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Medical Cost and Prevalence of Mental Diseases across Different Health Insurance Systems in Japan

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Background

- Japanese citizens are ensured the universal access to affordable healthcare owing to a compulsory insurance system mainly consisting of employer-based health insurance (EHI) for employees in mid-large companies and their families and the citizens' health insurance (NHI) for non-/self-employed workers.
- Even though these systems have the same coverage and same reimbursement, our previous claims databases study[1] revealed EHI and NHI differ in prevalence and medical costs of diseases, especially for mental diseases.
- In this study, we focused on mental diseases to explore the difference between population with EHI and NHI coverage.

Methods

Study design

- Cross-sectional study using claims databases
- Medical costs and prevalence of mental diseases in 2020 were compared between insureds in EHI and NHI.

Data source

- Three commercially available Japanese claims databases (Table 1)

Table 1. Data source

Provider	Insurance System	Data Period	Insureds, N
JMDC	EHI	Jan. 2005-Sep. 2021	13,665,051
DeSC	EHI	Apr. 2014-Aug. 2021	908,237
DeSC	NHI	Apr. 2014-Aug. 2021	7,147,428

Study population

- EHI: individuals covered by EHI in 2020 in the JMDC database (provided by JMDC Inc., Tokyo, Japan) or the DeSC database (provided by DeSC Healthcare Inc, Tokyo, Japan). The group consists of those insured as employees (EHI-employee) and those insured as members of the employee's family (EHI-family).
- NHI: individuals covered by NHI in 2020 in the DeSC database.
- Individuals aged ≥75 years were excluded from this study because they were covered by another health insurance scheme (The Medical Care System for the Advanced Elderly).

Analysis

1. Differences in medical costs and prevalence of mental diseases between EHI and NHI by demographic group
   - ✓ Medical costs per member per month (PMPM) for patients with mental diseases were analyzed by demographic group to examine the extent of the difference between EHI and NHI in each demographic group.
   - ✓ PMPM is based on prevalence and medical costs per patient per month (PPPM). Therefore, prevalence and PPPM were also analyzed separately by demographic group to examine each effect.
   - ✓ Patients with mental diseases were defined as individuals who had a record of a diagnosis with any ICD-10 code of F00-F99 (mental and behavioral disorders) in 2020.
2. Differences in medical costs and prevalence between EHI and NHI by type of mental diseases
   - ✓ In the demographic group with the highest difference in PMPM, the differences in medical costs and prevalence between EHI and NHI were examined by type of mental diseases.
   - ✓ Medical costs were divided into inpatient, outpatient, and prescription costs and length of stay were analyzed for some diseases with larger differences.

References:

1. Iwasaki et al. EPH115 Medical Cost and Prevalence of Diseases Across Different Health Insurance Systems in Japan. ISPOR Europe 2022, Vienna, Austria, 2022.
2. Itai S. Needs and Expectations of Family Members of Impaired Patients with "Social Hospitalization" in Japan. 23rd International Nursing Research Congress, Brisbane, Australia, 2012.

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Results

Differences in medical costs and prevalence of mental diseases between EHI and NHI by demographic group

- Study population: 9,750,853 individuals in EHI and 4,395,889 individuals in NHI.
- The PMPM was similar in <24 years and higher in NHI than in EHI in ≥25 years in both sexes. The difference was greatest in the 40–44 age group, with a ratio of NHI to EHI of 4.2 in men and 3.6 in women.
- The prevalence was also similar in <24 years, and higher in NHI than in EHI in ≥25 years in both sexes. In the 40–44 age group, the prevalence in NHI (13.6% in men and 15.9% in women) was higher than in EHI (7.6% and 9.1%).
- The PPPM was slightly higher in NHI at 10–24 years, and the difference was greater at later ages up to the 50's for both sexes. In the 40–44 age group, the PPPM for NHI (¥58,753 for men and ¥52,352 for women) was almost twice that for EHI (¥25,890 and ¥27,068).

Differences in prevalence and medical costs between EHI and NHI by type of mental disease in 40–44 age group

- In the 40–44 age group, the number of patients with mental diseases in the database was 33,990 for men and 37,814 for women in EHI and 16,057 and 17,090 in NHI.
- Among mental diseases, difference in PMPM (ΔPMPM) was the largest for schizophrenia followed by depression in both sexes (Table 2).
  - ✓ The ΔPMPM for schizophrenia and depression accounted for 64% and ≥20%, respectively, of the ΔPMPM for all mental diseases in both sexes (Table 2).
  - ✓ It should be noted that PMPM included all medical costs for patients with each disease, and patients were counted in multiple if they had multiple diseases.
- The large ΔPMPM in NHI is due to the higher prevalence of these diseases in NHI (schizophrenia: 6.1% in both sexes; depression: 4.1% in men and 5.5% in women) than in EHI (schizophrenia: 0.8% and 1.1%; depression: 2.9% and 2.7%).
  - ✓ Some employees who developed these diseases may have difficulty to be hired; considering such cases, a higher prevalence in NHI is reasonable.
  - ✓ Nevertheless, PPPM was also higher in NHI than in EHI (Table 2).

