Cuba's focus on preventive medicine pays off

Cuba's emphasis on public health, primary care, and training thousands of medical professionals has resulted in health successes and lessons for other countries. Sam Loewenberg reports.

In the airy, naturally lit examination room in a ward of the Salvador Allende teaching hospital, Carlos Campos places his hands gently on the chest of a shirtless young man who has come in with a fever. A group of students crowd around, listening intently. Campos places his thumbs on the patient's chest, and explains how students can detect problems through interpreting the vibrations of the lungs. "The vibrations from the lungs should neither swim nor fly", says Campos, pressing his palms on the patient's lower back. "Vibrations should only walk."

This hands-on, low-tech approach to medicine is fundamental to Cuba's unique approach to health care, which makes up for low resources by emphasising prevention and primary care. The country has the world's highest doctor-to-patient ratio, about 67 physicians per 10 000 people (in the UK it is about 36·5 per 10 000 people). A family doctor and a nurse are assigned to care for 150–200 families. These doctors live in the same communities with their patients, usually know them by name, and get to know many of the personal issues, social pressures, and environmental factors that could be affecting their health. Community doctors divide up their population by risk factors, such as smoking, drinking, or hypertension, and give those patients special attention and assistance.

The approach seems to have reaped substantial benefits such as a 40% decline in infant mortality since the 1960s, even as the basic economy remained flat, according to a 2009 analysis. Today, Cuba's infant mortality rate is lower than that of the USA. The analysis also found evidence of substantial improvement in the control of cardiovascular disease, leading to reductions in mortality and admissions to hospital. By focusing on primary care and health promotion, the Cuban health system is designed to prevent 90% of health problems. Cuba derived this strategy from the landmark International Conference on Primary Health Care in Alma Ata in 1978. "It is evident that it is a lot cheaper to prevent [health problems] than to apply treatment", said Alexander Ochoa Agüero, head of the public health and primary care department at the Latin American Medical School (ELAM), located in an old naval base outside of the capital Havana.

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The international medical school is part of an ambitious programme sponsored by the Cuban Government to offer free medical education to people from low-income communities from around the world. Established in 1998, in the wake of multiple hurricanes that blasted through the Caribbean and Central America, the Cuban Government set up ELAM to respond to the loss of life by training physicians to work with the poor. Since then, it has trained more than 26 000 students drawn from more than 123 countries. The school provides full scholarships to students for 6 years of medical education, plus free room and board, and about US$10 a month spending money. The programme was originally set up to educate Latin American students, but these days most are from sub-Saharan Africa. It has even managed to cross political borders, training hundreds of students from the USA.

Personnel as prevention

Cuba's medical training programme addresses a hugely under-appreciated yet critical implementation issue at a time when global health is entering a new phase. While high-income countries struggle to redesign their foreign aid programmes to leverage dwindling resources and competing political demands, private philanthropies focus on lofty goals like disease eradication and universal health coverage, and the UN sets ambitious targets for reducing the burden of disease, maternal and child mortality, and a host of other public health goals, one question has gone largely unasked: who is going to do all this work on the ground?

There is currently a deficit of more than 7 million doctors, nurses, and other skilled health professionals in the developing world, according to estimates from WHO. Nearly half of that deficit is in southeast Asia, and another quarter in Africa. The total number is expected to rise to 12·9 million by 2035. So what is to be done?

The answer, or at least a partial one, might be found in Cuba's quiet revolution in one of the most fundamental interventions: training.

For the **2009 analysis** see https://depts.washington.edu/sphnet/wp-content/uploads/2013/01/Macinko.pdf

For more on the **global health workforce deficit** see http://www.who.int/workforcealliance/knowledge/resources/hrhreport2013/en/

Allison Shelley

A neighbourhood health clinic in Cienfuegos, Cuba

While most countries provide financial aid to developing countries, the Cubans have been training both domestic and foreign doctors who are playing substantial roles overseas. With more doctors per head than almost anywhere else in the world, Cuba has created a new kind of soft power: so-called medical diplomacy.

