Exploring Factors for Regional Differences in Inappropriate Psychotropic Drug Prescribing : Ecological Study using a claims database in Japan

Misaki Fujisawa [1], Naoki Takashi [1], Shosuke Ohtera [1]

1. Department of Health Economics, Center for Gerontology and Social Science, Research Institute, National Center for Geriatrics and Gerontology

Introduction

Globally, Japan is known for its high rate of psychotropic drug prescriptions. Especially benzodiazepines have been associated with harmful outcomes such as falls in older adults. Despite policies to reduce these prescriptions have been implemented in Japan, the decline in prescriptions has been gradual. Low adoption of non-pharmacological interventions in Japan's healthcare system is a considerable concern.

We explored regional characteristics, including the number of prescriptions for cognitive behavioral therapy (CBT), to be associated with psychotropic prescriptions.

Aim:

① **To explore regional characteristics to be associated with psychotropic drug prescriptions**

② **To assess association with CBT and nursing homes**

Method

The National Database of Health Insurance Claims (NDB) Open data in 2020 were used. We calculated Standardized Claim Ratio (SCR) of outpatient prescriptions in benzodiazepine hypnotic, anxiolytic, antidepressant, antipsychotic, and CBT by Japan 47 prefectures.

SCRs ratios (maximum/minimum) were calculated to assess regional disparities for psychotropic drugs and CBT.

● **Standardized Claim Ratio (SCR) =**

$$\frac{\text{Observed number of claims}}{\text{Expected number of claims}} \times 100$$

● **Expected number of claims =**

$$\sum_{\substack{\text{sex,} \\ \text{age groups}}} \begin{pmatrix} \text{population of a sex and age group} \\ \text{in a target prefecture} \\ \times \text{ sex and age specific claim rate} \\ \text{of the sex and age group in whole Japan} \end{pmatrix}$$

To adjust for healthcare accessibility, SCR was normalized by the number of medical facilities (hospital and clinic) per 100,000 residents in each prefecture. We divided the 47 prefectures into three groups by tertile of SCR for CBT. Supply-adjusted SCRs of various psychotropic drugs were then compared between these groups.

● **Supply adjusted Standardized Claim (saSCR) =**

$$\frac{SCR}{\substack{\text{number of medical facilities} \\ \text{per 100,000 residents in a target prefecture}}}$$

In addition, we divided the number of nursing homes population 65 years and older by prefecture into three quintiles and similarly compared the SCRs for each psychotropic drug.

Results

Prescriptions for Hypnotic and Anxiolytic were higher in the Tohoku and Hokkaido regions. CBT showed large disparities.
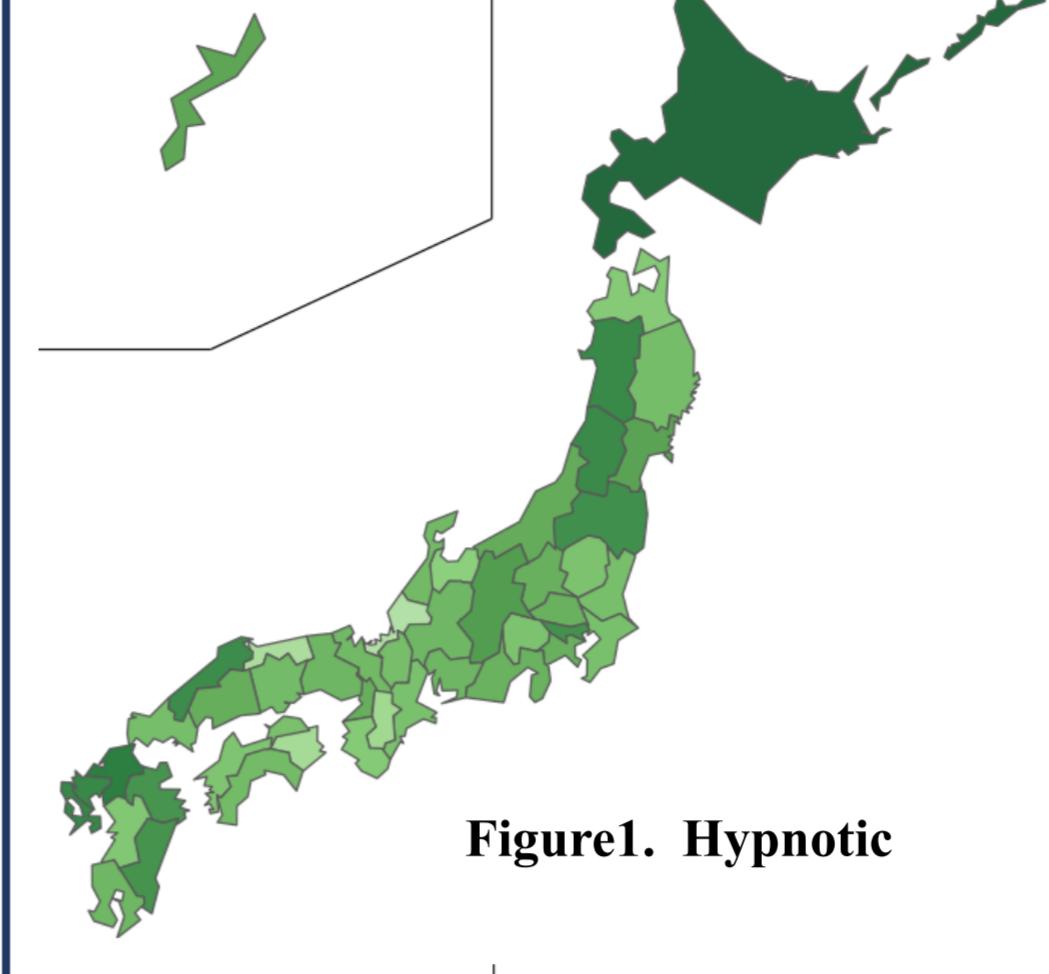

