HEALTH PROBLEM MITIGATION THROUGH ADVOCACY OF PUBLIC-PRIVATE-PARTNERSHIP FOR SOLUTION OF LOCAL HEALTH PROBLEMS THROUGH SERVICE BASED HEALTH CARE MODELS

Amrita*
Punit Saurabh**
Dhrubes Biswas***

Abstract: *As medical research and technologies touch new heights, the related businesses are also taking its advantage. There is a lot of difference between the ways of medical treatment in interior villages from those of towns in terms of cost, knowledge, awareness etc. The paper would examine the local health service issues such as malaria, jaundice and other severe seasonal diseases and the methods adapted to treat them locally and remotely. The essence of team-based medical-entrepreneurship and advocacy by Public-Private-Partnership will be dealt with depth in this paper. The advent of team-medical-entrepreneurship including volunteering doctors-nurses and other medical assistant staff would not only bring innovation in this area but also create sustainability for countless people who would be a part of the kiosk. The paper is a proposition of local health based entrepreneurship which would bridge the gap between medical-research and business opportunities by making business resources more accessible for every rural family.*

Keywords : *Health Problem, Public-Private-Partnership, Health Care Models*

The change in the structure, style and system of health care service is greatly driven by the rapid change in the demographics of the country.

INTRODUCTION

Entrepreneurs make things happen, besides, they convert the concepts into reality, be it a product, policy or a institution (Zilberman, 2006). Entrepreneurs are innovators who become champions of new processes. Openness to new ideas, freedom for investigation of operation and promotions are keys to entrepreneurial innovation. Entrepreneurs recognize, create, engage and exploit opportunities. Innovation is sometimes defined, rather broadly, as a new product, service, process, or type of organization (Trott, 2002; Tidd et al., 2001). Creativity and innovation are fundamentals of business novelty. Entrepreneurs know how and where to secure the resources they need and they frequently accomplish this with effective networking. (Thompson, Doherty, 2006). Innovations in the field of medicine will enable the general public to afford superior health care services.

The Indian health sector has greatly evolved with the use of electronic and imaging equipment since the reforms of 1990's. From a very conservative operation of the health sector primarily surrounding public sector health-care provider and small clinics, this sectors today sees big players. The market structure has evolved from a number of unorganized participants to organized health-care providers with franchisees in different locations. This change in the structure, style and system of health care services is greatly driven by the rapid change in the demographics of the country. With technology, we have greatly improved the life expectancy and life span of the population. Today, India stands as the

*Vinod Gupta School of Management, IIT Kharagpur, Sponsored Research & Industrial consultancy (SRIC) Indian Institute of Technology (IIT) Kharagpur-721302 Email : amrita@sric.iitkgp.ernet.in, iamthealchemist@gmail.com
**Vinod Gupta School of Management, IIT Kharagpur-721302 Email: punit.saurabh@gmail.com
***Prof-in Charge, Incubation & Entrepreneurship, Sponsored Research Industrial Consultancy (SRIC) & Managing Director, Science & Technology Entrepreneurs' Park & Professor of Electronics & Electrical Communication Engineering, IIT Kharagpur-721302 Email: dbiswas@ece.iitkgp.ernet.in

country dominated by people in the age of 25 to 40. The multi-national culture has spread into the health domain too. This sector is not only driven by effective treatment, but also by technology and personalization.

The Indian health sector offers ample opportunities for improvement. These can be clearly visualized if we focus on the value chain of an organization. However, the Indian health sector operations have been visualized typically from a functional aspect. The health sector has evolved and so have the customers. They demand new technology along with the responsiveness, customization and personalization. Information and technology are no longer bound by territory. The western part of the world is based explicitly on diagnosis while in the Indian scenario, the medical treatment depends on symptoms. While in the West patients reply on pin-pointed therapy, in India, people need to satisfy themselves by getting medicines for symptom-based diseases. This becomes pathetic for diseases like lung and colon cancer, where when the patient is treated till the third stage for other diseases, the actual disease is noticed. Though imaging has evolved much more in the last few decades, Indian population due to its high cost structure can not afford to get treated like the western systems. The proposed project will be a serious effort for making the new technologies available and affordable to each and every individual in the society. Therefore, the health sector also has to build in mechanisms to offer flexibility for all classes of people. Due to literacy and awareness, today the ordinary customer has become more demanding but helpless. This has to be set right. The health technology and niche-imaging techniques must be developed in such a manner that it becomes available and accessible to the common man. Apart from benefit benefiting the common man, it will push up the standard of living in India, bringing down the mortality rate and death rate.

