東邦大学

生命の科学で未来をつなぐ

Estimating social burden of 3 major diseases including LTC in Japan :

Super-aging society changes the breakdown of burden

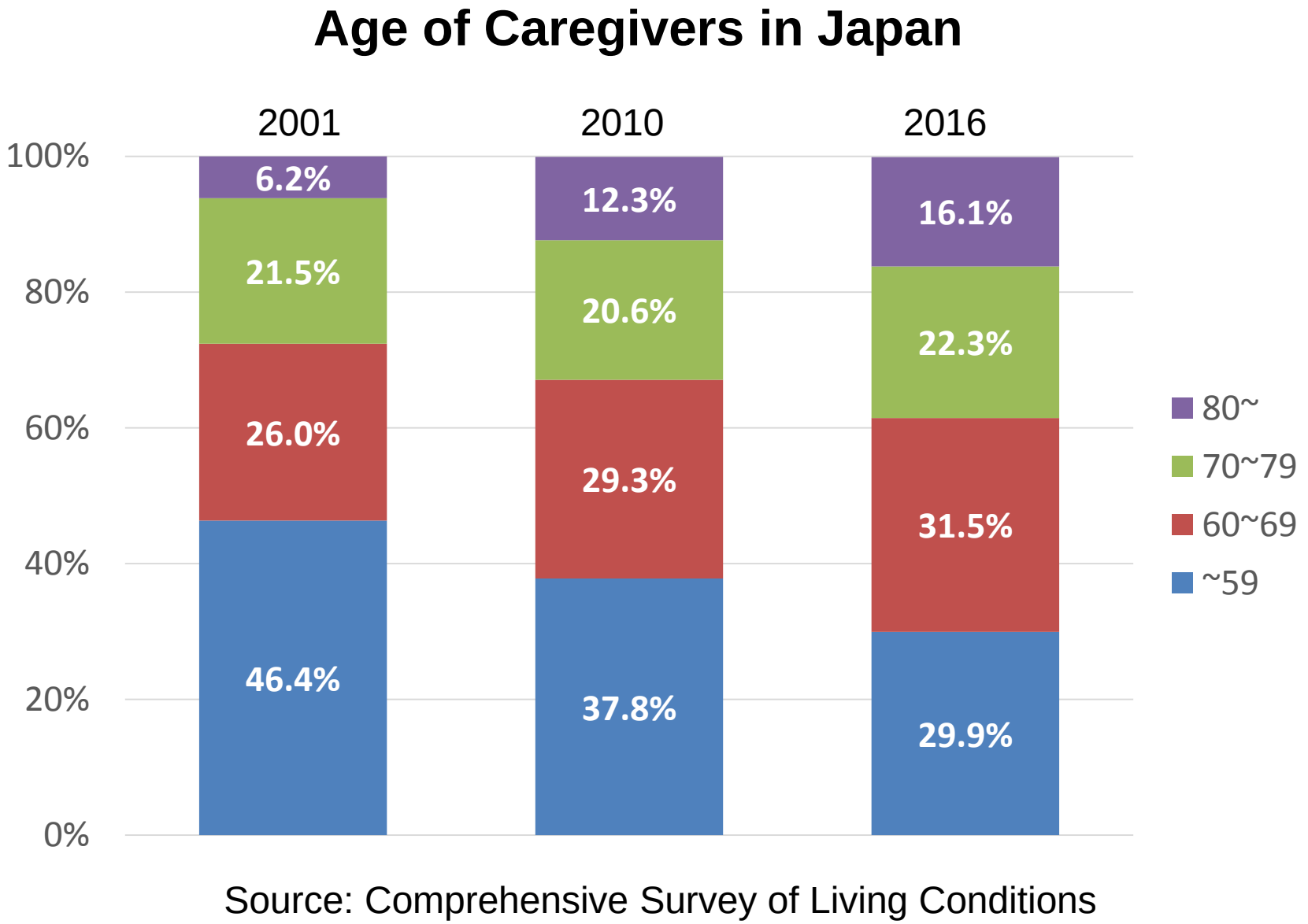
Koki HIRATA[1)] , Kunichika MATSUMOTO[2)] ,
Ryo ONISHI[2)] and Tomonori HASEGAWA[2)]

1) Department of Social Medicine, Toho University Graduate School of Medicine
2) Department of Social Medicine, Toho University School of Medicine

Increasing the family burden of LTC ①

- Aging of Japanese society is changing the structure of the diseases; chronic diseases are increasing.
  - Chronic diseases have a higher burden of long-term care (LTC) than acute diseases.
- Although there are services provided by public LTC insurance system in Japan, it is said that the burden of informal care by families is also large.
- In addition, caregivers are also aging in Japan.
  - "The elderly providing care for the elderly" problem is becoming more serious.

