



THE JOURNEY

SPINE FOUNDATION





HEALTHCARE IN INDIA

India is shining and is one of the fastest developing countries in the world. However there's a shadow that threatens to darken India's success story.



Let's begin with some facts that we all know because we are constantly bombarded with them in our Whatsapp forwards, Twitter reposts and Facebook pages. Here are a few.

Goldman Sachs predicts that India will be the third largest economy in the world by the year 2050.

India's GDP is growing at nearly 8% while the rest of the world average is hovering around 3%.

India is only one in three nations to build supercomputers and one in five to launch communication satellites.

A fifth of all Microsoft engineers, you guessed it, are Indians.

100 of the Fortune 500 companies have already set up R&D Centres in India.

This is a very short list of our many achievements. But before you go and knock open a bottle of champagne, consider these less talked about facts.

Nearly a fifth of the world's population lives in India, but there is just one doctor

for every 1700 people. Even Vietnam has a better doctor to patient ratio. India urgently needs 500,000 more qualified doctors. Now comes the second problem. 70% of the doctors practice in urban areas where just 30% of the people live. The reasons for this are many— from lack of basic infrastructure like housing, education, roads, water and electricity to a better and more financially profitable market for their services in urban centres.

Adding to the lack of doctors is another set of problems. India's healthcare sector is dominated by the private sector, and therefore expensive. On the other hand, the government public healthcare system is free, but ill equipped. There has been a steady decline of government spending in healthcare over the years, leaving the poor fewer options than before. According to a World Health Organisation report in 2007, India ranked 184 out of 191 countries in the amount of public expenditure spent on healthcare out of total GDP. Private

healthcare is expensive and majority of people do not have health insurance. So they have to spend a disproportionately higher percent of their income towards out-of-pocket healthcare expenses than the rich. The high cost of private healthcare has led many households to fall into, what's defined as Catastrophic Health Expenditure or CHE. CHE is health expenditure that threatens the household's capacity to maintain a basic standard of living. One study has found that over 35% of poor households fall prey to Catastrophic Health Expenditure.

What is the solution? Will we wait for the government to improve healthcare infrastructure and make quality healthcare accessible to the poor? Or hope that the private healthcare will become affordable?

On the other hand, you can raise your hand, take responsibility and say I will do something about it. And that's what the Spine Foundation did.

THE BACKBONE OF LIFE

While spinal affliction is debilitating for anyone, its effects are worse if you are poor.

Someone once said that in order to succeed in life, you need three things: a wishbone, a backbone and a funny bone.

Now what happens if the backbone is compromised? Millions of Indians suffer from afflictions of the backbone, from back pain to spinal disability. Back pain is amongst the top three reasons for doctor consults worldwide. People who are the backbone of their family or community are felled by their own backbone. It doesn't just affect the patient's life, but the lives of their family or community as well.

Spinal care wasn't even a speciality or field, but rather a part of orthopaedics until about 30 years ago. It is only recently that spine care has emerged as a speciality in its own right. Unfortunately it remains an urban-centric speciality. The doctors spend their time and training in perfecting surgeries and treatment options specially catering to the tip of the pyramid; cosmetic spine surgery, endoscopic spine surgery, total disc replacement, instrumented long segment spinal fusions for mechanical back pain. Spine care remains an expensive urban privilege.

That brings us to the question, what about the people at the bottom of the pyramid who can't afford this expensive spinal treatment, whose productivity and lives have been affected by spinal problems? What about the urban poor? What about the rural population? 70% of our population is rural, with little access to health care. And it is these people who are most susceptible to back problems.

A farmer has to spend a long time bending to sow and plow his crops.

Women have to walk for miles carrying water on their heads. They have to travel on unsprung bullock carts over bad roads. Add to that the fact that they might be malnourished, you have the recipe for a spinal disaster. This degenerative affliction can rob people of their mobility and leave them bed-ridden. And if this person happens to be the main bread earner in the family, the whole family goes hungry. The children's education suffers and daughters don't get married. With no access to spinal care or treatment, these families sink below the poverty line.

This is a problem not just in India but across the world. According to a report in the October 8, 2016 issue of the influential medical journal Lancet, low back pain is one of the top disability problems in the world. The authors of this report looked at 117 published studies covering 47 countries and data from national health surveys in many countries. The report also said, 'with ageing populations throughout the world, and especially in low and middle income countries the number of people living with low back pain will increase substantially over coming decades'.

The sheer number of people at the bottom of the pyramid without access to basic health care, forget specialised spinal care, is huge. Can we just ignore them? Can we make spinal care accessible and affordable to people who cannot afford them? How do we do it? How can we do it? What can be done to tackle the problem?

In a country as vast and populous as India, this might be just a drop in the ocean. But as we know, every drop matters. That's the raison d'être of The Spine Foundation.



A NEW THINKING IN SPINE CARE

Bringing succour to the spine patients at the bottom of the pyramid requires more than just money. It requires a new thinking.

In a perfect world there would be no need for the Spine Foundation. But since we don't live in a perfect world, the Spine Foundation exists for the 'have nots'. It was established in 1998 to finance treatment of patients who cannot afford it, both in villages and cities. Not just a partial, but a complete coverage of their expenses from investigation to rehabilitation. The initial money for the foundation came from the medical community itself. When a doctor goes to another doctor for treatment, he is not charged either for consultancy or surgery. They paid back instead by donating to the Spine foundation. The funds also came from the rich patients the Spine Foundation doctors treat in their normal urban practice and philanthropists. This cross subsidy is a bit like the idea of Robin Hood taking from the rich and giving it to the poor. Without the robbery, of course.

The Spine Foundation was established to reach out to people who don't have access to quality spine care due to geographical and economic reasons. The mission of the foundation is to provide quality spine care to the underprivileged, even in the more remote parts of India. The foundation's vision is of spine care in all four zones of India – North, South, East and West, in collaboration with the Association of Spine Surgeons and the Association of Rural Surgeons in India, to reach out to places that is under-served in terms of medical facilities. But what are the foundation stones on which this mission can be built?

It begins with the Spine Foundation's

philosophy of providing economical options in spine surgery without compromising on quality. And these are the steps that the Spine Foundation has practised, popularised, propagated and published over the years.

