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Physician visits and medication prescriptions for major chronic diseases during the COVID-19 pandemic in Japan: retrospective cohort study

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ABSTRACT

Objectives There have been concerns that patients with chronic conditions may be avoiding in-person physician visits due to fear of COVID-19, leading to lower quality of care. We aimed to investigate changes in physician visits and medication prescriptions for chronic diseases before and during the COVID-19 pandemic at the population level.

Design Retrospective cohort study.

Setting Nationwide claims data in Japan, 2018–2020.

Participants Working-age population (aged 18–74 years) who visited physicians and received any prescriptions for major chronic diseases (hypertension, diabetes and dyslipidaemia) before the pandemic.

Outcome measures The outcomes were the monthly number of physician visits, the monthly proportion of physician visits and the monthly proportion of days covered by prescribed medication (PDC) during the pandemic (April–May 2020, as the first state of emergency over COVID-19 was declared on 7 April, and withdrawn nationally on 25 May).

Results Among 10 346 patients who visited physicians for chronic diseases before the pandemic, we found a temporary decline in physician visits (mean number of visits was 1.9 in March vs 1.7 in April; p<0.001) and an increase in the proportion of patients who did not visit any physicians during the pandemic (15% in March vs 24% in April; p<0.001). Physician visits returned to the baseline in May (the mean number of visits: 1.8, and the proportion of patients who did not visit any physicians: 9%). We observed no clinically meaningful difference in PDC between before and during the pandemic (eg, 87% in March vs 87% in April; p=0.45). A temporary decline in physician visits was more salient in seven prefectures with a larger number of COVID-19 cases than in other areas.

Conclusions Although the number of physician visits declined right after the COVID-19 outbreak, it returned to the baseline one month later; patients were not skipping medications during the pandemic.

Strengths and limitations of this study

- ► This is the first study that investigated the changes in physician visits and medication prescriptions for major chronic diseases before and during the COVID-19 pandemic at the population level in Japan.
- ► We analysed the data on working-age adults aged 18–74 years with major chronic diseases (hypertension, diabetes and dyslipidaemia) using nationwide claims data before the COVID-19 pandemic in Japan.
- ► The use of nationwide claims data enabled us to have large sample size and results that may be representative of the general population in Japan.
- ► Given our study analysed the data on working-age individuals in Japan, our study findings may not be generalisable to younger or older populations or to populations of other countries.

INTRODUCTION

The COVID-19 pandemic has dramatically changed the patterns of healthcare delivery in many countries. In the USA, the total number of in-person physician visits decreased by 30%–60% during the COVID-19 pandemic (after March 2020) compared with before the pandemic.[1–3] Although the use of telemedicine has increased in the first several months of the pandemic, the decrease in the total number of in-person physician visits was larger than that could be fully offset by an increased telemedicine use in the USA.[1 3] Similarly, in Japan, the total number of outpatient visits decreased by 20% and 25% in April and May 2020 compared with the same months in the prior year, respectively.[4 5]

Many patients with any chronic conditions, such as hypertension and diabetes mellitus, are known to be at a high risk of severe complications when infected with SARS-CoV-2,[6–9] and therefore, those patients may have avoided physician visits (especially in-person visits) due to their fear of COVID-19, resulting in the deterioration of their chronic conditions. The lack of access to appropriate healthcare, such as fewer physician visits due to the COVID-19

Table 1 Characteristics of 10 346 patients with major chronic diseases

Variables	Total (n=10 346)	Patients who lived in the prefectures most affected by COVID-19 (n=7888)	Patients who lived in the other prefectures (n=2175)
Age (year), mean (SD)	57.5 (9.6)	58.1 (9.5)	55.4 (9.4)
Male gender	6856 (66)	5216 (66)	1435 (66)
Area			
Healthcare access only in the seven prefectures most affected by COVID-19	7888 (76)	–	–
Healthcare access only in the other prefectures	2175 (21)	–	–
Healthcare access both in the seven prefectures most affected by COVID-19 and the other prefectures	283 (3)	–	–
Comorbidities			
Hypertension	8052 (78)	6121 (78)	1704 (78)
Diabetes	1532 (15)	1160 (15)	341 (16)
Dyslipidaemia	4059 (39)	3124 (40)	825 (38)

We showed summary statistics of adult patients with major chronic conditions who visited physicians before the COVID-19 pandemic. Values represent n (%), unless otherwise indicated.

outbreak, may have a substantial negative impact on their long-term management and prognoses.[10] For example, a previous study showed a temporary reduction in healthcare access for patients with hypertension might be associated with a long-term increase in uncontrolled hypertension,[11] which is associated with higher risks of cardiovascular events and all-cause mortality.[12] In Italy, under the COVID-19 pandemic, policies such as temporarily extending prescriptions and promoting telemedicine were implemented to manage chronic diseases.[13] However, evidence is limited as to the quantitative evaluation of the impact of the COVID-19 pandemic on the continuity of care and the population health consequences of the pandemic.

