

の関係であった。半数以上（58%）の介護者は日中自宅にいたが、42%は日中自宅にいたことがなかった。将来の介護について聞いたところ、73%が在宅サービスを利用しながら、居宅介護を続けることを考えており、16%がサービスに頼らず家族だけで介護することを考えていた。12%は、将来的に施設入所を検討していた。

被保険者のサービス利用では、ベースラインにおいて、約 20%の被保険者が既に介護保険サービスを利用していた。そのうち 48%の被保険者は、居宅介護サービスを利用する。また、58%が通所型サービス、7%が短期入所型サービスを利用する。施設入所の平均入所数は 20.98 カ月であった。

ロジスティック回帰分析を行い、施設入所の要因として考えられる変数との関連性を検証した。ベースラインにて昼間に家に介護する人がいないこと（オッズ比 2.40、 $p < 0.05$ ）、ベースラインにて将来施設入所を希望していた家族（オッズ比 4.14、 $p < 0.05$ ）が有意である。居宅関連サービス（オッズ比 0.15、 $p < 0.001$ ）とショートステイサービス（オッズ比 0.14、 $p < 0.001$ ）を利用していた被保険者は、施設入所の利用は少ない傾向にあった。しかし、デイケアサービスを利用していた被保険者（オッズ比 8.48、 $p < 0.05$ ）は、施設入所する傾向にあった。

D. 考察

被保険者の高齢化が目立っていた。介護者は、昔と変わらず女性、特に成人した子どもの配偶者、すなわち嫁または当事者の配偶者がほとんどであった。被保険者の特性（年齢、性別）よりも介護者が日中自宅にいないことやベースラインでは自宅で介護をしていたものの、高齢者の状態が低下していくにあたって将来は施設入所を検討している介護者ほど結果として施設入所を余儀なくされることが示唆された。制度としては、介護を必要とする高齢者だけではなく、介護者への支援を考慮する必要があると考える。特に、介護者の生活や仕事を続けられながら、高齢者の居宅介護を可能にすると考え。

また、サービス利用に関しては、居宅関連サービスが施設入所を防ぐ要因だということは、そもそも介護保険設立の目的を達成したといえる。ショートステイや居宅関連サービスの利用によって、施設入所を防げる可能性を示唆する。実際、介護度は施設入所の要因として有意ではなかったため、これらのサービスは十分に高齢者の介護ニーズに役立っていることがいえよう。

デイケアサービス利用が施設入所の要因であることに関しては、デイケアが介護者のレスパイトとして、あまり役に立っていないかもしれない。したがって、デイケアサービスの内容や効果を検討する必要があると考える。

E. 結論

本研究では、介護保険制度の居宅サービスを利用されている被保険者を対象に調査し、施設入所の要因を明らかにした。施設入所利用に関する研究では、施設入所の要因として

被保険者の健康状態の低下と言われている一方、被保険者の介護者の有無など介護者の特性だとも言われてきた。

本研究では、健康に関連するニーズ要因が重要だったものの、介護者の特性が被保険者の施設入所と関連していることが実証された。高齢者の健康低下に伴うニーズだけではなく、介護者の介護負担やワークライフバランスへの支援をすることで高齢者の施設入所が防げるとも言えよう。介護者支援を含めた包括的な介護政策を考慮するために、今後も介護者の特性や役割の側面を分析に取り入れた研究を続ける必要がある。

F. 研究発表

1. 論文発表

なし

2. 学会発表

Chen, L., Tamiya, N., Kashiwagi, M., Takahashi, H., Sato, M. (2010). 「Examining the role of informal and formal care on nursing home admission among public long-term care insurance beneficiaries in Japan」 19th World Congress of International Association of Gerontology and Geriatrics, Paris, France.

