

A Study on the Cremation Status of Public Cremation Facilities By Jurisdiction Area and Outside of the Jurisdiction Area Targeting Users of E-Haneul Funeral Information System in Jeollabuk-do

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Abstract

We present following research summary and implications through the analysis of the research. First, the before the opening of public cremation facilities compared to new opening of those, the number of the corpse cremation increases to annual average of 5.5% of the rate, and it has a positive effect on increasing rate of the cremation. Therefore, a policy of expanding the supply of public cremation facilities should be pursued to improve cremation rate in the area of uninstalled public cremation facilities. Second, the before the opening of public cremation facilities compared to new opening of those, the number of the corpse cremation has increased to the annual average 3,623 people(56.9%) at jurisdiction area, while it has decreased to 949 people (28.3%) at the out of the jurisdiction area. The active efforts and building the funding expansion should be made to establish public cremation facilities of the central and local governments to improve convenience of the use of public cremation facilities. Third, since the before and after opening of public cremation facilities at Jeongeup City lead to great effect on demand of jurisdiction area and out of the jurisdiction area, the cremation demand should be reduced through the supply expansion of public cremation facilities and differentiation strategy to control cremation demand at the out of the jurisdiction area, focusing on metropolitan areas with high cremation demand, such as metropolitan areas or metropolitan cities.

Keywords: *Cremation Facilities, E-Haneul Funeral Information System, Cremation, Jurisdiction, Jeollabukdo, Corpse.*

1. Introduction

As of 2020, the elderly population aged 65 and over accounted for 15.7%(8,125,000 people) of the total population of Korea, but by 2025, it is expected to reach 20.3% and enter a super-aged society.

In addition, the proportion of the elderly population in 2020 is highest in Jeonnam(23.1%), Gyeongbuk

(20.7%), and Jeonbuk(20.6%) in that order [1]. Since deaths number also shows an increasing trend [2], as the increase of the elderly population and the extension of life expectancy, in order for the Ministry of Health and Welfare to operate all cremation facilities nationwide through a unified reservation system, the cremation number in public cremation facilities using the E-Haneul Funeral Information System [3], which has been increasing every year nationwide since November 1, 2011.

Jeollabuk-do, which has a high proportion of the elderly population, promoted the establishment of public cremation facilities in Jeongeup City to prepare for the increasing demand for cremation. After the pilot operation procedure, it has been operating in earnest since 2016 [4]. Therefore, this study selected public cremation facilities installed and operated in Jeonju City, Iksan City, Gunsan City, Namwon City and newly opened Jeongeup City in Jeollabuk-do as research subjects. Among cremation types classified into corpse, opening remains, and dead fetus, only corpse, which is the standard for calculating cremation rate, was selected as the target for research analysis.

During the period from 2013 to 2020, regarding to the corpse's cremation status in Jeollabuk-do using the E-Haneul Funeral Information System for before and after opening of public cremations in Jeongeup City is in the city of public cremation facilities, the purpose of the study is to present implications for enhancing the convenience of residents of jurisdiction area to use public cremations and improving the efficiency of the supply and demand policy of public commission facilities through comparative analysis by region. The regions are divided into jurisdiction area, the installation area of public cremation facilities, and out of the jurisdiction area, another area.

2. Operation situation of public cremation facilities in Jeollabuk-do

As shown in Table 1, as of December 31, while Jeongeup City is the largest with 39,554 m² of site area and 2,400 m² of total area of cremation facilities in terms of the public cremation facilities site area and total area of cremation facilities in Jeollabuk-do in 2020, Jeonju City, which has the highest demand for cremation, was the largest with the cremation furnaces(6th set) in terms of the size of cremation furnaces [5].

Table 1. Status of public cremation facilities in Jeollabuk-do

Sort	Sum	Jeonju City	Iksan City	Namwon City	Gunsan City	Jeongeup City
Site Area(m ²)	60,116	5,610	3,782	9,423	1,747	39,554
Total Area of Cremation Facilities(m ²)	4,805	619	858	250	678	2,400
Cremation Furnaces(Set)	26	6	5	3	5	5
Initial Installation Year	-	1977	1980	1983	1997	Nov 2015

3. Status of the deaths number and cremators number in Jeollabuk-do

Figure 1 shows the number of deaths and cremators in Jeollabuk-do from 2013 to 2020 [6]. The death number increased from 13,492 people in 2013 to 14,705 people in 2020, representing an average annual growth rate of 1.3%. In addition, the cremator number increased from 9,314 people in 2013 to 12,795 people in 2020, showing a high rate of increase at an average annual rate of 5.3%. Thus, relatively, cremators number compared to deaths number, it was analyzed to show that the high rate

of increase in annual average of 4.0%. At the same time, the cremation rate continued to increase every year, from 69.0% in 2013 to 87.0% in 2020, an average annual increase of 2.6%. However, in 2020, cremation rate in Jeollabuk-do was lower by 2.7% than the cremation rate in nationwide 9.7%.

