

An aerial photograph of a large dam and reservoir. The dam is a long, grey concrete structure with a road on top. The reservoir is a deep blue-green color. In the background, there are rugged mountains under a clear sky. The text 'Hello Doctor-555' is overlaid in a large, light blue font.

Hello Doctor-555

Delivering health care services at the doorstep of patient utilizing existing healthcare facilities of the District through ICT.

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Overview

Tehri Garhwal District, located in Uttarakhand State, offers a unique glimpse of how Public Health Interventions can be improved using Information and Communication Technology. The project “Hello Doctor 555” found acceptance in the population of Tehri Garhwal as it has improved various health indicators and reduced the Maternal and Child death.

Geography and Present State of Health affairs

Tehri Garhwal is surrounded by Uttarkashi District in the North, Pauri Garhwal District in the South, Rudraprayag District in the East, and Dehradun District in the West. According to Census 2011, population of Tehri is 6,18,931. As per Annual Health Survey Report of India, Tehri Garhwal District has the highest Maternal and Child Health Deprivation Indices amongst the Hill Districts of Uttarakhand. Higher value of these indices shows that there is poor/inadequate provision of health services to these categories of the population. Also, the Infant Mortality Rate (IMR) of Tehri Garhwal is 53, which is the highest amongst the Hill Districts in the State of Uttarakhand. Another important factor to take into consideration is that Tehri has 41 HIV positive cases and 728 Tuberculosis patients. Thus, due to these shortcomings shown in various health indicators, Tehri District is declared as one of the three high priority Districts in Uttarakhand. The following table depicts the performance of the District with respect to various health parameters, including Infant Mortality Rate (IMR).

Parameter	Rural	Total
Infant Mortality Rate (Base year 2013)	58	53
Neonatal Mortality Rate (Base year 2013)	43	41
Under-5 Mortality Rate	75	70
Maternal Mortality Rate	*	188
Population (female) age 6 years whoever attended school (%)	61.0	65.8
Women who are literate (%)	73.0	77.1
Current use of family planning (any Method) (%)	62.5	64.3
Total unmet need for family planning (%)	16.0	15.6
Mothers who had antenatal check-up in the first trimester (%)	48.2	53.8
Mothers who had at least 4 antenatal care visits (%)	17.3	23.8
Institutional births (%)	66.9	71.1
Institutional births in public facility (%)	57.4	59.4
Prevalence of diarrhea in children (%)	14.9	14.5
Children with fever or symptoms of Acute Respiratory Infection	78.2	78.8
Children under age 6 months exclusively breastfed (%)	45.3	43.7

*Data Unavailable

Following is the status of present district public health infrastructure:

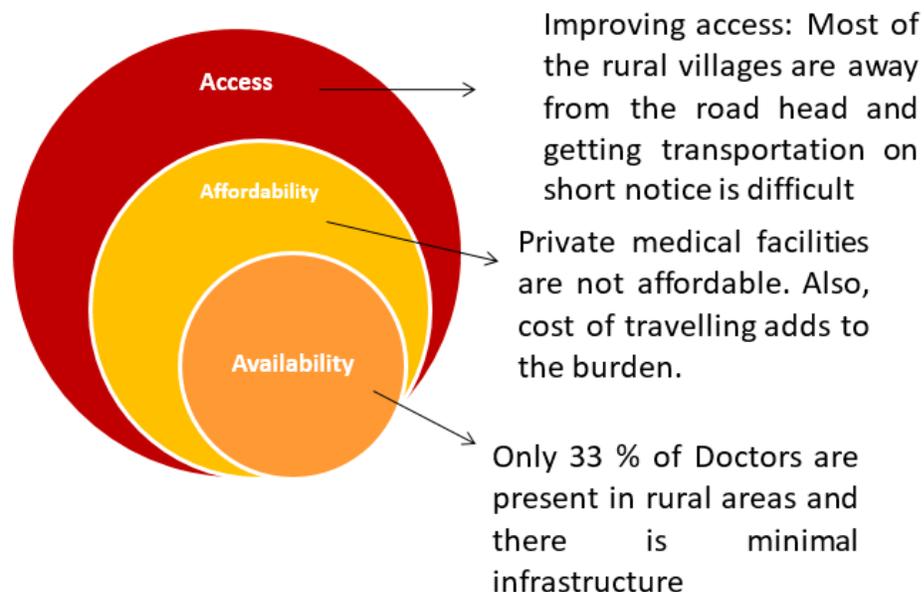
1 District Hospital, 1 Sub-Divisional Hospital, 3 Female Hospital, 11 Community Health Centre (CHC), 27 Primary Health Centre (PHC), 209 Sub Centre, 28 State Allopathic Dispensaries, 73 Ayurvedic Hospitals and Dispensaries, 12 Homeopathic Dispensaries, 1 Blood Bank and 1 TB Clinic.