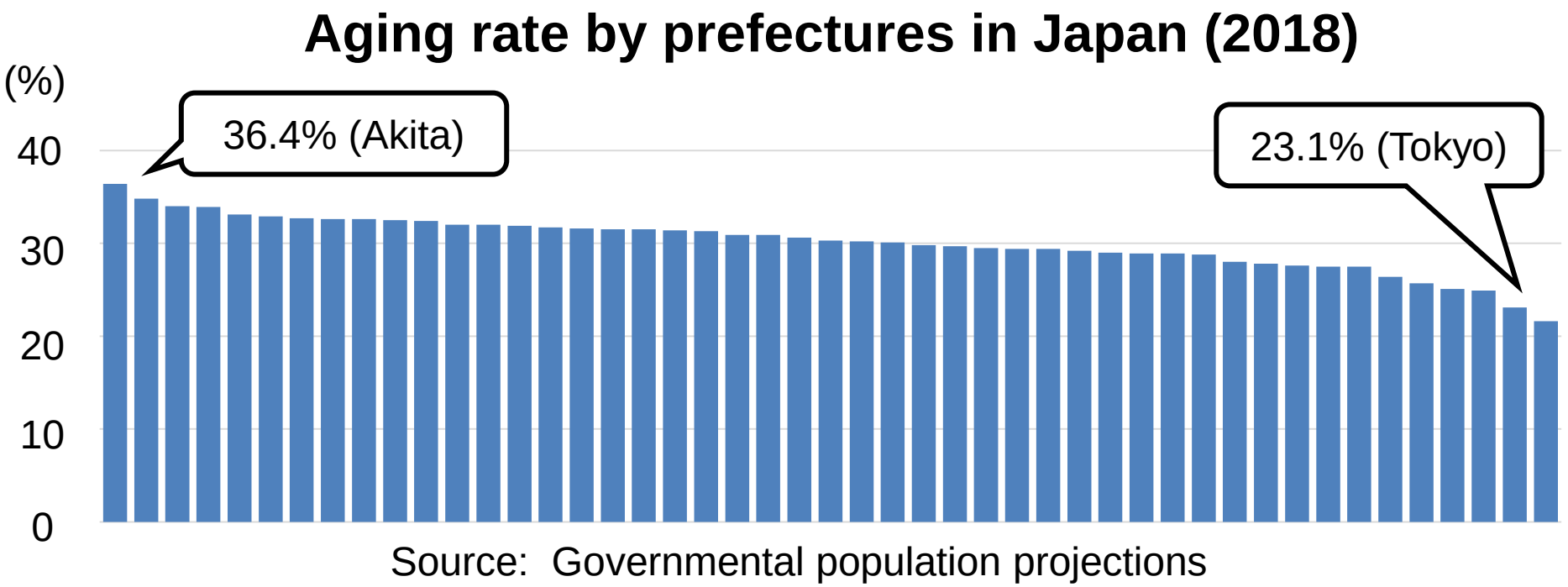
Increasing the family burden of LTC ②



Source: Comprehensive Survey of Living Conditions

Increasing the family burden of LTC ③

- The aging rate in all Japan is 28.1%, however rural areas are aging more than urban areas.