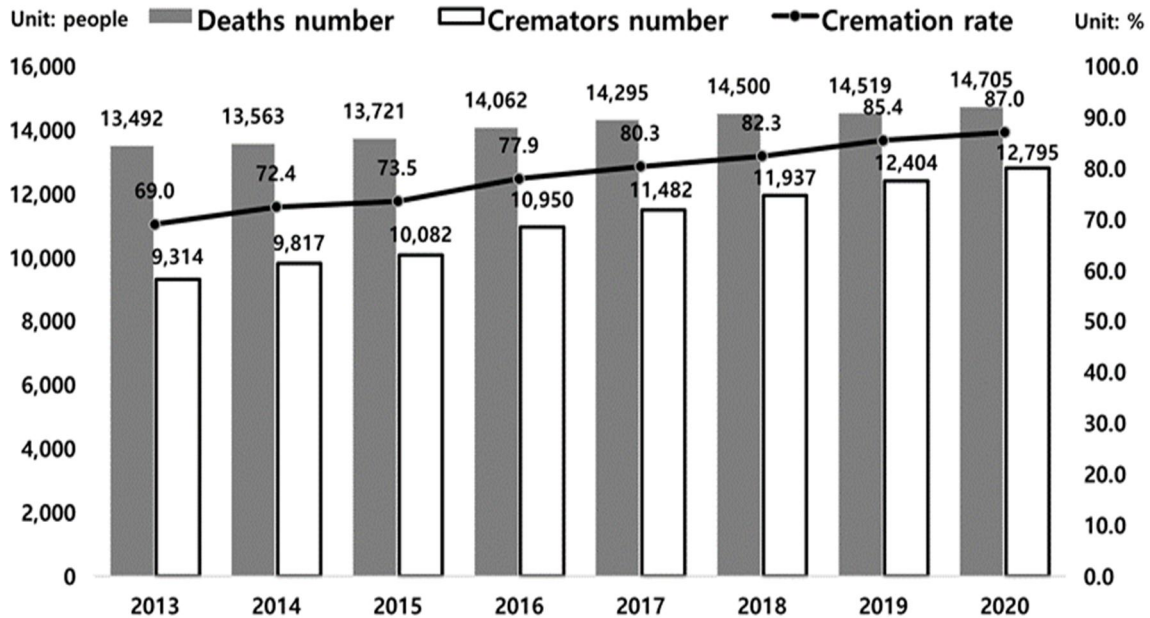


Figure 1. Progress of the deaths number and cremators number in Jeollabuk-do

4. Cremation status of jurisdiction area and out of the jurisdiction area in Jeollabuk-do

4.1 Cremation status of jurisdiction area and out of the jurisdiction area in Jeonju City

As shown in Figure 2, during the period from 2013 to 2015, before the opening of the public cremation facilities in Jeongeup City, the corpse cremation number of public cremation facilities in Jeonju City using the E-Haneul Financial Information System was 14,651 people, with an average annual average of 4,884 people. Among them, the annual average of jurisdiction area was 2,665 people(54.6%), indicating 446 people(20.1%) higher than the annual average of out of jurisdiction area which is 2,219 people(45.4%). On the other hand, during the period from 2016 to 2020, after the opening of public cremation facilities in Jeongeup City, the corpse cremation number of public cremation facilities in Jeonju City using the E-Haneul Funeral Information System was 21,923 people, an annual average of 4,385 people. The annual average of jurisdiction area was 3,201 people(73.0%), indicating 2,017 people(170.4%) higher than the annual average of out of jurisdiction area which is 1,184 people(27.0%) [7].

Based on the results of our survey and analysis, in terms of the corpse cremation number of Jeonju City public cremation facilities using the E-Haneul Funeral Information System, after opening compared to before the opening of the public cremation facilities in newly installed Jeongeup City was increased by annual average 536 people(20.1%) in jurisdiction area, while it was decreased by annual average 1,035 people(46.6%) at the out of the jurisdiction area. It was analyzed that this cause was due to the dispersion of cremation demand according to the opening of public cremation facilities in Jeongeup City.

