Open Access

OBM Geriatrics

Original Research

Estimating Potential Cost Containment through Provision of Unplanned Institutional Respite Services to Support Home-Based Care within Japan's Long-Term Care Insurance System

Yoko Moriyama [1, 2, *], Timothy Bolt [2, 3], Marilyn Luptak [4], Nanako Tamiya [2, 5]

1. Department of Health and Welfare Services, National Institute of Public Health, 2-3-6 Minami, Wako, Saitama, 351-0197, Japan; E-Mail: moriyama.y.aa@niph.go.jp
2. Health Services Research & Development Center, University of Tsukuba, 1-1-1 Tenno-dai, Tsukuba, Ibaraki, 305-8575, Japan; E-Mail: ntamiya@md.tsukuba.ac.jp
3. Faculty of Economics, Saitama University, 255 Shimo-Okubo, Sakura-ku, Saitama City, Saitama, 338-8570, Japan; E-Mail: tbolt@mail.saitama-u.ac.jp
4. College of Social Work, The University of Utah, 395 South 1500 East, Salt Lake City, UT, 84112, USA; E-Mail: Marilyn.Luptak@socwk.utah.edu
5. Department of Health Services Research, Faculty of Medicine, University of Tsukuba, 1-1-1 Tenno-dai, Tsukuba, Ibaraki, 305-8575, Japan

* **Correspondence:** Yoko Moriyama; E-Mail: moriyama.y.aa@niph.go.jp

Academic Editor: James S. Powers

Special Issue: Models of Caregiver Support

OBM Geriatrics
2019, volume 3, issue 3
doi:10.21926/obm.geriatr.1903061

Received: February 19, 2019
Accepted: June 24, 2019
Published: July 09, 2019

Abstract

***Background*:** Many informal caregivers providing at-home care to older family members want to continue serving as the primary caregiver if they get sufficient support. A key service enabling continued at-home care is access to unplanned respite care facilities for temporary institutional care on short notice and in emergencies.

***Methods*:** This study used city government survey results on service user satisfaction with the Japanese Long-Term Care Insurance (LTCI) system for a mid-sized, Japanese city. From this a range is estimated for the potential impact of improved easy access to unplanned respite

care services. Combined with reimbursement rules and cost data from the Japanese LTCI system, this is used to calculate potential financial implications of improving access to unplanned respite care services for the city.

***Results*:** Through the enabling of continued at-home care, our study suggests that increased access to unplanned respite care bed provisions could likely save the city between 4.0% and 12.9% of total expenditures on long-term care benefits (between 393 million yen and 1.28 billion yen per year for Tsukuba City). Providing increased access to unplanned respite care service would be very helpful in both cost containment and reduction of caregiver burden and fear.

***Conclusions*:** The model finds that increased ease of access to unplanned respite care services would both be welcome by informal caregivers and be cost effective within the Japanese LTCI system.

Keywords

Unplanned respite care; short-stay service; home care; informal caregivers; cost containment; long-term care insurance

1. Introduction

1.1 Background

With increasing numbers of older people, like many other countries, Japan has worked to develop a system to provide sustainable long-term care. In 2000, the Japanese government initiated a mandatory, public, long-term care insurance (LTCI) designed to allow older people to continue living independently in their home in accordance with the limits of their physical condition [1]. The LTCI system in Japan is organized such that the insurance provider is the recipient's local government. Everyone 65 years old or older, as well as those between 40-64 years old with aging-related diseases, is eligible for LTCI based purely on age and a care need assessment, regardless of income or family situation. Individuals who want to access LTCI services must apply to the local government and be certified. Through a nationally standardized assessment process, applicants are either classified into one of seven categories ("care need" levels 1-5 or "support need" levels 1-2), or rejected as not yet needing LTCI services. If they are certified, they can receive services under LTCI based on a care plan developed by a local care manager. LTCI covers in-home care services (for example home-help, visiting nurses, day services, and short stay services), access to institutional facilities (long-term care welfare facilities, long-term care health facilities, and care provider medical facilities), and also community-oriented services (such as group support for daily living activities for dementia patients, small-scale/multifunction in-home care, and regular or on-call visits). Users are responsible for a 10% co-payment for the services, with the remaining 90% covered by LTCI (individuals with high incomes have become responsible for a 20% co-payment as of 2015 or a 30% co-payment as of 2018). The maximum monthly long-term care insurance pay-out for an LTCI user depends on their assessed level of need. The national government sets the value of each service in terms of "units", with the reimbursement being approximately 10 yen per unit with slight local variations to this reimbursement rate.

