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京都大学大学院医学研究科 医療経済学分野  
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Impact of newly diagnosed conditions on medical and long-term care expenditures

抄録

**【Purpose】**

The aim of this study was to investigate the association of newly diagnosed conditions and other factors with medical and long-term care (LTC) expenditures.

**【Methods】**

In a retrospective cohort study, we analyzed subjects aged 65 years and over who had utilized LTC service between October 2010 and September 2011 linked to medical claim database and traced till March 2015. The independent variables included sex, age, care needs certification, the type of long-term care service used, dementia, living alone and new disease diagnosed. Then we conducted multiple linear regression analyses that used LTC expenditure, medical care expenditure and sum of LTC and medical expenditures respectively as the dependent variable.

**【Result】**

The sample comprised 60,834 individuals, 73.9% were women and the mean age was 82.9 years.

As for newly diagnosed conditions, except for gastric and duodenal ulcers and heart disease which were not significant, renal failure or diabetes and cancer diagnosis are significant with lower long-term care expenditure and other diagnosis are significant with higher long-term care expenditure especially for femur fractures. Dementia showed the highest additional LTC expenditure around 20,000 yen per insured-month among all diseases.

All newly diagnosed conditions were related to high medical care expenditure, especially “surgery procedure”, “renal failure or diabetes”, and “femur fractures”.

Except for cancer, all other diseases and dementia were related to higher LTC and medical combined expenditure significantly. “Surgery procedure” showed the highest sum of LTC and medical expenditures, followed by “femur fractures”, “cerebral palsy”, and “dementia”.

**【Conclusion】**

Newly diagnosed conditions demonstrated various impacts on LTC and medical expenditures. Femur fracture, cerebral palsy and dementia prevention are considered as important for reducing both LTC and medical expenditures.



# Impact of newly diagnosed conditions on medical and long-term care expenditures

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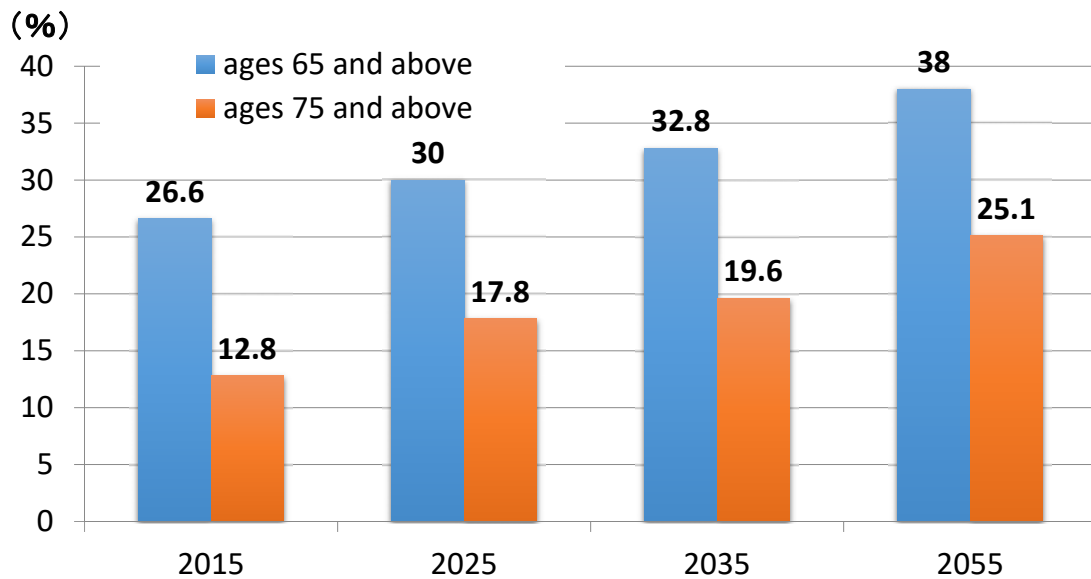
31/10/2017

## Declaration of Conflicting Interests

Presenter Huei-Ru Lin  
Noriko Sasaki  
Yuichi Imanaka

The authors whose names are listed immediately below certify that they have NO affiliations with or involvement in any organization or entity with any financial interest in the subject matter or materials discussed in this presentation.

