

# DIFFUSION AND UTILIZATION OF MAGNETIC RESONANCE IMAGING IN ASIA

**Raymond C. W. Hutubessy**

*World Health Organization*

**Piya Hanvoravongchai**

*Ministry of Public Health, Thailand*

**Tessa Tan-Torres Edejer**

*University of the Philippines, Manila*

*On behalf of the Asian MRI Study Group*

## Abstract

**Objectives:** An assessment of the current status of magnetic resonance imaging (MRI) was undertaken to provide input for future government decisions on the introduction of new technologies in Asia. The objective of the study is to describe and explain the diffusion pattern of this costly technology in several Asian settings.

**Methods:** Data on the diffusion pattern of MRI for different Asian countries (the Republic of Korea, Malaysia, Indonesia, the Philippines and Thailand) and regions (the cities of Shanghai and Hong Kong in China and the state of Tamil Nadu in India) were obtained from national representatives of professional bodies by using standardized questionnaires for the year 1997–98. In addition, utilization data were collected at the hospital level in three countries before and after the economic crisis in the region. For four countries plus Hong Kong, background information on the legal framework for “big ticket” technologies was collected.

**Results:** Since the introduction of the first MRI in the region in 1987, the number of MRIs has gradually increased both in public and private facilities in Asia. In 1998 the average number of MRI machines installed varied from less than 0.5 machine per million population to more than 5 machines per million population. The maintenance and operating costs, and not the absence of regulation, account for the low number of MRIs in the Philippines and Malaysia. Overall, installed MRIs have low magnetic field strength, vary with respect to brand and type, and are mostly in the private sector and in the urban areas of the region. The diffusion pattern of MRIs in countries of the Asian region appears to follow two types of patterns of diffusion: one set of countries seems to be composed of mostly early adopters and another set of countries appears to be composed mostly of late adopters.

**Conclusions:** Total number of MRIs per population in this region, though quite small compared to most OECD countries, reflects a higher share of the country’s health resource devoted to expensive high-technology devices. It is difficult to state the appropriate number of MRIs for each country; however, the study shows that there are observable problems in terms of efficiency, equity, and quality of MRI services. The research team proposes a few key recommendations to counteract these problems. Purchasing and regulatory bodies must be empowered with skill and knowledge of health technology assessment. Likewise, the fundamental problems resulting from inefficient and unfair health financing should not be overlooked, so that there is more equitable use of the technology.

**Keywords:** Magnetic resonance imaging, Health technology assessment, Diffusion, Economic impact, Developing countries

The Asian MRI Study Group thanks the Council on Health Research and Development (COHRED) in Geneva, Switzerland and the Health Systems Research Institute (HSRI) in Bangkok, Thailand for providing financial support for the group’s meetings. The views expressed are those of the Asian MRI Study Group, and are not necessarily those of the organizations they represent.