

# THE LOCATION TREND OF DAY SERVICE FACILITIES AND THE LEVEL OF SUFFICIENCY BY USE SPHERE IN YAMAGUCHI PREFECTURE

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**KEYWORDS:** Health coverage system, Day service for old people, Facilities location, Use sphere

**ABSTRACT:** This paper aims at explaining the location trend of day service facilities and the change in time series of the sufficiency level by use sphere after the health coverage system was introduced. The results are as follows. 1) Though the number of facilities construction before the introduction of care insurance system was about 3-10 facilities/year, the number increased rapidly with about 40 facilities/year after 2000. And the small-scale facilities in the capacity of less than 10 people are on the increase drastically in place of the facilities in the capacity of 11-30 people around the large-scale area after the care insurance law revision in 2006 which the promotion of supply of small scale multiple functions type was decided. 2) The aging rate and sufficient rate are similar to about 25% in the large-scale area, but the difference is seen in the middle scale area in 20-30% of aging rates and 15-40% of sufficient rates. 3) Though the aging rate exceeds 40% in the small-scale area in the cities of half, the sufficient rate is large before and after 20%, so the rate is low relatively. But, it was shown that an area (*ABU-cho*) existed with 37% of sufficient rate by forming the network of one large facility and three small facilities.

## 1. INTRODUCTION

### 1.1 BACKGROUND OF THE RESEARCH

It proceeded with the reform of the social welfare system from the latter half of 1980 years fee, the decision of the new gold plan that the emphasis was put for the service base maintenance (1994), the formation of care insurance law(1997), and the gold plan 21 (1999) that the basis was put on at-home welfare was settled on based on the health coverage system. Next year, the health coverage system was introduced to attempt strengthening of the area welfare support system (2000), at the same time, social welfare law was concluded and social welfare business law and so

on was revised (2000), and (1) construction of the social welfare system made in the user's standpoint (2) improvement in the quality of the service (3) fulfillment and activation of the social service (4) increase in area welfare were made the pillar of the law. With revision care insurance law (2006), it changes into the policy of the prevention emphasis, the establishment of the area inclusion center to provide the care preventive service and the contents that maintenance such as a small scale multiple functions type care office caused by the start of the area close adhesion type service by the local governments was promoted were included (table 1). The repair condition of the old people day service

facilities of the whole country after 2001 is shown in the figure 1. As for the number of facilities, it doubles in 21,000 facilities in 2007 from 9,000 in 2001, and it is understood that the maintenance is proceeding rapidly. About the management subject, though the social welfare corporation which became the center from before occupied 5000 facilities and majority in 2001, after the introduction of the health coverage system, the entering of the profit-making corporation has been increasing rapidly, and the number reached 7000 facilities in 2007, and the point that management by NPO which wasn't hardly seen in 2001 shows a tendency to increase is pointed out as the characteristics.

## 1.2 THE PURPOSE AND METHOD

For Yamaguchi Prefecture where the decrease in population and the progress of aging are nationwide remarkable, this paper aims at explaining the location trend of old people day service facilities after the health coverage system (2000) introduction to support care for home and the change in time series of the level of sufficiency by the area stage.

The method of research is that local governments are classified by the index of change of population and aging rate, and the changes of the aged population are put in order by the type, and the next, the classification of old people day service facilities repair process of Yamaguchi Prefecture is done, and facilities repair conditions are put in order by the type. The level of sufficiency of the day service facilities to the old people population is grasped more, and relations between the population change type and the repair process type are put in order.

## 2. THE OLD PEOPLE POPULATION CHANGE OF Yamaguchi Prefecture

### 2.1 THE POPULATION CHANGE AND TREND OF AGING

Table.1 Senior citizen welfare policy chronology of Japan

1989	<sup>2</sup> Senior citizen health welfare promotion ten year strategy <sub>2</sub> (Gold plan)
1994	(New gold plan)
1997	<sup>2</sup> Care insurance law <sub>2</sub>
1999	(Social welfare basic structural reform) (Gold plan 21)
	Social welfare law
2000	<b>The health coverage system</b> When the person who exists in the state of needing care or the state of the support necessary uses the nursing service, not only insurance that collects the cost (supply expense) from the insurant but also the country, administrative divisions, and the municipality bear responsibility.
2005	<b>Revision care insurance law</b> It converts to the policy of a preventive valuing. The maintenance such as the small-scale, multifunctional type nursing offices according to beginning of community-based service by the establishment of the region inclusive center that provides the preventive approach in long term care service and the municipality is promoted.