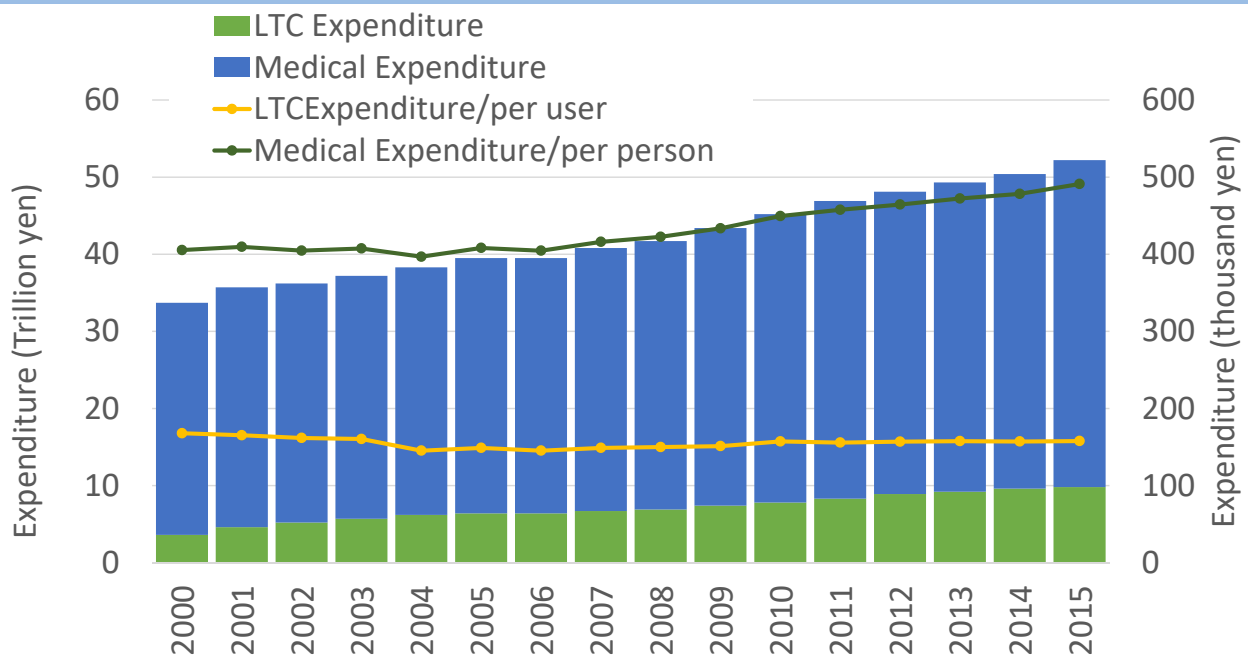
# Introduction(1/2)-Population



(出所)厚生労働省:介護保険事業状況報告 <http://www.mhlw.go.jp/toukei/list/84-1.html>  
 厚生労働省:介護給付費等実態調査 <http://www.mhlw.go.jp/toukei/list/45-1b.html>  
 厚生労働省:平成27年度 国民医療費の概況 <http://www.mhlw.go.jp/toukei/saikin/hw/k-iryohi/15/dl/kekka.pdf>

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# Introduction(2/2)-Expenditure



(出所)厚生労働省:介護保険事業状況報告 <http://www.mhlw.go.jp/toukei/list/84-1.html>  
 厚生労働省:介護給付費等実態調査 <http://www.mhlw.go.jp/toukei/list/45-1b.html>  
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(accounting year)

# Predictors of higher LTC & medical expenditure

- Former studies examined the **predictors** and **factors** related to LTC and medical expenditure.
  - Female, aged 75-84, higher care needs certification, use facility service indicate higher LTC expenditure.<sup>1</sup>
  - Diabetes, heart failure, CVD, stroke, hypertension, surgery, radiation therapy and other diseases are related to high healthcare expenditure.<sup>2,3,4</sup>

1. LTC and Medical expenditure should be considered comprehensively.
2. The impact of newly diagnosed disease is still unknown.

1.Olivares-Tirado et al. BMC Health Services Research 2011, 11:103  
2.Sato et al. Health Econ. 2009,18: 843-853  
3.Ozien et al. Diabetes Res Clin Pract. 2015, 109(1):185-90  
4.Echouffo-Tcheugui et al. Am Heart J. 2017,186:63-72.

## Purpose

- The aim of this study was to investigate the association of newly diagnosed conditions and other factors with medical and long-term care (LTC) expenditures.

## Methods (1/2)

- **Retrospective cohort study**
- **Database**
  - Kyoto prefecture long-term care insurance database
  - Kyoto prefecture national health care insurance database
  - Kyoto prefecture the Medical Care System for the Latter-stage Elderly People database
- **Sample**
  - Subjects who aged 65 years and over had utilized LTC service between October 2010 and September 2011 linked to medical claim database and traced till March 2015.

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## Methods (2/2)

- **RandomForest** to select the important features (disease)(R 3.4.1)
- **Dependent variables**
  - LTC expenditure
  - Medical care expenditure
  - Sum of LTC and medical expenditures
- **Independent variables**
  - sex, age, care needs certification, type of long-term care service used, dementia, living alone, surgery, hospitalization, clinic visit and new disease diagnosed

Linear  
Regression  
(SPSS23.0)

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# Result & Discussion

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## Distribution

Total subjects :  
60,834

		N	%
Age (Agerage:82.9 year-old)	65-74	11,616	19%
	75-84	24,996	41%
	85-94	23,259	38%
	>94	963	2%
Sex	Male(ref)	15,848	26%
	Female	44,986	74%
Care Needs Certification	Support Requiring Level 1	204	0%
	Support Requiring Level 2	695	1%
	Care Needs Level 1	12,315	20%
	Care Needs Level 2	16,789	28%
	Care Needs Level 3	12,455	20%
	Care Needs Level 4	9,754	16%
	Care Needs Level 5	8,622	14%

