



What New Delhi's Free Clinics Can Teach America

About Fixing Its Broken Health Care System

By Vivek Wadhwa

Rupandeeep Kaur, 20 weeks pregnant, arrived at a medical clinic looking fatigued and ready to collapse. After being asked her name and address, she was taken to see a physician, who reviewed her medical history, asked several questions, and ordered a series of tests including blood and urine panels. These tests revealed that her fetus was healthy but that Kaur had dangerously low hemoglobin and blood-pressure levels. The physician, Dr. Alka Choudhry, ordered an ambulance to take her to a nearby hospital.

All of these steps, including the medical tests, happened within fifteen minutes at the Peeragarhi Relief Camp in New Delhi, India. The entire process was automated—from check-in, to retrieval of medical records, to testing and analysis and ambulance dispatch. The hospital also received Kaur's medical records electronically. No paperwork was filled out, no bills were sent to the patient or insurance company, no delay occurred of any kind. Yes, it was all free.

The hospital treated Kaur for mineral and protein deficiencies and released her the same day. Had she not received timely treatment, she might have had a miscarriage or lost her life.

This clinic was more efficient and advanced than any counterparts

I have seen in the West. And Kaur wasn't the only patient there: at least a dozen other people received free medical care and prescriptions in the single hour that I spent at Peeragarhi in early March.

The facility, called the *mohalla* (people's) clinic, was opened in July 2015 by Delhi's chief minister, Arvind Kejriwal. It is the first of a thousand clinics that he announced would be opened in India's capital for the millions of dwellers in need. Delhi's health minister, Satyendar Jain, who came up with the idea for the clinics, told me he believes that these facilities will reduce not only human suffering but also overall costs—because people will receive timely care without burdening hospital emergency rooms.

The technology that made the instant diagnosis possible at Peeragarhi was a medical device called the Swasthya Slate. This \$600 device, roughly the size of a cake sheet, performs

thirty-three common medical tests including blood pressure, blood sugar, heart rate, blood hemoglobin, urine protein, and glucose. The Swasthya Slate also tests for diseases such as malaria, dengue, hepatitis, HIV, and typhoid. Each test takes just a minute or two, and the device uploads its data to a cloud-based medical-record management system that can be accessed by the patient.

The Swasthya Slate was developed by Kanav Kahol, who was a biomedical engineer and researcher at Arizona State University's Department of Biomedical Informatics until he became frustrated at the lack of interest on the part of the medical establishment in reducing the cost of diagnostic testing. He worried that billions of people were receiving no or substandard medical care because of the medical industry's motivation to keep prices high. In 2011, he returned home to New Delhi to develop a solution.

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Kahol had noted that, despite the similarities among medical devices in their computer displays and circuits, their packaging made them unduly complex and difficult for anyone but highly skilled practitioners to use. They were also incredibly expensive—usually costing tens of thousands of dollars each. He believed he could take the same sensors and microfluidics technologies used by the expensive medical devices and integrate them into an open medical platform. And with off-the-shelf computer tablets, cloud computing, and artificial intelligence software, he could simplify the data analysis to be easily understood by minimally trained front-line workers.

By January 2013, Kahol had built the Swasthya Slate and persuaded the state of Jammu and Kashmir, located in Northern India, to allow the device's use in six underserved districts with a population of 2.1 million people. The device is now in use at 498 clinics there. Focusing on reproductive maternal and child health, the system has been used to provide antenatal care to more than 22,000 mothers. Of these, 277 mothers were diagnosed as high risk and provided timely care. Mothers are now receiving care in their villages instead of having to travel to clinics in cities.

A newer version of the Slate, called HealthCube, was tested last month by nine teams of physicians and technology, operations, and marketing experts at Peru's leading hospital, Clinica Internacional. They tested its accuracy against the western equipment that they use, its durability in emergency-room and clinical settings, the ability of minimally trained clinicians to use it in rural settings, and its acceptability to patients. Clinica's general manager, Alvaro Chavez Tori, told me in an email that the tests were highly successful and "acceptance of the technology was amazingly high." He sees this technology as a way of helping the millions of people in Peru and Latin America who lack access to quality diagnostics.

The scope of opportunity is bigger than Latin America, however. When it comes to health care, the United States faces many of the same problems as the developing world. Despite the Affordable Care Act, 33 million Americans, or 10.4 percent of the U.S. population, still lack health insurance.

These people are disproportionately poor, black, or Hispanic, and 4.5 million of them are children. As a result, they receive less preventive care and suffer from more serious illnesses—which are extremely costly to treat. Emergency rooms of hospitals are overwhelmed by uninsured patients seeking basic medical care. When they do have insurance, families are often bankrupted by medical costs.

It may well be time for America to build mohalla clinics in its own cities. **N**

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