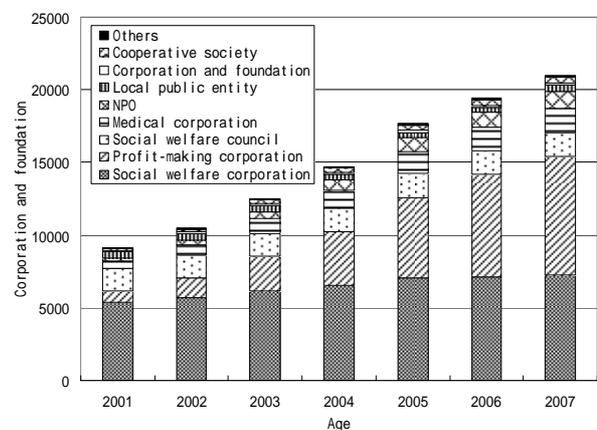


Fig.1 The repair condition of the old people day service facilities of the whole country

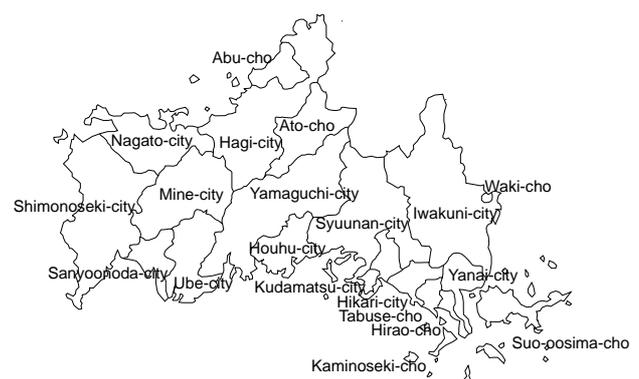


Fig.2 Yamaguchi prefecture complete map

Total population, old people population and aging rate change from 1985 until 2035 is shown in the figure 3 with the census and population prediction data by the Institute of Population

Problems. The total population of Yamaguchi Prefecture shows a tendency to decrease from 1,600,000 people in 1985, and it has predicted that it decreases to 1,100,000 people in 2035. The pace of decrease in the small scale local governments such as *Kminoseki-cho*, *Abu-cho*, *Atou-cho*, *Suo Ooshima-cho* is high. On the other hand, as for the old people (over 65 years old) population, it is on the increase from 210,000 people in 1985, and it reaches 460,000 people in 2020, it shifts to the decrease after that, and it is predicted that it decreases gradually. It is predicted that population decreases over 75 years from 2025, so the increase tendency of aging rate becomes weak, but the aging rate (over 65 years old) will meet 37% in 2035 by the decrease in total population.

## 2.2 THE POPULATION CHANGE PATTERN BY THE INDEX OF POPULATION, AGING RATE

To grasp the characteristics of change of old people population of every local government in Yamaguchi Prefecture, the factor analysis was done by the indexes of the total population increase and decrease rate in every 10 from 1985 to 2035, over 65 years old population increase and decrease rate, over 75 years old population increase and decrease rate, over 65 and 75 years old aging rate in every 5 from 1985 to 2035, and total population in 1985. The analysis is proceeded by using the first and second factor which the characteristic value of the factor is effective.

The factor score distribution of first and second shaft is shown in the figure 4, and the factor score distribution of local governments is shown in the figure 5. The shafts are interpreted as that first shaft shows the old people population increase and decrease rate and second shaft shows the aging rate, so in case of local governments that the factor score of first shaft is on the + side, and one of second

