

USE SPHERE COMPARISON OF REGIONAL NUCLEUS FACILITY AND AREA CLOSE HOMES FOR OLD PEOPLE'S DAY SERVICE

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Abstract

This paper aims at explaining the effect on network formation of day service facilities for old people in depopulating rural area by the use sphere analysis of regional nucleus facility and area close homes. The regional nucleus facility with satisfactory equipments is placed on the facility for the old people who hopes the special rehabilitation, and on one side the area close home with multiple functions is arranged in disperse and by placing it on the home to provide the service for the old people who likes the homelike atmosphere that is available without reserve, correspondence to general increase in demand, shortening of pick-up time by sharing use sphere and the fulfillment of old people's choice branch of day service menu become possible. The trial to combine the central facility with advanced function and the distributed arrangement of small scale welfare home with multiple functions that made use of existent building and to build the network of facility use is evaluated as an effective method to secure the amount and quality of welfare service corresponding to the increase in the demand and to realize the reduction of repair cost at the same time.

Keywords: Regional welfare home, Renovation of vacant house, Facilities location, Use sphere

1. Introduction

Local governments of depopulation area have the difficult subjects of the correspondence to the increase in demand for medical welfare to support old people's life due to the simultaneous progress of the decrease in population and aging and the maintenance of the service level under the conditions of the financial pressure. The regeneration of area community that aimed at the population settlement and fulfillment of old people welfare due to the existent building stock and use for talented people of the area is placed on the important subject. As a method of solution of the subject, the maintenance of the area close adhesion type's welfare facilities making use of existent facilities and private houses is started, and the validity of advantage to establish it at small cost and the effect as the welfare foothold stuck to the area have being watched. The construction of the old people welfare network by the connection of the wide area nucleus facilities and the area close facilities is the effective method to cope with increase in demand of the future welfare service in the depopulation area.

2. Purpose and Methods

A nursing home for the aged, day service center and home care support center were established as the wide area nucleus facilities in Yamaguchi Prefecture Abu-town in 1998. After that, three old people welfare footholds of the area close adhesion type were established. It pays attention as the advanced case that it proceeds with network construction of the nucleus facility and the area close homes in depopulation area.

This paper aims at explaining the effect on network formation of the facilities by the comparative analysis of the use characteristics of the nucleus facility and area close homes.

As for the method of research, in the first, by the data collection and the listening comprehension investigation, the establishment details, building outlines and the management method of the nucleus facility and area close homes are put in order, and terms of formation of the facilities network are explained. In the second, by making use of registrant data, facilities use pattern classification and the comparison of the use characteristics are analyzed, and the actual condition of the function sharing is cleared. In the third, by the research on the actual condition of picking up users, the role and validity of the facilities network are explained with the relationship analysis of facilities use sphere and pick up method.

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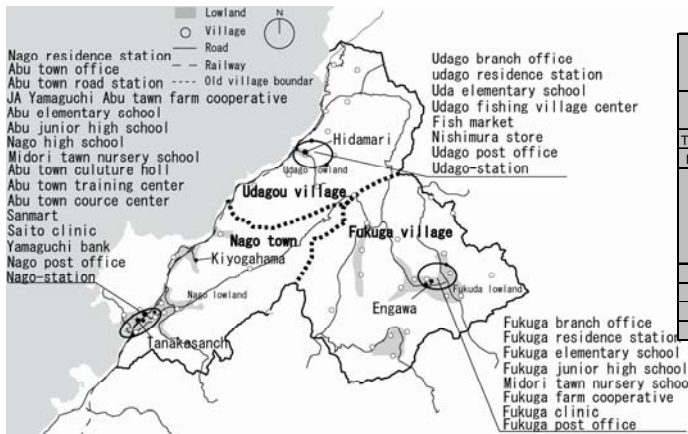