The Centers for Disease Control and Prevention recommend that patients with underlying medical conditions do not change their treatment plans and have at least a 30-day supply of prescribed medications on hand during the COVID-19 pandemic.[14] As for medication adherence, a recent study in the USA reported that patients with asthma and Chronic obstructive pulmonary disease (COPD) had an increase in adherence to controller medications right after the declaration of the COVID-19 pandemic by the WHO in March 2020.[15] However, evidence is limited as to how physician visits and medication prescriptions for patients with chronic conditions have changed during the COVID-19 pandemic at the population level.

In this context, we investigated the changes in physician visits and medication prescriptions for representative chronic diseases (ie, hypertension, type 2 diabetes mellitus (diabetes) and dyslipidaemia) before and during the COVID-19 pandemic in Japan.

METHODS

Data source and study population

We analysed data from the nationwide claims database (MinaCare database) from 1 March 2018 to 31 May 2020. The MinaCare database collects claims covering approximately 7.5% of the Japanese working-age population from large employers in 2020. This database includes both working individuals and their dependent family members within a wide range of age groups.[16 17] From this nationwide claims database, we identified 97 225 adults (aged 18–74 years) who are covered with any health insurance included in the database from 1 March 2018 to 31 May 2020. Among this population, we further identified 10 346 patients who visited physicians and received any prescriptions for three major chronic diseases (hypertension, diabetes and dyslipidaemia) at least once before the COVID-19 pandemic (from September 2019 to February 2020). We focused on these three diseases given the high prevalence rate.[18 19] In order to identify patients with major chronic diseases (hypertension, diabetes, and dyslipidaemia), we used ICD-10 diagnostic codes and the medication therapeutic category codes in Japan (online supplemental appendix). Our definition of physician visits included all types of physician visits: in-person, online and telephone visits.

Outcome measures

The outcomes were the monthly number of physician visits, the monthly proportion of physician visits and the monthly proportion of days covered by prescribed medication (PDC)[20] during the COVID-19 pandemic. The monthly PDC was calculated for each chronic disease (ie, hypertension, diabetes and dyslipidaemia) as the ratio of the number of days the patient is covered by the medication to the number of days of the month (eg, 30 days). If

