



NHIS GLOBAL FORUM **2025**

**Development of a support system for long-term care certification using big data and AI
-Toward the sustainable systems in a super-aging society**

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About me

■Affiliation

Department of Health and Welfare services,
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■Academic degree

PhD / MBA

■Certification

Social worker in Japan

■Study areas

Long-term care insurance

Health services research

Support for caregivers of older people

Today's topics

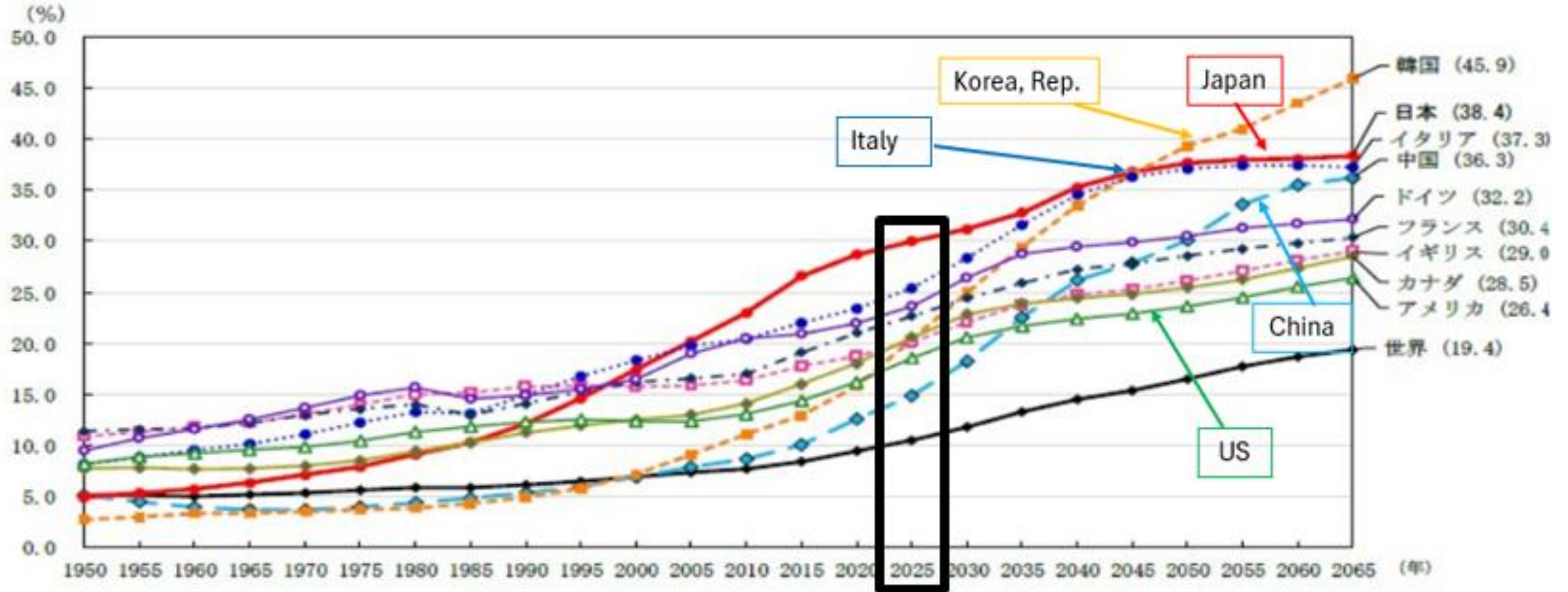
- The situation of aging in Japan
- Long-term care insurance (LTCI) in Japan
- Project of developing a support system for long-term care certification using big data and AI.



The situation of aging in Japan

Population aging rate

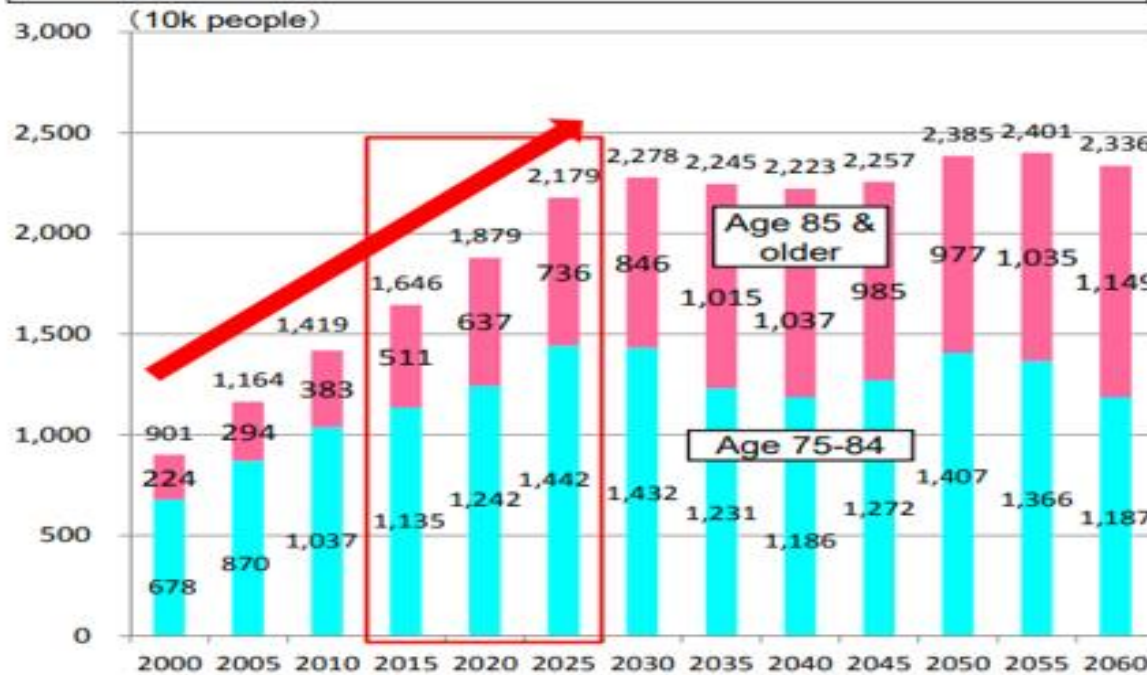
Changes in the p/Percentage of the Population Over Age 65 (1950-2065)