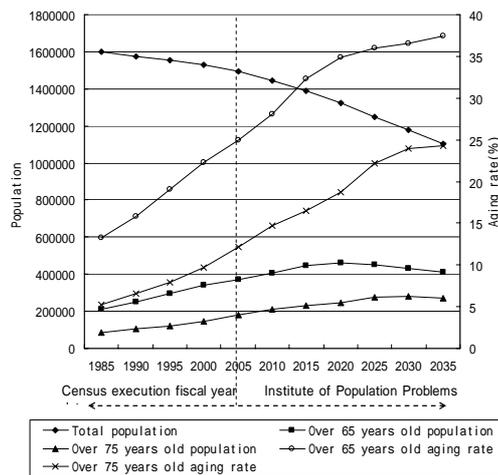


Fig.3

Total population, old people population and aging rate change

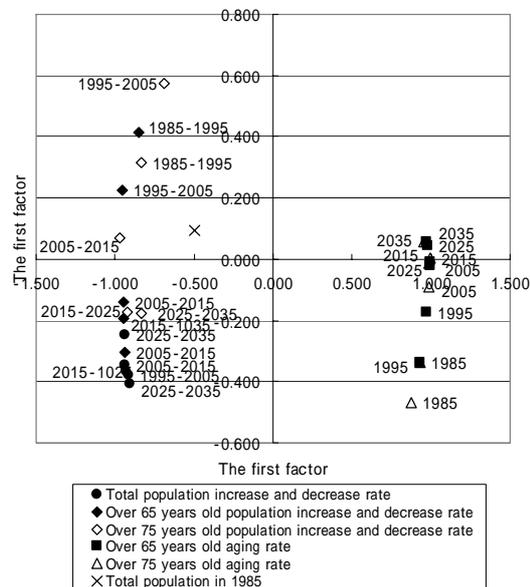


Fig.4 The factor score distribution of first and second shaft

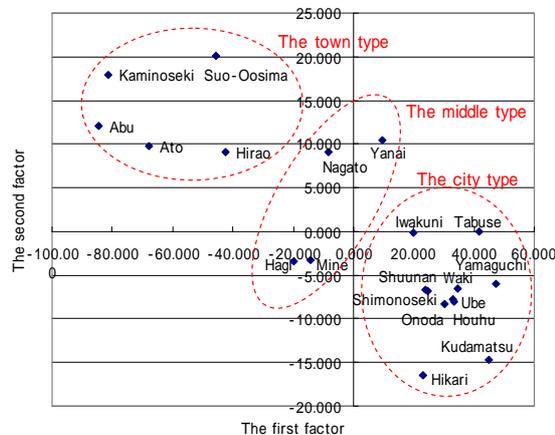


Fig.5 The factor score distribution of local governments

shaft is on the -side, the old people population growth rate is high and it can be interpreted that aging rate is low. On the other hand, in case of local governments that the factor score of first shaft is on the -side, and one of second shaft is on the +side, the old people population growth rate is low and it can be interpreted that aging rate is high. Local governments in the neighborhood of the origin can be interpreted as the middle-like ones in the old people population growth rate and aging rate too.

Next, the local governments were classified into three types by the cluster analysis with the factor scores of first and second shaft whose characteristic value is high. The map of government type is shown in the figure 6. The 10 local governments that contains the large-scale city in the prefecture like as *Shimonoseki City*, *Shunan City* belong to Type1, and the old people population growth rate is high and the aging rate is low so this type can be said "the city type". *Waki-cho* and *Tabuse-cho* are not the large-scale city, but they were contained in the large-scale group because the indexes are similar with these cities. *Hagi*, *Mine*, *Ngato* and *Yanai* cities are contained in Type2, and it is called "the middle type" that is the middle of large scale City and small scale town viewed from the index of population and aging rate. Small-scale towns occupies the Type3 like as *Suo Ooshima-cho*, *Abu-cho*, *Kaminoseki -cho*, and the old people population growth rate of this type is low and the aging rate is high, so it is called "the town type".