Home-based care is promoted in Japan because of long waiting lists for nursing home admission [2], people preferring to receive care in their own home rather than in an institution such as a nursing home [3, 4], and the higher cost of nursing home care compared to home-based care in the community in Japan [5, 6]. Family caregivers are essential for home-based care; however, they feel the burden of caregiving, and may develop physical and mental health problems themselves [7, 8]. Although some Western countries have legislation to support informal caregivers, there is currently no specific legislation to do so in Japan apart from care leave. Additionally, Japan's LTCI services are intended to support the care recipients, not the caregivers. LTCI's "short-stay service," also known as institutional respite care or residential respite care, is a service which supports family caregivers to give them "respite" indirectly by supporting recipients.

Family caregivers in various countries report the benefits of and desire for respite support in emergencies [9-11]. A study of family caregivers throughout Japan also reported that 54% of them need care services most during emergency periods when they cannot provide adequate care for their care-recipient [12]. In 2012, the Japanese government established a special reimbursement for unplanned institutional respite care besides the usual institutional respite care under LTCI to promote its use. Some local governments in Japan have secured institutional respite care beds for emergency use.

1.2 Tsukuba City Context & Data

In the Tsukuba 6th Survey for the Municipal Planning of Aging Social Services ("Tsukuba 6th Survey"), which was used for the present study, many at-home caregivers responded that they could continue caregiving if they had access to unplanned institutional respite care when needed (Figure 1). The survey findings suggested that marginal caregivers might continue providing care at home instead of institutionalizing their family members if sufficient unplanned institutional respite care was available. However, only 22.9% of home care recipients have opted to use this service in Tsukuba. Moreover, of all the caregivers who selected unplanned respite care services as an enabler for them to continue providing at-home care, only 30.5% have actually used this service (not in table). From interviews with care managers and service providers in Tsukuba, we found that there are regularly bed vacancies in Tsukuba City based on estimates of the number of beds and care recipients, but that care managers have difficulty locating bed vacancies easily. Therefore, we experimented with creating a calendar to show which institutions had capacity to accept older people in Tsukuba City in 2015 [13]. This approach was very good for finding vacancies; therefore, the city of Tsukuba has started publicizing vacancies for unplanned institutional respite care to care managers during the 2018 fiscal year.

As is well recognized, the cost of providing at-home care is lower than institutional care under LTCI in Japan. If institutionalization declines, it is also likely that the cost of long-term care will decline. Thus, given the increasing numbers of older people in Japan, it is urgent to develop models that will decrease the cost of long-term care.

The objective of this study is to use LTCI service evaluation survey data and the official service reimbursement rates to estimate potential cost implications for local government LTCI providers. If the LTCI system increased access to unplanned institutional respite care services, this would then support more continued at-home care rather than the transfer of care recipients to full-time institutionalization. This is based on estimating that use of unplanned institutional respite care by caregivers would increase if the government provided easy to use and timely notification of

unplanned institutional respite care vacancies to care managers. The study aims to identify "marginal caregivers" who are at the limit of being able to provide home-based care to their family members. These informal caregivers express the desire to continue providing care at home longer, delaying or avoiding institutionalizing of their family members, based on their self-reported need for access to such unplanned short-stay respite care services.

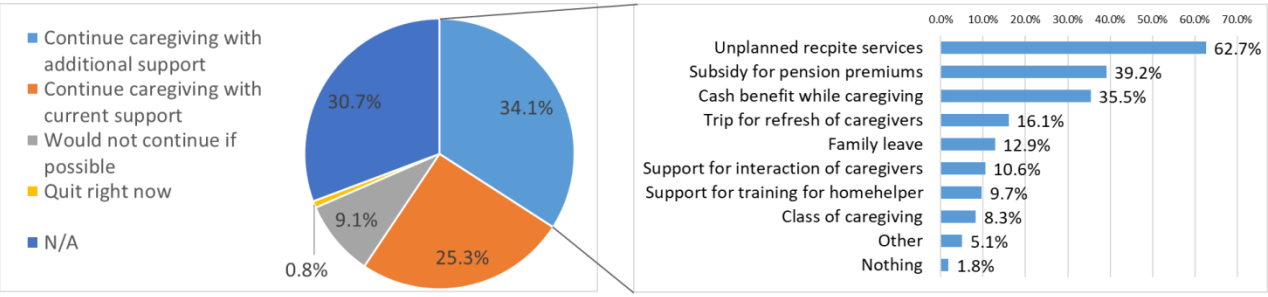

Figure 1 The distribution of intention to continue caring for family, and the distribution of support the caregivers need to continue caregiving at home among those who want to continue caregiving with additional support. Selection of multiple answers was allowed on the bar graph for support types.