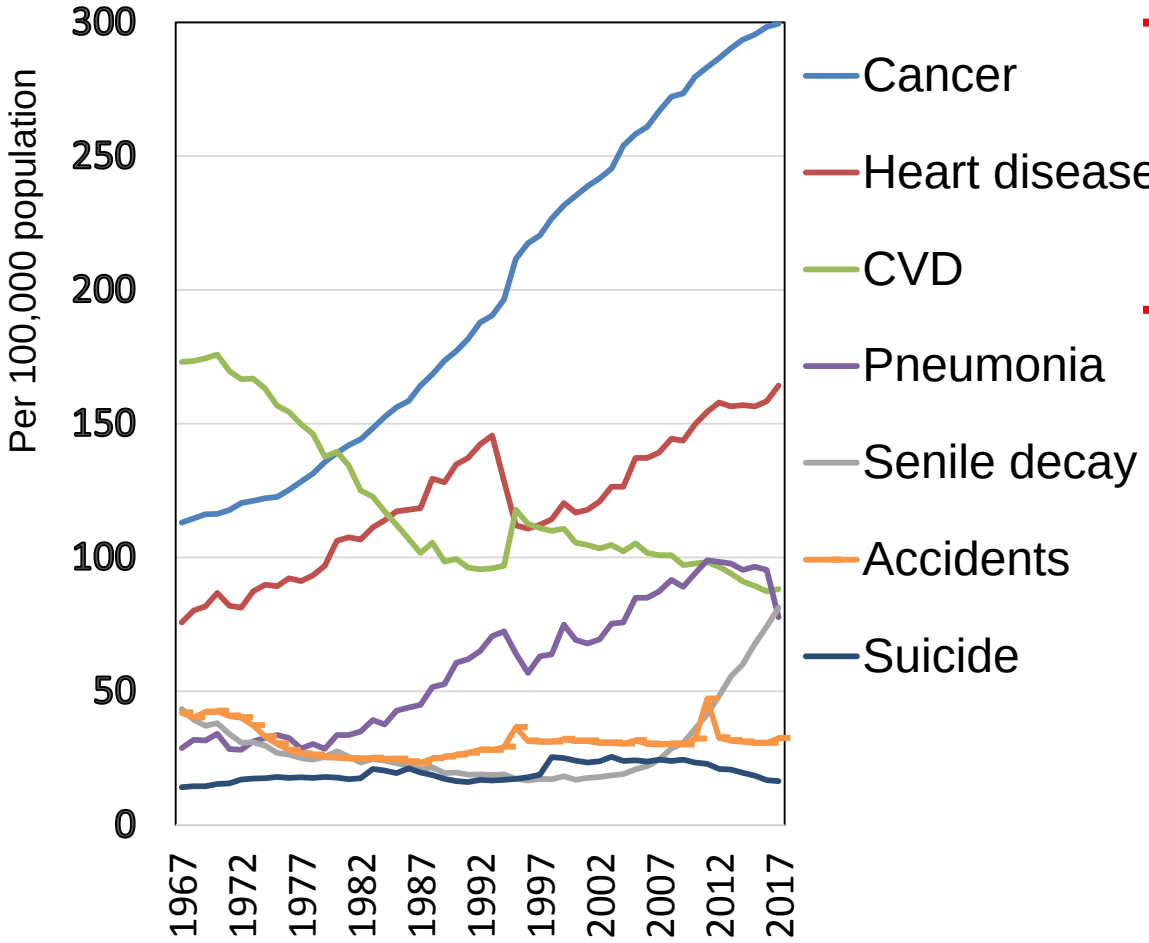


Source: Governmental population projections

- “The elderly providing care for the elderly” may eventually reach its limit.

3 major diseases in Japan

Trend of causes of death in Japan



CVD: Cerebrovascular disease

3 major diseases in Japan

- Those 3 diseases had been leading causes of death in Japan from 1950s to 2010s.
- But the structures of the social burdens can be different among these 3 diseases.

- One method of estimating the social burden of a disease is the cost of illness (COI) method.

The COI method

- A method for estimating the social burden of a disease as monetary value.
- The COI can be easily calculated from government statistical data.
- The COI can take into account not only direct cost but also indirect cost.

- However, the COI method may underestimate the burden of chronic diseases because it does not include the burden of LTC.

In an aging society, it is necessary to estimate the social burden of diseases, including burden of LTC.

Methods

Calculate the social burden of 3 major diseases in Japan using the comprehensive cost of illness (C-COI) method.

The C-COI method

- A method that evolved the original COI for estimating the burden of diseases, including the burden of LTC.