Changes in the population in Japan

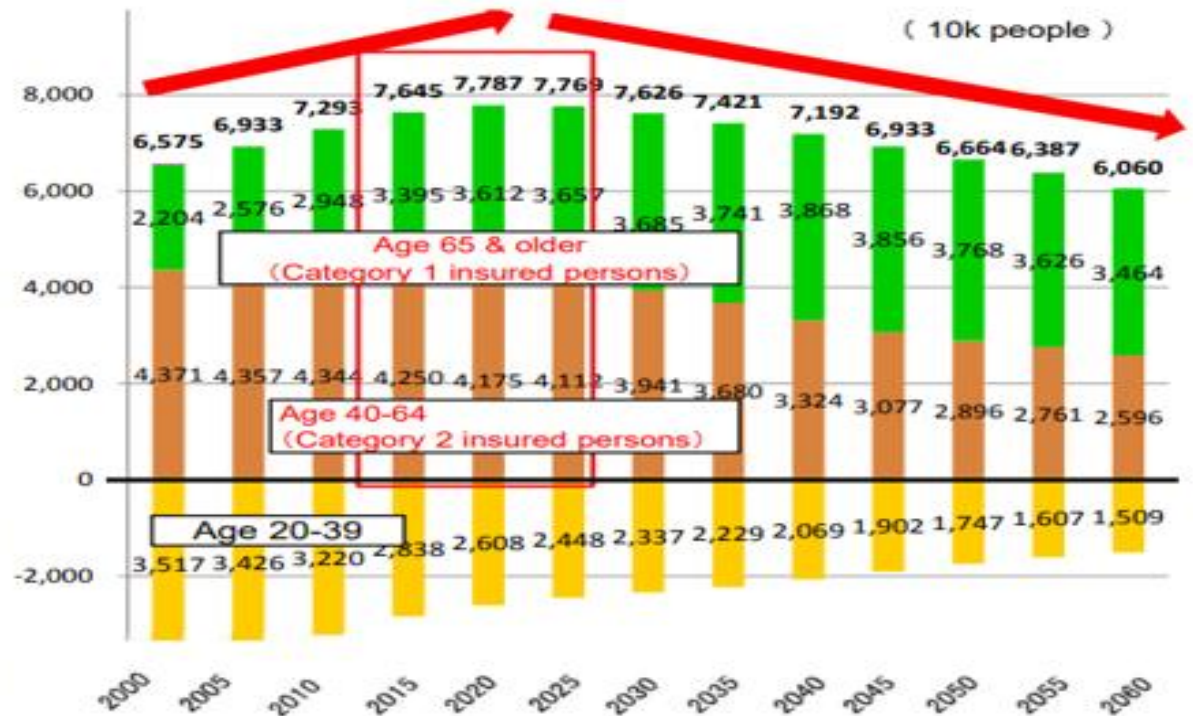
• Changes in the Population Over Age 75 (Age group with high percentage of persons requiring care)

- Since the establishment of the long-term care insurance system in 2000, the population over age 75 has increased rapidly and such increase will continue for 2025.
- From around 2030, the rapid growth of the population over age 75 will level off but the population over age 85 will continue to increase for another 10 years.



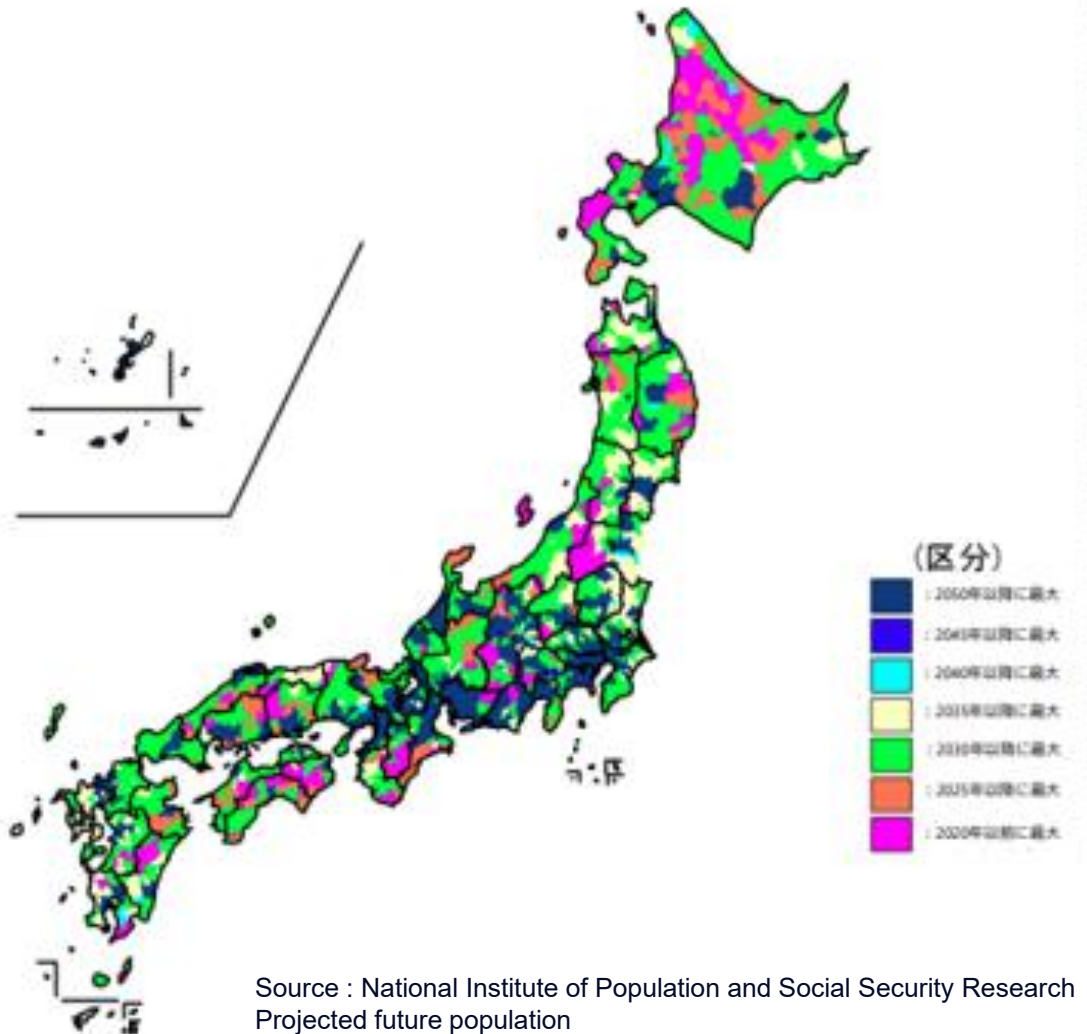
• Changes in the Population Over Age 40 (Age group paying for long-term care insurance system)