Challenges

One of the challenges to deliver health services in Tehri lies in the fact that 88.67% of Tehri Garhwal population lives in rural areas with a mountainous terrain, which creates a unique challenge as compared to rural areas of plains. Apart from the constraints of terrain, the small and scattered nature of rural settlement accompanied by a lack of adequate information regarding health related schemes compel patients to seek healthcare facilities from quacks.

With reference to Healthcare infrastructure and personnel, the uncertainty of availability of doctors, staff, diagnostics and medicines in Government Hospitals discourages patients to seek healthcare facilities, especially primary healthcare provided by the Government. Patients are also discouraged to seek immediate healthcare provided by the Government due to the high travelling cost and the high physical and emotional cost involved in the process.

The challenges are summarized in the following diagram:



Hello Doctor '555' Model - Case Study

Despite such difficult circumstances mentioned above, Hello Doctor '555' has provided a ray of hope by enabling individuals to overcome various road blocks to avail Government healthcare services using Information and Communication Technology (ICT). **To highlight the benefit and reach of Hello Doctor '555', the following case details a real life story wherein a beneficiary, with the help of Hello Doctor-555, overcame various obstacles. In this case, some names and identifying details have been changed to protect the privacy of individuals.**

A) CONTEXT AND BACKGROUND

Ratna Devi is a 32 year old housewife who resides in Dophardahr village, which is a part of Bhilangana Block, one of the remotest blocks of Tehri District. The predicament faced by her with reference to accessibility of affordable healthcare services represents the plight that majority of the residents of Tehri Garhwal face.

When Ratna was young, her exposure and knowledge were limited to the information and medicines provided by a local quack for any specific illness. Also, Ratna knew about various healthcare schemes only through the brochures brought by her mother during her visits to the Anganwadi and the information given by the ASHA workers during those visits.

But, after Ratna got married, the responsibilities of a new family pushed her to further explore the details of these schemes and look for benefit/implementation of these schemes. Due to the unavailability of the entire information at a single place which was easily accessible to the public at large, the exploratory process was slow and time-consuming.

B) PROBLEM

However, on 27th September 2016, Ratna and her family faced a problem which led them to explore in-depth of the nearest available healthcare service provider. On 27th

September 2016, Ratna fainted while working in the field, and her family members immediately called '108' for ambulance to reach Hospital but the service provision from '108' was disappointing as the ambulance failed to reach the patient's location within the required timeframe. Fortunately, Ratna gained consciousness after a few hours with the help of some injection and medicines from the local quack.

As time progressed, Ratna and her family slowly forgot about the previous incident. In 2017, Ratna gave birth to her third girl child at home. Although Ratna was ecstatic at this new inclusion in her family, she was apprehensive about how she and her husband would provide for their children as her first child, Meera was suffering from a congenital heart disease, which led to severe weight loss and malnourishment. Due to information asymmetry and lack of proper guidance, Ratna was not able to track a Government Hospital/Scheme that would help Meera. Also, though Ratna and her husband were saving money since long, they were still unable to arrange for the entire amount needed for surgery at a Private Hospital.

In a District like Tehri, usually the neighbours are counted as an extension of one's own family. Ratna's family and Mohan, Ratna's neighbour, shared a similar relation. Thus, when Mohan, an 87 year old agriculturist, had a paralysis attack, Ratna and her family came to help and care for Mohan. The paralysis attack had restricted Mohan's locomotion, and he was bedridden. He was in dire need of a wheel chair, but was not able to arrange for one. Hence, when Ratna was passing through the block office, she enquired for a wheelchair but she could only get references and ultimately was unable to get a wheelchair.

C) HELLO DOCTOR-555

In September 2017, while reading the newspaper, Prabhu, Ratna's husband, read an article mentioning Hello Doctor '555' services in Tehri District. The article mentioned that Hello Doctor '555' aims to deliver health care services at the doorstep of patient utilizing existing healthcare facilities of the District through ICT. The article mentioned about a toll free number that connects beneficiaries to all the services

that are mentioned in twenty plus schemes of National Health Mission (NHM). It also mentioned about the facility of video call, whereby a patient sitting at the remotest point can connect with the Doctor directly and get health services like consultancy, medicine and diagnostics.

Since it was a toll free number, Ratna eventually decided to give Hello Doctor '555' a try and called the number. Ratna called with an objective to obtain a wheelchair for her neighbor, Mohan. The staff, on the other side of the call, asked for certain details and informed that someone from Social Welfare Department will call back soon.

Ratna, who was accustomed to being given a later date whenever she had enquired for any healthcare services previously thought that she will not hear back from Hello Doctor '555'. But, two days later, to her surprise, she received a call, asking her for Mohan's address and was informed that a Social Welfare Department employee will come to deliver the wheelchair. Next day, the team arrived, and Mohan was asked to submit his medical documents and a wheelchair was provided to him.