Medical costs and length of stay for patients with schizophrenia

- For patients with schizophrenia, among the medical cost categories, the inpatient costs had the largest difference in PPPM (ΔPPPM), accounting for 88% for men and 80% for women of the total ΔPPPM.
  - ✓ The length of stay was longer, whereas the inpatient costs per day were lower in NHI than in EHI (Table 3A).
  - ✓ The percentage of patients hospitalized for ≥1 year was higher in NHI than in EHI (Fig. 3A).
- The ΔPPPM for inpatient costs was also the largest for patients with depression, accounting for 47% of the total ΔPPPM for men and 43% for women.
  - ✓ The length of stay was longer in NHI except for EHI-family in men; the inpatient costs per day were lower in NHI than in EHI (Table 3B). Although the length of stay was the longest in EHI-family for men, the effect may be small due to the small number of patients.
  - ✓ The percentage of patients hospitalized for ≥1 year was also higher in NHI than in EHI (Fig. 3B).
- The higher percentage of patients hospitalized for ≥1 year was suggested to contribute to the higher PPPM in NHI for patients with schizophrenia and those with depression. This may include patients who are stable and do not require any treatment but are hospitalized extremely long periods, know as "social hospitalization."[2]

Table 2. Comparison of medical costs between EHI and NHI by type of disease among 40–44 years

A. Men

Rank	Disease Name	Comparison of NHI to EHI: ΔPMPM[a]	%	PREV ratio[b]	PPPM ratio[c]
1	Schizophrenia	¥4,049	64%	7.6	1.7
2	Depression	¥1,319	21%	1.4	1.9
3	Bipolar affective disorder	¥1,026	16%	52.5	2.6
4	Mental retardation	¥865	14%	30.8	2.0
5	Neurosis	¥805	13%	1.6	2.1

B. Women

Rank	Disease Name	Comparison of NHI to EHI: ΔPMPM[a]	%	PREV ratio[b]	PPPM ratio[c]
1	Schizophrenia	¥4,078	64%	5.4	1.6
2	Depression	¥1,878	29%	2.0	1.6
3	Depressive state	¥1,106	17%	1.9	1.9
4	Neurosis	¥1,074	17%	1.6	1.8
5	Bipolar affective disorder	¥1,073	17%	58.6	1.6

[a]ΔPMPM: (PMPM in NHI) – (PMPM in EHI); [b]PREV ratio: (prevalence in NHI)/(prevalence in EHI); [c]PPPM ratio: (PPPM in NHI)/(PPPM in EHI)

Table 3. Structure of PPPM for patients with schizophrenia (A) and depression (B) among 40–44 years

A

Sex	Insurance System	Patients, N	PPPM	PPPM by category: IP	IP: For SCZ[a]	OP	Rx	IP, %	Length of stay /patient, days	Length of stay /IP, days	IP costs /day
Men	NHI	6,780	¥71,825	¥38,198	¥34,064	¥20,092	¥13,535	14%	23.6	167.7	¥15,840
	EHI-employee	3,445	¥40,784	¥10,602	¥5,099	¥16,167	¥14,014	4%	1.8	39.3	¥31,383
	EHI-family	357	¥62,683	¥32,336	¥26,962	¥15,516	¥14,831	11%	18.0	165.0	¥15,620
Women	NHI	5,982	¥75,389	¥38,208	¥32,183	¥20,950	¥16,231	14%	21.1	150.2	¥16,257
	EHI-employee	1,771	¥41,024	¥9,741	¥5,314	¥18,109	¥13,173	4%	1.6	38.7	¥32,435
	EHI-family	2,977	¥50,237	¥17,816	¥10,936	¥18,115	¥14,306	8%	5.9	71.3	¥20,876

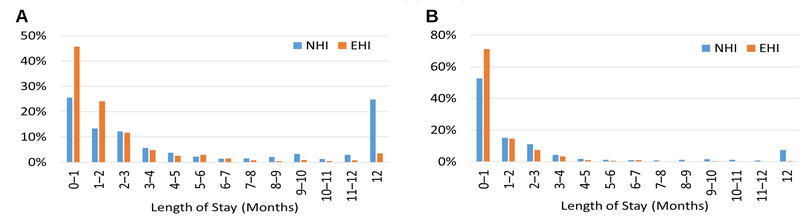
B

Sex	Insurance System	Patients, N	PPPM	PPPM by category: IP	IP: For DEP[a]	OP	Rx	IP, %	Length of stay /patient, days	Length of stay /IP, days	IP costs /day
Men	NHI	4,912	¥50,740	¥15,818	¥8,698	¥20,669	¥14,253	5%	4.3	82.5	¥20,593
	EHI-employee	12,722	¥26,684	¥4,433	¥1,588	¥12,760	¥9,491	2%	0.5	26.1	¥36,074
	EHI-family	251	¥63,076	¥29,757	¥17,321	¥17,037	¥16,282	8%	6.8	85.4	¥25,151
Women	NHI	5,610	¥49,791	¥14,463	¥7,408	¥19,691	¥15,637	5%	3.7	69.7	¥20,644
	EHI-employee	5,656	¥28,138	¥4,648	¥1,318	¥13,257	¥10,234	1%	0.3	23.1	¥39,830
	EHI-family	5,554	¥34,424	¥8,430	¥2,917	¥14,203	¥11,791	3%	1.1	34.6	¥29,650

DEP: depression, IP: inpatient, N: number, OP: outpatient, Rx: prescription, SCZ: schizophrenia.

[a]Inpatient costs for schizophrenia/depression are the costs recorded on the inpatient claims associated with schizophrenia/depression as the disease name.

Figure 1. Distribution of patients with schizophrenia (A) and depression (B) by length of hospital stay in EHI or NHI



Limitations

- Accuracy of the claims data used in the study affects the results.

Conclusions

Medical costs and prevalence of mental diseases were higher in NHI than in EHI. Patients with schizophrenia or depression who stayed in hospital for ≥1 year push up the overall costs.

To explore differences due to socioeconomic effects, analyses of differences in the incidence of diseases between health insurance systems may be desirable.

Health check-up data in the JMDC and DeSC databases may also be useful to examine the effects.