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Reenita Das, Senior VP & Partner, Transformational Health (Healthcare) Practice, Frost & Sullivan

Policy

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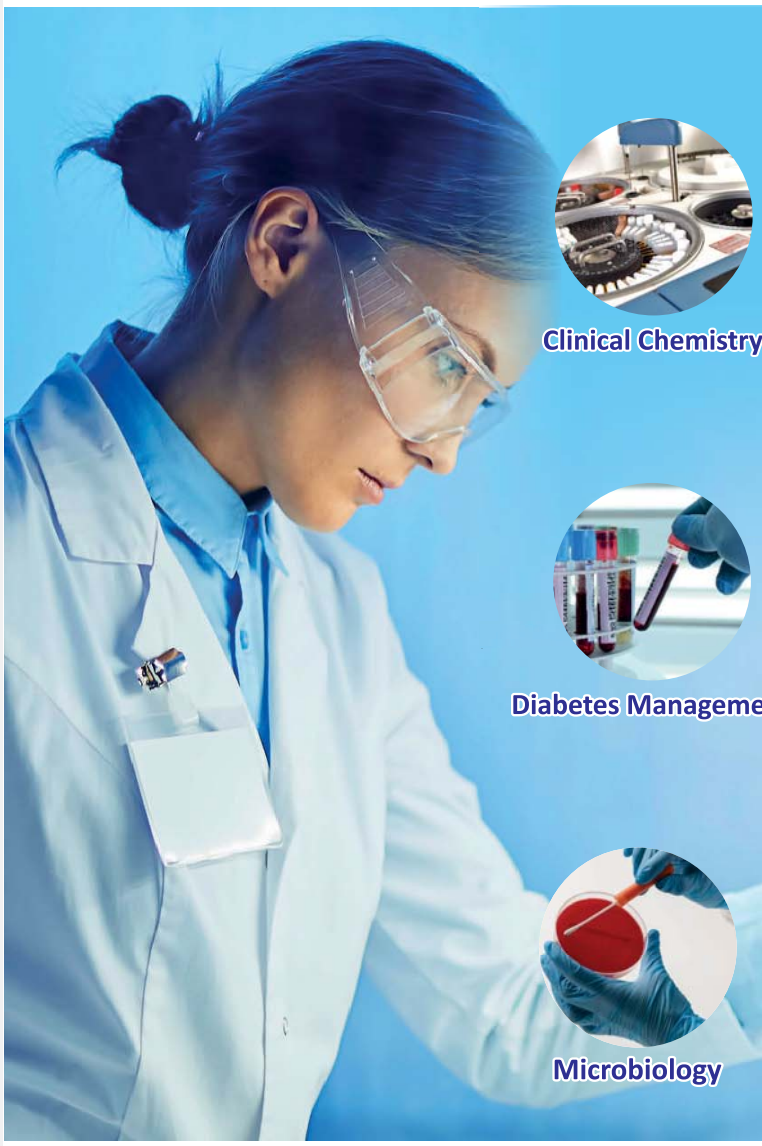

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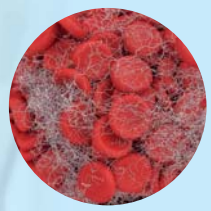

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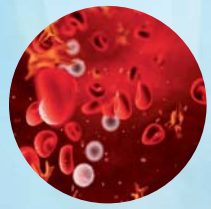

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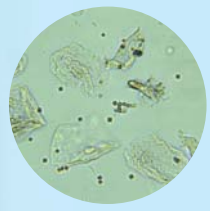

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Interview

Dr Kamini Walia
Senior Scientist with the Indian Council of Medical Research, New Delhi

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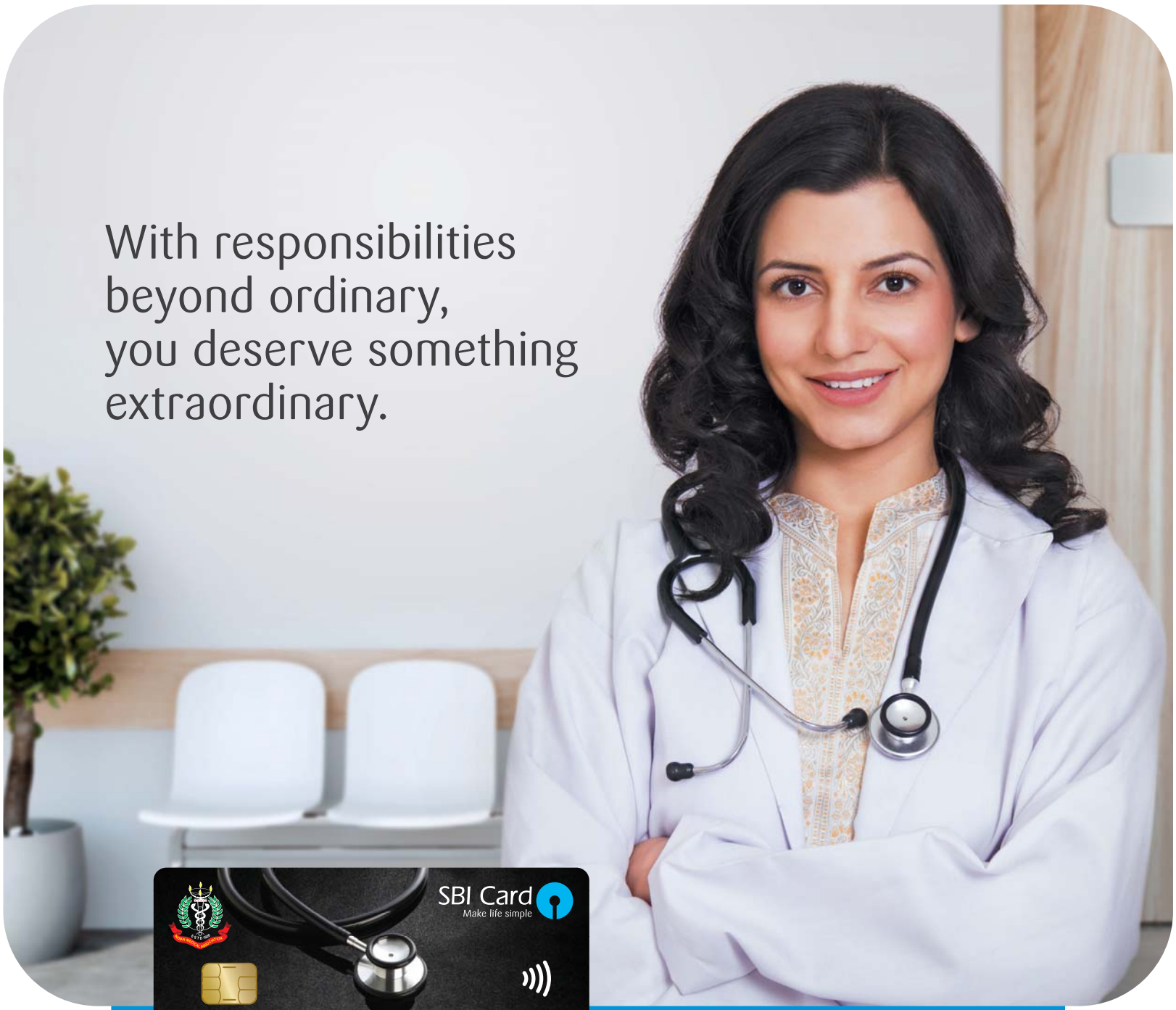

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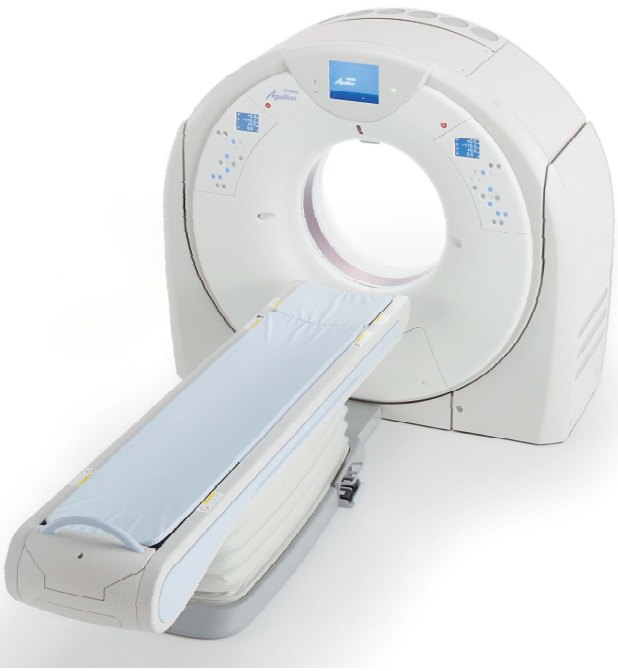

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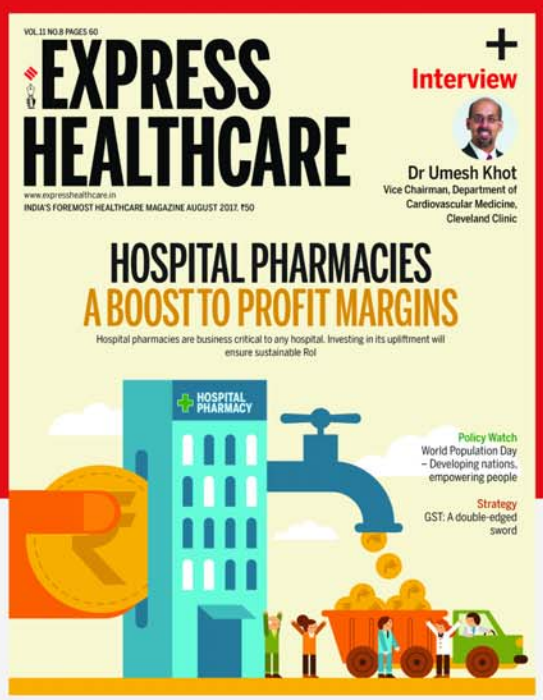

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Senior Scientist, Indian Council of Medical Research, New Delhi

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Making data drive health coverage

A recent study published recently in *The Lancet* provides hard numbers to back what health economists already know: that nations failing to invest in health and education are at risk of stagnating economies and lower per capita GDP. Positioned as the first-ever scientific study ranking countries for their levels of human capital, the study titled, "Measuring human capital: A systematic analysis of 195 countries and territories, 1990–2016" by the Institute for Health Metrics and Evaluation (IHME), University of Washington shows that India's ranking of 158th in 2016 represents an improvement from its 1990 ranking of 162nd. No doubt, we still have a long way to go, considering that India is now ranked just behind Sudan (157th), ahead of Namibia (159th). The US has in fact shown a massive drop from 6th place to 27th.

The question is, will the Ayushman Bharat – Pradhan Mantri Jan Arogya Yojana (AB-PMJAY) improve these rankings? Undoubtedly so, given that there will be many easy wins in the initial days. But we will have to fix the weakest links. High on the list of cautionary messages was the fact that previous schemes have not had the desired success. For example, an analysis based on data from the last National Sample Survey Office health survey conducted in 2013-14, shows that access to a government health insurance scheme may have had uneven effects across income classes and regions.

The good news is that while previous health schemes may not have had the disease statistics to guide them, this time we have good data to guide policy makers and implementors. The data comes from the latest India State-level Disease Burden Initiative, which was released on September 12, just before the launch of AB-PM-JAY. The findings, reported in five research papers, paint a very sorry picture of India's health as a nation over the last 25 years.

As a joint initiative of the Indian Council of Medical Research (ICMR), Public Health Foundation of India (PHFI), and IHME in collaboration with the Ministry of Health and Family Welfare, Government of India, the initiative is reportedly based on an analysis of all identifiable epidemiological data from India since 1990 as part of the Global Burden of Disease study.

Thus the findings should be "quite useful for titrating the Ayushman Bharat effort according to the need of each state," as Professor Vinod Paul, Member, NITI Aayog, said at the launch of the report. He goes on to say that these findings will be utilised "in collaboration with the state decision makers to determine the appropriate balance of activities under the Health and Wellness Centres to strengthen comprehensive primary healthcare in each state." If the ICMR-PHFI-IHME study can truly guide the implementation of Ayushman Bharat, there is hope that we will see more positive health outcomes.

If the ICMR-PHFI-IHME study can truly guide the implementation of Ayushman Bharat, there is hope that we will see more positive health outcomes

Four diseases have the highest overall burden in India: ischemic heart disease, lower respiratory infections, chronic obstructive pulmonary diseases (COPD), and tuberculosis (TB). In the last quarter of a century, State-level Disease Burden Initiative shows that the prevalence of ischemic heart disease and stroke has increased by over 50 per cent, with an increase observed in every state.

The rate of increase in the burden of ischemic heart disease and diabetes has been the highest in the less developed states of India, where the burden of COPD and infectious conditions is already high.

The number of persons with diabetes in India has increased from 26 million in 1990 to 65 million in 2016. This jibes with the other estimates that put India as the country with the second largest number of diabetes cases (73 million in 2017). On the cancer front, the proportional contribution of cancers to the total health loss in India has doubled from 1990 to 2016, but the incidence of different types of cancers varies widely between the states.

The number of chronic obstructive lung disease cases in India has increased from 28 million to 55 million from 1990 to 2016, and death rate among these cases is twice as high in the less developed states than in the more developed states.

A worrying statistic is that suicide is presently the leading cause of death in the 15-39 year age group in India, 37 per cent of the total global suicide deaths among women occur in India, and suicide death rate among the elderly has increased over the past quarter century. This is also the most economically productive age group so policies need to be geared to analyse the root causes and take remedial action.

Many of these issues will be discussed at the fourth edition of Healthcare Sabha, our public health focussed event, scheduled for this October 5-6 in Delhi. Do look out for a detailed report in November issue of *Express Healthcare*.

VIVEKA ROYCHOWDHURY *Editor*
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INTERVIEW

Femtech had overall funding of over $1 bn, in the last few years

Reenita Das, Senior VP & Partner, Transformational Health (Healthcare) Practice, Frost & Sullivan, speaks on the advances in femtech, its impact on women's health and future growth drivers and trends of the segment, in an exclusive interaction with **Lakshmipriya Nair**

Despite huge unmet needs in women's health across the world why did it take so much time for this segment to emerge and gain recognition?
The delay in gaining recognition was primarily due to the industry's focus on chronic diseases in the last five to six decades. It was only in this decade that the focus extended beyond cancer, cardiac diseases etc. to lesser fatal diseases that people were suffering since a long time, such as respiratory diseases, sleep disorders etc. This move brought focus on women's health conditions, and thus to Femtech. Women's per capita health expenditure in the US is 25 per cent more than the male per capita health expenditure. Globally, over the years, healthcare products and solutions were designed, developed, and delivered without recognising the need for differentiated care for men and women considering the fundamental differences in physical, physiological and psychological factors. Impact of this is particularly true in India where the disparity in healthcare delivery is high based on differences in gender, socio-economic status and regional divide, and this often puts healthcare delivery for women on the back foot. Science and technology has driven these changes as well.