Figure1. Hypnotic
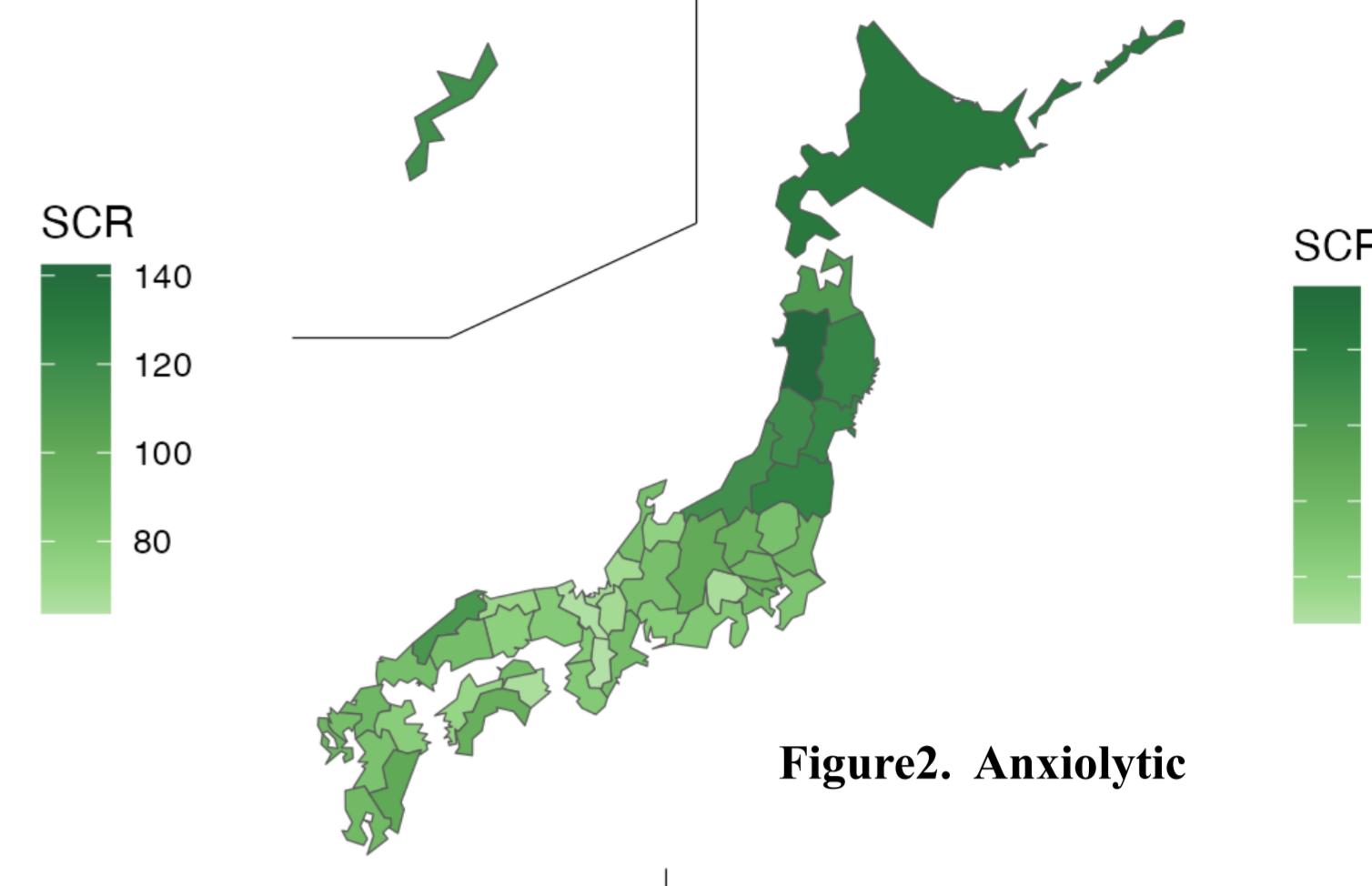