Some of the key areas where today's health sector customers focus on are:-

1. Responsiveness
2. Personaliz ıtion
3. Latest technology
4. Timely information
5. Regular feedback

We, as part Indian Institute of Technology, are working in incorporating technology domains that provide ample scope to improve and create value through the use and implementation of integrating systems. The health sector has been largely unorganized in India; therefore, the industry has been unable to avail of benefits that could have been possible through integration of a number of stakeholders of imaging like radiology, CT-scan and other such players in the market.

The Challenges faced

The healthcare system all around the world is characterized by multiple systems of medicine, mixed ownership patterns and different kind of delivery

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structures. A fundamental issue in public health which is of major concern in this paper is to hold countries of the world accountable for the health of their people and create innovation in health care systems. Most medical advances are incremental but the true break-throughs are very rare as far as the medical services are concerned. The paper discusses the hope which can bring about change in the medicine service industry. A large percentage of costs of local people go to paying high interest rates on loans for healthcare, emergency health requirements while travel and lost work time accounts for health related problems much of the remainder. The problem of many developing countries can be clearly seen when

- a mother suffers complications of labour without access to qualified support,
- a child misses out on essential vaccinations, and
- an inner-city slum dwellers live in squalor.

We see the absence of protection for pedestrians alongside traffic-laden roads and highways, and the impoverishment arising from direct payment for care because of a lack of proper health services. These and many other everyday realities of life personify the unacceptable and avoidable shortfalls in the performance of our health systems all around the world. The impact of ill health on productivity affects not only the poor, but societies and economies as well (WHO, 1999).

The tunnel view of the health sector has led to almost disregard of the opportunities available to improve responsiveness, efficiency and effectiveness of the health sector. Indian health sector is becoming high technology based. The patients, especially children who could get better treatment by imaging services such as radiography and ultrasound would make the whole of India not only healthy but also disease free. This will lead to eradication of many deadly diseases.

India is a blessed country. It has not only the advantage of immense natural resources but also it is rich with skilled labour to facilitate its entry in the new millennium. India provides the advantage not only in terms of inputs (Capital and Labour), but also provides the second largest consumer base of the world. It is richly endowed with these resources; however, over the years, there has been a strong urge to build the enterprise part of the input required to effectively utilize the available resources. Also, innovation and creativity have not been explored, because of which the essential risk taking motivation has lacked across the country.

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The aspect of support processes like HRM need to be exploited fully.

The entire health industry tends to focus on the core processes, basically the functional divisions of medicine. Therefore, the major applications of medicine have been in development of new technologies in different fields of diagnostics. The aspect of support processes, namely Human resource, procurement, infrastructure and technology have not been exploited to their full extent. Therefore, there is an opportunity to exploit these aspects of the value chain to improve

the three aspects in imaging and the health sector – responsiveness, efficiency and effectiveness.

The growth in the healthcare-sector is driven by the growing need for healthcare services mainly due to the lack of health-care facilities in the urban and rural areas of a country. Providing affordable health care is an urgent issue which must be referred accurately. In the context of mother mortality rate, country estimates of maternal mortality over time are crucial to inform planning of sexual and reproductive health based programmes and to guide advocacy efforts and research at the national level. The maternal mortality report 2005 estimated total of 536 000 maternal deaths worldwide in 2005, developing countries accounted for 99% (533 000) of these deaths, 270 000 deaths occurred in the sub-Saharan Africa region alone, followed by South Asia (188 000). Thus, sub-Saharan Africa and South Asia accounted for 86% of global maternal deaths. However, government and other not-for-profit organizations have taken efforts to teach the mother-care and related issues, even then these rates are high due to the lack of appropriate and easy services provided.