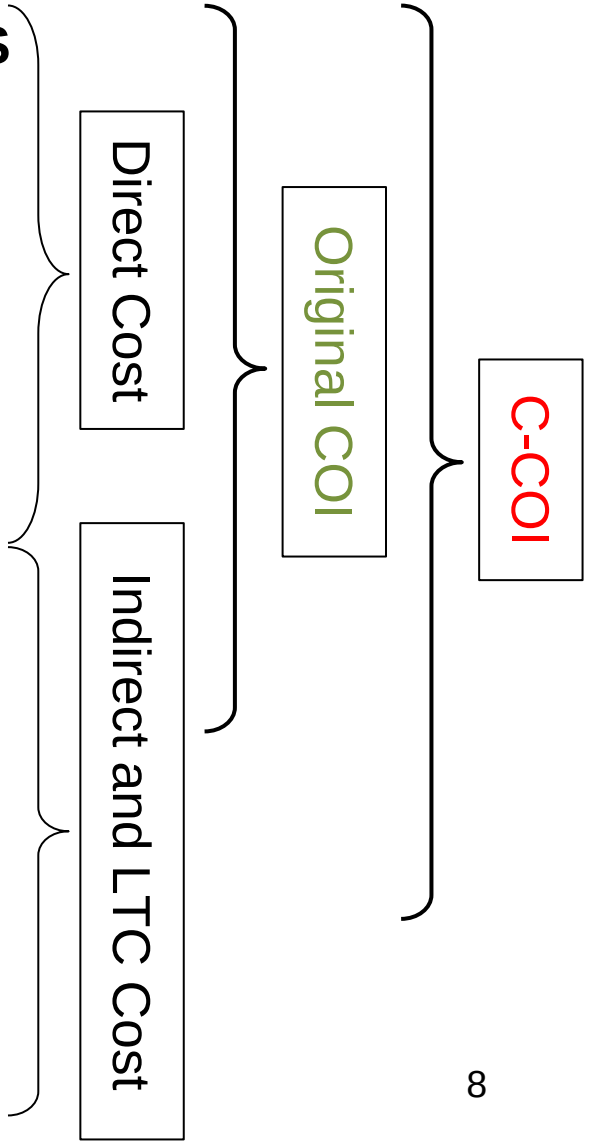
Social burden of diseases

Ⅰ. Cost for establishment and administration of HS

- Work force
- Medical goods ・Energy

Ⅱ. Cost for patients and their families

- Cost of medical care and medical drugs
- Other things
- Morbidity cost (Loss of opportunity)
- Mortality cost
- Formal care cost（LTC insurance benefit）
- Informal care cost（Family`s burden）
- Decline in QOL（Quality of Life）
- Mental burden



Calculation of C-COI

Direct cost	
Medical direct cost	**Annual medical expenses based on reimbursement data.**
Formal care cost	**LTC cost covered by public LTC insurance**
Indirect cost	
Morbidity cost	**(Total person-days of hospitalization × One day labor-value) +(Total person-days of outpatient × One day labor-value × 1/2)**
Informal Care Cost	**number of family caregivers × average time for care a day × 1-hour labor value per person (Two methods) × 365**
Mortality cost	**Number of death × Life time labor-value per person**

1. ***Benchmark discount rate was 3%.***
2. ***Life time labor-value was calculated summing up the income which patient could have earned in the future if they had not died.***

Two calculation methods of informal care costs ①

Opportunity cost approach;

A method based on the current situation of informal care by families in Japan.

Replacement approach;

A method that replaces families as caregivers with professional care workers.

Two calculation methods of informal care costs ②

Opportunity cost approach;

$$ICC_{OC} = \sum NFC_{ij} \times ATCd \times LVh_{ij} \times 365$$

Replacement approach;

