

## **Analysis of the Provision of the Early Childhood Services: A Comparative and Experimental Study of an Under-populated and an Urban Area in Japan\***

**Sachiko Kitano**

Fukuoka University of Education  
Japan

**Jun Uda**

Hiroshima International University  
Japan

Early childhood care and education are not separate issues, but must be considered holistically. The Japanese government started to accredit and promote integrated institutions called Kodomo-en. In order to make political decisions to locate institutions, the provision of the services in local areas needs to be examined. The present study reports the results of experimental and comparative research analyzing how the services are distributed in Akiotacho (an under-populated, intermediate and mountainous area) and Hakataku (an urban area) in Japan. Using a spatial information system, information about the location of the institutions, the distribution maps of the 0-5 year-old population, and characteristics of services provided were computerized. The results made it clear that in Akiotacho, the biggest problem for services was accessibility; the opportunity to get services in convenience. In Hakataku, the main problem was the limited nature of services owing to density of population. In addition, though there are many institutions in Hakataku, it was made clear that the characteristics of services provided in the area are limited even compared to Akiotacho. Our study suggests that more policy studies should be promoted specially dealing with integration and that aspects from local should be promoted.

**Key Words :** early childhood services, appropriate facility location, spatial information system, care and education integration

Early childhood care and education should not be

---

**Sachiko Kitano**, Associate professor, National Univ. Co. Fukuoka University of Education, 1-1 Akamabunkyo-Machi, Munakata-City, 811-4192 Fukuoka JAPAN. s-kitano@fukuoka-edu.ac.jp

**Jun Uda**, Professor, Hiroshima International University, 555-36 Kurose Gakuen-Dai, Higashi-Hiroshima-City, 739-2695 Hiroshima JAPAN. j-uda@hw.hirokoku-u.ac.jp

\* This research was supported with; Uda, J. et. al. Grant-in-Aid for Scientific Research (B), *Evaluation of the optimal location and appropriate provision of the institutions in the fields of hygiene, medical care and welfare; through simulation using geographic information system.*

treated as separate issues, but should be considered holistically. As Japan has had a separate system of Hoikusho (Child Care Center) and Yochien (Kindergarten) since the end of WW2, there have been serious arguments about the need for integration of care and education.

Current rapid demographic changes and the decline in the fertility rate resulted in new problems in early childhood care and education. As a result of the decline in the fertility rate, which is seen as a national crisis, many measures have affected early childhood education

and care. The Japanese Ministry of Education, Culture, Sports, Science and Technology, and the Ministry of Health, Labour, and Welfare agreed to construct synthesized early childhood care and education institutions. In 2005, the Japanese government started a new type of integrated institution called Kodomo-en. There were 35 of them in 2005, and started to operate more institutions widely from 2006. There were 105 Kodomo-en in August, 2007. The new type of institution, Kodomo-en, was expected to function as the center to support child rearing, child care and childhood education. It covers all the roles of Day Care Centers, Kindergartens, and child rearing support centers.

Though the total fertility rate has been declining, there are still about 20,000 children on waiting lists for Day Care Centers. In contrast, some Kindergartens are falling below the quota. As the number of women with younger children working on regular basis is growing, the need for the structural reconstruction of early childhood care and education services is ever increasing.

In order to prepare for the impending reform in

early childhood care and education in Japan, it is very important to develop tools to investigate and evaluate objectively the services provided in early childhood care and education. Using the tools developed for the evaluation of the optimal location for hospitals (Uda, 2000), some pilot studies (Kitano & Uda, 2003; 2005; 2006; 2007) analyzed the provision of early childhood services in certain local areas. As a result, the local governments adopted the suggestions described in the studies, and in addition to starting to organize comprehensive and integrated institutions, they also constructed facilities and new transportation services, according to the results of the studies.

In this study, data from our two case studies are introduced, examined, and compared in order to reveal the differences in local situations and in services provided in early childhood care and education. This will be followed by a discussion of different political problems concerning to the adoption of the integrated services.