- The population over age 40, who pay for the long-term care insurance, has increased since the establishment of the long-term insurance system in 2000 but will start to decrease after 2021.

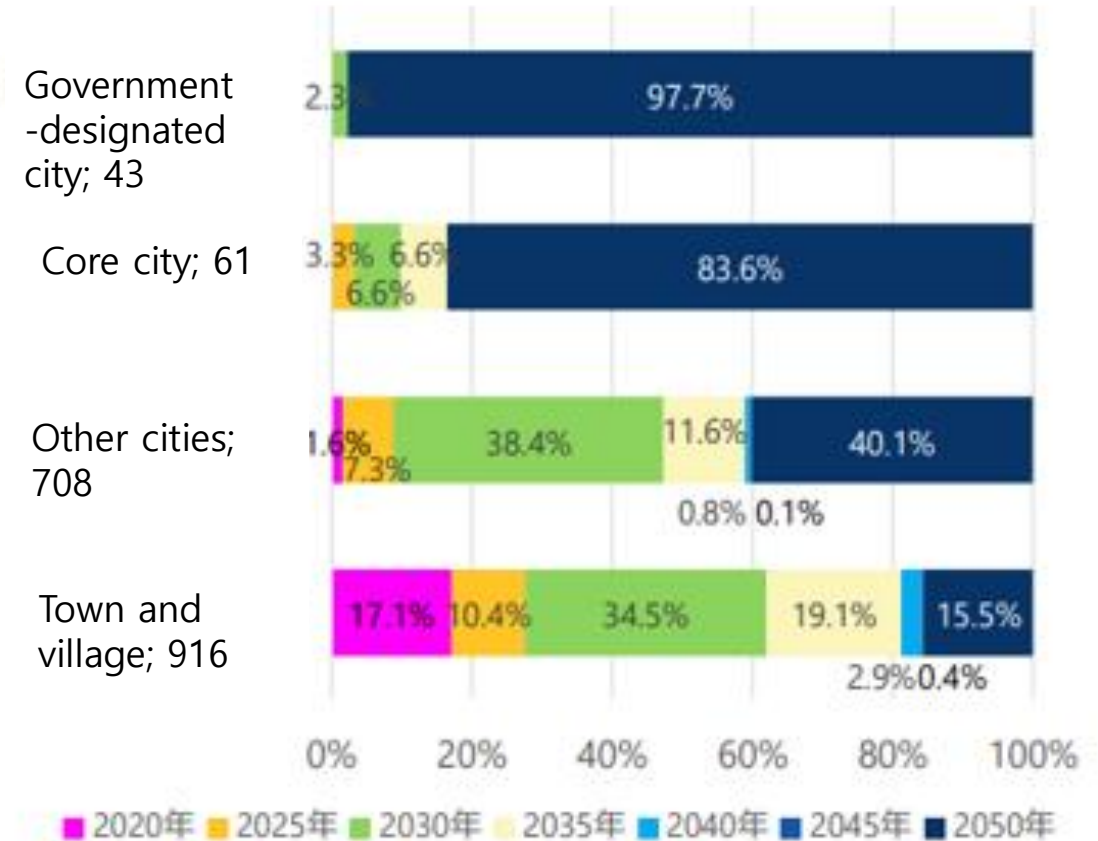


Sources: Future population estimates were taken from the National Institute of Population and Social Security Research's "Population Projections for Japan (January 2012): Medium-Fertility (Medium-Mortality) Assumption"
Actual past figures were taken from the Population Census by the Statistics Bureau of the Ministry of Internal Affairs and Communications (population with proportional corrections for those of unknown nationality/age)

The year when the population aged 75 and over will reach its peak in Japan



Municipality classification





Long-term Care Insurance (LTCI) in Japan

Three main social security in Japan

	Year of start	When they start to pay Premium
Universal health insurance coverage	1961	When they start to work
Pension system	1961	20 years old
Long-term care insurance	2000	40 years old