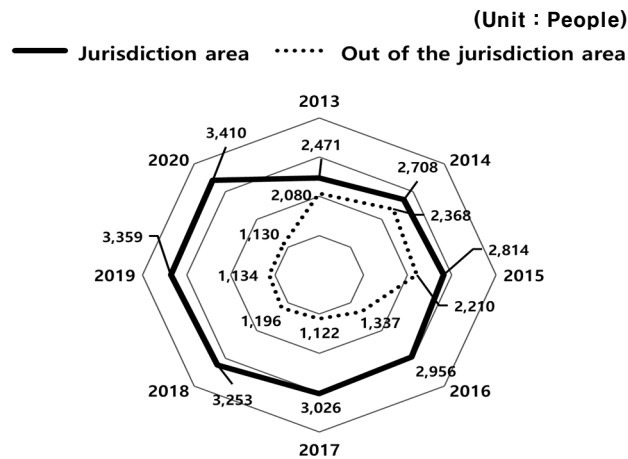


Figure 2. Cremation status of corpse by jurisdiction area and out of the jurisdiction area at public cremation facilities in Jeonju City

4.2 Cremation status of jurisdiction area and out of the jurisdiction area in Iksan City

As shown in Figure 3, during the period from 2013 to 2015, before the opening of the public cremation facilities in Jeongeup City, the corpse cremation number of public cremation facilities in Iksan City using the E-Haneul Financial Information System was 6,554 people, with an average annual average of 2,184 people. Among them, the annual average of jurisdiction area was 1,491 people(68.3%), indicating 798 people(115.2%) higher than the annual average of out of jurisdiction area which is 693 people(31.7%). On the other hand, during the period from 2016 to 2020, after the opening of public cremation facilities in Jeongeup City, the corpse cremation number of public cremation facilities in Iksan City using the E-Haneul Funeral Information System was 10,109 people, an annual average of 2,022 people. The annual average of jurisdiction area was 1,743 people(86.2%), indicating 1,464 people(524.7%) higher than the annual average of out of jurisdiction area which is 279 people(13.8%) [8].

Based on the results of our survey and analysis, in terms of the corpse cremation number of Iksan City public cremation facilities using the E-Haneul Funeral Information System, after opening compared to before the opening of the public cremation facilities in newly installed Jeongeup City was increased by annual average 252 people(16.9%) in jurisdiction area, while it was decreased by annual average 414 people (59.7%) at the out of the jurisdiction area. It was analyzed that this cause was due to the dispersion of cremation demand according to the opening of public cremation facilities in Jeongeup City.

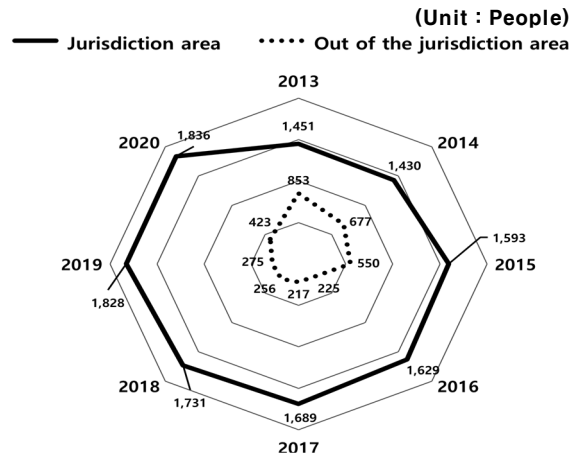


Figure 3. Cremation status of corpse by jurisdiction area and out of the jurisdiction area at public cremation facilities in Iksan City

4.3 Cremation status of jurisdiction area and out of the jurisdiction area in Namwon City

As shown in Figure 4, during the period from 2013 to 2015, before the opening of the public cremation facilities in Jeongeup City, the corpse cremation number of public cremation facilities in Namwon City using the E-Haneul Financial Information System was 2,149 people, with an average annual average of 716 people. Among them, the annual average of jurisdiction area was 508 people(71.0%), indicating 300 people(144.2%) higher than the annual average of out of jurisdiction area which is 208 people(29.0%). On the other hand, during the period from 2016 to 2020, after the opening of public cremation facilities in Jeongeup City, the corpse cremation number of public cremation facilities in Namwon City using the E-Haneul Funeral Information System was 4,380 people, an annual average of 876 people. The annual average of jurisdiction area was 624 people(71.2%), indicating 372 people(147.6%) higher than the annual average of out of jurisdiction area which is 252 people(28.8%) [9].

