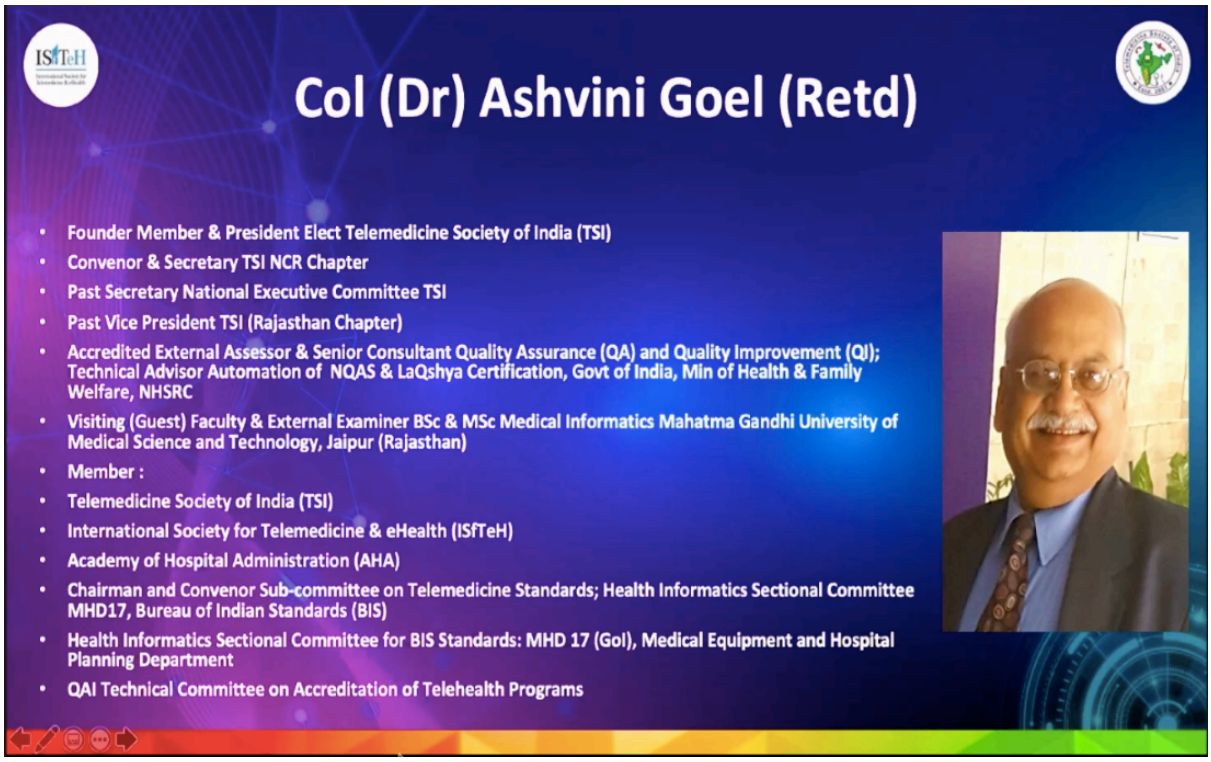
Day 1	Topic	Speaker
• 18th December 2020 (Friday)	• Welcome	• Col. (Dr.) Ashvini Goel (Retd.)



Good morning ladies and gentlemen. This is Dr. Ashwini Goel. I am the president elect of the Telemedicine Society of India. And I bring you greetings from the Telemedicine Society of India. As we kick off the proceedings today for the 16th annual International Conference of the Telemedicine Society of India, which is popularly known as TSI.

To begin the proceedings, I would request Mrs. Lalita Raghuram to invigorate us with the invocation song in her mellifluous and melodious voice. Over to Miss Raghuram. Thank you.

