



The Relationship between the Distribution of Home Medical Clinics and Home Care Service Offices in Japan

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The increasing number of older people in Japan has led to a need for cooperation between home medical and care services. The collaboration between medical and care provisions in home settings is thus a matter for concern. The present study examines the distribution of and relationship between the number of home medical clinics (HMCs) and home care service offices (HCOs) in Japan. We used national data, detailing the total population, percentage of older adults, and number of HMCs and HCOs. Overall, 23,428 HMCs and 35,612 HCOs were identified nationwide. While the southwestern region of Japan had a high number of HMCs relative to the northeastern region, there was not such a clear difference in the regional distribution of number of HCOs. A linear regression analyses, adjusted for the percentage of older people, revealed a significant positive correlation between the number of HMCs per 10,000 older people and HCOs per 10,000 older people ($\beta = 0.58$, $p < 0.001$). These findings may allow us to understand advances in cooperation between home medical and care services in Japan.

Keywords: aging population; home care service; home medical-care support clinics; home-visit care
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Introduction

Home medical services allow physicians to diagnose and treat patients in their own homes; for the most part, such services are used by older people (Ministry of Health, Labour and Welfare 2020; Shimizu and Kotani 2022; Sun et al. 2022). The aging population in Japan underpins the growing demand for expanded home medical services. Older patients tend to have multimorbidities (Cabinet Office, Japan 2021), strengthening the need for cooperation between medical and care services to support their life (Arai et al. 2015). The Japanese government also advocates for community-based integrated care systems that combine medical and care services (Morikawa 2014; Tsutsui 2014; Ministry of Health, Labour and Welfare 2020).

There is limited research on the relationship between home medical care and other home care provisions in Japan. According to an observational study, municipalities with more home medical services have higher rates of death at home (Morioka et al. 2018). Another qualitative study discusses the need to train physicians to provide both home medical and care services (Higashino 2016).

In Japan, which consists of 47 prefectures, each prefecture develops its own plan for managing home medical services (Ministry of Health, Labour and Welfare 2021). Home medical services are generally provided by clinics [home medical clinics (HMCs)] including “home medical-care support clinics (*zaitaku shien shinryosho* in Japanese)” where physicians visit patients’ homes in a 24-hour system, as well as the equivalent ones that are approved to provide comprehensive home medical management. Care services at home are often provided by “home care service offices (HCOs; *kyotaku sa-bisu zigyousho* in Japanese),” the representative offices where care professionals provide daily living support and physical/mental care. To date, no prior studies have examined the distribution of facilities with home medical services and home-visit care services at the national level, while the coexistence of these facilities is thought to be an indicator of collaboration between medical and care provisions in home settings. This study aimed to investigate the distribution of and relationship between the number of HMCs and HCOs in Japan.

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Table 1. National distribution of the number of home medical clinics (HMCs) and home care service offices (HCOs).