Can you elaborate on the need for gender-specific healthcare and how femtech is enabling a more individualised approach to effectively serve women's healthcare needs?
Femtech is not just a product for women's health conditions, but is also for customising products for women, based on their anatomy, even for chronic diseases affecting both men and women. According to research, 60 per cent of the US population has more than one chronic condition and women tend to have more than three chronic conditions on an average, as they grow older. To improve the quality of life for women, we can't have the same technologies and treatments for both genders. This has led to the need for customising the solutions for women. The focus of femtech currently is towards preventive care and wellness, which works best when the treatment/ monitoring is individualised.

I read an earlier article written by you which mentions that Femtech is set to be the next big disruptor in the global healthcare market. What are the factors combining to bring this about?
Femtech had an overall funding of more than $1 billion, in the last few years, which is a significantly high investment for an emerging sector in the short term. Most of the investments are driven by financial companies, not by major medical technology companies. This is a big driver because of the culture of investment companies to drive sales and develop the sector before they sell the companies. Interestingly, now the medical device associations, regulatory bodies are understanding the significance of femtech solutions in saving money for health systems and improving quality of women's life.

What are the factors encouraging/inspiring healthcare companies/ innovators/investors to

actively develop specialised, interactive applications for women's health?
Healthcare is in transition. The health systems are moving towards wellness and preventative care. Consumerisation of health and engagement of patients in their health and treatments has the changed the world for device manufacturers. Solutions that are customised, targeted and easy to manage for patients have the highest adoption rate even if it is out-of-pocket spending. Hence, now is the time to grow this sector.

What are the five big growth opportunities in femtech? In which areas of women health are we witnessing a major transformation due to femtech solutions?
Women's health and wellness, reproductive health, pelvic and uterine care, maternal and infant care are key areas witnessing transformation today with product launches and investments. It is interesting to note that the quality of life of women in these segments is poor, across both established and emerging geographies. Thus, affordable solutions in these segments for women in US or in India will have significant impact.

A Frost & Sullivan report released early this year predicts that with 50 per cent of the global population as target customers, femtech has a market potential of $50 billion by 2025 globally.

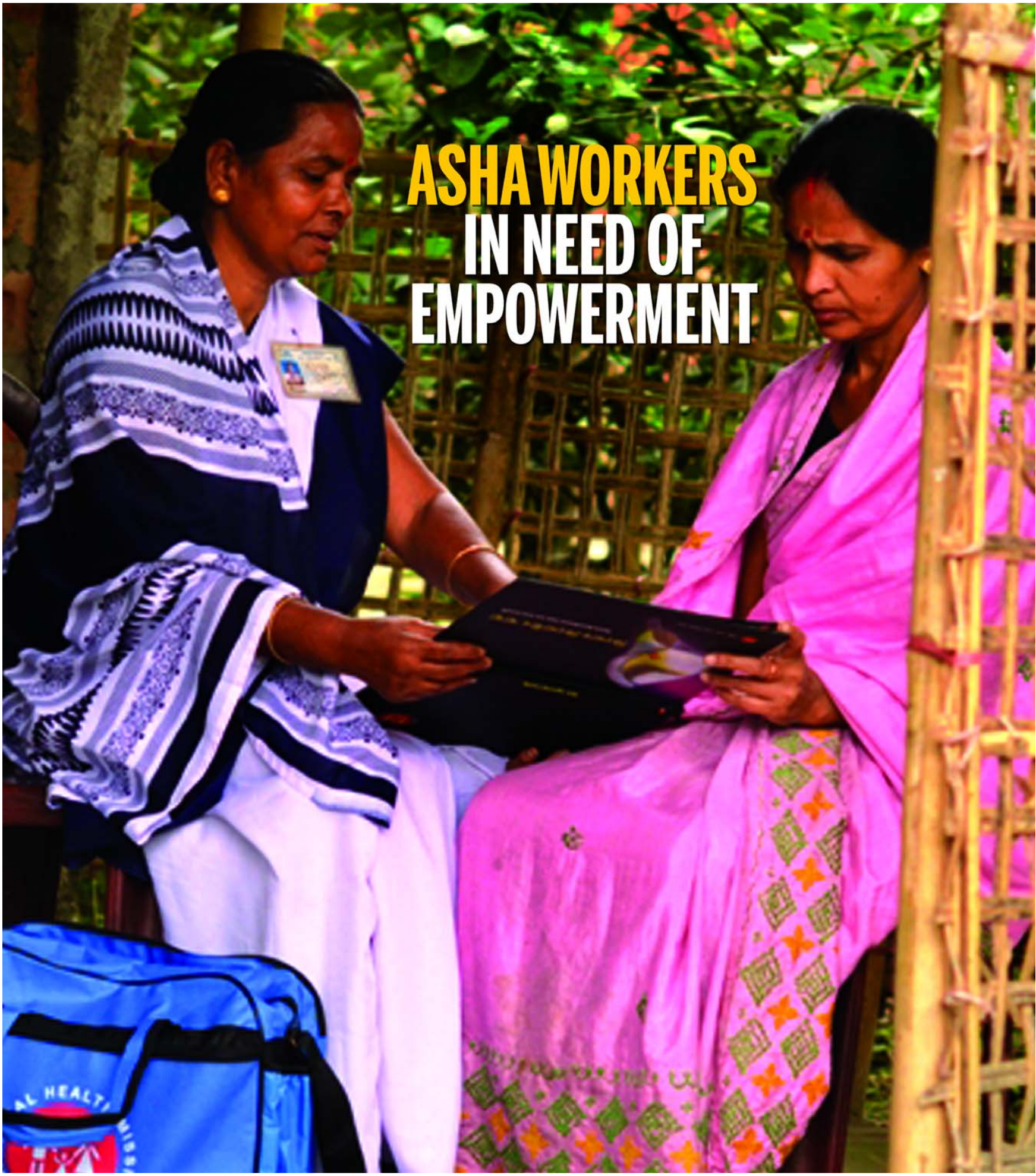
Can you throw more light on its market potential in India?
It is too early to predict market potential for India, but we anticipate significant change in women's mindset for femtech product adoption in the country. This we believe will help reduce the rural and urban divide in women's health in the country.

What will be the future trends in this segment?
The next focus of femtech solutions will move to customise the treatment for chronic diseases in women and use AI to improve quality of life for women using technologies, devices and apps. Anti-ageing, osteoporosis prevention etc. are expected to be the buzz words.

lakshmipriya.nair@expressindia.com

Next focus of femtech solutions will move to customise treatment for chronic diseases in women and use AI to improve quality of life for women

ASHA WORKERS IN NEED OF EMPOWERMENT



The strongest link in India's public health system, the Ashas are faced with several challenges. Their stories reveal some stark realities of the bureaucracy, corruption within the system and atrocities imposed by nurses, paramedics and senior medical staff working in the government sector

By **Raelene Kambli**

In January 2018, Jamena Khatun — an Asha worker from the Assam's Chikonmati village in Darrang district during her routine checkup identified that a four-year-old girl child, Nurjahan Begum was suffering from severe acute malnutrition (SAM). In a family of five siblings, Nurjahan's parents working on daily wages were unaware of the condition. Due to lack of finances, the parents were unable to provide their kids with nutritious food and medicine. Moreover, the family was not willing to take help of the Kharupetia Nutrition Rehabilitation Center (NRC) of Darrang district as they lacked trust in the system.

In Assam, prevalence of under-nutrition is relatively high among under 5 children. The recent data from NFHS-4 (2015-16) reveals that almost one third (29.8 per cent) children under five years of age are under-weight, 36.4 per cent children are stunted and 17 per cent children are wasted with 6.2 per cent of children are severely wasted.

Darrang district records a high load of severe acute malnourished children and is identified as an National Nutrition Mission (NNM) plus Aspirational district in Assam. Among the whole under population (123840) of drawing district, the percentage of stunting, wasting and anaemia is 43.5 per cent, 19.2 per cent and 45.5 per cent respectively and severity is more among the social economically backward population. Though children with SAM are identified in different vulnerable pockets, it is very difficult for an ASHA to motivate the child to admit in the Nutritional Rehabilitation Centre.

In keeping with this, Jamena put all her efforts in trying to convince the parents to seek help at the NRC as well as began the child's nutrition diet at home. However, since Jamena has limited resources, she couldn't do much to improve the child's medical condition. Jamena regularly visited the patient and continued to counsel the parents. When she realised that little Nurjahan had developed severe complications associated with SAM, she pursued help from Kshetrimayum Rojita Devi in order to convince Nurjahan's parents.

Jamena and Devi's relentless efforts finally won Nurjahan's parent trust and the little child was taken to the Kharupetia Nutrition Rehabilitation Center. At the time of admission, Nurjahan's condition was fatal. According to the NHM State Programme Manager, Dr Dipjyoti Deka, Nurjahan suffered from multiple complications. Weakness, apathetic, failure to thrive, conjunctival xerosis, fever and cough were a few to name. Her health indicators are mentioned below:

After weeks of treatment, Nurjahan's condition improved and now she is back with her family.

In this case, Jamena's adherence to her duty, her conviction and efforts put to save the life of a little child is commendable. She is certainly the cause why Nurjahan survived and now lives a better life. Like Jamena, there are several Asha workers who have dedicated their lives in the service of the nation.

A survey conducted by the Ministry of Health and Family Welfare between 2005 and 2012 indicates that health outcomes after the introduction of the ASHA programme have improved phenomenally in India. As per the report, a significant decline has been achieved in IMR from 58 per 1000 live births in 2005 to 30 per 1000 live births in 2012. Five states achieved the target of less than 21 and 12 states were in the range of 30-40. Maternal Mortality Ratio (MMR) reduced to 100/100,000 in 2012 from 301 in 2001. This could be achieved due to promotion of more institutional deliveries by ASHA workers. All thanks to this inevitable force of India's public health system, we have been successful in controlling and eradicating dreadful diseases such as polio. Over the years, there has been an increasing ownership of ASHAs within the health system. According to Dr Rajna Mishra, Senior Research Scientist & Project Lead, Public Health Foundation of India, "Asha workers are being valued as a key community resource for their facilitatory roles, their other two key roles in terms of activist/social mobiliser and community care provider is yet to be fully realised." Furthermore, during a public gathering in September this year, Prime Minister Narendra Modi hailed the efforts put by the ASHA community in order to improve the delivery of health and nutritional services within the country. He also announced the doubling of routine incentive packages offered to the Asha workers by the union government to motivate them. In addition, all Asha workers and their helpers will be provided free insurance under the Pradhan Mantri Jeevan Joyti Bima Yogna and Prime Minister Suraksha Bima Yogna.

Having said that, despite the recognition received so far, their achievements are not equivalently rewarded. There are several road blocks that hampers the successful implementation of the Asha workers programmes.

Factors affecting the performance of Asha workers

Right from convincing and counselling people, to delays in incentive payments to harassment from senior medical staff at district level, Ashas in India are faced with several challenges which not only demotivate them but hampers the implementation of health programme. A research report published in 2015 in the *Human Resource for Health* journal cited various challenges faced by Ashas. The report based on a large study revealed that the selection of ASHAs is influenced by power structures and poor community sensitisation of the ASHA programme. This presents a major risk in the long run to the success and sustainability of this programme. Moreover, during

Anthropomentry / Clinical features	At the time of addmission	At the time of discharge	After 4th follow up
Weight	6.675 kg	8.105kg	9.340kg
Height	74.7cm	74.7cm	Z score
< -3SD	< -3SD	Normal (median)	76 cm
MUAC	9.5cm	11.5cm	13.6cm
Visible wasting	Yes	No	No
Bipeadal edema	No	No	Other medical complication
*Yes	No	No	No

our research, *Express Healthcare* found out that the primary health centres which ASHAs are linked are ill-equipped. At times, these health centres do not even have a gynaecologist. ASHAs therefore, experience adverse consequences in their ability to inspire trust and credibility in the community.

Dr Misra explains, "Issues related to low incentive payments, delay in payments and release of funds, and rates of attrition are a cause for concern. Even though time lag between the selection of ASHAs and their trainings has been an issue in some states. Problems relating to the availability and replenishment of drugs and equipment kits for ASHAs is another hurdle. The need to improving the quality of skills of ASHAs related to nutrition, counselling for family planning, recognition of danger signs of pregnancy, and first contact care for sick newborn and children were also being pointed out from some states (10th CRM Report). The success of the ASHAs also depends on the 'triple AAA' platform (ASHAs, AWWs and ANMs) for convergent planning and implementation of programmes between the health and the ICDS departments."

Additionally, there are some ASHAs that have limited knowledge about their role as an 'activist'. Apart from this, their stories reveal some stark realities of the bureaucracy, corruption within the system and atrocities imposed by nurses, paramedics and senior medical staff working in the government sector.

Pramila Singh, an Asha worker from UP informs about the trails they have to undergo to ensure that good health in their community. "It has taken a lot many years for us to change the mindset of people, especially, women convincing them to have institutional deliveries. In our region, today, we have managed to increase institutional deliveries by around 60 per cent. This has helped in reducing MMR in our region. However, women struggle to get their cash benefits. The cash benefits take more than seven to eight months to reach the patients. At times, we have to help these patients financially in order to help them get nutritious food. We feel, after so much efforts put by us, we don't get our incentives on time. It takes several months of us to get our incentives."

While, Singh spoke to us, she also indicated of the ill-treatment done by nurses and paramedics at the health centres. "Usually, the women who seek help at the government's health centres are extremely poor. Nurses many times are very rude to these patients. When the doctor is not around, the nurses and other medical staff really act rude. Moreover, we have a severe shortage of ambulance services and we have to bear with the ambulance attendant's bad attitude."

