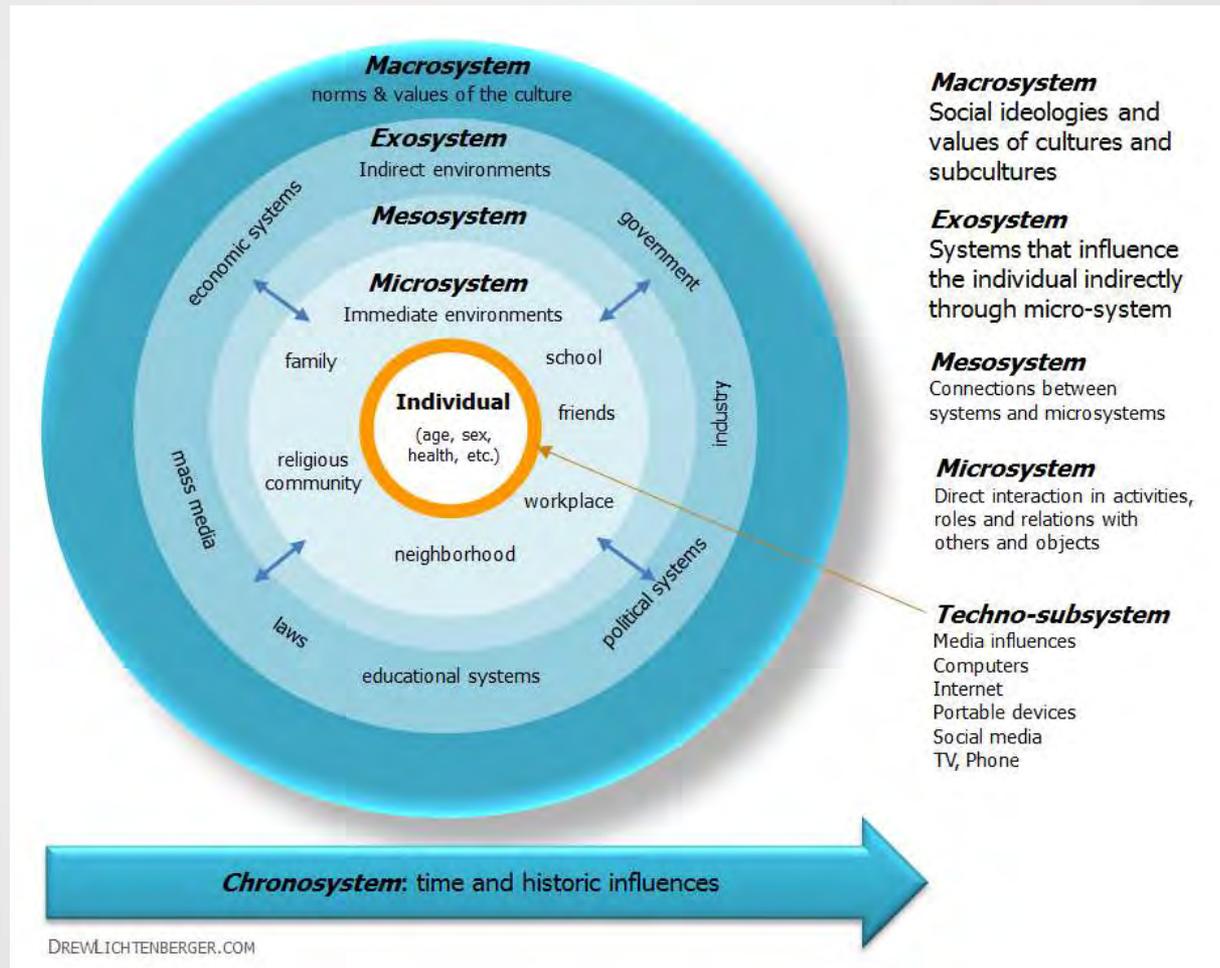
Behavior specific

Human ecology theory

Bronfenbrenner's ecological systems theory - the 5 systems:

1. **Microsystem:** institutions and groups directly impact
2. **Mesosystem:** interconnections between microsystem, interactions between family and teachers, relationship between child's peers and the family
3. **Exosystem:** links between a social setting in which the individual does not have an active role and individual's immediate context
4. **Macrosystem:** cultural contexts in which individuals live, socioeconomic status, poverty, and ethnicity
5. **Chronosystem:** environmental events and transitions over the life course

Bronfenbrenner's ecological systems theory



Global action plan

- “To reduce modifiable risk factors for NCDs and underlying social determinants through creation of **health-promoting environments.**” (World Health Organization, 2013)

Global action plan for the prevention and control of noncommunicable diseases 2013–2020. Geneva: World Health Organization; 2013