Fig.1. Space Characteristics of Subject Area and Position of Main Facilities

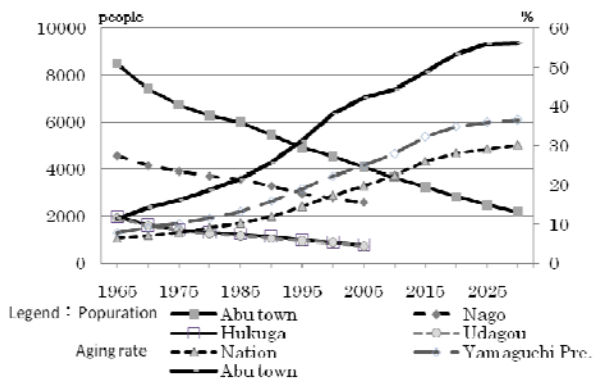


Fig.2. Change of Population and Aging Rate of Abu-town

3. Space Characteristics and Population of Subject Area

Nago town, Udago village and Fukuga village had combined in 1955, and became Abu town. It is the typical rural area that faced the Sea of Japan. The central area of Nago spreads out in the level ground part on the national route 191 line at present. Around JR Nago-station and town office, various public facilities, post office, medical and purchase facilities and so on are accumulated, so this area is functioned as the central district in the whole town.

The fishing village put by the Sea of Japan and national route 191 is the central area in Udago, and farm villages spread out in the hilly areas of the circumference. Hill area occupies most in Fukuga area, and central village is located in the comparatively wide basin. The distance from the center zone of the town is about 2.5Km, and the convenience of the traffic is low.

The population shifted to decrease after the 1960's of the advanced economic growth term, and decreased drastically from 10,000 to 7,400 persons in 1955-1970 years (fig.2), and this tendency has being continued, and the population is 4,100 in 2005. On the other hand, the old men of 65 years old and over show a tendency

Table 1. Outline of Regional Nucleus Facility

Institution's name	Kiyogahama Day service Center	Nursing home for the aged Seikouen	Kiyogahama helper station	Special nursing home for the aged Keizyuen	Group home Deai
Structure	RC one-story	RC one-story	RC one-story	RC one-story	Wood one-story
Total floor space(m ²)	605.72	2433.85	46.26	2629.97	321.9
Establishment year	1998.4	1998.4	2006.4	2000.3	2005.3
Main room's name	Rest room Office room Dining room, Toilet Special bath room Public bath room	Living room Dining room Rest room Office room Toilet, Bath room	helper station	Living room Dining room Toilet Lift bath room Public bath room	Living room Dining room Toilet Bath room
Office date	Mon.~Sat.	Mon.~Sun.	Mon.~Sat.	Mon.~Sat.	Mon.~Sat.
Office hours	8:30~18:00	0:00~24:00	8:30~17:30	0:00~24:00	0:00~24:00
Number of users	58	49	18	50	9
Number of staff	11	23	6	64	8

Table 2. Outline of Area Close Homes

Institution's name	Engawa	Hidamari	Tanakasanchi
Structure	Wood two-story	Wood two-story	Wood two-story
Total floor space(m ²)	283.46	129.42	119.61
Repair cost	2,400,000	8,500,000	0
Establishment year	2006.6	2008.6	2008.6
Office date	Tue.~Sun.	Sun.~Fri.	Mon.~Sat.
Office hours	8:30~18:00	8:30~17:00	8:30~17:00
Number of users	24	19(17)	26
Number of staff	5	4	4

Note: () shows number of the prevention of nursing care

to increase consistently after 1965 years, and they are on the increase from 968 people (1965) to 1781 people (2005). The total population of the town is decreasing, only old people population is on the increase, so the aging rates rose suddenly to 38.1% of 2000 from 11.4% of 1965's. Comparing with Yamaguchi Prefecture average (22.2%) and the national average (17.3%), the progress of the aging is remarkable, and the aging rate will be over 55% in 2030 by the result of a prediction.

4. Institution Process of The Facilities

4.1. Institution Process and Outline of Regional Nucleus Facility

Nursing home for the aged, day service center and home care support center were established in accordance with the introduction of the health coverage system in 1998 (table 1) , and special nursing home for the aged was established in 2000, so the level of the old people protective institution improved in the amount and quality rapidly. The group home which is the community life facilities of the dementia old people has been prepared newly in 2005, and the nucleus facility has reached in shouldering the role as the wide area welfare foothold. New management organization "Abu social welfare corporation" was established in 2000 to carry out the effective practical use of these facilities, and it is placed on the special incorporation that shoulders old people welfare of the town.