Background of the introduction of LTCI

Increasing of needs
for long-term care

Changes in a
household
status

Changes in an
environment
surrounding
families



Introduction of the LTCI system

< Three basic concepts >

■ Support for
independence

■ User oriented

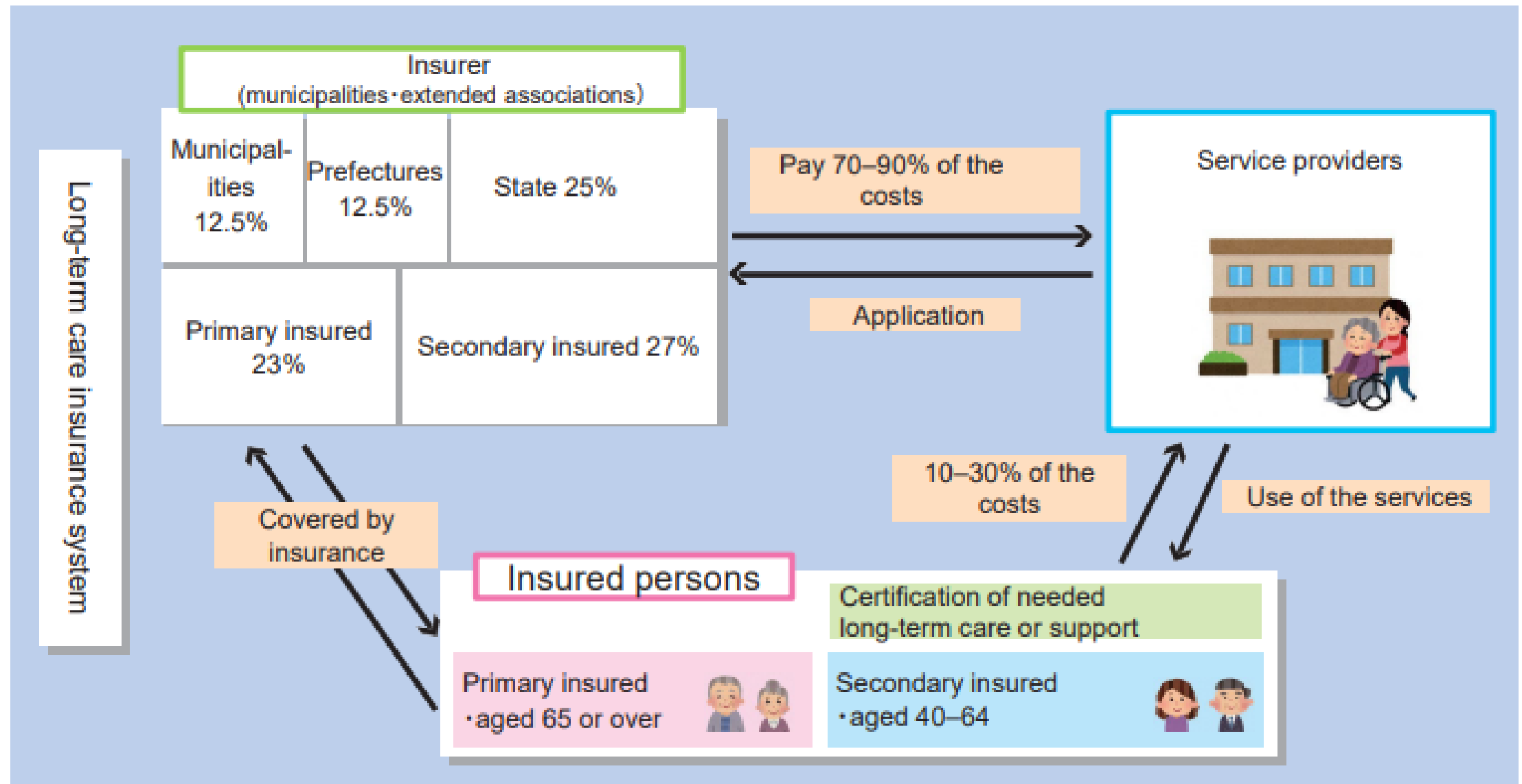
■ Social insurance
system

Insured persons

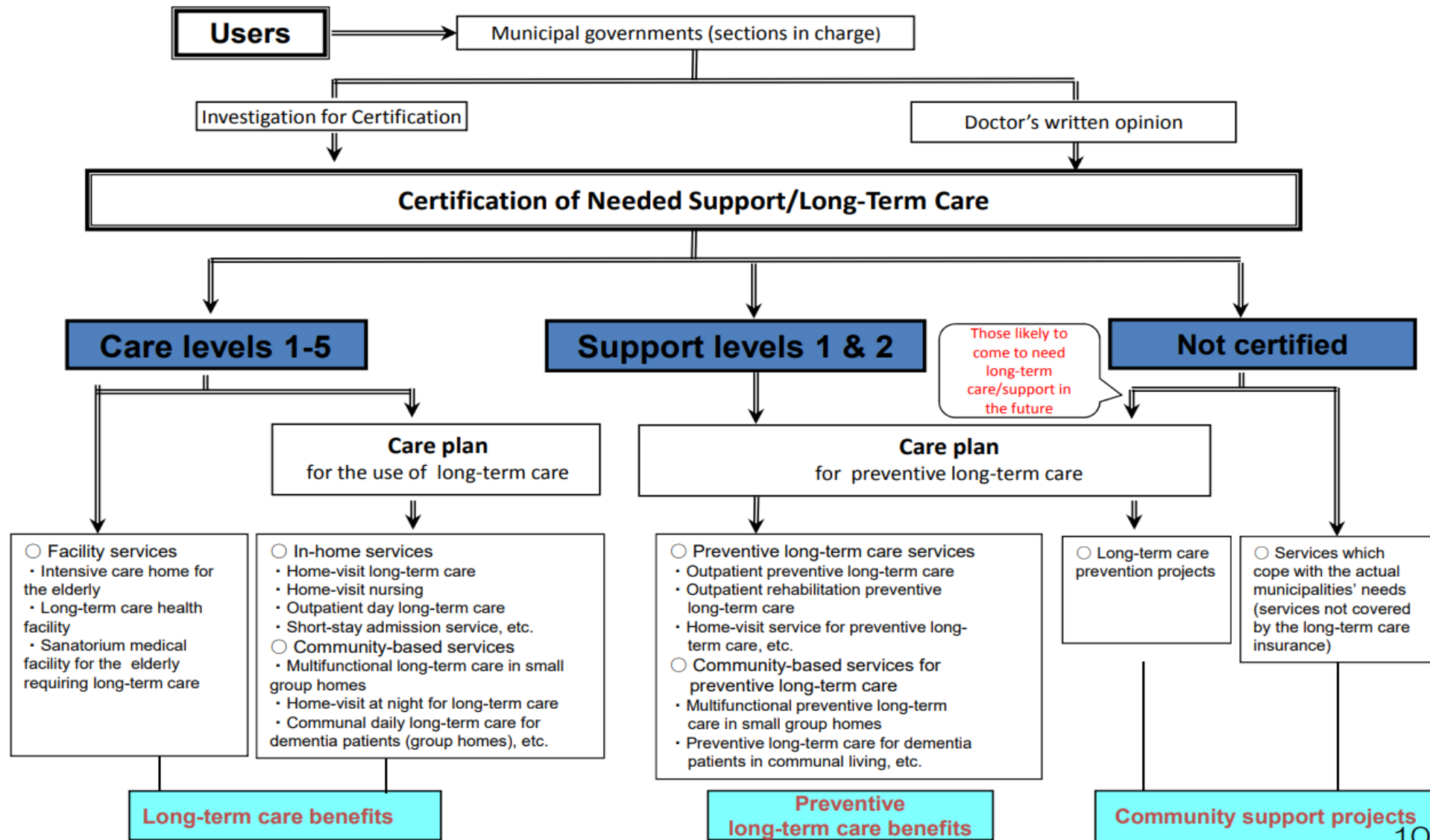
As of Mar. 2022

	Primary insured persons	Secondary insured persons
Eligible persons	Persons aged 65 or over	Persons aged 40-64
Number	35.9 million	41.9 million
Requirement for service provision	- Persons requiring long-term care (bedridden, dementia, etc.) - Persons requiring support (Daily activities requires support)	Limited to cases where a condition requiring care or support results from age-related diseases (16 specified diseases)
Percentage and number of persons who are eligible for services	6.81million(19.0%) Aged 65-74 : 0.71million (4.3%) Aged 75- : 6.10million (31.3%)	0.13million (0.3%)
Premiums collection	Collected by municipalities (in principle, withheld from pension benefits)	Collected with medical care premium by medical care insurers (in principle, half the premium is paid by employers for members of health insurance associations)

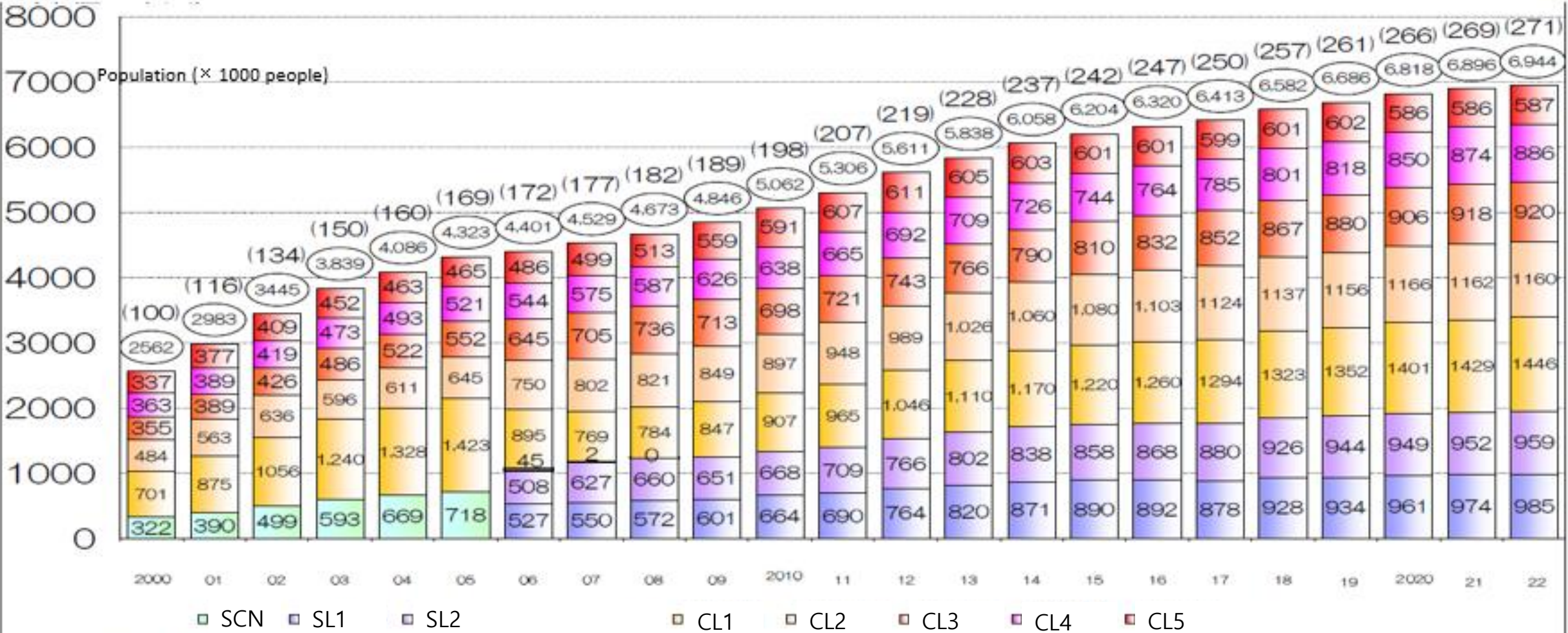
Operating entities of LTCL system and their financing