Good morning ladies and gentlemen. I bring you greetings from the Telemedicine Society of India. After the melodious and highly invigorating invocation song from Miss Lalita Raghuram: I think we are in the right mood to begin the proceedings of the Telemedicon 2020 the flagship event of the Telemedicine Society of India, which is the 16th annual International Conference being held on a virtual mode from the 18th that is today till the 20th of December 2020. As the Telemedicine Society of India, completes 20 years of its existence. It is heartening, indeed to be with you all today. As we initiate the proceedings of the 16th International Conference of the Telemedicine Society of India in the virtual mode. It is especially significant as a society takes its rightful pool space growing out of its teens and crossing the 20th year of its existence. Tele Health in India has grown exponentially in a very short time after the notification of the Telemedicine practice guidelines by the Government of India and this is the first international level telehealth conference after this notification of the guidelines by the Government of India.

The COVID pandemic has allowed the virtual health tech ecosystem to get established in a very short period. The experience of the past nine to 10 months has been invaluable and as the year closes, we need to reflect back and summarize all our learnings and look towards the future to make telehealth platforms not only universally accessible, but also affordable. In keeping with this ethos, the theme of the upcoming 16th annual International Conference has been aptly selected as Telehealth from the fringes to the mainstream. Telehealth has the potential to adequately address the issue of health and wellness concept and researched again, under the **Ayushman Bharat Scheme** and the universal health coverage program of the Government of India. It proposes to explore the opportunities that lie in deploying e-health technology in our country with a holistic approach to the concept of wellness. This vision has come to be realized in these days owing to the efforts and the initiatation of our honourable Prime Minister Shri Narendra Modi Ji.

TSI will be hosting this conference from the 18th to the 20th 2020 in a webinar mode as I said earlier, the discussions will focus around the growth and impact of telehealth in India as the necessary discussions around data privacy and patient safety. With the recognition of caregivers, and support and ancillary healthcare workers playing such an important role in the

delivery of health care and continuity of care. It is essential that the stakeholders understand, appreciate and debate on the ethical, legal and social implications of delivery of health care through means of information and communications technology.

So how did it all begin? Well, recognizing that Telemedicine is a tool by which the health services can have the capability to leapfrog to the last person in need of quality health care. It was in April 2001 that some people with a passion for bridging the vast healthcare divide in India got together to form a not for profit scientific society dedicated to creating awareness of Telemedicine at national level and carrying out scientific activities to promote Telemedicine. Members of the integrative body were selected from various organizations and various ministries of the government supporting Telemedicine activities like the Department of Information Technology, Indian Space Research Organization, the defence services, Academy organizations playing an active role in Telemedicine, like the All India Institute of Medical Sciences, New Delhi, the SGPGI Lucknow, and PGI, Chandigarh, as well as the Indian office of the World Health Organization.
TSI is now a mature and a well reputed society with a vision to provide quality health care services to the underserved and those in the outreach areas for the use of information technology. TSI has 11 state chapters with three more in the pipeline. Government of India recognizes TSI as the lead organization promoting telehealth in India, with members of TSI having been responsible for the development of various prestigious telehealth projects of the Government of India, like the Pan African, SAARC, and the Bimstec Telehealth Networks.

TSI is also recognized by the International Society for Telemedicine and E-health as the official name of the National Society representing Telemedicine activities in India, as well as the ATA, the ITU, the IEEE and various other international bodies. Members of TSI with their legal advisors are responsible for the formulation of the draft Telemedicine practice guidelines at the behest of the NITI Aayog and the subsequent issuance of the guidelines by the MCI board of governors and finally the Gazette notification on the same on the 14th of May 2020.

Now a bit about the role and mandate of TSI as far as making the Telemedicine and practice guidelines, a reality . TSI has been striving for the past almost 20 years to make the practice of telehealth a reality in India. It was very recently that we submitted the final draft of Telemedicine practice guidelines to the NITI Aayog, and the same was approved by the Board of Governors MCI. Shortly thereafter COVID happened and we were all in the midst of a global

pandemic. It was at this juncture that Telemedicine was rightly recognized as the ideal means of provision of health care to COVID and non COVID patients and for preserving the precious healthcare resources available within the nation for the purpose. Telemedicine has beco me a force multiplier in the true sense, and is going to be the new normal for routine treatment of patients.