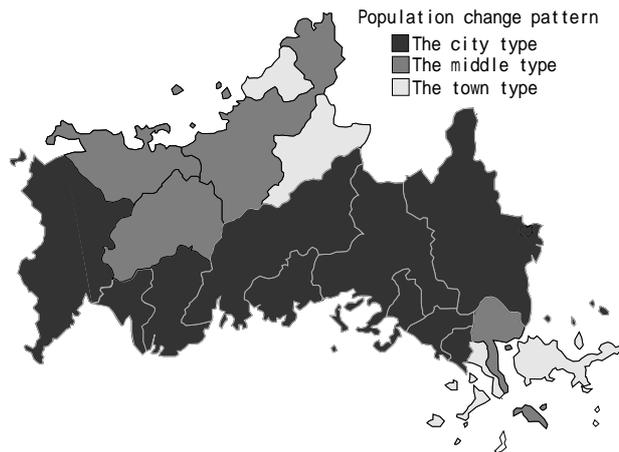


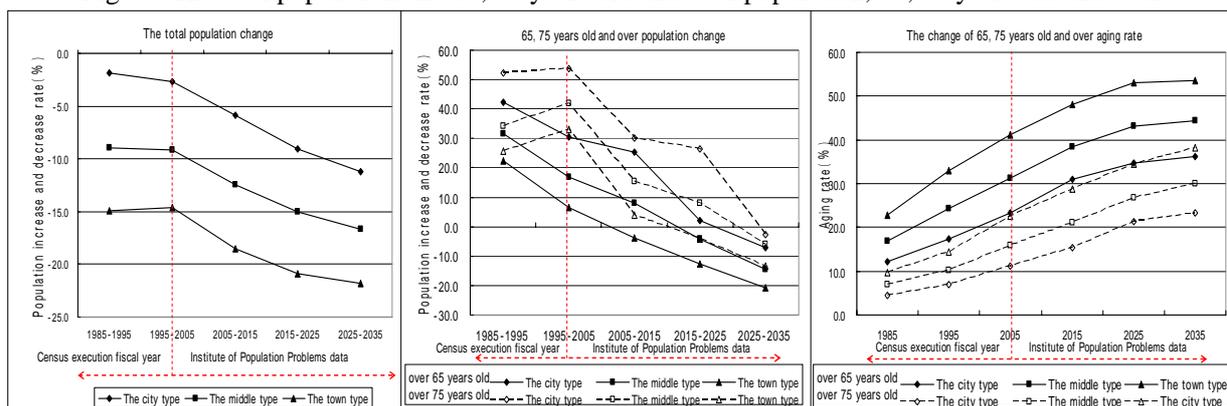
Fig.6 The map of government type

### 2.3 THE CHANGE OF OLD PEOPLE POPULATION BY THE TYPE

The total population and 65, 75 years old and over population change in every 10 from 1985 until 2035, and the change of 65, 75 years old and over aging rate in every 5 from 1985 until 2035 of every population change type is shown in the figure 7. The pace of decrease of "the city type" is the lowest with the total population increase and decrease rate and it becomes high in order of "the middle type" and "the town type". By the decrease tendency of three types are fundamentally the same, the decrease is slow before 1995 years, and the one after 1995 decreased rapidly year by year.

As for the population increase and decrease rate of over 65 years, "the middle type" and "the town type" are the almost same tendencies, and the decrease is slow in "the city type" from 1995 to

Fig.7 The total population and 65, 75 years old and over population, 65, 75 years old and over



2005 years but it follows the decrease tendency that it decreases rapidly after 2015 years and looks like 2 types of others. Though the population increase and decrease rate of over 75 years shows the tendency to increase until 2005 years with 3 types, it is changing into decrease after 2005 and "the city type" decreases rapidly after 2015.

In the next, as for the aging rate of over 65, 75 years old, "the town type" is the highest with each year as well, and it lowers in order of "the middle type" and "the city type". Though the aging rate of over 65 years shows the tendency to increase until 2025 years, the tendency becomes slow after 2025 years a little. The aging rate of over 75 years is the increase tendency that it looks alike together with 3 types, but the increase becomes slow in "the city type" after 2025 years a little.

### 3. THE ESTABLISHMENT CIRCUMSTANCES OF DAY SERVICE FACILITIES IN YAMAGUCHI PREFECTURE

#### 3.1 THE NUMBER OF DAY SERVICE FACILITIES

The change of the number of newly-established facilities of day service facilities from 1980 until 2008 is shown in the figure 8. In Yamaguchi Prefecture as well, day service facilities were established abundantly after the care insurance system introduction in 2000, 155 facilities were established newly in 2000-2004 and 205 facilities in 2005 -2008. As for the capacity of facilities, it occupied most in 11-30 people until 1999, but the small-scale facilities of less than 10 people, 31-50 people and more than 51 people were increased in addition to 11-30 people in 2000-2004 years, and small-scale facilities are on the increase drastically after 2005 more years. The at-home care service was recommended by the care insurance revision in 2005, and it can be thought that the small-scale facilities of the area close adhesion type increased

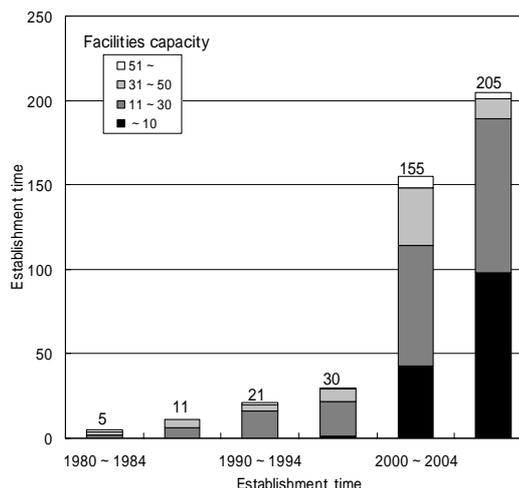


Fig.8 The change of the number of newly-established facilities of day service facilities

### 3.2 THE MANAGEMENT SUBJECT AND BUILDING FORM OF FACILITIES

Table.2 The management subject and building form of day service facilities

		The management subject									
		The whole	Social welfare council	Social welfare corporation	Medical corporation	Profit-making corporation	Medical corporation	NPO	Local public entity	Cooperative society	Agricultural cooperative association
On: 1999 (67) Under: 2008 (427)		67	65	1	1						
Building form	The whole	427	21	153	1	165	49	26	2	5	5
	Newly-established type	3	2	1							
	Private house improvement type	112	10	11	1	63	11	12		1	3
	The establishing as an annex type	61	3	9		33	10	5		1	
		64		63			1				
		254	8	133		69	28	9	2	3	2

by the influence of revision.

