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mHEALTH EFFECTIVENESS AND POTENTIAL IN INDIA

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ABSTRACT

Healthcare infrastructure deprived India lack skilled workforce to address healthcare issues in the large part of the county. Rural population in access of 70% living in villages or remote areas have no to little access to healthcare. Often, citizen have to travel long distance even for primary care. However, mobile have no rural – urban divide and most people in remotest areas have access to atleast basic mobile phones. There is enough awareness among the doctors and most doctors believe remote healthcare could be provided. Most consumers surveyed also believe mHealth is the future and willing to use mobile health services. It's very difficult for Government to create appropriate healthcare infrastructure in a short time. But mHealth may be an answer to many infrastructure and skilled workforce related questions. Most doctors and consumers believe mHealth may address the issue of lack of work force but there is a need to create awareness about mHealth to make it an effective service. This study attempts to explore the awareness, potential and effectiveness of mHealth in India.

KEYWORDS

mHealth, mobile health, WHO, TRI, doctor, consumer.

OVERVIEW OF mHEALTH

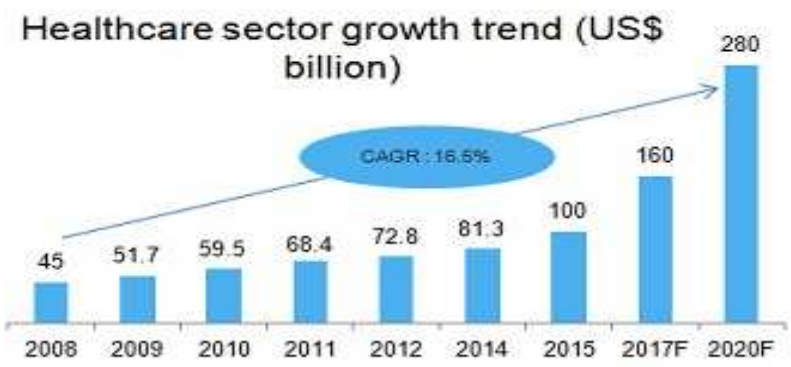
Mobiles have been seen in use in everyday life. Mobiles are no more mere device to communicate with each other or just send and receive text messages. Mobiles are now considered to be very important tool for business, communication, information sharing such as banking transactions, flight booking, education, news access, google search, entertainment, travel, hospitality and networking. Mobiles are being used in every aspect of life including healthcare. The use of mobiles in healthcare for communication and care delivery is widely known as Mobile Health or mHealth. mHealth has been defined by several authors since 2003 as per the convenience of author but the Global Observatory for eHealth (GOe) defined mHealth or mobile health as "medical and public health practice supported by mobile devices, such as mobile phones, patient monitoring devices, personal digital assistants (PDAs), and other wireless devices"[1]

Mobiles have transformed the healthcare practice and brought significant efficiency into the healthcare delivery system. Most hospitals initially started use of mobile phones for administrative functions, which has subsequently extended to other usage. For example, use of mobility by clinicians has transformed the quality of data capture and delivery. Mobility has brought significant efficiency and quality in capturing clinical data at bedside using mobile devices. Nursing staff entering Vitals of the patient at bedside and clinicians capturing Electronic Medical Record (EMR) in an Inpatient setting is a commonly observed feature across globe. Many doctors use mobile devices such as mobile phones, iPads, Tablets etc. for entering diagnosis, complaints, alerts, allergies, medication and diagnostic orders etc. With the increase in awareness and self-consciousness towards health, citizen expect effective and speedy healthcare solutions. The technological revolution in tele-communication and mobile devices have seen an increased trend by organisations to use mobiles for delivering services and information. The use of mobile phones and communication network for bringing efficiency and quality of health and health benefits is termed as 'mHealth'[2]. The dispersion of this technological advancement is backed up by the ubiquitous technologies and wireless subscription leading to cost effective, flexible and efficient ways to improvement of health[2].