1.3 Definition of Unplanned Institutional Respite Care

We define unplanned, institutional respite care (this service is called "short-stay" in Japan) within this current study according to the criteria set by the Japanese LTCI system to assess a recipient's qualification for this additional reimbursement [14]: 1) institutional respite care which the individual's care plan does not include; and, 2) care is provided in the case of urgent need for an unavoidable reason such as caregiver's illness or recipient's sudden change of symptoms.

2. Methods

2.1 Setting and Study Population

The present study uses data collected in February 2014 in Tsukuba City, located 60 kilometres northeast of Tokyo, Japan. It builds on a survey examining the satisfaction with and demand for various supportive services for caregivers. In 2014, the percentage of those living in Tsukuba City aged 65 years and over was 18.2% [15], which is lower than that of Japan as a whole (26%) [16]. Of those aged 65 and over, the proportion assessed and certified as being eligible for LTCI benefits was 17% [15], which is proportionally the same as the national figure for Japan.

The data collected in this study was from the Tsukuba 6th Survey for the Municipal Planning of Aging Social Services, which is a mandate of the Long-term Care Insurance Act to assess the care needs of aging individuals in each municipality in order to promote efficient care provision. The self-administered questionnaire was mailed to 1,972 Tsukuba City residents aged 65 or over who are certified as being eligible for LTCI, and also to their caregivers (response rate: 49.9%, n = 984). Subjects were selected by stratified random sampling with 7 geographic zones, and sampled proportionate to the population aged 65 and over certified as being eligible for LTCI from each zone. We obtained completed questionnaires from the Tsukuba City Office. We excluded 268 subjects assessed as only meeting the lower levels of "support need" since these typically do not permit institutionalization, unlike the higher "care need" levels. We also excluded 160 subjects

who did not respond about their caregivers, and 61 subjects who did not respond about their assessed care level. The final sample size for the analysis was 495. This study was approved by the Ethical Committee of the University of Tsukuba (approval No. 1009).

2.2 Estimation of Cost Containment

Data were collected from the Tsukuba 6th Survey, as noted above, and also from the Ministry of Health, Labour and Welfare (MHLW) report on the status of LTCI [15]. The Tsukuba 6th Survey included a question for caregivers about their desire to continue providing at-home care. We focused on those who answered that they could continue caregiving if they received support services and asked this group an additional question: "What support would you need to continue caregiving at home?" with multiple responses allowed. Access to unplanned (emergency) institutional respite care was the most frequently included selected response. (See Results and Figure 1 for more details.) From this, we identified those who selected "unplanned institutional respite care service" as the cohort who could continue home-based caregiving if they had access to unplanned institutional respite care. This study deals with the possibility of publicizing vacancies for unplanned institutional respite care to care managers with free notification and scheduling tools. We estimated the potential cost containment by comparing the cost of providing home-based care services and full-time facility-based care services based on the assumption that marginal caregivers would be able to continue providing care at home if they could access unplanned institutional respite care support instead of institutionalizing their family members.

This paper undertook a lower-bound and an upper-bound estimate for the cost implications. The lower bound estimate only modeled savings for the share of caregivers who stated they could continue caregiving if they had access to unplanned institutional respite care services, but did not identify any other additional services. The upper bound estimate includes all caregivers who included unplanned institutional respite care among the desired support services to continue caregiving.

2.3 Calculation Process

Our calculation procedure is described below, with the sequence numbering matching that used in Table 1 and Table 2. This is based on the local government implementing a system to notify care managers of vacancies in unplanned institutional respite care facilities and segmented by the care recipient's assessed level of care need. In the estimations, we allocated 90% of the cost of long-term care to municipalities (the remaining 10% are user co-payments, as this was the national policy in 2014 under which we calculated this simulation).

1) This is the number and percentage of caregivers who answered that they could continue caregiving if they had access to unplanned institutional respite care service anytime they wanted. Data is from the Tsukuba 6th Survey.

2) We scaled the survey results for the city by considering the average number of home-care users, aged 65 years old and over, in Tsukuba City in the 2014 fiscal year. The data is from the 2014 MHLW report on the status of the LTCI system [15].

