COVID-19 and migration: A research note on the effects of COVID-19 on internal migration rates and patterns in Japan

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Abstract
Data on interprefectural migration in Japan are used to discover if the pandemic coincides with any significant shifts in the levels of migration and/or the patterns of movement.

KEYWORDS
COVID-19, Japan, migration

1 | INTRODUCTION: JAPAN’S COVID IN CONTEXT

At the time of writing, Japan continues to struggle to control the spread of COVID-19. At just over 10,000 deaths, it has performed rather well in comparison with other high-income developed countries but at the same time rather poorly in comparison with its near neighbours in Northeast Asia. We can see some fairly clear patterns in the global distribution of responses to the pandemic: a broad-brush view would emphasise first that east has done better than west; so despite serious mistakes in the early stages of the disease, China’s death rate from COVID is just one five-hundredth of that of the United Kingdom. Some would argue that this is related to the contrast between the Confucian social collectivism of East Asian societies in contrast to the Christian (especially Protestant) capitalist individualism of Western Europe and North America. Secondly, we can see that left-wing or centrist governments have done well compared with right-wing “populist” authoritarian ones (compare Australia/New Zealand and Scandinavian countries on the one hand with Brazil, the United States under Trump, and now India on the other). This, in turn, is related to social and economic inequality; broadly speaking, countries with lower inequality have performed better than those with higher inequality. Thirdly, there seems to be a limited but clear advantage to having a head of government who is female (see Appendix A).

Where is Japan located in this picture? (For information on the current situation of COVID-19 infection in Japan, see Japan: Ministry of Health, Labour and Welfare, 2021, and for a general overview of the stringency of Japanese measures to combat the pandemic, see http://ourworldindata.org/grapher/covid-stringency-index). Japan is clearly eastern and one of the countries that inherits a “Confucian” collectivism. That is a plus. It has a right-of-centre government and is experiencing increasing inequality, but it is still relatively democratic, relatively equal, and relatively well-governed. That still counts as a minus. Cleanliness and good quality health care are highly prized, and social distancing in the form of good manners (for example, bowing rather than shaking hands or embracing) is deeply entrenched in the national culture. This is clearly a plus. The election of a female head of government, however, still seems to be a long way off. Sadly, this is a minus.

Japanese people have been historically accustomed to sudden danger, especially from natural disasters, and yet, for good reason, the fear of life-threatening events has recently reached a new high level. The combination in March 2011 of a massive earthquake and a horrifically destructive tsunami in Northeast Japan, and the nuclear explosions and meltdown in Fukushima, left a deep scar on people’s confidence about their safety and well-being as residents of their home country, Japan. It is hardly surprising then that when COVID arrived, there were very few who dismissed it as a hoax or played down its seriousness or questioned the need for restrictions on travel, social mixing, or eating out or the cancellation or postponement of major sporting and leisure events (but see Patrick, 2020). Hardly surprising also that many Japanese people began to adjust their plans to this new high-risk environment in which they now lived and worked. Was it wise to commute daily in crowded trains to busy office blocks, shopping centres or factories, when to do so endangered not only your own health but also those, young and old, with whom you shared your life and for whom you were responsible? Would it not be better to live not in a cramped and expensive city flat but in more spacious
surroundings in a small town or rural area—perhaps the area (your hometown or furusato) from which you or your parents or your grandparents migrated in the past? These are, of course, speculations—little hard evidence exists yet about our responses to COVID, and in any case, very many people found themselves in situations in which, even if they had wanted to reassess their priorities, start living in new ways in new surroundings, they lacked the financial or practical means to turn these wishes, however strongly felt, into decisions to do so.

In due course, the results of ethnographic research on the responses of individuals, households, families, and communities to COVID-19 will be published. But in the meantime, we can examine some of the effects of the pandemic at the macro level through the careful analysis of large data sets—data sets that continued to accurately monitor social behaviour throughout the pandemic. Specifically, in this paper, we use the data on interprefectural migration in Japan available from eStat, based upon the household registration system (see Appendix B), to discover if the pandemic coincides with any significant shifts in the levels of migration and/or in the patterns of movement. Were there, for example, changes in the origins and destinations of flows during the pandemic that resulted in new net migration balances for cities and regions?

