

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

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## Objective

- Japan has a compulsory health insurance system ensuring citizens the universal access to affordable healthcare.
- Each commercially available health insurance claims database has limitation in its generalizability.
- This research, using major commercial claims databases, assessed and compared the characteristics of major health insurance systems; employee-based health insurance (EHI) for employees in mid-large companies and their families and the citizens' health insurance (NHI) for non-/self-employed workers.

## Method

- The four commercially available databases below were provided for this study.

Table 1 Database Providers, Data Period, N

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
DeSC	Elderly*	Apr. 2014-Aug. 2021	3,623,056

\* Medical care system for the elderly aged 75 and over

- In order to compare EHI and NHI populations, average 2020 cost per member per month (¥PMPM) was calculated by Charlson Comorbidity Index (CCI) or ICD-10 disease category and reported by age/gender ranges.

## Conclusion

- Socioeconomic factors may contribute to the difference in prevalence rates of diseases and costs between the two major health insurance systems' claims databases. It is important for researchers to recognize underlying differences in health insurance systems when developing research plans or interpreting data.

## Results and Discussions

- The overall medical cost, especially inpatient (IP) cost, was higher in NHI compared with EHI except for 0-4 year olds (Figure 1). However, the difference was not caused by the distribution of CCI. Percentages of CCI>0 between EHI and NHI were very similar (Figure 2).

Figure 1 PMPM Ratio of NHI to EHI by Demographics by Inpatient (IP)/ Outpatient (OP) / Prescription Drug (RX)

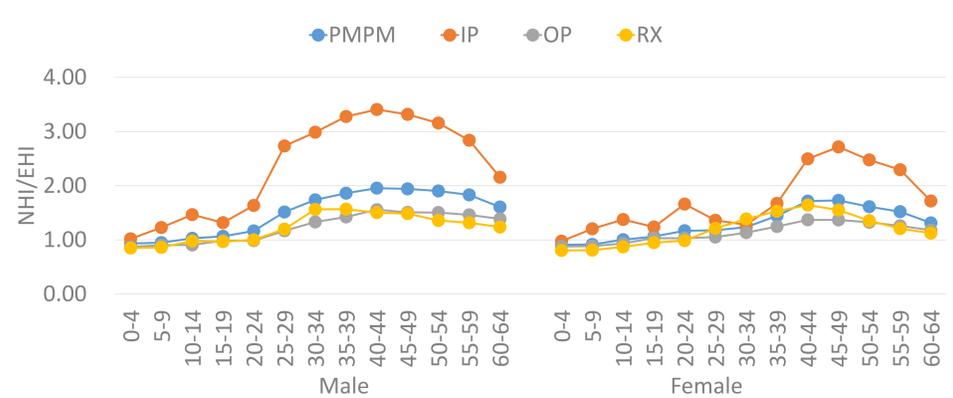
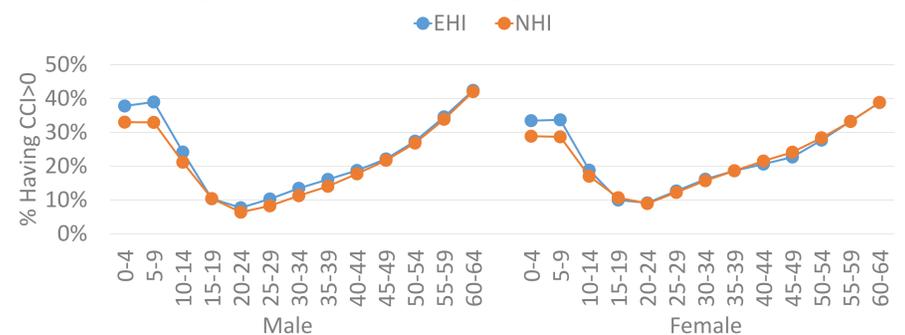


Figure 2 Pct. of People having CCI>0 by Demographics



- The prevalence of patients having each ICD10 disease class was different between EHI and NHI. Mental/ Nervous diseases were higher in NHI compared to EHI. Eye/Respiratory/ Skin diseases were lower in NHI compared to EHI. (Table 2)
- Average cost per patient per month (¥PPPM) was higher in NHI compared to EHI, particularly in males. (Table 3)
- People enrolled in EHI and NHI vary in their employment status, thus assumingly vary in socioeconomic status.
- Since socioeconomic status was reported to affect health\*, the difference of it can contribute to the difference between 2 databases as described above. \*Epidemiologic Reviews, Volume 26, Issue 1, July 2004, Pages 63–77, <https://doi.org/10.1093/epirev/mxh002>

