Loneliness and Mortality: Results from a Longitudinal Survey of Social Isolation, Health, and Lifestyles

Angelique Chan
Duke-NUS Graduate Medical School, Singapore
Department of Sociology, Singapore

Outline

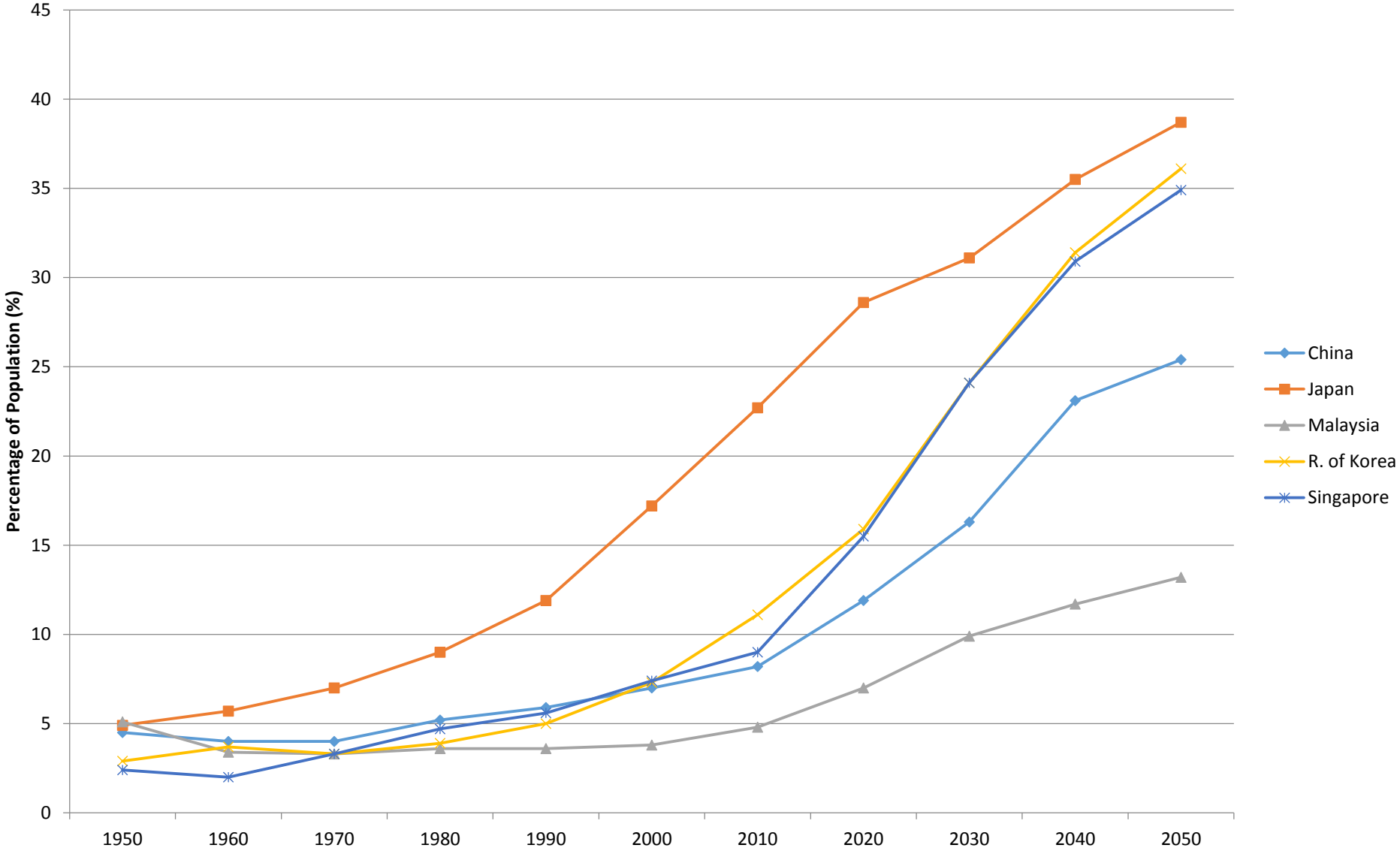
- Demographic changes in Singapore and the East Asian region
- Implications
- Priority areas for research and policy
  - Long-term care
  - Caregiver burden
  - **Social isolation**
- Analyses of the effects of social isolation on mortality in Singapore
- Results and discussion