Similarly, Netrdipa Patil speaks about the situation in the Kolhapur region of Maharashtra. She is also part of the Asha workers union for the state of Maharashtra. She says that in Maharashtra there are around 65,000 Asha workers and they all have similar issues. In her region, Patil caters to around 30,000 people with only two ANM centres. Asha workers in her region also face with identical problems of harrassment by senior nursing staff. While speaking also she revealed some startling facts. "Apart from a very incentive package of approximately ₹1.50 or ₹2 for a patient survey which is again delayed for six to seven months, we are faced with a severe shortage of medicine since the year 2009. Calcium tablets, Paracetamol, iron supplements, cough medicines which is a regular demand are in scarcity for a long time. We have met the Health Secretary and the Health Commissioner several times in these years. But as officers change, rules and methods of work also change. Recently, we met the current Health Secretary of Maharashtra, who announced that the government has finally come will a solution to ensure that

Pictures used for representational purpose

STATISTICS ON ASHA WORKERS AS OF JANUARY 2017

Statistics on Asha workers as of January 2017
In India, there are around 877535 ASHAs working under the National Health Mission Program (NHM) and 93 per cent of ASHAs are in position at the national level (as on January 2017; Update on ASHA Program, MoHFW, 2017). Of these, 498440 ASHAs are from high focus EAG states, 55189 from North East, 323093 from non-high focus states and 813 from the Union Territories (UTs).

34 out of 36 States/UTs are implementing ASHA programme under the National Urban Health Mission (NUHM). A total of 42,769 ASHAs (60per cent) have been selected in urban areas. As per the norms, there should be an ASHA for every village with a population of 1000. The average population being covered by each ASHA was 902 and varied from 880 in EAG states, 653 in North East and 980 in Non EAG states (as on January, 2017).

ROLE OF ASHA WORKERS

For years together, Ashas have acted as an interface between the community and the public health system. They serve as the first port of call for any health related demands of deprived sections of the population, especially women and children who find it difficult to access health services. Empowered with knowledge and a drug kit to deliver first-contact healthcare, every ASHA is expected to be the fountainhead of community participation for public health programmes in her village. She receives performance based incentives for motivating women for institutional deliveries, promoting universal immunisation, referral and escort services for Reproductive & Child Health (RCH) and other healthcare programmes, and construction of household toilets. Besides, she is a promoter of good health practices and provides a minimum package of curative care services and ensures timely referral of cases. She is supported by other institutional support mechanisms such as women's committees (Self-help groups or women's health committees), village Health Sanitation and Nutrition Committees of the Gram Panchayat, peripheral health workers especially ANMs and Anganwadi workers, and the ASHA mentors.

THE ASHA USUALLY FULFILS 10 CRITICAL FUNCTIONS FOR THE COMMUNITY WHERE SHE OPERATES AS FOLLOWS

1. Create awareness and provide information to community
2. Counsel mothers on birth preparedness, safe delivery, feeding practices, immunisation, family planning, RTI, etc
3. Facilitate community access to health care and health facilities
4. Accompany pregnant women and children to health facility
5. Provide care for minor ailments
6. Act as depot holder for ORS, IFA, DDK, Oral pills, condoms
7. Provider of DOTS
8. Newborn care and treatment of childhood illness (IMNCI)
9. Inform birth and deaths, disease outbreaks
10. Construction of Toilets for TSC (Total Sanitation Campaign) -Not included in UP state policy for ASHAs

medicines will not be in short supply. But, we are unsure of its implementation."

Patil also informed of the health surveys that they have recently conducted in the Kolhapur district that recorded 19,000 cancer cases with the region. She informed that the government officials indicated them of the survey, but no training is been provided to Asha workers to conduct such tests. Further on, the launch of the Ayushman Bharat scheme has brought more work for the Ashas as they will act as a key link with a responsibility on educating and convincing people to enroll themselves under this scheme. "People will be offered a cover of ₹5 lakh but we will get an incentive of ₹ 5 per registration only," she lamented.

While Singh and Patil are agitated with situation in their states, Pinky Tyagi from the Haridwar district, Uttarakhand and Jamena Khatun have been very contented in the facilities they receive in their region. Tyagi says that their payments have been on time, patients and doctors are cooperative and facilities at the health centres and hospitals are good. She says that more training and collaboration from the government will improve their work and bring in more efficiencies in the system.

Patil also believes that more training and proper planning of any new schemes is a must in order to increase competence among Asha workers. "The focus of our health programmes should be directed towards preventive care rather than looking to cure illnesses. If we want to build a strong and healthy nation, we should encourage a healthy lifestyle. Our Asha workers, therefore need to be uplifted and educated to take on better roles as health advisers", she recommended.

Empowering Ashas

In the same light, Indraprastha Institute of Information Technology Delhi (IIIT- Delhi) has come up with a project Sanghosti that is targeted at building a low cost technology-enabled solution for empowering ASHA workers. It is a research project which aims to strengthen an ASHA work by educating her though innovative mobile learning platforms. Last June, IIIT-D conducted a field deployment programme in Haryana to train 20 ASHA workers on Home-Based Newborn Care with the help of PGIMER Institute (Chandigarh) and a NGO SWACH (Panchkula, Haryana).

During their research, Sanghosti found significant positive results in terms of both imparting knowledge to the ASHA workers and in providing direct benefits to the corresponding target families. The study highlighted the potential of Sanghosti to establish a complementary approach to the traditional training mechanisms. IIIT-D is continuing their research and development on advanced features to make Sanghosti better.

Solutions like these, can be of great help in empowering the Ashas and facilitating them to realise their true potential as a health activists. In future, the government with needs to further increase the incentive packages for Ashas in order to motivate them. Also, look at better governance of the Asha programmes and take serious action on cases of harassment.

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INTERVIEW

‘Better regulations around diagnostics will ensure availability of quality diagnostics’

In a big step to address the widespread problem of inadequate access to diagnostic tests, the World Health Organisation (WHO) this May came up with the first ever essential diagnostics list (EDL). Inspired with the same, the Indian government is also putting together an EDL. **Dr Kamini Walia**, Senior Scientist with the Indian Council of Medical Research, New Delhi, explains the importance of EDL in conversation with **Raelene Kambli**

The government is looking at creating its own set of EDL for India. The WHO EDL is a reference document for all countries. India has its own set of health problems and the Indian list should address those health priorities

What is the main focus of the essential list of diagnostics? How important is this list of diagnostics in the Indian context?
WHO has brought out its first list on Essential list of diagnostics. The main focus of this diagnostic list is on primary healthcare as priority and to suggest tests for all levels of healthcare. It is important and should be implemented by programmes like TB, HIV etc.

Tell us more on the tests this list covers? The list has around 113 products for blood and urine test. Around 55 are priority tests. Can you shed some light of these priority tests?
There are tests and then there are supporting tests. the tests given in WHO list have been divided into two categories: primary health care and the rest.

The first edition of the EDL starts with two categories of in vitro diagnostics (IVDs)—general and disease specific. These recommendations are drawn from existing WHO guidelines, manuals and priority lists of medical devices that have been supported by a review of the evidence. The EDL includes basic information on the test: if it is for general routine assessment or specific to a disease, the purpose of the test, the assay format, type of sample, links to relevant WHO documents, or to any WHO prequalified or endorsed products. The general IVDs include those for clinical chemistry, blood transfusion, serology, microbiology, mycology, parasitology and haematology. These tests form the basic IVDs package to support routine diagnosis and monitoring of many conditions, such as diabetes, cardiovascular, anaemia and liver function. The disease-specific IVDs reflect the existing global priority disease priorities on WHO work programme; HIV, Hepatitis B and C, human papilloma virus,malaria, syphilis and uberculosis.For each IVD, it was recommended that guidance should be given to member states as to which level of care the test is most suited to; primary care or more specialised facilities, according to level of the facilities and expertise required. Primary healthcare tests can be used in mobile units, emergency situations, at home, community level and includes self-testing products. Other tests are more suited to clinical laboratories.

How is this going to be applied in India? What is your opinion on the same? Why does India need a separate set of EDL?
The government is looking at creating its own set of EDL for India. The WHO EDL is a reference document and all countries are advised to devise a list as per their health priorities. India has its own set of health problems and the Indian list should address those health priorities.

How will this EDL help in bridging the gap of quality access to affordable diagnostics in India?
By creating an EDL WHO is ensuring that all communities everywhere can benefit from diagnostic technology as a key component for achieving UHC. But implementation in countries will be critical. While some countries already have national lists of medical technologies/devices (57 per cent of 173 countries), others still not.As with the Model List of Essential Medicines, it is expected that India will adapt the EDL to suit our needs and systems, according to their local settings, work force, facilities, epidemiology and budgets. In future this is expected to pave way for more efficient procurement and affordable prices of diagnostics at all levels of health care.

India’s diagnostic sector is fragmented. This is sometimes detrimental to patients as they do not receive good quality diagnostic care. What according to you can help in disciplining this sector and ensuring quality access to diagnostic care to every Indian citizen?
Having an EDL along with the free diagnostics initiative will ensure availability of diagnostics at all levels of health care. Better regulations around diagnostics will ensure availability of quality diagnostics. Also important is consensus on diagnostic pathways for each syndrome. This will reduce the oportunity/utilisation of wasteful diagnostic tests.

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KING'S COLLEGE HOSPITAL NHS FOUNDATION TRUST

Indo UK Institute of Health (IUIH) has tied up with King's College Hospital NHS Foundation Trust for bringing world-class NHS standard healthcare to the first two of its eleven integrated medicities coming up in Nagpur, Maharashtra; and Amaravati, Andhra Pradesh. Here's an overview of the King's and its legacy...

King's College Hospital NHS Foundation Trust – or "King's" as it is more affectionately called by patients and staff - is one of the largest and most complex Foundation Trust's in the UK. Founded on its current site at Denmark Hill in 1913, it has grown to include the Princess Royal University Hospital (the "PRUH") and Orpington Hospital in Bromley as well as providing specific services elsewhere in South East London at Beckenham Beacon and Queen Mary's Hospital, Sidcup.

The Trust's 11,000 staff treat over one million patients every year and annually over

9,500 children are born in its maternity wards. The Trust also operates two emergency departments – one at Denmark Hill and one at the PRUH. On an average day, the emergency departments can treat between 450 and 700 patients, making them two of the busiest emergency departments in the UK.

Additionally, King's College Hospital is also one of London's major trauma centres and in 2017 the hospital played a major role in the capital's response to the three major incidents at Westminster Bridge; London Bridge and Borough Market and the fire at Grenfell Tower.

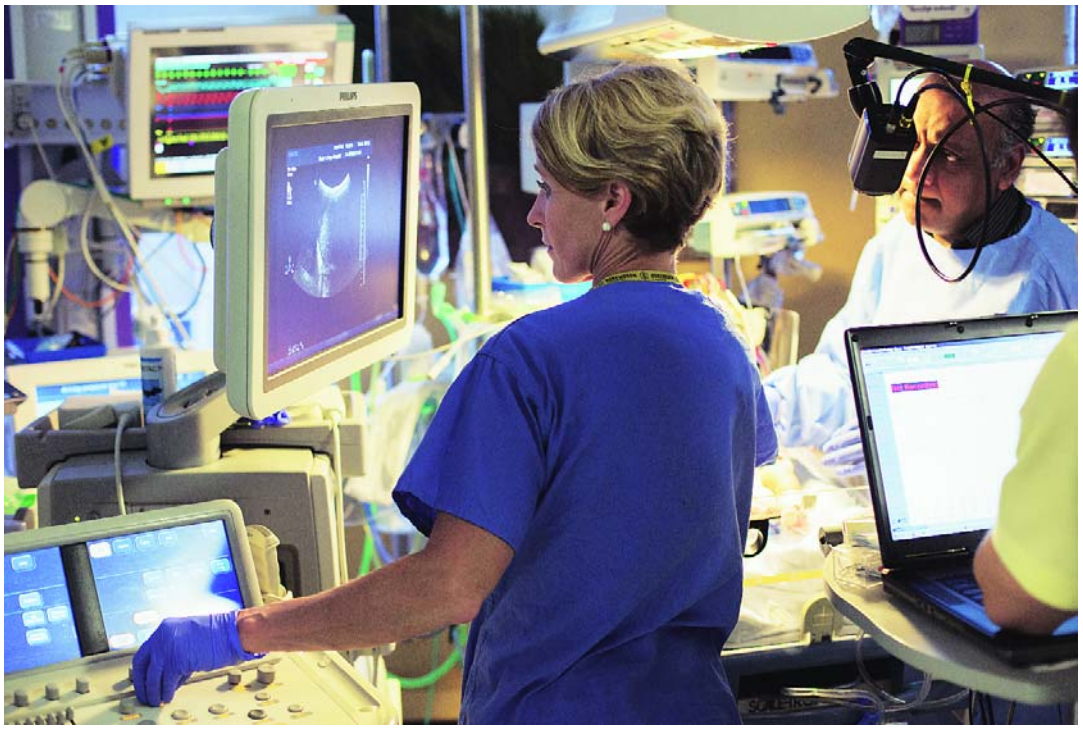
As well as being one of the UK's leading teaching hospitals, King's is also internationally renowned as a specialist and research hospital. It provides treatment and ongoing care in liver disease and transplantation, neurosciences, haemato-oncology heart disease, children's services and foetal medicine. At the forefront of innovation, over the past year alone the Trust has spearheaded advances in medical research and techniques that are improving the outcomes for a large number of patients.

Professor Keyoumars Ashkan, Professor of Neurosurgery at King's, is the European Chief Investigator for a trial that is developing a vaccine to treat patients with glioblastoma, the most aggressive form of adult brain tumour. The ten-year trial, involving patients from the UK, Germany, Canada and the US uses the patient's own immune cells.

King's College Hospital was also the first hospital in the UK to carry out an aortic valve replacement using a new type of durable biological heart valve. Traditionally, the procedure used either mechanical heart valves, which required patients to take blood-thinning medication for the rest of their lives to avoid the formation of clots – this is particularly problematic for younger people who want to avoid taking life-long medication and women hoping to have children as such medication prevents a successful pregnancy – or biological values which had limited durability and would require frequent replacement. The new valve does not require patients to take blood thinning treatment and does not need to be replaced as frequently, giving patients a double benefit.

Professor Wendler, Professor of Cardiac Surgery at King's College Hospital carried out the very first procedure, commented: "Although we have been replacing damaged aortic valves for many years, this new device is a game-changer for patients who do not want to take blood thinning medication, especially women hoping to start a family. We have avoided using mechanical valve prostheses in this group of patients due to the problems associated with blood thinning medication and pregnancy, and have relied on biological prostheses with limited durability. As a consequence, younger patients have required multiple open heart surgeries. This new prosthesis combines the best from both devices; it's durable and patients do not require blood thinning medication. This means fewer operations, the possibility of a healthy pregnancy and a good quality of life."