2 | OVERALL LEVEL OF INTERPREFECTURAL MIGRATION

As in later sections of this paper, we compare the results for 2019 with those for 2020. Because the major forces affecting levels and patterns of internal migration—underlying inequalities, economic restructuring, and business cycle effects—largely (with the partial exception of the last of these) operate over long time scales so that little change is expected between 1 year and the next, we can make the not unreasonable assumption that changes between 2019 and 2020 are due primarily to the pandemic.

The annual Japan Statistical Office eStat data show that the 2.57 million interprefectural migrants in 2019 declined by 4.1% to 2.46 million in 2020. Fortunately, we have monthly data as well. This shows that the first 2 months and the peak migration around March–April 2020 (the time when mobility is usually very high due to (i) student migrations—the academic year starts on April 1; (ii) migrations associated...
with job changes—new hires mostly start in April; and (iii) partly because of (i) and (ii), most housing moves are also at this time) were about the same in 2020 as they were in 2019. But from April to November 2020, the rates for 2020 were lower than those for 2019, often markedly so; this was especially true for May 2020, when interprefectural migrations were 60,000 less in 2020 than in the same month in 2019 (source: Statistical Office eStat). The size of the decrease and its timing over the year combine to provide the first hard evidence of the ‘shock effect’ of COVID-19 on internal migration flows in Japan.

### 3 | THE SPATIAL PATTERN OF NET MIGRATION BALANCES

In this section, we examine the net migration balances in Japan at both the individual prefecture level and for metropolitan regions. Figure 1 shows the results at the prefectural level for 2019. It is a truly remarkable pattern; only seven of the 47 prefectures have net migration gains, four of those (the four highest gains) are in the Tokyo metropolitan region (TMR), and the highest of all, far outstripping...
other prefectures, is Tokyo itself. This demonstrates nicely the “one-point concentration” of economic and social dynamism in the capital city (despite the strengthening of regional revitalisation policies after 2014, see Saito, 2021). With one minor exception (Shiga—which is suburban to the Kansai metropolitan region containing Osaka, Kyoto, and Kobe), all rural and non-metropolitan prefectures show net migration loss, with the highest rates in remoter rural areas, and especially in the north-eastern (Touhoku) region.

Looking at the shift between 2019 and 2020 (Figure 2), a remarkably clear pattern emerges. Most of the non-metropolitan, remote, and rural regions show a positive trend relative to 2019. This typically means not that they experienced net migration gain from internal migration but that their net losses were less severe. All six negative trends are in or close to the main metropolitan regions (Hyogo [Kobe], Kyoto and nearby Shiga in Kansai, Aichi [Nagoya], and Tokyo and Saitama in the TMR), but the figure for

**FIGURE 4** Tokyo metropolitan region: net migration balance for the four prefectures from January 2019 to January 2021

**FIGURE 5** Japan: gross in-migration rates 2019
Tokyo itself stands out as truly amazing—it's negative trend of -3.73 is far, far larger than any other. Tokyo very suddenly lost its attractiveness to internal migrants in Japan during the pandemic.

The dominance of Tokyo itself within the TMR results in a similar picture emerging if we focus on metropolitan regions rather than individual prefectures. From Figure 3 (Ishikawa, 2021, p. 5), we can see the sudden drop in the net gains of the TMR in 2020 compared with 2019, whereas the other two metropolitan regions (those focused on Osaka and Nagoya) remain close to zero net gain or net loss. The timeline in Figure 4 (Ishikawa, 2021, p. 8) confirms what was said earlier about the concentration of moves in the March–April months, shows that there was not a great difference between migration rates in March, but that from April onwards to the end of the year, net in-migration rates to the four provinces of the TMR were very low or even negative. To summarise, evidence at both prefectoral and metropolitan region levels for net migration balances confirms that the COVID-19 pandemic resulted in a sharp reduction in the attractiveness of Tokyo for Japanese interprefectural migrants.