KAZAKHSTAN
MONGOLIA
CHINA
INNER MONGOLIA
SINKIANG
TIBET
INDIA
PAKISTAN
AFGHANISTAN
NEPAL
BHUTAN
BANGLADESH
MYANMAR (BURMA)
THAILAND
CAMBODIA
MALAYSIA
INDONESIA
PHILIPPINES
NORTH KOREA
SOUTH KOREA
JAPAN
SRI LANKA
MALDIVES
UZBEKISTAN
KYRGYZSTAN
TAJIKISTAN
ASTANA
ULAN BATOR
BEIJING (PEKING)
PYONGYANG
SEOUL
TOKYO
KABUL
ISLAMABAD
NEW DELHI
KATHMANDU
DACCA
RANGOON
HANOI
VIENTIANE
BANGKOK
PHNOM PENH
MANILA
KUALA LUMPUR
JAKARTA
COLOMBO
TAIPEI
TAIWAN
Hong Kong
Shanghai
Gobi Desert
Lake Baikal
Sakhalin
Hokkaido
Honshu
Kyushu
Shikoku
Kuril Islands
SEA OF OKHOTSK
SEA OF JAPAN
YELLOW SEA
EAST CHINA SEA
SOUTH CHINA SEA
ARABIAN SEA
Bay of Bengal
INDIAN OCEAN
NORTH PACIFIC OCEAN
MARSHALL ISLANDS
INTERNATIONAL DATE LINE
TROPIC OF CANCER
EQUATOR
Sumatra
Java
Borneo
Celebes
Luzon
Hainan

Demographic changes in Singapore and East Asia

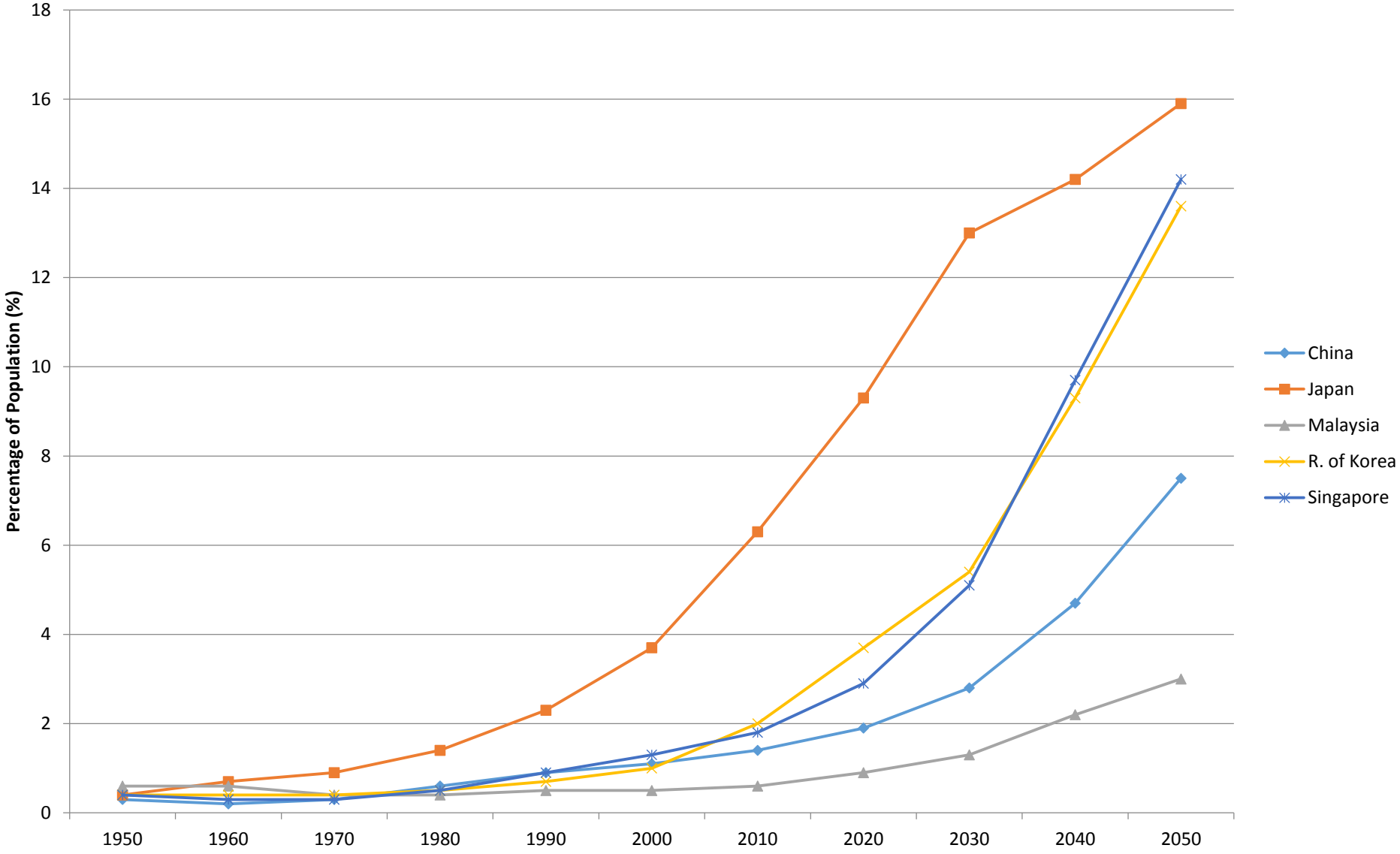
- Lower fertility
- Higher rate of non-marriage
- Later marriage
- Increased longevity