Based on the results of our survey and analysis, in terms of the corpse cremation number of Namwon City public cremation facilities using the E-Haneul Funeral Information System, after opening compared to before the opening of the public cremation facilities in newly installed Jeongeup City was increased by annual average 116 people(22.8%) in Jurisdiction area and increased by annual average 44 people(21.2%) at the out of the jurisdiction area. It was analyzed that the cause of the increase in cremation number was due to the increase in death number and cremation rate.

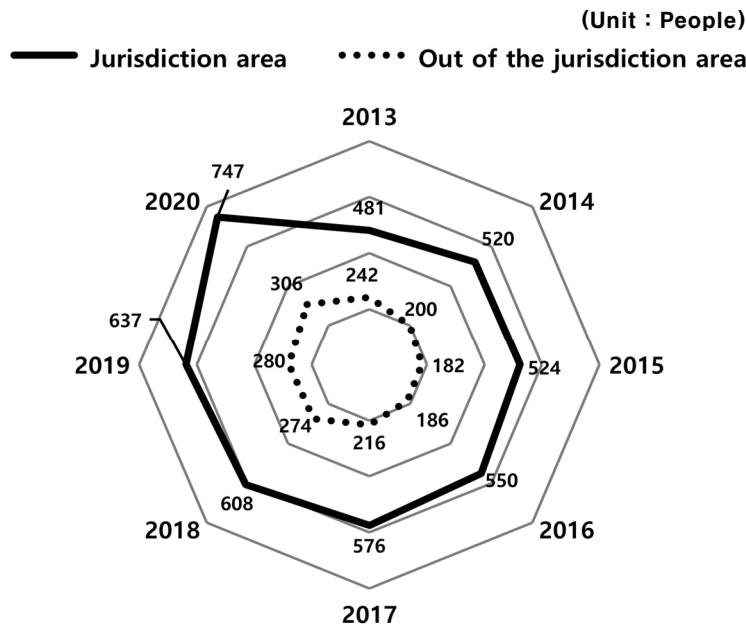


Figure 4. Cremation status of corpse by jurisdiction area and out of the jurisdiction area at public cremation facilities in Namwon City

4.4 Cremation status of jurisdiction area and out of the jurisdiction area in Gunsan City

As shown in Figure 5, during the period from 2013 to 2015, before the opening of the public cremation facilities in Jeongeup City, the corpse cremation number of public cremation facilities in Gunsan City using the E-Haneul Financial Information System was 5,785 people, with an average annual average of 1,928 people.

Among them, the annual average of jurisdiction area was 1,699 people(88.1%), indicating 1,470 people (641.9%) higher than the annual average of out of jurisdiction area which is 229 people(11.9%). On the other hand, during the period from 2016 to 2020, after the opening of public cremation facilities in Jeongeup City, the corpse cremation number of public cremation facilities in Gunsan City using the E-Haneul Funeral Information System was 10,938 people, an annual average of 2,187 people. The annual average of jurisdiction area was 1,838 people(84.0%), indicating 1,489 people(426.6%) higher than the annual average of out of jurisdiction area which is 349 people(16.0%) [10].

Based on the results of our survey and analysis, in terms of the corpse cremation number of Gunsan City public cremation facilities using the E-Haneul Funeral Information System, after opening compared to before the opening of the public cremation facilities in Jeongeup City was increased by annual average 139 people(8.2%) in jurisdiction area and increased by annual average 120 people(52.4%) at the out of the jurisdiction area. It was analyzed that the cause of the increase in cremation number was due to the increase in death number and cremation rate.