Figure2. Anxiolytic
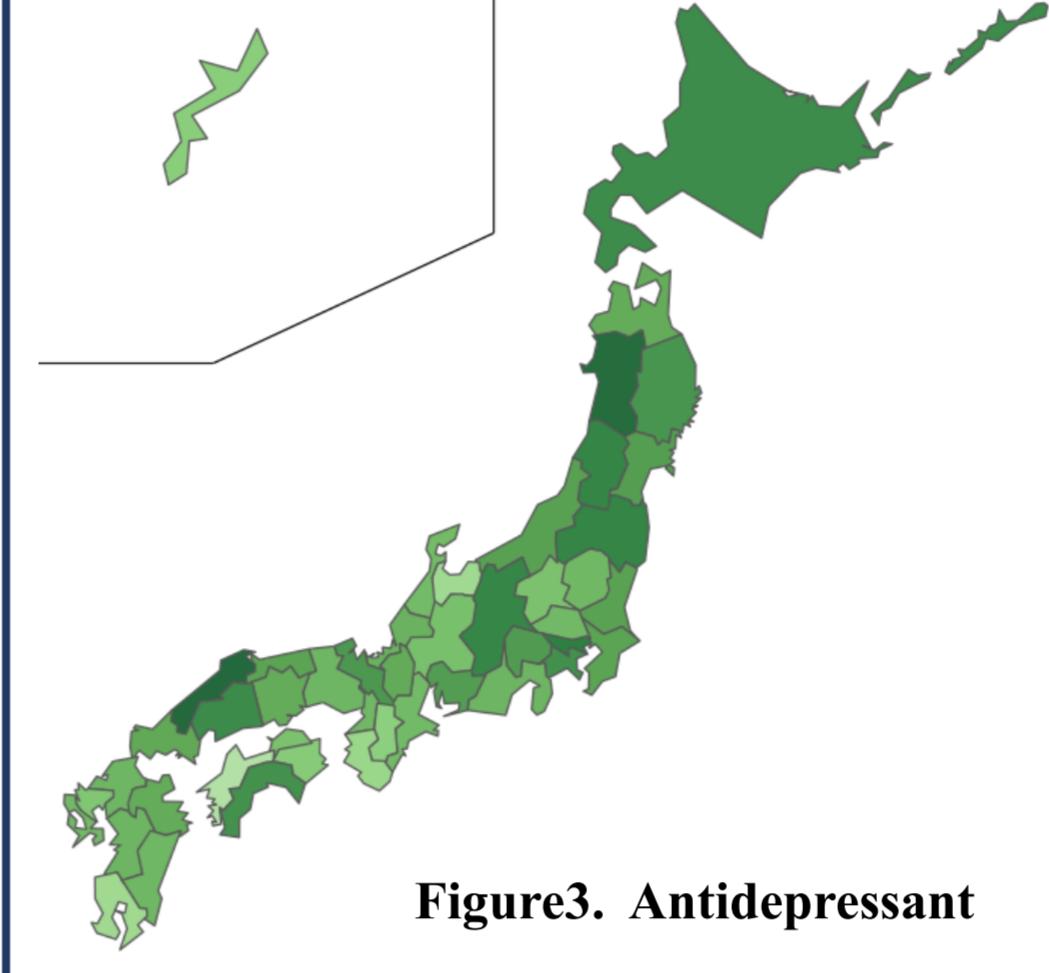
Figure3. Antidepressant
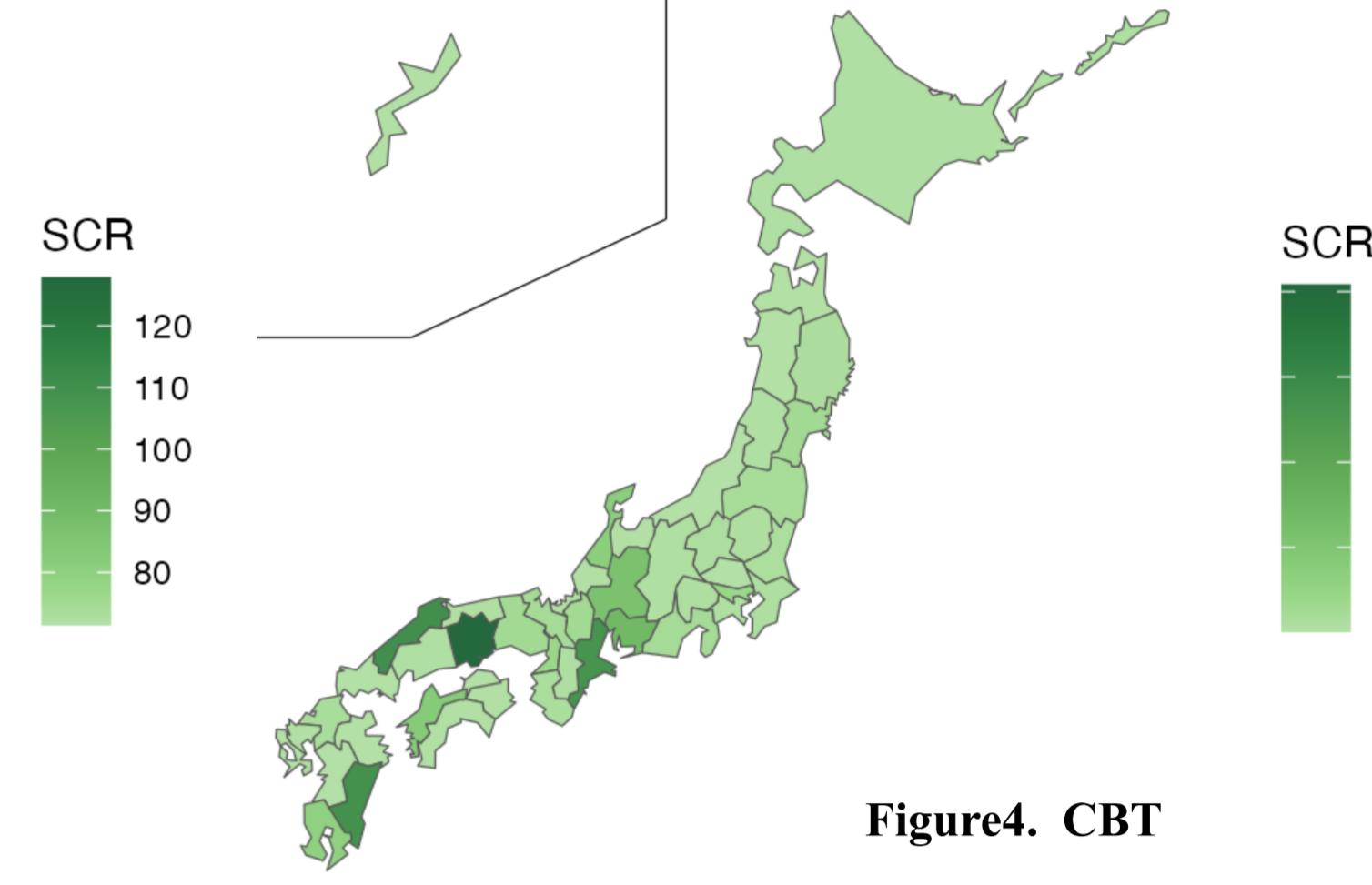
Figure4. CBT

