



The Innovator's Prescription

How Asia can disrupt the global healthcare

Asian innovators have the opportunity to design systems and services that are profitable and sustainable, yet affordable and accessible to everyone. As they do so, they can make major contributions to solve the global healthcare crisis by collaborating with colleagues in other regions to adapt and export those new models of care.

Today's healthcare systems are in a critical state of distress in nearly every nation around the world. In developing countries, the prevailing model equates to adequate care for the wealthy and little for the masses. Nationalised, single-payer models like the systems in the UK and Canada face long waiting lists and spiralling costs. The notoriously dysfunctional US system combines the follies of each: escalating costs that threaten to swamp public payers and employers, together with impending workforce shortages in critical areas—fostering both inequalities in access to care and in the ability of patients to afford it. Asian systems are facing similar pressures. As developing nations become more urban and affluent, patients will inevitably transition from sporadic reliance on local healthcare providers to a model of healthcare consumption that attempts to mirror the systems found in developed countries. Industry players will be increasingly tempted to compete by developing cutting-edge, centralised and high-cost infrastructure. However, the outcome of this model in western systems suggests that this impulse should be questioned, and, concerted effort should be made to avoid the traps in which those systems now find themselves. Improved healthcare should not come at the expense of creating innovative, convenient, low-cost models that are accessible to everyone.

Based on 20 years of research at the Harvard Business School as well as field work designing and deploying innovations, we have observed the transformation of industry after industry when complicated, expensive products and services are replaced by affordable, accessible alternatives. This agent of transformation, disruptive innovation, has a rich history of success in Asia. Cellular telephony catapulted Southeast Asian countries past stages of expensive infrastructure development. The advent of compact and inexpensive automobiles, first in Japan and more recently in India and China, has upended the global auto industry.

Consumer products targeting the bottom of the pyramid have found early traction in Asian markets. Indeed, innovations in Asia have often presaged transformations in the US and Europe. In Asian markets, themes of affordability and accessibility are familiar, particularly in developing economies that face the natural challenge of serving low- and rising-income consumers. Healthcare is an industry ripe for disruption worldwide, and it is possible that Asia will lead a wave of disruption there as well.

A more comprehensive discussion of disruptive innovation in healthcare can be found in *The Innovator's Prescription: A Disruptive Solution for Health Care* (available January 1, 2009) and at the book's website.

Enabling technology

Technological enablers in healthcare often take the form of innovations that precisely diagnose the underlying causes of patients' conditions. They replace the historical process of trial-and-error treatment of symptoms followed by post-hoc diagnosis. Precision medicine involves applying therapies that are predictably effective for precisely-diagnosed diseases, and this rules-based work can be standardised to facilitate treatment by a wider range of caregivers and in a wider range of settings than previously possible. This transition enables broader access and reduces overall system costs in two ways: Procedures can migrate from specialists to generalist physicians, nurses, family members and patients themselves. Additionally, the site of care can shift to local hospitals, outpatient clinics, offices, and retail locations. Avoiding the use of centralised hospitals populated by highly-trained specialists eliminate major drivers of healthcare costs.

Singapore's Economic Development Board, via its healthcare venture capital arm Bio*One Capital, has a good grasp of the concept of technological enablers, investing in a portfolio of disruptive companies. Building upon the Singapore government's investments in medical research, Bio*One formed Dx Assays, a joint venture with a European biotech firm. The focus is developing molecular diagnostic assays to facilitate cost-effective drug development by identifying appropriate candidates for trials based on genetic factors and precise disease diagnosis. On the treatment side, Bio*One has also funded ventures aimed at expanding access through accurate, simple to deploy therapies that would preclude intervention by a professional. One portfolio company, ReVance Therapeutics, is exploring novel technologies to deliver large active molecules through the skin. One lead application in clinical trials is delivery of botulinum toxin type A, which, in addition to cosmetic applications, can be used to treat a variety of muscular disorders, regulate certain glandular functions, and possibly treat very common conditions like prostate hyperplasia and migraines. The technology also shows promise for delivering insulin, antibody-derived therapies and non-steroidal anti-inflammatory drugs.

Telecommunications, too, has an important role to play in enabling healthcare disruptions. Remote care networks in Asia have been entrusted with outsourced diagnostic work for years. Using state-of-the-art telecommunications technology, Teleradiology Solutions, a Mumbai-based radiology services provider, leverages wage and time-zone differentials to allow hospitals in the US and Singapore to better meet growing demand. Though wage disparities may ultimately shrink in the long run, the same model can be applied to serve remote or sparsely-populated communities. With the advent of simple, low-cost, portable imagers and the increasing video capabilities of general telecommunications tools like mobile phones, the telemedicine model may allow health systems in developing economies to provide widely-accessible quality care without the 30-40 year cycle of infrastructure development.

Business model innovations

The US and European healthcare systems have been particularly resistant to business model innovations, with strong inertia due to entrenched fee-for-service accounting and payment models and a century-old focus on hospital- and physician-directed delivery. The result has been a system in which healthcare providers are economically incentivised to create or inflate demand for their services.

Generically, there are three distinct business models: solution shops, value-adding process (VAP) businesses and facilitated networks. In healthcare, these are often conflated in a single organisation, creating a complex, confused institution that is unable to accurately allocate costs and drive efficiency and productivity. Segregating these business models through the creation of single-purpose institutions is the most promising avenue to increased access and affordability.