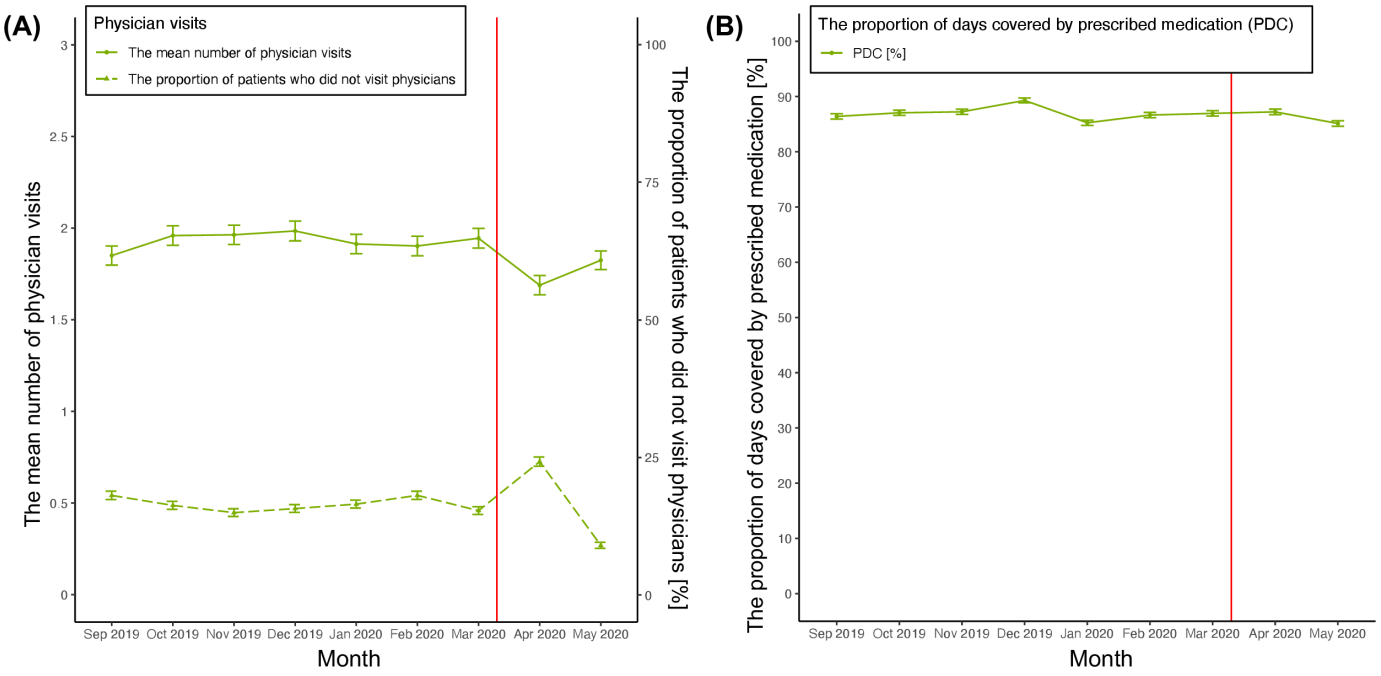

Figure 1 **Changes in physician visits and medication prescriptions before and during the COVID-19 pandemic**
We showed the changes in physician visits and medication prescriptions in the whole nation among patients who visited physicians before the COVID-19 pandemic. The corresponding values are presented in table 2.
(A) The solid line represents the mean number of physician visits (in-person, online and telephone) per month. The dashed line represents the proportion of patients who did not visit any physicians per month. The red vertical line represents the date of the state of emergency over COVID-19.
(B) The solid line represents PDC. The red vertical line represents the date of the state of emergency over COVID-19.
PDC, proportion of days covered by prescribed medication.

a patient had PDCs for multiple diseases (eg, hypertension and diabetes), we considered the larger value as the patient's PDC. Running out of medicine for 1 day out of a month (30 days) corresponds to a 3% reduction in PDC.

Statistical analyses

We computed summary statistics to delineate patients' characteristics. We assessed the monthly changes in the proportion of physician visits, the number of physician visits and PDC among patients who visited physicians for major chronic diseases before the COVID-19 pandemic from October 2019 to May 2020. In Japan, the state of emergency over COVID-19 was first declared in the seven most affected prefectures (Tokyo, Kanagawa, Saitama, Chiba, Osaka, Hyogo and Fukuoka) on 7 April 2020, then expanded to the national level on 16 April 2020, and finally withdrawn nationally on 25 May 2020. Therefore, we defined the COVID-19 pandemic periods as April–May 2020 in this study. In order to take into account non-linear changes in the use of physician visits and medication prescriptions, we analysed the data using t-test and Pearson's χ^2 test.

Secondary analyses

We assessed the changes in outcomes stratified between patients who lived in the seven prefectures most affected by COVID-19 (Tokyo, Kanagawa, Saitama, Chiba, Osaka, Hyogo and Fukuoka) and patients who lived in the other prefectures.

In addition, to disentangle the trend during the COVID-19 pandemic from seasonal trends, we assessed the proportion of physician visits, the number of physician visits and PDC for 3 months (March–May) of 2018, 2019 and 2020 among patients with major chronic diseases who regularly visited physicians for ≥2 years (n=9036). The flow diagram of study participants selected for analyses is shown in online supplemental figure 1.

A p value of <0.05 was considered statistically significant. All analyses were performed using SAS V.9.4 and R V.4.0.2. (The R Foundation for Statistical Computing) This study was a secondary data analysis of deidentified data, and therefore, the requirement for informed consent was waived.

Patient and public involvement

No patients were involved in setting the research question or the outcome measures or in developing plans for the design or implementation of the study. No patients were asked to advise on interpretation or writing up of results.

RESULTS

Characteristics of the study population

Our final sample included 10 346 patients who visited physicians and received any prescriptions for representative chronic diseases before the COVID-19 pandemic. Among 10 346 subjects, 6856 (66%) were male, the mean

Table 2 Physician visits and medication prescriptions among patients with major chronic diseases before and during the COVID-19 pandemic

Outcome	September 2019	October 2019	November 2019	December 2019	January 2020	February 2020	March 2020	April 2020	May 2020
The number of physician visits, mean (95% CI)									
Patients in the whole nation	1.9 (1.8 to 1.9)	2.0 (1.9 to 2.0)	2.0 (1.9 to 2.0)	2.0 (1.9 to 2.0)	1.9 (1.9 to 2.0)	1.9 (1.8 to 2.0)	1.9 (1.9 to 2.0)	1.7 (1.6 to 1.7)	1.8 (1.8 to 1.9)
Patients in the prefectures most affected by COVID-19	1.9 (1.8 to 1.9)	2.0 (1.9 to 2.1)	2.0 (1.9 to 2.1)	2.0 (2.0 to 2.1)	1.9 (1.9 to 2.0)	1.9 (1.9 to 2.0)	2.0 (1.9 to 2.1)	1.7 (1.6 to 1.8)	1.9 (1.8 to 1.9)
Patients in the other prefectures	1.7 (1.6 to 1.8)	1.8 (1.7 to 1.9)	1.8 (1.7 to 1.9)	1.8 (1.7 to 1.9)	1.7 (1.6 to 1.8)	1.8 (1.6 to 1.9)	1.7 (1.6 to 1.8)	1.6 (1.5 to 1.7)	1.6 (1.5 to 1.7)
The proportion of patients who did not visit any physicians (%) (95% CI)									
Patients in the whole nation	18 (17 to 19)	16 (16 to 17)	15 (14 to 16)	16 (15 to 16)	16 (16 to 17)	18 (17 to 19)	15 (15 to 16)	24 (23 to 25)	9 (8 to 10)
Patients in the prefectures most affected by COVID-19	18 (17 to 19)	16 (15 to 17)	14 (14 to 15)	15 (15 to 16)	16 (15 to 17)	18 (17 to 19)	14 (14 to 15)	25 (24 to 26)	7 (7 to 8)
Patients in the other prefectures	20 (18 to 22)	17 (15 to 19)	17 (15 to 19)	17 (15 to 18)	19 (17 to 20)	19 (17 to 20)	18 (17 to 20)	22 (20 to 24)	15 (13 to 16)
The proportion of days covered by prescribed medication (PDC) (%), mean (95% CI)									
Patients in the whole nation	86 (86 to 87)	87 (87 to 88)	87 (87 to 88)	89 (89 to 90)	85 (85 to 86)	87 (86 to 87)	87 (86 to 87)	87 (87 to 88)	85 (85 to 86)
Patients in the prefectures most affected by COVID-19	86 (86 to 87)	87 (86 to 87)	87 (87 to 88)	89 (89 to 90)	85 (85 to 86)	87 (86 to 87)	87 (86 to 87)	87 (86 to 88)	85 (84 to 85)
Patients in the other prefectures	88 (87 to 89)	88 (87 to 89)	88 (87 to 89)	90 (89 to 91)	87 (86 to 88)	88 (87 to 89)	88 (87 to 89)	89 (88 to 90)	86 (85 to 87)