3) We estimated the total number of caregivers who could continue caregiving at home, meaning that their care recipient could remain at home, if they had access to unplanned institutional short-stay respite care in Tsukuba by multiplying 1) and 2).

4) This is the expected annual frequency of usage of an unplanned institutional respite care service, based on reported current average usage from the Tsukuba 6th Survey. Two respondents were dropped from the analysis as outliers as they reported unrealistic excessive use of the unplanned care service, possibly due to misunderstanding the unplanned respite definition in the question or because such a care recipient would likely not be put on a home-based care plan.

5) This is the expected payment from Tsukuba's LTCI system for home-based care services per user per year (which includes the 90% coverage paid by LTCI, but excludes the care recipient's co-payment of 10%). We multiply the daily at-home care reimbursement rate by the expected number of days of home care. The days of at-home care comes from subtracting the expected number of days of respite care from the full year of at-home care. Under the LTCI system in Japan there is a 7-day maximum for each use of unplanned institutional respite care. MHLW data shows that 80% of unplanned institutional respite care visits in Japan are 7 days or less [17].

We multiplied the frequency of use by the 7-day maximum to calculate the expected days of unplanned institutional respite care per year. To derive the cost, we used the Tsukuba City data from the 2014 MHLW Report on the Status of LTCI [15].

6) This is a calculation for the cost of the unplanned institutional respite care assuming care would be provided in parallel establishments. The LTCI reimbursement coverage for respite care per day depends on assessed level of care need. When this is unscheduled care, an additional 90 units per day of supplemental reimbursement is made regardless of the recipient's assessed care need level. At the time of the study, the care "unit price" in Tsukuba was 10.55 yen per unit. Therefore, the value of unplanned respite care is calculated as:

(LTCI units for daily respite care based on assessed care need level + additional LTCI units daily supplement for unplanned respite care) × 10.55 yen/units × expected frequency of using unplanned respite care × 7 day maximum stay × 0.9 LTCI coverage.

7) We calculated the LTCI estimated annual cost for providing at-home services for these users by summing the home-based care and unplanned, short-stay respite care payments which is 5) + 6).

8) We used the 2014 fiscal year data from the MHLW status report on long-term care insurance as the estimated cost of providing institutional care services per user per year in Tsukuba City.

9) We calculated the total difference between continuing home care services with unplanned respite care use and the institutionalization of the care recipient for Tsukuba City LTCI for each care recipient who would do this. This is 8) - 7).

10) The total savings is therefore this per person difference in LTCI costs multiplied by the number of potential care recipients to which these marginal cases apply: 9) × 3).

3. Results

Table 3 shows the distribution of caregivers who want to continue caregiving for their family and includes the characteristics of caregivers and recipients. Among all of the responding family caregivers, 159 caregivers (32.1%) responded that they could continue caregiving with just their currently available support, 217 caregivers (43.8%) could continue caregiving with additional support services, 58 caregivers (11.7%) did not want to continue caregiving if possible, 4 caregivers (0.8%) wanted to quit caregiving immediately and 57 caregivers (11.5%) did not answer this question. This study focuses on the "marginal caregivers," defined as those who responded that they could continue caregiving if they were supported with additional services, and asked them

what support was needed, with the option of selecting multiple answers. The most frequently selected desired support option—chosen by136 caregivers (62.7%)—was unplanned institutional, short-stay respite care service (Figure 1). Of those, 42 caregivers (19.4%) only chose unplanned respite care service and none of the other options (not in table).

Table 1 shows a lower bound estimated savings of 393 million yen (approx. US$ 3.7 million; using 2014 average US dollar to Japanese yen exchange rate of 106JPY = 1USD) per year which equals 4.0% of total expenditures of long-term care benefits in the city of Tsukuba for the 42 caregivers (8.5%) who state they would continue caregiving if they had access only to unplanned institutional, short-stay services.

Table 2 shows the upper bound estimated savings of 1.28 billion yen (US$ 12.1 million) which equals 12.9% of total expenditures of long-term care benefits in the city of Tsukuba, if all 136 caregivers (27.5%) who chose unplanned institutional, short-stay service as a needed support service would continue caregiving.

The result is that this study suggests potential savings of between 4.0% to 12.9% of the total expenditure on long-term care benefits by the City of Tsukuba through supporting caregivers within the LTCI system with increased easy and secure access to unplanned institutional respite care so they can continue providing care at home instead of institutionalizing their family members.