Technological advancement in mHealth has forced the healthcare delivery organisations as well as citizens to use mobiles for faster, effective and efficient well-being of the people. Mobile Phones could be used as means of effective and efficient care delivery and mHealth could be very effective in India. As per the report of WHO[3], 70% of the wireless subscribers are from low and middle income group countries which shows that e-health has not reached the higher income groups as higher-income nations exhibit more mHealth activity than low income nations. Thus there is an intense need to propagate the significance of mHealth for the well-being of the people. In the coming years, mHealth is expected to play a significant part in healthcare. Mobile operators, hand set sellers and governments are making their concentrated efforts to make mHealth reach up to its potential. Various governments are also taking initiatives to make policy which would aid in uptake of mHealth by the physicians. This will help intensification of the assurance and faith of both general practitioner and patients on account of well-defined and reliable ways in which they interrelate with various constituents of mobile fitness solutions[4].

Indian healthcare is the fastest growing sectors, expected to advance at a CAGR of 15% between 2011-2017[5]. Fig. 1 shows the trend of healthcare sector between 2008 to 2015 as actuals and beyond as forcast[5].

FIG. 1: HEALTHCARE SECTOR GROWTH



Source: Frost & Sullivan, LSI Financial Services, Deloitte, TechSci Research
Notes: E - Estimate, F - Forecast, CAGR - Compound Annual Growth Rate

- The growth of Healthcare industry is fast paced owing to its strengthening coverage, services and increasing expenditure by public as well private players[5].
- Between 2008-2020, the Indian Healthcare market is likely to achieve a record CAGR of 16.5 per cent[5].
- MoH, has targeted development of 50 technologies in FY16 to address the treatment of disease like Cancer and TB[5].

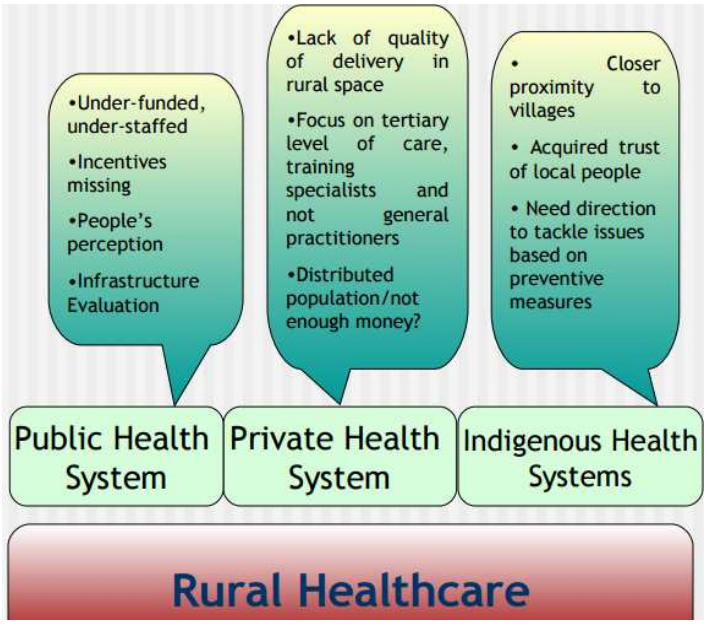
As per the Indian Telecom Services Performance Indicator Report (as on September 30th 2015), the number of wireless subscribers reached to 996.66 million. The urban subscribers grown to 577.82 million and rural subscribers grown to 418.84 million indicating a significant growth of rural mobile phone density of 359.67 million in December 2013[6]. The urban Tele density is 147.35 compare to 71.69 in December 2013 and that of rural is 48.18 compare to 41.95[6] in December 2013. The growing wireless telephone density both in urban and rural India provides tremendous opportunity to healthcare service providers and government to reach out to citizen across India both in urban and rural settings at anytime and anywhere. The mobile app market is growing every day. There are over 97,000 health and fitness related mobile apps available to download and over 4 million downloads happening per day, the mHealth industry is bound to gain popularity in coming years[7]. With the growth of mobile apps, the mHealth market is projected to be a 26 billion dollar industry by 2017[7]. Mobile phone subscribers are increasing rapidly and grown from 98.71 million subscribers in year 2006 to 996.66 million in 2015[8]. The rural subscriber base was 190.88 million as on March 31, 2010. The wireless subscriber base further grew and reached to 484.84 in September 2015.