The management subject and building form of day service facilities in 1999, 2008 are shown in the table 2. As for the management subject until 1999, though a social welfare corporation was most In addition to the social welfare corporation, the profit-making corporations increased after 2000 years, and medical corporations, social welfare conferences and NPO increased as well. After 2005 years, the management of profit-making corporation increased more.

The building form was classified into 3 types, newly-established type, private house improvement type and the establishing as an annex type to the existent hospital, home for the aged and so on. The establishing as an annex type such as home for the aged was most until 1999, but the newly-established type was increased along with the care insurance system enactment after 2000 years. Further more, private house improvement type is on the increase year by year by the influence of the system revision in 2005.

The management subject of the newly-established type has most profit-making corporations, and it is managed additionally by the social welfare conference, social welfare corporation, medical corporation, NPO and so on. The private house improvement type has most profit-making corporations too, and it is managed by medical corporations, social welfare corporation and so on additionally. There is an example that the management person provides home in the private house improvement type. The management subject of the establishing as an annex type has most social welfare corporations, and in these others, it is managed by profit-making corporations, medical corporation and so on. In case of social welfare corporation, establishing with home for the aged are most and in case of medical corporations, establishing with hospital are most. In addition, as for the establishing type, the facilities established with nursery school or hot spring have been increasing recently.

### 3.3 PATTERN OF FACILITIES REPAIR PROCESS

To grasp the facilities repair process of the self-governing body in detail, cluster analysis was done by using the 6 variables of the facilities component ratio that capacity (3 classification of less than 10 people, less than 11-30 people and

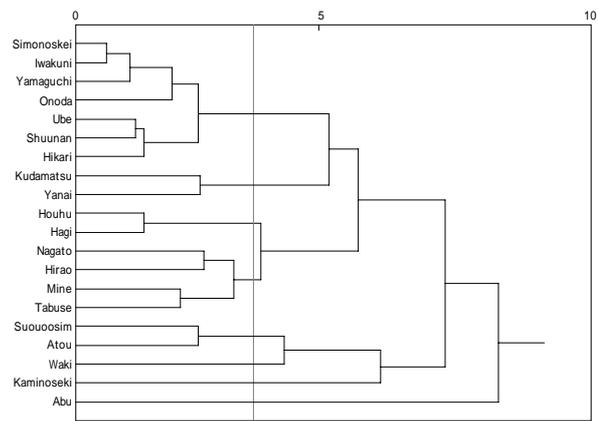


Fig.9 Tree diagram

Table.3 Mean of variables of every type

		2000 Level			2000 ~ 2004 capacity			2005 ~ 2008 capacity			2008 Level
		~ 10	11 ~ 30	31 ~	~ 10	11 ~ 30	31 ~	~ 10	11 ~ 30	31 ~	Level
a	Type1	0.37	13.11	14.79	12.50	25.99	16.45	3.00	2.78		
	Type2	0.54		21.46	3.45	15.90	25.96	13.51	2.88		
b	Type3	0.23	5.56	8.89	38.89	3.33	31.11	3.33	2.67		
	Type4	0.56	5.28	21.81		16.53	35.56		2.91		
c	Type5	1.46	3.13	34.38		37.50			6.87		
d	Type6	1.49							1.55		
e	Type7			100.00					2.99		
f	Type8					75.00		25.00	10.51		