Table1. SCR's statistics for Psychotropic drugs and CBT in Japan prefectures

	SCR Median	Ratio (max / min)
Hypnotic	92.1	2.2
anxiolytic	95.3	2.3
antidepressant	96.4	1.79
typical antipsychotic	91.9	2.3
atypical antipsychotic	97.5	2.3
Cognitive behavioral therapy (CBT)	22.5	329

Lower implementation of CBT correlated with fewer sleep medication prescriptions, although no clear relationship was established. Similar trends were observed for other psychotropic medications. Fewer nursing homes per capita among those aged 65 and above correlated with a higher frequency of sleep medication prescriptions.

Characteristic	Beta	95% CI[J]	p-value
CBT			
0-33%	—	—	
34-66%	20	-4.4, 45	0.10
67-100%	20	-4.3, 45	0.10

[J] CI = Confidence Interval
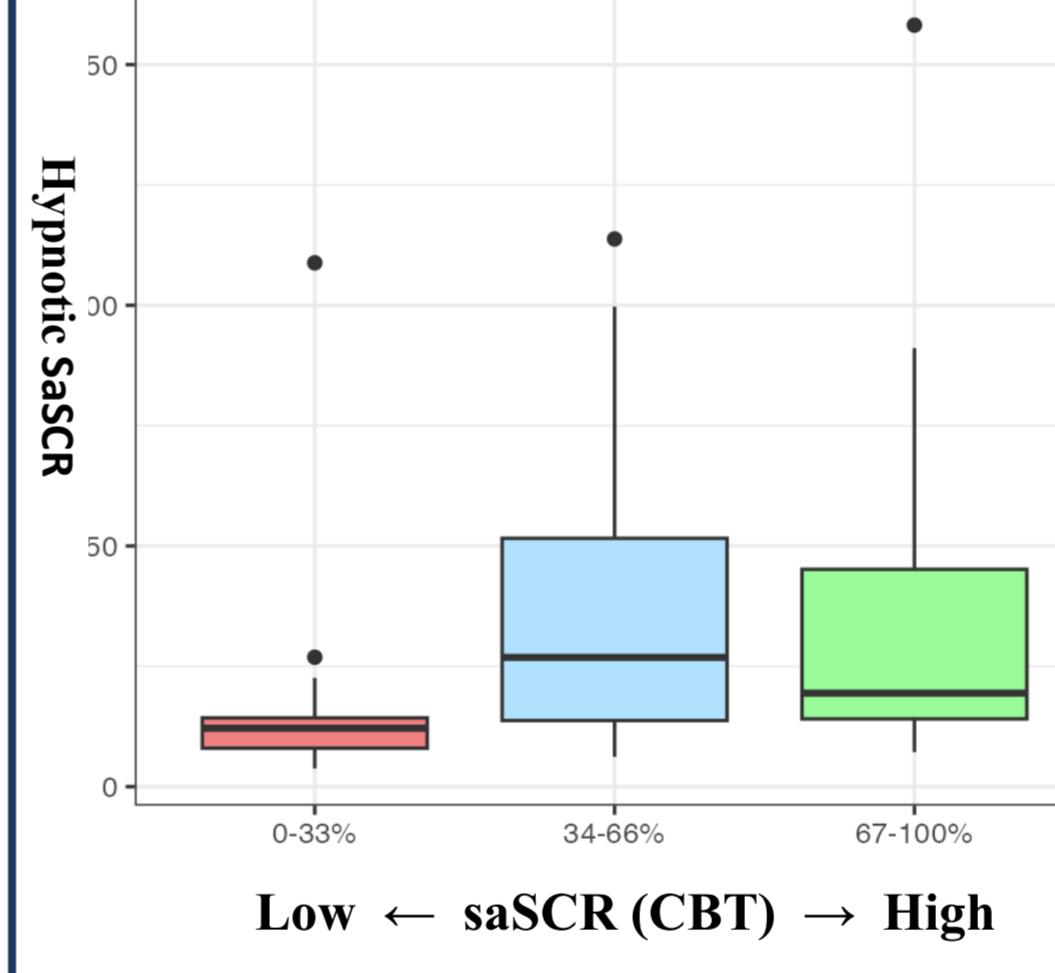
Figure5. Hypnotics saSCR