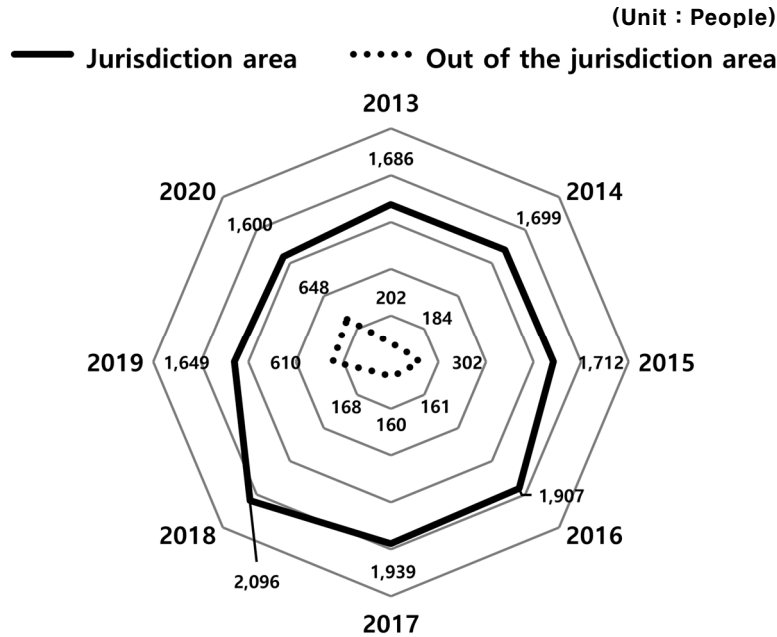


Figure 5. Cremation status of corpse by jurisdiction area and out of the jurisdiction area at public cremation facilities in Gunsan City

4.5 Cremation status by jurisdiction area and out of the jurisdiction area in Jeongeup City

As shown in Figure 6, during the period from 2016 to 2020, after the opening of public cremation facilities in Jeongeup City, the corpse cremation number of public cremation facilities in Jeongeup City using the E-Haneul Funeral Information System was 14,582 people, an annual average of 2,916 people. The annual average of jurisdiction area was 2,581 people(88.5%), indicating 2,246 people(670.4%) higher than the annual average of out of jurisdiction area which is 335 people(11.5%) [11].

Based on the results of our survey and analysis, after the opening of the public cremation facilities in Jeongeup City, in terms of the corpse cremation number of Jeongeup City public cremation facilities using the E-Haneul Funeral Information System, it showed increasing trend overallly. As such, it was analyzed that the reason for the continuous increase in the cremation number every year was the increase in death number and cremation rate.

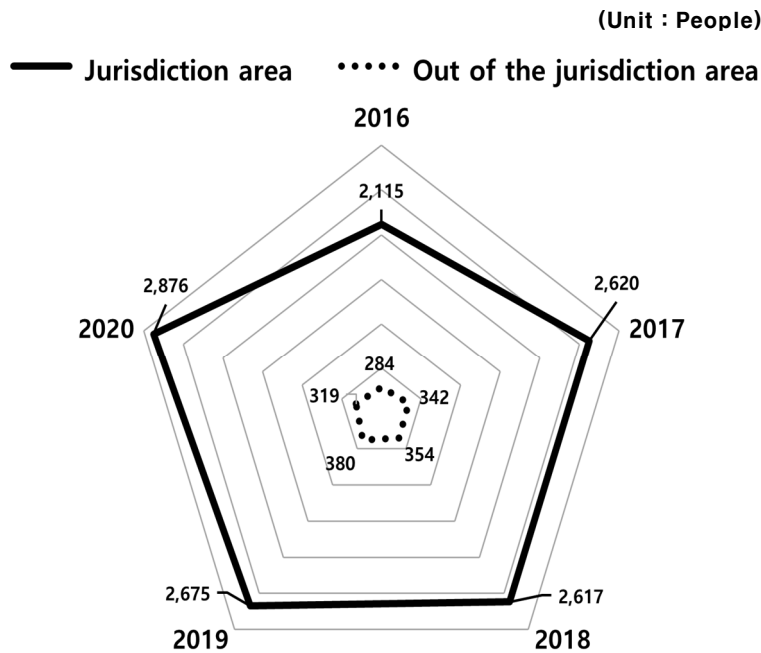


Figure 6. Cremation status of corpse by jurisdiction area and out of the jurisdiction area at public cremation facilities in Jeongeup City

5. Comprehensive analysis results

5.1 Average annual cremation status by public cremation facilities in Jeollabuk-do

During the period from 2013 to 2020, in terms of jurisdiction public cremation facilities in Jeollabuk-do using E-Haneul Funeral Information System, Figure 7 shows the average annual cremation status of corpse, which is the basis for calculating the cremation rate. In terms of the average annual cremation number by public cremation facilities, it is the highest in Jeonju City before the opening of the public cremation facilities in Jeongeup City, followed by Iksan City, Gunsan City, and Namwon City. On the other hand, after the opening of the public cremation facilities in Jeongeup City, Jeonju City was the highest, followed by Jeongeup City, Gunsan City, Iksan City, and Namwon City.