First comes conservatism. Ask if the patient needs surgery at all? Can this patient be treated without surgery? Doctors of the Spine Foundation have treated prolapsed discs and spinal tuberculosis without surgery and these have been published in reputed international spine journals.

Second is simplistic but innovative surgical techniques. There are dockets full of case studies where the doctors have documented patients who were treated by using simple techniques with equal results compared to more traditional, complicated and expensive surgeries. Again, case studies that have been published in many international journals.

That brings us to the third step; low-cost, affordable and low-tech systems and implants. The best way is to use no implants at all. Good old-fashioned surgical procedures that give excellent and comparable end results for treating conditions like spinal decompression or anterior cervical fusions. If you do have to use implants, there are low-cost indigenous implants that work as well. The foundation doctors have treated cases with thuraco-lumbar instability to neurofibromatosis using indigenous, low-cost systems. Yes, those too got published as case studies across the world.

That brings us to the last step, easy

to learn and reproducible methods. This is very important because the Spine Foundation wants to build a self-sustainable model to serve the people with spine ailments in rural areas. It works along with government and Non-Government Organisations to help them live a better life.

So let's take a look at the the model developed by the Spine Foundation to spread spine care in rural India.

It begins by identifying government hospitals in locations that are accessible to the rural population. Then they do a survey of the real needs of the patients here followed by a feasibility study. It is only after this that the decision is taken to go ahead with the camp or not. If it's a yes, they start campaigning to raise awareness about the camp. Transportation facilities to the camp from the surrounding areas is also arranged. The first step is to set up the Rural Spine Care Centre to conduct regular OPDs and surgeries by the doctors of Spine Foundation who travel there for the spine care camp.

The next step is to develop a support system by identifying local doctors who are interested in helping, assisting, learning and eventually taking over. They also train voluntary health workers, in patient care, counselling, on-site diagnosis, nursing and physiotherapy.

The foundation networks with secondary and tertiary care centres while also involving local medical colleges and institutes for better infrastructure and manpower.

The other thing that the Spine



Foundation does is train the doctors working in the interiors to identify and treat basic spine problems. A referral practice chain from interiors to these Rural Spine Care Centres via health workers and public health care doctors has been designed known as the 5-filter system.

The first filter is the village health worker or community health worker who identifies the patient. The identified patient is then referred to the medical staff at a nearby Public Health Centre,

filter two, that has the ability to treat minor medical cases. If the patient's needs can't be met here he is referred to a district or civil hospital that acts as filter three. In case the patient needs more specialised care, it is bumped up to an established orthopaedic unit or Rural Spine Care Centre that's operating under the guidance of the Spine Foundation which acts as the fourth filter. 95% of the patients are treated by this stage. It's only the most serious cases that are escalated to the fifth and final filter. The

Spine Foundation pays for the patient to be brought to either VN Desai or Wadia Hospital in Mumbai where highly qualified doctors and fully-equipped operation theatres are available.

There are many available government schemes and local health financing schemes that go waste. The foundation identifies and taps into these government programmes to fund its mission. The idea is to initiate the change, set systems in place so that it can be self-reliant and shift focus to the next centre, and challenge.



THE GENESIS OF THE SPINE FOUNDATION

What started as one man's dream, reaches out to thousands of people across the country today with its message of hope.

Can you name the hospital with the first exclusive spine surgery speciality unit in the country? In 1988, it was a government municipal hospital that was at the forefront of spine surgery and treatment in India – KEM Hospital in Bombay. The man behind this was an orthopaedic surgeon at the hospital who came from a family of freedom fighters

and doctors, actively involved in social service – Dr Shekhar Bhojraj. In the early 80s, the study of spine was not a speciality in India. Orthopaedic surgeons were caretakers of the spine. While Dr Shekhar Bhojraj practised as an orthopaedic surgeon, the cases that interested him the most were patients who came to him with back problems.

The backbone of a person was literally the backbone of his life, his family and community. A broken arm or leg could be fixed easily, but when a person developed a problem with the spine the solutions were not that simple. This debilitating condition could alter the course of a person's life. Interestingly the spine provides both stability and mobility. And when any

of these two factors are missing from a person's life the result can be catastrophic.

Though surgeons across the world were working on spine care for decades, it was only during the 1980s that spinal surgeons truly began to understand the spine in all its intricacies. Though neuro-imaging was introduced in the 1970s with the CT scanner and the development of the MRI, it was in the 1980s that instrumentation was refined and spine surgery came into its own. Dr Bhojraj kept himself abreast of the latest learnings and developments in the emerging world of spine surgery.

When Dr Shekhar Bhojraj set up the first exclusive spine surgery speciality unit at KEM hospital, he decided to give up all other orthopaedic work and concentrate solely on the spine. And with that became the first specialised dedicated spine surgeon in the country.

Though there was stellar work that was being done at KEM, it had its limitations. It was a municipal hospital, therefore facilities and funds were limited. Dr Bhojraj needed a bigger platform if he was to get the best advancements in spine care to India. As they say, if you really want something, the universe conspires to get it. In this case it came in the form of a phone call from Mumbai's Hinduja Hospital who wanted him to set up a specialised spine unit. They had the funds to further Dr Bhojraj's study and finance a more specialised spine care unit. He joined Hinduja Hospital and in 1993 set up the first dedicated private spine unit in a hospital in India.

Dr. Bhojraj's career was on an upward graph. His papers in international publications about the work done in India earned him laurels from his compatriots around the world. While Dr Bhojraj had the world at his feet there was an emptiness in his heart. He came from a family of social workers, not a capitalist family. While he had bought spine care and treatment to India, there were millions of people around the country that that could not and would not, benefit from all his learnings.