4 | THE SPATIAL PATTERN OF GROSS MIGRATION RATES

The map pattern of gross outmigration rates for 2019 (outmigrants per thousand population of origin prefecture) (not shown here) is interesting but not very surprising. The rates are highest for Tokyo itself, for other prefectures in the TMR, and for other metropolitan and major city areas, especially those with major university student populations. Cities like Sendai (Miyagi), Kyoto, Hiroshima, and Fukuoka often act as “siphon cities”—that is, they attract students from their surrounding regions, educate them at their major universities, and then channel many of the best qualified and most ambitious of them to Tokyo for employment and career development (upward social mobility). Rates of outmigration were lower in 2020 than in 2019 for all prefectures in Japan ... except one—Tokyo City, where the rate increased by about 5% (by 1.29 on a 2019 figure of 27.57). Once again, the sudden unattractiveness of Tokyo City is revealed.

The map pattern of gross in-migration rates is shown in Figure 5. As was the case with the outmigration rates, Tokyo and
its region stand out for their high rates as do other metropolitan areas and major university cities. At 33.5 per ‘000, the in-migration rate for Tokyo is ‘head-and-shoulders’ higher than other prefectures in Japan (and, of course, its own out-migration rate). It is, however, the shift from 2019 to 2020 that is really interesting (Figure 6). Only four prefectures showed a positive trend, and all of them are located in central Honshu (main island) but outside the TMR (Fukui, Nagano, Yamanashi, and Ibaraki). All the rest experienced a negative trend with the highest by far being Tokyo itself (−2.44). The figures for gross migration reveal that the net migration balances discussed above were the product of both changes in outmigration and in-migration, and that the changed position of Tokyo resulted from a sharp trend towards greater outmigration as well as a sharp trend towards smaller in-migration.

5 | AN ANALYSIS OF SHIFTS IN O-D MIGRATION FLOWS

We now turn to an analysis of the whole 47 x 47 interprefectural flow matrices for 2019 and 2020. In order to facilitate comparison over both space and time, the individual flow figures have been standardised by dividing the number of migrants (Mij) by the product of the population sizes at origin and destination (Pi * Pj) to produce a “migration velocity” (Mv). Because the number of migrants in 1 year between origin i and destination j is very small in comparison with the products of their populations, a scaling constant k (k = 10 to the power 11) is used to produce whole numbers for the “migration velocity.”

As might perhaps be anticipated, the migration velocities fall away quickly with increasing distance for non-metropolitan, remote mountainous, and rural prefectures. This is less so for metropolitan areas and especially less so for Tokyo and the prefectures of the TMR (Saitama, Chiba, and Kanagawa) where the connections with distant prefectures remain relatively high (though still regionally clustered). The focus of attention for the remainder of this section will be the matrix of shifts from 2019 to 2020 (Mv 2020 minus Mv 2019).

Two features of this 47 x 47 origin-destination (O-D) matrix of shifts in the size of individual migration flows dominate over all others: the first is the rapid decline in the migration velocities for contiguous and proximate origin and destination prefectures. So, one of the ways that mobility has been affected by COVID-19 is through the very sizeable reduction in short-distance migration. This might suggest that there are housing market factors (such as a delay in house

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**FIGURE 7** Japan: migration flows to Tokyo 2019
purchase or in the suburbanization plans of family households) as well as work- and study-related factors affecting recent migration decisions under pandemic conditions. The second dominant feature is the altered status of Tokyo in the migration flow matrix. To look at this more closely, we need to examine separately the flows to Tokyo and the flows from Tokyo.