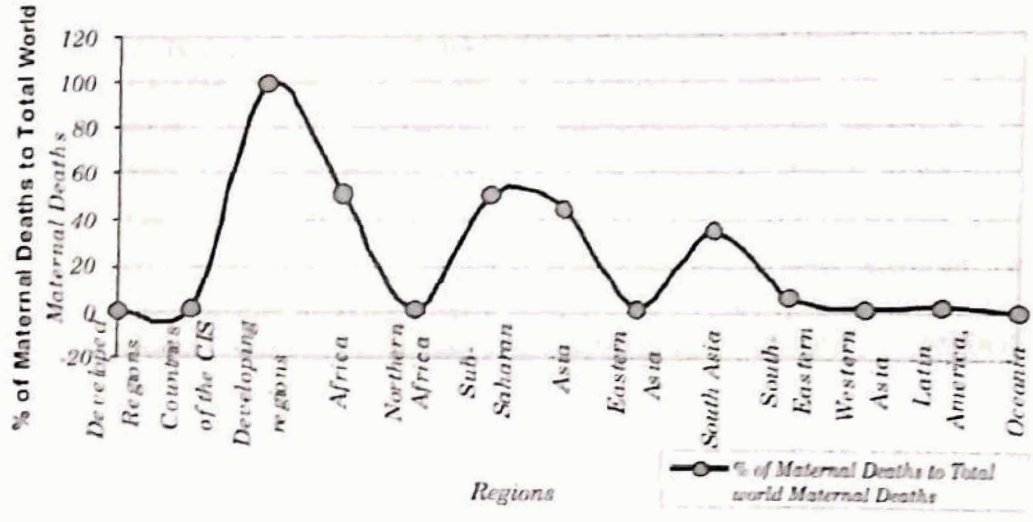


Figure 1: Scenario of % mother mortality rate around the World

The high mother mortality rate in developing countries can be accounted for more than 99%. There is a lack of health awareness among the emerging regions.

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Other problems faced by the people around the world are the health education. Malaria is one of the planet's deadliest diseases and one of the leading causes of sickness and death in the developing world. According to the World Health Organization there are 300 to 500 million clinical cases of malaria each year resulting in 1.5 to 2.7 million deaths. The proper education and health service provided to the patients are not enough in the countries especially in the developing countries. Critical factors in the relationship between poverty and health are

population and environmental health issues. Eighty percent of the poor in Latin America, 60% in Asia and 50% in Africa live on marginal lands of low productivity and high susceptibility to degradation.

Technology to Health Gap (T2H gap)

The management of medical innovations and latest technologies is one of the greatest challenges to the health care delivery system and healthcare providers (Rusinko, 2003). The health sector has widely been visualized as a coherent system focusing on the improvement in the knowledge and skills of diagnostic treatment. Examination of innovation and technology from the perspectives of firm, community and system has already been done (Constant, 1987; Van de

Ven, 1993, 2002). Medical education, itself provides extensive application of technology to improve on the functional aspects of the treatment of medicine. There are also a substantive number of non – functional aspects of the health service not dependent on the domain knowledge as such. Effectiveness, pricing, security as well as societal impact must be verified for the proper application of new medical technology (Abrams and Hessel, 1987; Garber et al.2000).

These key factors namely, personalization or customization, responsiveness and feedback greatly enhance the success and effectiveness of the service. However, these aspects have only found secondary relevance in literature and practice. Through increase in literacy rates and awareness among the common population, we have found that, the non-functional aspects of the service have gained immense importance in recent years. These non – functional aspects are also a function of the support processes of the value chain, the most important being technology. A wider perspective of innovation and technology, in terms of a community or network outlook, is required to enhance the knowledge of the technological innovation process which in turn would advance technological competitiveness and advance our ability to manage innovations and technologies (Van de Ven, 1993) in the field of medicine. Due to the extensive interaction and interdependence between all members of the technological community, this framework is going to be useful as a partnership to analyze the emergence of medical innovations and new medical technologies. However, in the existing Indian scenario, there is a wide gap between the current use of technology and the possible use of technology in the near future. We call this gap the "T2H gap". The Technology to Health gap refers to the unidentified space which is still to fully understand the full potential of technology for improving service in this sector. A more purposeful approach is required, in which medical innovations which occur in the industry such as to reach every patient at, a cheaper rate be designed rather than by accident of fame. The new design as proposed by us will help the technology gap to be filled for connectivity of health sector information with innovative medical techniques to every individual. As an Institute, fully devoted to

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However in the existing Indian scenario, there is a wide gap between the current use and the possible use of technology in the near future and this is called T2H gap.

cause of developing and using technology at all ends and applying it to different domains, we have found a major gap to fulfill, and this proposal is a step towards the said goal.

The solution

The basic solution for these problems around the world can be medical service interventions which would help the people of all statures to understand and access these services. The vaccination and drugs can be provided to the people by following health based business strategies, such as strengthening health systems and prevention programs, improving nutrition, and expanding access to clean water and sanitation. The non-health related endeavors, such as improving roads and communication, expanding education, and easing poverty should also be a part of these models. We must then carry out studies and trials with collaborators to learn what works best. Hence, there must be primary health care systems as a set of values and principles for guiding the development of health systems. Opportunities in healthcare need to be grasped by the entrepreneurs as there is a huge capacity to provide this service in the rural and urban set-up of the country. The time is ripe for entrepreneurs to take up the cudgels and use innovation and entrepreneurship for generation of societal goodwill in the healthcare domain. We may achieve the sustainable alternative to get out of the vicious circle of jobless growth as well.