He didn't know how to do it. He didn't know what he had to do. He only knew that he had to do it. Spine care couldn't be the privilege of the urban rich. Rather than wait for outside or government help Dr Bhojraj decided to put his money and time where his heart was. On 19th May 1998 Dr. Shekhar Bhojraj along with his wife

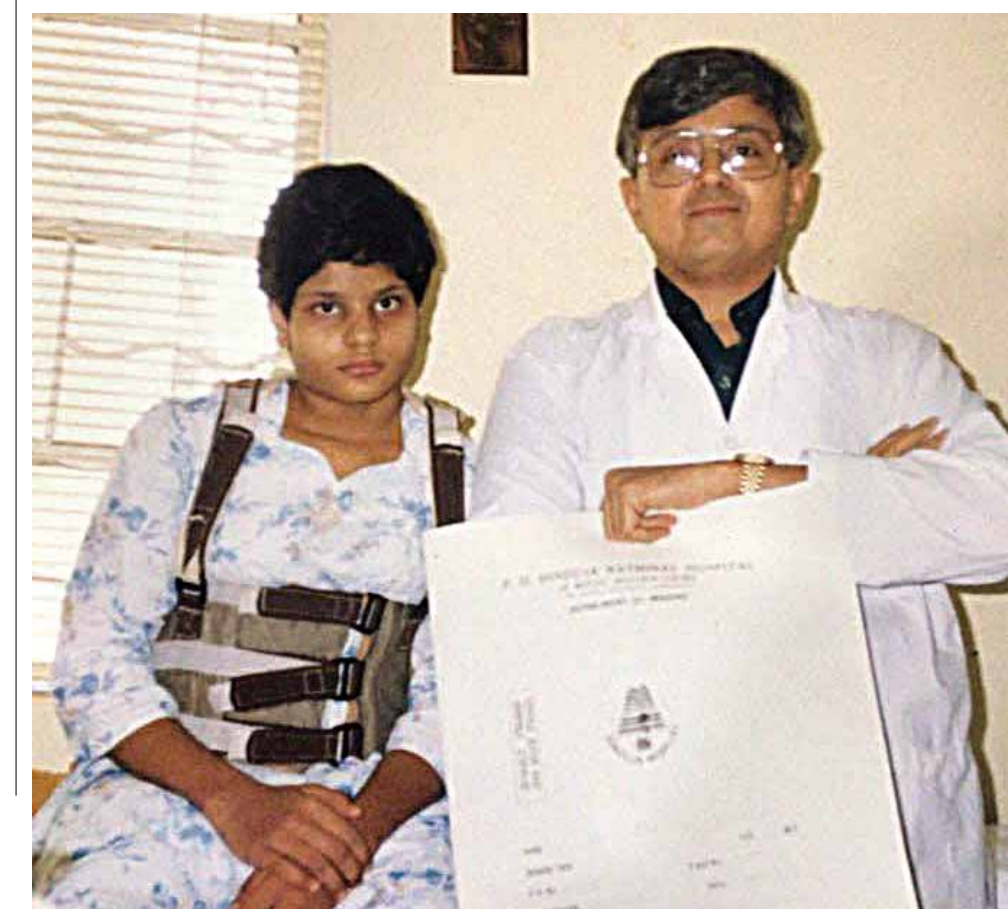
Dr. Shilpa Bhojraj, a practising consultant anesthesiologist super-specialised in cardiac anaesthesia, established the Spine Foundation with the two of them as founders and started to treat poor patients. By 2003 the Spine Foundation had made a difference to thousands of people across Mumbai. But what it lacked was a clear roadmap. This was about to change when Dr Bhojraj came across a news article about a doctor couple working in a very backward adivasi area in eastern Maharashtra. They had just been given the Maharashtra Bhushan award for the fantastic work they were doing there. He decided to go and see what Dr Abhay and Rani Bang's work was all about. This would have a profound effect on Dr Bhojraj and the Spine Foundation.

It was a scorching summer afternoon in 2003 when Dr Bhojraj accompanied by his 19-year old son Tejas, landed in Nagpur airport. His destination in Gadchiroli was Shodhgram, the campus from where Dr Abhay and Rani Bang conducted their work. It had been designed to represent Gandhi's ashram and a tribal village. Situated inside the forest among tribal villages was where they lived with colleagues and their families. It was from here that they treated, trained, researched and sought solutions to the people's health issues with their active participation.

Dr Bhojraj came as a 'tourist' to meet the Bangs and see the work they were doing. But what he found instead was inspiration for the Spine Foundation. In this hinterland, Dr Bhojraj experienced a serenity, simplicity, dedication and work culture that were close to his heart.

Dr Bhojraj discovered that poverty, illiteracy, malnutrition and heavy manual labour gave rise to high child mortality, sickle cell diseases, anaemia and back problems. The rural and tribal people had complained that backache was their major problem. Hence the doctors at Gadchiroli were in search of solution to this large scale problem. As part of its scientific approach, they were trying to design epidemiologic and community based studies to estimate the magnitude and the consequences of this problem. But they also wanted to find a solution to it. Now as a spine surgeon, back problems was something that Bhojraj knew a thing or two about. He realised that this was a golden opportunity to help these people. He would be a part of a great social service organisation with an international standing and a target population under constant monitoring and control.

The Spine Foundation had found it's way. But what exactly was happening in Gadchiroli that created this major shift in the Spine Foundation?



FINDING PURPOSE IN GADCHIROLI

Dr Abhay Bang and Dr Rani Bang show the way to affordable health care in a small village in the backward area of Gadchiroli.



Gadchiroli is 1000km from Mumbai and 200km south of the nearest airport in Nagpur. It's a two-hour flight from Mumbai, and then a five hour drive from Nagpur. Gadchiroli is home to Dr Abhay Bang, an MD in Medicine and his wife Dr Rani Bang, an MD in Obstetrics and Gynaecology. Their story is really an inspirational one and merits retelling.

Abhay and Rani Bang completed their MBBS from Government Medical College, Nagpur, Maharashtra in 1972. This was where they met. Abhay Bang came from a Gandhian family who had spent his childhood at the Mahatma's Sewagram in Wardha and studied in a school started by Gandhi and Rabindranath Tagore. Rani Chari on the other hand came from a wealthy family who preferred to wear ordinary cotton saris, wear no jewellery and live in a hut. As they discovered, their life's dreams and aspirations were quite similar. Thereafter they both completed their Masters, Rani in obstetrics & gynaecology and Abhay in Internal medicine.

Incidentally, both were toppers throughout their academic years. They could have got high-profile, high-paying jobs, or could have set up lucrative practices but chose instead to serve the poor of India. They returned to Wardha and set up a clinic to work amongst the poor, but soon learnt their first lesson - village problems cannot be solved by merely providing medicines!