Before the corporation establishment, capable talented people of the welfare field were employed newly as the management person in charge and staff, and they are active as the kernel of the old people welfare work promotion, also they are grappling



(a) Kiyogahama



(b) Engawa



(c) Hidamari



(d) Tanakasanchi

Photo1. The appearance of the facilities

the area close welfare homes maintenance actively.

4.2. Institution Process and Outline of Area Close Homes

After the construction of nucleus facilities was completed, dealing with the area close home establishment was started, and Abu welfare corporation established "Engawa." that the farmer house was reused in 2006 in Fukuga area. After that, "Hidamari" has established in the center village of Udago area, and "Tanakasanchi" rented a timber house has established one after another near JR Nago station in the central part of Nago area in 2008. As the result, the network of the area close homes had been built at the central area of old 3 town and villages before the merger. The outline of 3 homes is shown in table 2.

5. User Properties and Use Patterns of the Facilities

5.1. User Properties

As for the age of the day service user, the old people of 90 years old and over occupies about half and specially meets 70% at "Engawa", in the next there are many users in the 80's with about 40%, and lower than 10% under 80 years. As for the sex, it is characteristics that there are many men with 40% on "kiyoga beach" of the nucleus facilities on the other hand, there are many women with about 80% in 3 area close homes, and especially more than 90% is a woman with "Tanakasanchi".

About the user's degree of care and wheelchair use conditions, on "Kiyogahama", the care level 3 and over occupies 1/4, user rate of high care degree is high and four users of care level 5 that is rare in standard day service facilities have been received. Also wheelchair user occupies about 30%. On the other hand, there is a little care level 3 with about 15%, and there are many users of the care level 1, 2 with 50-60%, and the support need level 1, 2 is 20-30% of the rates in "Engawa" and "Hidamari". Independence (23%) and the support need level 1, 2 (38.5%)

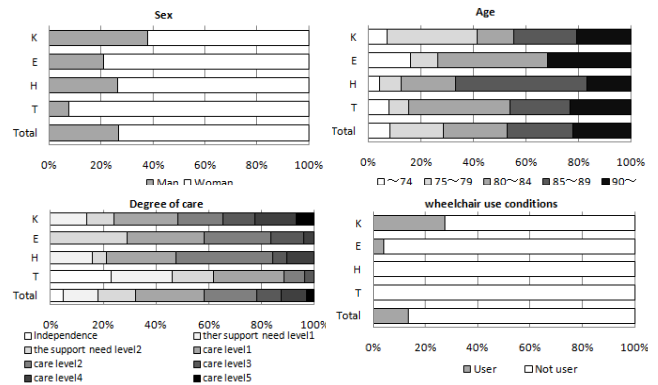


Fig.3. User Properties

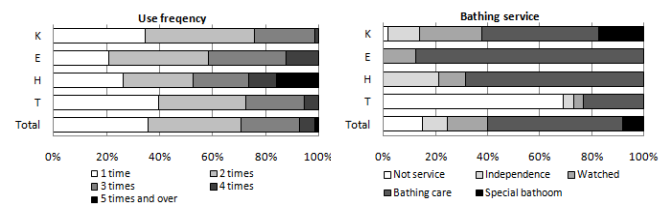


Fig.4. Use Frequency of Facility and Bathing Service

occupy 60% of the whole in the case of "Tanakasanchi", and there is a little care level 2 with 10%.

The point that the user's degree of care varies in the facilities greatly is the characteristics.

As for the week use number of times of the facilities, 1 time a week and 2 times are about 40% each in "Kiyogahama" and "Tanakasanchi", and there are a few users of 3 times and more in a week with about 20%. On the other hand, the user of 3 times and more in a week occupies 40-50% in "Engawa" and "Hidamari", especially, users of 4 times and more in a week are in 10-20%, and it is characteristics that the use number of times of the facilities is large.