The early childhood care and education policy in

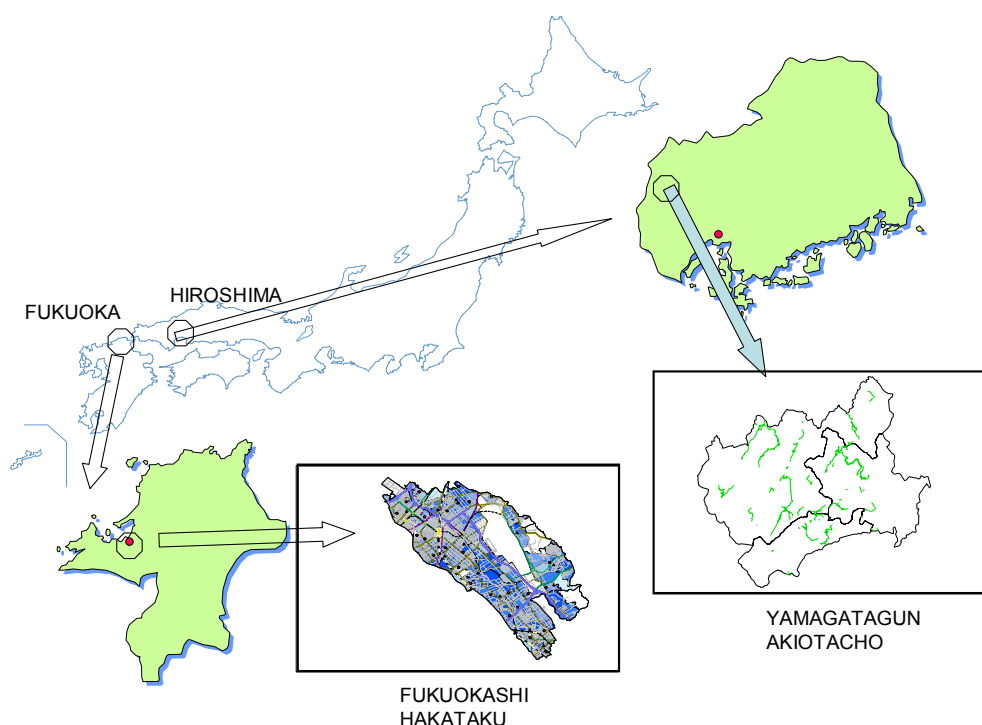


Figure 1. Akiotacho and Hakataku

Japan has strongly been affected by the government from the very beginning of the modern history (Shirakawa & Kitano, 2005). Current issues in integration of Kindergartens and Day Care Centers are also enhanced through the government. The Ministry of Education, Culture, Sports, Science and Technology and the Ministry of Health, Labor and Welfare organized the Office for Improving Kindergarten and Day Care Center Collaboration in 2006 (see <http://www.youho.org/index.html>). The integration of Kindergarten and Day Care Center is also enhanced by the strong leadership of the central government.

In this case study, we would like to show the difference between local needs and put forward the suggestion to develop a bottom up system to enhance the local conditions of early childhood care and education services. In Japan, because of the policy and research tradition of the top-down government oriented system, there are not a lot of researches on policy. For example there was only one session on early childhood care and education policy at the annual conference of the Japan Society of Research on Early Childhood Care and Education in 2007, in Saitama (JSRECCE, 2007).

The method of the examinations will be followed by two case studies on the early childhood care and education services provided in Akiotacho (under populated, intermediate and mountainous area) and Hakataku (urban area) (see Figure 1). Then potentials of our tools to investigate and evaluate provided services in early childhood care and education will be presented.

## Research Method

Using a spatial information system, different types of information (of 2000) in the area were input, such as; (1) the location of Child Care Centers (Hoikusho) and Kindergartens (Yochien), (2) the distribution maps of the birth to 5-year-olds population, and (3) transportation and road information (see Figure 2). For (1), data from the Geographical Survey Institute have been used with permission. For (2), data from census figures for each municipality have been used. For (3), commercially-supplied map information with all roads and other transportations in 1/25,000 maps have been used. For analysis, Geographic Information System (GIS) application

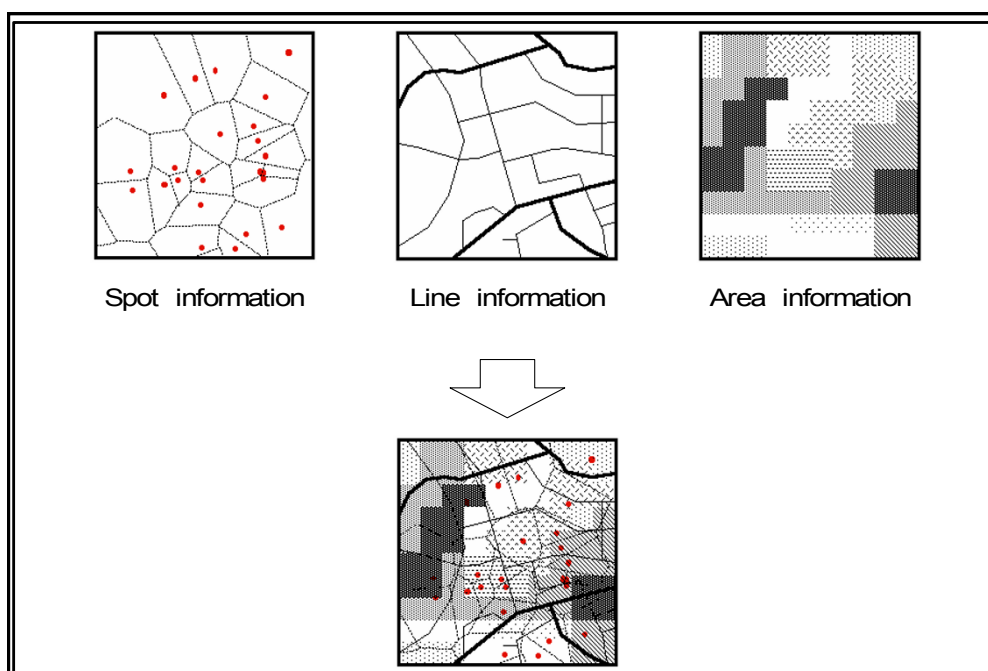


Figure 2. The spatial information system

is used. We also used public data from the Ministry of Education, Culture, Sports, Science, Technology and the Ministry of Health, Labour and Welfare Ministry, and data of national population census. With these types of data, we analyzed the optimization of location, focusing on the provided services, and revealed the characters of the service provided in the areas.

We divided the areas by the median point of institutions (which is called Voronoi area) and we show the 0-5 year-old population density fluctuation of the divided areas by dark and light coloring (which is called Voronoi population). Voronoi area's boundary line was drawn by set of whole series of median points of each institution. For children living in Voronoi area, the institution is the nearest place for them to get certain services. Voronoi population shows how many children are expected to get the service from the institution in Voronoi area. Characteristics of provided services are also examined. Characteristics are selected through categories from "i-kosodate.net", which give the

information (place, capacity, characteristics of services, curriculum, etc.) of all Day Care Centers in Japan.