The question of how to do relevant public health research in Indian villages finally led them to the Johns Hopkins University, Baltimore, USA. where their aim was to learn the science of public health research. America was a dollar intoxicated country; but it was also a knowledge intoxicated country. The Johns Hopkins University was a rich repository of knowledge on medical research in Indian villages. Here they learnt the fine art of research and ways to generate new knowledge. After finishing their Masters in Public Health they decided



to return to India. Their destination—Gadchiroli, one of the most deprived districts in the state of Maharashtra.

In 1985, Dr Abhay and Rani Bang founded SEARCH, an acronym for the Society for Education, Action and Research in Community Health. They started holding regular People's Health Assemblies where the local inhabitants could voice their concerns. Infant mortality emerged as one of the most pressing problems. In 1988, 121 newborn babies were dying out of every 1,000 births in the area. They found that there were 18 causes that may have been responsible for that infant's death, ranging from poverty, diarrhoea, infection or pneumonia to lack of a hospital. The challenge was how to save an infant who can die of 18 causes. The Bangs and their colleagues at SEARCH conducted world-class research on practical approaches to reduce mortality of young children in

resource-constrained settings. They found out a simple but radical solution - training of the village women in neonatal care.

The women were taught how to diagnose pneumonia (using an abacus designed by Dr Abhay Bang, to count breaths), how to resuscitate children and how to administer some basic antibiotics. Instead of villagers having to walk for miles to get to the nearest hospital, these health visitors (called arogyadoots which means 'health messengers') went to where they were most needed, carrying a small health pack on their back. As more women were trained, they passed on their knowledge to others and according to Dr Bang, entire communities became "empowered".

Subsequent work by Dr Bang and his colleagues in two of the most notable of their studies demonstrated the feasibility and effectiveness of community-based management of childhood pneumonia and the provision of home-based neonatal care by community health workers. This is just a tiny fraction of all the work done by Dr Abhay and Rani Bang at Gadchiroli. If you haven't heard about them, there's a trove of information available about these Padma Shri awarders who were bestowed this honour in 2018. This introduction is necessary to understand the road map followed by the Spine Foundation.



PADMA SHRI 2018

■ Dr Abhay Bang and Dr Rani Bang received the Padma Shri in Medicine from the President of India, Ram Nath Kovind at Rashtrapati Bhavan on March 20, 2018.



FINDING A NEW WAY IN GADCHIROLI

Doctors used to urban infrastructure and modern equipment learn how to do more with less from the doctors at SEARCH.

Within a year of his visit to Gadchiroli in 2003, Dr Bhojraj went back there with a team of specialised spine doctors to treat these vulnerable and poor patients whose lives had been paralysed by back problems.

Dr Bhojraj and the team were clinicians and surgeons used to urban infrastructure. Now, they had to evaluate, diagnose and manage these cases without the back-up of sophisticated gadgets and fancy investigations. Their urban 'investigation

friendly' setting had over the years corroded their clinical skills and the doctors had to get back to the basics of what they had learned. In this place the doctors had to rely on their diagnostic skills rather than specialised investigations

and start treatment using the most simplistic interventions.

The sheer number of people who turned up for their first camp was overwhelming. And they were far away from the infrastructure and equipment they were used to. They had very limited funds, and any intervention on their part had to be cost effective. The Spine Foundation doctors had to think differently.

The doctors at SEARCH, Dr Abhay and Dr Rani Bang, neurologist Dr Yogesh Kalkonde and public-health trained young Dr Anand Bang, had taken the concept of 'diagnostic triage' and adapted it to meet their needs.

Diagnostic triage was first used by French doctors treating the battlefield wounded at the aid stations behind the front, during the first World War. The term 'triage' comes from the French verb trier, meaning to separate, sift or select. The battlefield doctors would divide the victims into three groups.

- Those who are likely to live, regardless of what care they receive.
- Those who are unlikely to live, regardless of what care they receive.
- Those for whom immediate care might make a positive difference in outcome.

The Spine Foundation doctors too decided to follow their lead and divided the patients into three groups.

The first group of patients were those who were suffering from lower back pain, without the accompanying leg pain and showed no symptoms of any serious spine disease. They formed 80% of the people who came to them for treatment and did not need any kind of surgical intervention.

The second group of patients, were those who were suffering from neural compression and they made up 15% of the patients. They could be treated using simplistic surgical techniques and low-tech methods instead of complex and expensive ones, yet give the same results.

Under Dr. Rani Bang's leadership, SEARCH had set up a small 30-bed hospital of huts to operate upon the patients with chronic surgical problems. The approach was feasible and popular. Could it be applied to the 15% patients with spine problems in need of surgery?

There was only one way to find out. Dr. Bhojraj had to transport the complex machinery of spine surgery to Gadchiroli.

No doctors in the world had ever dared to do spine surgery in a rural setting. Not even one of Dr. Bhojraj's inspirations Dr. Oheneba Boachie Adjei, a top spine surgeon who had given up his good life in America to return home to Ghana and treat the poor in his country. If they succeeded it would be a first in the world.

Confounding all naysayers, in 2007, the doctors of the Spine Foundation did their first ever spine surgery in Gadchiroli. Using rudimentary equipment and operating in basic conditions the finest spine surgeons in India wrote a completely new chapter in spine care that day.

That still left 5% of the patients who formed the third group. They were suffering from serious spine diseases, namely fractures, tumours and infections. They needed specialised surgery using specialised equipment, that could not be done outside of a speciality hospital.

So what happens to the 5% serious cases? Dr. Bhojraj and his team couldn't just abandon them since there was no way to treat them at this rural setting. If they left these patients untreated, the mission would be incomplete. It wouldn't be the comprehensive care that they had promised to bring to the people.

The Spine Foundation funding provides for their investigations, treatment, admissions, surgery, rehabilitation and their ultimate placement back into the society, so that they can once again be productive members of the society. And if that means that the patient has to be moved to where the Spine Foundation doctors can treat them, the foundation pays for it.

The Spine Foundation's connection with Gadchiroli has grown over the years. So far they have treated 3642 patients in camps and clinics at in Gadchiroli. And operated on 165 serious patients. Amongst those operated by the Spine Foundation was Dr Rani Dang who chose to get operated at Gadchiroli amongst her own people, rather at some specialised hospital somewhere else. What can be a better endorsement for the foundation than that? In the first surgical camp, they operated on seven patients. In 2017, they operated on 17 cases in a single camp.