Cuba has sent an estimated 325 000 of its homegrown medical personnel (some of whom went on multiple missions) to 158 countries in the more than five decades since the overthrow of the Batista dictatorship, according to John Kirk, a Canadian academic and author of several works on the Cuban medical system. In fact, the first medical missions, to crises in Chile and Algeria, occurred just after the revolution, when around half of Cuba's doctors had fled the island. "Even 50 years ago, ideology and a spirit of humanitarianism trumped domestic economic challenges", said Kirk. He estimated, based on information from Cuban public health authorities, that more than 49 000 Cuban health-care workers are working in 65 countries around the world. Most of those are in Venezuela and Brazil.

A crucial part of the programme is also sending medical staff to countries that are in the midst of an emergency. Cuban doctors also played a key role in identifying and treating the cholera epidemic in Haiti. During the Ebola crisis in west Africa, Cuba's rapid deployment of dozens of doctors, nurses, and technicians was lauded by the international community. *The New York Times* editorial board wrote: "Cuba stands to play the most robust role among the nations seeking to contain the virus. Cuba's contribution is doubtlessly meant at least in part to bolster its beleaguered international standing. Nonetheless, it should be lauded and emulated."

Despite the recent thaw in relations with the USA, Cuba nonetheless remains an authoritarian system. The Ministry of Public Health has a notorious bureaucracy, which makes getting information for academics, researchers, and journalists particularly difficult. Much information can still only be obtained through informal channels.

Evolution of the system

The Cuban health system has gone through several phases of reform, beginning with a focus on infectious diseases in the 1960s and 1970s, and then on to community care, with a focus on chronic diseases in the following decade. During the 1980s, the neighbourhood family doctor system was set up. After the fall of the Soviet Union, Cuba's main sponsor, the country underwent hard times,

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and in a 2010 reform the system was consolidated and the workload for neighbourhood doctors increased.

Although infectious disease and malnutrition are no longer pressing issues (as they are for many of Cuba's neighbours), the biggest problems these days are chronic diseases such as cancer, diabetes, and hypertension, the result of citizens' increasing life expectancy, as is happening in much of the world.

One of the cornerstones of the Cuban health system are the polyclinics, which are district-level centralised medical centres. In the Santa Fe district of 27 000 people, the polyclinic oversees 22 family doctors' offices. In addition to the doctor and nurse team, they have now introduced vector control specialists to control mosquitos, cockroaches, and rats, said Irania Benedico Rodriguez, the director of a polyclinic in the Santa Fe district. Dengue remains a substantial problem in Cuba, and childhood asthma is also a concern.

Primary care education

Cuba's technological resources are often stretched, and students at ELAM tell of old textbooks and sparse living conditions. But those are often the same conditions that doctors in poor communities around the world work in, says Nikolai Cassanova, a second year ELAM student who grew up in the Crown Heights neighbourhood of Brooklyn, NY, USA. If there is a crisis, "I just pack some underwear and I'm ready to go", he says.

ELAM teaches not only primary care, but also the ethics and obligations of the medical profession. The ideology of solidarity is an inherent part of the curriculum. It is the "right of every citizen to have free and quality care", that is also accessible and equitable, said Ochoa. "To be able to have a health system like we have, you need the political will."

He acknowledges the challenges faced by students from abroad who try to implement unique Cuban health-care practices at home, such as home visits, knowing the local community, and spending a long time with the patient. Students from abroad are encouraged in their second year to begin doing research on health issues in their home countries.

These days, most students are no longer from Latin America but mostly from sub-Saharan Africa. Thembi Precious Sibanyeni, a second year student from Johannesburg, South Africa, said that implementing the prevention approach in her home country will be difficult, because the primary emphasis is on treating diseases as they occur. Even getting people to use condoms is difficult, she said.