The average annual number of corpse of public cremation facilities in Jeollabuk-do was 9,713 people during the period from 2013 to 2015 before the opening of public cremation facilities in Jeongeup City. However, during the period from 2016 to 2020, after the opening of public cremation facilities in Jeongeup City, there was a significant increase to 12,387 people.

Based on the results of our survey and analysis, it was found that the number of cremations in corpse increased by an annual average of 5.5% after the opening of public cremation facilities in Jeongeup City. Therefore, it was analyzed that the expansion of public funeral facilities due to the opening and operation of newly installed public funeral facilities had a positive effect on the increase in the cremation number and in cremation rates.

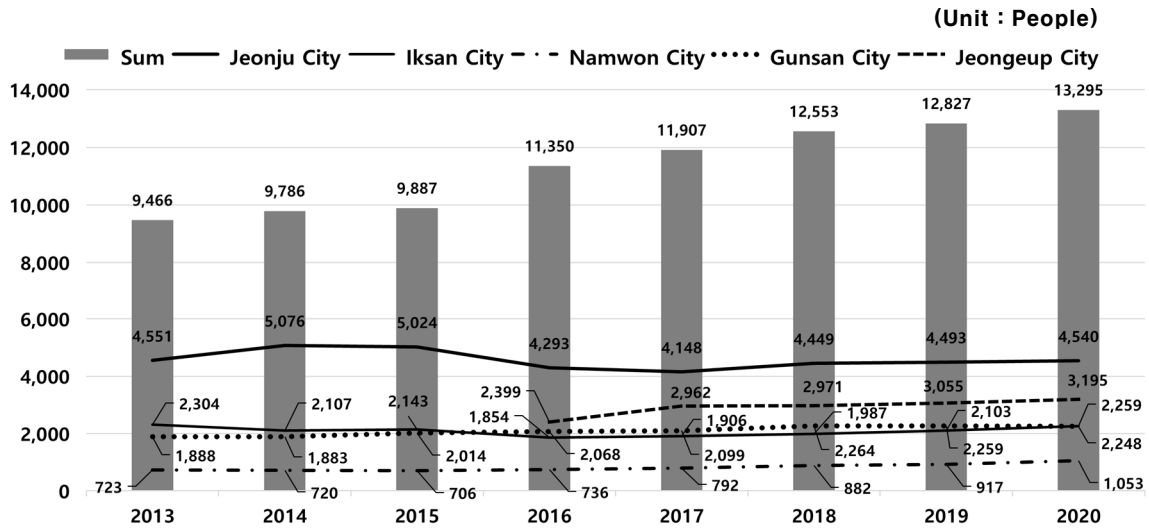


Figure 7. Average annual cremation status of corpse by public cremation facilities in Jeollabuk-do

5.2 Average annual cremation status of before and after opening of public cremation facilities in Jeongeup City

During the period from 2013 to 2020, in terms of public cremation facilities in Jeollabuk-do using E-Haneul Funeral Information System, the average annual cremation status of jurisdiction area and out of the jurisdiction area before and after opening of public cremation facilities in Jeongeup City were shown in Figure 8, 9.

Before the opening of public cremation facilities in Jeongeup City(2013-2015), Jeonju City had the highest annual average number of cremations by jurisdiction area, followed by Gunsan City, Iksan City, and Namwon City. On the other hand, Jeonju City had the highest annual average number of cremations by jurisdiction area after the opening of public cremation facilities in Jeongeup City(2016-2020), followed by Jeongeup City, Gunsan City, Iksan City, and Namwon City.