# Distribution

Total subjects :  
60,834

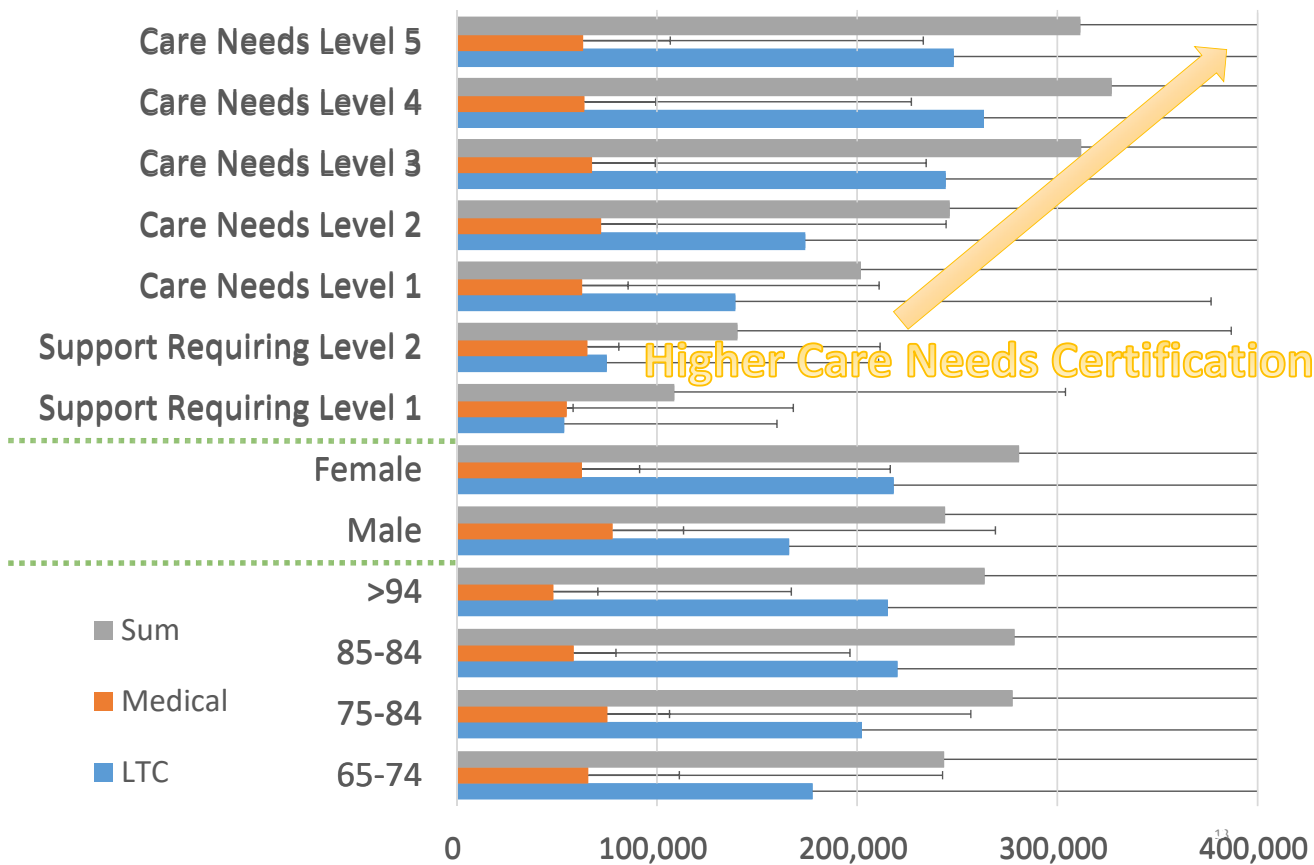
		N	%
Type of Service Used	Did not use	3,368	6%
	Home Care	26,366	43%
	Community Based Care	604	1%
	Facility Care	13,861	23%
	Multiple services	16,635	27%
Living arrangement & Dementia status	Living Alone	10,044	17%
	Dementia	31,782	52%