Recognizing this fact, the Board of Governors superceding MCI act of1956 released the official Telemedicine practice guidelines in partnership with the Niti Aayog on the 25th of March 2020. These guidelines have been approved by the Ministry of Health and Family Welfare and put up on the website. The Gazette notification of the same was published on the 14th of May as I said earlier, the TPG mandates that all those who wish to practice telehealth activities in India will have to undergo a training and certification within three years of issuance of these guidelines. TSI has the mandate to train doctors and other health care providers to utilize telehealth technology in the treatment of COVID and non COVID patients. A team of dedicated and highly qualified personnel professionals has developed an online training program on using telehealth technology for healthcare professionals with a certificate to be awarded at the successful coordination of training.

TSI aims to establish a pan India telehealth network of trained medical practitioners to facilitate delivery of medical advice over Tele consultations in both synchronous and asynchronous modes, covering as many districts as possible across the country. The training will ensure that all those who are trained will learn to function in conformity with the government's guidelines, and at the same time ensuring the privacy and security aspects of the patient's data. Great developments are taking place in the field of telehealth and very prestigious institutions reaching out to TSI for tie ups. It is our responsibility to ensure that we make all efforts and undertake all measures to promote this extremely enabling modality of great quality , delivering healthcare across the length and breadth of our country. We must make all endeavours to bridge the humongous healthcare divide for the benefit of all those who have been long deprived to the fruits of health care for so long. Jai Hind!

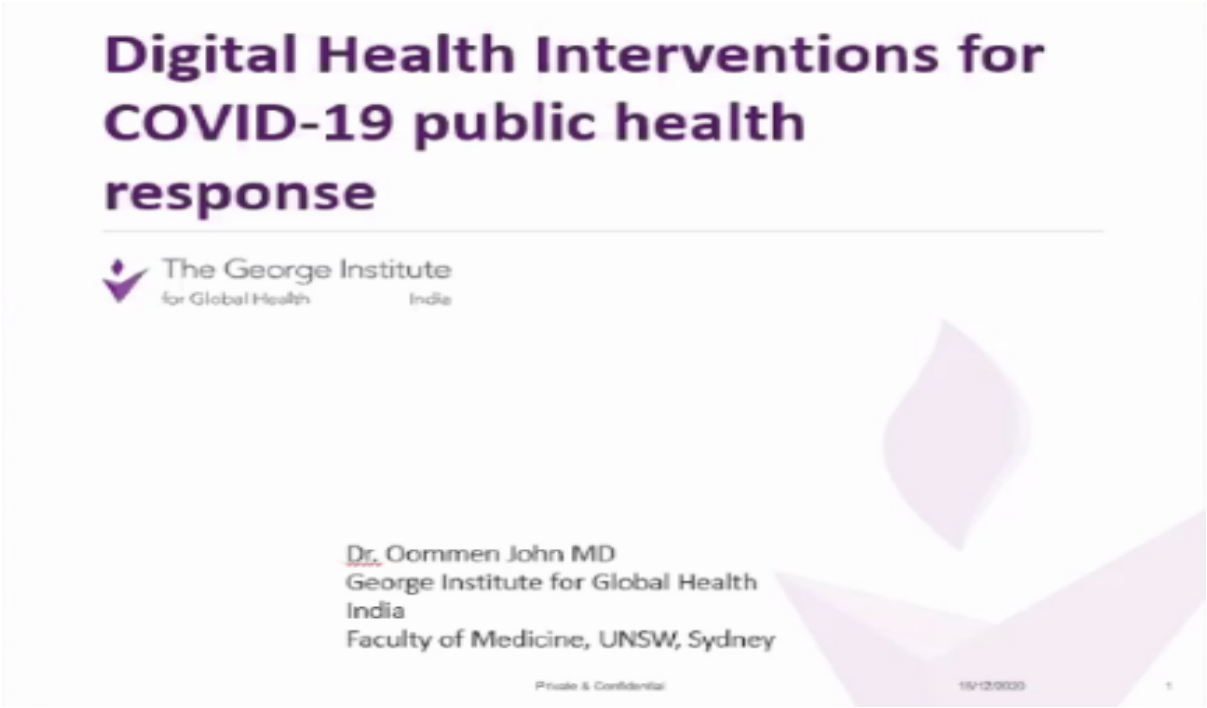
So ladies and gentlemen, let me tell you a little bit about the conference per se. As I stated earlier, in my welcome address for you all, this conference is a three day affair starting from the 18th of December, and going on to Sunday, the 20th of December. This is the annual flagship international event of the Telemedicine Society of India. Wherein, this year we have