Treatment of patients was just one part of the objective, they also had to collect and analyse the data collected during

these camps so as to be able to get a picture of the problems facing them, and what they needed to plan for the future. Apart from the medical service that they were providing, the Spine Foundation has initiated a research program in 2010 with four teams of spine surgeons, rheumatologists and physiotherapists involved in the study of lower back pain cases at Gadchiroli. They will soon publish these observations with constructive inferences and guidelines to set up a model for cost-effective healthcare for back problems. The findings will be beneficial not only to India but to all developing countries with limited resources.

Gadchiroli is an important milestone for the Spine Foundation, not because of the work they are doing here but for what it taught them. SEARCH has a philosophy of 'Go to the people' and a methodology of combining science with the needs of the people and developing appropriate solution. Dr. Bhojraj and his team made the valuable addition of professional expertise on spine care including surgical care. When these two strengths came together - a practical approach developed which was tried in Gadchiroli for more than ten years - it gave the Spine Foundation a model that could, and would be replicated across the country. In the following pages we will look at how it spanned out.





INDIA'S FIRST SPECIALISED PAEDIATRIC SPINE UNIT

The Spine Foundation reaches out to the little ones at Mumbai's Bai Jerbai Wadia Hospital for Children to give them a better future.

You might be the richest man in India living in an ivory tower but you will need to keep your window curtains closed if you don't want to see the squalor and slums that permeate Mumbai's landscape like festering wounds. While you cannot miss the wretched poverty it is easy to miss out the dregs at the bottom of this barrel, the children. Not just children but the sick and the disabled.

It is precisely for these children that the Bai Jerbai Wadia Hospital for Children exists. Founded in 1925, the hospital has an orthopaedic department, that was founded by Late Dr. R J Katrak who established the first orthopedic department for children in the city. It is now an established Mumbai University of Health Science fellowship teaching center for Paediatric Orthopaedics.

While there was an orthopaedic

department, it had no speciality spine unit. It was the orthopaedics who treated the spine cases. In 2004 the Spine Foundation decided to start a paediatric spine unit at Wadia and Dr Bhojraj started treating children at this charitable hospital. This was the first specialised paediatric spine unit in the country.

Paediatric spine surgery is by itself tricky. Children are not miniature version of adults. Anatomically and physiologically, there are a lot of differences. Bones in children grow longitudinally and appositionally, and remodel during growth. Bones in children are damaged more easily, but also heal much faster. But what made treatment at Wadia challenging for Dr Bhojraj and his team was a combination of social and economic factors.

The first is that children with spine tuberculosis were clinically presented in the relatively advanced stage by the child's parents. The second factor was how to optimise limited funds. And thirdly there was no universal standard technology, to treat these kind of cases with limited resources. But a good surgeon doesn't blame his tools. And so the doctors had to chart the way to deliver good results in deformity surgery at lower costs.

It meant moving away from the most modern surgical techniques to the most optimum technique, using locally manufactured implants and operating in basic set ups. Think of a modern airline pilot used to a cockpit kitted with the most advanced aids having to use his stick and rudder skills while flying a basic two-seater trainer aircraft.

They say that necessity is the mother of invention. In this case, invention and

innovation. The doctors had to innovate when it came to surgical techniques and work with the industry to engineer locally made growth rods and rib expanders.

Wadia hospital has 50 beds in the orthopaedic department. Over 2000 patients are admitted here annually. 3500 patients are treated at the OPD and 1000-1500 surgeries are carried out at the hospital every year.

While these are just numbers, it is important to remember that behind every number is a face, a name, a child and a family. One such name is Atharva Mangave who hails from Narsobawadi, a small town located at the confluence of Krishna and Panchganga rivers about 50kms east of Kolhapur in Maharashtra. It's a major pilgrimage centre for Dattatreya devotees who flock here to the temple of Shri Narasimha Saraswati, an avatar of Lord Dattatreya. Atharava had been born with congenital anterior chest wall defect. He was bought to Wadia when he was three-years old. The defect affected his spine and also decreased his lung capacity causing infections and thereby affecting his health. Remember that a child's bones are always growing, so there could be no one-shot solution to stabilise his spine. The doctors put in a growth rods to harness the growth of the spinal column and lungs while maintaining the spinal alignment. Till Atharva turned seven, he had to return to the hospital every six months, and then once a year till he turned 11. After the final surgery Atharava started gaining weight and thriving. Today he is just another happy child playing with his friends. The doctors of the Spine Foundation have given Atharva a new life.



REACHING OUT TO THE URBAN POOR

Establishing a specialised spine care unit in Mumbai to help the less privileged who constitute a large part of the urban population.



Mumbai, the maximum city. A city overflowing with people, with dreams in their eyes and desperation in their souls. Where the outstation trains come into the platform to disgorge a swarm of moths to the bright city lights. Starry-eyed dreamers following the footsteps of the Bangkok cook turned superstar Akshay Kumar. People pregnant with ideas seeking home for their prodigious talent. People possessed by the spirit of entrepreneurship seeking absolution in the city of gold. People fleeing poverty, exploitation, persecution come here not just for a better future, but any future. This is a city straining at its seams but somehow magically adjusts to make place for, one more.

It was in the fetid air of this city that the Spine Foundation found it's third breath. Dr Bhojraj after his visit to Gadchiroli realised that sometimes our search for answers take us far from home, only to recognise that it lay all this time right under our

noses. Dr Bhojraj and the Spine Foundation had found meaning and direction by the work done by the doctor couple in distant Gadchiroli, but had come back to realise that there was a bigger challenge facing them at home – the urban poor. Wedged between a creaking public healthcare infrastructure and an expensive private medical community, thousands of people were drowning in a quagmire of apathy, incompetence and greed. The poor could not, literally, afford the rising cost of living.

