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***This blog was co-authored with Justin Chakma,*** *an undergraduate student at the University of Toronto.*

When we envision an emerging market, we think of a rapidly growing country with small purchasing power, little infrastructure, and diminishing natural resources. These three aspects of emerging markets require innovations that can subsequently be taken global — a phenomenon known as "reverse innovation." However, a fourth and powerful driver of reverse innovation is the comparative absence of intermediaries: an institutional gap.

As Tarun Khanna has described, institutions such as venture capital firms, legal support, universities, regulators, and third-party auditors help to make markets and value chains more efficient. Institutional voids can persist for decades, and cannot be resolved by throwing more capital at the problem. They also differ from physical infrastructure and limited natural resources, as they often manifest themselves in non-physical forms.

A concrete example of an institutional void is universities for training physicians. It takes more than a decade to train medical specialists. Building new medical schools or expanding existing ones will only have

 

an impact on the needs of the local healthcare system in the distant future.

Medtronic is exploring ways to address that void in the area of chronic disease management.

Sixty-nine percent of deaths in the developing world are due to chronic disease, yet only 2.3% of international aid is allocated to chronic disease. In the United States, hospitalization of chronic disease patients accounts for the majority of health care costs. But innovation in managing chronic disease is happening faster in emerging markets such as India as a result of the scarcity of physicians.

India, which has more than one billion citizens, has only 100 qualified cardiac electrophysiologists. To tackle this institutional void, Medtronic developed a low-cost, pill-sized pacemaker that can be inserted into a stent, then embedded in the heart. This device eliminates the need for invasive inter-cardiac leads that deliver electricity to synchronize the heart. A much larger group of cardiologists and cardiac surgeons will be able to perform this procedure.

At this point, few specialists are actually trained to monitor this device, or other Medtronic devices. In addition, the fragmentation of India's healthcare system means that clinical outcomes aren't monitored and evaluated in a standardized way. This increases the potential for device failure, and personal-injury lawsuits — a serious concern for Medtronic in a market with millions of customers. Medtronic recently paid $268 million to settle cases stemming from fracture-prone cables used to connect hearts to defibrillators, which earlier recalls could have avoided.

 

But Medtronic anticipated these institutional voids in the healthcare regulatory system. To preempt poor clinical-outcome monitoring, Medtronic placed passive remote sensors in the stent and pacemaker that transmit signals via any mobile handset to a cloud computing infrastructure — "patient care in the cloud." The technology is being adapted for remote monitoring and adjustment of other products, including neuromodulators for Parkinson's patients, and glucose modules.

Physicians are able to access this data, improve compliance, and reduce unnecessary procedures, while Medtronic is able to gather real-time data for post-market surveillance to satisfy regulations, to preempt liability, and to improve future devices. Eventually, Medtronic intends to launch the low-cost pacemaker in the United States and Europe; they believe it will be able to lower costs, as well as risks, for all healthcare systems.

Medtronic is developing reverse innovations in a variety of ways. Its technically capable global sales force is intimately involved in its development, because they work so closely with local health care providers and see first-hand what works and what doesn't. In addition, Medtronic created a Paris-based medical device start-up incubator in partnership with a leading VC firm, Soffinova Ventures, to rapidly prototype potential reverse innovations from physicians in Eastern Europe. There are plans for a Singapore-based gateway under development.

Medtronic's work reveals two new principles about reverse innovation:

- **Institutional voids can create a powerful source of competitive advantage.**
- **Reverse innovation can be sourced in many ways.**

 

Can readers think of any others?

**Vijay Govindarajan** is the Coxe Distinguished Professor at Dartmouth College's Tuck School of Business, an executive fellow at Harvard Business School, and faculty partner at the Silicon Valley incubator Mach 49. He is a New York Times and Wall Street Journal bestselling author. His latest book is *The Three Box Solution*. His Harvard Business Review articles "Engineering Reverse Innovations" and "Stop the Innovation Wars" won McKinsey Awards for best article published in HBR. His HBR articles "How GE Is Disrupting Itself" and "The CEO's Role in Business Model Reinvention" are HBR all-time top-50 bestsellers. Follow him on LinkedIn.

@vgovindarajan

 