Through the integration of different stakeholder in the health sector, the different stakeholders can benefit greatly and also improve the overall quality of the services provides to the patients not only in terms of technology in the functional areas but also in the improvement of the overall quality of the health services.

A research by Novratis Foundation for Sustainable development (2006) has found out that the first delay in seeking treatment by the remote people from villages is due to fact that people must first mobilize and convert respurces. Selection involves taking into account both external and internal environment. "One needs to assess political, economical, social, technological, environmental, and legal factors as part of external environment.

Basic necessity for healthcare based Business models

Despite the huge differences between developing and developed countries, access is the major issue in rural health around the world. Even in the countries where the majority of the population lives in rural areas, the resources are concentrated in the cities. All countries have difficulties with transport and communication, and they all face the challenge of shortages of doctors and other health professionals in rural and remote areas. Many rural people are caught in the poverty– ill health–low productivity downward spiral, particularly in developing countries. The major risks to health arise not just from environmental or biological causes, but also from behavioral ones. Fully half of all deaths globally could be prevented or delayed through behavioral changes, including smoking

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cessation, exercise, dietary modifications, and safer sexual practices, as Harvard Health School scientists and their international collaborators reported in 2003. It is a huge challenge to inspire children and people at risk to change unhealthy behaviors.

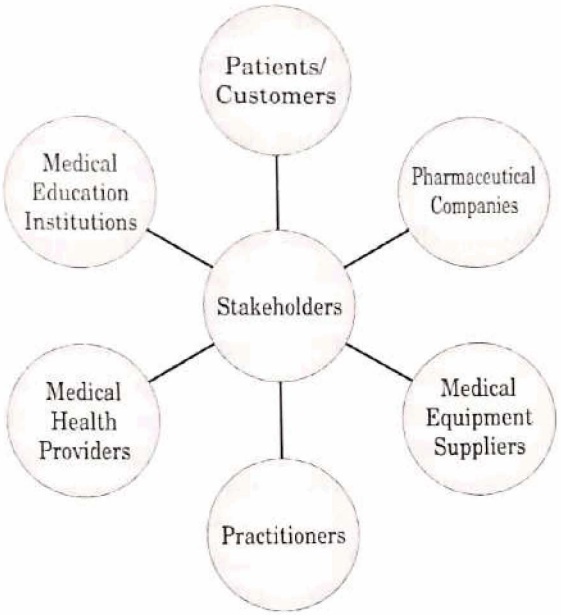


Figure 2: Different stakeholders in the health sector

The health sector in India has evolved into a highly competitive environment. It has tremendous growth potential.

In order to provide and deliver appropriate medical care, effective planning and management of health services is essential. With increasing demands from both public and political domains, the provision and successful utilization of objective decision-making tools is a challenging yet vital task.

The health sector in India has evolved into a highly competitive environment. The Indian customer has also evolved because of the increase in literacy into a more demanding individual. The market needs for diagnostic based treatment have also evolved. Some of the aspects of health sector demanded by the different stakeholders are listed below.

In developing countries like India and China, their high population makes them an important player; in the health care industry. Providing affordable health care is an urgent issue for a country where more than 1000 million people have minimum daily income of less than Rs 20 per day. Even as medical facilities in India and China are going hi-tech and their professionals global, rural regions seem to be languishing. There is a growing chasm between the haves and haves not with respect to availability and affordability of healthcare services.

According to the Insurance Regulatory and Development Authority, Indian healthcare industry has the potential to show the same exponential growth that the software industry showed in the past decade. This is because of a huge gap in the

supply and demand for basic medical facilities in the rural and urban areas.

Many rural and remote communities bear the cost of global change without the commensurate benefits. (Birrell, Dibden Wainer, 2000)

Rural Health Services

Despite the substantial differences between developing and developed countries, the key themes in rural health are the same around the world. "Access to services" is the major rural health issue. Even in countries where the majority of the population lives in rural areas, the resources are concentrated in the cities. All the countries have difficulties with transport and communication, and they all face shortages of doctors and other health professionals in rural and remote areas. The people in remote areas must be aware of the fact that they are not so unlucky to be seriously sick or injured that none saves them. People in rural areas are more focused towards their economic situation and security needs. The need for emergency response of the doctors and nurses must be taken as seriously as in any urban areas. Often, the way in which this felt need is expressed is through the community's primary focus on recruiting and retaining a doctor or doctors and having a hospital in the area (Strasser, Harvey, Burley 1994). Generally, the rural community all over the world faces the challenge of less funds, limited resources and poor infrastructural health care support. Rural health services require ample number of doctors and other health care providers who have the required skills to work efficiently and happily in these areas. Sustainability of these services is reliant on adequate health service infrastructure and availability of specialist maintenance.