We showed the changes in physician visits and medication prescriptions among patients who visited physicians and received prescriptions for major chronic diseases at least once from September 2019 to February 2020. We calculated each value from September 2019 to February 2020 based on data on patients who visited physicians and received prescriptions for major chronic diseases at least once, both from March 2018 to the previous month, and from September 2019 to February 2020. For calculating each outcome from March 2020 to May 2020, we used data on those who visited physicians and received prescriptions for major chronic diseases at least once from September 2019 to February 2020. The prefectures most affected by COVID-19 were defined as the seven prefectures (Tokyo, Kanagawa, Saitama, Chiba, Osaka, Hyogo and Fukuoka) where the state of emergency over COVID-19 was declared on 7 April 2020.
PDC, proportion of days covered by prescribed medication.

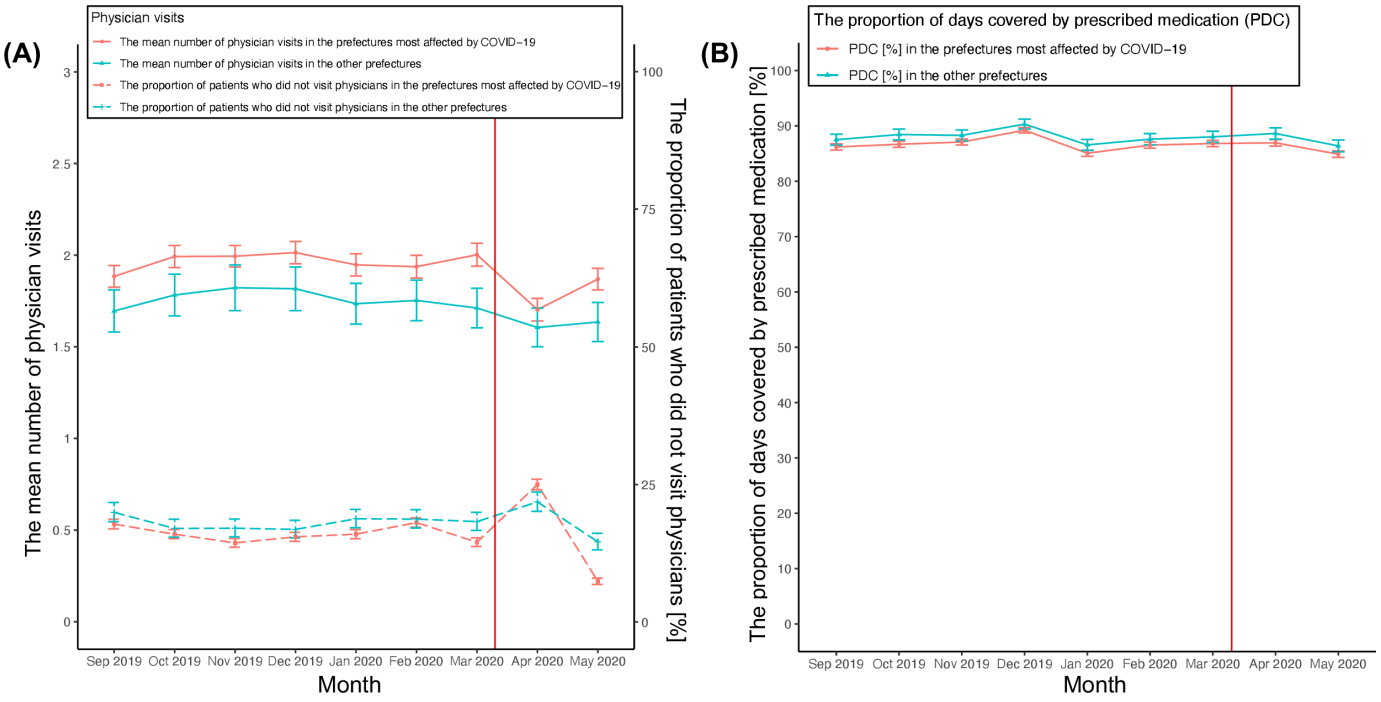

Figure 2 Changes in physician visits and medication prescriptions in the prefectures most affected by COVID-19 and the other prefectures before and during the COVID-19 pandemic