# Distribution

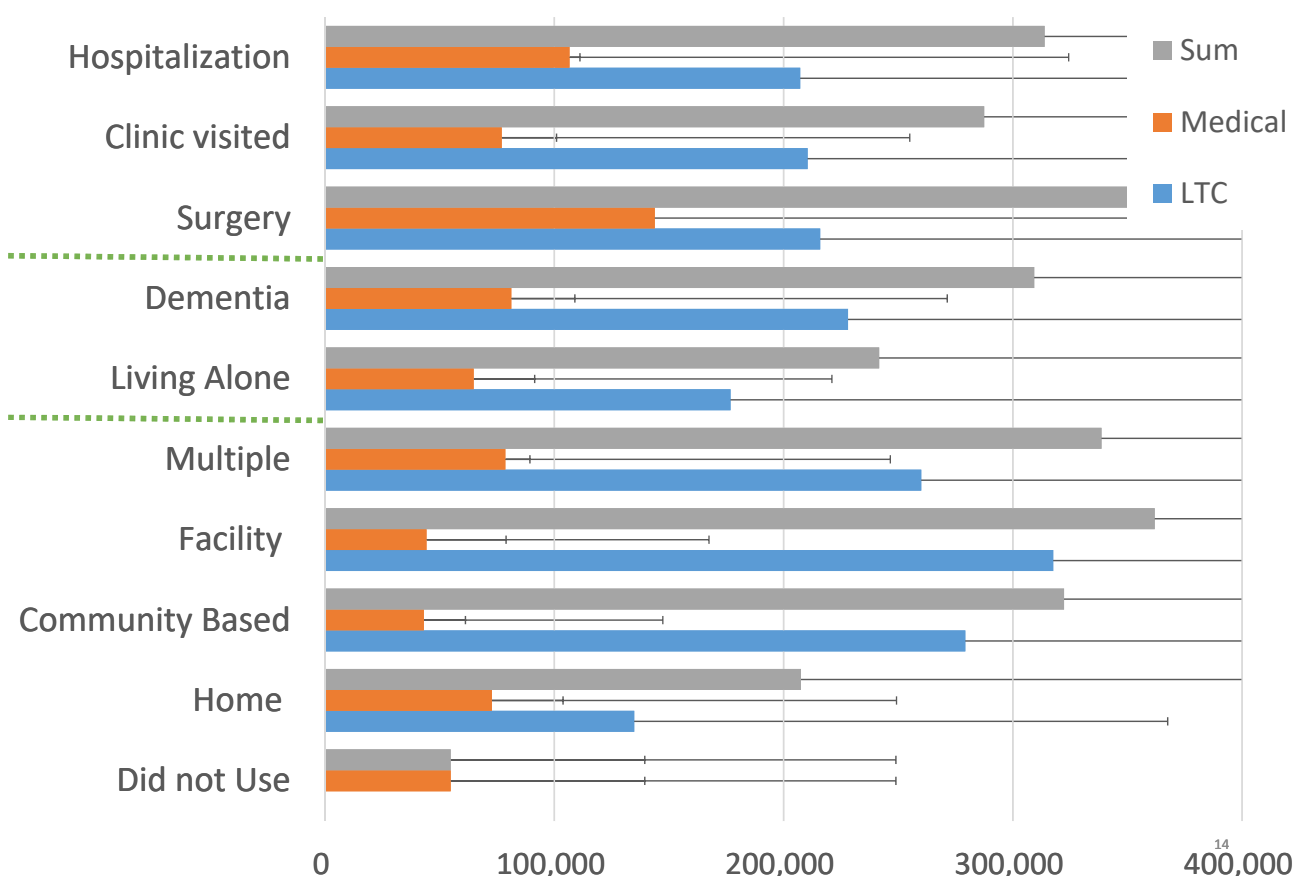
Total subjects :  
60,834

		N	%
Newly Diagnosed Disease	Cancer	2,971	5%
	Stroke	9,540	16%
	Cerebral palsy and other paralytic syndromes	1,037	2%
	Renal Failure / DM	4,653	8%
	Heart Disease	8,064	13%
	Pneumonia / bronchitis / COPD	15,750	26%
	Femur Fracture	3,198	5%
	Gastric ulcer / Duodenal ulcer	5,675	9%
Medical used	Surgery	1,845	3%
	Clinic visit	51,581	85%
	Hospitalization	34,997	58%