About the bathing service, with "Tanakasanchi", it is characteristics that there are a few users who take a bathing service with 30%, but most users take a bathing service in other facilities. Though the rate of watched and independence occupies more than 30% in "Hidamari" and "Kiyogahama", about 90% receives bathing care in "Engawa". The high rate of the special bathroom user with 17% is characteristics in addition to bathing care (45%) in "Kiyogahama" that has many users whose degree of care is high.

5.2. Use Pattern Analysis of the Facilities

Classification of the facilities use pattern was carried out by the quantification theory III and cluster analysis to grasp the relations between user's individual attribute and use form synthetically. Category distribution by the quantification theory III that made the age, sex, care occasion, wheelchair use, use number of times, bathing service the variables is shown in figure 5. The range of the care occasion,

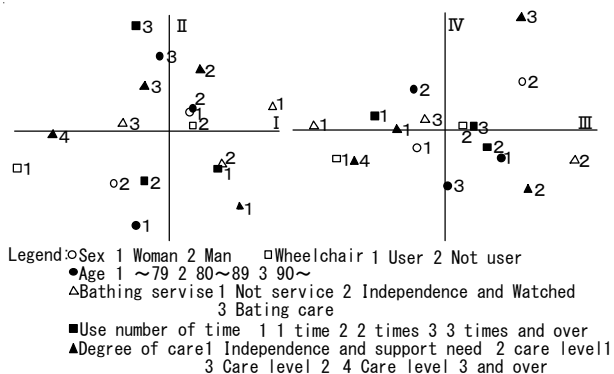


Fig.5. Category Distribution by The Quantification Theory III Analysis

Table 3. Result of Use Pattern Classification

Group	1	2	3	4	5	Average	
I average	0.87	0.15	-0.27	-0.29	-0.47	0.00	
II average	0.01	-0.29	-0.54	0.61	0.26	0.01	
III average	0.33	-0.34	-0.24	-0.53	0.43	-0.07	
IV average	0.19	-0.72	0.42	-0.18	-0.08	-0.37	
Sex	Woman	68	39	96	56	94	73
	~79	43	17	4	72	18	30
Age	80~89	28	74	44	22	70	48
	90~	29	9	52	6	12	22
Wheelchair	user	57	4				12
Degree of care	Independence and the support need				67	88	31
	Care level 1	4	4	92	33	6	28
	Care level 2	4	96	8			21
	Care level 3 and over	92				6	20
Use number of time	1	18	27	16	39	73	34
	2	39	30	32	55	24	37
	3 and over	43	43	52	6	3	29
Bathing service	Not service		9	20		36	13
	Independence and Watched		17	36	94	6	31
	Bathing care	100	74	44	6	58	56
Number of users		23	22	30	28	24	

wheelchair, bathing of I shaft is big. The care level 3 and over and use of wheelchair are located in the minus side, independence, support need level and the one without bathing are located on the plus side, so it is interpreted with the shaft that shows the user's degree of care. More than use number of 3 times a week and 90 years old and over are located on the plus side, and 79 years old and under and use number of 1, 2 times a week are located in the minus side, so II shaft is interpreted with the shaft that shows the use number of times and age.

Bathing (independence and watched) is located on the plus side, and the one without bathing is located in the minus side, so III shaft is interpreted with the shaft that shows the existence of bathing. Age of eighty years old fee and care level 2 are located on the plus side, and over an age ninety years old and care level 1 are located in the minus side, so IV shaft is interpreted with the shaft that shows the relations between age and degree of care. And, the accumulation correlation ratio to IV shaft is 0.58.

Next, the use pattern was classified in five groups by the cluster analysis that made the scores from I to IV shaft of each case the variables. The result is shown in table 3, there is no relationship between G1 and the age, and it can be said as the group which the

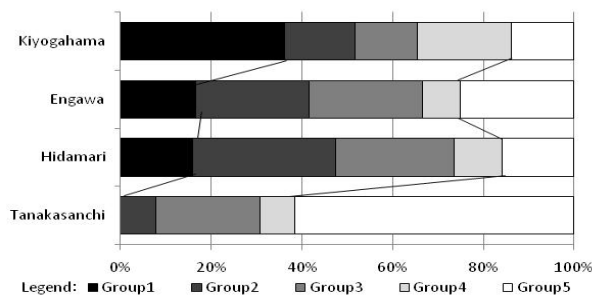


Fig.6. Component Ratio of Facility Use Pattern

degree of care is high and use number of times is large. Group 2 can be said as the group that the age is eighty years old fee, main care level is 2 and the use numbers comparatively large. Group 3 can be said as the group that the age is ninety years old fee. care level 1 and the central use number is the largest of all.