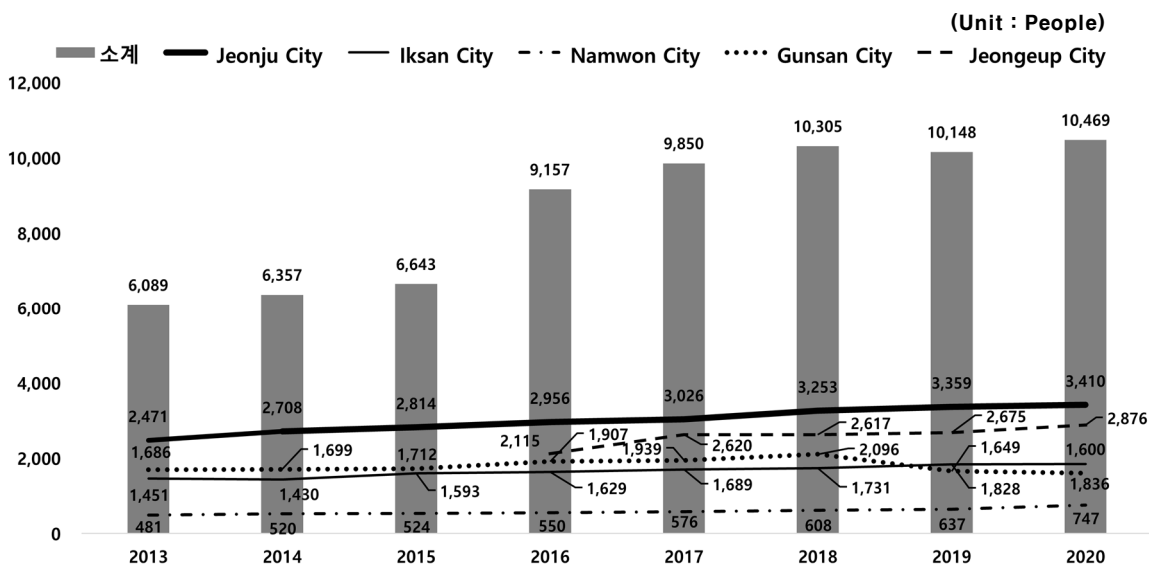


Figure 8. Average annual cremation status of corpse by jurisdiction area before and after opening of public cremation facilities in Jeongeup City

Before the opening of public cremation facilities in Jeongeup City(2013-2015), Jeonju City had the highest annual average number of cremations by the out of the jurisdiction area, followed by Iksan City, Gunsan City, and Namwon City. On the other hand, after the opening of public cremations in Jeongeup City(2016-2020), Jeonju City had the highest average number of cremations by the out of the jurisdiction area, followed by Gunsan City, Jeongeup City, Iksan City, and Namwon City.

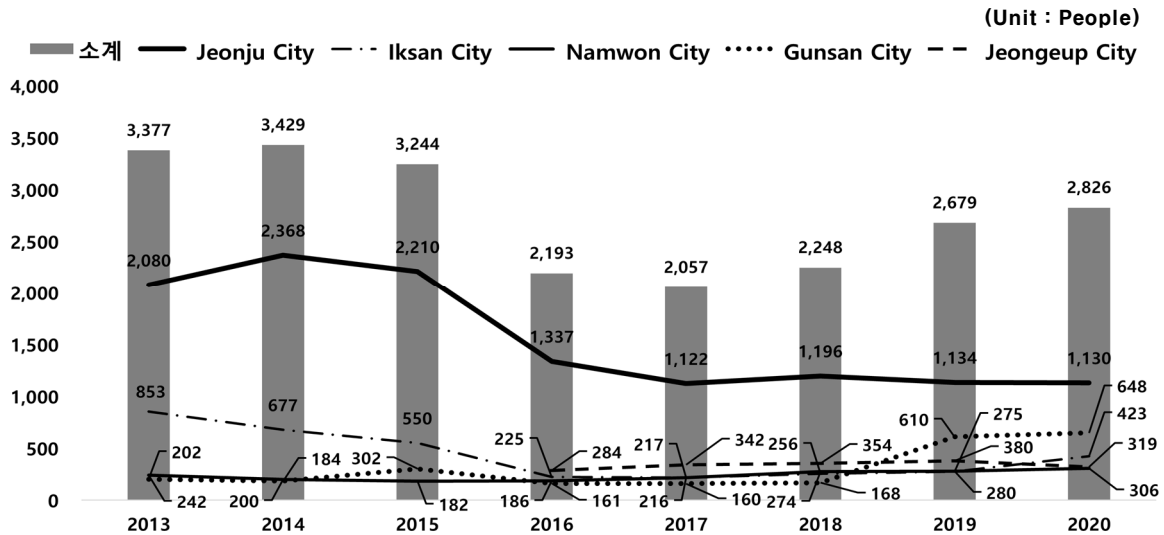


Figure 9. Cremation status of corpse by out of the jurisdiction area before and after opening of public cremation facilities in Jeongeup City

Based on the results of our survey and analysis, after opening compared to before the opening of the public cremation facilities in newly installed Jeongeup City, Jeonju City showed the highest increase in the annual average number of cremations for jurisdiction area by public cremation facilities in Jeollabuk-do to 536 people. Following that, the number of cremations in Jurisdiction area increased in all public cremation facilities in the order of 252 people in Iksan City, 139 people in Gunsan City, and 116 people in Namwon City. Therefore, it was analyzed that the operation of the opening of newly installed public funeral facilities had an effect on the increase in the number of corpse cremation of jurisdiction area for the entire public cremation facilities. On the other hand, the average annual number of cremation in corpse for the out of the jurisdiction area was decreased by 1,035 people in Jeonju City and 414 people in Iksan City.