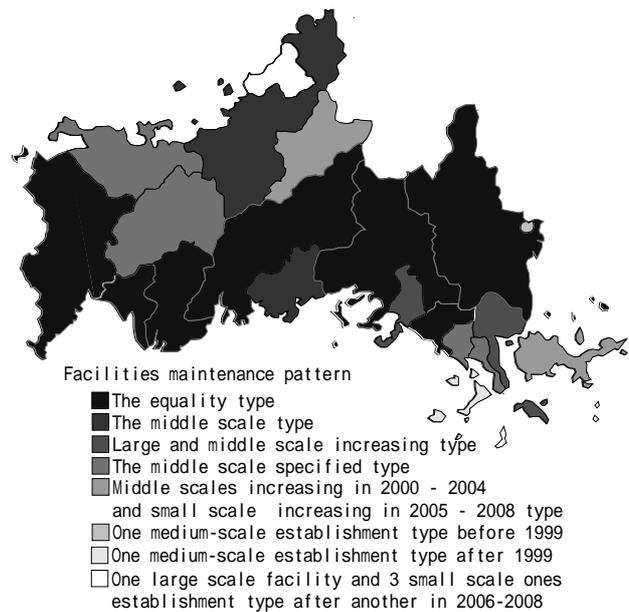


Fig.10 Type map

more than 31 people) was combined with establishment time (2 classification in 2000-2004, in 2005-2008) and 2 variables of facilities level of the population of around 10,000 people in 2000 and 2008, as the result local governments were classified into eight types. Tree diagram is shown in figure 9, mean of variables of every type is in table

3 and type map is in figure 10.

Type1 is called with "the equality type" because the facilities of the accommodation capacity of less than 10 people, 11-30 people and more than 31 people established equally over 2000-2004 and 2005-2008. The facilities were increased in the accommodation capacity of 11-30 people in 2000-2004 and 2005-2008, so Type2 can be called as "the middle scale type". The repair level in 2000 of Type3 was low, large scale (capacity of more than 31 people) facilities increased in 2000-2004 and middle scale facilities increased in 2005-2008. On the other hand, small scale facilities is not on the increase after 2000, so Type3 is named as "large and middle scale increasing type". Though middle scale facilities increased after 2000 years, large-scale facilities don't exist at all, so Type4 can be called as "the middle scale specified type". The level in 2000 of Type5 is high, the middle scale facilities increased in 2000-2004 and small scale one is on the increase in 2005-2008, so this type can be said as "middle scales increasing in 2000 - 2004 and small scale increasing in 2005 - 2008 type". As for Type6 (*Waki-cho*), one middle scale facility was established before 1999, and the level in 2008 has decreased since 1999 due to the increase of old people population. As for Type7 (*Kaminoseki-cho*), one middle scale facilities was established in 2000-2004, and the repair level is the lowest in the prefecture. As for Type8 (*Abu-cho*), one large scale facility and 3 small scale ones were established one after another in 2006-2008, and the repair level is the highest in the prefecture.

### 3.4 RELATION BETWEEN POPULATION CHANGE AND REPAIR PROCESS

Relations between the population change type and the facilities repair process type and the change of the facilities level are shown in figure 11.

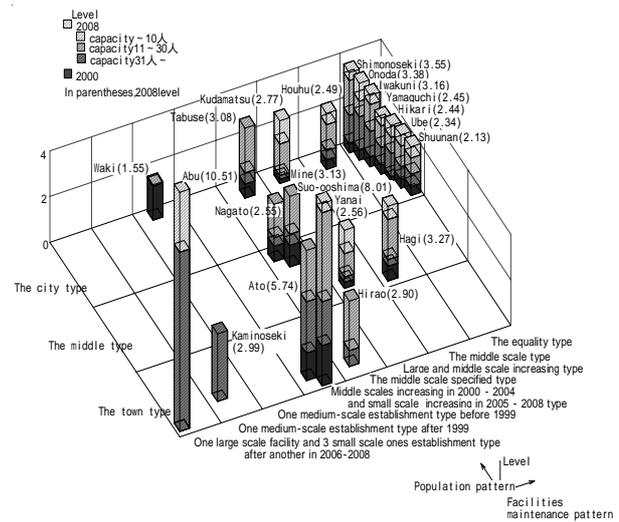


Fig.11 Relations among population change type, facilities repair process type and change of facilities level 2008.

Facilities level was calculated by using the population and the number of total facilities in 2000,  $\text{Facilities level (around 10000 people)} = \text{Total facilities number} / \text{Population} \times 10,000$

Many small-scale facilities were specially established in "the equality type" in 2005-2008 though the level in 2000 and 2008 is average from the viewpoint of all prefectures. Because many middle scale facilities were established in 2005-2008, the level defined by the number of facilities per population didn't rise very much at the middle type. In the local town area, there is the dispersion with facilities repair level. As for *Suo Ooshima-cho* and *Ato-cho*, it proceeds with the facilities repair before 1999, and middle and small scale facilities were increased equally after 2000, so the repair process is similar to "the city type". On the other hand, in *Hirao-cho*, *Abu-cho* and *Kaminoseki-cho*, the repair of middle scale facilities has been started after 2000.

### 4. SUFFICIENCY LEVEL OF DAY SERVICE

The level of sufficiency was calculated by using the facilities capacity and the old people (over 65 years old) population with the following

formula.