The transparency and expeditiousness of the whole process left the villagers spellbound. The team also informed Ratna and nearby individuals that if someone had any health related requirements or issues, they can call on the toll free number or approach nearest sub-center to have a one to one interface with the Doctor.

HOW HELLO DOCTOR 555 WORKS

A) TOLL FREE NUMBER

As mentioned earlier, Meera, Ratna's eldest daughter, was suffering from congenital heart disease. Although the respective ASHA worker had already informed Meera and Ratna about the availability of Rashtriya Baal Swasthya Karyakram (RBSK) scheme, but Meera and Ratna were unaware of the details and contact person for this scheme,

Instilled with greater hope and confidence after her previous encounter with Hello Doctor '555', Ratna called the toll free number in December 2017 to describe the situation of her eldest daughter. Mrinal, an employee of '555', answered the call and

asked for certain details like name, age, address, etc. to complete the preliminary enquirer information form. When prompted to describe problem/health condition, Ratna said *“beti ke dil mein chhed hai aur paise nahi hain ilaaj karane ke liye”*. Mrinal immediately asked for Meera’s details like age, gender, health issues, blood group, patient history, etc. to complete the patient information form. On completion of the details, Ratna was immediately connected to Vijaya, Manager RBSK. The lady officer, on the other side, asked a few more details like weight of the girl, etc. and informed that soon someone will get in touch with her after reviewing the patient’s information provided by Ratna. Also, Vijaya mentioned certain precautionary measures that Ratna should take until someone contacts her.

Rashtriya Baal Swasthya Karyakram (RBSK) is a scheme under National Health Mission to detect and manage defects, diseases and development delays including disabilities at birth. It covers thirty plus health conditions of children between the age group of 0 - 18 years.

Vijaya, as a Manager, monitors the implementation of the scheme at the District level. She immediately called RBSK team of Bhilangana block and asked them to visit the patient’s location. The team, on reaching the patient’s location, filled up few forms and took approval from authorities to take Meera and Ratna to Coronation Hospital (District Early Intervention Center), Dehradun. The team also assured Ratna that there will be no cost involved from her side. The checkup was done and Meera was referred to the empanelled Everest Tertiary Care Hospital.

Since Meera was underweight, RBSK representatives and doctors had to wait for two months for the surgery. During this period, Rashtriya Kishore Swasthya Karyakram (RKSK) team was made responsible for looking after the health of the girl.

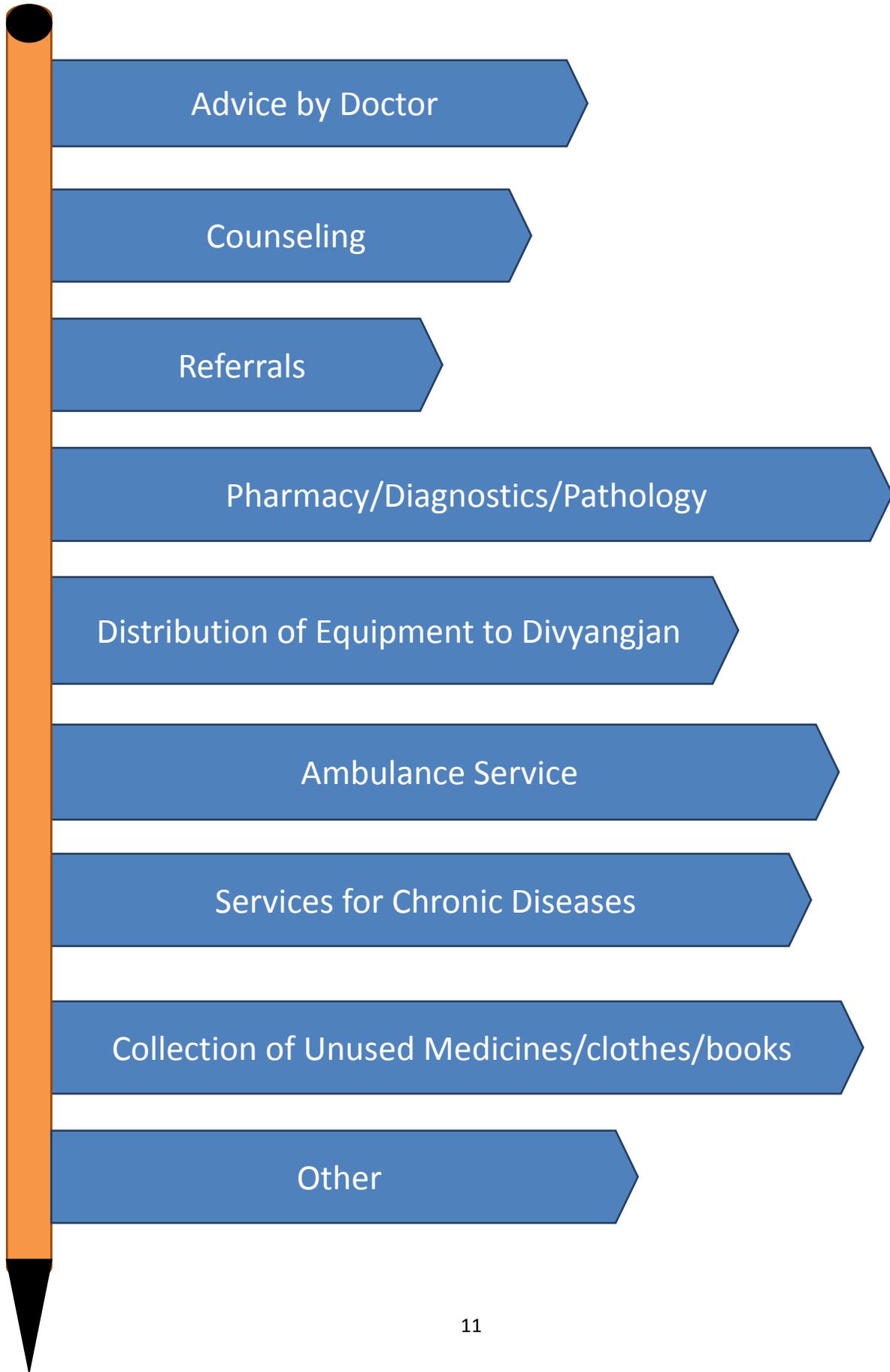
Finally, on 23rd February 2018, Meera’s surgery was done and two days later, she was discharged and Khushiyon ki sawari (KKS) dropped her back. The out of pocket expenditure on surgery, hospitalization, and travel for the family was zero in this case, and the whole preliminary process happened on a phone call.