Group 4 can be said as the group that the age is 79 years old and under. healthy user is main and the use numbers comparatively small. Group 5 can be said as the group that the healthy user of an age eighty years old fee and the use number is smallest.

The component ratio by the facilities of these use patterns of five groups is shown in the figure 6. In case of nucleus facility "Kiyogahama", Group 1 that has many wheelchair users and the degree of care is high occupies about 40%, and fitting to Group 2, the number is beyond the whole majority, so many users whose degree of care is high are using. In case of area close home "Engawa", though the user of care level 3 and over is about 20%, there are users of the support need level and under, so the rate of Group 2, Group 3 and Group 5 is about the same, and various people are using both the degree of care and generation. Because Group 2, Group 3 occupies more than 50%, it is characteristics that the use number of times is large. In case of "Hidamari", though the rate is similar to "Engawa", the rate of G5 is low. On the other hand, the rate of Group 5 of the case of "Tanakasanchi" is high with more than 60% and the rate of Group 1, Group 2 doesn't reach 10%, so the degree of care is low and there are many users whom the use number of times is small.

6. The Use Sphere Analysis of the facilities

6.1. Use Sphere of Regional Nucleus Facility

Day service users are 58 people at present, and Nago area that is close to the facility is 38 people, Udago (8 people) and Kiyogahama area (4 people), the use of the resident of the point where is convenient for the pick-up on the line of the national route is abundant is the characteristics (fig.7). The use sphere is large with 5.5km in the use sphere by 50% and by 3.0km 80%, because the rate of the user from Hagi City area where it left facilities 13.5km and Udago area where it left facilities 10.0km occupies 21%.

As for the user from Nago and Udago area, the

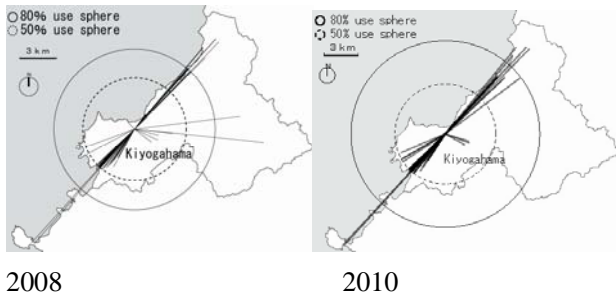


Fig.7. Use Sphere of Regional Nucleus Facility

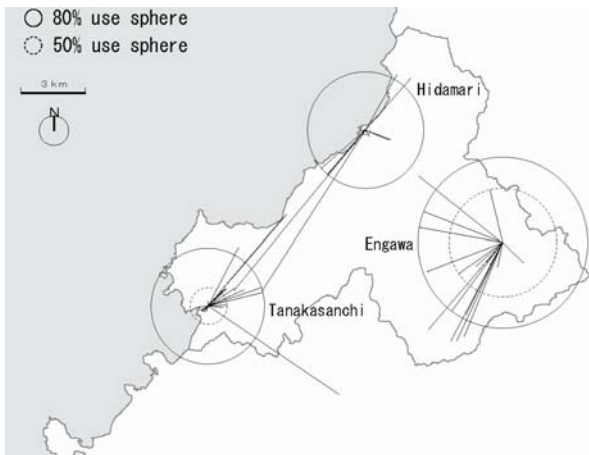


Fig.8. Use Sphere of Area Close Homes

continuation user before small-scale facilities opening and the user who hopes for bathing and rehabilitation in the foothold facilities where equipment became satisfactory is the main. On the other hand, from Fukuga area where needs for more than one hour to pick up users, there were 6 persons before "Engawa" was established in 2008, and after opening, there were 2 users, but facilities use sharing with "Engawa" is completed with 0 person at the moment in June, 2010.

