

Recovery dynamics of visitor flows in the greater Noto region after covid-19 and sequential disaster shocks

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INTRODUCTION

This study examines the dual impacts of the novel coronavirus (COVID-19) and the Noto Peninsula Earthquake on the Noto Peninsula region based on visitor count data from areas with major tourism-related facilities. Using multiple regression analysis, it identifies correlations between visitor counts for young adults, middle-aged adults, and older adults using annual factors, tourism-type factors, and regional factors, clarifying the complex recovery status following the disasters.

Beginning in 2020, COVID-19 spread worldwide, significantly impacting socio-economic activities. To prevent or reduce the spread of infection, different countries implemented various policies in response, including entry restrictions, curfews, and lockdowns. In Japan, a state of emergency was declared, and the population was requested to refrain from nonessential outings. These restrictions led to a significant decline in tourism demand in Japan, plunging the tourism industry into a severe crisis (Japan Tourism Agency, 2022). With the later lifting of the state of emergency and easing of entry restrictions, tourism gradually began to recover (Japan Tourism Agency, 2025a, 2025b).

However, on January 1, 2024, during this recovery, the Noto Peninsula Earthquake struck, its epicenter falling in the Noto region of Ishikawa Prefecture. It had a registered seismic intensity of 7 Shika and Wajima, Ishikawa Prefecture, and its seismic intensity was 6 or higher across a wide area of the Noto region. According to the Cabinet Office (2024), the human toll included 241 fatalities and 1,296 injuries. There were 7,704 completely destroyed buildings and 9,467 partially destroyed residential buildings. This earthquake dealt another blow to the tourism industry in Ishikawa Prefecture, which had begun its recovery.

It is well known that tourism demand is highly vulnerable to exogenous shocks, such as pandemics and disasters (Cró and Martins 2017, Ritchie and Jiang 2019, Rogerson and Rogerson 2020). Therefore, to revitalize tourism in affected regions and achieve sustainable tourism, it is crucial to understand the impacts of exogenous shocks on tourism and its status of recovery.

Numerous studies have analyzed the impact of exogenous shocks on tourism. For example, Škare et al. (2021) performed an early analysis of the effects of COVID-19 on the travel and tourism industry. That study demonstrated that the global impact of COVID-19 was significantly greater than that seen in past pandemics. Some papers focused on a specific country. For example, Pramana et al. (2021) examined Indonesia, and Foo et al. (2020) focused on Malaysia. Other relevant studies have been published in Japan, such as, for example, Kurihara et al. (2022) and Cui and Shibusawa (2025). Kurihara et al. (2022) focused on lodging demand in tourism, examining in the case of Japan what types of lodging facilities were impacted by COVID-19 and which ones recovered. Cui and Shibusawa (2025) analyzed falling revenue and influencing factors for tourism-related businesses in the Nishimikawa region of Aichi Prefecture, focusing on the early phases of COVID-19 (2020–2021).

Studies of the impact of disasters such as earthquakes on tourism include those of Bay-ram and Çiftçi (2021), who examined the effects of the 1999 İzmit Earthquake in Turkey on tourist numbers, and Huang and Min (2002), who investigated recovery following the 1999 921 Earthquake in Taiwan.

Natural disasters and pandemics can occur simultaneously and exacerbate each other's effects. Cui and Shibusawa (2024) studied the impacts of and contributing factors to sales fluctuations at tourism-related businesses in the cities of Hitoyoshi and Atami, which were affected both by the COVID-19 pandemic and by natural disaster.

As noted, previous studies have tended to focus on a single exogenous shock, accounting for its impact on tourism and recovery. Cui and Shibusawa (2024) examined the combined effects of two exogenous shocks, but cases also exist in which a new shock takes place during the recovery phase from damage that was caused by an exogenous shock, as seen in the Noto region of Ishikawa Prefecture that was mentioned earlier.

This study focuses on the Hokuriku and Noto regions, which were impacted by the Noto Peninsula Earthquake after being hit by COVID-19, to demonstrate their complex recovery following these consecutive shocks. Specifically, using visitor data for major tourism-related facility areas from 2018 (pre-COVID-19) to 2025 (post-Noto Peninsula Earthquake), we analyzed the relationship between visitor numbers and annual, tourism-type, and regional factors separately for young, middle-aged, and older adults. Thus, the ability to examine visitor numbers by age group is a key feature of this survey. Another key feature of the data used in this study is that it is based on big data derived from GPS data. This makes it possible to analyze visitor numbers as recently as 2025.