B) VIDEO CALLS

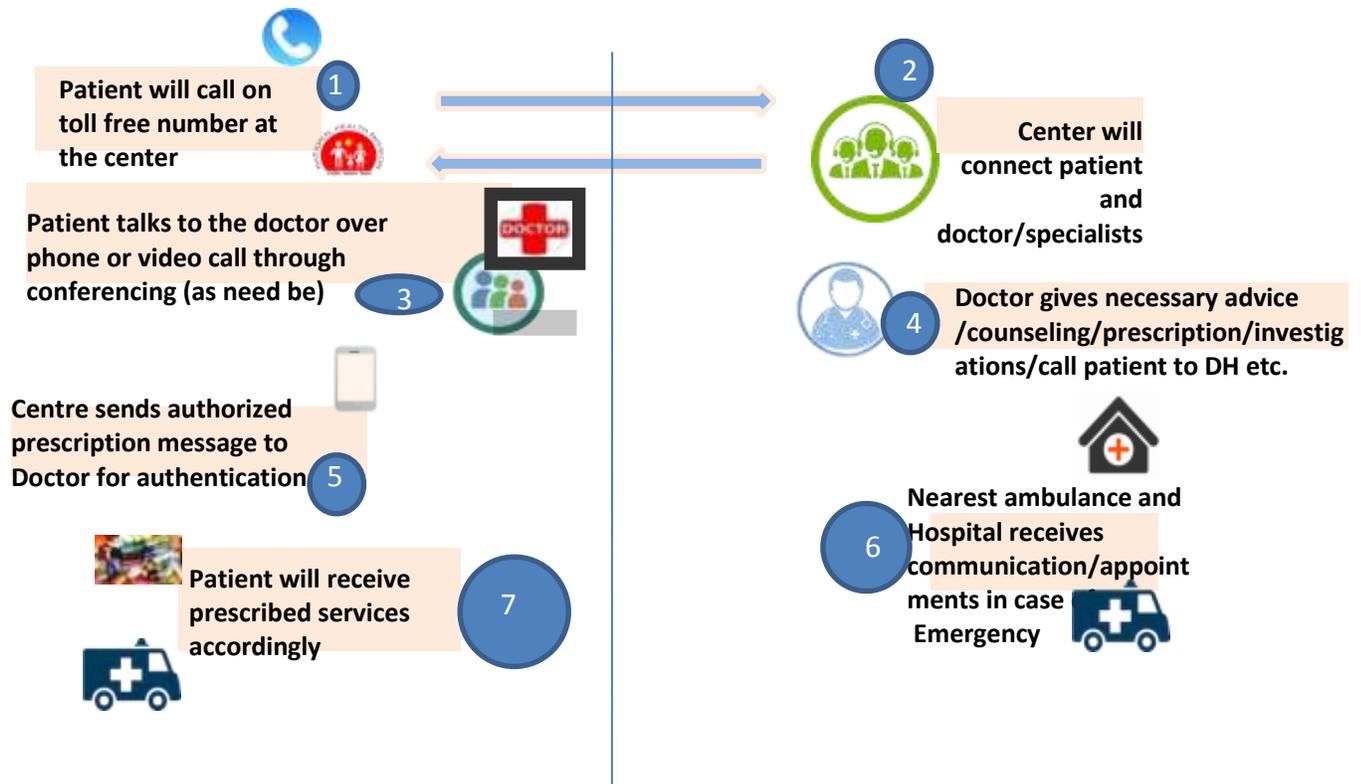
Lately, Ratna has been taking special care for her Health as she's expecting her fourth child. However, as happened on 27th September 2016, Ratna fainted again while doing household chores. This time, she and her husband visited Dhopardhar (Bhilangana) sub center which is twenty minutes' walk from her house.