Table 1 Lower bound estimate for the caregivers who state they would continue caregiving if they had access only to unplanned institutional respite care services.

		Basis for calculation	Care need level 1	Care need level 2	Care need level 3	Care need level 4	Care need level 5	Units	Total
1)	The number and percentage of the people who answerd they could continue caregiving if they used unplanned institutional respite care services anytime they wanted	Tsukuba survey	12 (8.9%)	15 (9.1%)	10 (10.4%)	2 (4.2%)	3 (5.9%)	people (%)	
2)	The average number of home-care users (65 year and over) in Tsukuba city per year in 2014 fiscal year	Report on project of LTCI	947	952	632	386	242	people	3,159
3)	The number of people who can stay at home if they have access to unplanned institutional respite care services in Tsukuba city	①×②	84	87	66	16	14	people	267
4)	The avarage times of using unplanned institutional respite care per year	Tsukuba survey	1.29	1.50	1.68	1.55	2.06	times	
5)	LTCI payment for home care services per user per year in Tsukuba city for normal home-based care (365 - each times × 7days for using unplanned institutional respite care)	Report on project of LTCI	873,996	1,183,871	1,735,596	2,106,664	2,415,428	yen	
6)	LTCI payment for an each times × 7days unplanned institutional respite care services per user per year using Tsukuba LTCI unti cost	Care reward points table	57,789	73,976	90,669	90,658	129,524	yen	
7)	LTCI payment for (365 - each times × 7days) days of home care services & the another days of unplanned institutional respite care per user	⑤＋⑥	931,785	1,257,846	1,826,265	2,197,322	2,544,952	yen	
8)	LTCI payment for fulltime institutional care services per user per year in Tsukuba city in 2014 fiscal year	Report on project of LTCI	2,664,577	2,841,538	3,082,404	3,149,945	3,365,978	yen	
9)	Difference in LTCI payments between home care services supported by unplanned institutional respite care services and fulltime institutionalization in Tsukuba per year per person	⑧ - ⑦	1,732,792	1,583,692	1,256,139	952,623	821,026	yen	6,346,272
10)	Total difference in costs based for those expected to use it	⑨ × ③	145,862,602	137,061,321	82,695,833	15,321,354	11,687,542	yen	392,628,653

Table 2 Upper bound estimate for the all caregivers who chose unplanned institutional respite care.

		Basis for calculation	Care need level 1	Care need level 2	Care need level 3	Care need level 4	Care need level 5	Units	Total
1)	The number and percentage of the people who answerd they could continue caregiving if they used unplanned institutional respite care services anytime they wanted	Tsukuba survey	40 (29.6%)	51 (30.9%)	24 (25.0%)	12 (25.0%)	9 (17.6%)	people (%)	
2)	The average number of home-care users (65 year and over) in Tsukuba city per year in 2014 fiscal year	Report on project of LTCI	947	952	632	386	242	people	3159
3)	The number of people who can stay at home if they have access to unplanned institutional respite care services in Tsukuba city	①×②	281	294	158	97	43	people	872
4)	The avarage times of using unplanned institutional respite care per year	Tsukuba survey	1.29	1.50	1.68	1.55	2.06	times	
5)	LTCI payment for home care services per user per year in Tsukuba city for normal home-based care (365 - each times × 7days for using unplanned institutional respite care)	Report on project of LTCI	873,996	1,183,871	1,735,596	2,106,664	2,415,428	yen	
6)	LTCI payment for an each times × 7days unplanned institutional respite care services per user per year using Tsukuba LTCI unti cost	Care reward points table	57,789	73,976	90,669	90,658	129,524	yen	
7)	LTCI payment for (365 - each times × 7days) days of home care services & the another days of unplanned institutional respite care per user	⑤＋⑥	931,785	1,257,846	1,826,265	2,197,322	2,544,952	yen	
8)	LTCI payment for fulltime institutional care services per user per year in Tsukuba city in 2014 fiscal year	Report on project of LTCI	2,664,577	2,841,538	3,082,404	3,149,945	3,365,978	yen	
9)	Difference in LTCI payments between home care services supported by unplanned institutional respite care services and fulltime institutionalization in Tsukuba per year per person	⑧ - ⑦	1,732,792	1,583,692	1,256,139	952,623	821,026	yen	6,346,272
10)	Total difference in costs based for those expected to use it	⑨ × ③	486,208,675	466,008,492	198,470,000	91,928,123	35,062,625	yen	1,277,677,915

Table 3 The distribution of caregivers' desire to continue providing at-home care and characteristics of care recipients and caregivers.

