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PERSPECTIVES

Using health information technology to reduce regional health inequality in Taiwan

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Taiwan's mountainous areas and offshore islands are home to approximately 365,000 people, or 1.6% of the nation's population. These communities are distributed across 48 mountainous and offshore island regions, covering approximately 44% of Taiwan's total area. Because of transportation issues, economic scale, and other factors, the traditional methods of treatment are unable to completely resolve the problem of insufficient medical resources in mountainous areas, offshore islands, and other remote areas. Only integrated, innovative service models can reduce inequities in access to medical care in such regions compared with more populated areas.

The Ministry of Health and Welfare has for several years sought to improve the quality of care in these places through economic incentives, human resource cultivation, integrated service models, and infrastructure improvements such as vigorous promotion of digitized health care.[1,2] Completely computerized physician order entry systems and picture archiving and communication systems have been established in 48 public health centers situated in mountainous areas and offshore islands, while in major hospitals in metropolitan areas image report centers have been established, with radiology specialists providing real-time, high-quality image reports (Fig. 1).

In addition to the 48 public health centers that provide medical services, this digitized infrastructure allows physicians to send vehicles to 319 isolated mobile medical stations. Such mobile clinics provide health services to disadvantaged groups living in remote areas.

In 2013, the Ministry of Health and Welfare established an electronic medical record exchange system for these 48 public health centers of mountainous regions and offshore islands. This is another milestone in the field of digitized medical care.[3]

Electronic medical records store the content of patient visits digitally, replacing paper records. They have the following advantages: (1) *Interhospital exchange of records:* Transmission of electronic medical records to the medical institutions that are receiving transferred patients allows physicians to adopt correct medical measures for people seeking treatment across multiple institutions, improving the continuity of medical care; (2) *Correctness:* Traditional paper-based medical records frequently suffer from typos, and some providers' handwriting is difficult to read. Use of electronic medical records reduces the likelihood of these types of errors; (3) *Better management and retrieval:* Modification, saving, review, and copying of electronic medical records can be tracked. This prevents tampering with medical records and creates a paperless medical practice management environment with all information in electronic formats for better management and retrieval; (4) *Permanent storage:* Paper medical records are difficult to preserve, and are likely to be destroyed or become unrecoverable if fires, floods, or other disasters occur. Using cloud-based storage, backups can be generated for all electronic medical records and thus the records

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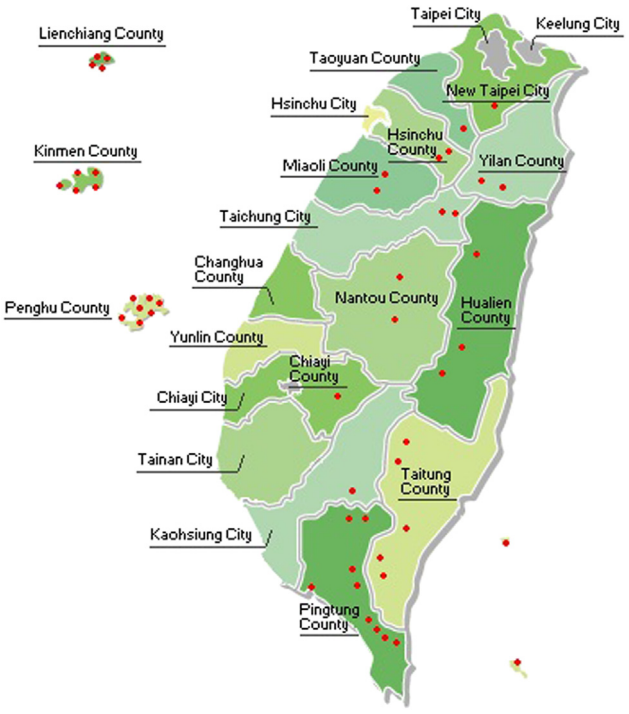

Figure 1 Forty-eight public health centers in mountainous areas and offshore islands located across Taiwan.

can be stored permanently; and (5) *Environmental protection:* Electronic medical records can reduce paper consumption.[4]

The electronic medical record exchange system will allow residents of remote townships and offshore islands to use their national health insurance IC (Integrated Circuit) cards after returning from hospitals of metropolitan areas so that physicians at their local public health centers can access hospital and outpatient records, discharge summaries, image reports, and laboratory reports through the Internet.[5,6] This will reduce the need for residents of remote townships to make frequent trips to hospitals of metropolitan areas. It will also provide a substantial saving in transportation costs and reduce the loss of working hours, while improving the quality of medical care. This electronic medical records exchange system is to be made available in all 500 hospitals and 20,000 clinics in Taiwan by 2015.

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