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Dr Samlee Plianbangchang

Unleashing the potential of technology in intelligent vaccine management

According to WHO, India has only succeeded in achieving 65% coverage in basic immunization while countries with similar or lower per capita GDP are far ahead.

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By Dr. Davinder Gill
 CEO, Hilleman Laboratories ,
 MSD Wellcome Trust

India has come a long way since its 'Tryst with

Destiny' 70 years ago. This especially holds true if we look at the extraordinary evolution of our healthcare environment. Today, India is known globally as the "Pharmacy of the World". We not only create medicines for 1.3 billion Indians, we also export them in large quantities to other underdeveloped as well as developed nations of the

world. India's expertise at producing globally acclaimed medicines including vaccines has earned us the pride of being a nation which has the largest capacity for WHO prequalified vaccine manufacturing in the world.

For a nation to make such remarkable progress as ours, multiple reasons come into play. One very pertinent reason is the political will of the country, as rightly put by [Dr Samlee Plianbangchang](#) Regional Director, WHO, in his advice on strengthening public health for human development. A clear example of this is our commitment to 'Mission Indradhanush', which aims to realise 90% basic vaccination coverage in our population by 2018. What's more, in the BRICS Health Ministers' Meeting of 2017, the Indian Union Minister of Health and Family Welfare, [ç](#), reinstated India's growing commitment towards healthcare. He assured that the country's National Health Policy is completely aligned with the Sustainable Development Goals targets, with major focus on improving the country's vaccine programmes and drug security. This shows India's absolute resolve in meeting its Millennium Development Goal (MDG).

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However, as with any success story, there are gaps. For a country that provides 37% (1) of the total WHO pre-qualified vaccines, India is far from achieving complete coverage in immunization within its own population. According to WHO, India has only succeeded in achieving 65% coverage in basic immunization while countries with similar or lower per capita GDP are far ahead. For instance, Brazil stands at 90% and Mexico at 88%. This is quite disappointing given that India accounts for approximately one-fourth of global deaths from vaccine preventable diseases (VPD). Besides, supply of indigenously produced, low-cost vaccines is plentiful. What makes it further distressing is the fact that even countries with low resource settings, for instance Bangladesh, have been able to achieve near full immunization coverage. Thus, it is not good news for India. Today, India has ten million under-immunized children, and a frightening 1 of every 3rd child in the country is not fully immunized under our National Immunization Program. This

must change.

One of the most formidable challenges that exists in the country's healthcare system is the inefficiencies in vaccine management, mostly in logistics and temperature monitoring systems (2). Ironically our universal immunization program (UIP), which is among the world's biggest, is largely facilitated by indigenously developed vaccines, an admirable feat. In addition, almost all the globally recommended policies for vaccine management are adopted in India, including the use of [vaccine vial monitors](#) (VVMs), the shake-test, the [multi-dose vial policy](#) (MDVP), the use of diluents and the monitoring of vaccine wastage rates. But the country's vast population, geographical expanse combined with poor living conditions have vastly impeded the vaccine delivery system, leading to huge vaccine wastage and inadequate immunization coverage.

So, what's missing?

It takes meticulous planning, strong logistics and cross-functional innovation to transport a vaccine from its manufacturing site to administration in the field. At the heart of a robust delivery system is cold chain infrastructure . Cold chains help preserve vaccines at prescribed temperatures and maintain product-specific environmental parameters including air quality levels. They are the primary source for transporting and storing vaccines, more so in tropical climate of developing countries like India. A breakdown of the cold chain system results in wastage of vaccines due to exposure to environmental conditions. Administering expired vaccines can do more harm than good and must be avoided at all costs. Thus, lack of sustained cold chain management can prove detrimental towards achieving immunization coverage .

A study by the National Cold Chain & Vaccine Management Resource Centre (NCCVMRC) shows that in India there is a 25% shortage in overall cold chain capacity (National Cold Chain Assessment, 2014). There exists a glaring 200-300% scarcity in walk-in coolers (WIC) and walk-in freezers (WIF) (1) This is extremely worrying as India aims to introduce more vaccines within its UIP which is likely to further burden our crumbling systems.



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What the country needs at this hour is an efficient mechanism to optimise vaccine outreach and delivery. First, we need to build on our existing capacity including our technical staff by increasing their ability to handle complex vaccine environment and familiarize them with best practices in supply chain management. Second, vaccines under all conditions, need to be carefully temperature managed so that they don't lose their potency. Third, we need efficient collection of reliable data for informed decision-making in planning for vaccine distribution, in improving supply chains, and in introducing newer vaccines in the future.

Globally, and in India, newer technologies are being explored to minimise vaccine wastage. A case that needs special mention is the development of heat stable vaccines. Once fully developed, these vaccines will greatly relieve the need for cold chain, easing the logistical problems that we face today and bringing down costs (7). This also means it will be much easier to store, transport and administer vaccines across multiple geographies. Consequently, these next-generation heat stable vaccines can be delivered to the most remote corners of India, ensuring wider immunization coverage. Another great example of the use of newer technologies is the [Electronic Vaccine Intelligence Network](#) (eVIN). In 2014, the Ministry of Health and Family Welfare partnered with [UNDP](#) to design and implement an Electronic Vaccine Intelligence Network which allows healthcare workers to better understand the vaccine preservation machinery. The eVIN innovation is already making an impact in our UIP and early results suggest a promising start.

In short, these are exciting times for healthcare in India. The world of vaccines is showing more promise than ever. Technology and Innovation have made healthcare sustainability a real possibility of near future. And with the will to conquer and the technology in our grasp, I am confident that India will continue to surge ahead in bridging the gap of vaccine access and coverage among the most deserving of our people.



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PTI | August 29, 2017, 07:27 IST

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Reuters | August 28, 2017, 17:35 IST

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