## The Case of Akiotacho

Akiotacho, Yamagatagun, in Hiroshima prefecture, is an under populated, intermediate, and mountainous area, and its composition of population (Figure 3) reflects the coming national tendency of Japan; fewer children and aging society (Figure 4). Akiotacho's current composition of population is similar to the expected Japanese composition of population in 2040, calculated by the National institute of Population and Social Security Research (See <http://www.ipss.go.jp>). The total area is 342.25 km<sup>2</sup> and the population is only 9,181.

Figure 5 shows the situation of early childhood care and education services provided in the area. There are 5 Kindergartens and 6 Day Care Centers in Akiotacho. It is hard for Children in Akiotacho to access the services.

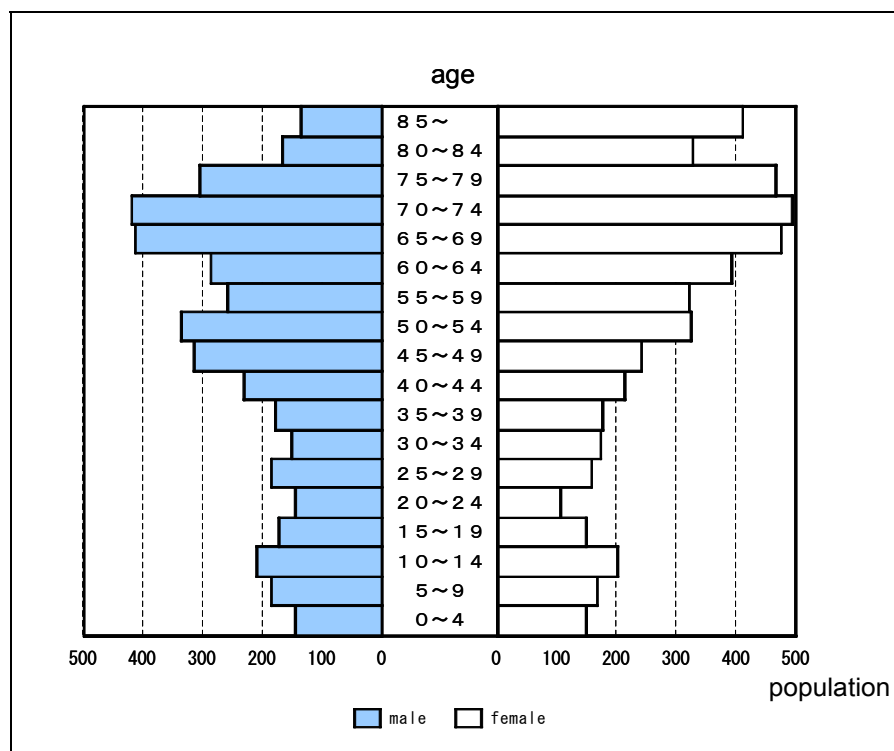


Figure 3. Population of Akiotacho

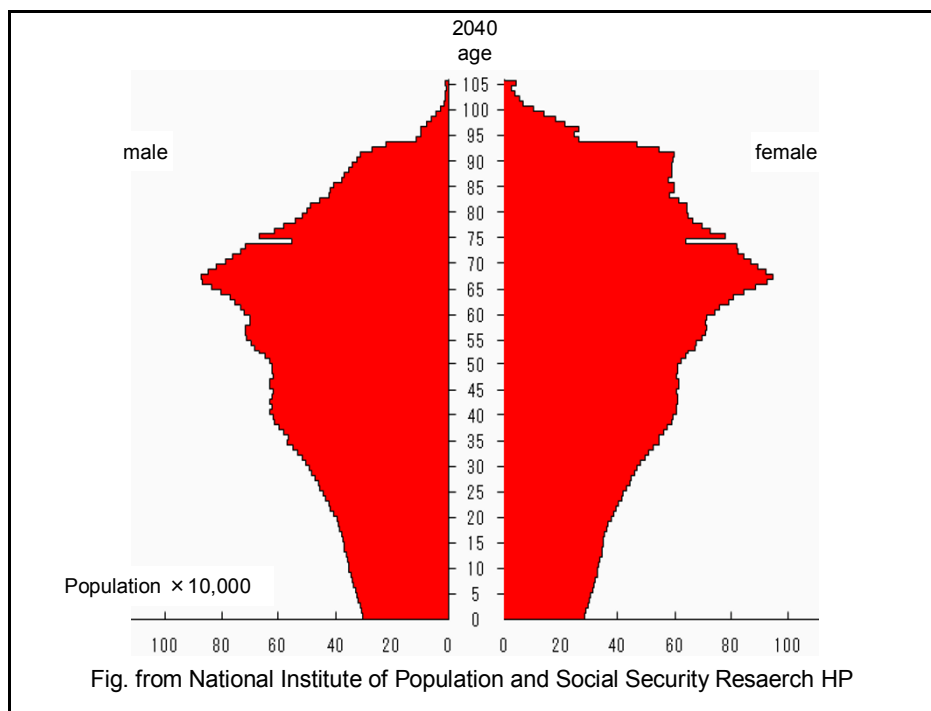


Figure 4. Expected Japanese population in 2040

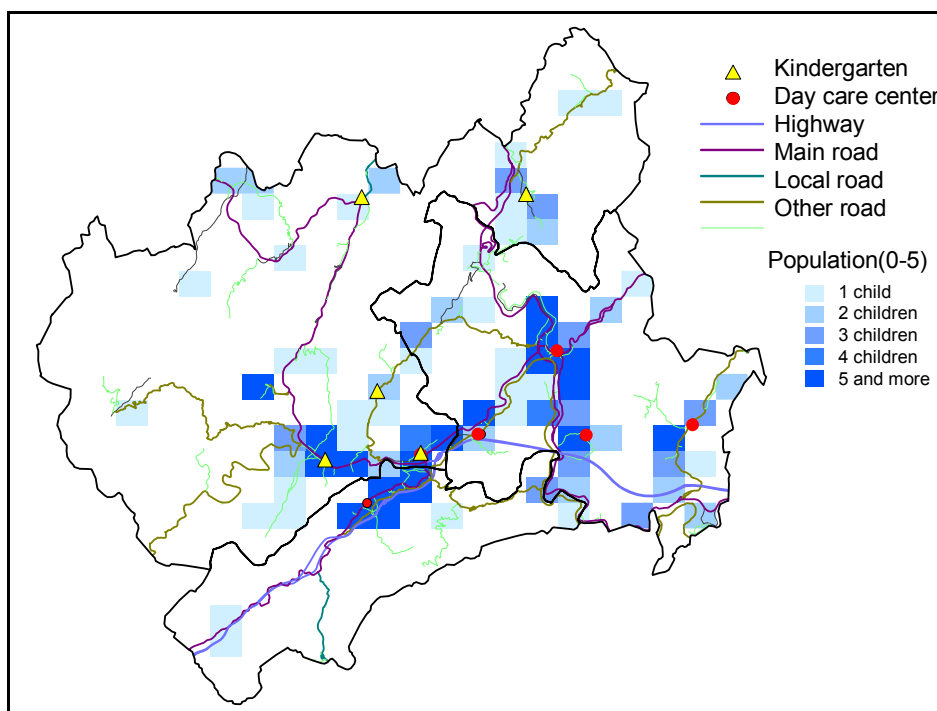


Figure 5. Provision of the early childhood services in Akiotacho