Prefectures	Percentage of older people (%)	Number of HMCs (n)	Number of HMCs per 10,000 older people (n)	Number of HCOs (n)	Number of HCOs per 10,000 older people (n)
All					
Maximum	37.3	2,699	11.3	5,201	22.0
Minimum	22.1	83	2.8	124	5.5
Mean	30.3	498	6.3	758	9.4
Median	30.4	280	6.6	453	8.7
Each prefecture					
Hokkaido	31.8	519	3.1	1,653	9.9
Aomori	33.4	128	3.1	500	12.1
Iwate	33.4	115	2.8	352	8.7
Miyagi	27.8	253	4.0	499	7.8
Akita	37.3	118	3.3	263	7.4
Yamagata	33.7	186	5.2	215	6.0
Fukushima	31.2	256	4.5	468	8.2
Ibaraki	29.3	314	3.7	532	6.3
Tochigi	28.7	270	4.9	382	6.9
Gunma	29.7	399	6.9	497	8.6
Saitama	26.3	786	4.1	1,423	7.4
Chiba	27.1	602	3.5	1,575	9.3
Tokyo	22.1	2,699	8.7	3,228	10.4
Kanagawa	25.0	1,516	6.6	2,107	9.1
Niigata	32.5	312	4.4	396	5.5
Toyama	32.2	135	4.1	254	7.6
Ishikawa	29.5	205	6.1	249	7.5
Fukui	30.3	83	3.6	157	6.7
Yamanashi	30.4	93	3.8	170	6.9
Nagano	31.6	419	6.5	512	7.9
Gifu	30.0	490	8.3	453	7.6
Shizuoka	29.8	576	5.3	692	6.4
Aichi	24.7	1,364	7.3	1,776	9.5
Mie	29.5	355	6.8	577	11.1
Shiga	25.8	255	7.0	361	9.9
Kyoto	28.5	642	8.7	713	9.7
Osaka	26.7	2,672	11.3	5,201	22.0
Hyogo	28.3	1,470	9.5	1,847	11.9
Nara	31.3	280	6.8	556	13.4
Wakayama	33.1	341	11.2	532	17.4
Tottori	32.0	128	7.2	124	7.0
Shimane	34.0	204	9.0	219	9.6
Okayama	29.5	462	8.3	473	8.5
Hiroshima	29.0	746	9.2	731	9.0
Yamaguchi	34.3	269	5.8	385	8.4
Tokushima	33.1	210	8.8	326	13.7
Kagawa	31.2	202	6.8	295	9.9
Ehime	32.5	276	6.4	450	10.4
Kochi	35.0	91	3.8	211	8.7
Fukuoka	27.2	1,146	8.2	1,493	10.7
Saga	30.3	175	7.1	161	6.5
Nagasaki	32.8	360	8.4	357	8.3
Kumamoto	31.1	365	6.8	629	11.6
Oita	32.9	258	7.0	430	11.6
Miyazaki	32.2	153	4.4	438	12.7
Kagoshima	31.9	375	7.4	424	8.4
Okinawa	22.1	155	4.8	326	10.0

Materials and Methods

Data

The collected data detailed the total population, percentage of older people, and number of HMCs and HCOs. Information on the total population and percentage of older people by prefecture was obtained from the population census; the Statistics Bureau of Japan uses this census to provide a basic and complete tabulation of the population (Appendix 1). Information on the number of HMCs (“home medical-care support clinics” and the equivalents) was drawn from a list of medical institutions that submitted notifications to local health and welfare bureaus (Appendix 2). The number of HMCs per 10,000 older people was calculated based on the data on the older population and number of HMCs. Information on the number of HCOs (“home care service offices”) was obtained from the Ministry of Health, Labour, and Welfare surveys of care-service facilities and establishments (Appendix 3). The number of HCOs per 10,000 older people was also calculated based on the data on the older population and number of HCOs.

Analysis

Correlation analyses were performed to determine the relationship between the number of HMCs per 10,000 older people and 1) the percentage of older people or 2) the number of HCOs per 10,000 older people by prefecture. Pearson correlation tests and linear regression analyses adjusted for the percentage of older people were performed using EZR software (Kanda 2013), a graphical user interface for R (The R Foundation for Statistical Computing, Vienna, Austria; version 4.0.3). The statistical significance level was set at 5%. Geographic information, including prefectural boundaries, was obtained from the Geospatial Information Authority of Japan’s Global Map Japan Vector data (version 2.2) and mapped using Quantum Geographic

Information System software (version 3.22).

All of the data used in this study were obtained from publicly available sources; no personal information was included in the analysis. The ethical review board waived the need for this study.

Results

As shown in Table 1, the percentage of older people in each prefecture was as follows: 22.1% (Tokyo, Okinawa; the minimum level); 30.4% (Yamanashi; the median level); and 37.3% (Akita; the maximum level). Nationwide, there were 23,428 HMCs and 35,612 HCOs. The minimum number of HMCs in a prefecture was 83 (Fukui); the median was 280 (Nara); and the maximum was 2,699 (Tokyo) (Table 1). The minimum, median, and maximum numbers of HMCs per 10,000 older people were 2.8 (Iwate); 6.6 (Kanagawa); and 11.3 (Osaka). The minimum number of HCOs per 10,000 older people in a prefecture was 5.5 (Niigata); the median was 8.7 (Iwate and Kochi); and the maximum was 22.0 (Osaka). Geographically, there was a high number of HMCs in the southwestern region of Japan relative to in the northeastern region (Fig. 1A). By contrast, the regional distribution of HCOs did not show such a clear deviation found in HMCs (Fig. 1B).