$$ICC_{RA} = NFC \times ATCd \times \overline{LVh} \times 365$$

ICC: Informal care cost

NFC: number of family caregivers

ATCd: Average time for care a day

LVh: 1-hour labor value per person of care giver

i: sex, j: age class

$\overline{LVh}$: average wage per hour of professional care workers

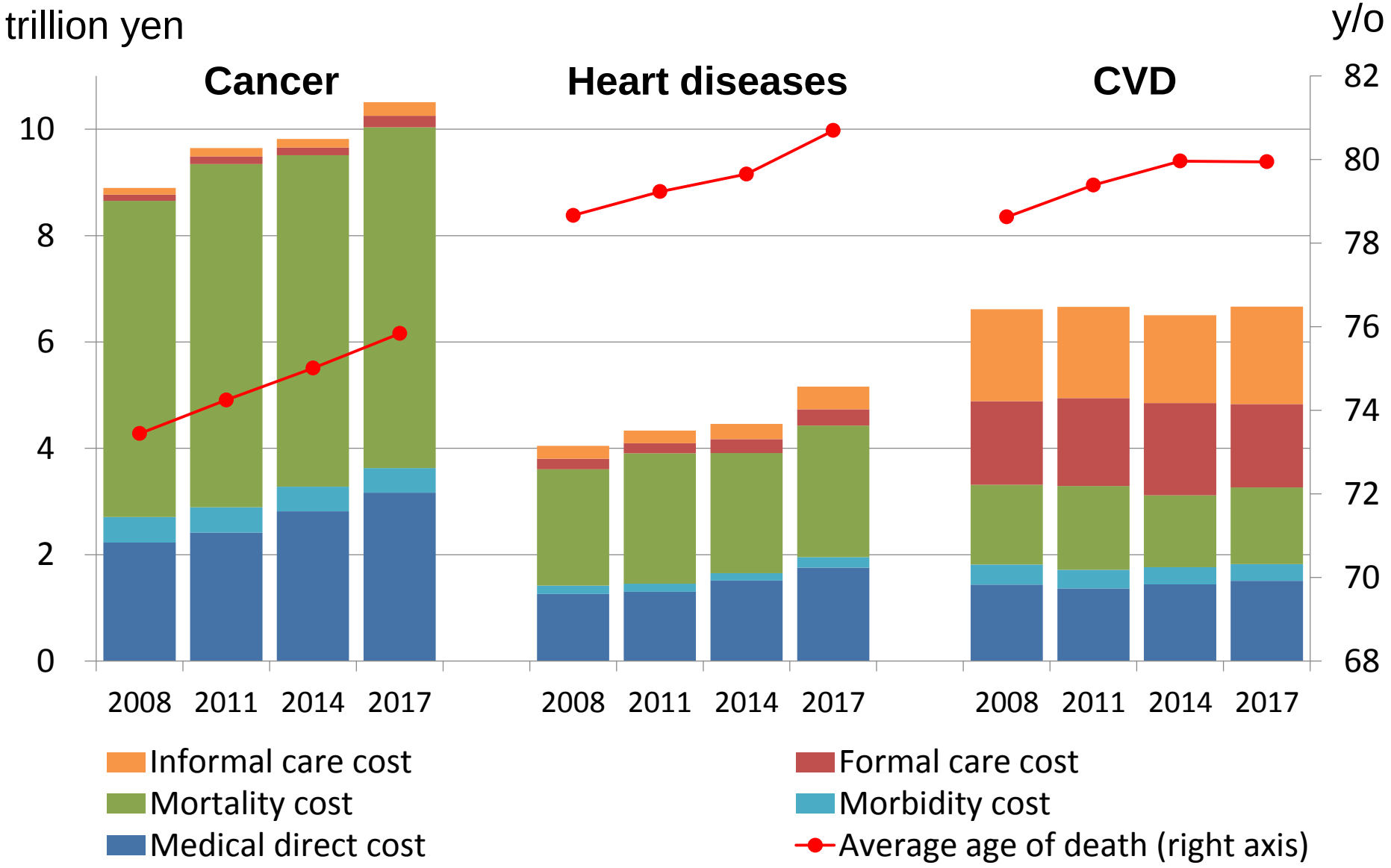
Data set

Diseases：Cancer (ICD10: C00-D09) 、Heart disease (I01-I02.0, I05-I09, I20-I25, I27, I30-I52) 、CVD (I60-I69)