Percentage of Population aged 65+



Source: Population Division of the Department of Economic and Social Affairs of the United Nation Secretariat, *World Population Prospects: The 2010 Revision,* http://esa.un.org/unpd/wpp/index.htm

Percentage of Population aged 80+



Source: Population Division of the Department of Economic and Social Affairs of the United Nation Secretariat, *World Population Prospects: The 2010 Revision,* http://esa.un.org/unpd/wpp/index.htm

Implications of Demographic Trends

- Fewer family members available to support older adults
- Sandwich generation caring for children below 12 and members aged 65+ simultaneously
- Longer period of caregiving → increased financial and emotional burden (E.g., dementia)

Other implications of population aging

- Increased dialogue on:
  - Social integration of older adults within families and society
  - Burden of chronic disease
  - Caregiving
  - Role of family versus the State in providing care
  - Sustainable health system
- **NEED FOR EVIDENCE-BASED POLICY FORMULATION**

Priorities for Older Persons in East and Southeast Asia

- Maximize family care
- Aging in place
- Strengthen community based health care services
- Minimize hospitalizations and institutionalization
- **HOW?**

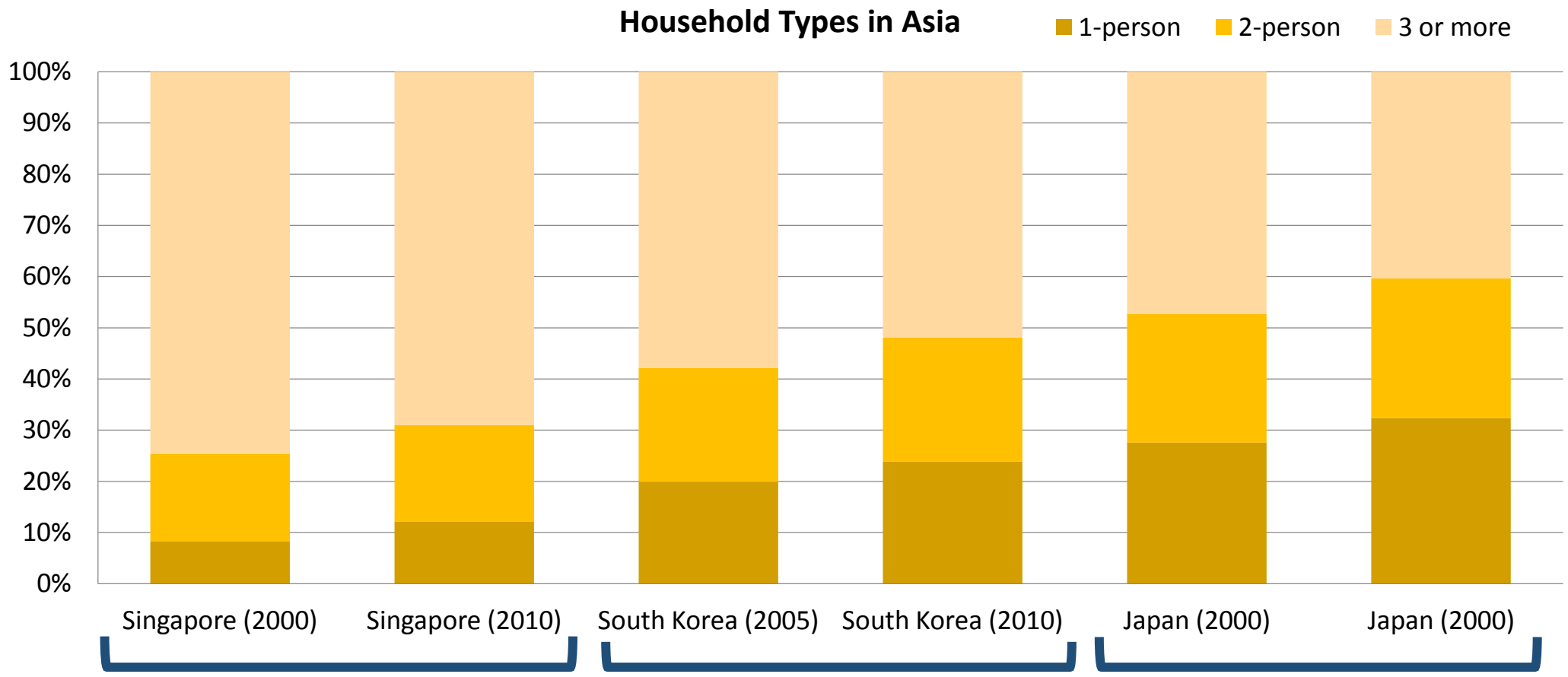
Rethink social policies

- Reconsider traditional assumptions
- Account for changing cohort characteristics
- Not one size fits all: need targeted policies

Example: Social policy and living arrangements

- Traditional social policies in Asia have enforced the importance of living in multi-generational families.
- Recent evidence has shown a decline in multigenerational households and an increase in single and two person households.
  - How do living arrangements impact health of older adults?
- Will traditional policy work going forward?

Trends in living arrangements in Singapore, South Korea, and Japan



Source: UN Demographic Yearbook

Why is loneliness important?

Social relationships, or the relative lack thereof, constitute a major risk factor for health - rivaling the effect of well-established health risk factors such as cigarette smoking, blood pressure, blood lipids, obesity, and physical activity.

(House, Landis, and Umberson; *Science*, 1988)

How does loneliness affect mortality?

Pathways

Main effects model: Social relationships directly encourage protective health behavior, and loneliness can alter human physiology (increased vascular resistance, higher systolic blood pressure)

Buffering model. Social relationships help dampen responses to stressors.

How is loneliness measured?

Three dimensions
(Holt-Lunstad et al. 2010)

Social networks: Level of integration in social networks