Technology is also becoming increasingly integrated into the care of patients. In another first, a team at King's developed the first ever virtual reality app in an NHS setting to help reduce anxiety in children. The app helps to prepare the youngest patients for MRI scans which can be a frightening experience and can require the use of a general anaesthetic to get through the scan.



By using panoramic 360-degree videos children experience what an MRI scan involves before the real thing takes place. The resource can be viewed on a virtual reality headset or explored on a phone or tablet. Called My MRI at King's, the app takes children all the way through the events that will happen on the day, from arriving at the hospital to entering the scanner. The VR technology allows children to feel as though they are inside an MRI scanner and experience what it will be like on the day. Children have the opportunity to get accustomed to the loud tapping noises that happen during the scan (this is the electric current in the scanner coils being turned on and off), as well as learning that they need to keep still for the duration of the scan.

As the NHS celebrates its 70 anniversary in 2018, King's remains at the vanguard of providing the best quality care for all its patients for generations to come.

Slow and steady, the Jupiter Hospitals' way

Dr Ajay Thakker, Chairman and Managing Director, Jupiter Hospitals, believes in the greenfield over brownfield strategy. Thus while his first decade as a radiologist turned healthcare entrepreneur was dedicated to stabilising the Thane and more recently the Pune facilities, he is now scouting for a third location, again in Mumbai's suburbs. His son **Dr Ankit Thakker**, CEO, Jupiter Hospitals, has started on the groundwork for their first international foray: an LA- based neuro rehab centre

By **Viveka Roychowdhury**

The year was 2005. As an experienced radiologist, Dr Ajay Thakker had a thriving imaging practice in Thane, a suburb of Mumbai. Having being born and brought up in the same district, he started observing a disturbing trend. Quite often, the results from his practice would be the first indication of internal abnormalities like brain tumours, abdominal mass, etc. This would be the beginning of a very traumatic time for such patients and their families, as they struggled to cope with further treatment. But besides the costs, he realised that travelling to larger hospitals in South Mumbai and western suburbs for tertiary care was equally, if not more, draining on both patients as well as their care givers.

As he puts it, "I would see patients running from pillar to post for their tertiary healthcare. There were about 2000 primary and secondary healthcare beds in Thane and surrounding areas, but there wasn't a single tertiary care facility. If even 10 per cent of these 2000 patients need tertiary healthcare, you can definitely provide this care in Thane." And this was the rationale for shutting his successful imaging clinic and turning entrepreneur.

Leading a group of doctors, he shortlisted a location close to the arterial Eastern Express Highway, which was easily accessible to residents from nodes around Thane, like Mulund, Bhiwandi, Airoli, MIDC and SEEPZ as well as Navi Mumbai. A little more that 22 km away and an hour's drive from Mumbai's International airport, the three acre Thane facility, which was inaugurated in 2007, also sees a fair share of patients from different states of India as well as overseas.

Dr Ajay Thakker, Chairman and Managing Director, Jupiter Hospitals with his son Dr Ankit Thakker, CEO, Jupiter Hospitals

Jupiter Hospital's Thane facility with 350+ beds across seven floors

Today, Jupiter Thane is a tertiary care centre providing comprehensive healthcare in all segments, from birthing to geriatrics and end of life care, 'a community hospital'. Equipped with 350+ beds across seven floors, the facility reportedly houses a cancer care clinic, cardiac care including open heart surgeries, the region's largest paediatric facility with a 50 bedded Children's ICU, as well as a liver and kidney transplantation facility. On the accreditations front, Jupiter Hospital Thane became the region's first NABH accredited institution.

Expanding on the philosophy behind the group, he says that besides being a community hospital, as the promoters are all doctors, they were clear that the group should offer learning and teaching opportunities for the doctors and clinical staff themselves, along with clinical care for patients. Thus post graduate education became a major thrust. Currently the group has more than 50 students doing their DNB post MBBS, for three years. They also have teaching programmes in orthopaedics, paedriatrics, anesthesia, radiology, radiotherapy, surgery MUHS post MS, programmes in critical care.

The second milestone

With the first facility in place

and thriving by the fifth year, the management, led by Dr Thakker decided to expand to a second location. Pune as a city was an obvious choice due to its proximity to Mumbai, which meant that the promoters could monitor both Thane and the upcoming facility very easily. Within Pune, the promoters zeroed in on Baner because it is a newly developed node with a population of about a million residents, but with no healthcare facilities within 5-6 kms. Situated near Prathamesh Park, Baner, this is a strategic location that helps to cater to the healthcare needs of surrounding major nodes like Aundh, Balewadi, Pimpri and Chinchwad. Like Thane, this zone lacked tertiary healthcare facilities and patients had to travel to the main city for secondary and tertiary healthcare.

Pune as a city was an obvious choice due to its proximity to Mumbai, which meant that the promoters could monitor both Thane and the upcoming facility very easily

Built over a period of two years, the Baner facility currently has about 150 operational beds, spread from the ground to eighth floors, with all OPD and diagnostic facilities located conveniently on the ground floor. Dr Thakker mentions that once all 13 floors are fully commissioned, it will have around 350 operational beds.

Baner is due to have its first NABH inspection in September, and after required changes are made based on the findings, it is expected to get its accreditation in October. He emphasises that the accreditations are important to sensitise the whole staff of the facility to the importance of having systems and processes in place, not just in terms of legality, but also to ensure continuity of care and patient safety.

The hospital segment has seen a wave of consolidation, with mega acquisitions like the Fortis- IHH Healthcare hogging the headlines. But there are many smaller strategic buyouts which help expand the footprint of a clinical strong player like the Jupiter Group. For instance, Apollo Hospitals acquired a 50 per cent equity stake in Lucknow based 330 bedded-Medics Super Specialty Hospital to strengthen its position in the North India market. But while this may seem an attractive strategy to build a network in Tier II, III, and IV towns, Dr Thakker remains a firm advocate of greenfield rather than brownfield projects.

"We don't believe in acquiring existing facilities because we believe that older hospitals, with their infrastructure, were good for that point in time. The same infrastructure is not good enough for today."

Tackling the affordability challenge

While patients flock to Mumbai for treatment, observers point out that setting up a hospital as well as the cost of healthcare in some smaller cities could in fact turn out to be much more affordable for both hospital managements as well as patients. Dr Thakker acknowledges this fact. Pune for instance, is about 15 per cent cheaper than Mumbai, due to the lower cost of land, infrastructure, human resources. The cost of living in Pune is therefore lower so patients would find it more economical, provided they can get the same level of care.

But this logic does not extend beyond a certain point. Dr Thakker reasons that cost is a function of the medical condition. Certain procedures, like for example liver transplants, require a huge number of consumables, like drugs and equipment, which might need to be imported or are made only by MNCs. For these kinds of procedures, the cost will not differ much between cities because the requirement and therefore cost of consumables would remain the same beyond a certain point.

Inflation over the last decade has hit all business sectors and healthcare entrepreneurs like Dr Thakker are no different. Comparing the costs of putting up the two facilities, he says, "When we started on the Thane facility (around 2005), the rupee-dollar exchange rate was ₹ 42/43. Today it is ₹ 70 to the dollar. So if the installation cost per bed in the Thane facility was ₹ 60-65 lakhs, today its above ₹ 1 crore, minus the cost of the land. So inflation does impact the installation cost. Similarly, the costs of other components required to put up a hospital like steel, cement, labour, etc have also gone up." Thus the Baner facility, projected to have a final bed strength of 350 operational beds, signifies an investment of ₹ 350 crore for the Jupiter Hospital management.

Paediatric cardiology facilities at Jupiter Hospital, Thane

Jupiter Hospital's Pune facility is slated to have 350 beds once all 13 floors are commissioned

The rupee-dollar rate is particularly relevant to the healthcare sector as most biomedical equipment have to be imported. While promoters are hit by inflation, there's a limit to how much costs can be passed on to patients.

He points out that the cost per bed could escalate even more without tight control of expenses. But while ₹ 90 lakhs to a crore is the minimum installation cost for a bed in a comprehensive tertiary care hospital, it could be less if the facility does not provide specialised services like heart care, etc. If the promoters of a hospital decide to not provide cancer care, their costs drop because they can do without certain high end equipment, For instance, they wouldn't need linear accelerators (LINAC), which reduces the cost of the facility by ₹ 20 crore. Similarly, they wouldn't need a PET CT scan, which costs around ₹ 10 crore. Thus that's a reduction of ₹ 30 crore, from the projected capex of a hospital under construction.

"Cost is a function of the

AYUSHMAN BHARAT SHOULD BE ABOUT EMPOWERMENT, NOT ENFORCEMENT

Dr Thakker's views on the impact of government policies like Ayushman Bharat (AB) on healthcare entrepreneurs like himself and his expectations from the government

It depends how it rolls out. If there is no pressure on the private sector/ entrepreneur to participate, and government creates its own infrastructure through Employees' State Insurance Corporation (ESIC) hospitals or government hospitals, or through charitable hospitals where they have given permission and land, that would be a great incentive.

If the government can provide healthcare to these large numbers of patients covered by AB, which make up the bottom of the pyramid, that will also leave the top of the pyramid to get better healthcare facilities at different places. The government will have to work at erasing the bad image that public healthcare facilities have in the minds of patients. This will not happen overnight but they will have to work towards it. Take for example the UAE which has made it compulsory for employers to make sure that 100 per cent of their employees are insured. It is employer driven and empowering the employee to choose where she would like to go for treatment using her insurance card. The insurance card gets transferred to new employees as the employer moves on. Most of India's employed populations in the organised sector is covered this way but AB aims to cover the bottom of the pyramid. I agree that the government is curtailed by its budget for the AB scheme. But every shop, even with one employee, needs an establishments license. So why cannot the government link the license to employee insurance coverage?

The only challenge is that the patient is not empowered. He is not allowed to do as he wants but is directed to do what the government wants. It is enforcement not empowerment of the patient.

If the government becomes creative and thinks differently, what can be done in an industrial country can also be done in an agriculture driven country like ours. The whole idea is enforcement versus empowerment. I personally think that it is better to empower than to enforce.

technology the hospital has," explains Dr Thakker. For instance, Jupiter Hospital has a 128 slice CT scan. A CT scan can cost anything between ₹ 1 crore to ₹ 7 crore. An MRI can cost between ₹ 3-11 crores. So there is a huge delta.

As Dr Thakker elaborates, "We don't compromise on technology because we know that having bought it, we have to use it for the next 10 years. What is best today, might be just usable after 10 years. So we need to look at technology which will last for at least 10 years without getting obsolete. Obsolescence is a big challenge, especially in a tech driven sector like healthcare." Therefore the strategy at Jupiter Hospitals is to buy top-of-the-line technology; whether its the 128 slice CT scanner, the 3 Tesla MR, dual energy stereotactic LINAC, or the multi slice PET.

Dr Thakker believes that while personal skills are important, healthcare is no longer driven by personal skills alone, but by technology. As an example, he points out that even a highly skilled surgeon will not be able to perform as well during a laparoscopic surgery without high definition cameras.

Jupiter Thane is a tertiary care centre providing comprehensive healthcare in all segments, from birthing to geriatrics and end of life care, 'a community hospital'

Not just patients first, but their families too

There are certain similarities in the architectural layout of both the Thane and Pune facilities. Like the use of space and light and providing step out gardens wherever possible. The staircase from both lobbies are wide and branch out into two, giving patients and relatives ample space to navigate.

Dr Thakker stresses that the first and foremost priority while designing a Jupiter Hospital is patient privacy. For example, he points out that even the twin sharing rooms in Jupiter Hospital's Pune facility are more like private rooms. They are partitioned from top to bottom, with individual air conditioning/HVAC controls as well as entertainment units. Except for sharing a bathroom, they are in a private room. So for the same cost, the hospital management did an architectural change to give the patient complete privacy.

Privacy is not merely a luxury but a necessity in certain situations. As Dr Thakker explains, "Consider that if one patient is coughing, the other cannot sleep. One patient has a high grade fever and needs the airconditioning which may cause the other patient to shiver. This was a learning from the Thane facility which was implemented on one floor but was implemented in all

rooms of the Pune facility. What is important is the controlled atmosphere for all patients, as the need of each patient will be different. I think that is a very important architectural change."

Another design element that stands out are the large bay spaces, which ensure patients' families do not feel crowded. Patients and their families at the Pune facility can even sit out in an indoor garden on the sixth floor called Shanti Niketan, complete with palm trees, etc. with enough light and sun. The upper floors overlook this garden so patients and their relatives of these four floors can also connect with nature, which brings its own peace of mind.

"Our philosophy is that we need to take care of not just the patients, but the whole family as a unit, at least in this country," says Dr Thakker. "India is not like the US or other western countries where the family visits the patient over the weekend or as and when convenient. In India, we have a family member staying with the patient all the time. So we made sure that we don't get influenced too much by international architecture and design which would probably discount the family's needs to some extent."

Shanti Niketan, an open garden on the sixth floor of Jupiter Hospital, Pune

GenNext and what's next

Jupiter Hospitals has a clear succession plan in place, with Dr Thakker's son, Dr Ankit already in the saddle. Under the guidance of his father, he has grown into his role as an executive director and group CEO. Dr Thakker points out that with a unique combination of having done his medicine in Mumbai, his internship in the US, and his MBA with London School of Economics, Dr Ankit understands healthcare, finance as well as administration. "We see him as Generation Next, giving the organisation a new shape."

The new shape includes scouting for a location for a neuro rehabilitation centre in Los Angeles (LA). Revealing more about this opportunity Dr Thakker says, "We are currently starting our first overseas facility, which will be a Jupiter rehabilitation centre in California. We have a huge neuro ortho rehab centre in our Thane hospital. A group of physicians and therapists from LA visited our facility and they were so impressed with it, that they asked us to collaborate with them and set up one for them in LA Ankit has taken up this challenge and will be in LA in September to select a location and set up such a facility in LA. Based on this first international experience, we will decide on future plans."

Jupiter Hospitals thus finds itself in its 11th year, with two operational facilities. The pace might seem slower than other hospital groups but could prove to be more sustainable in the long run. And the pace could be picking up, with senior Dr Thakker actively scouting for an appropriate location for the third facility while his son starts the ground work for the group's first overseas foray. The third hospital, like the first, will be in a suburb of Mumbai, currently lacking tertiary care facilities. Will the slow and steady strategy serve this group well? Or will the promoters decide otherwise? Only time will tell.