G. 知的財産権の出願・登録状況（予定を含む。）

なし

図 1. 施設入所要因の変数

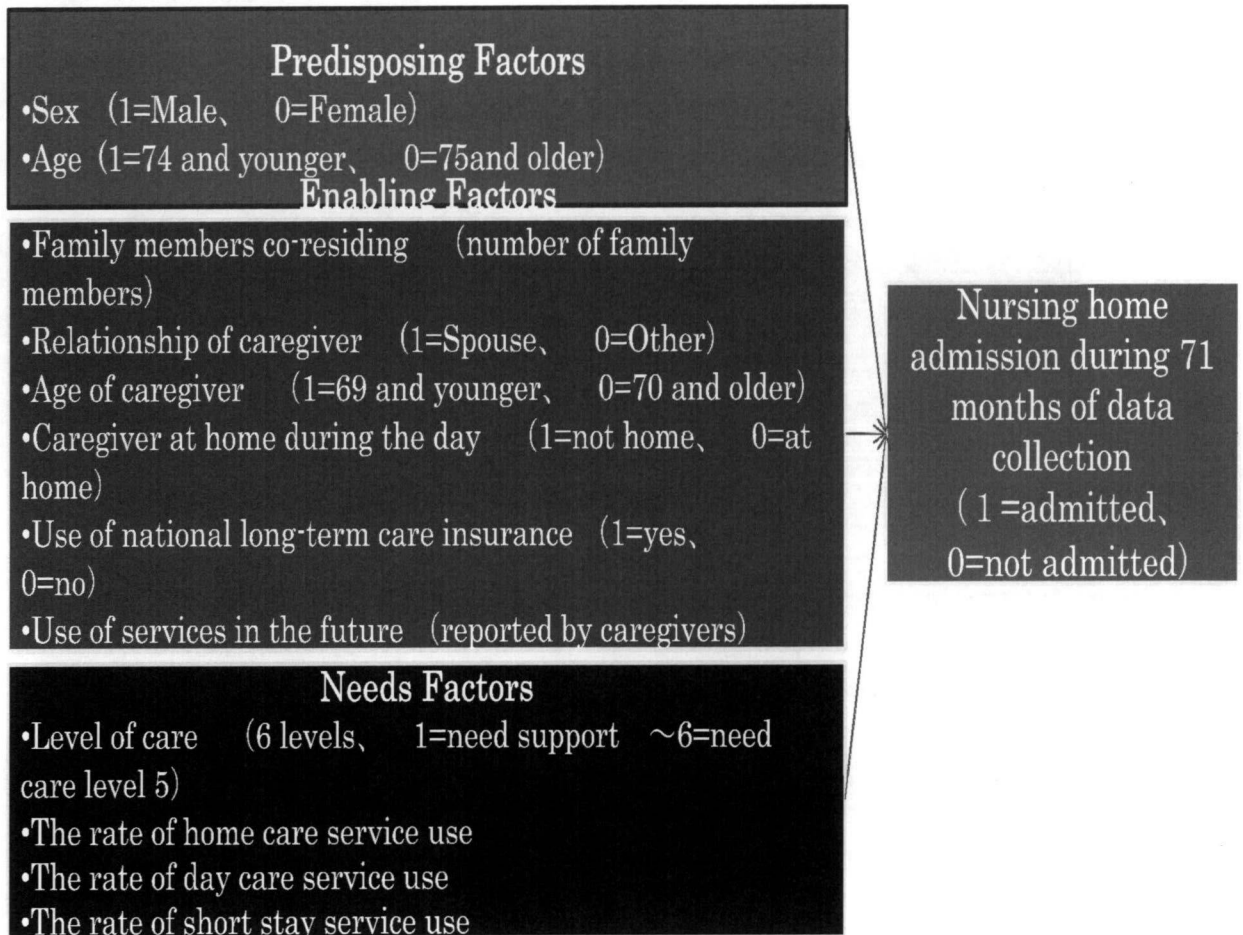


表 1. 被保険者の属性

Characteristics	N (%)	M(SD)
Sex (Female)	141 (65.28%)	
Age (75 years or older)	151(69.91%)	
Number of family members co-resident (number)		3.44(1.82)
Level of care		2.71(1.35)
Use of NLTC services	174 (80.93%)	
Number of persons admitted to nursing home	68 (31.5%)	Average length of stay : 20.6 (15.4)months
No one at home during the day	79 (39.11%)	

表 2. 介護者の属性

Characteristics	N (%)
Caregiver sex (female)	162 (82.23)
Caregiver's relationship	
Spouse (husband or wife)	66 (31.28)
Children (son or daughter)	40 (18.96)
Spouses of children (wife of son, etc)	64(30.33)
Others (relatives)	30 (14.22)
No caregivers	11 (5.21)
Caregiver's age	
30s or under	29 (13.43)
40s	35 (16.2)
50s	46 (21.3)
60s	49 (22.69)
70s	38 (17.59)
80s or older	19 (8.8)

表 3. サービス利用について

Types of service (Multiple answers possible)	N (%)
Home care	
Home care (daytime)	46 (21.3)
Home care (weekend)	15 (6.94)
Home care (early morning, evening)	3 (1.39)
Bathing	19 (8.8)
Visiting Nurse	18 (8.33)
Visiting rehabilitation	2 (0.93)
Home care counseling	3 (1.39)
Day care	
Day care	104 (48.15)
Day rehabilitation	22 (10.19)
Short-stay	
Short stay (non-medical)	10 (4.63)
Short stay (medical)	5 (2.31)

表 4. 施設入所の要因：回帰分析

Variables	odds	95% confidence interval
Predisposing		
Sex	0.96	0.40-2.32
Age	0.93	0.37-2.33
Enabling		
Number of co-residing family members	0.84	0.67-1.06
Caregiver's relationship	2.27	0.79-6.55
Caregiver's age	1.06	0.43-2.61
Caregiver not home during the day	2.40*	1.04-5.50
Future NLTC service use	4.14*	1.18-14.54
Current NLTC service use	1.18	0.42-3.36
Needs		
Level of care need	1.25	0.91-1.72
Home care type services	0.15***	0.06-0.40
Day care type services	8.48*	1.11-64.65
Short stay type services	0.14***	0.05-0.38