India is a developing Nation with high penetration of mobile phones both among the rural and urban population. Hence, mHealth provides access to larger population across the country without the rural – urban divide. The mHealth may prove to be a significant contributor in healthcare delivery need based on the demographic profile and availability of mobile phones a citizen may have. In recent time Honourable Prime Minister's office has used simple SMS and WhatsApp messages for disseminating need for nutrition, girl child and healthcare directly to citizen of India. Health ministry time to time release healthcare related advisory. At a local level both in Urban and Rural India State Officials and District Collectors send health advisory and warning to the people including those in remote areas which otherwise was difficult to reach. The public health might use mHealth for information dissemination and remote consultation both audio and video, health counselling, health condition monitoring, telemedicine and tele radiology etc. This may help a remotely located patient who may otherwise not have access to urban healthcare facilities.

LITERATURE REVIEW

Healthcare to the citizen of India is the state matter. It has been a challenge for every state in the country to provide reasonable healthcare to all the people in the state. 73% of the population lives in villages and 26.1% of the population lives under poverty line[9]. As large part of Indian population lives in rural areas where quality of healthcare is negligible to non-existent. As a result, the rural and remote areas in India are deprived of healthcare. The healthcare infrastructure is extremely poor in remote areas resulting in worsening of the health condition of the population in these areas. Preventive and primary healthcare is an absolute need of these areas. The public *health* service is more focused on precautionary and primary healthcare aspects[10]. Vaccination of mother and child, prenatal care, family planning and observation of select ailment are the focus of rural primary healthcare. The doctor to population ratio in the rural areas is very low[11]. 66% of the rural population do not have access to critical medicines and specialist care. 31% of the rural population forced to travel long distance to have access to healthcare facility[11]. Jhunjhunwala et al. (2008)[11] presented a model of rural healthcare and presented difficulties in accessing healthcare facilities by rural population Fig. 2.

FIG. 2: RURAL HEALTHCARE IN INDIA



Source: (Jhunjhunwala et al., 2008)

As per Deloitte report (2012)[9] the doctors to patient's ratio is 1:20000 in rural areas against the WHO ratio of 1:250 indicating an acute shortage of doctors in rural areas. The urban healthcare compare to rural is in much better condition. As per Kumar (2008)[10], 40% of population lives in urban India but they have access to more than 60% of the healthcare resources. Poverty is a significant reason for illness among the urban population. 100 million people among 336 million living in urban areas face acute poverty hence vulnerable to health problem[12]. Government has taken many initiatives to improve the healthcare delivery across India but the lack of infrastructure, doctors and nurses divide in rural and urban India is huge. In recent years there has been significant increase in the lifestyle disease among the urban population negatively contributes to productivity and efficiency of the nation. Though the urban population has better access to healthcare facilities but Burns (2014)[13] indicates that there is no difference in the condition of the urban poor to that of rural population because of urban poverty.

The basic mobile phones to smart phones penetration across India including rural areas is high. The mobile phones availability with health workers have helped in healthcare delivery to rural population. Health workers like ASHA dedicated to field job and equipped with phones have become more efficient. Different Health Apps and mobile compatible devices have improved the performance of health workers significantly[14]. Health workers on the filed need to collect huge amount of data related to patient and public health which is humanly difficult to remember and prone to mistakes reports Treatman et.al[14]. Mistakes in data capture by community health worker leads to poor protocol compliance. Smart phones compatible with attachable gadgets and multimedia techniques helps in following the protocols and capture of patient and public health data and significantly helped the community health workers[14]. Many of the Accredited Social Health Activist (ASHA) workers have been provided with video facility on their mobile phones which has helped the health workers in effective and accurate communication and counselling[14]. In a study on Operation ASHA (OPASHA) in the state capital Delhi revealed that mobile technology and biometric combined prevents drug resistant tuberculosis and service is efficiently delivered with verification through finger prints[15]. Indian government is sensitive about the facts that mobile technology cannot be ignored and decided to link all district hospitals with leading tertiary care centres electronically in their 12th 5 year plan. This will be done using video conferencing techniques and mHealth will provide the framework for faster and accurate transmission of patient data[16]. This is a revolutionary policy decision to harness the power of mobile phones and promotion of mHealth in the country[16].