Characteristic	Beta	95% CI[J]	p-value
CBT			
0-33%	—	—	
34-66%	20	-4.4, 44	0.11
67-100%	17	-7.1, 40	0.2

[J] CI = Confidence Interval
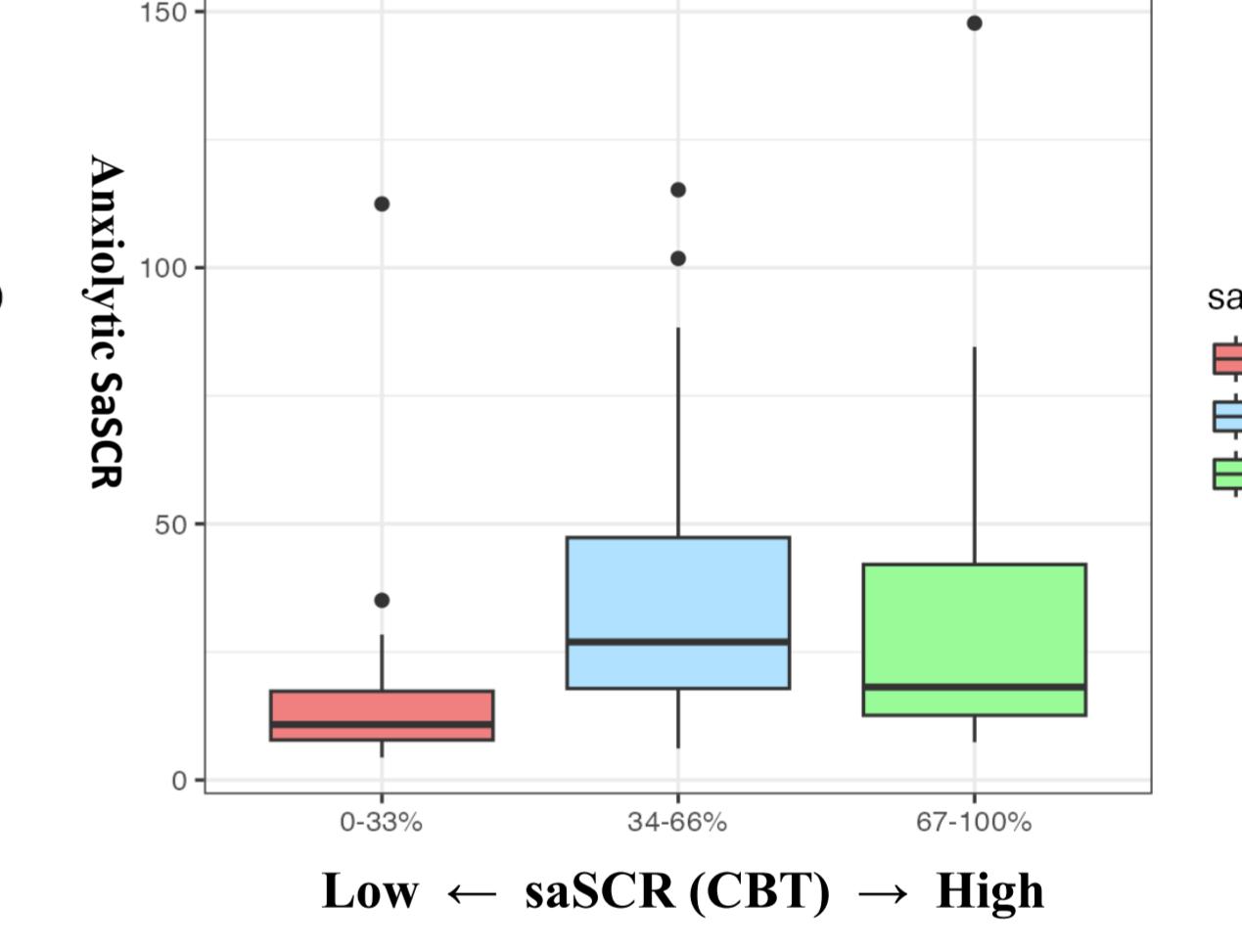
Figure6. Anxiolytics saSCR
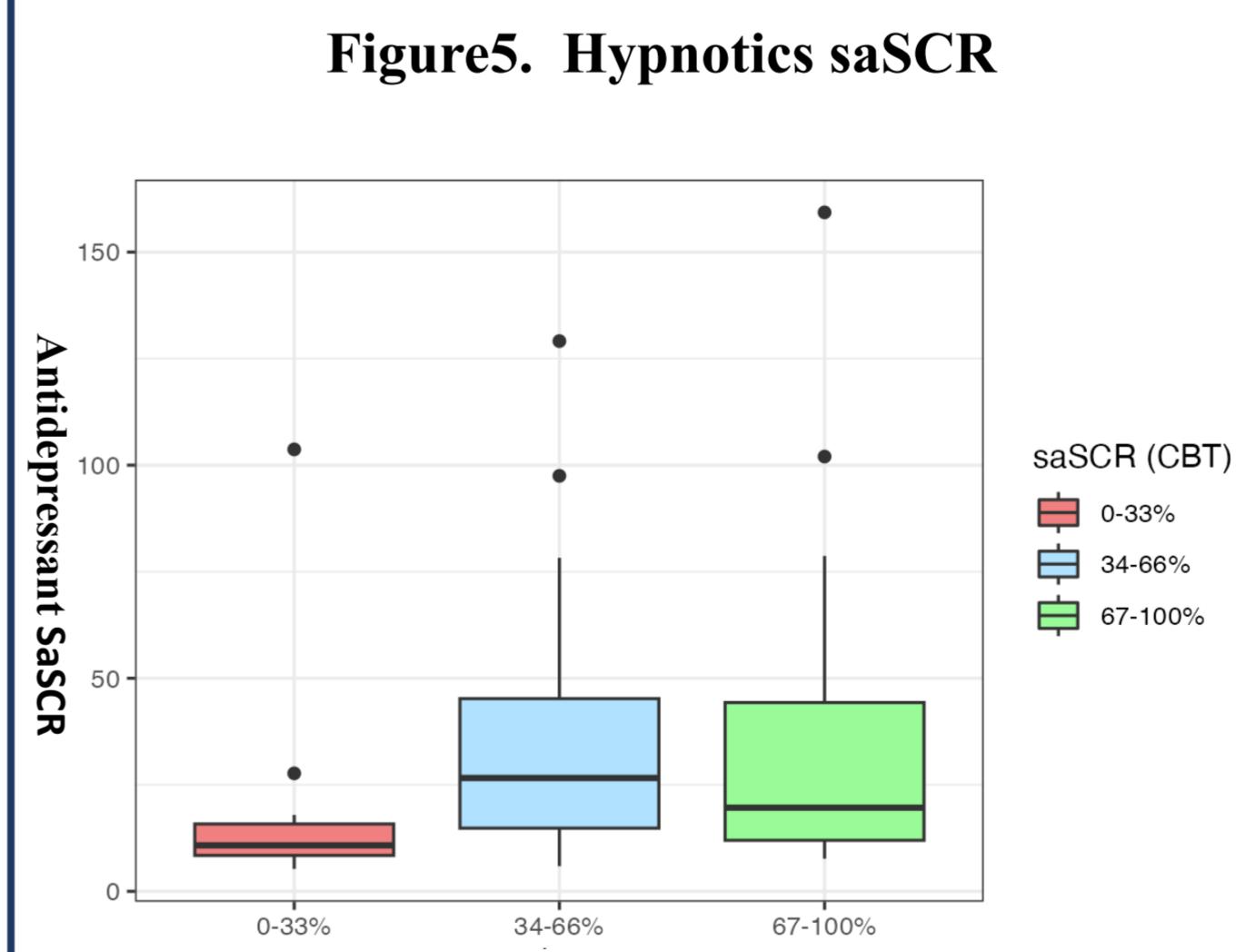
Characteristic	Beta	95% CI[J]	p-value
CBT			
0-33%	—	—	
34-66%	21	-4.1, 46	0.10
67-100%	21	-3.9, 45	0.10

[J] CI = Confidence Interval

Figure7. Antidepressant saSCR

Characteristic	Beta	95% CI[J]	p-value
Nursing home			
0-33%	—	—	
34-66%	-39	-61, -18	<0.001
67-100%	-43	-64, -22	<0.001