Throught the world the key factors in rural health is "Access to Services"

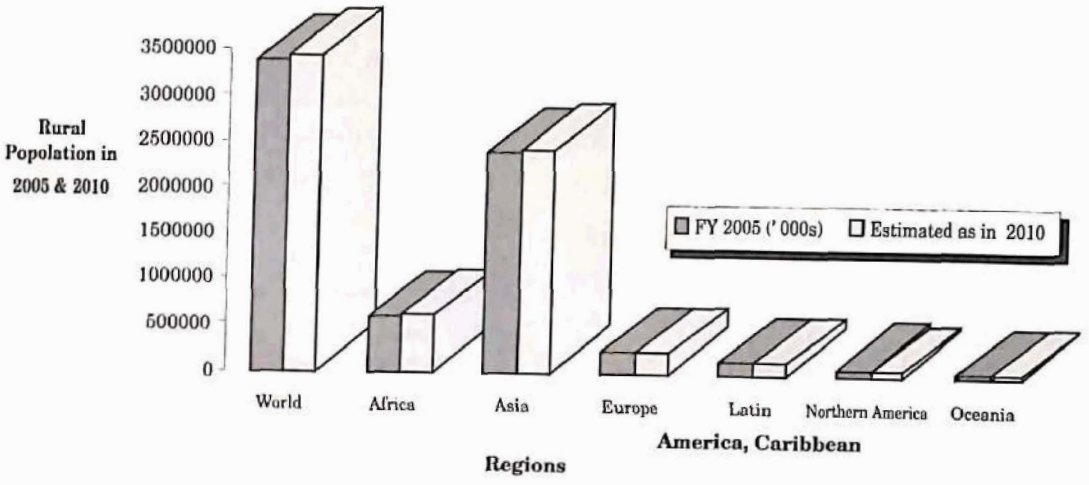


Figure 3: Rural population in the world and regions in thousands.
(source data: World Population Prospects: The 2006 Revision and World Urbanization Prospects: The 2007 Revision)

Contemporary Health Care models

Public-Private Partnership: Narayana Hrudayalaya (NH)

The hospital was founded by Dr. Devi Prasad Shetty who is a renowned cardiac surgeon. He has also been awarded many prizes in the field of medicine and health care. The business model of NH follows the commitment to reach out and bring world class health care services to the community around.

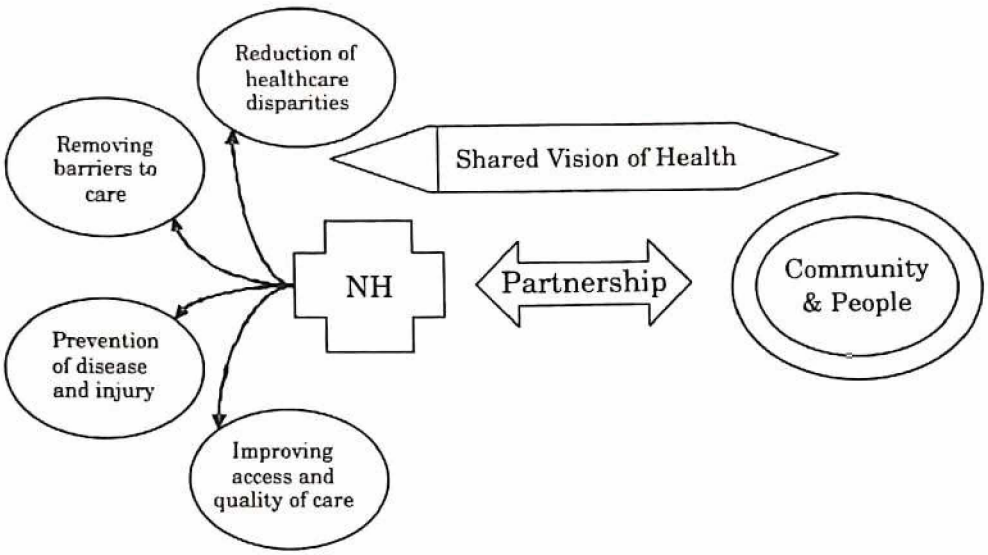


Figure 4: A Model which may be followed by our proposed PPP model

PPP model holds the key for effective & efficient health care.

The dream of making sophisticated healthcare available to the masses, especially in a developing country, has rightly been achieved by NH. The business model followed by them is "caring with compassion" asking for cheaper rates and quality service. They believe that the need of the hour is to create a viable platform for health care givers who like to share, learn, understand and extend the services to the needy.