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CARING FOR THE CAREGIVER

Jupiter's Thane facility is adjacent to the Fortune Park LakeCity, a premium hotel by the ITC group, devoted to the needs of intra-state and overseas patients and their accompanying relatives. This option of staying as close to the hospital as possible reduces the stress and strain on both the patient as well as the family members, no doubt aiding the recovery process as well.

The hospital-hotel package is beneficial for patients who can be discharged within a day or two, but need observation and follow up over the next few days or a week. Dr Thakker narrates a recent case of a patient from Oman, who came to Jupiter Thane for a knee arthroscopy. Though he was discharged from the hospital in 24 hours, he couldn't immediately travel back to Oman. So he was shifted to the hotel next door for three days, visited the hospital as and when needed for post operative care, and returned back to Oman on the fourth day. Given the choice of a three day stay in a hospital or hotel, most patients would prefer the later, especially if it is close enough to the doctors and facilities in case of an emergency.

Jupiter Hospital's Pune facility could not include an adjacent hotel as the Pune government's DC rules do not allow a mixed user or a medical tourism facility. But each floor of the Pune facility has a couple of family suites which can be used for outstation patients' relatives.

DOING WELL AND DOING GOOD

Dr Thakker emphasises that while the group covers all branches of medicines/healthcare, they also try to cover the whole spectrum of society, from those living in makeshift shelters under the Eastern Express Highway to those living in high rises. The Jupiter Hospitals Group reserves 45 beds for the Jupiter Charitable Institute (JCI). Of these, patients in 35 beds are given free clinical care, paying a very affordable ₹ 350 per day for food from the adjacent Fortune Park LakeCity, which caters to the patients' and relatives needs.

Besides these 45 beds for JCI, another subsidiary, Jupiter Nethralaya is committed to perform at least 1000 free surgeries per year, which averages to around 20 free surgeries in a week. Dr Thakker stresses that they do not have different technologies for these free surgery cases. Two days of the week (Tuesdays and Fridays) are reserved for free surgeries, while the rest of the days are for paid surgeries. All surgeries, including on the free days, use the same operation theatre, the same equipment, with the same surgeons and staff. Jupiter Nethralaya has facilitated more than 2000 free opthalmic procedures to date.

Home virtually turned into a hospital. Is this the future of healthcare?

With rapidly changing dynamics in healthcare space, the demand for India's home health sector is only set to rise. By **Sanjiv Das**

INDIA, HOME to one of the largest young population in the world, also has a growing number of geriatric population. According to data from Deloitte, the global elderly population is expected to grow more than double to two billion by 2050 from 840 million in 2013 and India will have 340 million elderly by 2050. Coupled with changes in the traditional family system and rise of nuclear families as well as diseases triggered by lifestyle changes, the geriatric population needs healthcare by their side. This, in turn, is where the concept of home healthcare comes to play.

The convenience of receiving healthcare services at home is the highest level of access that a patient can hope to get. And this service is not only being accessed by the elderly, the young generation is also looking for the convenience and effectiveness of ongoing therapy. Though at a nascent stage in India, the home healthcare market is going to witness a phenomenal growth in years to come. Providing accessible, affordable and high quality treatment will be the motto of the home healthcare providers.

Today, the country is witnessing a dearth of doctors and paramedics. Hence, patients travel far and wide to get quality treatment as there is a disparity between metropolitan cities and tier II and III cities when it comes to quality healthcare. Also, cost factors force many to forgo treatment mid-course. Home healthcare, if properly implemented, can play a pivotal role and get rid of these issues.

"The key challenge comes from the unorganised sector who do not follow standards of care or manservants hired as attendants for providing home care.Standardisation and accreditation practises have already begun to regulate home healthcare industry and are key to eliminating wrong practices"

Dr Gaurav Thukral
COO, HealthCare at HOME

"The home healthcare sector is still in its early years and is making the shift from an unorganised sector to a professionally-driven organised healthcare delivery system. The market is evolving fast with a few players having established a wider pan India presence"

Narasimha Jayakumar
CEO, Nightingales Home Health Services

With enhanced customer experience, this segment can be a huge asset to influence others to adopt home healthcare and return to home healthcare providers as and when healthcare needs arise in their lives"

Meena Ganesh
MD and CEO,
Portea Medical

Growth prospects

According to a report by Zion Market Research, the global home healthcare market was valued at $228.90 billion in 2015 and is expected to generate revenue of $391.41 billion by 2021, growing at a CAGR of 9.4 per cent between 2016 and 2021.

Home healthcare also referred as home medical care or formal care, includes occupational and physical therapy and skilled nursing. Sometimes, it involves helping older adults with activities of daily living, such as bathing, dressing, and eating.

According to the report, Asia Pacific is expected to be the fastest region for the home healthcare service market. In the Asia Pacific, emerging countries such as India, China, Singapore, and Malaysia is anticipated to drive the home healthcare market due to improving healthcare standards.

Dr Gaurav Thukral, COO, HealthCare at HOME, says, "Though the concept is yet to reach its potential, there are plenty of opportunities for all players. The key challenge comes from the unorganised sector, small time players who do not follow standards of care or maids or manservants hired as attendants for providing home care. Standardisation and accreditation practises have already begun to regulate home healthcare industry – which is the key to eliminating wrong practises."

According to Narasimha Jayakumar, CEO, Nightingales Home Health Services, "The home healthcare sector is still in its early years and is making the shift from an unorganised sector to a professionally-driven organised healthcare delivery system. The market is evolving fast with a few players having established a wider pan India presence and others remaining focussed to individual cities."

"Some contributing factors for this growth include affordability, need for personalised care for chronic and lifestyle-based diseases, changes in the traditional family system, and rise in nuclear families," says Meena Ganesh, MD and CEO, Portea Medical.

Challenges to conquer

A majority of the population has a general perception where they think that home healthcare is all about having nurses or an attendant at home. The segment has witnessed an increase in the demand for home healthcare services in categories other than the elderly and those needing post-operative care. There are endless opportunities in this segment provided certain things are in place. Besides opportunities, the sector also has a lot of challenges which if overcomed will be a game changer for the society.

Says Jayakumar of Nightangles, "The key opportunity of this segment is the rise in chronic diseases in the country and ageing population. Patients with chronic conditions go through expensive recurrent

hospitalisation and a clinically driven home healthcare service can reduce the incidence of hospitalisation for these patients thus providing a cost effective healthcare delivery solution. Traditionally, home healthcare and the responsibilities associated with it were entrusted to a stay-at-home member of the household. The challenge of most sectors which transition from unorganised to organised approach is the price value proposition for the consumers. The second is the workforce transition."

According to Ganesh of Portea Medical, lack of regulation, zero insurance for healthcare services availed at home, and the fact that there is very low government spend on this sector are some of the hurdles. She says, "With enhanced customer experience, this segment is poised to be a huge asset to influence others to adopt home healthcare and return to home healthcare providers as and when healthcare needs arise in their lives."

Says, Thukral from Health-

THE SECTOR IN INDIA IS EXPECTED TO GROW TO
$6 BILLION
BY 2020 IN INDIA

GLOBAL HOME HEALTHCARE MARKET WAS VALUED AT
$263 BN
IN 2016

FROM
840 MILLION
IN 2013, THE GLOBAL ELDERLY POPULATION IS EXPECTED TO MORE THAN DOUBLE TO
2 BILLION
BY 2050

Care atHOME, "One of the major challenges in this segment is that people find it hard to believe that high-end home healthcare services are possible. They feel that they can get good services only though admittance in hospitals."

In need of government's support

Indians still pay a fat amount from their own pocket to meet their health expenses as compared to countries like the US and the Middle East. Though the government is trying to bring in health schemes for the masses, a majority of the population remains underserved and is dependent on the under-financed and overcrowded public healthcare system. Unless basic healthcare needs reach the masses, the road ahead seems bumpy for the home healthcare sector. It needs to be seen on how government's initiative can actually help the sector in the long run.

Jayakumar says, "The government should strengthen the training of paramedical personnel who want to make a career in home healthcare and include this course in the vocational training institutes like ITI. The growth of this sector is closely linked to insurance reimbursement, so the government must include home healthcare cost reimbursement in all its health insurance coverage schemes which will also provide the impetus to private health insurance schemes to include home healthcare in their products."

Ganesh of Portea Medical says, "The home healthcare sector also currently has the lowest government spend. There is a need to put in place norms and incentives for regulation of this sector taking a cue from countries such as United Arab Emirates. Insurance companies do not cover home healthcare services under their ambit, something that needs urgent attention."

With the Ayushman Bharat Scheme in place, there will be an increased burden on hospitals as more patients will seek treatment and the segment has the potential to relieve the ever increasing burden on hospitals and doctors.

Thukral says, "The government can support the growth of the home healthcare industry by introducing standardisation and regulation practices, mandating its inclusion in government-led health insurance policies and formulating policies to reduce burden on hospital infrastructure through home healthcare partnerships. We are hopeful that moving forward, the government will also understand the value that home healthcare solutions provide bring to the healthcare industry."

Insurance

Health insurance in India is in a dismal state as not many people opt for it due to various reasons. Since not many opt for health insurance, going ahead to get quality treatment, is a distant dream for many. Though many insurance providers aptly provide insurance covers, a few of them are providing their services in the home healthcare segment and in days to come more are likely to venture into this segment. Can the insurance sector

be a game changer for the segment?

Says Thukral from HealthCare atHome, "Standardisation and regulation of home healthcare industry is sure to extend health insurance cover to home healthcare soon. Inclusion of insurance of home healthcare service is beneficial for both the patients and for the insurance company as well. Insurance companies can increase their market and coverage by covering home healthcare as one of the cashless or reimbursable service."

One of the advantages which the insurance sector can bring in this segment is significant reduction in fraudulent cases. The home healthcare sector rely on the most current technology to deliver their services efficiently and economically.

According to him, "All the activities related to patient care are recorded in the system, leaving a trail and can be audited at any point of time. Hence, there is always backup data available to check for fraudulent claims. In addition there will be a significant reduction in claim amounts as home healthcare service is much cheaper."

Jayakumar mentions, "Although home healthcare services are gaining considerable traction in India, currently, they are not comprehensively covered by health insurance companies. Across the globe, home healthcare is covered under insurance and has been a key enabler for healthcare insurance companies — to reduce the overall cost of care and thus help consumers by restricting the rise in insurance premium on a yearly basis. We are hopeful that healthcare insurance products will soon cover the cost of home healthcare."

Ganesh from Portea opines that insurance companies do not cover home healthcare services under their ambit, something that needs urgent attention. She says, "Insurance plans do not cover home healthcare as a separate category. However, some services are covered only if prescribed by doctors or if the expenses incurred are an extension of hospitalisation."

SERVICES WHERE INSURANCE CAN BE APPLIED

Domiciliary treatment: Treatments that otherwise need hospitalisation but are carried out at home.
Day care treatments and OPD: There are some medical procedures such cataract surgery and hemodialysis, which do not need the patient to stay in the hospital for 24 hours (which is the basic condition for getting covered under an insurance plan). There are some insurance policies that cover few home services under the OPD category.
Pre- and post-hospitalisation: This category includes home care services such as post-surgery and chronic care.
Lack of proper insurance plans currently indicates that many of the home-based services are restricted to the affluent urban population, with little or no penetration into the rural and semi-urban regions. Extending insurance cover to this wing of healthcare can prove beneficial not only for patients but also for insurance companies. There is also a need to educate medical practitioners about the benefits of home healthcare.

Source: Portea Medical

Technology, a key enabler

Home healthcare services with the help of appropriate technology can cover a wide base of population in the country. The space is dotted with healthcare aggregators, doctor discovery platforms and start-ups offering home healthcare services. The sector is already on a fast track with digital technology in place where it is easier these days to detect fails and missed medication. Also, mobile devices, along with AI and algorithm-based analytics, will enable care givers provide real time consultation in remote areas.

Jayakumar opines that integration of information technology with medical electronics is enabling the sector to provide high quality medical care at home at affordable prices. He says, "Patient-centric approach enabled by technology convergence consisting of connected devices and digital health are reportedly more accurate in early adoption of preventive measures and facilitates quicker intervention, as and when required."

The sector is able to provide high quality medical care at home with developments in information technology (IT) and integration with medical electronics.

"Though healthcare IT has been in use for long to bridge gaps in expert care, it is now being increasingly used in home healthcare systems to deliver health at home, largely due to advancement in user friendly medical devices. Home healthcare medical devices can be broadly divided into two types, active or passive. Both types of technology can be used interchangeably and serve varied functions in home health care. The information recorded in them can be read later on by an expert or can even be actively transmitted to a hospital or health centre," says Thukral from HealthCare at Home.

Ganesh from Portea Medical says, "With enhanced customer experience, this segment can be a huge asset to influence others to adopt home healthcare and return to home healthcare providers as and when healthcare needs arise in their lives. "

He futher adds, "The key to quality home healthcare lies in accessing the right and latest technology at affordable rates. This will not only help hospitals offload their burden of occupancy but also bring down cost of medical care depending on the facilities and services availed for the home patients."

Manpower training and logistics

Proper manpower is needed for any organisation to function properly to sustain and the same goes for this sector too. Home healthcare companies are investing a lot in this sector though the sector is still unrecognised. A perception still exists where many believe in hiring a healthcare assistant (a manservant or maid) who have no medical experience.

Jayakumar says, "At Nightingales we have an extensive training schedule for all staff whether they are clinicians, nurses, physiotherapists, speech therapists or bedside care givers. All our staff is full time on the payroll of the company and we follow all statutory and regulatory processes around their employment. The logistics are all tech enabled and GPS monitored so we know at any given time where our staff is stationed or in transit."

Thukral says, "Leaders of the home healthcare industry in India are investing in world class training for their staff along with quality set ups for home care. This focus on trained home healthcare staff combined with advanced technology for diagnosis, treatment and patient monitoring ensures that the patient continues to receive quality care, as received in the hospital, with the additional benefit of comfort of familiar atmosphere, proximity of loved ones and economic viability."

He also mentions that there is a great need to ensure that clinical staff is effectively trained to be able to manage patient complication at home through an exhaustive induction programme, recurring on job trainings, refresher trainings and audits.

Ganesh from Portea says, "One area that needs serious attention is skill development for nursing attendants and general assistants. Home care is not part of any nursing curriculum and people are unaware of such a concept. There is a need to include home care as a key component of nursing and create awareness on how this additional skillset is required. The sector must be made lucrative for youngsters to be seen as a potential and alternative career path."