We showed the changes in physician visits and medication prescriptions in the seven prefectures most affected by COVID-19 and the other prefectures among patients who visited physicians before the COVID-19 pandemic. The corresponding values are presented in table 2.

(A) The solid line represents the mean number of physician visits (in-person, online and telephone) per month. The dashed line represents the proportion of patients who did not visit any physicians per month. The red vertical line represents the date of the state of emergency over COVID-19.

(B) The solid line represents PDC. The red vertical line represents the date of the state of emergency over COVID-19.

PDC, proportion of days covered by prescribed medication.

(SD) age in 2018 was 58 (10) years. Of these patients, 8052 (78%) had hypertension, 1532 (15%) had diabetes and 4059 (39%) had dyslipidaemia. The detailed characteristics of major chronic diseases in 10 346 patients were shown in online supplemental table 1. There were 7888 (76%) patients living in the seven prefectures most affected by COVID-19 and 2175 (21%) patients living in the other prefectures (table 1).

Changes in physician visits and prescribed medications during the pandemic

Figure 1 shows the monthly changes in (1) the number of physician visits, (2) the proportion of physician visits and (3) PDC among patients who visited physicians for major chronic diseases before the COVID-19 pandemic. The mean number of physician visits remained constant at around 2.0 per person-month before the COVID-19 pandemic. We found an abrupt, transient decline in the number of physician visits from 1.9 in March to 1.7 in April (p<0.001), and it returned to the baseline level of 1.8 in May. The proportion of patients who did not visit any physicians remained constant at around 16% from before the COVID-19 pandemic. We found that the number increased from 15% in March up to 24% in April (p<0.001), and then decreased to 9% in May. We found no evidence of changes in PDC between before and during the COVID-19 pandemic (eg, 87% in March vs 87% in April; p=0.45) (table 2).

Secondary analyses

Figure 2 shows the monthly changes in each outcome in the seven prefectures most affected by COVID-19 versus other areas among patients who visited physicians for major chronic diseases before the COVID-19 pandemic. A temporary decline in physician visits was more salient among patients living in the seven prefectures most affected by COVID-19 compared with patients living in the other prefectures. We found no difference between both areas regarding PDC—we found no changes during the pandemic in both regions (table 2).

Figure 3 shows the changes in each outcome in the whole nation from March to May in 2020 compared with the previous years (ie, 2018 and 2019) among patients who regularly visited physicians for ≥2 years. In April 2020 (the beginning of the COVID-19 pandemic), there was a temporary decline in the mean number of physician visits compared with those in other study periods (eg, 1.9 in April 2018 vs 1.9 in April 2019 vs 1.7 in April 2020; p<0.001). Likewise, in April 2020, there was a temporary increase in the proportion of patients who did not visit any physicians compared with those in other study periods (eg, 14% in April 2018 vs 16% in April 2019 vs