6.2. Use Sphere of Area Close Homes

In Fukuga area, small-scale villagea are distributed in wide scale, and there are many users from Uoga area with no welfare facilities as well, so comparing with other 2 homes, the use sphere is large. Though the use sphere of 50% of users is 2.0km, the sphere is large with 3.5km by 80%, it is the home covering the whole of Fukuga area. By the guidance of the facilities use and the understanding of the local inhabitant of Fukuga area, users increased in 24 people after 3 years. Effect on use sphere sharing by network construction is admitted from four people's changing from "Kiyogahama" to "Engawa." after the opening of "Engawa."

As for "Tanakasanchi", the use sphere is comparatively small, so the use sphere is within the range of 0.7km in user's 50% use and 0.7km in 80% use, because the location is in the central zone the town ". In case of "Hidamari", the use sphere is within

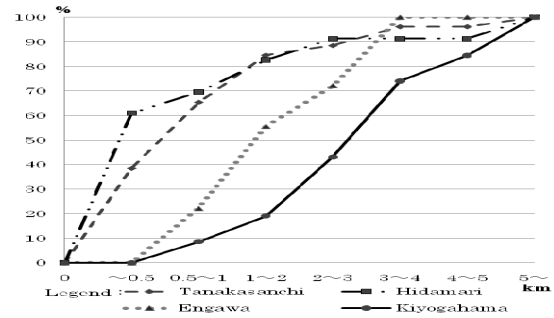


Fig.9. Use Distance Aggregate of Users

the range of 0.2km in user's 50% use and 1.5km in 80% use too, so the use sphere is smallest in 3 homes, because the location is in the fishing village that is in the center of the area. The village inhabitants near the home are made the main object, and 2 facilities works as the home that the old people who likes a homelike atmosphere can use without reserve.

6.3. Use Sphere Comparison of Four Facilities

The use distance accumulation graph is shown in the figure 9. Because "Kiyogahama" of nucleus facility has many long-distance users from Hagi City and Udago area, the accumulation rate of less than 2km is lower than 20%, and it is finally over 80% by more than 4km. It is considered that the equipment level of the facility is high, so the old people's use of high care degree from wide area is abundant. "Engawa" covers the whole area of Fukuga area, so the accumulation rate less than 2km is low in about 55% in the area close homes. On the other hand, in case of "Hidamari" and "Tanakasanchi", the degree of care is comparatively low and the use of the home neighboring resident is the main. so the accumulation rate under 0.5km meets 60% and 40%, and it is beyond 80% together under 2km.

7. Method of Picking up Users and Time Required

In case of "Kiyogahama", four cars including wheelchair lift car is used to pick up users for degree of care is high. Two staffs accompany one lift car to pick up the users in Nago area, for going up and down of wheelchair user, time needs so much in spite of the close place to the facility. A van picks up Udago area users, and sometimes Kiyogahama area user is included, and time is needed when there are a few users because this area is away from the facility, and a small car needs one hour for pick-up of one person in Hagi City.

Pick-up time varies in the case of "Engawa.", "Hidamari." and "Tanakasanchi" with users, so the pick up is divided into several times. In case of "Engawa", three cars are used to cover the whole area of Fukuga area, but time is needed because of the largeness of the use sphere. In case of "Engawa", it takes long time because users from Nago area is picked up though the use sphere is smallest and there is a user by walking, and . by the view point of

average time per day, pick-up time per person is long in the second because the use number of times of user of Nago area is large. In case of "Tanakasanchi", one car is used usually because the use sphere and number of user are small, but the pick-up time is long in comparison with the use sphere because there is a user from Hagi City.

8. Conclusions

In this paper, the effect on network formation was examined from the view point of use characteristics of facilities for the advanced case of day service network building in the depopulation area. The results are as follows.