Procedure for Use of Long-term Care Services



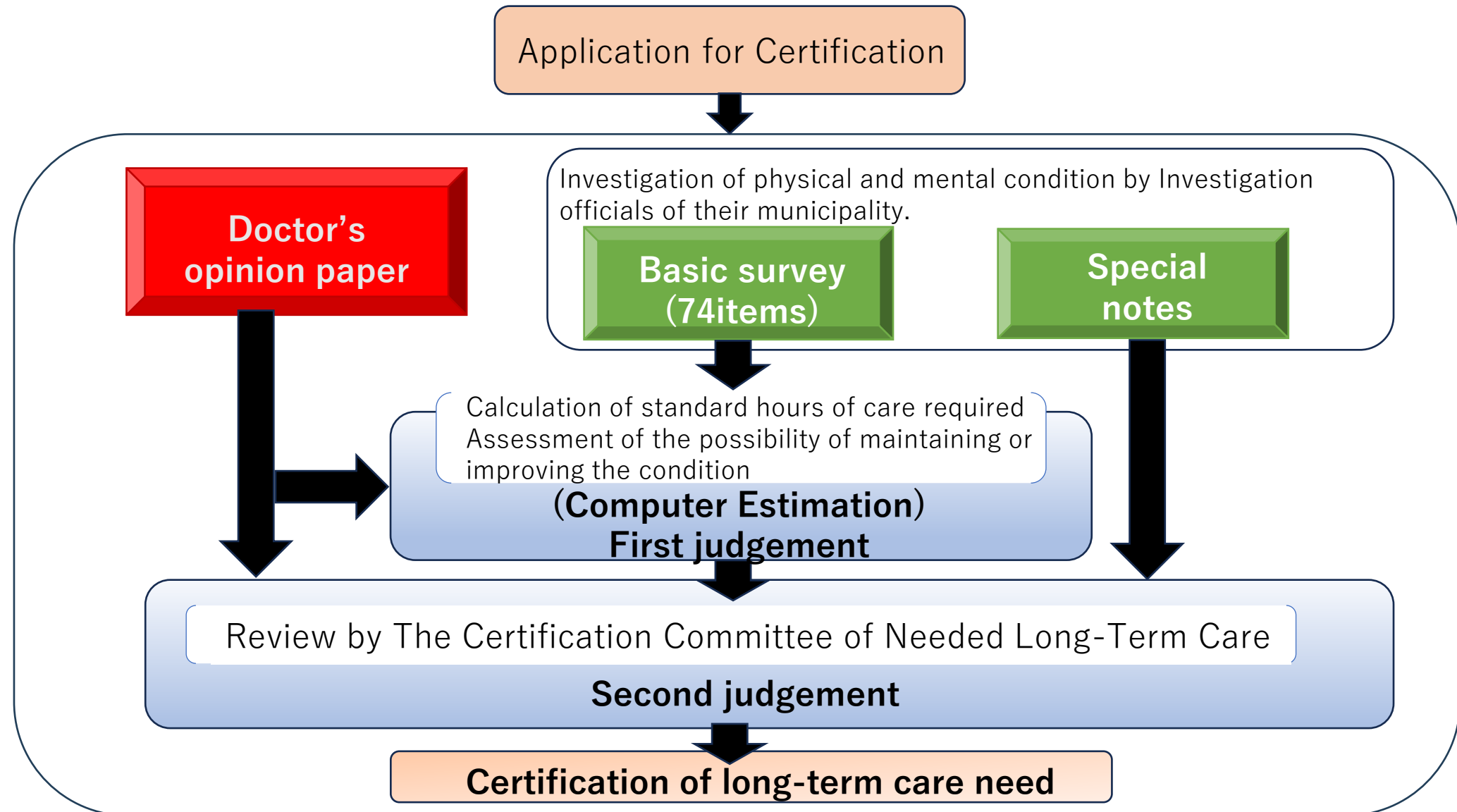
Changes in the Number of People Certified for Long-Term Care/Support Need



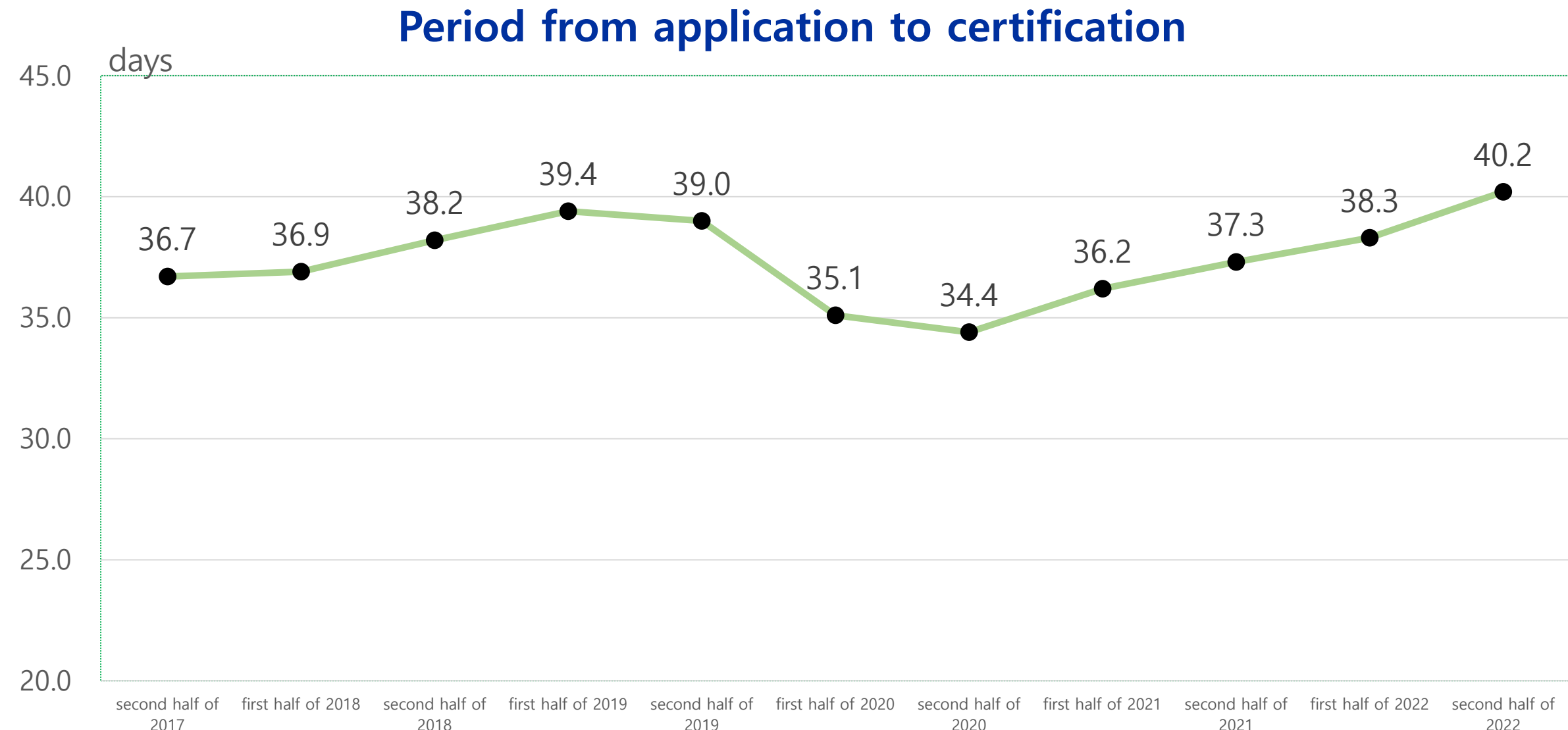
※ SCN : Support Care Needed, SL : Support Care need Level, CL : Care need Level