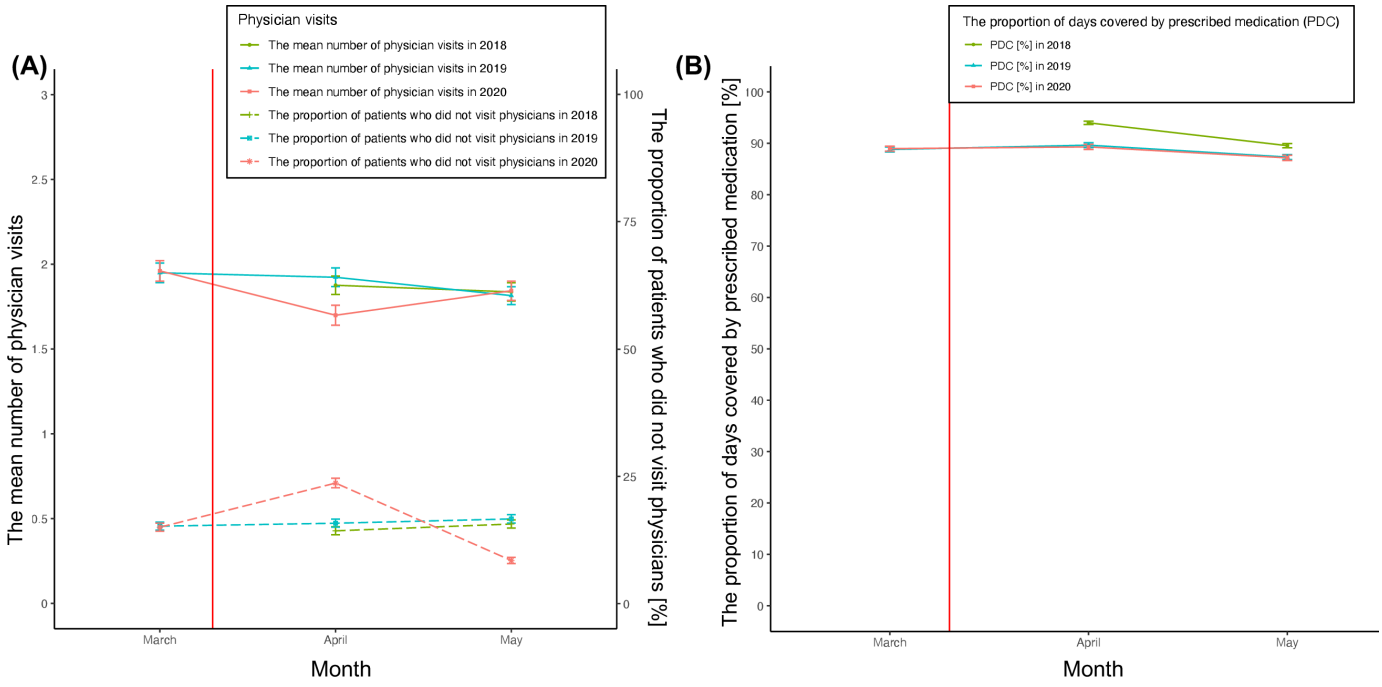

Figure 3 **Changes in physician visits and medication prescriptions from March to May in 2018, 2019 and 2020**
We showed the changes in physician visits and medication prescriptions in the whole nation in 2018, 2019 and 2020 among patients with major chronic diseases who visited physicians for ≥2 years. Each outcome in March 2018, which could not be calculated accurately without data before February 2018, was not shown in figure 3. The corresponding values are presented in online supplemental table 2.
(A) The solid line represents the mean number of physician visits (in-person, online and telephone) per month. The dashed line represents the proportion of patients who did not visit any physicians per month. The red vertical line represents the date of the state of emergency over COVID-19 in 2020.
(B) The solid line represents PDC. The red vertical line represents the date of the state of emergency over COVID-19 in 2020.
PDC, proportion of days covered by prescribed medication.

24% in April 2020; p<0.001). However, there were no clinically meaningful changes in PDC from March to May of 2018, 2019 and 2020 (online supplemental table 2). We showed the breakdown of patients who had an in-person, online or telephone visit at least once between March and May in 2018, 2019 and 2020 in online supplemental table 3.

DISCUSSION

Using the nationwide claims database before and during the COVID-19 pandemic in Japan, we found a transient decline in the number of physician visits right after the outbreak of COVID-19, and it returned to the baseline one month later. This temporary reduction in physician visits is more salient in the seven prefectures most affected by COVID-19 than in the other prefectures. Despite these changes, we did not find any difference in PDC between before and during the COVID-19 pandemic regardless of the area status of the COVID-19 pandemic. Taken together, these findings should be reassuring for policymakers, given that they suggest that the continuity of care received by patients with chronic diseases was affected temporality due to the COVID-19 pandemic.

Our results based on patients with chronic conditions were consistent with previous papers, which have shown a decreased total number of physician visits by any patients during the COVID-19 pandemic compared with before the pandemic.[1–5] Patel *et al*[3] analysed the claims data on all types of outpatients in the USA and reported a 25% decrease in the total number of physician visits during the pandemic. This reduction was observed even though telemedicine visits became widely available as Medicare expanded reimbursement for telemedicine visits due to the COVID-19 pandemic. The current study—focusing on vulnerable patients with major chronic conditions—builds on these earlier studies and extends them by demonstrating a temporary reduction in physician visits even including the number of online and telephone physician visits, particularly in seven prefectures most affected by the COVID-19 pandemic. Given that essential medications for major chronic conditions have been prescribed even during the pandemic, physicians may delay their patients' next regular outpatient visits with a longer term medication prescription. In such an unprecedented situation, it is inevitable that physicians would choose a flexible approach to control patients' chronic conditions. However—as Baum *et al*[11] reported, the 6 month closure of a healthcare system due to a hurricane increased uncontrolled hypertension, which persisted for 24 months—a transient decline in physician visits may

have a negative impact on patients with chronic conditions in the long run.

Although we did not have any clear explanations for an increase in the number of physician visits up to the previous baseline in May 2020, this improvement could be due to the relative convergence of the COVID-19 pandemic as the state of emergency over COVID-19 was finally withdrawn nationally on 25 May 2020. Considering that the COVID-19 pandemic situation is fluctuating until the infection is well-controlled worldwide, physicians should arrange individualised schedules of regular outpatient visits and medication prescriptions based on each patient's conditions. Our findings indicate that the COVID-19 directly affected the population health through morbidity and mortality caused by the virus and had substantial indirect impacts on the chronic disease management.[10] These findings shed light on the importance of the need to programme the health governance for future emergencies that account for both direct and indirect population health impact of the pandemic.