As shown in Table 2, Pearson correlation test found no relative correlation between the number of HMCs per 10,000 older people and the percentage of older people. There was a significant positive correlation between the number of HMCs per 10,000 older people and the number of HCOs per 10,000 older people ($r = 0.55$, $p < 0.001$). Furthermore, a regression analysis adjusted for the percentage of older people showed a significant positive correlation between the number of HMCs per 10,000 older people and the number of HCOs per 10,000 older people ($\beta = 0.58$, $p < 0.001$).

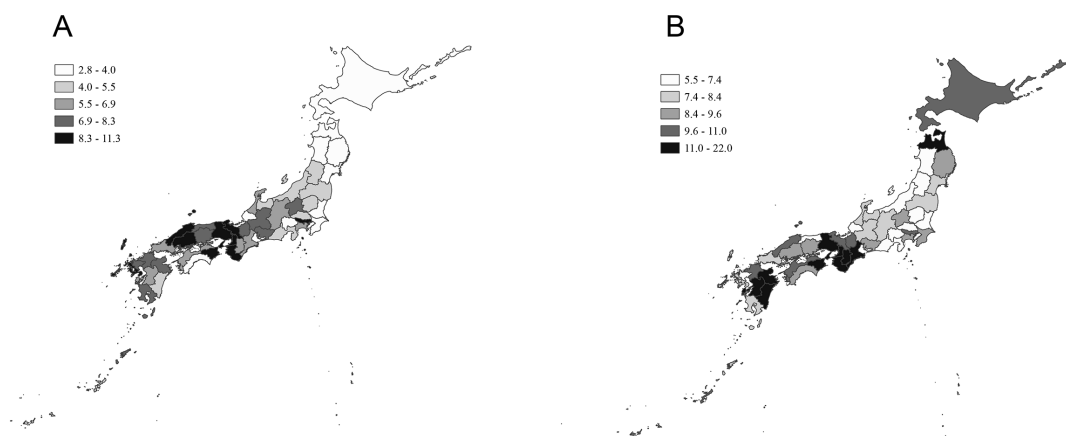


Fig. 1. Geographical distribution of home medical clinics and home care service offices in Japan. (A) Home medical clinics (the number per 10,000 older people). (B) Home care service offices (the number per 10,000 older people).

Table 2. Correlations for the number of home medical clinics (HMCs) per 10,000 older people.

Variables	Univariable analysis		Multivariable analysis	
	r	p value	β	p value
Percentage of older people (%)	-0.20	0.18	-0.14	0.23
Number of HCOs per 10,000 older people (n)	0.55	< 0.001*	0.58	< 0.001*

HCOs, home care service offices; r, Pearson correlation coefficient; β , standardized regression coefficient.

*statistical significance.

Discussion

The present study observed a comparative non-parallel distribution of HMCs (with a high deviation in the southwestern region) and HCOs in Japan. A positive relationship was observed between the number of HMCs per 10,000 older people and the number of HCOs per 10,000 older people. As Japan encourages home medical and care services to cooperate (Arai et al. 2015; Sun et al. 2022), these findings can help us understand the current state of home medical and care provisions in Japan.

Some variability was seen in the number of HMCs per 10,000 older people across prefectures, with a high number found in southwestern Japan. The provision of home medical services could be influenced by regional conditions (e.g., the amount of resources and the need of patients and families) (Arai et al. 2015). There are more medical facilities and physicians in southwestern than northeastern Japan (Awashima et al. 2020). Such regional conditions can be partly associated with high deviations in home medical services in the southwestern region.

The difference in the number of HCOs per 10,000 older people by prefecture seemed to be less prominent than that seen in HMCs. Although the reasons for it remain unknown, it may be partly explained by the fact that medical and care facilities have historically been developed separately (Iwagami and Tamiya 2019).