香港中文大學醫學院

Faculty of Medicine

The Chinese University of Hong Kong

Safety and accessibility of built environment

- Several aspects of housing design are considered to affect the ability of older people & people with disabilities to live comfortably at home:
- In general, it is considered important to have accommodation that:
 - has even surfaces;
 - has an elevator if it is multi-level accommodation;
 - has railings & non-slip floorings in bathroom and kitchen;
 - has passages and doorways large enough to accommodate a wheelchair;
 - and is appropriately equipped to meet the ambient environmental conditions

Neighborhood designs

- Physical environment
 - Proximity of housing to amenities
 - Range of public facilities / amenities
 - Safety & convenience
 - Availability of parks / open space
- Social environment
 - Community centers as a place for social gathering
 - No. of social events
 - Attract residents from different backgrounds, ages, cultures → intergeneration, intercultural integration

Design a healthy environment



This design separates the smokers and non-smokers.

But does it encourage people to quit?

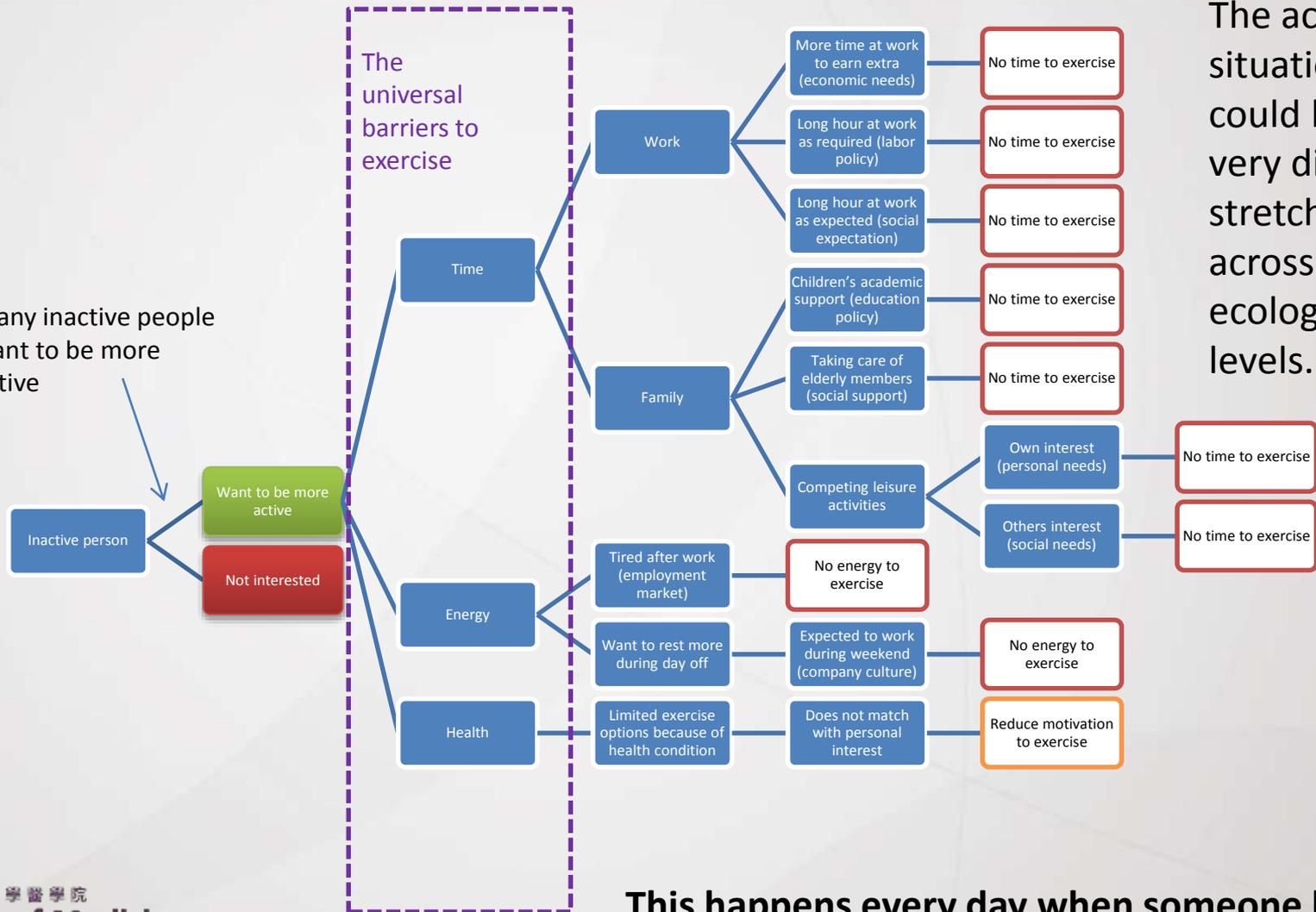
Would it be a trigger to smoke for those who are trying to quit?