Migration velocities for flows to Tokyo in 2019 are shown in Figure 7. This pattern has three dominant features: (i) the very high rates of flow from the three other prefectures of the TMR (Saitama, Chiba, and Kanagawa)—no surprises there! (ii) the high rates of flow from northern/north-eastern Japan in comparison with those from western/south-western Japan. This is explained by both locational and cultural factors; flows from western Japan are likely to be reduced by the existence of strong “intervening opportunities” in the form of major cities like Hiroshima and metropolitan areas such as the greater Osaka region (Kansai) and the Nagoya metropolitan region; at the same time, there has been a long history of migration to Tokyo from the rural and relatively low-income Touhoku (north-eastern) region—so the economic and cultural links between them are particularly strong; (iii) as has been noted before, the flows from city–prefectures with major universities (such as Fukuoka, Hiroshima, Hyogo [Kobe], Kyoto, Nagoya [Aichi], and Sendai [Miyagi]) are typically higher than for their surrounding regions.

In Figure 8, we see the shift from 2019 to 2020. The shift is everywhere negative; not a single prefecture of origin sent more migrants to Tokyo in 2020 than in 2019. This is a remarkable result and a further demonstration of the shock effect of the pandemic on the Japanese internal migration system. In this riskier environment, people are choosing, it seems, to avoid the largest, most-densely-occupied urban agglomeration in Japan.

The pattern of migration velocities for flows from Tokyo in 2019 is shown in Figure 9. It has two main features: (i) the “distance-decay effect” whereby the rates of flow fall away with increasing distance from Tokyo and (ii) the slight but distinctive bias towards flows to other metropolitan and major city destinations. Once again, the lowest rates of flow link Tokyo with the prefectures of western Japan.

In Figure 10, we see the shifts in the flows from Tokyo from 2019 to 2020. In our judgement, this is perhaps the most significant and intriguing pattern of all of those shown here in this paper. Only three prefectures have significantly lower migration velocities in 2020 than in 2019: one is Shiga (outer metropolitan Kansai), and the other

![Migration flows to Tokyo 2020 minus 2019](image-url)
two are the major city–prefectures of Nagoya (Aichi) and Fukuoka. It is the positive trend pattern that is so interesting. Yes, some of the increase in migration is to local prefectures within the TMR (especially Kanagawa and Chiba), but look at the prefectures that are further away! Nagano, to the west of Tokyo, is touristy and mountainous; it has many second homes belonging to Tokyoites—from here you can be distant but still in touch, very close to nature, and living in spacious surroundings yet with full access to modern facilities and services (see references to Nagano in Kajimoto, 2020). Or take the cases of Tottori, Shimane, and Kochi in western Japan; the first two are located on the north (Japan/East Sea) coast and the third on the south side of the island of Shikoku. All are, by Japanese standards, extremely remote, mostly mountainous, and overwhelmingly rural. Taken together with the sudden loss of attractiveness of Tokyo to internal migrants, this shift in favour of remoter rural regions represents a remarkable reversal of pre-COVID migration patterns and trends.

6 | CONCLUSIONS

A very useful way to summarise these shifts is to examine the relationship between net migration and (log) population density for 2019 and 2020 shown in Figure 11 (Ishikawa, 2021, p. 10). The slope of the regression line has shifted—it is distinctly less in 2020 than in 2019. What this means is that Japan's “one-point concentration” has been weakened by the pandemic; the largest metropolitan city has lost out, and the emptier parts of Japan, famous for their depopulation over the last 70 years, have gained.

Does this represent a turning point in Japan's regional demographic evolution? We do not know, of course. But the “bounce back” expected by Saito (2021, p. 91) may turn out to be only partial. First, the growth and prosperity of global cities like Tokyo (and therefore their net migration gains) have been based on the strong expectation, supported by past experience, that neoliberal globalisation was here to stay. Yet, since 2008, globalisation has stalled or even gone into reverse (Fielding, 2021), and we might expect the migration response to do the same. Maybe we are entering a postglobal era? Secondly, the ways we work and shop are changing, and these changes have been accelerated by the pandemic. They imply different and often much looser connections between residences on the one hand and workplaces and major commercial centres on the other, and they are greatly facilitated by developments in communications technology—developments that allow people in their working and nonworking lives to escape the requirement that they be physically present in the
FIGURE 10  Japan: migration flows from Tokyo 2020 minus 2019