家族介護者の続柄の違いによる被介護者の生命予後に関する研究

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研究要旨

【目的】 現行の日本の介護保険制度において、介護を行う家族に対する現金給付は行われていない。しかしながら、家族による介護と介護保険サービスの両立を目指すため、家族による介護がどのように被介護者の健康状況、生命予後に影響を与えているか知る必要があると考えられた。

【方法】 A県B市在住の65歳以上の在宅要介護認定対象者をランダム抽出した。アンケート調査にて家族介護者の続柄を含めた健康・生活状況を得た。また、同市の協力によりアンケート実施後51カ月間の死亡転出の情報を得た。

【結果】 調査対象に該当しアンケートに回答した191人（回答率：62.1%）を分析した。配偶者に介護された群の被介護者の4年累積生存確率は男性で53.2%、女性で84.2%であった。実娘に介護された群では男性で66.7%、女性75.0%で、義理の娘に介護された群では男性で80.0%、女性51.3%であった。特に、女性高齢者群での結果は、コックス比例ハザードモデルによる要介護度などの共変量を加えた多変量解析でも支持された。

【考察】 女性高齢者が在宅にて要介護状態となった場合、義理の娘が主介護者であると累積生存確率が低いことが分かり、主家族介護者の続柄は生存のメカニズムと何らかの関与があることが考えられた。現行の介護保険サービスの適切な利用あるいは拡張によって、家族主介護者の続柄による生存格差が縮小する可能性がある。

【結論】 義理の娘が主介護者である女性高齢者において累積生存確率がその他の群に比べて低い可能性が示唆された。

A. 研究目的

現行の日本の介護保険制度において、介護を行う家族に対する現金給付は行われていない。しかしながら、家族による介護（informal care）と介護保険サービス（formal care）を両立、あるいは適切な資源配分をできているのか評価する必要がある。そのために、家族による介護が被介護者の健康状況、生命予後にどのような影響を与えているか知る必要があ

ると考えられた。

B. 研究方法

A県B市在住の65歳以上の在宅要介護認定対象者696人のうち半数を無作為に抽出した。2001年12月にアンケート調査を行い、家族介護者の続柄を含めた健康・生活状況の情報を得た。また、同市の協力によりアンケート実施後51カ月間の死亡転出の追跡調査を行った。

(倫理面への配慮) 個人を特定する情報は当該自治体から提供されていない。当研究を含めた同自治体の介護保険関係データを使用した研究は筑波大学の倫理委員会にて承認された。

C. 研究結果

調査対象に該当しアンケートに回答した191人(回答率:62.1%)を分析に使用した。配偶者に介護された群の被介護者の4年累積生存確率は男性で53.2%、女性で84.2%あった(図1)。実娘に介護された群では男性で66.7%、女性75.0%で、義理の娘に介護された群では男性で80.0%、女性51.3%であった。ログランク検定では、男性群において配偶者介護群と義理の娘介護群のp Valueが0.146(図1)、女性群においてp Valueが0.012(図2)であった。また、女性の群では、共変量に被介護者の年齢、要介護度、介護保険の各サービス利用の有無、同居家族の人数を投入したコックス比例ハザード分析においても、ハザード比が6.30(1.21-32.80:義理の娘介護群 vs 配偶者介護群)であり、有意に(p Value = 0.029)差が認められた(表1)。

D. 考察

女性高齢者が在宅にて要介護状態となった場合、義理の娘が主介護者であると累積生存確率が低いことが分かり、主家族介護者の続柄は生存のメカニズムと何らかの関与があることが考えられた。サンプルサイズが小さいため、さらなる吟味が必要だと考えられるが、現行の介護保険サービスの適切な利用あるいは拡張によって、家族主介護者の続柄による生存格差が縮小する可能性がある。