An evolving sphere

Even though hospitals are venturing into this model, they are jittery about the fact that it is not their core competency. Hospitals with in-house resources sometimes limit their services to a certain distance due to internal capacity of medical manpower and medical infrastructure.

According to Jayakumar continuing expansion of home healthcare services either by hospitals or standalone home healthcare cos: will accelerate the growth of this emerging healthcare ecosystem and give patients and their families the confidence of receiving high quality clinically led healthcare services in the comfort of their home.

Says Ganesh from Portea Medical, "While this is definitely a welcome change, hospitals only provide assistance for people with chronic diseases and the elderly patients. While hospitals want to provide this as a continuum of care, they understand that this is not their core competency and that it is prudent to align with specialist players for services in this segment."

Thukral from Healthcare at Home opines that with hospitals offering home healthcare solutions, they are able to admit more number of new patients as patients requiring step down care can be referred to home healthcare solution providers. A symbiotic relationship between hospitals and home healthcare solution providers is shaping the future of Indian healthcare.

The way forward

The need of the hour is to ensure that home healthcare, like the other segments, is better regulated and recognised as an industry. This will help in extending the reach to remote corners of the country as well. Moreover, a symbiotic relationship between hospitals and home healthcare solution providers will help shape the future of the sector. Provided its nurtured properly, the home healthcare segment can be a good option for cost effective treatment under the comfort of one's home.

Government's effort with the private sector and people's changed mindset will be a game changer for the sector in the coming times.

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INTERVIEW

Ayushman Bharat, a great propeller for growth of the healthcare sector in India

From market trends, to changing dynamics, to the introduction of Ayushman Bharat scheme, to the role of AI in transforming radiology, **Sushant Kinra**, MD, Carestream Health India, shares his insights on how these aspects impact on progress of the healthcare sector in tête-à-tête with **Raelene Kambli**

How important is India as a market for Carestream? Tell us about your company's market share in India?

The Indian healthcare market is extremely important to Carestream. If we look at the revenue and the opportunities generated from the worldwide markets – India is the third largest country or region with the US and China being at the top two.

We are one of the top medical equipment companies in India, especially in the secondary imaging segment. Based on the different business we operate in, we are number one or number two in the industry. But more than focussing on market share, we are looking to capture mind share. This does takes time to develop, but it is a more sustainable model of business.

In healthcare, a lot of companies are struggling to sustain their business. We are seeing a lot of spinoffs and consolidations. What are the lessons you have learnt to sustain your business?

Carestream was established in 2007, prior to which we were part of the healthcare division of Kodak. Our company did face some challenges in the first five years, but we emerged stronger by learning lessons on the way. These challenges have helped us to reshape our company, reinvent strategies and helped us get to the top.

There are a lot of concerns

> Carestream was established in 2007, prior to which we were part of the healthcare division of Kodak

surrounding the quality of medical devices and equipment that are coming to market. A lot of patients' lives are at stake. What is your opinion on this? What kind of pressure does your company face in these areas?
There have been some concerns on the quality of medical devices and equipment coming to the market, but patient safety has always been a priority for all of us in the industry. Our industry contributes every day to saving, improving and transforming lives of millions of people around the world.

Carestream has always had a reputation of being a patient-centric company. We keep a constant watch on our quality standards and our products are subjected to strict regulatory standards, focussed on patient safety. We will never shift our focus from the patient, as that is what Carestream stands for.

What are your thoughts on the Ayushman Bharat project being implemented by the government?
We see Ayushman Bharat as a great propeller for growth in the future. Yes, there are a few challenges with regards to the price control policies associated with it, but with a collaboration between the Indian Medical Device Industry and the Niti Aayog; we see that a common consensus can be achieved and that we are moving in the right direction.

We see Ayushman Bharat as a great propeller for growth in the future. Yes, there are a few challenges with regards to the price control policies associated with it, but with a collaboration between the Indian Medical Device Industry and the Niti Aayog; we see that a common consensus can be achieved and that we are moving in the right direction

Under the Ayushman Bharat, if approx. 40 per cent of the population are going to be covered under the insurance gambit, a lot of people who are now reluctant to go a hospital to seek healthcare services, will be in the position to get healthcare up to ₹ 5 lakh. This will create a demand-supply gap in the existing healthcare infrastructure and that's where we see an opportunity for the private healthcare players and equipment device companies like us to ensure that our products and services, match the expectation of our customers.

What other opportunities do you see for the healthcare industry in India and especially, for the radiology sector in the current times?
Well, I see immense opportunities for growth for the healthcare sector in India, especially, when digital technologies are transforming the way healthcare can be delivered. Radiology as a discipline is also transforming and I see that Artificial Intelligence (AI) is gaining a lot of attention and will be a key enabler for this sector.

Everyone is talking about AI being the game changer for Radiology. What are your thoughts on this?
Although there are debates surrounding it, there is currently some great work happening in this field. All this momentum only excites me and makes me very positive on this technology.

I clearly see radiology as one of the first fields to be disrupted by AI. If AI picks up the way is it destined, it will surely enhance radiology and will lead to better patient care.

You have been working with a lot of radiologists. What is the kind of response you have got from them on the concept of AI in radiology?
We have got a mixed response from radiologists. Some of them are very upbeat about this technology and eager to work on these applications. Some seem very sceptical and of the opinion that AI is not a game changer as it cannot replicate the human mind.

How is Carestream contributing to the AI technology?
For radiology and especially medical devices companies like us, the biggest advantage is that we are the ones who are feeding into the data for AI. For example, our Digital X-ray or Computed Radiography equipment actually converts the analog data into digital data as AI needs a lot of data. More the data, the better it is. This demand for digital information will only increase.

We have already launched AI in our Health Care Information System products. With more machine learning, we will be able to solve complex problems. That's where we see a huge potential for our company. If you closely look at this trend, this opportunity is not only for Carestream but for all device manufacturers in our field.

But all this will come with a cost isn't it? And in a sector which is battling with cost crunch, how will you ensure that these costs won't be transferred to patients?
Yes, AI has a huge potential to transform the field of radiology like never before. Now that everyone's focus has shifted in understanding its applicability and researching on areas that it can be utilised, I am sure this technology will become a great enabler to radiologists and medical professionals.

The most exciting part is that this technology will not increase the cost but will reduce it and in return this will have a direct cost reduction in the service provided to patients. On the whole it will improve the quality of healthcare services without increasing the cost to the patient.

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How can blockchain technology transform the healthcare sector?

Use of blockchain tech can speed up processes and provide security across healthcare systems. **Dr Anandhi Ramachandran**, Associate Professor, International Institute of Health Management Research, New Delhi reveals more

Blockchain is a de-centralised distributed digital archive collectively maintained by a network of computers, called nodes. One individual alone cannot modify the data. It requires permission from everyone else who maintain the particular record. Blockchain technologies have long been associated with cryptocurrencies as the primary method by which data integrity and security across networks have been successfully maintained. According to research portal, PRSnewswire, the global blockchain market is expected to be worth USD 20 billion by 2024. Financial firms such as banks, for example, often need to deal with vast amounts of complex data reconciliation and verification processes, which form a substantial cost to the firm's annual revenue. Blockchain fundamentally shifts the platform to a shared and distributed database that can be shared across multiple organisations without compromising on data privacy. Permissions can be restricted based on user type and transactions recorded, updated and validated on all the nodes in a network simultaneously. This saves them USD 8-12 billion on an annualised basis. Blockchain applications to healthcare, in view of the increased use of digital systems to maintain electronic health records, finances and insurance claims, are also expected to return similar dividends.

How Blockchain works to benefit healthcare systems

In a typical hospital setting, transactions occur frequently. From patient registration, payments and account tracking and therapy outcomes, health indices and costs are being monitored continuously. Each participant can be associated with their own electronic ledger with attributes that are distinct from other participants. The simultaneous existence of multiple ledgers can give opportunities for fraud, error and inefficiency. But now that each computer system shares a copy of all ledgers, information can be checked and verified against all other copies, redundancy eliminated and vulnerabilities significantly reduced. Unlike centralised databases, blockchain works over distributed systems. Cryptographic codes are auto-generated for different levels of users and the role of an intermediary is ruled out, thereby limiting the number of points of exposure and access to sensitive data. Paper use is also drastically cut down, thereby barring the possibility of delays and potential losses for stakeholders.

Data integrity and interoperability

The crucial characteristic of blockchain is that a block of code registers changes in the state of a record immutably and also works to restrict complexities of algorithms that govern the manner in which changes are made. Block chains maintain records of every change that takes place in data, track real-time records of every permanent transaction, hold certificates of authenticity and track service details along the value chain. They help free up capital for business organisations, reduce transaction costs, speed up processes and provide security and trust across networked systems. It also allows for easy interoperability of health data between hospitals, clinics and doctors. Some of the key areas where blockchain technology is likely to impact future healthcare are as follows:

Maintaining the integrity and interoperability of medical records. Wherever medical records are generated, they may be added to the end of the blockchain providing absolute proof of advice and patient indices because this data cannot be changed. This aspect is particularly important for clinical trials and medico-legal cases which hinge on integrity of data.

Managing permissions - Patient consent forms maintained on paper often lend themselves to tampering. With new interpretations of privacy regulation coming up, it has become very important to record consent for purposes of data sharing by informing patients through permanent records.

Managing payments - Customised care plans for the patient can be better implemented through use of the blockchain, tracking appointments and health indicators and rewarding patients for contributing their data to clinical trials and research.

Limitations of Blockchain technology

All this is not to say that there are no impediments to adoption of blockchain technology in healthcare. Experts point out that blockchain still has not been tested against large data sets. It does not make itself automatically amenable to data analytics – the precise requirement of data fed into healthcare intelligence systems. Performance of transactions is slow. But as a proof of authority and character of immutability, this technology has no equal at present.

More improvements in algorithm design and network implementation are required. Indiachain is government's plan to implement block chain infrastructure as a complimentary to India Stack. Smart Contracts a derivative of block chain technology has been developed for implementing policies in claims processing.

INTERVIEW

‘Subsidised facilities for cardiac screening in children will help in early detection, better treatment outcomes’

Dr Minnie Bodhanwala is the CEO of two charitable semi government Hospitals in Mumbai viz Bai Jerbai Wadia Hospital for Children and Nowrosjee Wadia Maternity Hospital. This World Heart Day, Dr Bodhanwala shares insights on the reasons for low detection of cardiac ailments in children and how utmost care needs to be taken during and post their cardiac surgeries, with **Tanuvi Joe**

Which factors are responsible for heart ailments in young children ?
Cardiac ailments are the major cause of deaths in India, more than 28 per cent of total deaths were due to cardiovascular diseases in adults, whereas in chidren it is the cause of four to five per cent of all deaths. The major cause of cardiac ailments in children are cardiac heart anomalies followed by infective, metabolic and hereditary causes. The increasing modern sedentary lifestyle in children can trigger heart ailments in childhood which may present early or when adults.

Health conditions of the mother, such as diabetes, hypertension or habits like smoking and drinking during pregnancy can also cause heart ailments in children. Pollution could lead to Cardiovascular diseases in children and the components of pollution affect the blood vessels and can lead to serious heart problems. Children suffering from heart ailments should avoid exertion in polluted areas.

Why do many of these heart ailments go undetected ?
Many heart ailments in children show up at a later age with serious symptoms. There could be various reasons to

the same with the most common being lack of screening for cardiac diseases during pregnancy or early childhood. Some heart ailments are less severe and complicated to diagnose in early childhood and hence they are detected only when symptoms appear later in life. Hence, apart from screening, it becomes important that parents stay alert and do not ignore symptoms like Cyanosis which is a blue tinge to the skin, sudden episodes of rapid breathing, difficulty with feeding – shortness of breath when suckling, poor growth, dizziness, inappropriate tiredness etc. and visit the doctor immediately for evaluation.

What kind of care is required for the child during and after the treatment?
You have to be more careful that symptoms do not exacerbate and the child is stable for surgery. Children with heart diseases often don’t grow well and develop as fast as other children. This is because they are more prone to other infectious diseases as well. One has to ensure that the kids receive proper nutrition in consultation with your doctor and do not get any infections during the course of their treatment. One also has to be careful about the physical activities a child is allowed during treatment or post surgery. Also, regular follow ups and timely medications need to be ensured during and after surgery.

In what way can holistic treatments better the recovery of the child?
Holistic treatment helps achieve better results in treating patients for cardiac ailments. Holistic care can help children integrate appropriate self care and help children undergoing surgey recover faster, make the experience less painful and experience fewer complications. Holistic treatment involves use of play therapy, touch therapy, use of music, art therapy, communication skills etc. Young children are undergoing continuous development and thus physical, mental, emotional, social and play environments have a strong impact on their overall well-being.

With a holistic approach, we are able to promote learning and development in all aspects of life that will help lead a better life in future as well. The doctors, nurses and hospital staff play an important role in providing holistic care to the children and it should be incorporated as a part of treatment, not only for cardiac ailments but all other ailments in children as well.

What initiatives can the government take to ensure timely, advanced and accessible treatment?
The government should understand the magnitude of the problem which is now becoming a huge public concern. It should focus on intervention plans for prevention and treatment of children suffering from heart diseases. There is also a need to make necessary resources available for setting up and strengthening paediatric setups across the nation. An universal health coverage for children suffering from heart diseases will help take off the financial burden from parents and focus more on providing specialised care and attention to the children. Free or subsidised facilities for screening will also help in early detection and better treatment outcomes. It could also ensure programmes on awareness of prevention of cardiac diseases by promoting healthy lifestyles.

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INTERVIEW

‘Air pollution has been associated with increased cardiovascular mortality’

Dr Bipeenchandra Bhamre is a cardiothoracic Surgeon at Sir HN Reliance Foundation Hospital & Research Centre with years of experience in complex heart surgeries. Dr Bhamre discusses the use of latest tech and equipment to treat CVADs and how holistic treatments are key for faster recovery of patients, with **Tanuvi Joe**

Are pollution and work stress causing CVDs and heart ailments in young people ? Why?
Air pollution has been associated with increased cardiovascular mortality in some studies, particularly significantly increased particle PM 2.5 in the air is associated with blood vessels. The elderly population who already has atherosclerotic plaques in the coronaries have increased chances of getting heart attacks. The pollution by PM 2.5 is mainly due to fuel and industrial air pollution.

These causes have been shown to disrupt the plaques leading to heart attacks but we need to conduct more studies to further learn the association of pollution and increased heart attacks. Even chronic work stress can lead to increased stress hormones, high blood pressure and diabetes which are all risks factors for heart attacks.