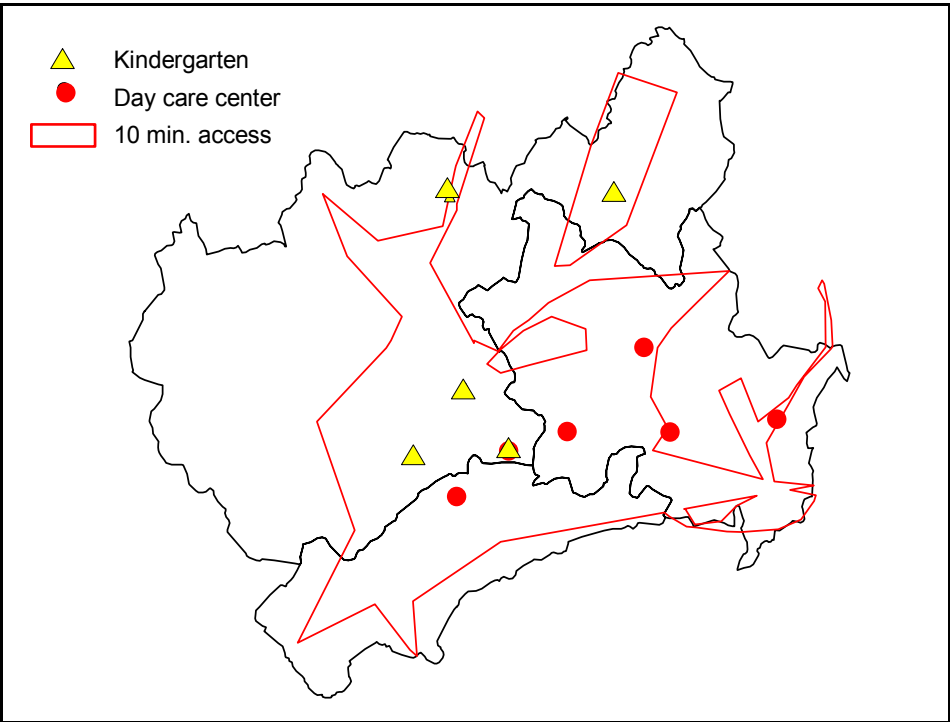


Figure 6. The accessibility

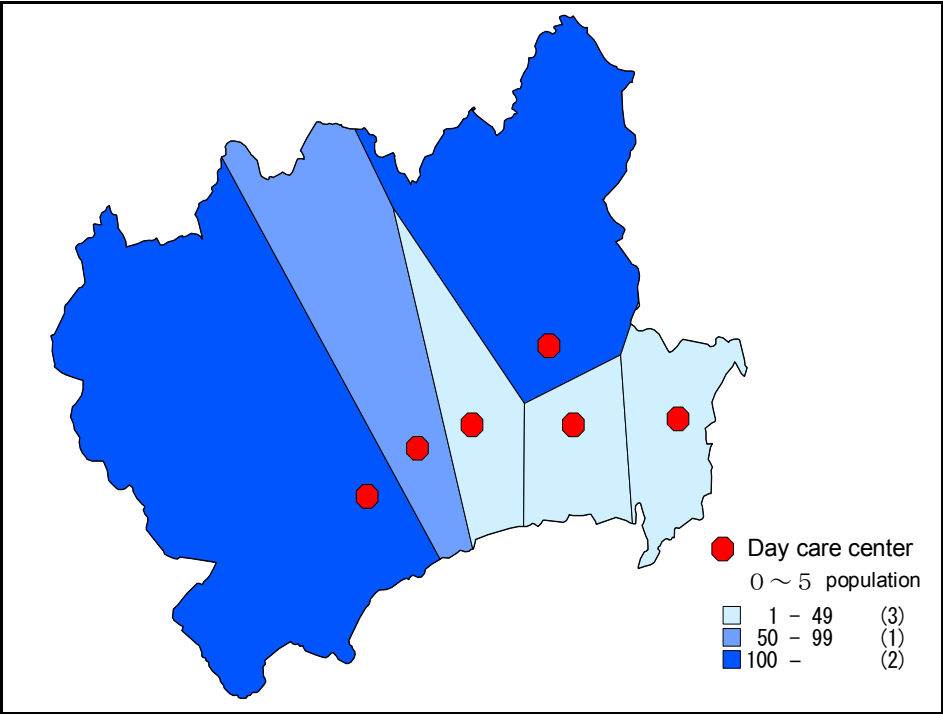


Figure 7. Day care center Voronoi area

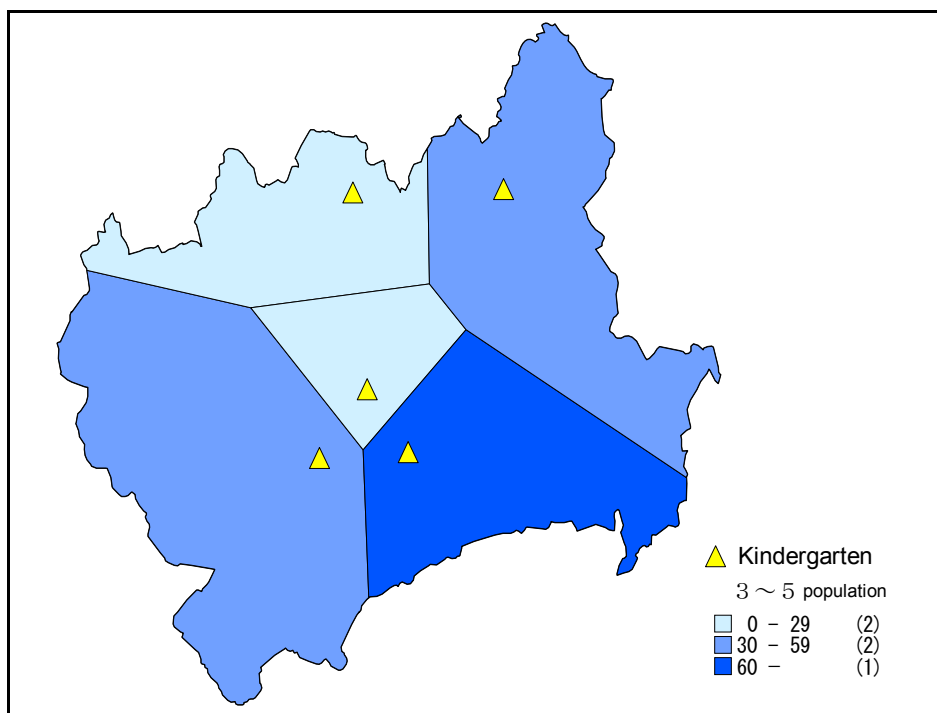


Figure 8. Kindergarten Voronoi area

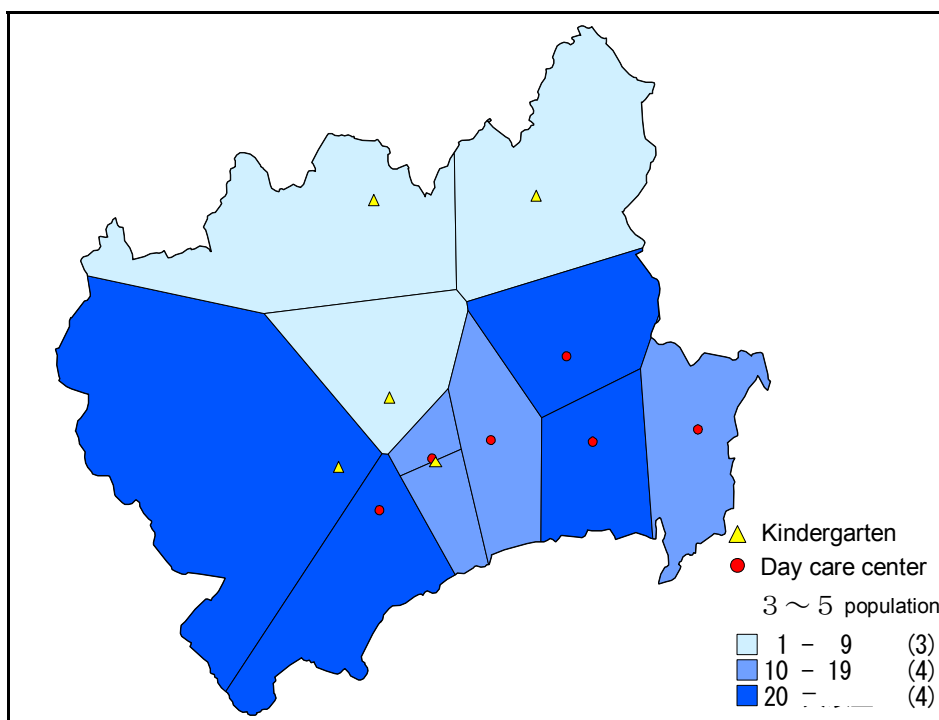


Figure 9. Kindergarten and day care centre Voronoi area

According to our calculations, more than 15.89 % of 0-5 year olds children in Akiotacho, cannot access any of the Kindergarten nor Day Care Center within 10 minutes by car (Figure 6).