E. 結論

義理の娘が主介護者である女性高齢者において累積生存確率がその他の群に比べて低い可能性が示唆された。

F. 研究発表

1. 論文発表

現在英文査読雑誌に投稿中

2. 学会発表

なし

G. 知的財産権の出願・登録状況（予定を含む。）

なし

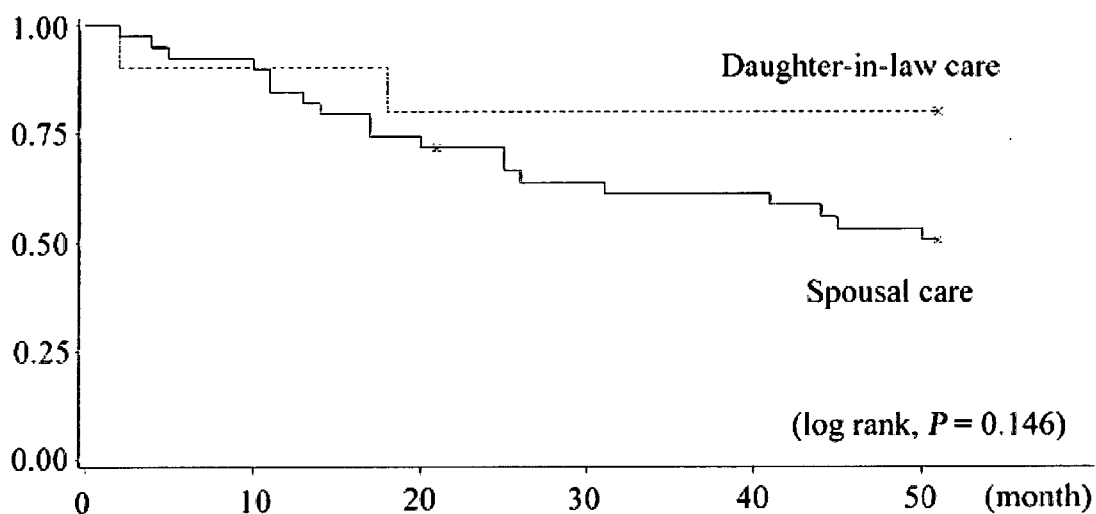


図1 男性被介護者における主家族介護者の続柄による累積生存確率の違い

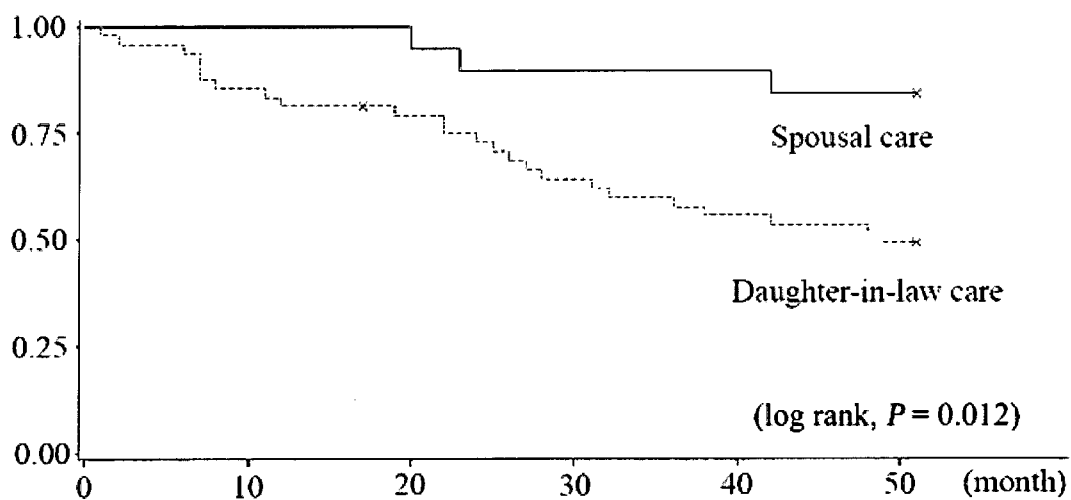


図2 女性被介護者における主家族介護者の続柄による累積生存確率の違い

表1 女性被介護者におけるコックス比例ハザード分析

	HR (95% CI)	P 値
配偶者介護群	1.00	
義理の娘介護群	6.30 (1.21 - 32.80)	0.029
実の娘介護群	3.08 (0.49 - 19.29)	0.230

介護予防給付導入が低介護度者の介護保険サービスの
消費パターンに与える影響

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研究要旨

【目的】日本で介護保険制度が設立されたが、要介護認定者数は増加傾向にあり、介護保険制度の総費用は急速に上昇している。この介護保険制度を持続可能にするために、2005年6月に新介護予防給付制度が設立された。本研究は“新介護予防給付”の導入が、軽介護度者と認定された利用者集団の介護保険サービスの消費パターン及びその支出に与える影響について検討する。

【方法】東京郊外にある市を対象に1年間の縦断的記述研究を実施した。分析対象者は介護保険制度の改案が行われる前（2006年3月時点）に要支援および要介護度1と認定された327名の高齢者とした。介護保険制度の改案に伴う要介護度の再認定の影響を特定するために、ベースライン時における介護保険給付費利用率とサービス費用が検討された。

【結果】観察終了時点において、44%の分析対象者が“新介護予防給費”の受給対象者となった。これらの者の在宅サービスの利用は有意に低下し、通所サービスの利用は有意に増加した。また、全体の介護予防給付費の利用率も有意に低下していた。新たに“要支援”と認定を受けた者においては、利用した1月あたりの介護サービスに対する費用が以前に比して有意に低下していた。

【考察・結論】要支援者における介護保険サービスの消費パターンは介護保険制度改案に影響を受けることが明らかになった。介護保険制度の改案と介護保険利用者のケアの質、生活の質の関連を明らかにするためにも、本研究結果をより詳細に分析する必要がある。

Introduction:

In 1990, the percentage of people aged 65 and older in Japan was 12% [1,2]. Since then, the Japanese population has aged rapidly. In 2006, the total Japanese population reached 127.7 mill and the proportion of elderly population was 20.8%, the highest in the world. By 2025, the ratio of the elderly is expected to reach 30% of the total population and one out of four people will be an elderly person aged 75 or more in Japan [3,4]. To deal with the accelerated aging of Japanese society and the increased needs of nursing care for elderly, in April 2000, the Japanese government introduced a Long-Term Care Insurance system “*Kaigo Hoken*” (hereafter LTCI) [3,5,6].