It is worth noting the positive relationship between HMCs and HCOs. Because older people require closely integrated medical and care services in general (Cabinet Office, Japan 2021), both HMCs and HCOs may naturally coexist. Indeed, one might say that the positive correlation (coefficient: 0.5-0.6) is in not-very-poor coordination between HMCs and HCOs, even in considering their inconsistent distribution as abovementioned. On the other hand, given the urgent level of population aging throughout Japan, the correlation appears to indicate that Japan must promote more coordination between home medical and care services. Furthermore, we can monitor the state of home medical and care provisions using an indicator like the correlation pattern obtained in the present study.

The present study has some limitations. First, the correlation studies do not fully confirm causality. Second, home medical services are not always provided by HMCs only, although HMCs are the main providers of home medical services. Similarly, other than HCOs can provide home care services, although HCOs are the representative provid-

ers of home care services. Third, the present study has not examined the vital status of patients receiving home medical and care services. Finally, the present study has not explored the patients' costs. Since the inverse or trade-off relationship between medical costs and long-term care costs was reported (Jin et al. 2020), the consideration of costs might bring some ideas to the study. Future research should address these limitations.

In summary, we observed a high number of HMCs in southwestern Japan, contrasting with a comparatively even distribution of HCOs. There was a positive relationship between the distributions of number of HMCs and HCOs in Japan. These findings would provide useful insights and contribute to the literature on ways to advance cooperation between home medical and care services in Japan.

Conflict of Interest

Takashi Kuwayama is also employed by Fukuda Denshi Co., Ltd. The authors declare no conflict of interest.

References

- Arai, H., Ouchi, Y., Toba, K., Endo, T., Shimokado, K., Tsubota, K., Matsuo, S., Mori, H., Yamura, W., Yokode, M., Rakugi, H. & Ohshima, S. (2015) Japan as the front-runner of super-aged societies: perspectives from medicine and medical care in Japan. *Geriatr. Gerontol. Int.*, **15**, 673-687.
- Awashima, M., Itagaki, T., Sugano, R., Kinoshita, N. & Takiguchi, T. (2020) Geographic disparities in the average cost of medical care for adults aged 75 years or older in secondary medical areas and their association with medical, socioeconomic, and lifestyle-related indicators. *Niigata Journal of Health and Welfare*, **20**, 16-24 (In Japanese with an English abstract).
- Cabinet Office, Japan (2021) Annual Report on the Ageing Society [Summary] FY2021. <https://www8.cao.go.jp/kourei/english/annualreport/2021/pdf/2021.pdf> [Accessed: April 4, 2023].
- Higashino, S. (2016) Initiatives to establish support systems for primary health care and home care in community-based integrated care in Shizuoka prefecture, Japan. *J. Natl. Inst. Public Health*, **65**, 120-126 (In Japanese with English abstract).
- Iwagami, M. & Tamiya, N. (2019) The long-term care insurance system in Japan: past, present, and future. *JMA J.*, **2**, 67-69.
- Jin, X., Mori, T., Sato, M., Watanabe, T., Noguchi, H. & Tamiya, N. (2020) Individual and regional determinants of long-term care expenditure in Japan: evidence from national long-term care claims. *Eur. J. Public Health*, **30**, 873-878.
- Kanda, Y. (2013) Investigation of the freely available easy-to-use software 'EZR' for medical statistics. *Bone Marrow Transplant.*, **48**, 452-458.
- Ministry of Health, Labour and Welfare (2020) Patient Survey [Summary] FY2020.