She told Ram, a pharmacist, of her persistent weakness and tiredness. As the pharmacist kit at the sub-center had fetal heart rate monitor device, a reading was taken in order to monitor the heart beats of the baby. Ram also asked whether Ratna has Iron-Folic Acid (IFA) tablets and if she is consuming them in the prescribed manner.

As Ratna was six months pregnant, Ram made a video call to the District Hospital Hello Doctor '555' studio. Dr. Rekha, a Gynecologist at the District Hospital was called into the studio.



How 'Hello Doctor' Works?



The blood report, given by the Auxiliary Nurse Midwife (ANM) to Dr. Rekha, clearly indicated the low hemoglobin count, i.e.6hb, which put her in high risk category. However, earlier this was not brought to the notice of any senior doctor which was a critical miss.

Using an ambulance, Ratna was taken to the District Hospital to get an ultrasound done. Also, a representative of family planning program at the hospital was put on task for counseling Ratna and her husband, as having four kids posed serious questions on the execution of family planning programs in District and might create financial hurdles for Ratna and her family in the near future.

After such counselling, Ratna realized that it is important to be a healthy mother to enable her children to be healthy as well. As a consequence of this, she is now regularly going for the Ante-Natal Care (ANC) checkups. The center is calling her on a regular basis for counseling and is also preparing her for the delivery.



During her stay in District Hospital, Prabhu visited '555' studio and call center which is located in the same premises and found that more than 19632 residents of Tehri District have availed various services of this initiative. In fact, people from neighbouring Districts also call for the services.

C) CONCEPT AND TECHNOLOGICAL INTERVENTION:

During one of her visits to the Hello Doctor '555' studio, Ratna was curious to know more about the project and how it has provided the services in an easy and timely manner. She was surprised to see how Tehri District is overcoming the challenges of Terrain, rural background and constraints of human and financial resources in the delivery of healthcare. The District Administration used technology in the following way:

- District Hospital equipped with IVR (Interactive Voice Response) system and Audio and Video conferencing system.

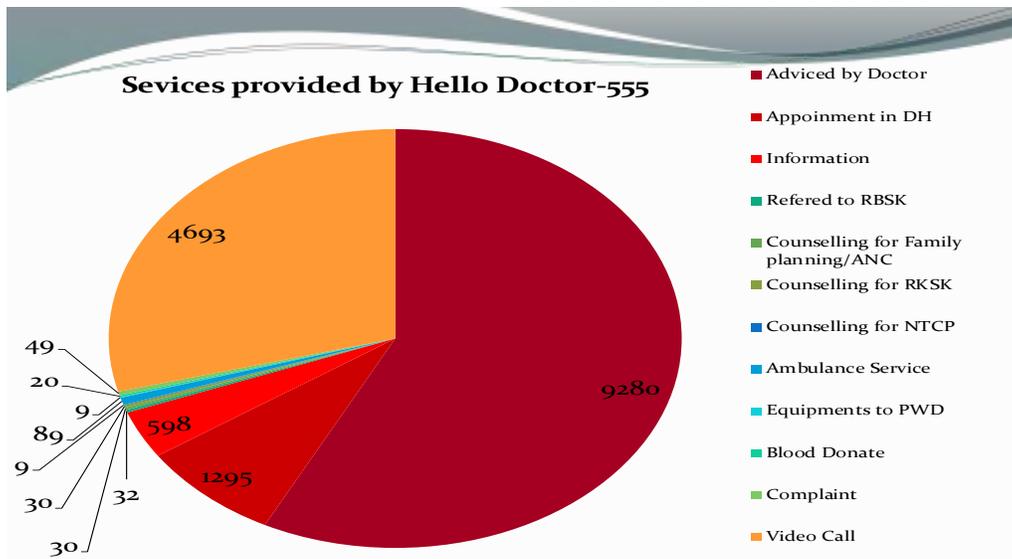
- District Hospital and sub centers equipped with the tablets and optimized software for video call. The software has been specially designed to handle audio and video conferencing calls, aiding in consultation, tracking of health progress of patients.
- Android based online/offline mobile application with integrated tele-consultation kit, aiding in registration of patients and tracking their health progress.
- CCTV camera installed at District Hospitals and Sub Centers for active video conferencing
- Android based Point of Care devices like Electrocardiogram (ECG) Machine, Fetal heart rate monitor, Gluco-meter, Pulse Oximeter, etc., for diagnosis and uploading in the software for analysis and decision making.