Go beyond the built environment

- The environment should be designed to facilitate the “healthier choice”
- However, the choice to become healthy is not an on-off switch
- Traditional health promotion mostly assume that people are “rational” who would act according to the best of their interest once they know the facts. **But we know that is not true**
- Change of lifestyle is a continuous, long-term effort that riddles with barriers

The “user experience” of choosing to be active

Many inactive people want to be more active



The actual situation could be very diverse, stretching across all ecological levels.

This happens every day when someone have to make the decision to exercise.

Difficulty of making choice

- One-time decision such as register for organ donation is relatively simple when compare to lifestyle change
- As illustrated in the previous “choosing to be active” example
- For smokers, they are constantly attacked by cravings and withdrawal
- For healthy diet, research found that people have to make 200-300 decisions about what to eat on a typical day (Wansink and Sobal, 2007)

Wansink B, Sobal J. Mindless eating: the 200 daily food decisions we overlook. *Environment and Behavior*. 2007;39:106-123.

Dual-system framework of human behavior

1. Automatic System (default system)

- rapid intuitive solutions
- associative, influenced by context
- sensitive to immediate pleasure
- save cognitive effort

2. Slow System

- takes over when default solution feel wrong
- controlled
- deliberative
- dependent on cognitive capacity

Human decision making

- We are not aware that we made those 300 dietary decisions every day because we don't actually "think" about them when we made the decisions
- Decisions that require deliberate thoughts are processed by the (slow) Reflective System (System 2)
- Using the Reflective System is mentally taxing. And it requires the person to have complete information about the situation (which we usually don't have)
- Therefore, we mostly make decisions under familiar situations using the (much faster) Automatic System (System 1) to reduce cognitive loads
- We typically use a few rule of thumbs as mental short-cuts to make decisions through the Automatic System (Amos and Kahneman, 1974). That can lead to seemingly irrational behavior

Amos T, Kahneman D. Judgment under uncertainty: heuristics and biases. Science. 1974;185:1124-31.

Choice architecture

- The real choice is not between healthy and unhealthy lifestyle
- Thaler and Sunstein (2008) coined the term “choice architecture” to reflect the needs to design the a system that could “nudge” people towards more desirable behaviors
- For example, using opt-out or forced choice for organ donation registration instead of opt-in increased registration rate (Johnson and Goldstein, 2003; Thaler et al, 2010)

Thaler RH, Sunstein CR. Nudge: improving decisions about health, wealth and happiness. New Haven: Yale Univ Press. 2008.

Johnson EJ, Goldstein DG. Do defaults save lives? Science. 2003;302:1338-1339.

Thaler RH, Sunstein CR, Balz JP. Choice Architecture (April 2, 2010). Available at SSRN: <http://ssrn.com/abstract=1583509>

Choice architecture

Process of designing systems and services in such a way that the “good choice is easy and rewarding and does not take much effort.

Choice architecture - tools

1. Defaults
2. Expecting error
3. Understanding mappings
4. Giving feedback
5. Structuring complex choices
6. Creating incentives

Guided choices

- The choice architecture approach respects the personal freedom to choose, to make informed-decision
- The key is to construct the different options in such a way that people are more likely to choose the more desirable option, **even when their behaviors are controlled by the Automatic System**
- Attention should also be placed on the “user experience”, the experience of the people who need to make the choice and change their behavior

How would you open
this door?



What about now?



Stimulus response compatibility

- Seeing flat plate on door signals pushing
- Handle on door signals pulling
- But many of us have encountered doors with handles on both sides that can only be opened to one side. **That violates stimulus response compatibility**



Good design?



Successful design if the desired outcome is separation of smoker and non-smoker to reduce 2nd hand smoke

Design failure if the desired outcome is for smokers to not smoke or quit

Lack of empathy

- Many current efforts are designed from the top-down, often assuming that whatever worked in another place would work for the local population as well (just like it worked for medical treatment)
- Societal level health promotion effort often forget about population diversity
- From marketing, we know that different groups of people behave different (market segments). There is no reason to believe that segmentation won't happen just because the behavior is different
- For example, sometimes we said we want to give more choices to people. But older adults prefer less choice than younger adults (Reed et al., 2008)
- Raising the price of all-you-can eat pizza buffet led people to eat more (Just and Wansink, 2011)
- To design better choices, we need to be more empathetic towards the people

Reed A, Mikels JA, Simon KI. Older adults prefer less choice than young adults. *Psychology and Aging*. 2008;23:671-675.

Just DR, Wansink B. The flat-rate pricing paradox: conflicting effects of “all-you-can-eat” buffet pricing. *The Review of Economics and Statistics*. 2011;93:193-200.