	Care recipients								Caregivers	
							Age	Sex	Age	Sex
	Total	Care level					Mean±SD	Female	Mean±SD	Female
	(n=495)	1(n=135)	2(n=165)	3(n=96)	4(n=48)	5(n=51)				
Continue caregiving with current support	159(32.1%)	40 (29.6%)	60 (36.4%)	30 (31.3%)	11 (22.9%)	18 (35.3%)	81.6±9.8	73 (48.7%)	65.5±13.6	110 (70.5%)
Continue caregiving with additional support	217(43.8%)	71 (52.6%)	62 (37.6%)	43 (44.8%)	22 (45.8%)	19 (37.3%)	81.9±9.3	93 (45.6%)	66.5±13.1	160 (73.7%)
Would not continue if possible	58(11.7%)	8 (5.9%)	18 (10.9%)	13 (13.5%)	10 (20.8%)	9 (17.6%)	82.7±7.6	30 (54.5%)	64.4±11.3	41 (70.7%)
Quit right now	4(0.8%)	1 (0.7%)	1 (0.6%)	0 (0%)	0 (0%)	2 (3.9%)	86.0±4.2	0 (0%)	76.5±23.6	4 (100.0%)
No answer	57(11.5%)	15 (11.1%)	24 (14.5%)	10 (10.4%)	5 (10.4%)	3 (5.9%)	81.1±6.5	13 (25.5%)	68.9±11.9	36 (76.6%)

SD: Standard deviation.

4. Discussion

4.1 The Value of Unplanned Respite Facilities to Informal Carers

The main fear of family caregivers seems to be related to the lack of support in case of an unexpected crisis which prompted the demand for increased access to unplanned respite care services; however, the everyday burden of caregiving is also recognized as stressful. When asked in the Tsukuba 6th Survey, 10% of care recipients and 50% of care managers indicate that their requests for unplanned institutional respite care have been rejected by local care institutions (not in table). The intentions of family caregivers does influence the location of care and whether the care recipient is ultimately institutionalized [18, 19].

If home-based care is to be promoted, it is necessary to provide support that will help alleviate the fears of caregivers in an emergency. Six years after Japan's LTCI system was established, community-oriented services were started in order to support older people continuing to live at home or in their own community with diverse and flexible services. Municipalities can introduce services according to their local needs and priorities as well as setting the fee for such services. Within this framework, night sitting services were introduced in 2006, and regular visits/on-call visiting services were introduced in 2012 nationwide. Some municipalities, however, cannot provide those services sufficiently. Moreover, unplanned institutional respite care services are the only support option that can be used in an emergency which has a reimbursement rate. Therefore, unplanned institutional respite care services are often used in emergencies. Some studies also have found that the burden on caregivers declines when care recipients use institutional respite care [20, 21], and others reported that use of institutional respite care is effective in preventing institutionalization [22, 23]. Providing unplanned and emergency support might reduce these caregivers' stress and fears and allow them to continue primary caregiving at home. The research team has experimented with making a calendar that showed which institutions had capacity to accept older people in Tsukuba City in 2015 to promote the use of unplanned institutional respite care [13]. If Tsukuba City adopts such tools or a similar approach to notify care managers of vacancies, it should increase access to these services. They have started a web site providing information on vacancies in the 2018 fiscal year.

The demand for unplanned respite care and general cost implications are expected to be generalizable to other nations. Specific results depend on specific estimates related to participation and to the services included. The benefits of such a model to other nations also depends on the degree to which services are covered by the healthcare system in each country.

4.2 Financial Support

At the same time, we should consider that the second need identified by family caregivers completing the survey was financial support. We did not analyze policies around increasing direct financial support because the Japanese government has no plan to provide monetary benefits. There are likely two primary reasons. The first is simply that offering substantial monetary benefits would not be affordable. Another concern is that providing monetary benefits conflicts with the philosophy underpinning the LTCI system as it is based on a principle of socializing care with a socially shared responsibility for caring for older people. As a result, individual families could end up being obliged to take on caregiving if monetary benefits are provided instead of the current model of in-kind support.

4.3 Admissions to Unplanned Respite Care System

There are also concerns about the admission of new unplanned institutional respite care recipients. First, it can be hard for the receiving institution to assess and understand the health situations of recipients when they arrive on short notice or in an emergency. Also, it may be difficult to arrange adequate staffing on short notice and in the case of a family emergency. However, implementing systems that support increased easy access to unplanned institutional respite care services is deemed worthwhile. Many caregivers wish to have easy and certain access to this service, and these systems are also generally found to be cost effective. Standardized guidelines for the municipality is needed for easy and efficient access, such as having common forms to assess the health situations of care recipients and preparation of applications by care managers or family.