In recent years, what are the various trends you have observed while performing cardiac surgeries?
This is a very exciting time for cardiac surgery. We have plenty of advanced equipment and we understand care in a much better way compared to the previous decade. Newer technologies help patients to recover faster, they help us manage more critical patients to give them a new lease on life. For eg. we recycle patients’ own blood during surgery and this reduces requirement of multiple blood transfusions. In recent times, minimal access surgery options are available for highly selected patient groups. All this is benefitting the patients and speeding up the recovery time.

This is a very exciting time for cardiac surgery. We have advanced equipment and understand care better

Can you elaborate on robotic surgery and how is it more beneficial in treating of CVDs ?
Robotically assisted cardiac surgery is a minimally invasive cardiac surgery where we don't open the breastbone. Using this technology we can perform operations through small incisions with rapid patient recovery, less pain and less blood transfusions. This technique is not suitable for all patients. For example, in cases where one has heart blocks involving the left anterior descending artery, this technology won't be applicable.

Why do you think holistic treatment is important for the smooth recovery of a patient ?
When we speak about holistic healing, we are looking at the person as whole, body and mind. It's not only about the heart. Your mind should also be prepared, enabling the cardiac surgery experience to be more effective.

Can India take a cue from the cardiac healthcare models in developing countries?
I have worked extensively in India as well as abroad. Technology wise, our private hospitals are similarly equipped as in the West. Our doctors are at par in knowledge, skills, dedication and open to adopting new technologies. Our society is different than the West. Implementation of the same health care models across our country will take some time. But the process of availability of the best care for our patients and improved infrastructure has been gaining pace.

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INTERVIEW

‘We will be treating the patients’ eyes rather than the microbes themselves’

A team of scientists and clinicians from the University of Sheffield are working with colleagues at the LV Prasad Eye Institute in Hyderabad, India, to develop a new treatment for eye infections that does not rely on conventional antibiotics - to which many microbes are becoming rapidly resistant. **Professor Pete Monk** from University of Sheffield’s Department of Infection, Immunity and Cardiovascular Disease, is leading the research. In an interview with **Tanuvi Joe,** he discusses about how the treatment can be applied safely without needing time-consuming identification of the bacterial pathogen, allowing it to be used as early as possible in remote rural locations

Why has the University of Sheffield partnered with the LV Prasad Eye Institute for its upcoming eye treatment?
LV Prasad has an international reputation for clinical excellence but it is also internationally renowned for the quality of the scientific research that it performs. This makes it a unique institution in India and one that many overseas partners would like to work with. The University of Sheffield has a long-standing connection with LV Prasad that has already resulted in a new, effective therapy for loss of vision that is being adopted throughout India. Building on these established links, the University of Sheffield and LV Prasad have jointly developed a new project, to help prevent eye infections in India. If successful, we would expect to see the new treatment adopted in similar countries throughout the world.

Which are the various factors that contribute to eye infections in India?
Infections to the eye often follow accidental injury to the transparent layer at the surface of the eye, the cornea. The cornea normally resists infection by preventing bacteria and fungi in the environment attaching to the eye, so that they are routinely swept away every time that we blink. Damage to the cornea provides a site to which microbes can stick strongly, resisting the action of blinking and tears. These microbes grow and cause further damage, penetrating into lower layers and eventually into the body of the eye. At this stage, removal of the infected eye is required to save the patients' lives.

With a high number of agricultural workers, India naturally has many people whose eyes can be damaged during the harvest. Unsafe working conditions in small industries or at home can also lead to corneal damage. Another factor in India is the frighteningly rapid rise of resistance to antibiotics: up to 50 per cent of eye infections can be caused by resistant bacteria which cannot be treated with conventional antibiotics. Finally, due to the climate in India, fungal infections are far more common than in the USA or UK and these infections are often difficult to treat.

What could be the reasons for incorrectly detecting eye infections in India?
After damage, the eye will become red and sore whether it has become infected or not. A patient with 'red eye' may have minor damage that will quickly heal or a potentially catastrophic infection and this can only be diagnosed by access to a clinical laboratory that can detect the presence of infectious microbes. Such laboratories are often only available in larger towns, with cost and distance a major barrier that prevents patients seeking help until it is too late. This is why we are aiming to develop a treatment to prevent microbes from sticking to damaged eyes, that is sufficiently cheap and safe to apply to any 'red eye' without diagnosis of an infection. Importantly, our proposed treatment will not lead to increased resistance to antibiotics.

While developing this treatment, what principles have been kept in mind?
It is important to note that LV Prasad has established a 'pyramid' of eye health care, with the Institute in Hyderabad as the apex that broadens out in secondary and primary centres, down to a base of individual trained healthcare workers in the villages of states in Andhra Pradesh, Telangana, Odisha and Karnataka. By providing a treatment that can be applied at the base of the pyramid of care, we hope to prove the principle that both the treatment and an efficient means of distribution are necessary. After doing this, we will create a global network of developing countries that uses the LV Prasad pyramid model to provide effective eye protection to all citizens.

How is this treatment unique compared to the existing ones?
Our treatment is unique, in that we will actually be treating the patients' eyes rather than the microbes themselves. We use a small fragment of protein found in the cornea which acts on the cells of the eye to disperse the 'landing sites' that bacteria and fungi use to stick to areas of eye damage. Treating the eye rather than the microbes means that resistance does not get produced in the bacteria and fungi. We have also shown that our treatment works well in combination with old antibiotics to which some bacteria have become resistant, allowing the re-use of these existing drugs.

How will this treatment be made accessible to the rural households?
We will use the LV Prasad pyramid to get the treatment to rural households. We envisage that stocks of the treatment will be held by village healthcare workers and used in cases of damage to the cornea even without diagnosis of infection. A partner pharma company in India will be required to make this possible.

We will be working with scientists at LV Prasad to develop the best possible treatment. We already know that our treatment works well in the laboratory but it is important that we test the treatment on samples of the microbes that are encountered frequently in clinics at LV Prasad. By working with clinicians, we will also be able to ensure that the treatment causes no harm to the human eye.

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Smartening up for a healthier future: Why must the smart city roadmap focus on smart healthcare?

State-of-the-art ICT drives India's urban centres leading to technology transforming and optimising the healthcare sector. **Rajiv Bhalla**, Managing Director, Barco India shares more insights

SMART CITIES – as the buzzword dominates conversations amongst policymakers, administrators, and businesses, the initiative has already been generating a massive buzz across the country. One of the main reasons for its popularity is the way it is expected to impact the quality of life for the country's urban populace. Challenges and hassles in key areas such as urban mobility, security and safety, administration, planning, energy utilisation etc. – all too familiar to city dwellers – will be addressed, as seamless and real-time information sharing will enhance service delivery. One aspect which is expected to benefit the most from a smarter technological framework is that of healthcare.

VoIP platforms enable sharing, streaming of live video feeds in ORs, facilitating real-time collaboration and consultation between medical experts

The current healthcare situation in India

To say that the current healthcare situation in India is a bit of a paradox will not be inaccurate. The country's healthcare industry is currently valued at $100 billion and is expected to be worth $280 billion by the end of this decade on the back of exponential year-on-year growth. More than 50,000 people become doctors every year in India. Medical tourism has also been witnessing a remarkable boom; patients from even developed countries like the US and the UK are opting for medical procedures in the country, thanks to the availability of high-quality, low-cost treatments.

And yet, the other side of the coin is not as pretty to look at. The per capita healthcare expenditure in the country languishes at around $60 – a number which stands nowhere in comparison to the $300 per person that China spends on health care, or the $1,000 which Brazil is estimated to be currently spending. Despite being the largest supplier of skilled medical professionals in the world, India faces an immediate shortage of almost six lakh doctors to meet its own healthcare requirements. Large sections of its own population have little to no access to quality health care; according to projections made by the Medical Council of India (MCI), there is currently one doctor for every 1,674 patients in the country, while industry experts estimate the actual ratio could very well be upwards of one doctor for every 2,000 patients. These statistics underline why the push for smart cities must include smart healthcare in its roadmap.

Solving the healthcare conundrum through technology

Understanding how a smarter infrastructure will address India's growing healthcare challenges will require us to take a peek through the looking glass into the future. Consider an urban centre, where everything – sensors, wearable devices, medical facilities, emergency response teams, patients – are all interconnected with one another. Low-energy wearable devices and sensors can collect and transmit patient data in real-time throughout the day to a centralised interface.

This remote monitoring will be supplemented by in-depth, exhaustive medical records of the patient, which can be accessed easily and readily by doctors and medical practitioners. Not only will such depth of information allow for preventive diagnosis, but will also enable highly personalised remedial recourses – including treatment and medication – aimed at preventing the health-related complications from arising in the first place. This preventive approach will reduce the overall burden on the healthcare infrastructure, which is at present stretched beyond its tipping point. The pre-emptive diagnosis could, in an area as critical as healthcare, end up being the difference between life and death itself.

But what is most exciting about a smarter and more interconnected healthcare infrastructure, apart from the better medical response and pre-emptive patient care, is its enablement of higher-quality healthcare services. For example, 4K video-over-IP streaming services can bring together a variety of medical data from different sources onto a single screen. This is particularly helpful in critical medical applications, such as digital operating rooms, where doctors and surgeons need to make precise and accurate decisions. Leading VoIP platforms also enable sharing and streaming of live video feeds between and outside ORs, thereby facilitating real-time collaboration and consultation between medical experts. This not only improves the efficiency of healthcare providers, but also helps in making medical services more streamlined, cost-effective, and convenient for the patient.

It is no secret that India is moving towards a smarter future. The Smart Cities Mission has reiterated the country's commitment to achieving technological parity with its more developed peers around the world. As interconnectivity and state-of-the-art ICT becomes the core which drives India's urban centres, the magic touch of technology will transform, improve, and optimise everything. The healthcare sector, in particular, stands to benefit the most from a smarter infrastructure. Health, to use the oft-used phrase, is wealth. As we move towards a smarter, more empowered, technologically-led future, it would behove us to remember it.

THE FORMULA FOR THOSE WHO FORMULATE THE PHARMA SECTOR

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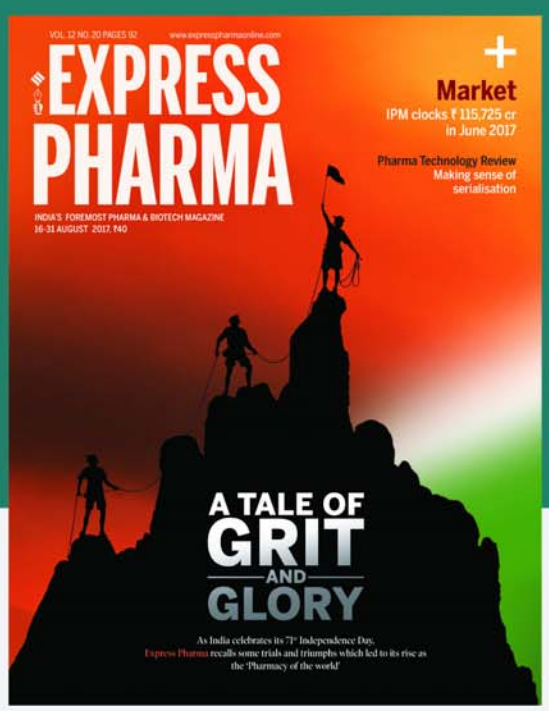

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Carestream offers advanced second-generation metal artifact reduction software for its Onsight 3D extremity system

The latest version of Carestream's image viewing software is designed to increase workflow efficiency, enhance volumetric post-processing compatibility with PACS, fulfill NEMA XR-29 standards compliance and offer new features for users in hospitals, imaging centres and orthopaedic clinics

CARESTREAM HEALTH has started shipping a new version of software for its CARESTREAM OnSight 3D Extremity System that offers new standard features as well as optional enhanced metal artifact reduction software that can improve visibility of anatomy around metallic objects. Carestream's OnSight 3D Extremity System uses a large-area detector that captures a 3D extremity image in a single rotation that takes only 25 seconds.

The latest version of Carestream's image viewing software is designed to increase workflow efficiency, enhance volumetric post-processing compatibility with PACS, fulfill NEMA XR-29 standards compliance and offer new features for users in hospitals, imaging centres and orthopaedic clinics. This software is free of charge for current customers and will be installed on new OnSight 3D extremity systems.

"Our second generation of CMAR 2 metal artifact reduction software can improve visibility of patient anatomy near metallic objects and reduce the halo effect and other artifacts that may appear in the image. This helps orthopaedic specialists optimise their diagnostic and treatment decisions," said Helen Titus, Carestream's Business Segment Manager, Cone Beam CT.

The software makes it easier to view metal screws, plates, nails and other hardware. Both the original image and corrected image are always available to view and compare. A user selects a 'moderate' or 'complex' metal setting so Carestream's image processing software can deliver an optimized view based on metal content. Metal artifact reduction can be activated prior to the scan or after the original reconstruction is complete.

Carestream also offers administrative analysis and reporting software as an optional software module that provides a digital dashboard for administrators and practice managers. Users can export information such as: exam types; minimum, maximum and average dose; reasons for rejected exams and other data into an easy-to-use spreadsheet. Managers can use this information for quality control and technologist training.

Dose is significantly reduced because only the affected body part is imaged. And since the patient's head and body are not confined, patients do not experience the claustrophobia that often occurs with traditional CT systems. The compact extremity system can be installed in an exam room and plugs into a standard wall outlet.

The Carestream OnSight 3D Extremity System is available in the US, Europe and other countries.

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Kohinoor Surgicals launches LED OT Lights

NOWADAYS LEDS are used in surgical operating room lights. Earlier halogen or incadascent filament bulbs were in use. Manufacturers used magnifying plastic lenses with LEDs to get the maximum intensity during surgeries. Due to high and heavy light intensity shower / rays and heat, while performing long time surgeries, many surgeons used to face eye problems like 'cataract' and 'Macular degeneration.' It led to loss of vision in some while others faced hardships to recognise colours etc. Macular degeneration is considered as an incurable eye disease.

Macular degeneration is caused by deterioration of the central portion of the retina, the inside back layer of the eye that records images one sees and sends them via the optic nerve from the eye to the brain. The retina's central portion, know as the Macula, is responsible for focussing central vision in the eye, and it controls the ability to read, drive a car, recognise faces or colours and see objects in fine details.

To prevent this and as a precautionary measure, Kohinoor Surgicals uses multifaceted multi-reflectiors with diffuser in LED OT lights i.e. Kohinoor Surgical's brand OT lights. It gives optimum and smooth light beam and focusses from different angles to minimise shadows and give a cool light intensity at the surgery site. Hence the surgeons were comfortable while performing surgeries.