Data source ：Governmental office statistics

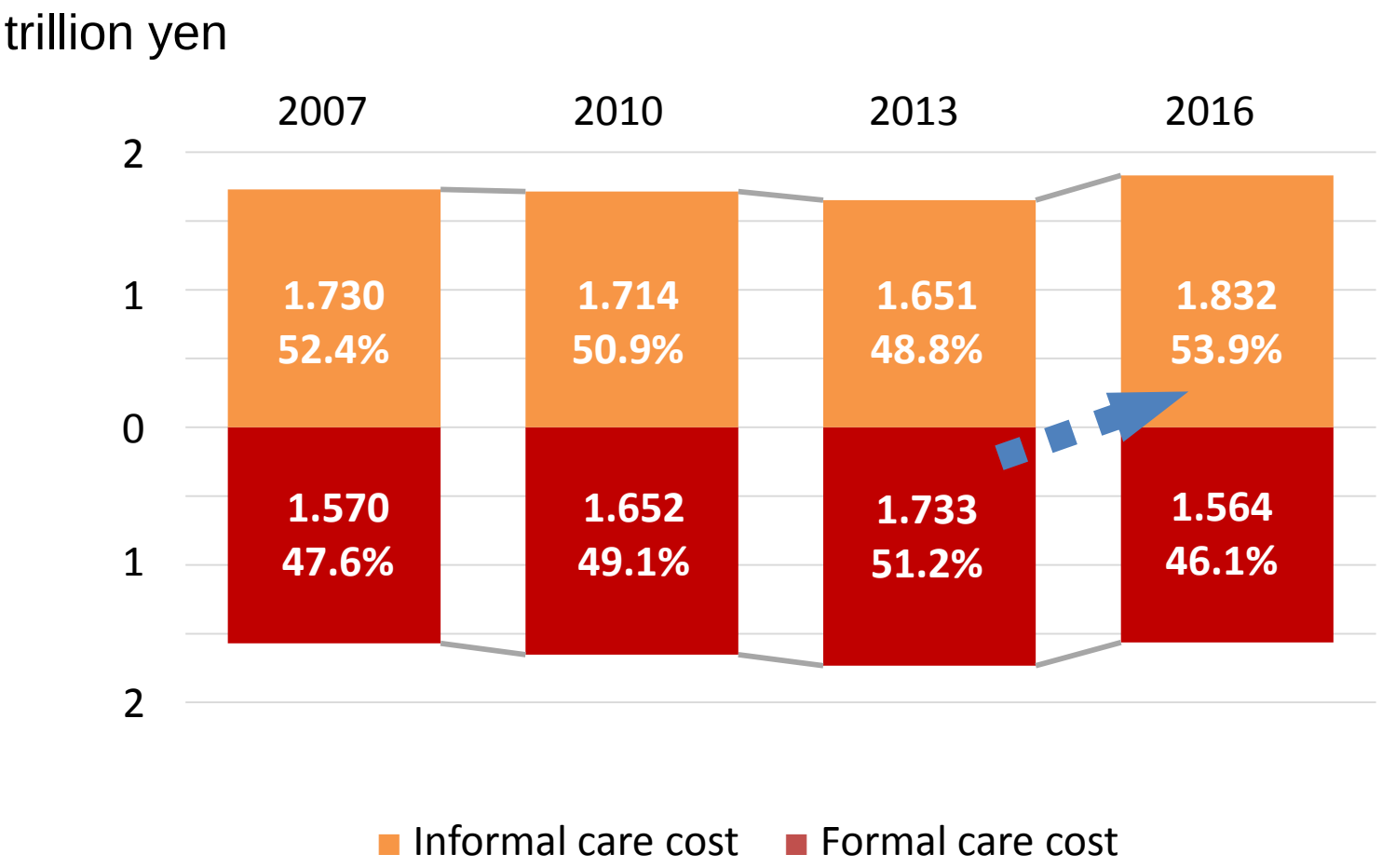
- Patient Survey
- Survey of National Medical Care Insurance Services
- Vital Statistics
- Abridged life table
- Basic Survey on Wage Structure
- Labor Force Survey
- Estimates of monetary valuation of unpaid work
- Population estimates series （2008・2011・2014・2017）