Migration velocities 2020 ($Mv = (M_{ij}^*k)/(P_{i}^*P_{j})$) (see text) minus migration velocities for same flows in 2019

Source: Household Register Data

250 kms

FIGURE 11  Japan: the relationship between net migration balance and (log) population density in 2019 and 2020

2019

$y = 0.4131x - 1.2234$

Rsq. = 0.6754

2020

$y = 0.3047x - 0.8969$

Rsq. = 0.5862

FIGURE 11  Japan: the relationship between net migration balance and (log) population density in 2019 and 2020
metropolitan city. Thirdly, and finally, we may have reached “peak financialization” in high-income capitalist economies (Foroohar, 2019); if so, the economic dynamism of the TMR might be expected to be adversely affected. There are signs, again accelerated during the pandemic, that contemporary capitalism is shifting towards the production of socially useful goods and services for the real economy, towards a hydrocarbon-free economy (with all that that implies for urban agglomeration), even, perhaps, towards a more locally connected production–exchange–consumption society. Such developments, which are likely to be far more influential than government regional redistribution policies, really would have the potential to revitalise Japan’s regions!

DATA AVAILABILITY STATEMENT
The data used are publicly available migration data based upon the Japanese household registration system (published by the Japanese government through eStat).

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## APPENDIX A

**DOES HAVING A FEMALE HEAD OF STATE (FHoS) MAKE A DIFFERENCE TO COVID-19 DEATH RATES (DRs)?**

| Country          | Population     | Deaths | DR per 100k |
|------------------|----------------|--------|-------------|
| Bangladesh (Hasina) | 163,046,161    | 8,162  | 5.06        |
| Germany (Merkel)  | 83,517,045     | 59,776 | 72.08       |
| Taiwan (Tsai)     | 23,773,876     | 8      | 0.03        |
| Serbia (Brnabic)  | 8,772,235      | 4,071  | 58.31       |
| Togo (Dogbe)      | 8,082,366      | 79     | 1.00        |
| Denmark (Frederiksen) | 5,771,876   | 2,171  | 37.45       |
| Finland (Marin)   | 5,532,156      | 685    | 12.41       |
| Norway (Solberg)  | 5,378,857      | 574    | 10.80       |
| New Zealand (Arden) | 4,783,063    | 25     | 0.51        |
| Lithuania (Simonyte) | 2,759,627    | 2,867  | 102.78      |
| Gabon (Raponda)   | 2,172,579      | 70     | 3.30        |
| Estonia (Kallas)  | 1,325,648      | 433    | 32.78       |
| Iceland (Jakobsdottir) | 339,031    | 29     | 8.20        |
| Barbados (Mottley) | 287,025       | 14     | 4.88        |
| **Total FHoS**    | **315,541,545**| **78,964** | **25.02**  |
| **World**         | **7,713,468,100**| **2,271,277** | **29.45**  |
| **World—FHoS (nonFHoS)** | **7,397,926,555**| **2,192,313** | **29.63**  |
| **UK (for comparison)** | **67,530,172** | **109,547** | **164.76** |
| **China**         | **1,433,783,686**| **4,821** | **0.35**    |

Sources: FHoS: Wikipedia for 2020; COVID deaths: John Hopkins COVID dataset for Feb. 2020; population: UN population estimates for 2019.

Interpretation: Answer **YES**, FHoS rates are somewhat lower, but Germany pulls the DR up for FHoS, and China pulls DR down for nonFHoS.

## APPENDIX B

**THE HOUSEHOLD REGISTRATION SYSTEM**

Almost all East Asian countries have a household registration system. In Japan, household registration is strictly enforced; one must, by law (the Law of Basic Resident Registers—Law 81, 1967), register a change of address with the new municipality within 14 days, providing personal information, date of move, place of previous residence, and reason for migration. Information from these registrations is then collected and processed to produce an annual publication “Annual Report on Internal Migration in Japan Derived from the Basic resident Registers” published by the Statistics Bureau at the Ministry of Internal Affairs and Communications.