4.4 Limitations of the Study

One limitation of this current study is the potential underestimation of the need for respite care services. Participants who did not respond to the question about their desire to continue caregiving were kept in the analysis because of our concern that excluding them would overstate the share of caregivers for whom an unplanned respite service would enable continued care at home. We also expect that most of these respondents were likely to be struggling with the burden of providing care but facing internal conflict and unwillingness to explicitly express their desire to stop. While many family caregivers prefer to provide home care for their aging relatives [3, 4], they are conflicted about whether to continue or not because of the huge burden.

This current study is also limited in that it is focused on estimating cost containment purely based on the respondents stated desires. We need to continue by assessing the actual results of increased respite care access policies. Further research is needed to investigate whether rates of continued caregiving at home increase with access to unplanned institutional respite care services.

This study uses a co-payment rate of 10% for all participants as that was the rate for everyone at the time. Since then, co-payment rates have increased for some higher income care recipients (affecting about 9% of LTCI recipients in 2018). Cost containment would be a little smaller if some of the higher rate of co-payments was used because then the share of the cost picked up by the municipality would be lower.

Within this current study, the goal was to estimate the cost containment for government as the primary payer; however, it is also important to consider the opportunity cost to informal caregivers for providing home-based care. When considering service options, Chappell et al. found that home care was significantly less costly than residential care even when informal caregiver time was valued at replacement wage rates [24].

5. Conclusions

We estimated the cost containment from offering increased access to unplanned, emergency respite care services by comparing continued home-care services and facility-care services. At-home care is promoted all over the world because older people tend to want to remain at home and because the financial or physical resources needed for institutionalized care are lacking. Reducing care costs and improving service quality as citizens become older is an urgent social issue

and policy goal in many countries. A key aspect of promoting home-care is providing the support for informal, family caregivers, including access to unplanned institutional respite care.

The support for informal carers of older people is an issue faced by nations around the world. Japan has addressed this in part within its LTCI system. While the specific cost structures will vary across systems and nations, the demand and need to consider forms of unplanned respite care is relevant to many nations.

Author Contributions

YM contributed to the concept of this study, design of the analysis, collection of data, analysis of the data, and the writing of the manuscript. TB contributed to the design of the analysis and the writing of the manuscript. ML contributed to the writing of the manuscript and supervision of this study. NT contributed to the concept of the study, design of the analysis, collection of data, and supervision of this study.

Funding

This study was supported by JSPS KAKENHI Grant Numbers JP15KK0106, the Ministry of Health, Labour and Welfare (H28-seisaku-ippan-003) and (H27-seisaku-senryaku-012).

Competing Interests

The authors have declared that no competing interests exist.

References

1. Kaigo hoken ho dai 2 jo (Long-Term Care Insurance Act. Article 2); 1997. Available from: http://www.japaneselawtranslation.go.jp/law/detail/?vm=04&re=01&id=94.
2. Ikegami N, Yamauchi K, Yamada Y. The long term care insurance law in Japan: Impact on institutional care facilities. Int J Geriatr Psychiatry. 2003; 18: 217-221.
3. Cabinet Office, Government of Japan. Heisei 24 nendo koureisha no kenkou ni kansuru chousa. Opinion poll on elderly health; 2012. Available from: http://www8.cao.go.jp/kourei/ishiki/h24/kenkyu/zentai/pdf/2-4_2.pdf; http://www8.cao.go.jp/kourei/ishiki/h24/kenkyu/zentai/pdf/2-4_3.pdf.
4. Sugimoto K, Kashiwagi M, Tamiya N. Predictors of preferred location of care in middle-aged individuals of a municipality in Japan: A cross-sectional survey. BMC Health Serv Res. 2017; 17: 352.
5. Tsutsui T, Muramatsu N. Japan's universal long-term care system reform of 2005: Containing costs and realizing a vision. J Am Geriatr Soc. 2007; 55: 1458-1463.
6. Tirado PO, Tamiya N, Kashiwagi M, Kashiwagi K. Predictors of the highest long-term care expenditures in Japan. BMC Health Serv Res. 2011; 11: 103.
7. Schulz R. Visintainer P, Williamson GM. Psychiatric and physical morbidity effects of caregiving. J Gerontol. 1990; 45: 181-191.
8. Zarit SH, Todd PA, Zarit JM. Subjective burden of husbands and wives as caregivers: A longitudinal study. Gerontologist. 1986; 26: 260-266.
9. Homer AC, Gilliard CJ. The effect of inpatient respite care on elderly patients and their carers. Age Aging. 1994; 23: 274-276.