Mumbai is home to over 22 million people. The government and municipality run five tertiary teaching hospitals to serve the denizens of this megacity. A tertiary hospital is large hospital which usually offers a full complement of services like paediatrics, obstetrics, general medicine, gynaecologist, surgery etc with specialist doctors. Patients are often referred from smaller hospitals to a tertiary hospital for major operations, consultations with specialists or when sophisticated intensive

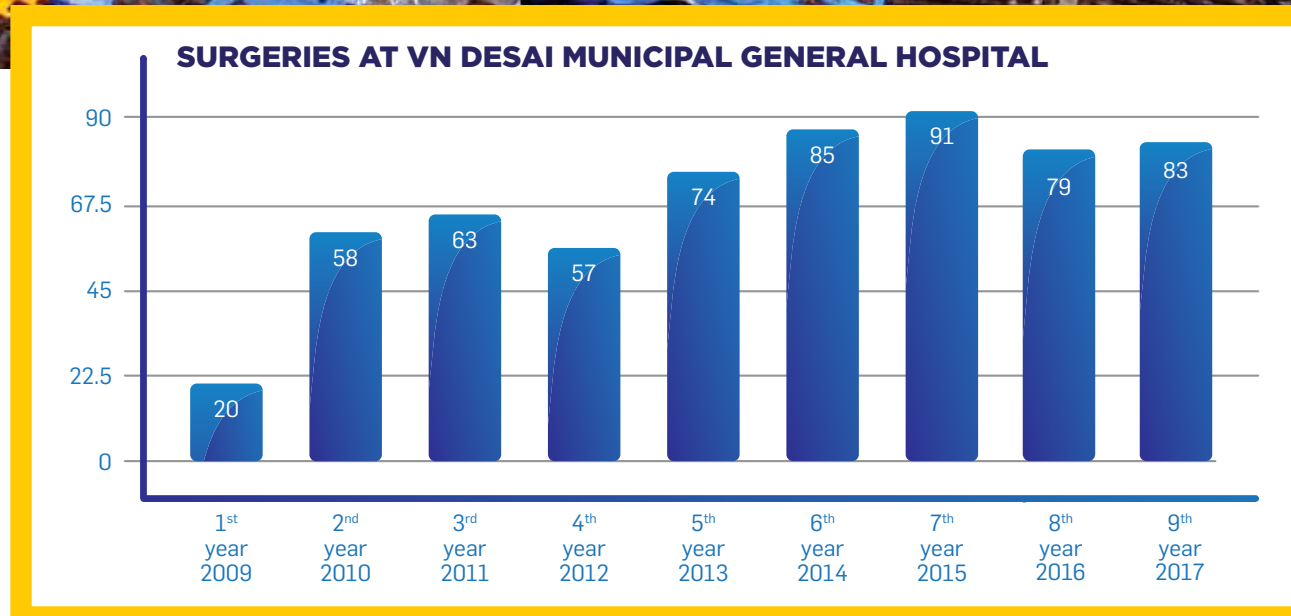
care is required. Little wonder that these five main Mumbai hospitals are flooded with patients and the waiting list is endless.

To support these hospitals there are 20 peripheral hospitals across the city. These hospitals face many challenges, ranging from a lack of manpower and specialists to a lack of essential equipment and infrastructure. Therefore anything apart from very basic and routine treatments, all other cases are referred to one of the five tertiary hospitals. So the patient has a choice, join the endless queue or sell off everything the family owns and get treated at a private hospital.

Since returning from Gadchiroli, Dr Bhojraj wanted to do something for Mumbai's urban poor. The task seemed too big and the challenges too unsurmountable. How would they reach out to the people, and where would they treat them?

The answer came in the form of Dr Madhav Sathe, a consulting anaesthetist who is also the driving force behind the Bombay Mothers & Children Welfare Society. He offered Dr Bhojraj space at Dr HV Tilak hospital. This municipal hospital is located at BBD Chawl in Mumbai and visited by the lesser privileged sections of the society who receive treatment here at subsidised rates. In 2006, Dr Bhojraj started a low-cost spine care program here. The experiment turned out to be a success and the spine care ward was soon a buzzing hive of activity where the poor patients could access quality spinal treatment. But the good doctor was not satisfied. He wanted to reach out to more people and for that the Spine Foundation needed a big municipal hospital. What could he do?

This is when Dr Bhojraj came across a



Mumbai based NGO called the Center for Study of Social Change (CSSC) that has been quietly working in Mumbai's H-East ward. For those who know Mumbai, the H-East ward covers an area of roughly over 13 sq kms. Its boundary extends from the Mithi River CST Road to the localities of Vakola and Kalina to the Dharavi Link Road and Vile Parle Subway. Though over 10 lakh stay in Mumbai's H-East ward, over 75% of them stay in slums. This whole ward is served by just seven government health posts, six dispensaries, one maternity facility and one general hospital – VN Desai Municipal Hospital in Mumbai's Santa Cruz, East.

CSSC was founded in 1971, and as it's brochure states it 'essentially works for integrated human development by bridging the gap between knowledge and activity'. As the NGO had discovered, for any significant social change the first step is the participation of women. Dr Amartya Sen has said, 'Women should no longer be seen as the beneficiaries of development but must themselves become the agent of change'.

CSSC had set up a Woman of India (WIN) network that promoted health, family planning, education and income generation. Under the health scheme, health workers from the NGO went door to door and then if needed, referred the patient to one of the 20 WIN clinics it ran in this ward. It also ran camps and health programs from its campus. More serious cases were referred to the VN Desai Municipal General Hospital.



would fail frequently and surgeries had to be cancelled. The hospital's ICU too didn't have all the facilities that were needed and had to refer their patients to better equipped hospitals. In case you needed blood after working hours, you could not. Moreover patients who were not covered by a government medical scheme like the Rajiv Gandhi Jeevandayee Arogya Yojana (a health scheme run by the Government of Maharashtra for the poor people of the state) did not qualify for the subsidised health care. And even when they did, the patients had to bear the cost of medications and investigations not available at VN Desai Hospital. Any purchase the hospital had to do had to be routed through its few registered vendors and any decision had to go through a six steps of approval. It was like waiting six months for a run-out decision by an umpire in a cricket match.

While there was a bigger war to be won, the Spine Foundation decided to concentrate on the smaller battles. that it could win. They decided on three fronts – mindset, manpower and money.