Solution shops, like the general hospitals that excel at diagnosing and solving unstructured problems, will necessarily have high-cost business models, and the payment systems they employ should compensate them sufficiently for their specialised services. The fee-for-service model is appropriate for these problems and is likely to persist in dedicated solution shops.

VAP businesses, by contrast, focus on transforming incomplete or broken things into higher-value outputs. For unrefined crude oil, the treatment process to transform it into petrol is consistent and known. Therefore, the petroleum refining business conforms to the VAP model. Many medical procedures are likewise suitable for VAP hospitals and clinics, which take a narrowly-defined slice of customers with similar needs and apply standardised, efficient care—often at a fraction of the cost of a solution shop or conflated model. Aravind Eye Hospital in India, a pioneer in the VAP hospital movement, is now the world's largest and most productive eye care facility. From the outset, Aravind's founders were committed to providing free eye care for the poor, creating a powerful incentive to develop innovative low-cost treatment models. By some measures, Aravind is more than five times as productive as the average ophthalmologic hospital in India.

Expanding their reach beyond their local markets, VAP hospitals like Aravind can serve as models for the emerging trend of medical tourism. While some early entrants in medical tourism have simply re-created the high-cost model of solution shop general hospitals, the savings based on wage and cost differentials alone are not a durable advantage. Innovative business models like Aravind have a greater chance of remaining relevant even as wages rise, because unlike solution shops, VAP businesses present a more attractive value proposition by charging fixed prices for their outcomes—often guaranteeing the results. Because of this output orientation, VAP hospitals can significantly reduce the total system costs.

A final model, facilitated networks, holds promise for treating chronic illnesses requiring behaviour changes, coordinating the response of caregivers and patients to disease outbreaks, and filling persistent

infrastructure and logistical gaps in the medical landscape. Examples of facilitated networks in healthcare include communities targeted to specific chronic conditions like dLife.com, which focusses on Type 1 and 2 diabetics, whose daily healthcare questions and needs cannot be conveniently, efficiently, and profitably served by traditional healthcare providers.

Facilitated networks played an important role in containing the 2003 SARS outbreak in China. ESRI China, a geographical information software firm, created the SARS Mapping Website that used data from government health authorities to produce accurate maps of affected areas that even included details about specific buildings. Public health officials, health workers, the media and individual citizens could get up-to-date reports on suspected, actual, and recovered cases to inform their activities. The same model could easily be adapted to create an effective H5N1 influenza surveillance and response network.

Facilitated networks have also helped coordinate blood donations in India, which faces chronic blood shortages. In the absence of comprehensive municipal or national blood banks, the burden of finding lifesaving units of blood often falls to the patient or his family. Indianblooddonors.com is a network that connects patients and potential blood donors using the Internet and SMS messaging to sign up donors, post requests, and coordinate donations. Using Rs 2 lakh of his own money and without the assistance of the government or NGOs, Kushroo Pocha has created the largest blood donor database in India.

Networks like these can help accomplish the same individual and public health outcomes that formerly required constant reliance on skilled health workers or the building of high-cost infrastructure and organisational capacity.

The mechanism of disruptive innovation

- Enabling technologies that simplify and routinise formerly complex and unstructured processes (e.g. precise diagnostic technologies, telecommunications)
- Business model innovations that allow companies to profitably deliver affordable, accessible solutions to consumers (e.g. targeted and efficient providers, facilitated user networks)
- Value networks of companies that have mutually compatible economic models which together provide the underlying commercial infrastructure (e.g. drug and device suppliers aligned with integrated payer-providers and a health information system).

Value networks

The final element of disruptive innovation, value networks, is often the most difficult in industries like healthcare in which system participants have evolved to develop mutually-incompatible economic incentives. As a result, the commercial infrastructure is resistant to change, even when it optimises overall outcomes, and the system remains deadlocked. One model for untying this Gordian Knot is integrating the payer, provider, and physician models as some nationalised systems have done. Though Singapore has focussed considerable effort in this direction, the model may not be widely replicable as it requires significant control and alignment of multiple stakeholders.

In the absence of government-controlled reform, innovative businesses should explore models for creating integrated systems of their own. In the US, Kaiser Permanente created a system in which it owns hospitals, employs doctors, and provides services to consumers for a fixed annual fee. Aravind, the Indian eye hospital, has also had success integrating critical parts of its commercial infrastructure. Given its volume of eye patients, Aravind was able to set up a manufacturing facility to produce intraocular lenses of comparable quality to imports at less than 15 per cent of the cost. Its value network has also evolved to include facilities to train and house doctors and nurses, ensuring a supply of quality practitioners.

Conclusion: The last shall be first?

Asian systems at every stage of development are being confronted by the challenges of delivering comprehensive, accessible and affordable healthcare. However, many are not yet encumbered by the legacy cost structures and patient expectations that impede innovation elsewhere. The patterns we have seen in healthcare and other industries suggest that innovation paths need not be linear or predetermined. Emulating the established healthcare models already found elsewhere will guarantee that Asian systems will always remain behind. But the central message of disruption is that innovations can come from unexpected and counterintuitive sources.

By experimenting with new healthcare models, Asian innovators have the opportunity to design systems and services that are profitable and sustainable, yet affordable and accessible to everyone. As they do so, they can make major contributions to solve the global healthcare crisis by collaborating with colleagues in other regions to adapt and export those new models of care. Meanwhile, developed economies in Asia can foster

innovation by funding and facilitating technologies and business models that enable the rehabilitation of their healthcare systems. With deliberate management and foresight, Asian healthcare systems can pioneer innovations that not only serve their populations, but also provide the models the rest of the world is so desperately seeking.

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