- <https://www.mhlw.go.jp/toukei/saikin/hw/kanja/20/dl/suikaikanja.pdf>
[Accessed: April 4, 2023] (in Japanese).
- Ministry of Health, Labour and Welfare (2021) Annual Health, Labour and Welfare Report 2021.
<https://www.mhlw.go.jp/english/wp/wp-hw14/dl/02e.pdf>
[Accessed: June 11, 2023] (in Japanese).
- Morikawa, M. (2014) Towards community-based integrated care: trends and issues in Japan's long-term care policy. *Int. J. Integr. Care*, **14**, e005.
- Morioka, N., Tomio, J., Seto, T., Yumoto, Y., Ogata, Y. & Kobayashi, Y. (2018) Association between local-level resources for home care and home deaths: a nationwide spatial analysis in Japan. *PLoS One*, **13**, e0201649.
- Shimizu, N. & Kotani, K. (2022) Health information exchange in relation to point-of-care testing in home care: issues in Japan. *Clin. Chim. Acta*, **532**, 10-12.
- Sun, Y., Iwagami, M., Sakata, N., Ito, T., Inokuchi, R., Uda, K., Hamada, S., Ishimaru, M., Komiyama, J., Kuroda, N., Yoshie, S., Ishizaki, T., Iijima, K. & Tamiya, N. (2022) Development and validation of a risk score to predict the frequent emergency house calls among older people who receive regular home visits. *BMC Prim. Care*, **23**, 132.
- Tsutsui, T. (2014) Implementation process and challenges for the community-based integrated care system in Japan. *Int. J. Integr. Care*, **14**, e002.
- Tohoku Health and Welfare Bureau (2022) List of Medical Institutions Approved for Notification.
https://kouseikyoku.mhlw.go.jp/tohoku/gyomu/gyomu/hoken_kikan/documents/201805koushin.html
[Accessed: June 30, 2022] (in Japanese).
- Kanto Shinetsu Health and Welfare Bureau (2022) List of Medical Institutions Approved for Notification.
<https://kouseikyoku.mhlw.go.jp/kantoshinetsu/chousa/kijyun.html>
[Accessed: June 30, 2022] (in Japanese).
- Tokai-Hokuriku Health and Welfare Bureau (2022) List of Medical Institutions Approved for Notification.
https://kouseikyoku.mhlw.go.jp/tokaihokuriku/newpage_00349.html
[Accessed: June 30, 2022] (in Japanese).
- Kinki Health and Welfare Bureau (2022) List of Medical Institutions Approved for Notification.
https://kouseikyoku.mhlw.go.jp/kinki/gyomu/gyomu/hoken_kikan/shitei_jokyo_00004.html
[Accessed: June 30, 2022] (in Japanese).
- Chugoku-Shikoku Health and Welfare Bureau (2022) List of Medical Institutions Approved for Notification.
<https://kouseikyoku.mhlw.go.jp/chugokushikoku/chousaka/shisetsukijunjuri.html>
[Accessed: June 30, 2022] (in Japanese).
- Shikoku Health and Welfare Branch Bureau (2022) List of Medical Institutions Approved for Notification.
https://kouseikyoku.mhlw.go.jp/shikoku/gyomu/gyomu/hoken_kikan/shitei/index.html
[Accessed: June 30, 2022] (in Japanese).
- Kyushu Health and Welfare Bureau (2022) List of Medical Institutions Approved for Notification.
https://kouseikyoku.mhlw.go.jp/kyushu/gyomu/gyomu/hoken_kikan/index_00007.html
[Accessed: June 30, 2022] (in Japanese).
- Appendix 3: Survey of care service facilities and establishments, data source:
Ministry of Health, Labour and Welfare (2021) 2021 Survey of Care Service Facilities and Establishments.
<https://www.mhlw.go.jp/toukei/saikin/hw/kaigo/service21/index.html>
[Accessed: April 4, 2023] (in Japanese).

Appendix

Appendix 1: Population census, data source:

Statistics Bureau of Japan (2020) 2020 Population Census: Population, Households, Residences, Foreigners, Elderly Households, Single-Mother/Father Households, Parent-Child Living Together, etc.
<https://www.stat.go.jp/data/kokusei/2020/kekka.html>
[Accessed: April 4, 2023] (in Japanese).

Appendix 2: List of medical institutions that submit notifications to local health and welfare bureaus, data source:

Hokkaido Health and Welfare Bureau (2022) List of Medical Institutions Approved for Notification.
https://kouseikyoku.mhlw.go.jp/hokkaido/gyomu/gyomu/hoken_kikan/todokede_juri_ichiran.html
[Accessed: June 30, 2022] (in Japanese).