Private: Shankar Netralaya (SN)

The eye care hospital has been working for 28 years and the hospital has gained international excellence and is acclaimed for its quality care and compassion. On an average, 1200 patients walk in for treatment in no less than a hundred surgeries are performed every day. The business model is based on the sustainable development of eye care which charges minimum amount of the money from its patients. The hospital was founded with a missionary vision.

Public: Government Hospitals

The general complexity of these hospitals' business models are generally hindered by multi dimensional factors including:

- → demographic change,
- → social and behavioral change,
- → organizational change,
- → political change,

- strategic change,
- technological and clinical change,
- inherent variation and uncertainty in treating individuals

The multiple interactions inherent in the operations of healthcare are spawning a growing interest in the integration of complexity science and healthcare management. For example, changes in the number of beds will impact on the number of necessary theatre sessions. Thus, organizational and strategic changes cannot be considered in segregation from the multifaceted network of inter- and intra-related hospital services. The size, complexity, interactivity and continuous dynamism of the healthcare services present a particular test for modelers who seek to develop workable abstractions of underlying systems from which consequential outputs can be deduced.

Manage care services through Public Private Partnership

This model is an innovative medical entrepreneurship. For any existing enterprise, whether business or public-service institution, the controlling word in the term "entrepreneurial management" is "entrepreneurial." Innovation in the business models of health care systems is not a recent phenomenon but is more followed now than in earlier times. The networked manage care if implemented properly can be very successful for the developing countries where the problems of rural population is higher. The accessibility to health services can be made available by the network of nurses and doctors. The infrastructural facility may be handled from the central office. The regions will be provided with the nurses and doctors list for the families of the region. These families may contact the regional nurses who would in turn assign them to a doctor of the same or nearest region. The following figure depicts the networked healthcare service.

Better management of health care services can be through innovative medical entrepreneurship.

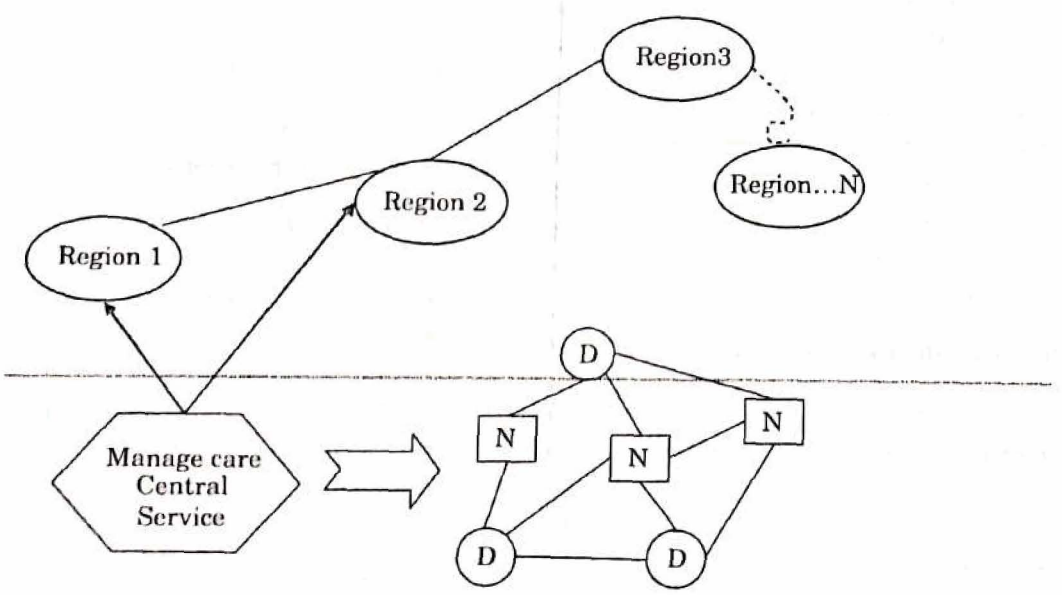


Figure 5: Manage Care Delivery Innovation: Networked Business Model-IIT KGP

A successful business model for medical entrepreneurship can be carried out by maintaining professional data bases of the doctors patient case studies and resources available.

Probable Business Models for Medical Entrepreneurship

A survey of local areas in and around Kharagpur has revealed that the above discussed factors are responsible for the ignorance of the rural population. They need some innovation in health care systems. There must be ways to solve the distress of the health delivery problems and to articulate a case for new investments by wealthy nations in global health to reduce health gaps between the rich and the poor. There has been low penetration of health care products in mid-market and end-market due to high cost of technologies used and profile of the doctors. This proposed model will provide solution using Medical Entrepreneurship which would be at affordable costs by general public. This partnership will enable mass penetration of technology to the users- both practitioners and patients.