10. Perks A, Nolan M, Ryan T, Enderby P, Hemmings I, Robinson K. Breaking the mould: Developing a new service for people with dementia and their carers. Qual Ageing Older Adults. 2001; 2: 3-11.
11. Shanley C. Developing more flexible approaches to respite for people living with dementia and their carers. Am J Alzheimers Dis Other Demen. 2006; 21: 234-241.
12. Support Network Center of Caregivers, Arajin. Kazoku (Setai) wo Chushin to shita Tayo na Kaigosha no Jittai to Hitsuyou na Shien ni Kansuru Chousakenkyujigyou. Survey into the current situation and support necessary for various caregivers, with focus on the family (households); 2011. Available from: http://carersjapan.com/images/activities/reserch2010_pamph.pdf.
13. Moriyama Y, Tamiya N. Tsukuba-shi ni okeru sabisu teikyousha・akademia・gyousei ittai de jisshi shita kinkyu shotosutei kushooshirase jisshojikken, Demonstration experiment on bed vacancy data sharing for unplanned institutional respite care conducted by providers, academics and government in Tsukuba City. The report of research about the support for family caregivers by Health, and Labour Sciences Research Grant 2017; 43-44. Available from: https://mhlw-grants.niph.go.jp/niph/search/NIDD00.do?resrchNum=201601015A.
14. Kaigo-houshu hayami-hyou: 2015 nen 4 gatsu ban. (Quick reference matrix of nursing-care benefits). Tokyo: Igakutushinsha; 2015. (pp.90). (in Japanese).
15. MHLW. Heisei 26 nendo kaigo hoken jigyou jyoukyou houkoku. Report on the Status of LTCI; 2014. Available from: http://www.mhlw.go.jp/topics/kaigo/osirase/jigyo/14/index.html.
16. Cabinet Office, Government of Japan. Heisei 28 nendo kourei shakai hakusho. White paper for aging society; 2016. Available from: http://www8.cao.go.jp/kourei/whitepaper/w-2016/html/zenbun/index. html.
17. MHLW. Tanki-nyusho seikatsu kaigo ni-okeru kinkyuji no sabisu no teikyou jyoukyou ni kansuru chousa. Survey on the provision of emergency institutional respite care; 2013. Available from: http://www.mhlw.go.jp/stf/shingi/2r985200000348 6h-att/2r985200000348g2.pdf.
18. Tamiya N, Kobayashi Y, Murakami S, Sasaki J, Yoshizawa K, Otaki J, et al. Factors related to home discharge of cerebrovascular disease patients: 1-year follow-up interview survey of caregivers of hospitalized patients in 53 acute care hospitals in Japan. Arch Gerontol Geriatr. 2001; 33: 109-121.
19. Tokyo Council of Social Welfare. Shoto sutei kara mieru zaitakufukushi・kaigo hoken no ima. Current state of at-home welfare services and long-term care insurance system from the perspective of respite care services; 2008.
20. Kuzuya M, Enoki H, Kasegawa J, Izawa S, Hirakawa Y, Shimokata H, et al. Impact of caregiver burden on adverse health outcomes in community-dwelling dependent older care recipients. Am J Geriatr Psychiatry. 2011; 19: 382-391.
21. Van Exel J, Moree M, Koopmanschap M, Goedheijt TS, Brouwer W. Respite care-An explorative study of demand and use in Dutch informal caregivers. Health Policy. 2006; 78: 194-208.
22. Moriyama Y, Tamiya N, Kawamura A, Mayers TD, Noguchi H, Takahashi H. Effect of short-stay service use on stay-at-home duration with certified care needs: Analysis of long-term care insurance claims data in Japan. PloS One. 2018; 13: e0203112.
23. Tomita N, Yoshimura K, Ikegami N. Impact of home and community-based services on hospitalization and institutionalization among individuals eligible for long-term care insurance in Japan. BMC Health Serv Res. 2010; 10: 345.

24. Chappell NL, Havens B, Hollander M, Miller J, McWilliam C. Comparative costs of home care and residential care. Gerontologist. 2004; 44: 389-400.