Table 2 Prevalence of Patients by ICD10 Disease Class of NHI Subtracted by EHI by Demographics

Gender	Age	A00-B99 Infectious	C00-D48 Neoplasms	D50-D89 Blood	E00-E90 Endocrine	F00-F99 Mental	G00-G99 Nervous	H00-H59 Eye	H60-H95 Ear	I00-I99 Circulatory	J00-J99 Respiratory	K00-K93 Digestive	L00-L99 Skin	M00-M99 Musculoskeletal	N00-N99 genitourinary	S00-T98 External
Male	0-19	-4.5%	-0.6%	-0.2%	0.1%	0.3%	0.2%	-8.2%	-5.0%	-0.1%	-5.5%	-1.3%	-7.2%	-1.4%	-0.4%	-3.7%
	20-39	-4.0%	-0.4%	0.0%	-0.4%	3.1%	2.4%	-9.1%	-1.1%	0.0%	-10.0%	-3.2%	-5.0%	-1.1%	-0.5%	0.6%
	40-59	-1.1%	-1.3%	1.1%	-1.7%	6.4%	5.1%	-7.1%	-1.1%	-1.5%	-7.7%	-2.1%	-0.7%	-0.9%	0.7%	2.1%
	60+	-0.3%	-2.0%	1.7%	-3.3%	5.1%	3.9%	-6.4%	-1.5%	-3.1%	-7.0%	-2.8%	-0.6%	-1.7%	0.2%	1.9%
Female	0-19	-3.5%	-0.7%	-0.1%	0.1%	0.4%	0.3%	-8.4%	-4.5%	-0.1%	-4.3%	-1.0%	-7.0%	-0.9%	0.0%	-2.7%
	20-39	-2.8%	-2.3%	-1.3%	-1.2%	4.3%	3.4%	-11.3%	-1.2%	0.4%	-6.4%	-2.8%	-6.0%	0.0%	-4.8%	-0.4%
	40-59	0.1%	-3.8%	0.1%	1.3%	7.0%	6.5%	-8.1%	-0.8%	1.9%	-3.6%	0.8%	-1.0%	1.4%	-3.2%	0.5%
	60+	0.2%	-1.4%	0.7%	0.7%	2.8%	3.0%	-2.5%	-0.4%	2.0%	-2.5%	-0.8%	-0.3%	0.1%	-1.0%	0.4%

Table 3 Ratio of NHI to EHI ¥PPPM by ICD10 Disease Class by Demographics

Gender	Age	A00-B99 Infectious	C00-D48 Neoplasms	D50-D89 Blood	E00-E90 Endocrine	F00-F99 Mental	G00-G99 Nervous	H00-H59 Eye	H60-H95 Ear	I00-I99 Circulatory	J00-J99 Respiratory	K00-K93 Digestive	L00-L99 Skin	M00-M99 Musculoskeletal	N00-N99 genitourinary	S00-T98 External
Male	0-19	1.18	1.37	1.23	1.10	1.16	1.26	1.15	1.17	1.30	1.07	1.19	1.13	1.31	1.27	1.11
	20-39	2.28	1.99	2.04	2.29	1.96	2.06	2.57	2.12	2.26	2.18	2.19	2.24	2.09	2.54	1.87
	40-59	2.45	1.95	2.03	2.23	2.21	2.13	2.70	2.29	2.22	2.45	2.32	2.52	2.22	2.60	2.09
	60+	1.92	1.69	1.77	1.78	1.90	1.81	1.92	1.82	1.75	1.98	1.82	1.98	1.82	2.03	1.77
Female	0-19	1.11	1.28	1.08	1.06	1.14	1.18	1.13	1.13	1.20	1.04	1.12	1.07	1.17	1.18	1.11
	20-39	1.52	1.45	1.54	1.58	1.54	1.56	1.73	1.64	1.62	1.55	1.57	1.58	1.55	1.38	1.55
	40-59	1.85	1.62	1.86	1.79	1.83	1.72	1.91	1.80	1.71	1.81	1.79	1.87	1.72	1.81	1.76
	60+	1.39	1.31	1.38	1.33	1.50	1.38	1.32	1.27	1.32	1.36	1.38	1.40	1.32	1.48	1.37

This study was funded by Shionogi & Co., Ltd.