Thus, Hello Doctor 555 is an end to end solution starting with the registration of the patients, proceeding to various diagnostic tests using Android based point of care devices, ending with consultation with specialists and Therapy.

D) OUTCOME AND IMPACT:

After understanding the working model of Hello Doctor '555', Ratna enquired as to how many people have availed the Hello Doctor '555' facility and how many have benefitted from the same.

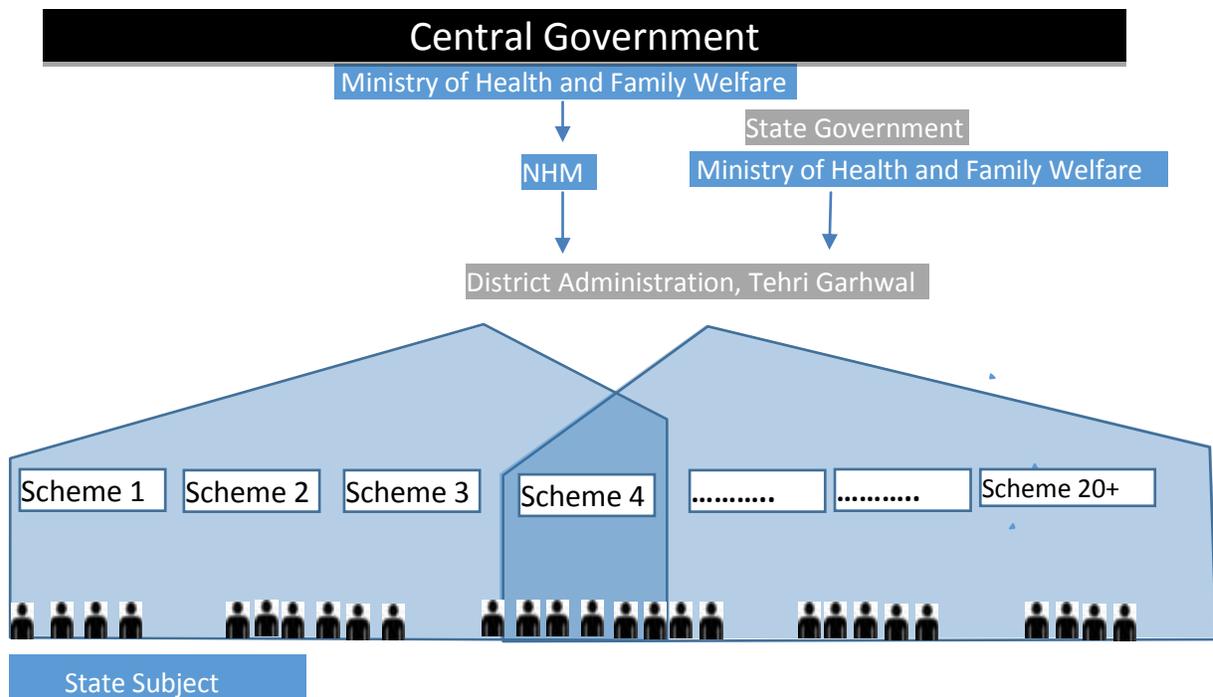
The center in charge showed her a pie chart which is as follows:



The enthusiastic center in charge of 555 Hello Doctor gave out more facts and figures to Ratna, which are as follows:

- Received over 19000 calls(audio/video)
- Service access point is localized at block level in sub centers
- Little or Zero Cost to Citizen
- Reduction in travel time and distance to avail health service
- Significant increase in institutional deliveries
- Real-time service delivery, Transparent process and Accountability ensured
- Activated ten delivery points in the remotest areas
- District Health Society (DHS) for analyzing feedback of patients
- Started Jan Aushadhi Kendra in the remotest part of the District
- With community participation, activated VHNSCs in the District
- It is also a center for monitoring and planning and grievance redressal for health services.
- Water quality analysis projects to reduce diarrheal cases
- Project for Adolescent girls with special focus on menstrual hygiene and anemia.

- More than fifty lakhs rupees were collected through crowd-funding and health services were provided within and outside Government sector through crowd sourcing.
- Collected and distributed medicines worth Rs.45,000 from the medicine collection boxes located in five nagar palikas and clothes worth Rs.6,45,000 in winters.