The aim of the model is to develop a deeper understanding of the burden, severity, and cost of current and anticipated global health delivery problems, in both human and economic terms as well as to formulate and test hypotheses concerning the root causes of health kiosk problems we hope to change, from the biological, chemical, ecological, and environmental forces at work to the social, economic, and political. Traditional Health care solutions need to be integrated to one piece.

Probable benefits from such type of medical entrepreneurship business model may be as follows :

- maintains a database about customers (patients), clinics, nursing homes and hospitals and a mechanism to search them.
- allows users to compare costs and services which are provided by health care centers.
- provides an online platform for discussion of health related issues. Also provides information about the technologies available in the field and the health centers which provide them.
- provides a doctor's directory (to search for specialized treatments).
- provides a mechanism for healthcare service providers to advertise and remind the public of health hazards.
- Provides access to new technology and services to the common man.
- allows for a single number, immediate access to the nearest medical centre for treatment.
- helps customers find local practitioners and specialists near their homes.

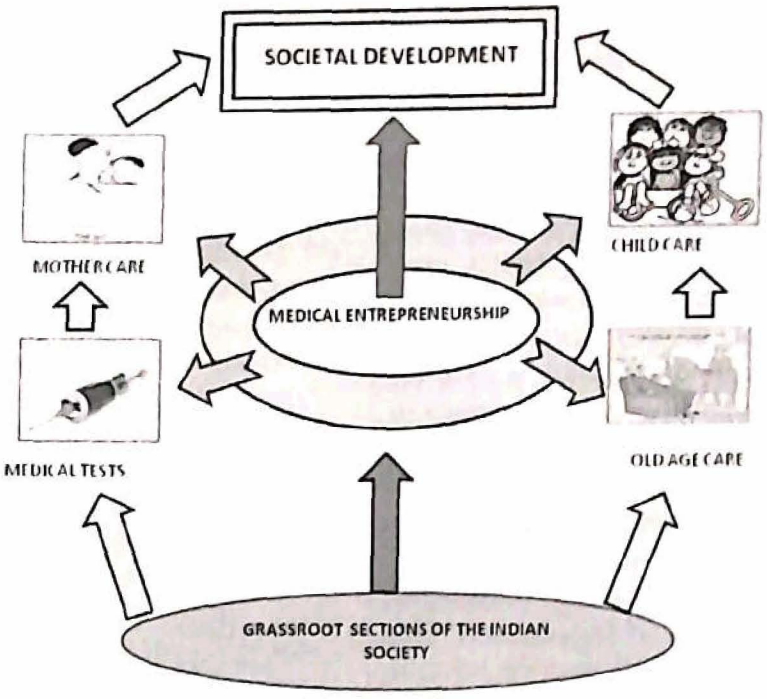


Figure 6: Societal Development by the Proposed PPP Model

Comparison between Suggested & Existing Business Model

Parameters	**Suggested Business Model**	**Existing Business Models (Nursing homes, Govt. Hospitals etc.)**
Cost	Cheap and affordable by all	Involves higher rates, sometimes required services unaffordable by all
Information Accessibility	Each rural family will be covered for information and contact person of the health kiosk services	Available but not accessible for all especially in far flung villages and less educated.
Employment	Will employ local entrepreneurs for the kiosks in addition to trained medical practitioners and nurses.	Most of the entrepreneurs are physician turned entrepreneurs of Government establishments; hence need trained practitioners, nurses.
Local Solutions	Solves local information requirement during emergency, Easy and accessible solution of health delivery problems as early as possible	Provides either costly alternatives or cheaper but inaccessible/unmanaged emergency cares
Local Practitioners	Categorize local practitioners as per availability and equal customers benefit	Bigger Nursing homes do not involve local practitioners leaving them behind in competition
Service Focus	Service for all in the form of social, economic benefit and right to better health benefit	Leaves behind poor people who have the right to access good health services.

There are a few business models which can be implemented easily and efficiently.

✓ The relation of patient's affluence to number of visits to doctors

It is worthy to be noted that sometimes the business models though existing, and much into knowledge of a person is simply not utilized because, the person lacks entrepreneurial skills to put the techniques into actual practice. The patients affluence to the doctors is directly proportional such that

$P(a) \alpha n(D)$

Where, P→Patient

a → Affluence

D →Doctors

n → cardinal value of set

The richer patients tend to go to the doctors and many doctors frequently unlike their rural and poor counterparts.