# Descriptive statistics — Expenditure (Mean,yen) (1/3)

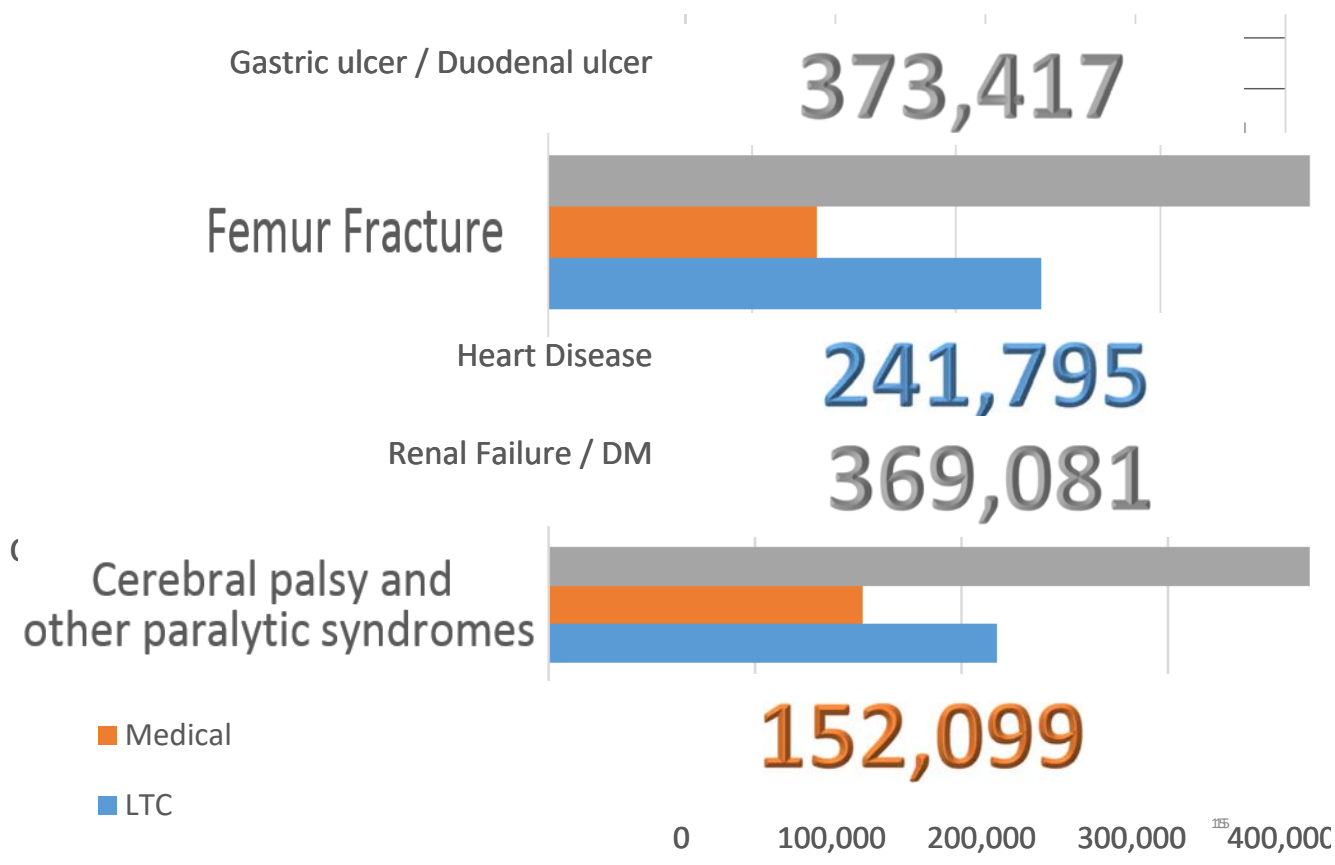


# Descriptive statistics — Expenditure (Mean,yen) (2/3)