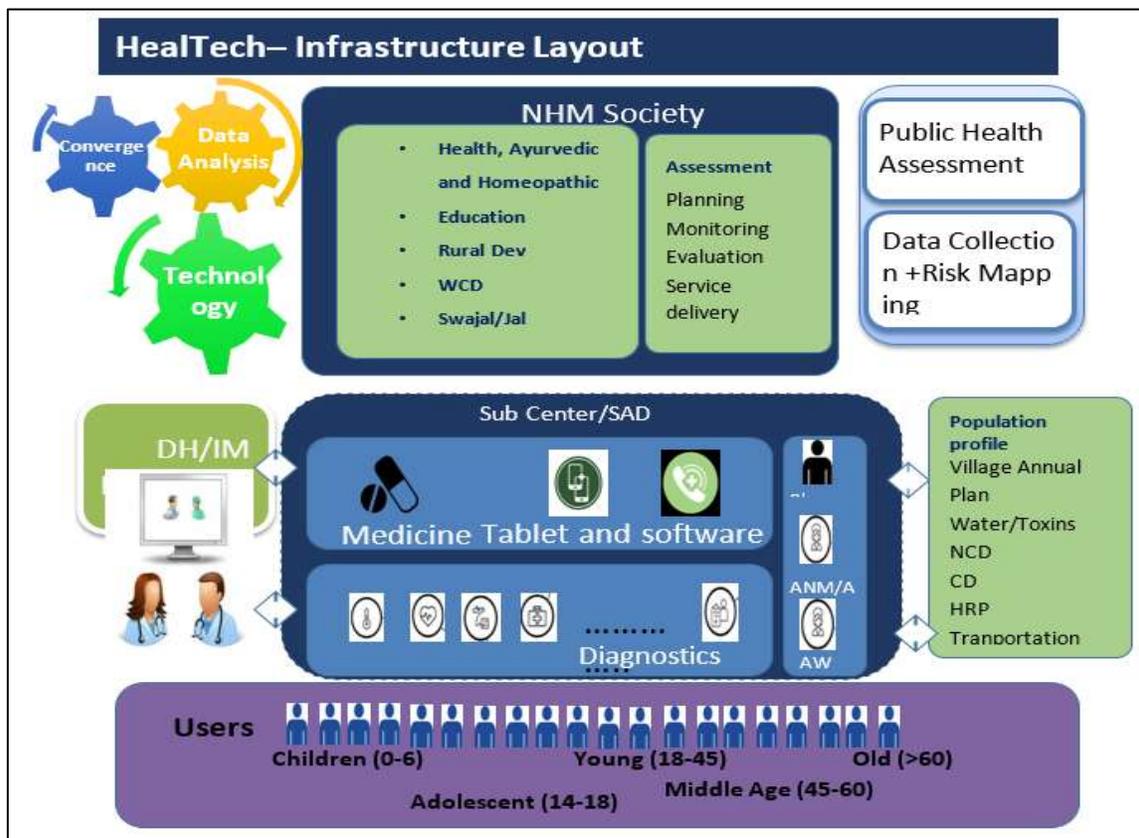


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- 20+ Schemes under NHM by Government of India
 - 20+ Focus Areas
 - Over 6lakh beneficiaries

Ratna never knew there are more than twenty plus schemes in health sector available to her and other individuals in Tehri. “Hello Doctor 555” has created a repository of all the healthcare schemes of Central and State Government and high quality data consisting of availability and locations of doctors, AYUSH Doctors, Hospitals, pharmacist, pharmacies, community health workers, Ambulances, Diagnostics, etc. in Government or private sector.

Way Forward

“Hello Doctor 555” has changed the way healthcare services are delivered and consumed in Tehri District. It has successfully leveraged the technology to reduce the mental, physical and financial burden on the citizens. “Hello Doctor” has created an organizational structure in which all the departments shall work together to improve the health indicators of the District. Departments like education, WCD, water supply, etc. play a very significant role in improving the health status of individuals. Establishing a link among them and accordingly preparing a plan for the well-being of citizens are the final objectives of this initiative.



Filling Gaps

There are various services for all ages and illness under different schemes, but Hello Doctor-555 fills the gap by intervening during service delivery to achieve the final objective of such schemes.

For example in National Health Mission (NHM), under RBSK, there are fifteen teams in the District covering all the Anganwadis and schools once a year. This system fills two gaps: serving children left unattended in the process and a proper follow up system to the referred children so that the final objective of the scheme is achieved.

Under ICDS, District has around 81 malnourished children, this system fills the gap of monitoring and follow up of these children, also serving their nutritional needs.

The RSK system enables the kids who have inhibitions in sharing their issues to talk freely about their issues.

On similar lines, this initiative has analyzed gaps and developed SOP for gap filling of all schemes related to health. At the same time, it has generated a system to help people in need by directing them to right sources.

Leveraging technology for transparency, accountability and efficiency

Public service delivery systems are responsive and transparent when monitored properly. To monitor health staff, biometrics and online CCTV cameras were installed in DH/SDH and other facilities. This has helped in rationalizing the unutilized staff as well as making them accountable for their performances.