The market need may be specified as follows:

→ Responsiveness in the health sector services

→ Personal touch

→ Sophisticated up- to- date technology

→ Competitive cost (Based on comparison)

→ Best of the doctors in the industry

→ Regular feedback from doctors with the help of diagnostics

The deliverables from such kind of proposed business model can be as follows

→ Services and comparative costs of the different health service providers.

→ Extensive database of treatments and preventive guidelines for major diseases.

→ Online consultation from practitioners.

→ New technologies and new treatments for diseases.

→ Ability of pharmaceutical companies to find appropriate customers and doctors for drug trials.

→ An online platform for customers to manage their disease and treatment details in a single account

→ An online discussion forum for customers to discuss with other customers about services and treatments.

→ Access to new medical equipment which can be ordered through partnership with medical suppliers who can advertise their products.

→ Practitioners can connect to medical associations and know about their events.

→ Mother care

The need for improving healthcare benefits in the semi-urban and rural set-up in India is being increasingly felt. The reason is that a large

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number of deaths are reported in the countryside which is solely because of the absence of proper health infrastructure in the villages. The probability of an Indian mother dying during childbirth is roughly 10 times that of her Chinese counterpart. Reducing the Maternal Mortality Ratio (MMR) by three-quarters in 10 years is now a Millennium Development Goal. Therefore, business models which address mother-care including pre –natal and post-natal care can turn out to be an important factor for providing healthcare to all.

✓ **Child care**

Child health care refers to care of children from conception to birth and after birth till the age of five. After the age of five, the child's health is taken care of by school health programmer team. The health of the child, in fact starts with the birth of girl child who is the future mother of the child. It involves indiscriminately care of the girl child's health care services including health care of the fetus during antenatal periods (ante-natal pediatrics), health care services include health care of neonates from birth to 28 days, care of infants from one month to 12 months, care of toddlers from one year to two years and care of pre-school child from two years of age.

✓ **Old Age Care**

The business model of the old age care would deal in creating proper place for old and uncared people in the villages. The older people do not get much care and attention due to various other issues related to home and family. We should create a low-cost recreation centre for them. The elders must be taken care of, in the society and we owe our business model of old age care to them.

✓ Medical tests

There is an absence of medical equipment, testing centers and polyclinics in the rural areas . Rural people have to travel to the cities to get a simple test or check-up done. This provides a great hindrance to extremely poor people, who do not have the money to relocate to cities quite often for check-ups. Therefore, the need to implement B-models for catering to the rural areas has become a necessity. For instance , opening of testing centers at villages is a case in point.

✓ **Polyclinics**

Operation of polyclinics through managed care could be an important part of creating sustainable business models in the villages. These could be run on a co-operative basis by the entrepreneurs.

The Medical centres related to the PPP Business model of Medical Entrepreneurship may be benefited in many ways.

- ✓ Single repository of all data about a patient means quick availability in case of emergency
- ✓ Using patient data as a knowledge house – for treating other patients
- ✓ Availability for doctors to offer online consultation

Operation of polyclinics through managed care should be an important part of creating sustainable business models in the villages. These should be run on a co-operative basis by the entrepreneurs.

- ✓ Information of different services available at different medical centers.
- ✓ Easy referral of patients to other medical centers (at a commission of their own)
- ✓ Showcasing your medical center and services
- ✓ Advertising new products and events (health camps)
- ✓ If the practitioner is part of certain Health Association (e.g. All India medical association), then receive feedback, newsletters, and events details from there.

The interaction between the different stake holders of this model will also be helpful in many ways.

- ✓ Create innovative business services for health sector in imaging and many other health based models which is rarely available to common man
- ✓ involve new inter-country business models
- ✓ create mechanisms for improving the imaging and other health care models through feedback from these business models
- ✓ Create similar collaborations of the professors and graduate students in good number all around the world to use the latest technologies and trends in health and such service models.

Networked Business Models will emerge organized around shared customer acquisition and fulfillment mechanisms.

Conclusion

It is essential that we build our endowment in order to attract, retain, and nurture extraordinarily creative and dedicated people. Networked Business Models will emerge organized around shared customer acquisition and fulfillment mechanisms. Technology strategies will focus on trusted, low-cost integration of networked entities which would create new business strategies in health care businesses. The innovative health awareness system helps village health committees to become independent bodies and work with the national healthcare sys¬tem and other projects. (Alexandra, 2008). In order to provide and deliver appropriate medical care, effective planning and management of health services is essential. With increasing demands from both public and political domains, the provision and successful utilization of objective decision-making tools is a challenging yet vital task (Harper & Pitt, 2004)

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