As the LTCI system is steadily established, the demand for LTCI services has increased greatly and consequently, the expenditures of the LTCI are drastically growing, threatening the sustainability of the system [6,7]. The total LTCI expenditure for FY2006 was ¥ 7.1 trillion representing 1.4 % of GDP and a growth of 100% of the LTCI budget after 2000[5,6]. Following a fifth-year review of the LTCI system a revised LTCI Law was enacted in June 2005 aiming to ensure the sustainability of the LTCI system, by the establishment of a prevention-oriented system, review of facility benefits, establishment of a New Service System, maintenance/improvement of service quality and review of financial burden and the system management[6].

As the number of elderly people requiring slight support or care increased remarkably – accounting for 49% of those certified of LTCI in June 2005 [5,6] - and with the motto “supporting independence”, the preventive benefits before the revision were reorganized into “New Prevention Benefit” (hereafter, NPB) by reexamining the scope of eligible persons, the content of services and care management [6]. Some authors have considered this reform feature as a major change of the LTCI system [5,9].

The NPB aims to provide services to help people to improve and maintain skills for independent living, therefore, maintaining or improving their quality of life by appropriate service use [6,10]. In the new scheme, Local Comprehensive Support Centers “*Chiiki Houkatsu shien center*” (hereafter, LCSCs) will evaluate needs of persons with low-need levels and recertify them to NPB which include “Support level 1” and “Support level 2” and draw up a care plan to prevent the need for care [5,6]. Indeed, NPB scheme underlies a restriction of the provision of instrumental activities daily living (IADL) support services particularly “home help services”, which will be provided as long as the home helpers do not perform all the tasks. Ikegami (2007) suggests it is doubtful the new preventive services will be able to postpone or reverse further decline in elderly, rather it should be successful in containing expenditures[8].

The recertification process associated to NPB has also an economical effect on entitlement of benefits. The upper limit of the benefits for home long-term care services is set much lower than that in the previous LTC insurance for the lowest need levels [11,12] and the three principal services; home help services, day service and day rehabilitation services have new monthly fixed fees [5] (see Annex 1).

The concept of “consumption pattern” generally refers to the relation to goods and services that characterize a lifestyle or livelihood. In this study we assume “consumption pattern” as the combination of services consumed by LTCI users; the frequency and type of LTC services consumed and considered as adequate for fulfilling their needs [14].

Despite a large number of studies have been conducted in Japan regarding factors associated with LTC services utilization, scarce evidence is available [5,7,8,9] about the effect of the NPB scheme on the consumption pattern of services by the elderly population and their economical effect for

LTCI system. Therefore, it is necessary to examine the effect of the LTC law amendment, specifically the NPB scheme on the consumption pattern of LTC services and their expenditures associated in the cohort of the users of the two lightest levels (“*you shien*”) of the LTCI system.

From the observation of changes of the pattern consumption of services as well as their financial effects, the objective of this study is to understand the effects of the changes that are being performed in LTCI system in terms of 1) the consumption pattern of services and 2) the expenditures of a current cohort of slight need level of LTC users.

Methods:

A longitudinal descriptive analysis was conducted during one year to explore the effect of the last LTCI law amendment on the consumption pattern of the current users of lowest care of needs of the LTCI system in city A. The study cohort was followed for 12 months after the implementation of the LTC law amendment (April 2006). Then the study period it is extended from April 2006 to March 2007. The baseline group evaluation was set up at March 2006.

The consumption pattern was evaluated regarding: 1) recertification of care level categories, 2) the services utilization, 3) the utilization rate of benefits, and 4) expenditures, copayment and subsidies of Kaigo Hoken.

The service utilization was measured through; 1) insurance benefits in-home versus facility services and 2) care-mix of services used by care level recipients. Insurance benefits refer to the kind of benefits provided by the system and two main groups that are recognized; in-home services and services at facilities [6]. Care-mix refers to the combination -the mix- of services measured in day units, used by recipients in a given care level of LTCI.

The utilization rate of benefits is the proportion of the benefits units used versus the fixed limits defined by each certified care level in Kaigo Hoken. The amendment of LTCI Law introduced a new certification level and new entitlement benefits for certified users of Kaigo Hoken (see Annex 2).

Here: (Table 1: Limit of benefits for home long-term care services in Kaigo Hoken.)

Sample Population

City A is located in a suburban area approximately 100 km West of Tokyo. The estimated population as of October 1, 2006 was 52,343 and the proportion of elderly persons (aged 65 or over) was 20.8% [13]. This proportion is the same as the average in Japan [1].

The sample population of this study was based on City A's LTC record of all elderly persons certified in LTC Support Level and Care Level 1 by March 2006 who received long-term care services during 12 consecutive months before the implementation of the amendment of the LTCI Law Act (April, 2006).

In April 2005, a total of 1,197 persons used LTC services in city A and 96.4% were over 65 y-old. Three hundred and twenty-seven persons were eligible for this study, representing 28.3% of the total elderly LTC users in April 2005. This cohort represents the study baseline group. A 30.6% were recipients of Support Level and 69.4% were in Care Level 1 (see Table 2).