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Way forward for DiaSys India

Sachin Singh, Head Strategic Marketing, DiaSys Diagnostics India, talks about the company's growth in one of the fastest growing economies of the world by leveraging global experience to meet local challenges

DIASYS IS proud in celebrating four years of India operations. During this short journey, we made memorable and notable accomplishments in the backdrop of very challenging economic environment in our country. Upgrading manufacturing unit to spacious 2000 square metres state-of-the-art premises in Navi Mumbai in March 2017 shows our commitment for providing high quality indigenous products and in line with the 'Make in India' initiative by the government.

A major area of strength of DiaSys India is our effective sales and service network, which assures our customers that we shall continuously improve for satisfaction. We have a direct presence in all four poles of the country through four regional offices based at Delhi, Kolkata, Chennai and Mumbai, which are supporting 100+ channel partners, and our staff counts now 180+ employees.

On one hand, DiaSys India has countless achievements and accomplishments, especially from last year, which proved to be exceptionally productive for the company: entire team and distributors across country have actively contributed to this progress.

On the other hand, from the demand perspective, governmental policies and intent, increased health awareness have led to an increase in preventive healthcare, screening and check-ups, as well as enhanced treatment monitoring; in addition, reimbursements by insurance companies, increased wealth, increase in the seniority of the population, as well exponential jump in life style related ailments have also contributed to the rise of the IVD industry.

DiaSys is following its mantra 'choosing quality' to be a solution provider for quality products, systems and services! Our focus on understanding customer needs and demands, to create the best possible offering for them, has enabled us to gain acceptance and presence all over India at key institutions but also in rural places.

Our emphasis on quality patient care, lab efficiency including turnaround times, workflow solutions and improving the

existing technologies has led to the development of a constant and futuristic improvement in our product range. As a matter of fact, this year we introduced in Hematology with 3-part (respons r3H) and 5-part (respons r5H) differential hematology analyser, innovative solution for the Indian market.

DiaSys India is looking forward to accompany the growth of the IVD market in India: moving up segment in chemistry like introducing CLIA parameters on chemistry platform, hematology with launch of various products targeting mid high-end customers. Also, DiaSys will offer specialised solutions, hence focussing on special parameters in top end hospitals and research universities. In addition, India is the hub for the DiaSys Group for research and development and manufacturing for POC products – Make in India & Export using the global network.

In our search for quality diagnostics, we take this opportunity to announce, among also other novelties, our new innovative solutions: Procalcitonin, "First time in Clinical Chemistry". We are constantly focussed on identifying new needs and new key parameters: Quantified Vitamin D, Handheld Urine ACR Analyser etc. Also, our R&D, in India, has made significant progress in POCT device 'QDx Instalyte,' novel electrolyte analyser (all-in-one concept); with our technological advancements, we shall contribute to changing healthcare landscape. In addition, the 67 key parameters of the Sys200/400 systems will be manufactured in India: it will be a benefit to the end user using parameters in closed vials, therefore avoiding errors and thereby improving productivity.

DiaSys India understands that manufacturing unit plays a critical role in competitive scenario to deliver the value to customer. Through regular investments, employing skilled manpower and training systematically, we seek to accelerate the introduction of processes, technologies, and regulations required to continuously roll out high quality products from our Navi Mumbai manufacturing unit. Presently, we manufacture the key reagents relevant to the health of India in the segments of biochemistry, hematology, urine and Point of Care.

The recently announced world's biggest health care coverage policy 'Ayushman Bharat' will be a milestone in the healthcare coverage. DiaSys India is preparing itself to be a part of this initiative by the Government of India through its customers and leveraging the advantage of in-house R&D and manufacturing set up. In all, DiaSys India is well poised for the next level of growth in one of the fastest growing economies of the world by leveraging the global experience to meet the local challenges.

Transasia showcases total diagnostic solutions at MAPCON 2018

AT THE recently concluded MAPCON, Transasia offered the attending pathologists an opportunity to gain insights into the latest advancements in the in-vitro diagnostic industry.

In its 39th year, the annual conference of the Maharashtra Chapter of IAPM (MAPCON) was held between September 7 and 9, 2018 and hosted by the Armed Forces Medical College (AFMC), Pune.

As the principal partner, Transasia organised two scientific sessions: 'Acquired bleeding disorders' by Dr (Col) Jyoti Kotwal, Sr Consultant, Dept. of Hematology, SGRH & GRIPMER, New Delhi and

'Pathophysiology and diagnosis of Hemophilia' by Dr Swati Pai, Head of Dept, Lab Medicine, Manipal Hospitals, Bengaluru.

At its booth, Transasia commemorated the trust, commitment and service of our armed forces. It further harnessed its position as a leader in the Indian IVD Industry by showcasing its latest and best technologies. 'Make in India', fully automated biochemistry analysers, XL-1000 and EM 200 and coagulation analyser ECL 760 were on display.

Additionally, Hb-Vario, its HPLC system and urine chemistry systems, Laura XL and Laura Smart were also exhibited alongwith the automated ESR system, Vesmatic Easy. Transasia is the sole distributor in India of the world-class Sysmex hematology analysers, of which the 3 PDA, XP-100 and 6 PDA, XN 330 were showcased. Further, Transasia's rapid diagnostic kits, that offer sensitivity and specificity for dengue and malaria detection were well received at the booth.

Besides quality products and solutions, Transasia also provides a sophisticated LIMS, through its information technology partner, Caredata. At the booth, the Caredata team offered the visiting delegates solutions for enhanced lab efficiency.

How hospitals can prevent loss of life during emergencies?

Natural disasters can drastically alter the lives of thousands of people at a time. Medical centres are institutions which can bring about a positive change in the lives of the afflicted population. Therefore, it is highly essential for hospitals to formulate a disaster action plan which can be deployed effectively. **Vivek Tiwari**, Founder & CEO, Medikabazaar.com, gives an insight

HOSPITAL READINESS during emergency remains uneven. Hospitals must anticipate the risks surrounding natural disasters to avoid a ripple effect. Hospitals must anticipate the risks of surrounding natural disasters to avoid a ripple effect. Reputations are built and destroyed based on how a particular medical establishment provides the necessary healthcare services to the affected/displaced people during a disaster.

When talking about disasters in the Indian context, the recent floods in Kerala is the first instance which comes to mind. With more than 200 people dead and 300,000+ displaced, it is one of the deadliest cases of natural disasters in the country. As per various news reports, healthcare centres which faced a daunting task of providing medical care to thousands of affected people were not equipped with adequate facilities to render their services. Reports also stated that the majority of the hospitals were working with a minimal number of staff (between 30-35 per cent). There was shortage of essentials such as liquid oxygen supply for the patients as fresh supplies did not reach the medical facilities due to blocked roads and chaotic traffic.

From the above situation, an overarching narrative can be perceived. Hospitals and medical facilities in the affected regions did not have a thorough action-plan to deal with the emergency situation. During any disaster, patients can be afflicted by a range of health problems. From serious physical injuries to mental health issues like depression and Post-traumatic stress disorder

(PTSD). Medical establishments must prepare themselves efficiently to deal with almost any type of challenge during emergencies. In short, they have to stretch their limits.

In order to do so, hospitals need to take specific measures which can help them to administer the required medical services to the afflicted.

Management of medical supplies

Lack of medical supplies is one of the primary reasons as to why healthcare establishments fail to deliver the necessary services to patients during disasters. When disaster strikes, it is very likely that transport and supply routes can get disrupted. This makes the procurement of essential equipment and consumables during disasters, a hugely taxing or at times an impossible task. Therefore, it is imperative that medical facilities keep an updated inventory of all their equipment. More importantly, all hospital equipment must be in working condition. Hospitals should analyse their consumable's consumption patterns and forecast their requirement. They should also establish connections, sign agreements with trusted and reliable vendors who can deliver medical supplies in case of shortage.

A streamlined and transparent supply chain will make it easier for hospitals to procure equipment and supplies at times of emergencies. Medical centers can tie-up with organisations such as Medikabazaar.com who are providing end-to-end supply chain solutions for an efficient procurement system. This way hospitals can also procure sufficient supplies beforehand and stockpile them in the event of an impending disaster.

Staff management

One of the most pivotal aspects of a disaster action plan is a planned allocation of hospital staff. During emergencies, medical centres can very well see an overflow of patients. This is why it is all the more important to have adequate hospital staff so that they can deal with the situation. Secondly, they must be deployed in an organised manner so that no patient is left unattended. To do this, hospitals need to track the attendance of the staff members' *vis-à-vis* patients regularly. Based on the data, they can estimate as to how many staff members might show up during the time of a disaster. They can then take the necessary steps to make sure the facility is adequately staffed to deal with emergencies. Healthcare facilities also have to train their employees to deal with situations where there is a high clinical demand so that they can perform their duties efficiently under pressure.

Ensure effective communication

During emergencies, it is crucial that all concerned factions - patients, people, fellow medical staff, media, etc. receive information on time. This way, informed decisions can be taken which can result in efficient collaboration between all to better the situation. Miscommunication can lead to more chaos and in severe circumstances, loss of life. Medical centres, during disasters, should appoint a spokesperson who will be incharge of conveying the relevant information to the media, law enforcement agencies, etc. Also, hospitals should establish open and active communication lines internally so that every department in the facilities are continually updated on new cases and information.

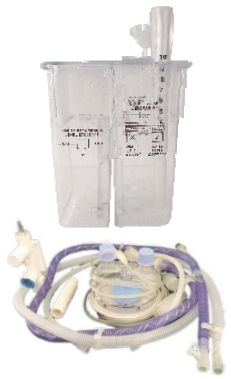
Establish security protocols

An able security team equipped with a systematic and thorough disaster security protocol is vital for the smooth functioning of a medical centre during emergencies. During disasters, the security team should manage the number of visitors properly, take control of critical areas such as triage sites and the healthcare centre's access points. They should also identify the potential security hazards and take necessary proactive measures to prevent any mishap which can disrupt the functioning of the healthcare establishment.

There are other measures such as formulating post-disaster measures, analysing surge capability, establishing triage protocols which are also pivotal during a disaster. However, if medical facilities do not undertake any one of the steps mentioned above during an emergency, then there can be dire consequences.

Emergencies and disasters can be sudden, however, most of them can be predicted. In both cases, medical establishments should make it a point to devise a robust action plan which can be deployed at the time of or before an imminent disaster.

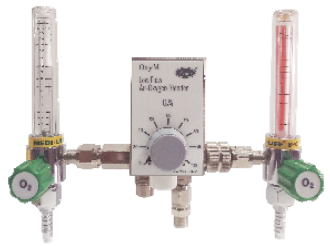
Continued monitoring and updated technology have been the strengths of nice Neötech



Bubble CPAP
Combo Kit

nice 8050
Heated (Respiratory)
Humidifier

nice 5020
Infant T-Piece Resuscitator



nice 5005 Low flow
Air Oxygen Blender

HORNPUFF
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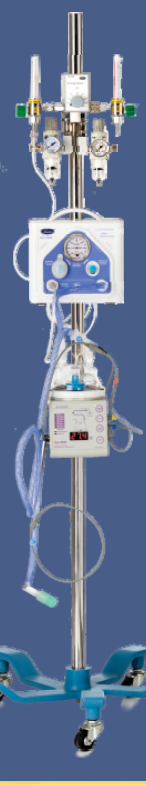
Infant T Piece Resuscitator
PIP & PEEP Control
Over Pressure Relief



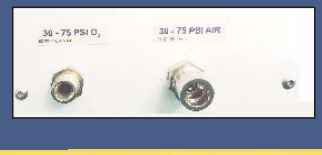
Infant T-Piece
Resuscitator
HORNPUFF

Infant T Piece Resuscitator
with Air/O_2 Blender
& Humidifier

PIP & PEEP Control
Over Pressure Relief
Air/O_2 Blender
Heater wire Servo control
Humidifier

Resuscitation Mask
Size: 00, 0 and 1

Infant T Piece Resuscitator
with in-built air oxygen blender
PIP & PEEP Control
Over Pressure Relief
Air and oxygen inlet port
Oxygen Percentage 21% to 100%
In-built flowmeter 0 -15 lpm



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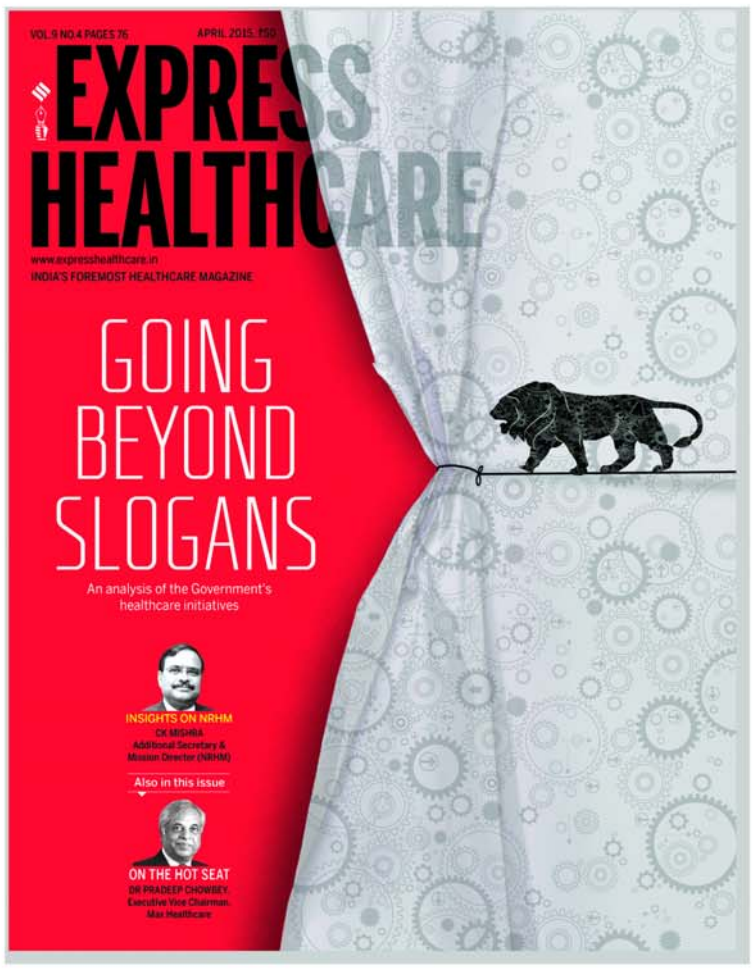

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