Figure 7 shows the Day Care Center Voronoi area with 0-5 year-old population data, Figure 8 shows the Kindergarten Voronoi area with 3-5 years population data (Only 3-5 year-olds can attend the Kindergarten in Japan), and Figure 9 shows the Day Care Center and Kindergarten Voronoi area with 3-5 population. Figure 9 shows the experimental simulation of how the early childhood care and education services would be provided if early childhood care and education institutions were integrated. Table 1 shows the 0-5 population and dimensions of each Voronoi area.

Our visual data shows that Aki-Ota-Chow is facing an aging society with fewer children. The problems are opportunity to get services in conveniently because of lack of the accessibility. It is suggested that the transportation system provided to other than children should be used and shared. Examining the convenience of institutions, it is strongly suggested that Kindergarten and Day Care Center should be integrated. It is also

suggested that a new system of comprehensive family support plan using public facilities in child welfare, education, and also in healthcare should be built in such an under populated area. One possibility is to use the facility for the social welfare for the aged as integrated institutions. In order to respond to the coming aging society with fewer children, we have to think of a comprehensive and integrated approach.

Characteristics of the services are also limited in Akiotacho. There is only one Day Care Center where holiday services are provided. Three Day Care Centers provide the extended hour services (more than 11hours services a day). 2/3 of these Day Care Centers' Voronoi areas are wider than 100 km<sup>2</sup> and Voronoi population of these Day Care Centers are more than 100 0-5 year-old children. All of the 6 Day Care Centers provide the temporary services (for children who are not allowed to attend Day Care Center) and the integrated early childhood special education services.

## The Case of Hakata-Ku

Hakataku in Fukuoka-city is located in Fukuoka prefecture, which is in the middle of one of the biggest cities in Japan. The total area of Hakataku is 31.47 km<sup>2</sup> which is about 1/10 of Akiotacho. The population of Hakataku is 105,967. There are 28 Day Care Centers and 12 Kindergartens in Hakataku (Figure 10). The transportation system is very extensive in Hakataku (Figure 11) and all children can access either a Kindergarten or a Day Care Center within 10 min drive.

Figure 12 and Table 2 are the experimental simulations of how the early childhood care and education services would be provided if early childhood care and education institutions were integrated. Integration would mean getting services in a more convenient way. The population of Voronoi area is very high in Hakataku. Until recently, not all 0-3 year-old children attended Day Care Centers as Day Care Centers in Japan are remitted as it offered to families where both parents are working. From data of 2005, only 4.2% of 0 year-old, 18.0% of

Table 1

*Population and dimensions of Voronoi area*

	0-5 years population	Voronoi area km2
Kindergarten 1	74	92.5
Kindergarten 2	10	50.6
Kindergarten 3	11	24.6
Kindergarten 4	21	4
Kindergarten 5	14	45.9
Day care center 1	43	29.6
Day care center 2	20	7.6
Day care center 3	96	25.4
Day care center 4	30	19.1
Day care center 5	29	19.7
Day care center 6	18	23.3