extremely fantastic, I would say a fabulous faculty, and it is going to be both visual as well as an intellectual treat for all of us to hear the people speaking in 17 symposia, there are 150 faculties, who will be giving you their views on telehealth there are 35 free papers. We have an extremely powerful engagement with the government functionaries. We have the union commerce secretary to the Government of India coming in for a keynote address and he will will be inaugurating the virtual exhibition. We have the member of NITI Aayog Dr. V. K Paul, who will be inaugurating the conference in the evening and delivering a keynote address. We have a very senior functionary from the Government from the Ministry of Health and Family Welfare, the regional secretary and FA, **Dr**. **Dharmendra Gangwar** coming in on the second day for a note.

We have a sitting judge, Justice of the Supreme Court, **Shripathi Ravindra Bhat**, who will also be apprising you about the privacy and security issues and the legal aspects of the same. We have the Swamiji the Mahadish of **Adichunchanagiri Math**, which is a 2000 year old math and it will be very interesting for you to know that Swamiji himself is a post graduate and did his engineering from IIT Madras. He will be deliberating on the ethical and social issues. Then, on the culminating day, we have the joint secretary at the Ministry of Health and Family Welfare, who is actually in charge of Telemedicine affairs in India, and has been very intimately associated with the COVID pandemic. He would be delivering a keynote as well.

So, suffice it to say that for all these three days, you are in for an intellectual treat as far as the content and the faculty is concerned. We have ensured it is virtually a global affair, not merely restricted to India. And we are also having a very significant development in the sense that we have got together a panel of almost all the SAARC countries and TSI would be striving to develop a SAARC network of telehealth enabled countries and which is of course for the future. So over to the organizers. And I hope you really enjoy this visual treat and intellectual treat that we're offering to you. Thank you. Thank you so much, Good Morning.

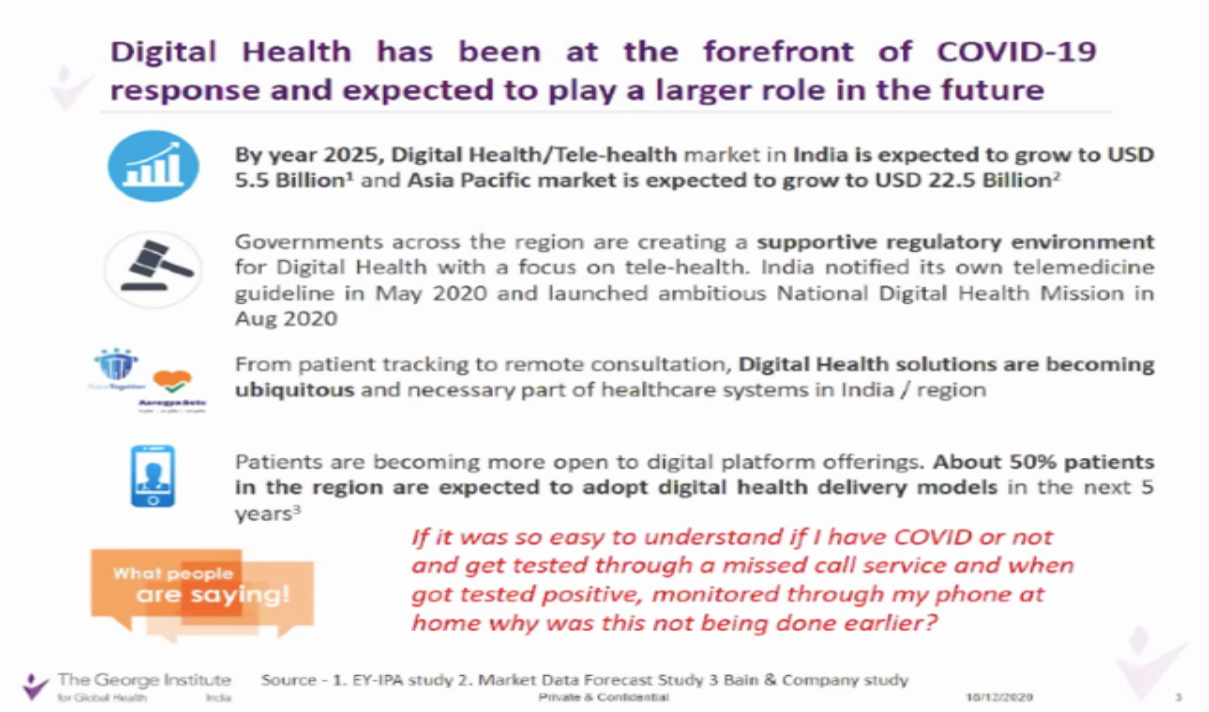
Day 1	Topic	Speaker
• 18th December 2020 (Friday)	• Digital health interventions for COVID19 public health response	• Dr. Susheel Oommen John