FY 2022

LTCL Certification System



Average number of days required for administrative work related to long-term care certification



Speeding up the certification process for long-term care using digital technology and AI

- Implementation of a model project on the use of AI in the certification of long-term care need; Starting in FY2024
- Further promote the digitization of tasks related to long-term care certification ; Starting in FY2025
 - Digitization of attending doctor's opinion papers
 - Online holding of Certification Committee of Needed Long-Term Care and paperless operations, etc.
- Conduct necessary research and studies on the use of AI in the certification of care needs ; Starting in FY2025



Our Project

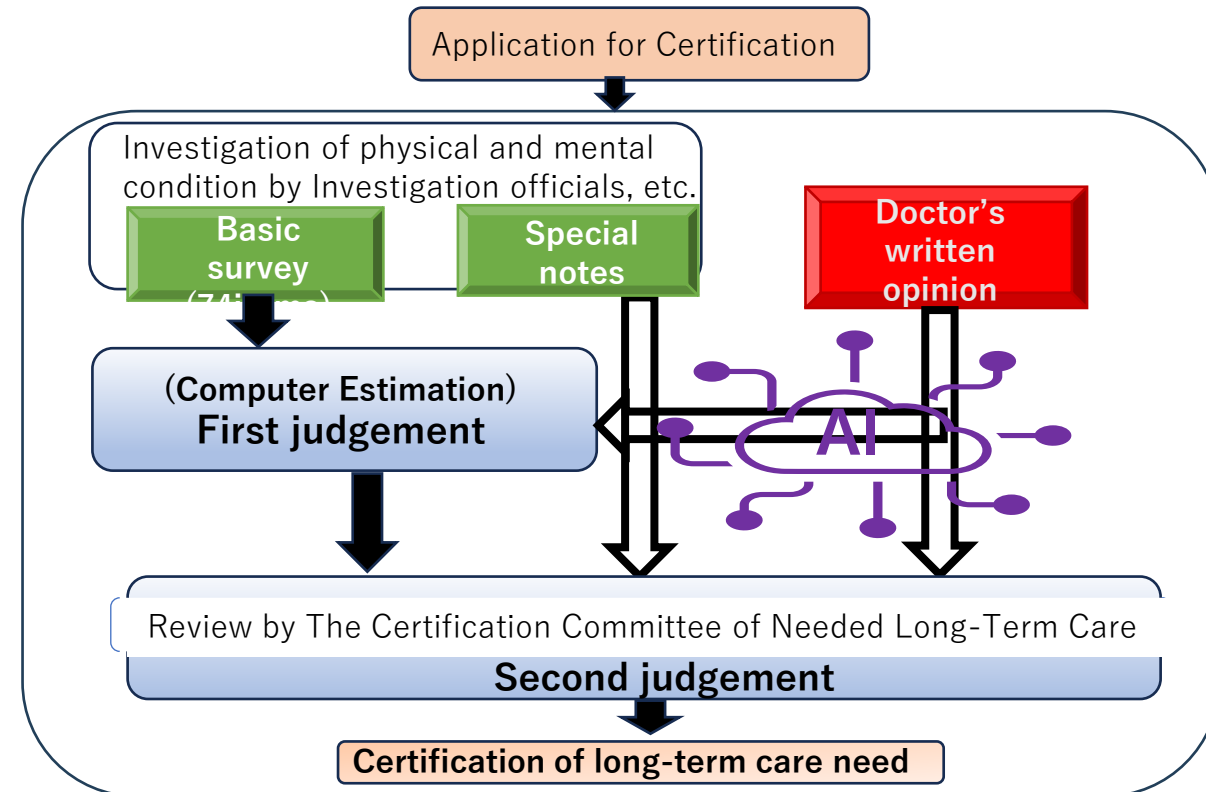
**Development of a support system
for long-term care certification
using big data and AI.**

Background of our study

- The number of people requiring long-term care is increasing
- A heavy burden on The Certification Committee of Needed Long-Term Care.
- The Certification Committee of Needed Long-Term Care is done through human eyes, so there is concern that there are differences among municipalities and councils.

Support by an “automated system” in the second judgement of certification of needed long-term care .

To develop an “automatic second judgment system” using artificial intelligence (AI) technology based on machine learning, aiming to reduce the burden of The Certification Committee of Needed Long-Term Care in the second judgment.



Study Procedures

- 1 . Nationwide survey of local governments by the project team
- 2 . Search for factors related to severity in second judgment
 - Analysis by Japanese Long-term Care Database
 - Analysis by data of local government
- 3 . Constructing AI Model
- 4 . Implementation research using our constructed AI model