Analyzed data

The LTCI registered data of City A is based on receipt data collected monthly. After transforming the raw data into an individual subject data, we applied the inclusion criteria to select the study cohort. From the LTCI registered data of City A, we obtained the following data: age, gender, care level, provision date, type of services, frequency of services, total days used by services, the amount of insurance benefit units used, and the amount of expenditures, copayments and subsidies. The utilization rate of benefits was calculated as explained above.

Ethical consideration

City A approved our use of the data after we submitted a formal application for accessing data, explaining the purpose and contents to be used. We also pledged to take maximum care in handling the data and to treat all data anonymously and in a random order to prevent personal information from being revealed in the course of our study. Ethics approval form was gained from the University of Tsukuba Ethical Committee in Japan.

Data analysis

After calculating the data on the characteristics, services utilization, utilization rate of benefits and expenditures of the 327 subjects included in the baseline group, i.e. all elderly persons certified in LTC Support Level and Care Level 1 who received long-term care services during 12 consecutive months before the implementation of the amendment of the LTCI Law Act, we checked their monthly stay in Kaigo Hoken for one year after the law amendment application (April, 2006).

The result of the **1) recertification process** of individual in both categories at 6 and 12 months was registered. Also, the subjects whose death or move out of the LTC system were accounted.

2a) Services utilization was evaluated through average days of services and insurance-benefits consumption by care level. Average day by services was calculated for the most current services utilized by care levels and compared between equivalent categories at baseline date and at the end of the study period. To compare the insurance benefits, we pay attention in the proportions of the subjects and insurance benefits units, utilized in facilities services by Care Level 1 users of the study cohort at baseline and at the end of the study period. As subjects categorized in Support Level before the revision does not use facilities services then, the comparison was only carried out between users

of care category.

2b) To compare the care-mix of services of the study cohort, the proportion of the total days used in the main in-home and commuting services in each category was calculated at the baseline time and at the end of the study period. It must be pointed out, that the utilization of facilities services is not considered in care-mix of services analysis due to fact that they are not accounted by days in this data.

3) An individual utilization rate of benefits for the study cohort was calculated. The average of utilization rate of benefits by care level was calculated and a comparison between equivalents categories of the baseline group and the cohort at the end of study period was conducted.

4) To compare the expenditures, a total expenditure of the study cohort and an annual average expenditure, copayments and subsidies by users were calculated by the year before and after the implementation of the LTCI law amendment. To compare the effect of the recertification process on the expenditures by care level and gender, an individual monthly average expenditure was calculated based on whole subjects of the cohort that stayed in the LTCI system the period from April 2005 to March 2006 and remained until the end of the study period. Finally, we compared the effect of the law amendment on the individual expenditure in a subset of study cohort whom stayed continuously in LTC system from April 2005 to March 2007 (n: 250 cases). Also, an annual average of subsidies by person was calculated and compared one year before and after the LTCI law revision. As in 2007, the Japan consumer price index has no change from the previous year [15], monetary values of expenditures, copayments and subsidies were not indexed.

In order to identify any significant difference through variables we used parametric and non-parametric statistics tests according variables characteristics. The significance level was set at < 0.05 (CI =95%). The statistical analysis was carried out using SAS 9.1 System for Windows.

Results:

Characteristics of the Baseline Group

Table 1 summarizes the basic characteristics of the 327 subjects of the study cohort by March 2006. The average age was 83.1 years, ranging from 67–101years. There were 240 female subjects (73%). The aged group over 80 y-old represented 69.7% of the sample. Thirty-one percent of subjects of the baseline group were certified in Support Level and 69% in Care level 1 in March 2006.

The overall average utilization rate of benefits of the study cohort was 59.3%. The main services used by Support Level recipients were: commuting services(54%), in-home services(44%) and

short-stay services(2%).On the other hand, Care Level 1 recipients utilized commuting services(47%), in-home services(34%),short-stay services(10%) and services at facilities(9%). It must be pointed out that recipients can use more than one service; 24% and 41% in Support Level and Care Level 1, respectively.

Here: (Table 1: Basic characteristics of the Baseline Group (March, 2006))

Leasing of welfare appliances by its nature – devices - is a permanent service once allocated in both recipient groups, consuming 31 day/person/month. The average days by person for “day service” and “home help service” are higher in Care Level 1 (7.9 and 12.8 days/person/month, respectively) than in Support Level (5.5 and 7.8 days/person/month, respectively).

Kaigo Hoken system on City A cared a monthly average of 1,219 persons in the period from April 2005 to March 2006. In this period, the total monthly average expenditure on LTC services was ¥ 176,638,375 and copayments reached ¥ 16,953,003. The expenditures of the study cohort represent 14.5% of the total expenditure of Kaigo Hoken as of March 2006 in city A. At this date, the baseline group expended an average of ¥ 79,779 by person and copayments reached ¥ 7,625 by person. The subsidy beneficiaries were 8 persons with a total of ¥ 7,541 by person.