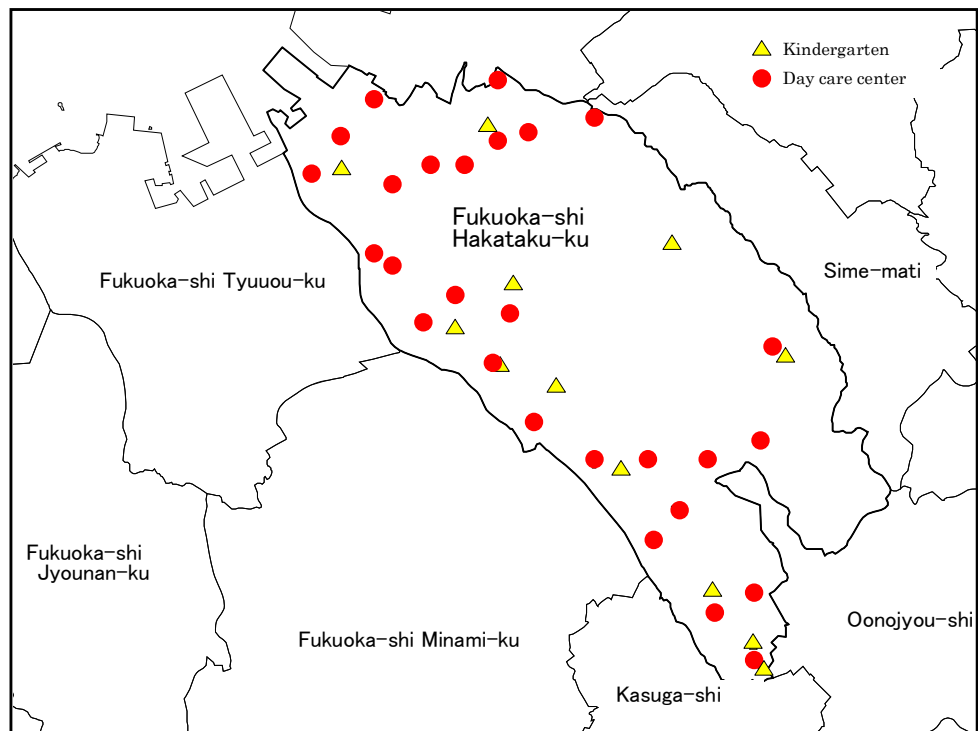


Figure 10. Kindergarten and day care center in Hakataku

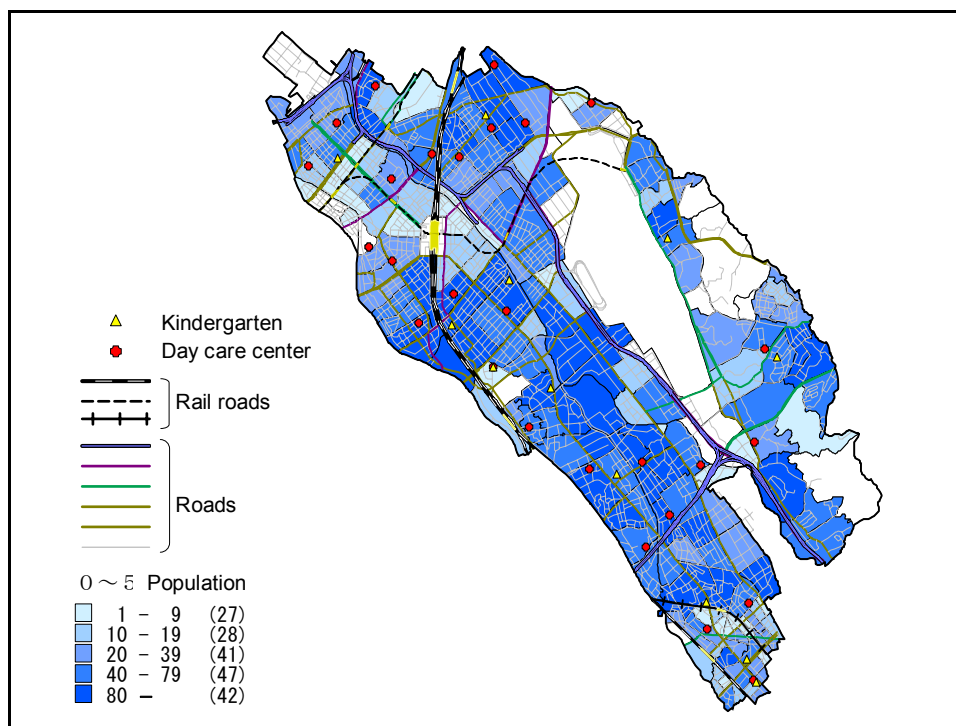


Figure 11. Provision of the early childhood services in Hakataku

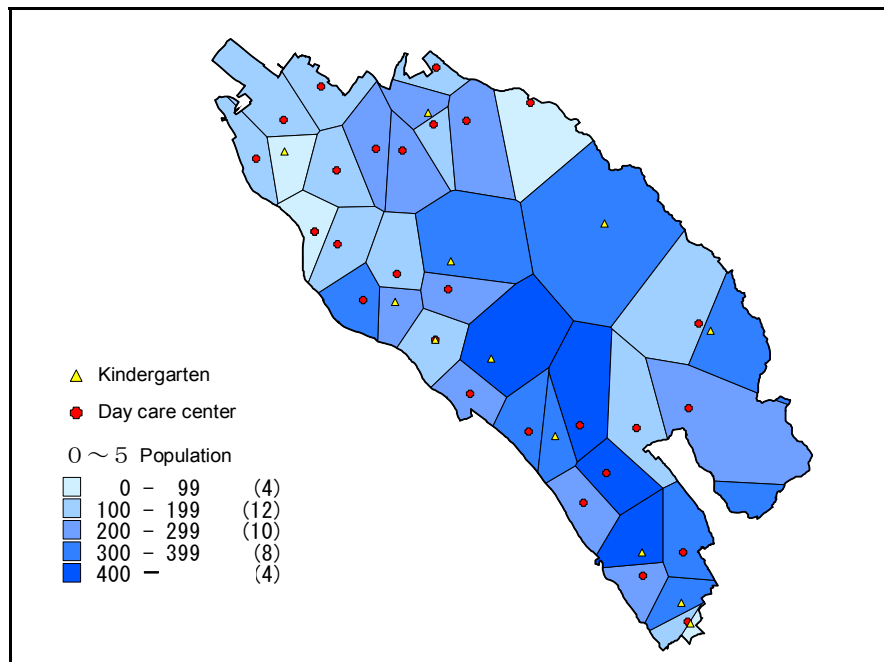


Figure 12. Kindergarten and day care center Voronoi area

Table 2

Population and dimensions of Voronoi area in Hakataku

Institutions	0-5 years population	Voronoi area km2	Institutions	0-5 years population	Voronoi area km2
Haikusho 1	316	0.55	Haikusho 20	214	0.43
Haikusho 2	47	0.46	Haikusho 21	598	1.20
Haikusho 3	134	0.52	Haikusho 22	454	0.64
Haikusho 4	169	0.89	Haikusho 23	146	1.11
Haikusho 5	219	0.48	Haikusho 24	141	1.66
Haikusho 6	176	0.64	Haikusho 25	135	0.16
Haikusho 7	121	0.69	Haikusho 26	263	2.38
Haikusho 8	146	0.71	Haikusho 27	391	1.03
Haikusho 9	169	0.63	Yochien 1	89	0.45
Haikusho 10	205	0.70	Yochien 2	380	1.69
Haikusho 11	197	0.68	Yochien 3	257	0.40
Haikusho 12	173	0.28	Yochien 4	206	0.38
Haikusho 13	207	0.76	Yochien 5	755	1.57
Haikusho 14	287	0.60	Yochien 6	398	3.59
Haikusho 15	343	0.57	Yochien 7	302	0.43
Haikusho 16	173	0.33	Yochien 8	495	0.66
Haikusho 17	200	0.58	Yochien 9	304	0.37
Haikusho 18	295	1.12	Yochien 10	61	0.06
Haikusho 19	61	1.19	Yochien 11	357	1.03

1 year-olds and 25.6% of 2 year-olds attend Day Care Center all over Japan.