Sufficient occasion (/1000) = facilities capacity/old people population ×1000

The change of sufficiency of day service facilities of Yamaguchi Prefecture is shown in figure 12. though the rise of level of sufficiency to the number of old people over 65,75 years was comparatively slow before 1999 years, the level was risen drastically after 2000, so the effect of care insurance system introduction in 2000 is admitted remarkably.

In the next, the change of sufficiency level by repair process type is shown in figure 13 and sufficient occasion map in 1999 and 2008 is in figure 14, 15. Though the level of sufficiency was under 10 in most governments in 1999, the ones that exceed 20 are most in 2008, and there are only 3 cases to be lower than 20.

The number of old people will be on the increase rapidly in the city part, and the demand for day service will increase from now on. The characteristic of the city type is that the repair pattern of "the equality type" is abundant. But, middle scale facilities are major in *Kudamatsu City*, *Hofu City* and *Tabuse-cho* in five local governments of high rank that the level of sufficiency is high. The level of sufficiency was rose drastically with 35 in 2008 from 2.9 in 1999 because middle scale facilities increased in 2000-2005 years in *Kudamatsu City*.

Facilities repair is alike in the middle scale facilities by four cities middle type, and there are many establishing cases to the existent facilities. Day care facilities had been already established before 1999 years in Mine City, the level of sufficiency is high with 12.7 at 1999, and it proceeded with the establishment of facilities over 2000-2004, so the level of sufficiency in 2008 is the highest with 30 among 4 cities though facilities weren't being established after 2005. It proceeded

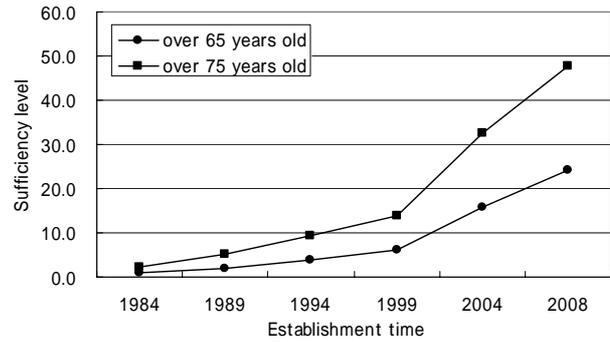


Fig.12 The change of sufficiency of day service facilities of Yamaguchi Prefecture

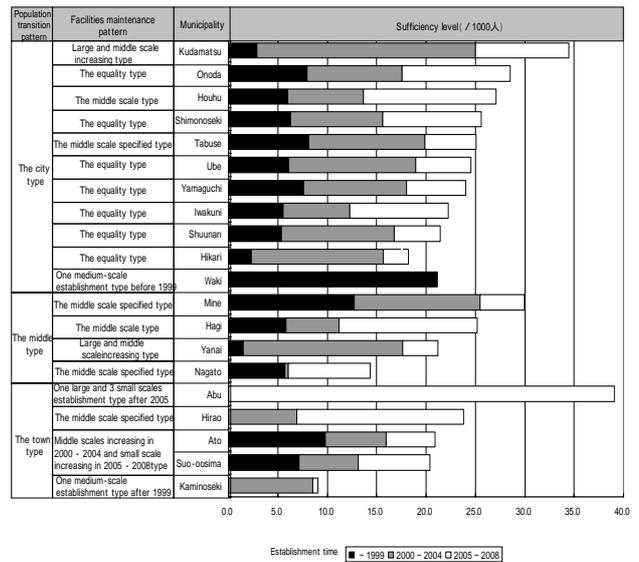


Fig.13 The change of sufficiency level by repair process type

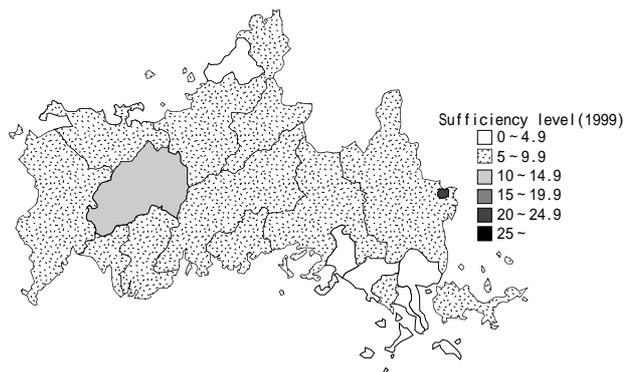


Fig.14 Sufficient occasion map in 1999

with the establishment of the facilities even in *Yanai City* over 2000-2004 years, and the level of sufficiency rose greatly. On the other hand, facilities were established in *Hagi City* after 2005 years, and the level of sufficiency rose to 25.2 in

2008 from 5.8 in 1999. There was no facilities establishment among 2000-2004, and the level in 2008 is the lowest with 14.3 in Nagato City.