Our study has limitations. First, our data mainly included the Japanese working-age population of 18–74 years. Thus, our results may not extrapolate to the younger or older populations. Second, due to the data availability, we could not investigate the changes in physician visits and medication prescriptions for major chronic diseases over the period after May 2020. Therefore, it is possible that the patterns we observed in this study may not be different if we had a longer follow-up period and more recent data. Third, our data do not include information on patients' compliance with their prescribed medications for major chronic conditions. Lastly, since we analysed Japanese nationwide data, our findings may not be generalisable to other countries, though an abrupt decline in the number of physician visits was observed during the pandemic in the USA.[1–3] Further research is needed to understand the general effect of the COVID-19 pandemic on healthcare for chronic diseases in various contexts.

CONCLUSION

The number of physician visits declined right after the surge in the number of patients with COVID-19 (April 2020); however, it returned to the baseline one month later (May 2020). We did not find definite evidence that patients were skipping prescribed medications for major chronic conditions during the COVID-19 pandemic.

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Supplementary online content for:

Physician visits and medication prescriptions for major chronic diseases during the COVID-19 pandemic in Japan: Retrospective cohort study

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Supplementary online content

eAppendix. The definition of patients with major chronic diseases

1. Patients with hypertension:

・One of ICD-10 diagnostic codes for physician visits was one of the following: I10, I11, I12, I13, I14, or I15 AND

・One of prescribed medications was classified into one of the following medication therapeutic category: 213 (diuretics), 214 (antihypertensive agents), or 217 (vasodilators) OR

・One of the prescribed medications was the combination drug of Amlodipine and Atorvastatin

OR

2. Patients with type 2 diabetes mellitus:

・One of ICD-10 diagnostic codes for physician visits was one of the following: E11 AND

・One of the prescribed medications was classified into one of the following medication therapeutic category: 396 (drugs for diabetes mellitus except for insulin)

OR

3. Patients with dyslipidemia:

・One of ICD-10 diagnostic codes for physician visits was one of the following: E785 AND

・One of the prescribed medications was classified into one of the following medication therapeutic category: 218 (drugs for dyslipidemia)

・One of the prescribed medications was the combination drug of Amlodipine and Atorvastatin

Patients with major chronic diseases were defined as those individuals with at least one of three conditions: hypertension, type 2 diabetes mellitus, and dyslipidemia.

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eTable 1. Detailed characteristics of major chronic diseases in 10,346 patients

Hypertension	Diabetes	Dyslipidemia	Total number (n = 10346)
✔	-	-	5334 (52)
-	✔	-	427 (4)
-	-	✔	1656 (16)
✔	✔	-	526 (5)
-	✔	✔	211 (2)
✔	-	✔	1824 (18)
✔	✔	✔	368 (4)

We showed detailed characteristics of major chronic diseases in adult patients who visited physicians before the COVID-19 pandemic. Values represent n (%).
Abbreviations: COVID-19 = coronavirus disease 2019

eTable 2. Changes in physician visits and medication prescriptions from March to May in 2018, 2019, and 2020

Outcome	In 2018	In 2019	In 2020	P value
The number of physician visits, mean (95% CI)				
In March	-	1.9 (1.9-2.0)	2.0 (1.9-2.0)	-
In April	1.9 (1.8-1.9)	1.9 (1.9-2.0)	1.7 (1.6-1.8)	< .001
In May	1.8 (1.8-1.9)	1.8 (1.8-1.9)	1.8 (1.8-1.9)	0.75
The proportion of patients who did not visit any physicians [%] (95% CI)				
In March	-	15 (14-16)	15 (14-16)	-
In April	14 (13-15)	16 (15-17)	24 (23-25)	< .001
In May	16 (15-16)	17 (16-17)	8 (8-9)	< .001
The proportion of days covered by prescribed medication (PDC) [%], mean (95% CI)				
In March	-	89 (88-89)	89 (88-89)	-
In April	94 (94-94)	90 (89-90)	89 (89-90)	< .001
In May	90 (89-90)	87 (87-88)	87 (87-88)	< .001