It requires extended periods of time to recover and reconstruct after large-scale exogenous shocks. Thus, it is not uncommon for another shock to occur while a region is still in the recovery phase from a first one. Therefore, illustrating the status resulting from such consecutive shocks is considered useful for future research on disasters and tourism.

METHOD

This study analyzed visitor trends from 2018 to 2025 for 26 major tourism-related facilities affected by the Noto Peninsula Earthquake, using annual visitor data from the KDDI Location Analyzer (KLA). Here, the Noto Peninsula and surrounding areas (Kanazawa and Toyama) are defined as the Greater Noto Region.

The 26 major tourism-related facilities were categorized by region into four areas: Kanazawa, Central/Southern Noto, Oku-Noto, and Toyama Bay. They were further classified by tourism-type into five categories: urban, nature, shrines and temples, hot springs and lodging, and transportation hubs.

The visitor numbers of visitors utilized the total population estimate from the KLA. This refers to the visitor numbers in a 250-meter radius of the target tourist facility that meets the condition of staying for 15 minutes or longer. The analysis was focused solely on visitors and excluded residents and commuters from the tally. This eliminated the influence of activities of daily living and commuting, concentrating primarily on tourist-driven foot traffic. The multiple regression model used in the analysis is described below.

First, visitors are categorized into weekdays and holidays. Second, each group is further categorized by age group. The age groups used are young adults, middle-aged adults, and older adults. Young adults are those in their 20s and 30s, middle-aged adults are those in their 40s and 50s, and older adults are those aged 60 and above.

FINDINGS

In this study, we first present the recovery status of visitor numbers by region and by tourism-type using an index based on 2018 levels. We then use a multiple regression model to examine how visitor numbers—broken down by weekdays/holidays and age group—can be attributed to annual factors, tourism-type factors, and regional factors.

The results reveal the following three points. First, the impact of the earthquake disaster on visitor numbers was greater than that of the COVID-19 pandemic. From 2020 to 2023, visitor numbers on both weekdays and holidays had been gradually recovering, peaking in the decline seen in 2021. However, due to the earthquake disaster, the coefficient decreased more sharply in 2024 than ever before, and even in 2025, numbers have not returned to pre-earthquake levels; it is likely that it will take time to recover to pre-pandemic levels. Second, among tourism-type, the COVID-19 pandemic and the earthquake disaster had a greater impact on nature tourism and visits to shrines and temples. In addition to the decline in visitor numbers caused by these consecutive shocks, the fact that some structures and natural monuments require time to repair—or are difficult to restore—is likely affecting the recovery

of visitor numbers. Third, it is evident that the greater the extent of disaster damage in a region, the greater the impact on visitor numbers. According to the Cabinet Office (2024), while Kanazawa City recorded a seismic intensity of 5+ during the Noto Peninsula Earthquake, Wajima City and neighboring Shika Town in Oku-Noto recorded a seismic intensity of 7, and the coastal areas also suffered damage from tsunamis and landslides. In particular, it is possible that Oku-Noto's appeal as a tourist destination has diminished because major tourist sites that attracted many visitors were damaged by landslides and fires. Furthermore, given the status of infrastructure and tourist site restoration, it is conceivable that visitors to the Noto Peninsula have begun to concentrate in Kanazawa City, resulting in a significant positive impact on the city.

CONCLUSION

This study focuses on the Hokuriku and Noto regions and aims to illustrate the recovery status following a series of exogenous shocks. By analyzing visitor trends using data on visitor numbers in the region's major tourism-related areas, we found that the impact of the earthquake disaster on visitor numbers was greater than that of the COVID-19 pandemic. Furthermore, among different tourism-type, nature tourism and visits to shrines and temples were found to have been significantly impacted. When examined by region, the impact was greater in areas that suffered severe earthquake damage, such as Oku-Noto.

This paper presents the recovery status in visitor numbers following successive shocks, broken down by age group. Furthermore, by distinguishing and clearly presenting these trends by region and tourism-type, it is expected to provide foundational insights for developing more effective tourism recovery policies.

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