[J] CI = Confidence Interval
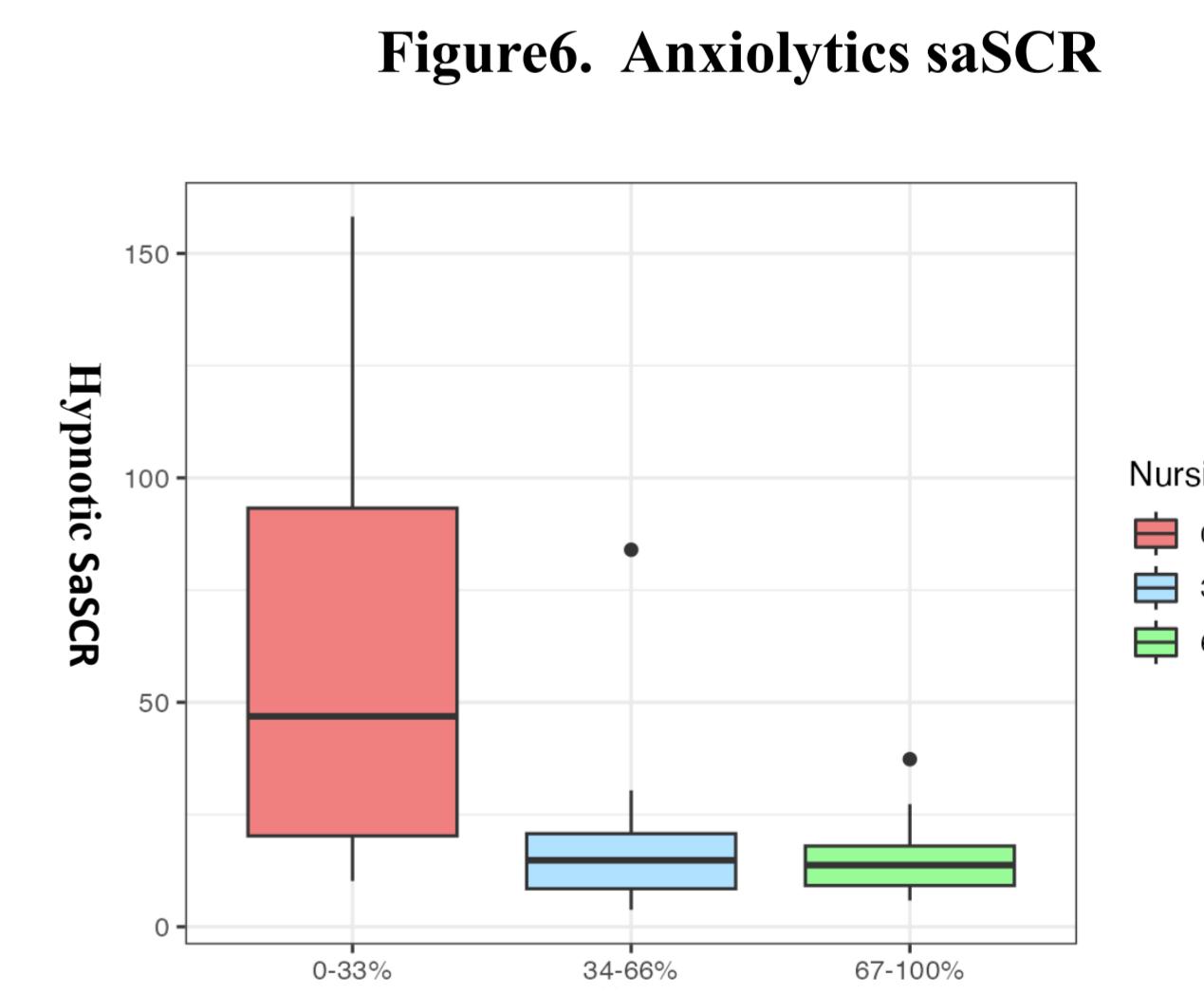
Figure8. Hypnotics

Conclusion

① In Japan, there's a significant regional disparity in the prescription of psychotropic drugs, and an even greater disparity exists for CBT.

② Some regions show low rates of both CBT and psychotropic prescriptions, suggesting the possibility of under-treatment in these areas.

COI Disclosure
We have no financial relationships to disclose