- Comprehensive Survey of Living Condition of the People on Health and Welfare
- Fact-finding Survey on Economic Conditions in Long-term Care
- Survey of Institutions and Establishments for Long-term Care
- Survey of Long-term Care Benefit Expenditures （2007・2010・2013・2016）

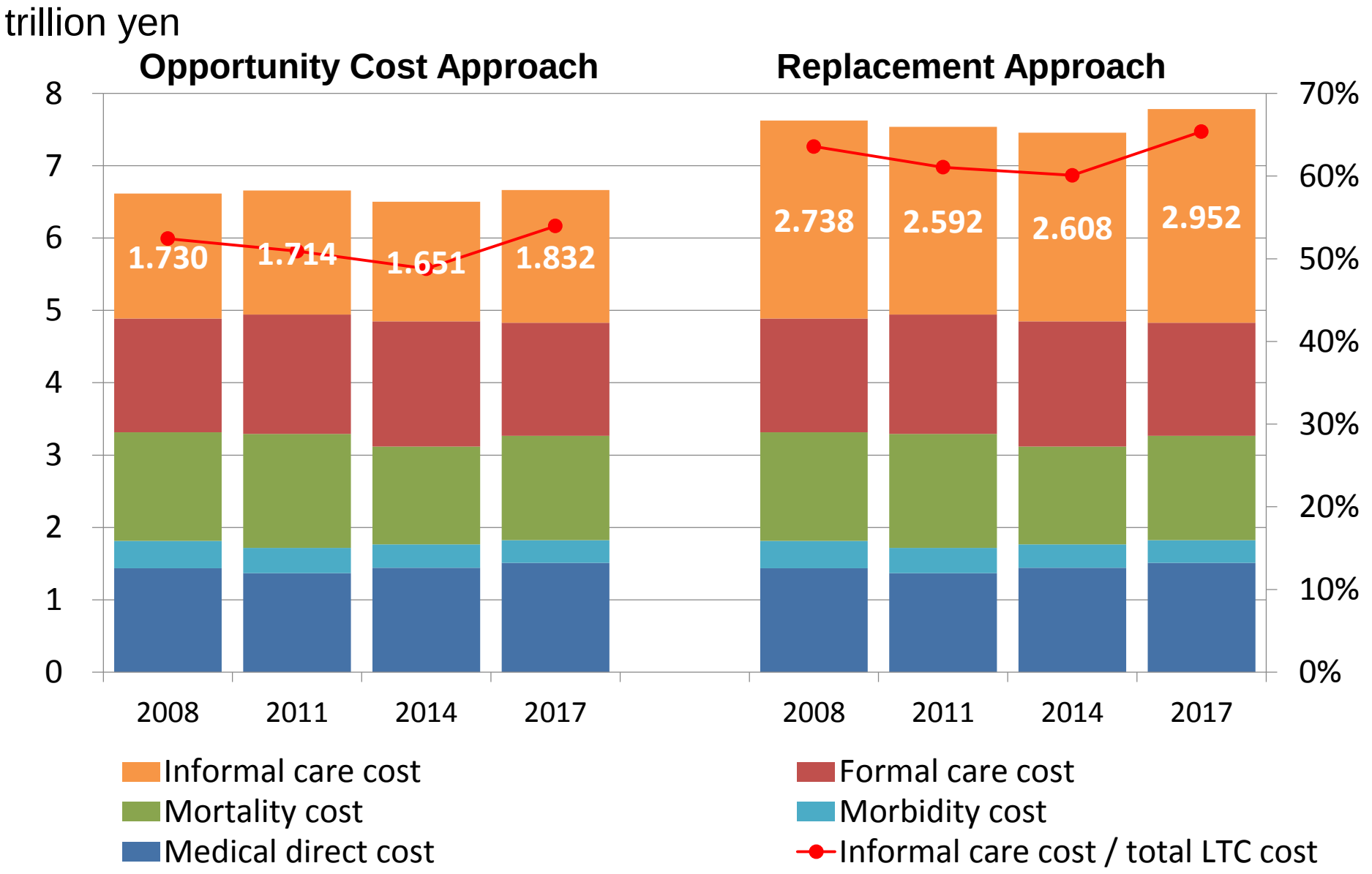
Result ①：C-COI of 3 major diseases



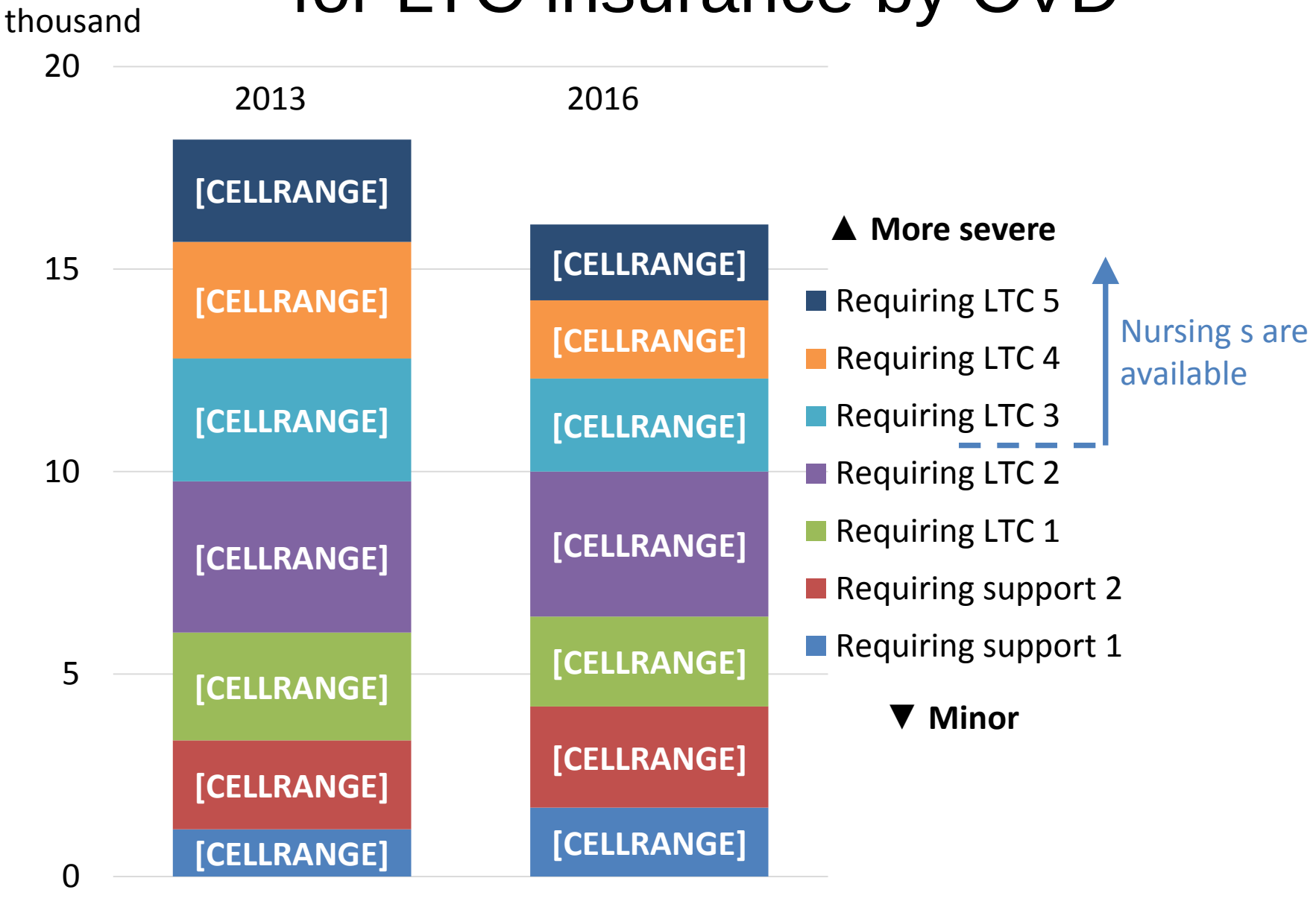
Result ② : Formal and Informal care cost of CVD