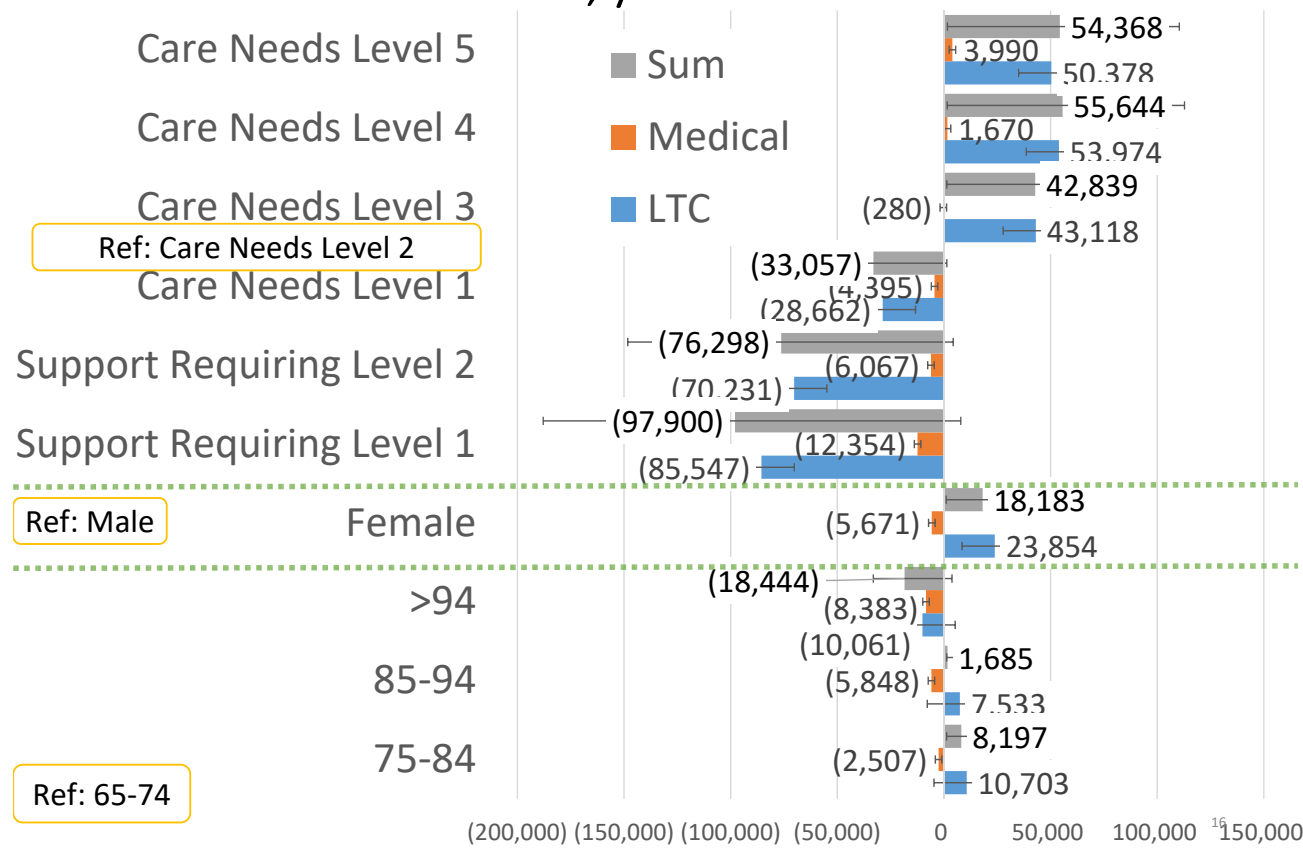


# Descriptive statistics — Expenditure (Mean, yen) (3/3)



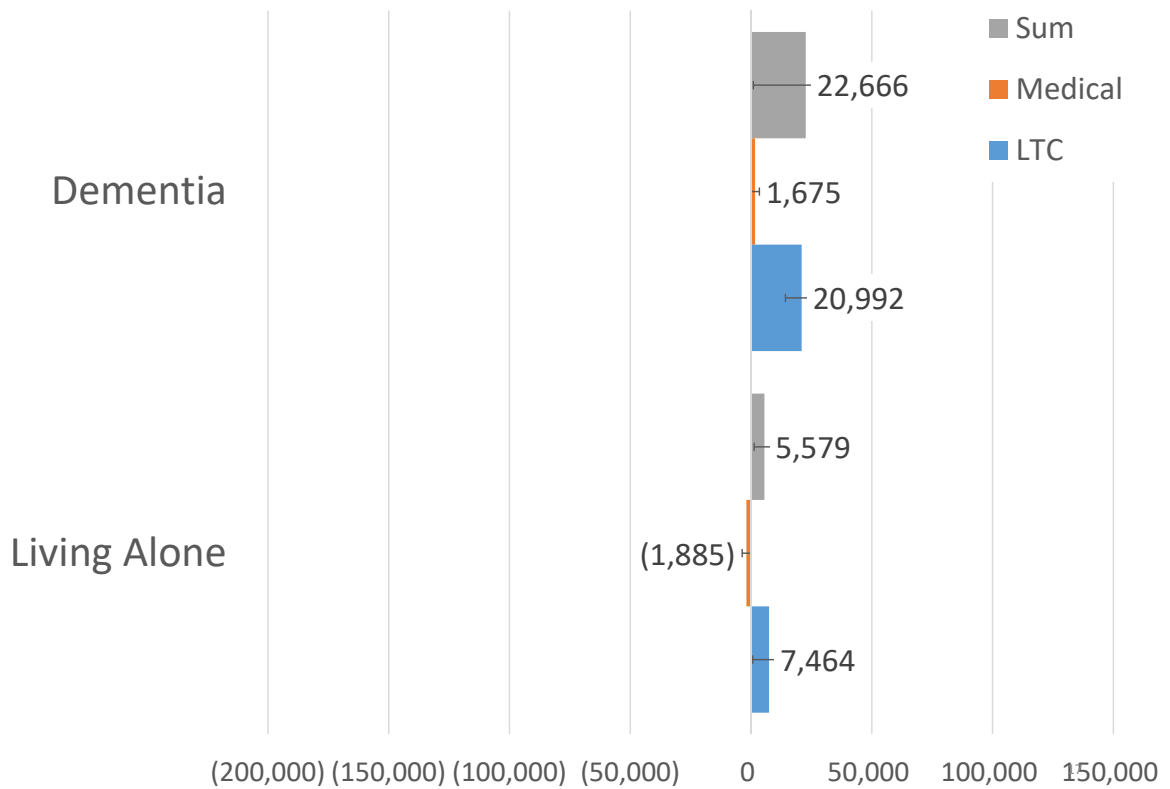
## Multiple Linear Regression(1/4)