The characteristic of the town type is that there is the dispersion with the facilities repair of every town. In *Ato-cho* and *Suo Ooshima-cho*, facilities had been established before 2000 years, the middle scale facilities increased in 2000 -2004 years and Small-scale facilities were increased smoothly after 2005 years, so the repair process is similar to the city type. As for *Abu-cho*, *Kaminoseki-cho* and *Hirao-cho*, it is common in the point that middle scale facilities established after 2000 years are the main stream. There was no facilities location before 1999 in *Hirao-cho*, but facilities increased around the middle scale facilities after 2005, and the level has been risen greatly. In *Abu-cho*, facility wasn't prepared too before 2004 years, but the large and small-scale facilities had been established continuously after 2005, as the result the sufficient rate in 2008 is the highest in 39 in the prefecture.

## 5. CONCLUSIONS

In this paper, the establishment trends of old people day service facilities after the care insurance system introduction were put in order and the local gap of service level and the character of change in time series were explained. The results are as follows.

(1) The number of new establishment of day service facilities were about 3-10 /year before the care insurance system enactment, but the number increased rapidly with about 40 facilities/year after 2000, and after the care insurance law revision that the repair promotion of small-scale care office stuck to the area was decided in 2006, small-scale facilities of less than 10 people are on the increase drastically around the city part adding to the capacity of 11-30 people.

(2) By the classification with the index of change of

population and aging rate, local governments were classified into three types. "The city type": old people population growth rate is high and rise in the

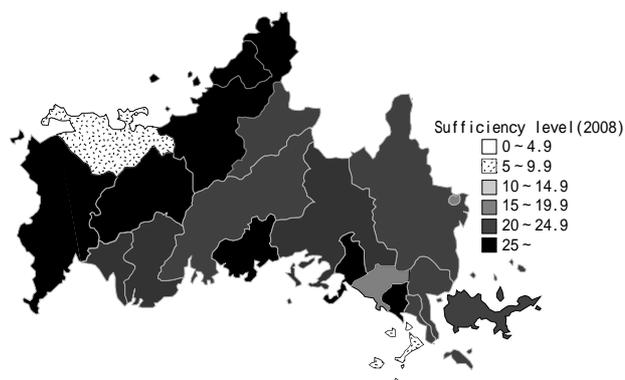


Fig.15 Sufficient occasion map in 2008

aging rate is low relatively because the population decrease rate is low. "The town type": the old people population growth rate is low but the population decrease rate is high, so the rise in the aging rate is high. "The middle type" : the indexes are middle of city type and town type.

(3) The facilities repair process was classified in eight types with the index of establishment time and facilities accommodation capacity. The city part has many equality types that small, middle and large-scale facilities are arranged equally. In the middle scale City part, the facilities location of the middle scale is in the subject, and there are many cities that facilities repair have started in earnest after 2000 years in the town part.

(4) There are many repair patterns of the equality type in the city type, the level of sufficiency is distributed in the close range to the prefecture mean of 20-25. Effect on the scale of facility is admitted in 3 cases of the middle scale type in the 5 cases beyond the sufficient occasion 25. Middle scale facilities are alike together the main type by four cities of middle type, the level of *Mine City* is is over 30 but the facilities repair in 2000-2004 didn't proceeded in *Nagato City*, so the level is low with 14, and the difference of the level

is existed among 4 cities. Excluding *Kaminoseki-cho* (sufficient level 9), all the levels of sufficiency exceed 20 in the town type, especially the level reached 39 in Abu-cho where facilities repair was promoted after 2005 years and the difference of the level is recognized in the town type too.

Facilities repair type is different in the city part and the town part, especially, after the care insurance system revision in 2005, small-scale facilities increased drastically in the city part, and the increase in the middle scale facility is conspicuous in small city and town part. In the city part, the number of old people is on the increase rapidly, so the increase in demand for day service can be anticipated and the population density is high relatively, so the time cost to pick-up can be reduced in case of small-scale facilities. On the other hand, increase in the number of old people can't be anticipated as much as city part and the time cost to pick up rises because of low population density. In case of small-scale facilities, the profit of the facilities management is low, so the facilities repair of the establishing type of the middle scale comes to take the greater part, as the result the establishment of small-scale facilities may be refrained.

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