Not only government but some corporates have also shown inclination towards promoting mHealth and exploring the opportunities in addressing the needs of huge rural healthcare market. Some of the important initiatives are Non-emergency help lines of HMRI runs the Health Information Helpline (HIHL) which is established to reduce the minor illness load on the Health System[17]. The Non-emergency help line service is available in some of the states like Chhattisgarh, Karnataka, Jharkhand, Maharashtra, Assam, Rajasthan, and Andhra Pradesh[17]. Citizen in these states may dial number "104" to avail the service and this has been a great success. The service has already serviced over 70 million calls till April 2014[17]. The service was initiated in Andhra Pradesh in Feb 2007 and later adopted by other states.

Apollo – Aircel, a group company of Apollo Hospitals provides mobile health-care[18] through mobiles and offers the service on number 55106. A consumer may dial the number to avail consult and advice at just INR 2 per minute. In recent times, more and more healthcare delivery organisations offering mHealth remotely and mHealth seems to be gaining momentum. Apollo ICICI Lombard Health Insurance Companies, Apollo Telemedicine, Prism Apollo, Apollo Munich, Airtel Doctor, Med-India web site[19] are offering healthcare services through mHealth platform.

Green paper[20] by European Commission indicates that mHealth could play an important role in healthcare delivery, and may prove to be a tool for prevention and bring efficiency in healthcare delivery system[20]. Mobile apps and mobile based solutions may help patients in self-assessment and remote diagnosis[20]. mHealth may prove to be an efficient tool in early detection of chronic condition and also help in infant and maternal mortality condition improvement. Huge money and resources required to efficiently manage these conditions. The Global Burden of Diseases 2010 study indicates total Disability Adjusted Life Years (DALYs) lost for Indian population is 518,879,000 years[21]. The burden of just chronic illness and infant and maternal mortality is over 600 billion dollars (approximately)[22]. Ageing population is a huge challenge for some of the economies like Europe. Delivery of healthcare to ageing population is expensive and enforces huge budgetary pressure. mHealth is perhaps the solution to meet the healthcare needs of ageing population[20]. A simple illness, if not monitored carefully among the ageing population leads to a chronic illness. mHealth solutions may be used for regular monitoring and sharing of clinical data with the provider for timely intervention and care[20].

The report on "The Socio-Economic Impact of Mobile Health" by BCG states mHealth a revolutionary idea and indicates that in the coming years healthcare services will be enabled by mHealth and healthcare delivery will be revolutionized by mHealth[23]. Simple SMS for transmission of health related information to masses on one hand and medical devises compatible or attached with smartphones to diagnose and monitor health issues are going to be the future of healthcare delivery[23].

METHODOLOGY

This study is based on the data collected through online survey and face to face interviews. 300 consumers through online survey and 717 consumers in NCR were contacted face to face using a carefully designed questionnaire containing 10 questions related to the awareness and effectiveness of mobile health. Further, 5000 clinicians were contacted using online methods across the country. Through an online survey, more than 250 clinicians responded to the questionnaire. A face to face interview of 50 doctors was also conducted. The questionnaire for clinicians contained carefully designed 23 questions of which response to only 2 questions relevant to this paper have been considered. Specific efforts were made to reach out to clinicians in every state of the country and response included in this paper are from every state. The clinicians responded were from nursing homes, clinics, large hospitals to corporate chains. Consumers contacted were from different age groups ranging from 8 years to 40+ years with maximum emphasis on the age group between 17 to 25. The paper considers views of over 300 clinicians and about 1017 consumers on their views on effectiveness and awareness about mHealth.

