Five-Year Experience of a Medical Information Network System

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Introduction

Miyagi Prefecture is located in northeastern Japan, 360 km from Tokyo. The population of Miyagi is 2.3 million. In 2011, Miyagi was the most affected area by the Great East Japan Earthquake and Tsunami (GEJE), which devastated the northeastern coastal region, and resulted in 10,563 (19,575, total number in Japan) deaths and 1,227 (2,577) missing persons as of Sept. 1, 2017. The earthquake and the following tsunami destroyed many medical facilities, resulting in loss of medical information on paper and on servers in hospitals and clinics (Figure 1). Since it was recognized that backing up patient data during and after disaster was extremely important, it was necessary to develop a cloud storage system for medical information in Miyagi Prefecture.

The backup system is based on the Standardized Structured Medical Information eXchange (SS-MIX), which enables data from medical record systems developed by different vendors to be stored in a similar format (Figure 2). As of January 26, 2018, the number of facilities backing up to the MMWIN was 827 (Figure 3, 4 and Table 1). The number of registered patients exceeded 58,400, which is more than 2.5% of the residents of Miyagi (Figure 5A). All backed up clinical data, including patients’ basic information, disease names, blood tests, and prescription list, reached more than 290 million items from 7.7 million persons (Figure 5B). Using a large amount of data, the sharing of information among facilities is progressing, especially in cases of patient transfers among hospitals and clinics. The budget has been provided by the government for five years. Additionally, a usage fee has been collected from participating facilities. To maintain this project, the balance between cost and income should be improved by increasing the number of participating facilities. The next steps are sharing image data, renewal of the system, and secondary use of clinical data.

Table 1. Participating facilities

| Participating facilities | Total in Miyagi | Ratio
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<tbody>
<tr>
<td>Hospitals</td>
<td>81</td>
<td>58.2%</td>
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<tr>
<td>Clinics</td>
<td>226</td>
<td>16.1%</td>
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<tr>
<td>Pharmacies</td>
<td>342</td>
<td>30.7%</td>
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<tr>
<td>Nursing facilities</td>
<td>178</td>
<td>11.6%</td>
</tr>
<tr>
<td>Total</td>
<td>827</td>
<td>10.8%</td>
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Figure 1. Miyagi Prefecture and the Great East Japan Earthquake

Figure 2. Structure of MMWIN

Figure 3. MMWIN participating facilities

Figure 4. MMWIN participating facilities

Figure 5. The number of registered patients and backup data items

Figure 6. The past and future

References


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