E.g. involvement in community and religious groups

Supportive social interactions
E.g. inter-generational transfers

Individual: Perceptions of availability of support
E.g. feelings of alienation and dislocation

Research questions

Research questions

1. Independent of health, is loneliness associated with mortality?

2. How do different dimensions of loneliness affect mortality?

Approach

1. **Loneliness + socio-demographics**

2. Loneliness + socio-demographics **+ social networks**

3. Loneliness + socio-demographics + social networks **+ living arrangements**

4. Loneliness + socio-demographics + social networks + living arrangements **+ health**

Methods

- **PHASE -1 , 2009**
  - Nationally representative survey conducted by MCYS of community-dwelling adults aged 60 years and above (N=4,990)
- **PHASE – 2 2011**
  - Follow-on to SIHLS
  - Sample restricted to only those who answered the social isolation questions in 2009 (N=3,802)

- Variables: Socio-demographics, chronic diseases, social isolation and loneliness, cognitive impairment, depression, disability, functional status, vision, sleep, lifestyle, dental health, mental health

Methods: Cox proportional hazards model

- Outcome variable: Mortality based on follow up survey and National Death Registry, up to December 2012
- Time-to-event calculated in days calculated from the 2009 interview date
- Covariates from baseline survey
- Baseline survey weights used
- Stata 12 (StataCorp, College Station, TX)

Measuring social isolation

UCLA 3-item Loneliness Scale

- How often do you feel that you lack companionship?
- How often do you feel left out?
- How often do you feel isolated from others?

Responses: Always, fairly often, occasionally, rarely, never

- Score range: 0-12

Independent variables

Modified Lubben Social Network Scale (12 questions)

- How many relatives/friends/neighbors …
  - do you see or hear from at least every month?
  - are close enough to ask for help or discuss private matters?
- How often do relatives/friends/neighbors…
  - consult you before making an important decision?
  - available to talk when you have an important decision to make?

Independent variables

Living arrangements (categorical)

- Living…
  - alone
  - only with spouse
  - only with child(ren),
  - with spouse AND child(ren)
  - only with others

Independent variables

- **Socio-demographic:** Age, gender, ethnicity, marital status, housing type, and education

- **Health**: Number of comorbidities, ADL limitations, IADL limitations, smoking status, depression, cognition

Table 1: Distribution of social networks outside the household (Lubben's revised scale) and living arrangements by extent of loneliness