香港中文大學醫學院

Faculty of Medicine

The Chinese University of Hong Kong

Design thinking

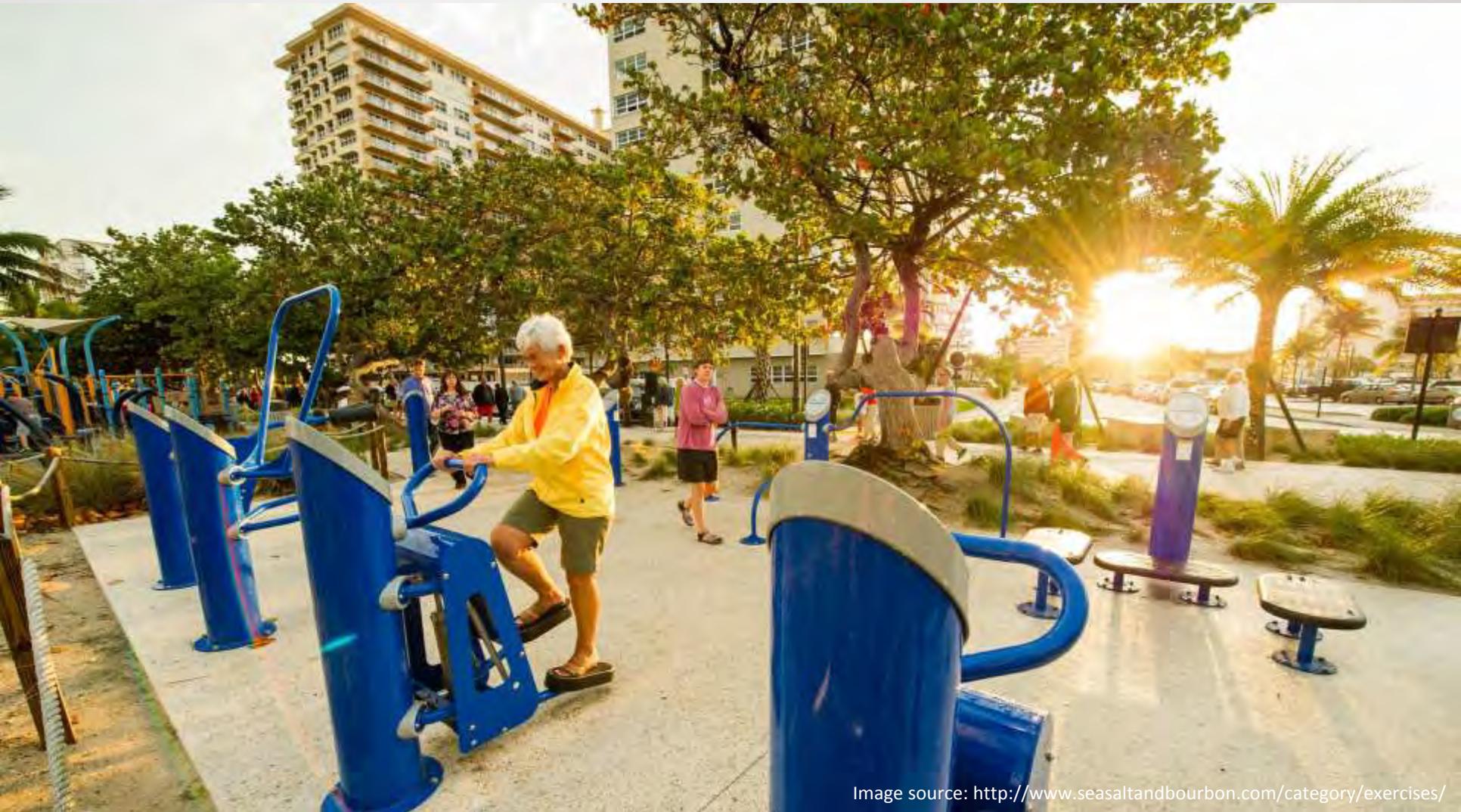
- Borrowing from the design thinking process (Brown, 2009), choice architects could:
 - Assume the beginner’s mindset, don’t assume the “experts” have all the answers. **Be empathetic**;
 - Don’t settle for the middle-ground (on average...). Learn from the extremes, especially the “positive deviants” who are already performing the desired behavior to a very high degree. They might provide important insights;

Brown T. Change by design. Collins Business. 2009.

Ageing in place

- To achieve “ageing in place”, instead of the current top-down approach that placed the responsibility on the people themselves, a more supportive environment is needed
- Not just the built environment, but the choice environment should be carefully constructed
- The aim is to **create good choices and user experience** for the people so they are more likely to perform the desired behaviors (not smoking, active lifestyle, healthy diet, etc.)
- That is the future for managing NCD in an ageing society

How do we construct the **choice environment** so that sedentary people will want to come to the park? (and make other healthy lifestyle choices)



Thank You!