Unstandardized Coefficients, yen



# Multiple Linear Regression(2/4)

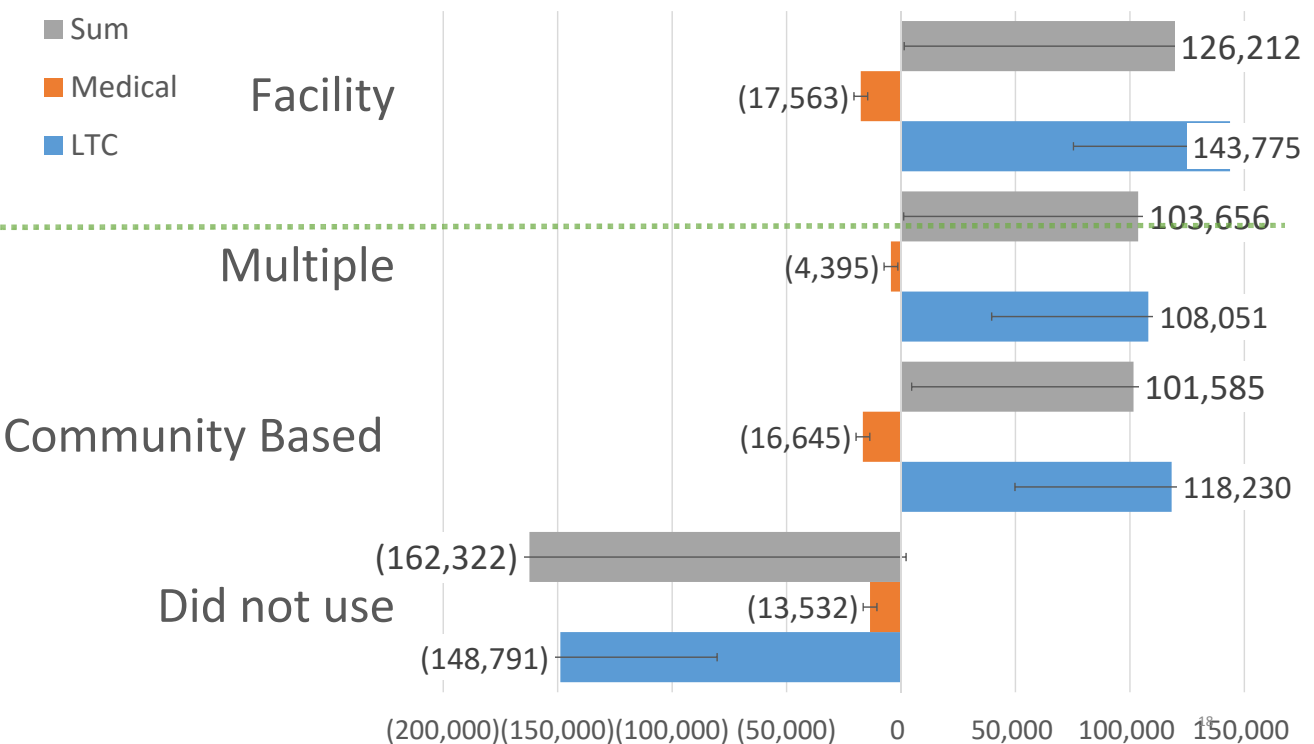
Unstandardized Coefficients, yen



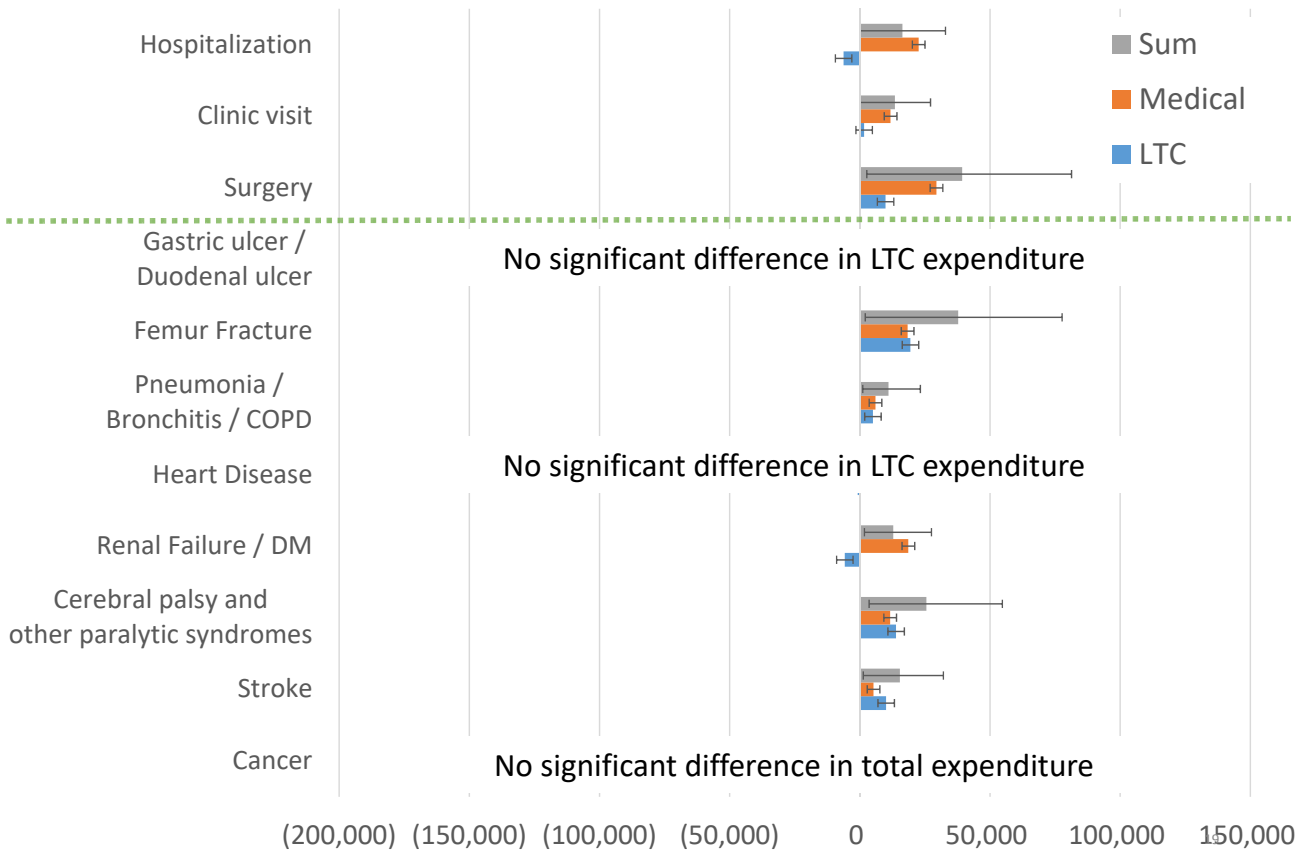
# Multiple Linear Regression(3/4)