Recertification of Care Level Categories

By the end of the study period; 84% of the baseline group remained in Kaigo Hoken, 10% moved out and 6 % died in this period (Table 2). All of the recipients certified in Support Level before the revision and who remained in the system at the end of the study period (n:82) were reclassified; 42.7% to the new “Support Level 1”, a 31.7% to new “Support Level 2”, a 12.2% to Care Level 1, a 9.8% to Care Level 2 and the remained 3.6% to Care Level 3 or Care Level 4.

On the other hand, recipients of Care Level 1 who stayed in the system by the end of the study period (n:194) were reassigned; 7.7% to new “ Support Level 1”, a 23.7% to new “Support Level 2”, a 35.1% remained in Care Level 1, a 24.2% to Care Level 2, a 6.2% to Care Level 3 and 3.1% to Care Level 4.

Here: (Table 2: Recertification of baseline group by Care Level after LTCI law amendment)

As the recertification process was carried out, the new “Support Level 1” (n: 50) was integrated by 70% of subjects coming from Support Level and 30% from Care Level 1. The new “Support Level 2” (n:72) was conformed by 36% of subjects from Support Level and 64% from Care Level 1. Then, 44% of the subjects of the baseline group whom remained at Kaigo Hoken at the end of study period (n:276), were recertified to receive new preventive benefits.

Services Utilization : In-home vs facilities services

Roughly, Kaigo Hoken insurance benefits are categorized at in-home services, commuting services, facilities services and community-based services. Usually, most of the lowest care of needs users utilized in-home or commuting services and did not utilize facilities services. Previous LTCI law amendment implementation, 12.3% of recipients of Care Level 1 of the baseline group used *facilities services*; special nursing home for the elderly (18 cases) or LTC health facilities (10 cases) however, this proportion increased to 17.9% at the end of the study period. This difference was not statistically significant. On the other hand, a comparison of the proportion of the insurance benefits units used in *facilities services* by recipients at Care Level 1 at baseline (28%) and at the end of the study period (36.9%), shows a significant increase of the utilization of insurance benefits used in facilities services by this group (X^2 test, $p < .0001$). See Figure 1.

Here: (Figure 1: Utilization of Facilities services in Care Level 1: Users and Insurance Benefits (March, 2006 / March, 2007))

Services Utilization: Care-Mix of services

In city A, with exception of the utilization of facilities services all the LTC services are accounted in a daily-based system, i.e. services are provided and counted in days-used monthly. According the categories of services after the revision, the services in “new prevention benefits” were gathered into; services to prevent the need for care, support to prevent the need for care and community-based prevention programs. Services to prevent the need for care includes: home-visit services, commuting services and short-stay services [4].

We compared the care-mix of services between equivalent categories of the baseline group with the cohort at the end of the study period. The proportion of the total days used by services to prevent the need for care in each category was calculated. On the figure 2 the proportion of the total days used by services to prevent the need for care by subjects in Support Level pre-2006 revision and recipients of “Support Level 1” and “Support Level 2” of the new classification, are compared.

Three services explained the 95% of the total days (n:1,142 days) consumed by subjects belonging to Support Level before the LTCI revision; “leasing of welfare appliances” (40%), “day services” (30%) and “home help services” (25%). However, at the end of study period in “Support Level 1”; “day services” (50%) and “home help services” (34%) consumed most of the days (n: 262 days) of this group. At the same time, recipients of “Support Level 2” consumed a total of 663 days distributed in: “day services”(44%), “leasing of welfare appliances” (28%), and “home help services” (17%). The difference of the patterns of care-mix of services between Support Level pre-revision and both of the “new support” categories, were statistically significant (X^2 test, p

=.000).

Here: (Figure 2: Care-mix of services in Assistance and Care Categories.)

On the other hand, figure 2 exhibits the proportion of the total days used by services to prevent the need for care in subjects in Care Level 1 before and after the revision. Before the revision, three services explain 87% of the total days consumed (n: 3,963 days) in this care level; “leasing of welfare appliances” (45%), “day services” (27%) and “home help services” (15%). However, a year after the law amendment implementation, “day services” (54%) and “home help services” (17%) consumed most of the total days (n: 853 days) of the Care Level 1. The difference between patterns of care-mix of services within this care level was statistically significant (X^2 test, $p = .000$).

Utilization rate of Benefits

The average utilization rate of benefits of the baseline group was 58.2% in subjects with Support Level and 59.8% in Care Level 1 as of March 2006. There was not a significant difference in the means for the utilization rate of benefits between these categories at this time.

Once the recertification process was carried out and compared the mean of utilization rate of benefits of the baseline group at Support Level with subjects in the new Assistance categories; “Support Level 1” and “Support Level 2”, a decrease of the utilization rate at the end of study period was proved in both new categories. These differences were statistically significant (*Student’s t-test*, $p = .0035$ for SL vs SL1 and $p = .0005$ for SL vs SL2).

An opposite effect was observed in subjects belonging to Care category. In comparison with Care Level 1 of the baseline group, an increase of utilization rate of benefits in subjects of care level categories at the end of the study period was observed. However, these differences were not statistically significant.