1. Nationwide survey of local governments

-Result 1

1. Nationwide survey of local governments

-Result 2

2. Search for factors related to severity in second judgment

Japanese Long-term Care Database

■ Information stored

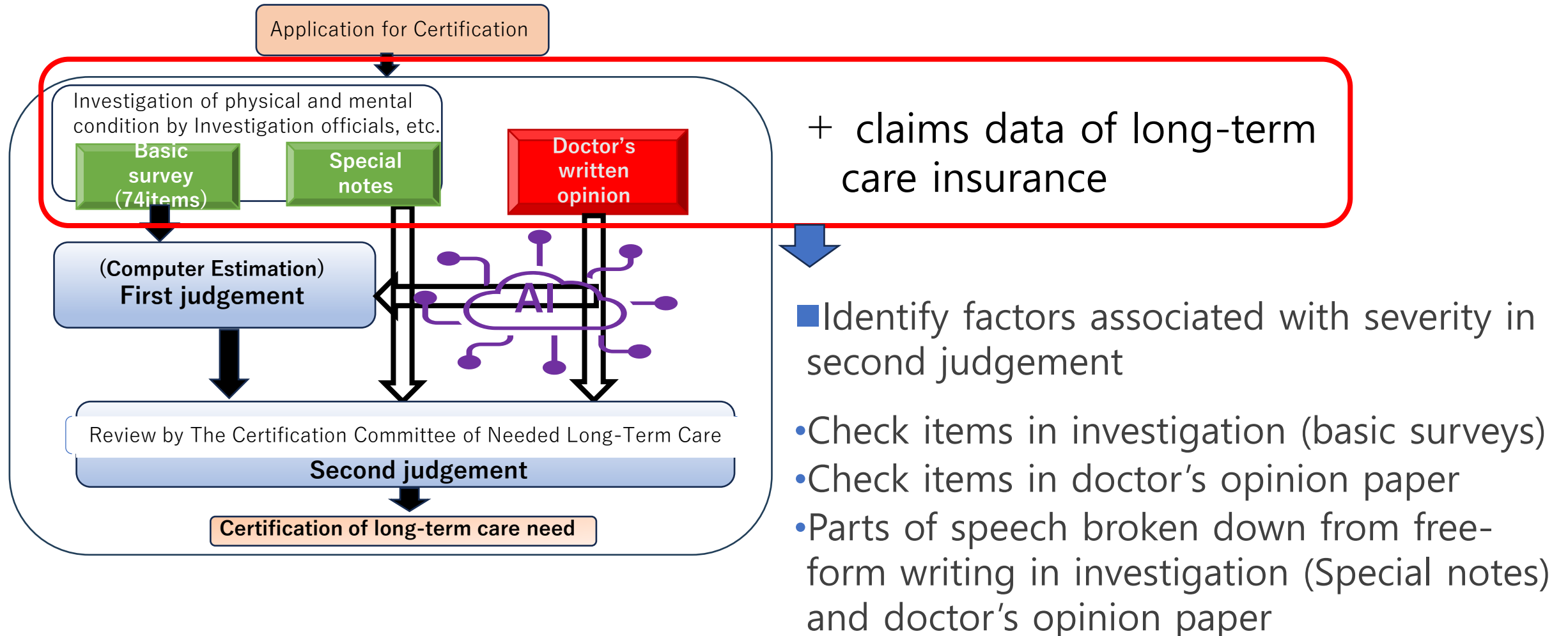
- National claims data of long-term care insurance
- Information of long-term care certification
- LIFE : Long-term care Information system For Evidence

■ Types of data to be provided

	Special sampling	Fixed data set	Sampling Data-set	Summary table
Contents provided	Data extracted from the DB according to the extraction conditions specified by the applicant.	Of all data extracted and maintained in advance, only the data within the scope of the application may be used.	Information extracted at a certain rate in advance is provided after further safety considerations are made.	Tally sheets extracted and tabulated according to the conditions specified by the applicant.
Form of data	individual votes		individual votes	Summary table

2. Search for factors related to severity in second judgment

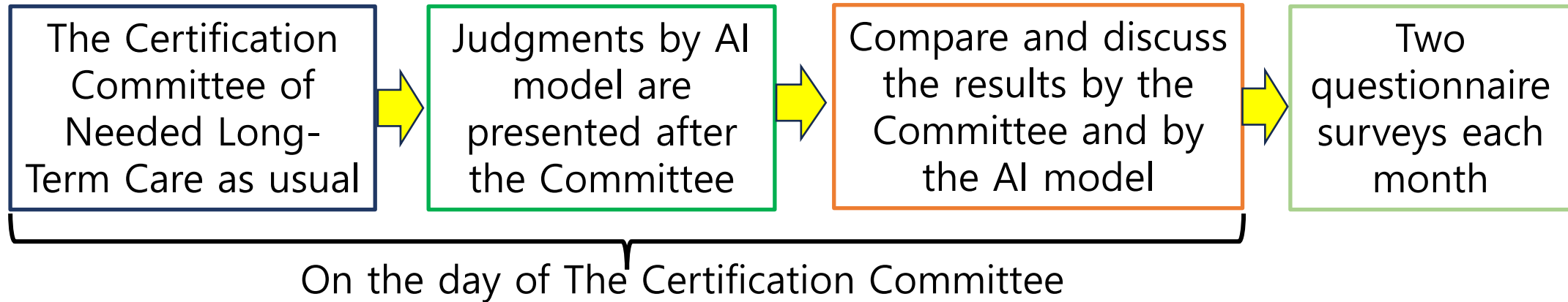
Data by local government



4. Implementation research using our constructed AI model

Trial and system improvement in a municipality

- Implementation Schedule: Conducted 16 times in total over a 2-month period
- Implementation Method



- Accuracy of judgments by AI model

4.Implementation research- Questionnaire survey result 1

1.Were you satisfied with the AI results compared to the actual results?

2. Do you think that AI-based judgements will reduce your burden in the future?

4. Implementation research

-Questionnaire survey

3. Do you think AI-based judgments are useful?

3-a. How would you like to utilize the AI results? Only those who answered ① and ② in Q3

Summary 1

□ Toward maintaining the social security system among declining birthrate and aging population in Japan

- The current aging rate is 29% and is expected to rise further.
- However, the extent of aging varies depending on the region.
 - ⇒ Measures tailored to local conditions
- The working-age population is expected to decline.
- Difficulties in securing human resources for care are anticipated.
 - ⇒ Improve efficiency through the effective use of robots, ICT, and AI.

Summary 2

- **Research and development of a support system for long-term care certification using big data and AI**
 - **The number of applications for long-term care certification is increasing, and the administrative burden is expected to grow.**
 - **Concerns about inconsistencies caused by human judgment.**
 - ⇒ **Working on the development of a care certification support system.**
 - **Explore factors that are likely to result in changes in the level of care in secondary assessments by analyzing claims data of long-term care insurance and Information of long-term care certification.**
 - **Implementation research in local government using AI model constructed these findings.**
 - ⇒ **Continuing our research to improve accuracy.**

Thank you!