Good morning. Thank you for this opportunity. I really thank all the organizing committee, particularly Dr. Sunil Shroff, and Col. Goel and the rest of the team here and my honourable chairs for this opportunity. I'm going to share about digital health interventions in the context of COVID-19 for public health response and like I was introduced I work at the Georgia Institute for global health and I'm faculty at UNSW Sydney. I do need to share a couple of declarations. I serve in capacity as secretary to Asia Pacific Medical Association on the advisory board, I have a couple of organization I do have consulting engagements with WHO and Asian Development Bank and I have a grant funding from couple of these agencies, and recipient of a scholarship again, from UNSW Sydney, and I understand that sometimes such relationship can affect the course of the presentation. So I want to take us through how digital health has been at the forefront of COVID-19 response and the role that is expected to play in the future.

Are you able to see my screens please somebody? Can you confirm? Yes,

We can see your screen.



It is anticipated that by the year 2025 digital health in particular Telehealth market in India is expected to grow to up to about 5.5 billion and in the Asia Pacific market, it's grown to 22.5 billion.

So we need to keep in context that the Government's in the region in the context of the COVID pandemic have created supporting regulatory environments. And the focus has been largely on telehealth. India itself notified its Telemedicine guidelines in March, and it was ratified in May, and also launched the National Digital Health Mission in August of 2020 and most recently, the National Health Authority has put out the comprehensive data management policy as well.

So there's a lot of activity that is going on in the digital health context. And our focus for this morning is primarily how have digital Health Solutions helped in health care delivery systems as well as in public health response in the context of the pandemic. So, as we are all aware, many countries have introduced several mobile based interventions for COVID-19 and also, that is one part of it the for the pandemic response itself, there have been a number of digital health interventions that have been launched. But we also are aware that asks strict measures to prevent the transmission of COVID-19 also resulted in almost a shutdown of healthcare establishments and care delivery and this also required the digital health interventions to scale up and be available to provide a virtual environment in which the continuum of care was to be