It was analyzed that increase in corpse cremation number and the dispersion of cremation demand in jurisdiction area due to the supply expansion of the newly installed public cremation facilities had an effect on the decrease in the corpse cremation number of out of the jurisdiction area.

6. Conclusion

Based on the results of the survey and analysis of this study, we want to present the following summary and implications of the research results through a survey analysis on the cremation status of corpse, using E-Haneul Funeral Information System, by jurisdiction area and out of the jurisdiction area before and after the opening of public cremation facilities in Jeongeup City, Jeollabuk-do.

First, it was analyzed that the cremation number in corpse, after opening compared to before the opening of the public cremation facilities in newly installed Jeongeup City, showed a high annual average increase of

5.5%, which has a positive effect on the increase in cremation rates. Therefore, the policy of expanding the supply of public cremation facilities to improve the cremation rate should be promoted.

Second, after opening compared to before the opening of the public cremation facilities in Jeongeup City, the average annual number of corpse at jurisdiction area in Jeollabuk-do increased by 3,623 people(56.9%), while the out of the jurisdiction area decreased by 949 people(28.3%). It was analyzed that there was a positive effect on the increase in the cremation number of jurisdiction area and the decrease in the cremation number of out of the jurisdiction area. Therefore, in order to improve the convenience of using public cremation facilities, active efforts and financial support should be expanded by the central government and metropolitan local governments for establishing public cremation facilities.

Third, before the opening of public cremation facilities in Jeongeup City, as the cremation rate in the out of the jurisdiction in Jeonju City and Iksan City, having public cremation facilities with a high number of cremation, is 45.4% and 31.7%, respectively, it was analyzed that the cremation number had a significant effect on the increase in the demand for cremation in the out of the jurisdiction area.

Therefore, it is necessary to induce the installation of public cremation facilities in uninstalled area, focusing on metropolitan areas and metropolitan cities, through the policy promotion of a differentiation strategy to restrain of the cremation demand for out of the jurisdiction area such as increase in usage fee for the out of the jurisdiction area, limitation of cremation reservations in the morning when people prefer cremation, restrictions on the use of public chanel facilities or public natural sites after cremation.

References

- [1] Statistics Korea, 2020 senior Statistics, 2020.
- [2] Ministry of Health & Welfare, "Guide of Funeral Business of 2021," 2021.
- [3] J. S. Choi and J. L. Kim, "Comparison in the use of the Public Cremation Facilities Located in Seoul through the Online Reservation Service of E-haneul Funeral Information System," *The Journal of the Institute of Internet, Broadcasting and Communication(JIIBC)*, Vol. 18, No. 2, pp. 125-131, Apr 2018.
DOI: <http://doi.org/10.7236/JIIBC.2018.18.2.125>.
- [4] J. S. Choi and J. L. Kim, "Analysis of the Effect of Construction of Public Cremation Facilities in Jeongeup City on Cremators Number Using E-Haneul Funeral Information System in Jeollabukdo and on Cremation Rate," *International Journal of Advanced Smart Convergence(IJASC)*, Vol. 10, No. 1, pp. 117-124, March 2021.
DOI: <http://dx.doi.org/10.7236/IJASC.2021.10.1.117>.
- [5] T. S. Park, B. S. Park, and S. J. Ryu, *Cremation Facilities of Korea and Cremation Facilities of Japan*, Funeral and Cremation Culture Research Forum, pp. 200-208, 2020.
- [6] Korea Funeral Culture & Policy Institute, Cremation statistics, <http://www.kfcpi.or.kr>. Mar 12, 2021.
- [7] Jeonju City Facilities Management Corporation, Data of Request to Information Disclosure, Feb 10, 2021.
- [8] Iksan City, Data of Request to Information Disclosure, Jan 28, 2021.
- [9] Namwon City, Data of Request to Information Disclosure, Jan 29, 2021.
- [10] Gunsan City, Data of Request to Information Disclosure, Feb 1, 2021.
- [11] Jeongeup City, Data of Request to Information Disclosure, Feb 3, 2021.