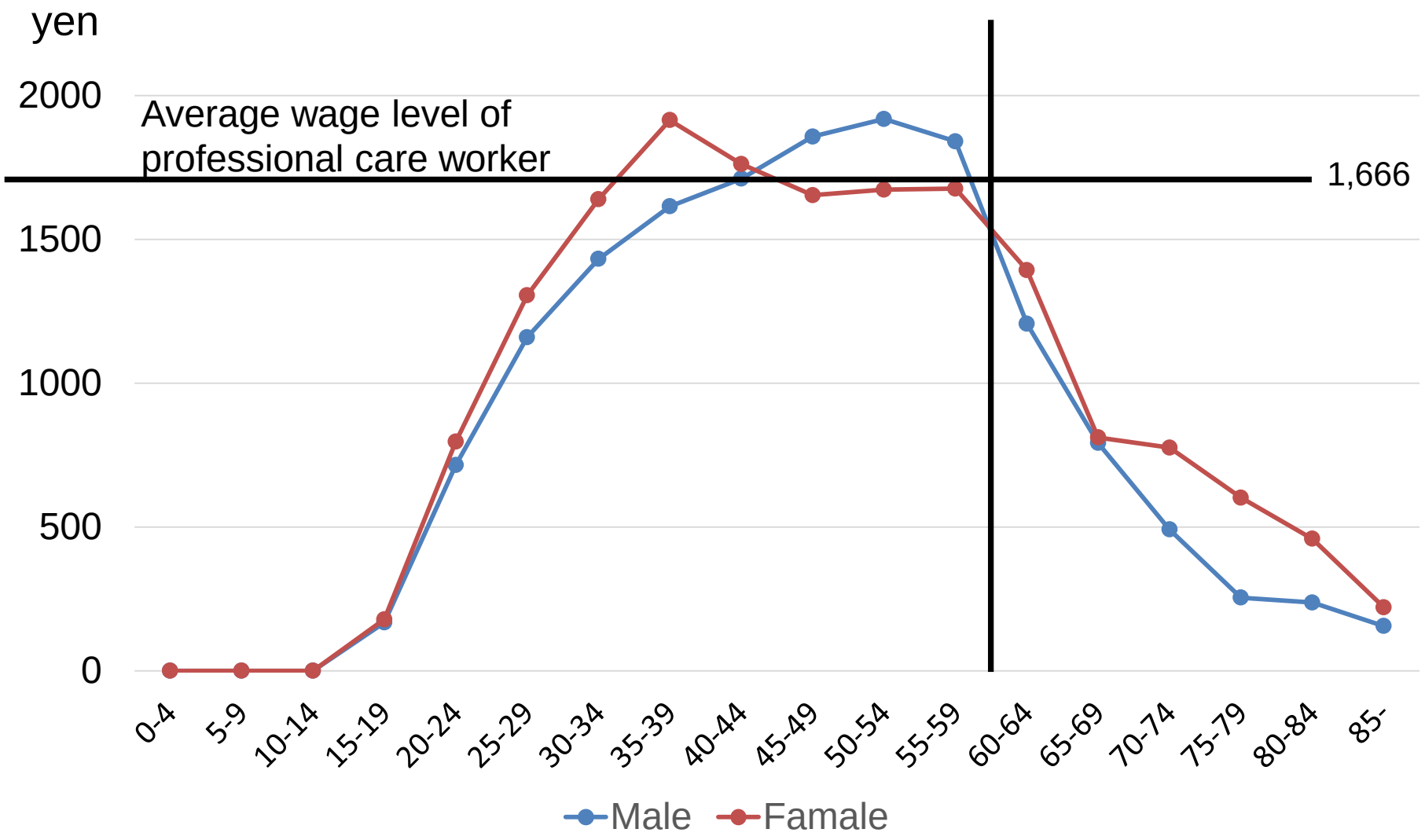
Result ③ : C-COI of CVD by two methods



Reference : Number of people certified for LTC insurance by CVD



Reference : Lifetime labor-value per person in 5 years age groups in 2016



Discussion & Conclusion ①

- Trend of C-COI for cancer and heart disease was on the rise, while that for CVD was flat.
  - ➢Medical direct costs are particularly increasing.
  - ➢Morbidity cost and Mortality cost were compressed due to the aging of the patients.
- Mortality cost as a percentage of total C-COI was higher for cancer than for the other two.
  - ➢The average age at death of cancer is lower than the other two.

Discussion & Conclusion ②

- Cost of LTC for CVD, a chronic disease, was higher than the other two.
  - ➢Estimating the social burden of chronic disease using the original COI method is underestimated.
- Formal care cost for CVD decreased in 2016, but the informal care cost has been on a consistent upward trend.
  - ➢People certified for LTC insurance by CVD has decreased and the certification level has been reduced in 2016 compared to 2013.
  - ➢People with a history of CVD who cannot receive LTC insurance support may be adding to the burden on their families.

Discussion & Conclusion ③

- Informal care cost calculated by replacement approach is 1.51-1.61 times as much as the cost calculated by opportunity cost approach.
  - ➢This reflects that average age of family caregivers is older than that of professional care workers.
  - ➢The gap between both approaches means compression of monetary value of informal care by aging.
- Considering the present situation, the room of family to accept LTC burden has become smaller.
- In the near future more professional caregivers will be required. And the social burden of CVD is assumed to converge on the estimation based on replacement approach.

Thank you for your attention

多謝你既關注

ご清聴ありがとうございました