DATA ANALYSIS AND RESULTS

The survey conducted was for different age groups. All together 1017 consumers participated in the survey. By age group, maximum (480) consumers surveyed were in the age group of 26 to 30. This age group is young, generally employed and use phones for communication. While 240 consumers were in the age group of 17 to 25, and 227 were in the age group of 31-40 Fig. 3. The survey included both males and females but female participation were almost 1/4th of the total participants Fig. 4. There was no differentiation of male and female consumers in terms of percentage using or aware of mHealth hence, the differentiation between the male and female consumers about awareness of mHealth could not be derived.

FIG. 3: CONSUMER SURVEY PARTICIPATION BY AGE

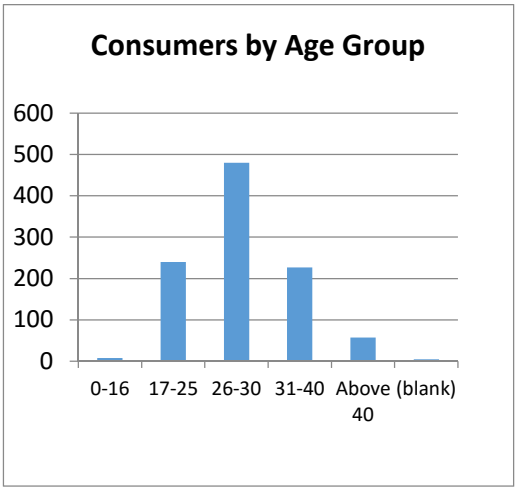
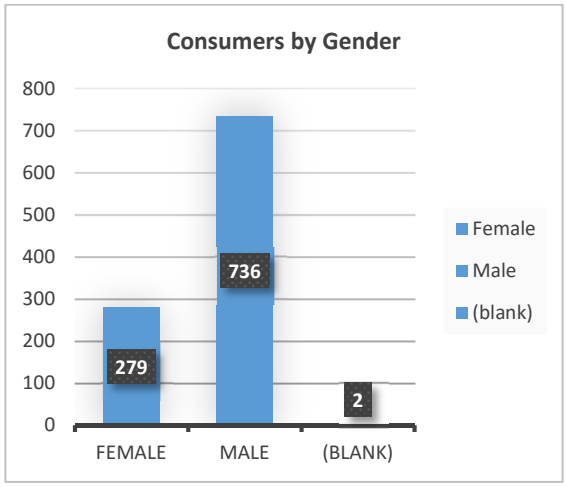


FIG. 4: CONSUMER SURVEY PARTICIPATION BY GENDER



In the fig. 5 data about doctors indicate 84% doctors have answered in favour of using mobile phones for remote consultation. This is a good sign of awareness and willingness to use mobiles for health care among doctors hence, the mHealth effectiveness is suggested. However, the consumer survey Fig. 6 below suggest that 18% consumers surveyed use mobile phones to get advice on phone before they visit a doctor for health issues. Just 2% consumers have video calls with doctors before deciding to visit a doctor or hospital. In recent times there have been many companies providing video consultation on phone at a nominal price and the response of 2% could be the result of recent phenomenon. This percentage is likely to advance in future as more and more awareness about mHealth is created. While 84% (Fig. 5) doctors believe remote consultation will help a patient but 76% (Fig. 6) consumers do not believe in remote consultation but prefer to visit a doctor instead of consultation on mobile. This suggest most doctors are willing to provide care over phone but consumers are reluctant and believe face to face consultation is necessary.

FIG. 5: DOCTOR RESPONSE- CAN REMOTE CONSULTATION HELP A PATIENT?

