



## Commentary on “Importance of a Collaboration Agreement in the Management of Physician-Staffed Helicopters” in Japan

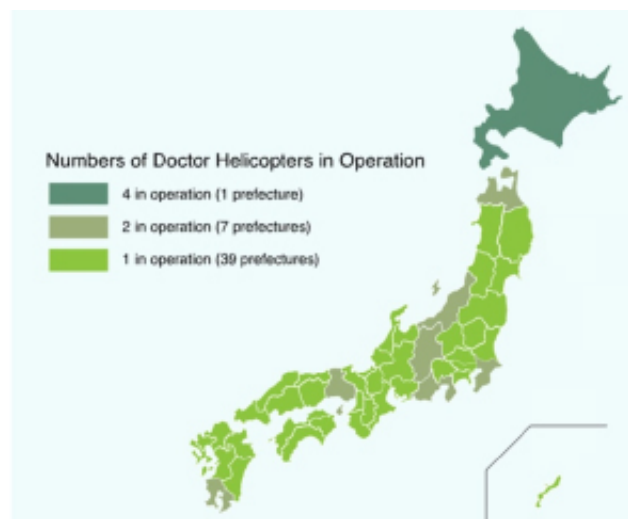
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### DESCRIPTION

A physician-staffed helicopter is called a doctor helicopter (DH) and it is capable of quickly bringing a doctor and nurse to an emergency site. The DH stand by at base hospitals, ready to respond to dispatch requests, and is equipped with medical equipment and medicine needed for initial treatment. As of April 2023, 56 DHs have been deployed in 47 prefectures across Japan, covering approximately 378,000 square kilometers and serving 124.5 million people. There are four DHs in Hokkaido Prefecture, two each in Aomori, Niigata, Chiba, Nagano, Shizuoka, Hyogo and Kagoshima Prefectures, and one in the remaining prefectures (**Figure 1**) [1]. When a 119 emergen-

cy call comes in at the Fire-fighting Central Command Room, an ambulance is dispatched to the scene, and a request for DH dispatch is sent to a base hospital. The DH carrying staff on board lands at the Rendezvous point, the staff enters the ambulance, and they immediately begin treating the patient. The Rendezvous Point is the location for landing and take-off at the emergency scene where the ambulance meets the DH. These points are selected in advance by the Flight Coordination Committee in each prefecture. The committee selects locations such as schoolyards, parking lots and parks. There are approximately 600 Rendezvous Points per base hospital. In addition to these emergency dispatches, the DH also transports patients between medical institutions as interfacility transport.



**Figure 1:** Distribution of doctor helicopters in each of the 47 Prefectures. There are four DHs in Hokkaido Prefecture, two each in Aomori, Niigata, Chiba, Nagano, Shizuoka, Hyogo and Kagoshima Prefectures, and one in the remaining prefectures

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There are two key collaboration agreements in the management of multiple DHs: The mutual support agreement during peacetime and the mutual support agreement during catastrophic disasters. The purpose of the agreement during peaceful times covers responding to overlapping requests for dispatch, addressing multiple injured patients simultaneously, and cooperating when it is impossible to dispatch DH due to local conditions or mechanical issues across prefectural borders. In 2014, it was made possible to request DH dispatch from other prefectures even in situations where the DH from the local prefecture could be deployed if such a dispatch would allow for faster treatment and transport, based on the agreement [2]. The difference in time required for transportation is a crucial factor in life-or-death emergency medical care, so this relaxation of requirements can be seen as a significant advancement and provides double and triple safety nets.

Of the 47 prefectures in Japan, only 7 (Okinawa, Miyazaki, Oita, Kumamoto, Tokyo, Kagoshima and Hokkaido) do not have such an agreement with neighboring prefectures. Among them, Kagoshima and Hokkaido both have multiple DHs, which are used when necessary. In the Kansai Wide-Area Union, which expands the neighboring prefectural agreement, seven DHs are deployed together and operated across the seven prefectures

included in the Union. This agreement is the largest agreement in Japan and has a flexible operational structure that is not bound by prefectural boundaries.

One of the largest prefectures, Shizuoka, which has two DHs in its eastern and western regions, has unique agreement with neighboring Prefectures. Eastern Shizuoka has an agreement with Yamanashi and Kanagawa Prefectures, and Western Shizuoka has an agreement with Nagano and Aichi Prefectures. Based on the collaboration agreement, there have been a number of dispatches for mutual coverage in the eastern regions where medical resources are limited [3-5]. Recently, a car collision involving two vehicles occurred, resulting in four seriously injured individuals. During that incident, three DHs—one each from the eastern and western regions of Shizuoka Prefecture and Kanagawa Prefecture—utilized a single rendezvous point to transport critically ill patients (Figure 2). In the neighboring prefectural agreements, the prefecture that dispatches the DH bears the operating expenses. Requesting assistance from another prefecture can impose a financial burden, which may result in hesitance to make such requests. Ongoing discussions are thus necessary to determine how to distribute the expenses among the participating prefectures.



**Figure 2:** Rendezvous point for car accidents. Three doctor helicopters in Western and Eastern Shizuoka and Kanagawa Prefecture collaborated to manage multiple injured patients

The other key collaboration is the Mutual Support Agreement during catastrophic disasters. Catastrophic disasters involve large numbers of injured people who need to be transported in a short time to locations spread out over a wide area outside the disaster zone. In the Great East Japan Earthquake, multiple DHs were dispatched for the first time to the disaster area without any agreements in place [6]. The operation of DHs had not been incorporated into the national disaster management basic plan, and there were no established grounds or command structures for their activities in the affected areas. In such circumstances, coordination with fire departments, self-defense

forces and other organizations was not effectively achieved. The Japanese government subsequently began reviewing its disaster prevention basic plan.

In 2015, guidelines for establishing the operational framework of DHs in the event of catastrophic disasters were provided by the Ministry of Health, Labour and Welfare to each prefecture, thereby establishing rules. First, aviation operation coordination teams including DHs are stationed at the prefectural offices of disaster-affected areas, enabling coordination with helicopter operators, such as fire departments and the Self-Defense For-

es. Second, the maximum response range for the DHs during a catastrophic disaster is within a radius of 300 kilometers from the center of the affected area. Third, when a DH enters the disaster area, it creates a gap in the operational area of all DHs in that region. To cover that gap, Japan's 47 prefectures are divided into 10 blocks (Figure 3), and the general practice is to

coordinate which DH from that block will be dispatched to the disaster area. Once the DH to be dispatched is determined, the remaining DHs within the same block cover the vacuum in their assigned areas to avoid creating any gaps. Fourth, DHs can take off and land freely during a disaster.



**Figure 3:** 10 blocks covering catastrophic disasters in Japan's 47 prefectures. Once the DH to be dispatched is determined, the remaining DHs within the same block cover the vacuum in their assigned areas to avoid any gaps

Furthermore, a number of new systems have been developed. In the Great East Japan Earthquake, it was difficult to track the locations of helicopters. Therefore, satellite communication was utilized to enable real-time tracking of all 57 DH locations [7]. The lessons from the Great East Japan Earthquake were applied during the Kumamoto earthquake that occurred in April 2016 [8]. Japan is a small island nation with a high population density, so it employs various measures to prepare for both everyday disasters and large-scale catastrophic events.

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## CONFLICT OF INTEREST

The authors declare no conflicts of interest.

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