Here: [Table 3: Comparison of Utilization rate of Benefits (%) in study cohort.]

Expenditures, Copayments and Subsidies

Before the LTC law amendment, city A expended a total of ¥ 2.120 billion for LTC services during the period from April 2005 to March 2006. Elderly recipients represent 97% of these expenditures. In this period, the study cohort expended a total of ¥ 294,811,939; it means, a 14.5% of the total expenditures of elderly recipients on LTC system in city A. The total annual average of expenditures and copayments by person/year of the study cohort during the period of April 2005 to March 2006 reached ¥ 901,566 and ¥ 86,075 respectively. Copayment represents 10% of the total expenditures in most of the cases. (Table 4)

Here: [Table 4: Expenditures, Copayments & subsidies.]

One year after the implementation of LTC law amendment, the total expenditures in LTCI system in City A reached a total of ¥ 2.121 billion. During the period of April 2006 to March 2007, a total annual average of the expenditures and copayments of the study cohort decreased to ¥ 888,404 person/year and ¥ 85,586 person/year, respectively. There was no significant difference in the total annual average expenditures and copayments before and after the law amendment.

A comparison of the monthly average expenditure by care level and gender of the study cohort before and after the law amendment application was conducted. There were not significant differences on average expenditures between genders within care level at the extreme dates of the study. However, when the individual monthly average expenditure of the study cohort was compared, before and after the recertification process, subjects of both gender in the assistance category moved to the “new support” categories, showed a significant decrease on average expenditure (see table 5). On the other hand, women on baseline group belonged to Support Level and who were recertified as Care Level 1 exhibited a significant (*Wilcoxon-test, p-value=.000*) increase of the monthly average expenditures during the study period.

Moreover, table 5 shows the subjects of the baseline group in both gender at Care Level 1 and recertified as Support Level 1 showing a significant decrease of the individual average expenditures. In subjects moved to Support Level 2 only women showed a significant decrease on the individual average expenditures. Finally, men that remained in Care Level 1 during all the study period exhibited a significant decrease of the average expenditures. At this care level, the difference on average expenditures showed by women was not statistically significant.

Here: [Table 5: Individual averages expenditures by Gender and Care Level of the study cohort]

We compared also, the effect of the law amendment in the total individual expenditure in a subset of the study cohort whom stayed in LTC system from April 2005 to March 2007 (n: 250 cases). Because there is an important dispersion of the total annual expenditure of the subjects in this subset, we used the median to compare this effect. The median of the expenditure one year before the implementation of the law was ¥ 796,110 (min: ¥ 46,000; max: ¥ 3,365,330). One year after the law amendment, the median of the expenditures reached ¥ 763,810 (min: ¥ 30,000; max: ¥ 3,312,650).

Graph 1 shows the total individual expenditures and the trend curves –exponential- of this subset of the study cohort, during a year before and after the law amendment. Subjects, whose total expenditures were under the median before the revision, increased significantly (*Wilcoxon-test,*

$p = .035$) their total annual expenditures after the law amendment implementation. Conversely, in subjects whose total expenditures were over the median of the expenditures before the law amendment implementation, a significant (Wilcoxon-test, $p = .001$) decrease of the total annual expenditures by person after the revision was observed.

Here: [Graph 1: Total Expenditures of Subset study cohort before & after LTC law amendment.]

In this cohort, the subsidies are benefits that only compensate women in the former care level and it consists in the exemption of copayments. In the study cohort, subsidies supported 8 persons with an annual average by person of ¥ 83,407 the year before the law amendment. One year after the law implementation, the same beneficiaries were subsidized with an average of ¥ 72,219 by person/year. There was no significant difference in the amount of subsidies in this subgroup.

Discussion:

With the Law Amendment of LTCI of 2005, the reduction of economic incentives for institutionalization, moving out of the insurance benefits, fees for meals and residence expenses has led to a cost reduction in LTCI of 4% at facility sector [16]. However, special attention relies on the provision of IADL support services by the New Preventive Benefits contained in the law amendment. Ikegami (2007) suggests it is doubtful the new preventive services will be able to postpone or reverse further decline in elderly, rather it should be successful in containing expenditures by restricting the provision of IADL support services in those eligible for the two lightest levels [8].

Concerning to in-home services, where cost contain through direct benefits cut back has been more difficult and complex, the implementation of NPB underlies indirect restrictions to the use of benefits by reducing uppers limits of benefits and/or fixing fees of some of the most currently services used [5,8]. Basically, the provision of the new preventive services intended to prevent elderly from becoming dependent while their need level are kept low. Initially LTCI was focused on providing services to dependent elderly; however the focus changed to the “prevention of the need for care” after the revision of LTCI law [6,9].

The present study was performed to examine the effect of the NPB scheme on the pattern of consumption services and expenses associated in the two lightest levels of the current users of LTCI system in city A. Then, we will drive the discussion counterpointed the main measures contained in NPB scheme remarking these effects on services utilization and expenditures of the current users of LTCI system in city A.

The NPB implies the reexamination of the scope of the eligible persons. The recertification process of current users at Support Level and Care Level defines new limits of the benefits. The net