Unstandardized Coefficients, yen

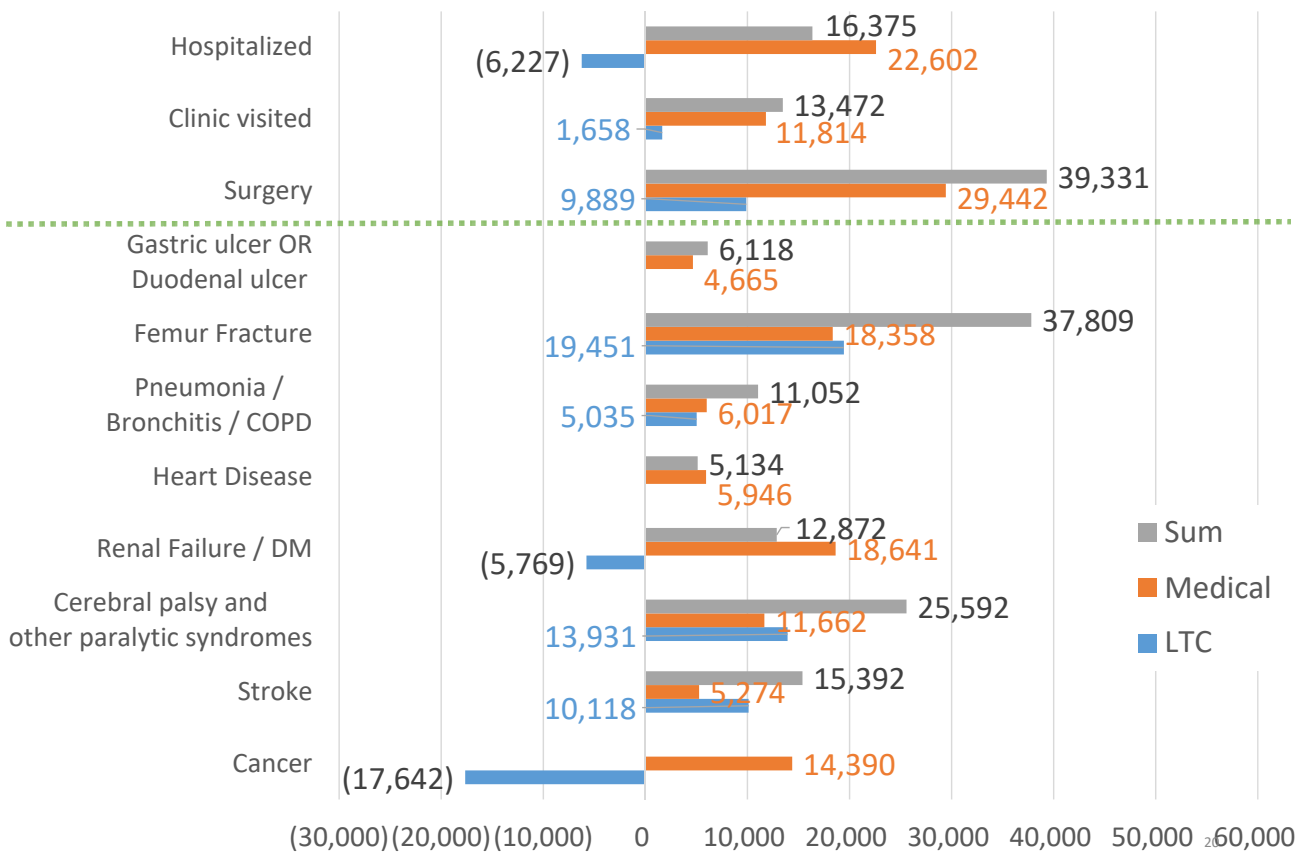
Ref: Home Care



# Multiple Linear Regression (4/4)



# Multiple Linear Regression - enlarged



## Limitation

- Subjects selection focus on Long-Term Care Service users.
- Exclusion of subjects who died during the observation period.
- Disease severity can not be estimated.
- The relation between average expenditure and newly diagnosed diseases could be underestimated.

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## Conclusion

- Newly diagnosed conditions demonstrated various impacts on LTC and medical expenditures.
- Femur fracture, cerebral palsy and dementia prevention are considered as important for reducing both LTC and medical expenditures.

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