From the data, it is made clear that even if Day Care Center and Kindergarten were integrated, only 4/38 institutions would become the expected strength of less than 100 children capacity.

There is only one Day Care Center that provides holiday services in Hakataku, as same as in Akiotacho. However there are 24 Day Care Centers where the extended hour services are provided, and 20 Day Care Centers with the integrated early childhood special education services.

## Conclusion

In Akiotacho, the main problem is to get services in conveniently because of lack of accessibility. More than 15.89 % of children are unable to attend the early childhood facilities within 10 minutes of drive. Though in Hakataku, all children are able to get services with in 10 minutes of drive, the high ratio of institution- children is the biggest problems. None of Kindergartens and Day Care Centers in Akiotacho have more than 100 Voronoi 0-5 years population, though there are 34 out of 38 Voronoi areas in Hakataku where have more than 100 0-5 years population. As for the characteristics of services, all Day Care Centers in Akiotacho provide the temporary services and the integrated special education, however only 9 offer temporary services and 20 offer integrated special education, in Day Care Centers in Hakataku.

It is also made clear that even if Kindergarten and Day Care Center are integrated; children living in urban areas are still not provided better services as far as child / institution ratio and child / teacher ratio is concerned. At the research meeting of “Technical Consultation on Resources and Early Childhood Services in Rich Countries” held in UNICEF Innocenti Research Centre, during 5-6 February 2007, it was suggested that the child / trained adult ratio for 4-5 year olds in all publicly subsidized, centre-based services should not be greater

than 15:1. The number in Japanese regulations for 4-5 year olds are very high, 30 for Day Care Centers, and 35 for Kindergartens.

It is also made clear that even if Kindergartens and Day Care Centers are integrated; children living in less-populated area will not be provided better services as for convenience of accessibility. In many local areas, public early childhood care and education facilities have been closed down because of the decrease of the 0-5 population. It is suggested that all data about accessibilities, dimension of voronoi area, and its population should be gathered and used from a comprehensive standpoint to reconstruct the regional early childhood care and education facilities planning.

This study made clear the differences in early childhood care and education services provided in different areas. It is suggested that though the Japanese government started to operate more integrated institutions called Kodomo-en, more studies on the provided services in early childhood care and education are needed on a local level. As we have a long history of the diverse system of Kindergarten and Day Care Center, data are also collected separately in different ways. More policy studies from integrated aspects and local aspects should be promoted to ensure the best interest of the child in Japan, otherwise, the promotion of Kodomo-en will unfortunately result in quantitative and qualitative reduction of early childhood care and education services.

## References

- Akiotacho (2004). Retrieved from <http://www.akiota.jp/>
- Fukuoka City Online (2005). Retrieved from <http://www.city.fukuoka.jp/index.html>
- The National Institute of Population and Social Security Research. (2007). Retrieved from <http://www.ipss.go.jp/>
- Ministry of Health, Labour and Welfare (2005). Retrieved from <http://www.mhlw.go.jp/>
- The Ministry of Education, Culture, Sports, Science and Technology (n.d.). Retrieved from <http://www.>

mext.go.jp/

The Office for Improving Kindergarten and Day Care Center Collaboration. (2006). Retrieved from <http://www.youho.org/index.html>

Japan Society for Research on Early Childhood Care and Education (2007). Program of the 60th annual conference of JSRECCE.

Kitano, S., & Uda, J. (2003). A study for analyzing the provision of the early childhood services in Kure-City and Kurose-Cho. *The Annual of Research on Early Childhood*, 25, 63-70.

Kitano, S., & Uda, J. (2005). A study for analyzing the provision of the early childhood services in Munakata-City, *Bulletin of Fukuoka University of Education* 54, Part V. Art, Health and Physical Education and Home Economics, 77-91.

Kitano, S., & Uda, J. (2006). Analysis of the provision of the early childhood services: the case of an Intermediate and Mountainous Area. *Bulletin of Fukuoka University of Education* 55, Part V. Art, Health and Physical Education and Home Economics, 61-70.

Kitano, S., & Uda, J. (2007). Analysis of the provision of the early childhood integrated services: the experimental case of Hakata-Ku in Fukuoka-City. *Bulletin of Fukuoka University of Education* 55, Part V. Art, Health and Physical Education and Home Economics, 173.

Uda, J. (2000). Developing information system for health, medical and welfare services, using GIS system. *Journal of Japan GIS Association*, 9, 433-436.

Shirakawa, Y., & Kitano, S. (2005). Research and policy issues in early childhood care and education in Japan. In B. Spodek & O. Saracho (Eds.), *International perspectives on research in early childhood education*, (pp.137-160). Greenwich, Connecticut: Information Age Publishing.