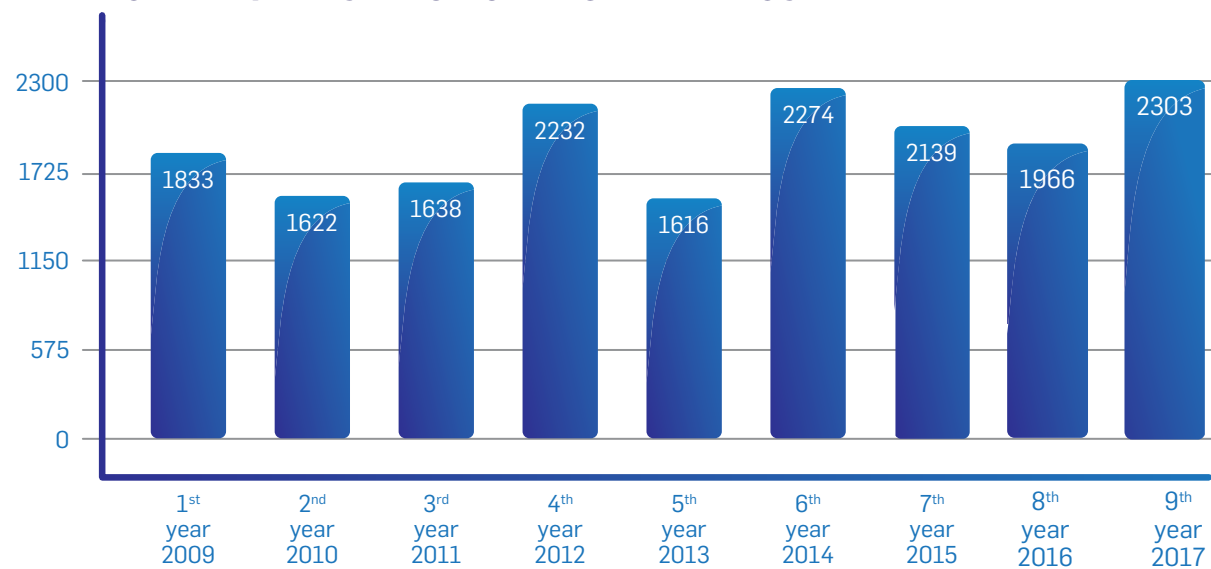
In it's very first year of operation the Spine Foundation treated 1833 patients and performed 20 surgeries at VN Desai Hospital. By 2017 the number of OPD patients had gone up to 2303 and 83 surgeries.

While it were the doctors of the Spine Foundation who were the face of this change, there are many other people and organisations who helped make this happen. The Pentagon Charitable Foundation offered to sponsor the operation theatre that the hospital needed and thanks to their help the hospital has a well-equipped OT running today.

Are things at VN Desai Hospital perfect now that the Spine Foundation has pitched in? Far from it. It needs money to set up MRI and pathological labs. It needs a functional 24-hour blood bank. It needs manpower and resources. It needs more NGOs, watch dog committees, public-private partnerships and citizens to get involved.

Yes Mumbai is a city whose streets are paved with the potential of gold. But there are different understandings of what this gold is. For some it is money. For some it's fame. While for others its a chance to give back something to the people, to be a part of the solution. And that is what makes all the difference.

OPD AT VN DESAI MUNICIPAL GENERAL HOSPITAL



While having his morning cup of tea one rainy morning when you wonder if God is showering his blessings or hurling down curses, Dr Bhojraj had an idea. In spite of all the work done by the NGO, there was one thing missing – spinal treatment. And who better to fill that gap than the Spine Foundation? The Spine Foundation would set up a specialised spine unit at the VN Desai Municipal General Hospital to serve the poor in this ward. The simplistic techniques and low-tech methods they had practiced so successfully at Gadchiroli could be used here to make spine treatment accessible to the poor. And they would be able to help a larger number of people.

It was easier said than done. When the Spine Foundation first proposed the idea everyone was most sceptical. There was just no precedent for such an idea. VN Desai Municipal General Hospital, named

after Mumbai's mayor the Late Vishnu Nandrai Desai, was a municipal hospital with funding from the government. Moreover the hospital had no manpower or infrastructure to spare for the Spine Foundation. But Dr Bhojraj and his team were not ready to accept defeat. They steered through every obstacle, reached out to every power they could and worked ceaselessly to make it happen. Finally in 2009, the Spine Foundation opened its spine unit at the VN Desai Municipal General Hospital to bring spine care to the people who could not afford it.

Though they had successfully managed to start the spine unit at VN Desai Hospital, the team faced many challenges. There was a dire shortage of physicians, anaesthetists, physiotherapists, nursing staff and ward boys needed for the smooth running of an operation theatre. Moreover the equipment

REACHING OUT TO THE RURAL POOR

Economic and geographic constraints mean a large number of people have no access to quality spine care. The Spine Foundation hopes to change that.



- | | | | |
|----|------------|----|-------------|
| 1 | Gadchiroli | 11 | Pardi |
| 2 | Ambejogai | 12 | Bilaspur |
| 3 | Akola | 13 | Goa |
| 4 | Dhule | 14 | Dhar |
| 5 | Ratnagiri | 15 | Ranchi |
| 6 | Sittilingi | 16 | Sindhudurg |
| 7 | Aurangabad | 17 | Rajasthan |
| 8 | Aarohi | 18 | Bihar |
| 9 | Dehradun | 19 | West Bengal |
| 10 | Goraj | | |
- Established RSCC
■ Planned RSCC

The doctors of the Spine Foundation have built up a vast repertoire of experience and expertise of working with minimum resources under difficult conditions at Gadchiroli and VN Desai hospital. Now they want to expand their operations to reach out to the people at the bottom of the pyramid who do not have access to quality spine care. While the urban poor are concentrated in large cities and easier to get to, the rural poor are scattered across the 3.287 million square kilometres that make up India. For most of these people making a trip to Mumbai to access quality spine care is as impossible as a trip to the moon. That is why the Spine Foundation is in the process of setting up Rural Spine Care Centres.

The work done by the Spine Foundation hasn't gone unnoticed. In June 2018, the Government of Maharashtra approached them and signed a Memorandum of Understanding with the Spine Foundation to replicate their Gadchiroli model throughout the state under the Maharashtra University of Health Sciences. The four rural medical colleges that the Spine Foundation is working with are at Ambajogai, Dhule, Aurangabad and Akola.

Ambajogai: This town in the Beed district of Maharashtra is home to Swami Ramanand Teerth Rural Medical College, the first rural medical college in Asia. This is the medical college where the Spine Foundation set up its first camp for patients in the region in January 2017. So far, they have treated 900 patients and performed 35 surgeries in Ambajogai.