N=4536	Loneliness		
	Never lonely 49% (n=2259)	Sometimes lonely 32% (n=1390)	Mostly Lonely 19% (n=887)
Social networks outside the household			
Isolated	25.8	17.6	29.3
High risk of isolation	22.1	22.9	22.1
Moderate risk of isolation	23.5	28.4	34.9
Low risk of isolation	28.7	31.0	13.7
Living arrangements			
Alone	4.7	5.5	13.1
With spouse only	17.4	18.0	14.1
With children only	18.3	15.3	29.2
With spouse and children	54.9	54.9	36.8
With others only or maid only	4.7	6.4	6.8

Social networks outside the household (modified version of Lubben's revised social network scale): Scale consisted of 12 items (6 each for social networks with friends and with relatives outside the household). Scores from all 12 were added up, a higher score indicating stronger social networks. Cumulative score was divided in quartiles for the above tables. Those in the first quartile were considered isolated, those in the second at high risk of isolation, those in the third at moderate risk of isolation, and those in the fourth at low risk of isolation.

*n's are unweighted

Table 2: Distribution of extent of loneliness and living arrangements (Lubben's revised scale) by social networks outside the household

N=4536	Social networks outside the household			
	Isolated 23.8% (n=1117)	High risk of isolation 22.4% (n=1145)	Moderate risk of isolation 27.2% (n=1086)	Low risk of isolation 26.6% (n=1188)
Loneliness				
Never lonely	52.9	48.4	42.2	52.9
Sometimes lonely	23.8	32.8	33.5	37.3
Mostly lonely	23.3	18.8	24.3	9.7
Living arrangements				
Alone	9.1	7.7	5.6	4.2
With spouse only	16.4	16.8	20.2	23.5
With children only	30.2	24.8	24.5	18.0
With spouse and children	36.3	44.9	44.8	50.2
With others only or maid only	8.1	5.9	4.9	4.0

Loneliness: The UCLA three-item loneliness scale was used to assess loneliness. The three items were: How often do you feel you lack companionship? How often do you feel left out? How often do you feel isolated from others? Each item had five possible responses (always, fairly, often, occasionally, rarely, never), scored from 0 (always) to 4 (never). The score of each item was reverse coded, and were added up. Scores were divided into 3 categories: never lonely (0), sometimes lonely (1-3), mostly lonely (4-12)

*n's are unweighted

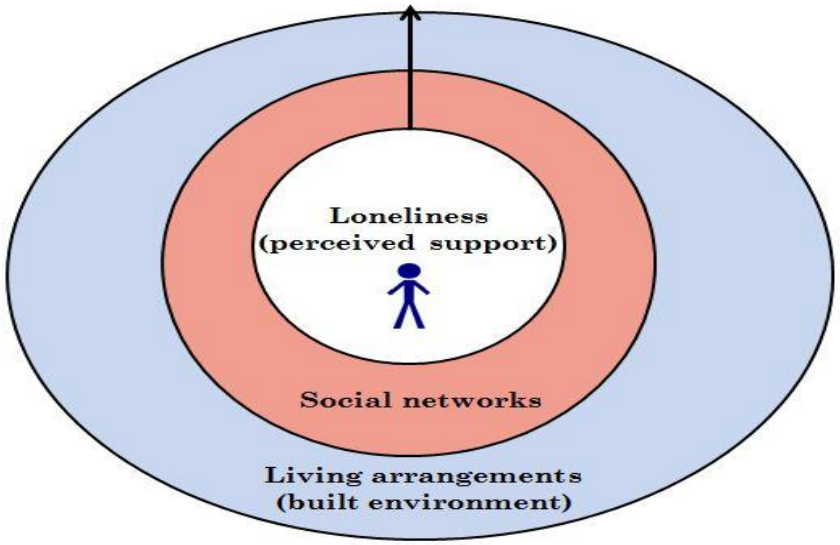
Results of multivariate analyses

Variable	Unadjusted	Model 1 (Loneliness and social isolation	Model 2 (…. + sociodemographic)	Model 3 (…. + health indicators)
Lonely				
Never lonely	ref	ref	ref	ref
Sometimes lonely	1.5*	1.55*	1.41*	1.44*
Mostly lonely	1.91*	1.82*	1.62*	1.34
Social Isolation				
Isolated	2.07*	1.97*	0.47*	0.71
High risk	1.87*	1.77*	0.90	0.90
Moderate risk	1.46*	1.35*	0.62*	0.97
Low risk	ref	ref	ref	ref

Insight

- Perceived loneliness is associated with a greater risk of death in Singapore
  - It is more predictive of mortality than living arrangements and social networks

How can we apply what we learned to policy?



- Multi-generational housing may be valuable, but it is not sufficient
- Policy should address perceived loneliness
  - Psychosocial services
  - Promote awareness by community and health care providers

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