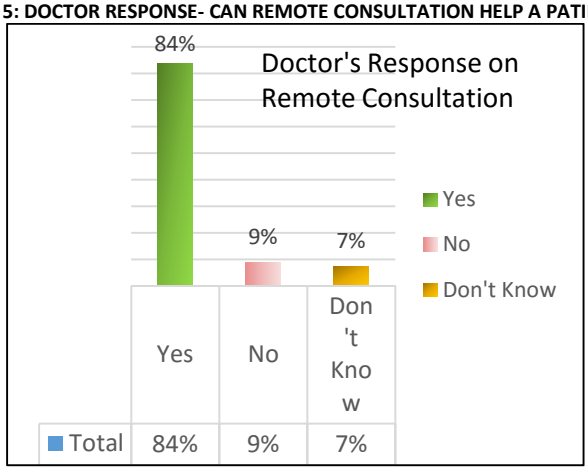


FIG. 6: CONSUMER RESPONSE- USE OF MOBILE PHONES

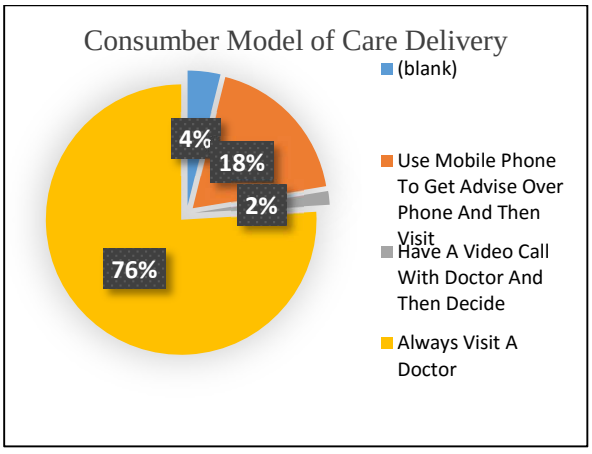


Fig. 7 below shows data on doctor's awareness about mHealth. While 84% doctors (Fig 5) believe remote consultation will help patients but only 57% (Fig. 7) doctors confirm awareness about mHealth. On the other hand only 35% (Fig. 8) consumers confirm about awareness about mHealth. The figures below gives an indication about some awareness among the doctors and consumers both but large number of doctors and consumers are not aware that any mHealth service is available in India.

FIG. 7: AWARENESS ABOUT mHEALTH AMONG DOCTORS

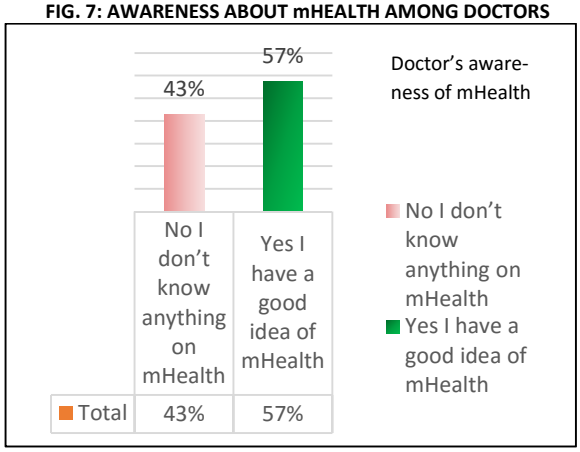
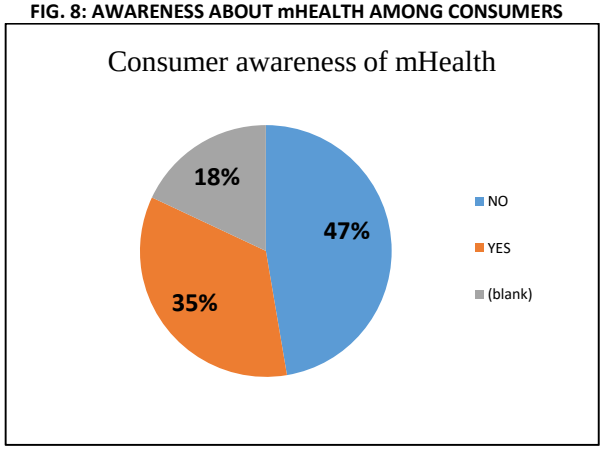


FIG. 8: AWARENESS ABOUT mHEALTH AMONG CONSUMERS



On the question of future uses of mHealth, 61% consumers (fig. 9) indicated that they would like to use mHealth for health issues and 28% were not sure but may be considered as sitting on the cusp but will start using mHealth as the awareness increases. This indicates 89% consumers are willing to use mHealth for healthcare needs. 54% consumers have indicated that they would like to volunteer for mHealth and given opportunity would like to use mHealth Fig. 10).