Primary care education is also exceptional in Cuba because of the financial help students get. Medical students in many countries are frequently hesitant to study family medicine, among the least lucrative of medical specialties, because of the enormous debt they accumulate in medical school. That is not a problem at ELAM, where the education is largely free or the students' home government pays for it—although in recent years the school has also been

accepting some traditional fee-paying students as well. Cassanova wonders why the USA does not offer special scholarships for students who are studying primary care. Without the burden of debt, many more would enter the specialty, he says.

Cassanova is particularly inspired by the focus on preventive medicine and public health. "The doctors actually take time to educate the community", he said, such as going to a patient's home to show them how to cook with less salt, or demonstrating proper hand-washing to mitigate infectious diseases such as cholera.

While most Latin American medical schools are increasingly challenged as to the quality of education and research they are delivering and are dropping in global rankings, "the Cuban model continues to deliver health care at a level that is producing very good basic results, although their health and medical education and research will likely face significant quality challenges in the coming years as well", said Ok Pannenborg, who served as an interim director at the Pan-American Health Organization in 2014–15.

Maternal health care

Cuban medical officials attribute the country's low maternal and infant mortality to the risk assessment programme that the health service implements prior to conception and during pregnancy, which assesses biological, sociological, and psychological factors. The system closely tracks the health of expectant mothers. They assess risk factors to the fetus such as alcohol, coffee, and tobacco consumption. They do ultrasound scans after the first 11 weeks and again after 21 weeks, with four in total.

When the Cuban health system reorganised in 2010, the maternal health programme consolidated the number of maternal homes for high-risk pregnancies from 300 to 138 nationwide, while still maintaining the same amount of beds. There was need for greater efficiency and to use resources better, said Mercedes Piloto Padrón, a senior specialist in the Department of Maternal and Infant Health at the Ministry of Public Health.

Since the regime came into power in the 1960s and health became a major priority, they wanted to end the practice of women delivering babies at home. Since the 1980s, nearly all births have occurred in hospitals.

Initially, the maternal homes were set up for women from rural areas. They have since become a common stopover for many expectant mothers because they now include assessment

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of a wide variety of risks such as mothers being underweight, suffering from chronic disease, or having multiple babies. The women stay until they are stable, and then go home, or if things get worse then they go to hospital.

Even with all of the otherwise positive statistics in maternal and infant health, exclusive breastfeeding for the first 6 months is only at 33%, down from 48% 3 years before. Piloto says it is unclear why this is the case. And the rate of caesarean sections nationally is around 30%, well above the recommended percentage of 10–20%.

Emergencies abroad

The prevention approach also extended to the Cuban medical mission sent to west Africa to aid in the Ebola crisis. In preparation for the visit, a model hospital was constructed so the team going to west Africa could prepare for conditions on the ground. That meant donning protective gear and exposure to heat and basic working conditions, as well as disposal of materials and bodies. WHO said that the staff should not touch patients, "but we Cubans are used to being on the front line, treating people well", said Jorge Pérez Ávila, director general of the Institute of Tropical Medicine in Havana.

Allison Shelley

Saada Ly, a Guinean medical student with ELAM, examines a pregnant woman

The Cubans treated about 6000 people with Ebola virus disease in 7 months in west Africa, and had mortality rates of less than 25%, he said. Out of the 255 doctors and health workers, only one Cuban health worker was infected, and he recovered—and asked to return to the field, said Perez. "That means our strategy was right."

For students from poor countries, the hope is that when they return home, they will help fill a medical personnel gap that can be devastating—a point driven home most brutally during the Ebola outbreak. "All the world saw that my country's health system was deficient", during the 2015 Ebola outbreak, said Saada Ly, a sixth year ELAM student from Conakry, Guinea. There were not enough doctors, not enough resources, but most of all a lack of government support for the health sector, said Ly, as he took a brief pause from working in a small two-room neighbourhood medical clinic in Cienfuegos. "We are poor, but we are not that poor."

Now, Ly says, more than 150 Guinean students are studying medicine in Cuba to eventually bolster the workforce back home. "It is a drop of water in the sea, but at least it is a drop."

Sam Loewenberg

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