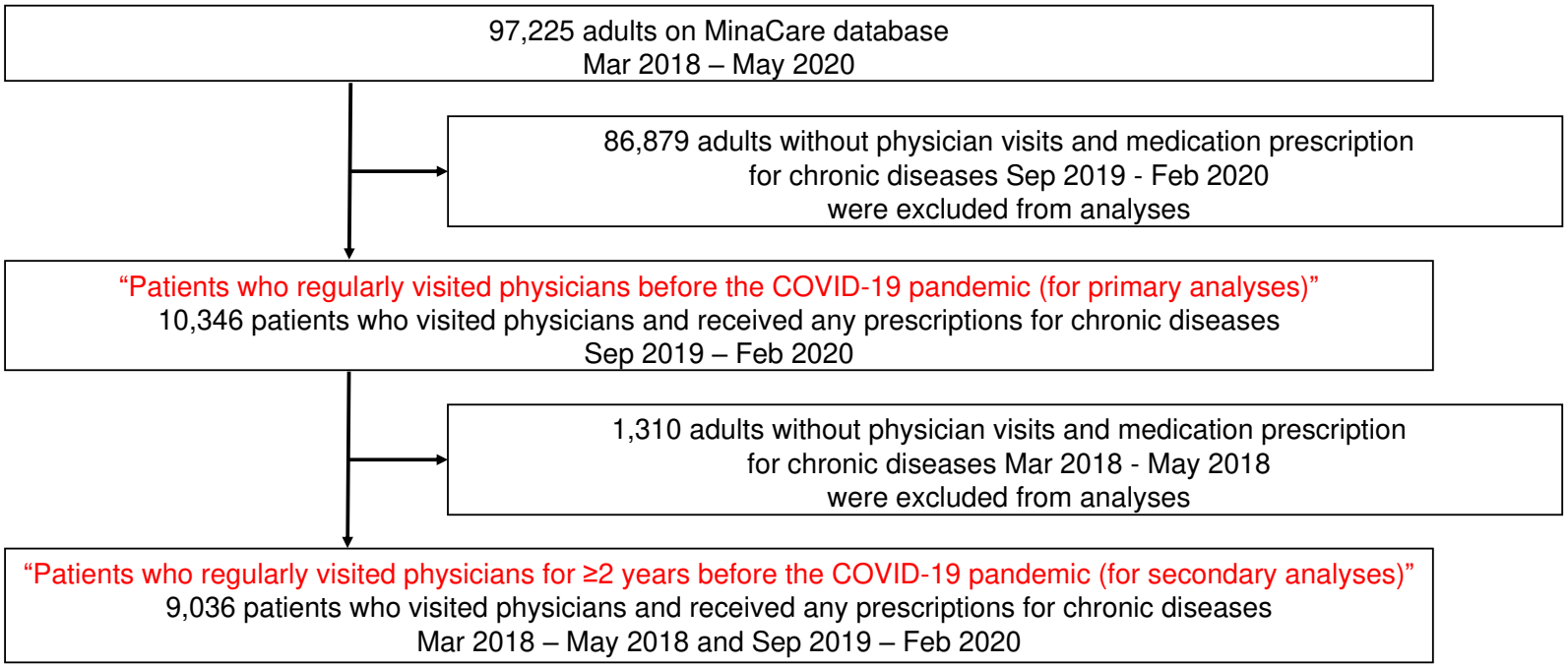
We showed the changes in physician visits and medication prescriptions in the whole nation in 2018, 2019, and 2020 among patients with major chronic diseases who visited physicians for ≥2 years. Each value in Apr 2018 and May 2018 was calculated based on data on those who visited physicians and received prescriptions for major chronic diseases at least once both in March 2018 and from Sep 2019 to Feb 2020, and from Mar 2018 to Apr 2018 and from Sep 2019 to Feb 2020, respectively. Each outcome in Mar 2018, which could not be calculated accurately without data before Feb 2018, was not shown in eTable 2.
Abbreviations: 95% CI = 95% confidence interval; PDC = proportion of days covered by prescribed medication; COVID-19 = coronavirus disease 2019

eTable 3. The breakdown of patients who had an in-person, online, or telephone visit at least once between March and May in 2018, 2019, and 2020

The percentage of patients (%)	March to May In 2018	March to May In 2019	March to May In 2020
Patients in the whole nation			
In-person physician visits	99.9	99.1	98.9
Online physician visits	0.00	0.00	0.15
Telephone physician visits	0.37	0.38	4.41
Patients in the prefectures most affected by COVID-19			
In-person physician visits	99.9	99.1	98.9
Online physician visits	0.00	0.00	0.18
Telephone physician visits	0.38	0.37	4.79
Patients in the other prefectures			
In-person physician visits	99.9	99.1	98.9
Online physician visits	0.00	0.00	0.05
Telephone physician visits	0.28	0.45	2.94

We showed the percentage breakdown of patients who had an in-person, online, or telephone visit at least once between March and May in 2018, 2019, and 2020. The total does not necessarily add up to 100% because a single patient may have experienced more than one type of physician visit. Values represent n (%).
Abbreviations: COVID-19 = coronavirus disease 2019

eFigure 1. Flow diagram of study participants selection for analyses



From the nationwide claims database, we identified 97,225 adults aged ≥18 years who are covered with each health insurance from March 1, 2018, to May 31, 2020. Among these, we further identified 10,346 patients with major chronic diseases who visited physicians and received any prescriptions for major chronic diseases at least once before the COVID-19 pandemic (i.e., from September 2019 to February 2020). Among 10,346 patients, we identified 9,036 patients with major chronic diseases who visited physicians and received any prescriptions for ≥2 years before the COVID-19 pandemic.