FIG. 7: CONSUMER BELIEVE mHEALTH IS THE FUTURE

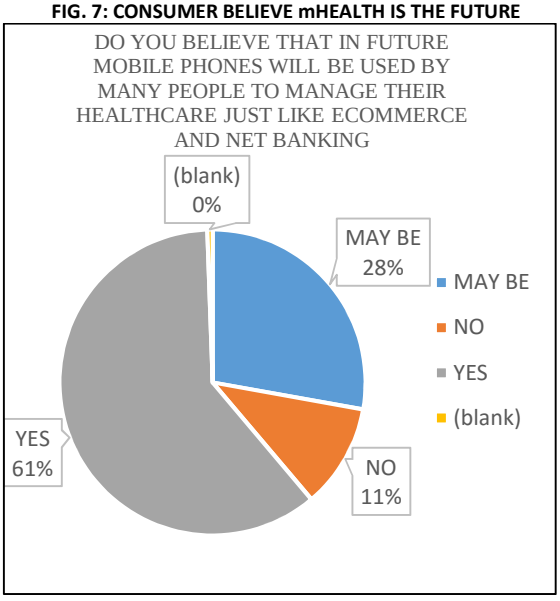
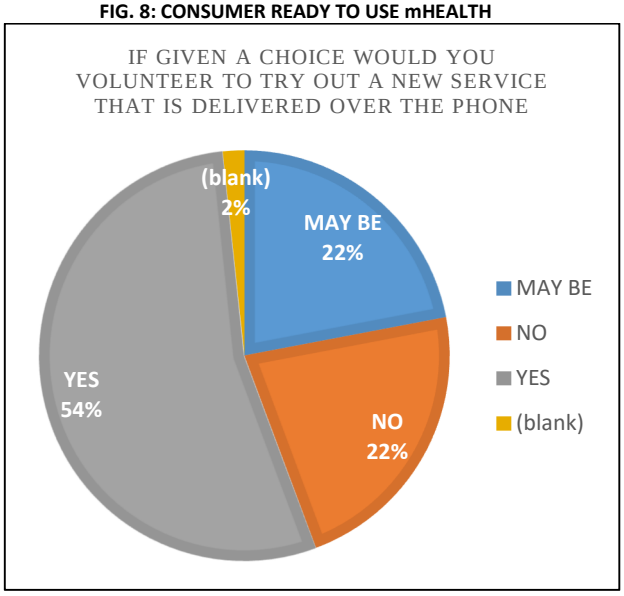


FIG. 8: CONSUMER READY TO USE mHEALTH



CONCLUSION

The report by BCG on "The Socio-Economic Impact of Mobile Health" suggests that mHealth is a revolutionary idea and in future healthcare services will be enabled by mHealth. Many corporates hospitals such as Apollo, ICICI, Airtel, Aircel, Just ask, Lybrate, doctor on call, Letsdoc etc are aiming to provide healthcare services through mobile. 104 service of HMRI is also an example of mHealth services in India. The survey finds that 84% doctors believe that remote care could be provided over phone. However, awareness about mHealth services in India is at its primitive stage. Large number of consumers are willing to avail healthcare services over mobile but most of them are not aware of any service available in India. 61% consumers believe mHealth is the future and 54% consumers are ready to use mobile for health issues is a clear indication that mHealth is the future, mobiles are going to play an important role in healthcare delivery specially to the rural population. This study clearly suggests that mHealth is the future and effective though awareness is required.

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