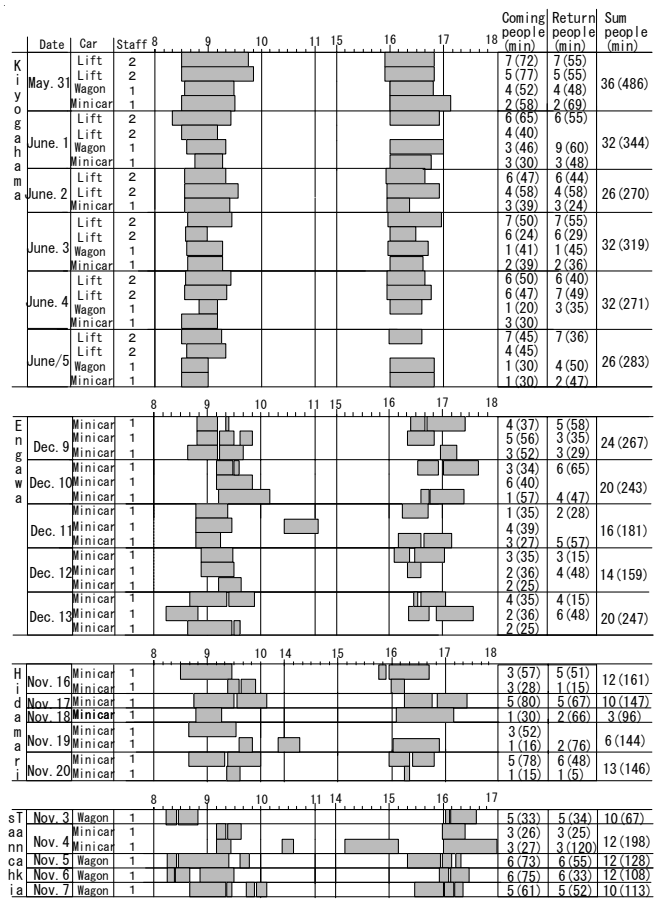
(1) Because the level of care equipment of "Kiyogahama" of wide area nucleus facility is high, there are many users whose degree of care is high, and users who use a wheelchair, so the use sphere is the largest because there is the use from same town and adjoining city. On the other hand, "Hidamari" of area close home has many users with the care level 2 in the neighborhood of the home, so the use sphere is small. The user's degree of care of "Tanakasanchi" is low as well, and there are many users of 1-2 times in a week, and the use sphere is small too. Because the use sphere sharing with "Kiyogahama" has been established, there are no relations to degree of care and age, the home is used from the whole area of Fukuga, so the use sphere is large as the area close home relatively.

(2) Because "Kiyogahama" has much the use number and wheelchair users, users are picked up by four cars that contain two lift car. There are users from distant place too, and average pick-up time is long with 16.1 min./person. In case of "Engawa", the average pick-up time is short with 11.7 min./person, though the users are picked up by 3 cars to cover the whole area of Fukuga area. Because the use sphere of "Tanakasanchi" is small and the use number is 5-6 persons/day, pick-up by one van is the basis, and average pick-up time is short with 11.0 min./person. On the other hand, though the use sphere of "Hidamari" is the smallest, there are pick-ups to divide into several times, and users from the distance too, the average pick-up time needs 15.8 min./person..

If the burden sharing of both facilities is promoted more, it is expected that correspondence to increase in demand, the fulfillment of the day service menu and more shortening of pick-up time become possible.

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note : About Hidamari, it takes to come from Nago in Nov. 16, Nov. 18 and Nov. 19.

Fig.10. Time Required for Picking up Users

Table 4. Average Time Required for Picking up Users

Institution's name	Comeing users(min.)	Return users(min.)	Sum users(min.)	Pick up time staff need for a user (min.)	Riding time for a user (min.)
Kiyogahama	15.3(172.5)	15.3(156.3)	30.7(328.8)	16.1	64.3
Engawa	9.2(124.8)	9.2(94.6)	18.8(219.4)	11.7	44.1
Hidamari	4.4(71.2)	4.4(65.6)	8.8(138.8)	15.8	55.8
Tanakasanchi	5.6(59)	5.6(63.8)	11.2(122.8)	11.0	51.7

Note: Pick up time staff need for a user = Pick up time × Number of staff / Number of users
Riding time for a user = Pick up time × Number of staff / Number of users

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