Dhule: In a tribal district in North Maharashtra is the town of Dhule, on the proposed Delhi-Mumbai industrial corridor. The Spine Foundation collaborates with the Shri Bhausaheb Hire Government Medical College & Hospital to reach the people in the area. Since the first camp in September 2016, the Spine Foundation has treated 765 patients here and operated on 21 patients.

Aurangabad: Did you know that Aurangabad was a part of the Hyderabad state till 1956? While the city is an industrial powerhouse it is also a gateway to the tourist hubs of Ajanta and Ellora caves. Since it's first camp here at the Government Medical College the foundation has treated 253 patients and carried out eight surgeries.

Akola: This city in the Vidharba region of Maharashtra, is also known as the cotton



city. The Government Medical College & Hospital in Akola is the base of the Spine Foundation here. So far the Spine Foundation has treated 714 patients and performed 35 surgeries in Akola.

The Spine Foundation does not wait for a MoU with the government to establish their camps. They first came to Ratnagiri in March 2017 and treated 101 patients on this visit. Four camps and six months later the Spine Foundation doctors have treated 543 patients and operated on eight more.

As of the moment the Spine Foundation runs eight Rural Spine Care Centres in Maharashtra including Gadchiroli. It is now spreading its wings across the country, but to put feet on the ground is a huge task. That is why it is working in collaboration with the Association of Spine Surgeons in India and the Association of Rural Surgeons in India to expand its reach nationwide.

The Spine Foundation is gearing up to enhance its presence at Sittilingi in Tamil Nadu; Aarohi, Rishikesh and Dehradun in Uttarakhand; Godhra in Gujarat; Dhar in Madhya Pradesh; Ranchi in Jharkhand and Samastipur in Bihar, with more to follow.

You might ask if it's worth all the work, time and money being invested on it. So here is a true story.

During a Spine Foundation camp in

Akola, Maharashtra the doctors came upon a young woman, barely 20-years old with an infant she had given birth to just a week ago. She was emaciated and bed-ridden in a bed soiled by her own urine and could barely breastfeed her baby. Suffering from spinal tuberculosis and other associated conditions, she had been deserted by her husband and left to her fate.

Since she was in a serious condition, the doctors operated on her the very next day and put her on an anti-tuberculosis treatment. Though weak, she responded to the treatment and recovered well enough to be discharged from the hospital soon after.

Thereafter the doctors lost sight of her though records showed that she visited the cell for her anti-tuberculosis medicine and at another time she came to visit a paediatrician for the care of her child. About six months after the operation a young lady with a healthy child walked into the OPD for a follow-up. The doctors thought that she had walked into the wrong place since she looked perfectly healthy, till one of the doctors recognised her as the same woman that they had operated on a few months ago on an emergency basis. The Spine Foundation's intervention that day had saved not just one life, but two.



working in the field for the past 20 years, but the journey has just begun. The next step is to set up more Rural Spine Care Centres across all the 27 states of India. Not just randomly set up a centre but develop standardised protocols and algorithms for starting a new centre. And after setting it up, critically evaluate and study their functioning to identify the deciding factors for poor or excellent results. Findings that can be shared to learn and fine-tune other centres.

The other grand plan that the Spine Foundation is working towards is to set up a National Centre for Comprehensive Spine and Musculoskeletal Care at Gadchiroli that will bring evaluation, surgery and rehabilitation to the afflicted in this backward region.

towards setting up a hands-on training centre in Mumbai to develop the clinical and surgical skills in the team and the new recruits.

Another objective of the foundation is to incorporate the maximum government schemes that exist to make these projects self sufficient.

While the immediate objective of the Spine Foundation is to bring spine care to the poor wherever they are in India, the larger objective is to spread this message across the world so that nobody has to suffer anymore. The research and findings of the foundation can be replicated in any developing economy.

If you wish to help, contribute or know more about the work being done by the Spine Foundation check out their website www.spinefoundation.org.in.

The Spine Foundation is also working



THE FUTURE, THE SPINE FOUNDATION WAY

The Spine Foundation is on a mission to spread the message of quality health care across all 27 states of India , and the world.

Tata Motors disrupted the global car industry when it launched the Tata Nano. Mansukh Prajapati, a potter and clay baker from Gujarat has devised Mitti Cool, an ingenious refrigerator

made entirely from terracotta (clay) that keeps water cool and fruits, vegetables and milk fresh for days – and yet doesn't use a single watt of electricity. Some call these 'jugaad engineering, others call

it 'reverse innovation' or 'constrained innovation'. Call it what you will, but it has to meet four vital parameters. The price-cost factor that enables you to create a new market. Scalability to meet

the price-performance targets. It must be aspirational, and liked by the consumer. And lastly it must be resource efficient to make optimal use of available resources. The Spine Foundation uses this same philosophy to create a change for the better through innovation, commitment and dedication.

The Spine Foundation is an unique experiment to reach out to the rural population and set up viable centres offering quality care at the grassroots level. It isn't just a not-for-profit organisation but actually pays for the cost of treatment from its own pocket.

The foundation is trying to offset its initial costs through funding agencies to start with but eventually making it self-sustainable by linking it to existing government funding and public insurance schemes that are not reaching the grassroots. Big corporate houses and industries with sizeable CSR budgets are another possible source of funding that the Spine Foundation is actively pursuing.

The Spine Foundation has been

DOCTORS OF THE SPINE FOUNDATION

TRUSTEES

Dr. Shekhar Bhojraj- Mumbai
Dr. Shilpa Bhojraj- Mumbai
Dr. Abhay Nene- Mumbai
Dr. Premik Nagad- Mumbai
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Dr. Suman Dhar- Tripura
Dr. Jayesh Bhanushali - Thane



CONTACT DETAILS



Dr. Shekhar Bhojraj: 09821064458

Dr. Premik Nagad: 09322536667

Dr. Priyank Patel: 09619006006

www.spinefoundation.org.in

CORRESPONDENCE

Dr. Shekhar Bhojraj
Spine Clinic

A791, Lilavati Hospital & Medical Research Centre,
Bandra Reclamation, Bandra (W), Mumbai 400050

spine_clinic@rediffmail.com
09820688221/022 26406497

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