Daily monitoring of IPD/OPD/Referrals is done. This has tremendously reduced unwanted referrals, especially in case of deliveries in Government Hospitals breaking the nexus of Private-Government Doctors. Movement of 108/KKS/other ambulances are tracked through GPS.

With the constant analysis of IDSP data, it was found that quality of water in local tanks and springs needs attention to deal with water borne diseases. Department of Water Supplies developed GSM based device that can be installed in local tanks to monitor quality and discharge of water online.

Awareness and preparedness for emergent situations

“Hello Doctor-555” also works to generate awareness among villagers especially for disaster preparedness. A television is installed at the sub-centers for spreading awareness through presentations and videos. These centers serve as a warehouse of disaster management equipment.

Scalability and Replication

- MoU with AIIMS Rishikesh and Jolly Grant Himalayan Hospital for tertiary care consultancy services
- Extension of video calling services in whole District
- Other Districts are replicating the same model

Conclusion

Hello Doctor-555, with the help of technology, is transforming the way delivery of health services is planned and executed. The convergence of different welfare schemes had multiplied the impact of Government schemes which they otherwise had.

Aligned with the principle of providing service at the doorstep of citizen, Hello Doctor is setting an example for other Districts to emulate.

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Teaching Notes

Learning Objectives:

- Importance of innovation and technology to bring transparency in delivering health services in remote areas
- Identification of pain points in hilly areas for service delivery and solution provided by *Hello Doctor 555*

Suggested questions and Analysis:

- a) What are the key points to be kept in mind while replicating *Hello Doctor 555* in other States? Does the *Hello Doctor 555* model stay relevant in non-hilly States?
- b) Identify the pain points in hilly areas that Hello Doctor 555 has been able to address? Also, point out the key factors which are essential for adoption of such a service in hilly areas?

Group Discussion and Role Play:

Divide the participants in groups of 4-5 and discuss the case on following aspects. Each group should take one aspect:

- a) Discuss on the issues related to information asymmetry in hilly areas and what can be done to solve this issue?
- b) How should *Hello Doctor 555* proceed to enable upgradation and inclusion of other services? What should be the technological and infrastructural investment that *Hello Doctor 555* should undertake for the same?

Role Play Activity:

Make two group of 4-5 participants each

- The first group (Team Hello Doctor 555) should represent staff required for both administration and medical services provision
- The second group (Team Patients) should represent the patients from hilly areas

Team Patients would be provided a list of the names of Government Healthcare Schemes present in their specific region and would be asked to decide which scheme would benefit someone who is suffering from a chronic illness or someone who has been in an accident. This would enable the participants to understand the importance of someone who is able to help the patients in comprehension of the various health services available in the region.

Later on, **Team Patients** would be provided with the contact information (mobile number) of **Team Hello Doctor 555** and encouraged to explain the illness over the phone. Then one of the patients would visit **Team Hello Doctor 555** to undergo a regular check-up.

The objective of this exercise is to enable the participants to understand the importance of dispersion of information in an understandable manner. Additionally, it will also help in understanding what would be the challenges or advantages of conveying the health issue over the toll free number, which in turn would assist the *Hello Doctor 555* representatives to enable better adoption of their project.

Summary - Key lessons learnt (15 minutes). Each participant shall write down a summary in not more than 500 words highlighting key learnings from the case.

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List of Acronyms

Acronym	Full Form
AIIMS	All India Institute of Medical Sciences
ANC	Ante Natal Checkup
ANM	Auxiliary Nurse Midwife
ASHA	Accredited Social Health Activist
AYUSH	Ayurvedic, Yoga and Naturopathy, Unani, Siddha and Homeopathy
CCTV	Closed-circuit television
CHC	Community Health Centre
DH	District Hospital
DHS	District Health Society
ECG	Electrocardiogram
GPS	Global Positioning System
GSM	Global System for Mobile
HRP	Human Reproduction Programme
ICDS	Integrated Child Development Services
ICT	Information and Communication Technology
IDSP	Integrated Disease Surveillance Programme
IFA	Iron-Folic Acid
IMR	Infant Mortality Rate
IPD	In Patient Department
IVR	Interactive Voice Response
KKS	Khushiyon ki sawari
MOU	Memorandum of Understanding
NCD	Non-communicable Diseases
NHM	National Health Mission
NTCP	National Tobacco Control Programme
OPD	Out Patient Department
PHC	Primary Health Centre
RBSK	Rashtriya Baal Swasthya Karyakram
RKSK	Rashtriya Kishore Swasthya Karyakaram
SC	Sub Centre
SDH	Sub-District Hospital
SOP	Standard Operating Procedure
VHNSC	Village Health Sanitation and Nutrition Committee
WCD	Women and Child Development