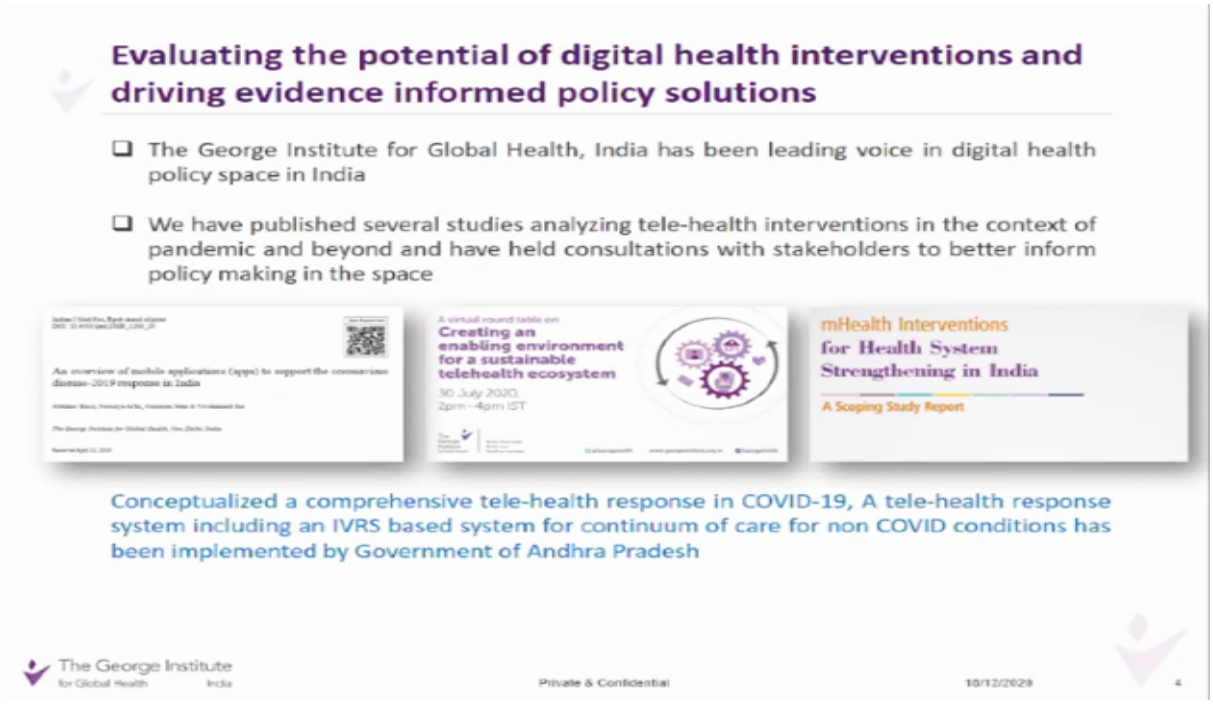
delivered. So this is both in the context of COVID, as I will explain a little later in our discussion, as well as for the non COVID condition.

So what happens to somebody who has got diabetes or hypertension, or chronic conditions such as osteoarthritis, and if they were not to go back to the hospitals in for the next couple of months? What happens to them? Do digital platforms have a role to play? Is it just Teleconsultation ? Or is it more comprehensive that we are talking about? So patients largely have become very, very aware, not that they were not aware before but the pandemic has really enhanced the vision and the scope of digital platforms to end users citizens at large and particularly those who have either been affected with COVID-19 their immediate relatives or people with non COVID conditions who had to seek care and a mechanism by which they could continue to avail care when everything else was shut down? So it is anticipated that about 50% of patients in India as well as in our Asia Pacific region are expected to expect that healthcare delivery systems adopt digital delivery models in the next couple of years.

So here is a quote from one of the people that we interacted with in rural Andhra Pradesh. So this is what he said, if it was so easy to understand over a telephone call, and if I have COVID, or not, and then actually get a test by booking a test through a missed call service. And when he got tested positive, he was monitored through his phone at his home. Why was this not being done earlier?

None of this is rocket science. Right?

It took us a pandemic to realize that you can use simple tools in our hands to actually deliver comprehensive care even in the context of something as infectious as COVID-19.



So we at George Institute have been evaluating the potential of digital health interventions, and that how these interventions can actually be driven by evidence based policy solutions. So I'll just give a context to what we are going to talk about the particular systematic review that we did about mobile applications in the context of Coronavirus, disease 19 response in India. So, to set stage, we've been working in this area for the last three, four years. So we looked at all the mobile applications that have been introduced in India over a period of five years, in early 2018 and we brought out this report and a publication on M-health interventions for health systems strengthening the focus of these exercises that if there have been any publications that is related to mobile interventions for healthcare delivery, then looking at it from a health systems perspective, using the WHO health system framework to see what are those interventions?

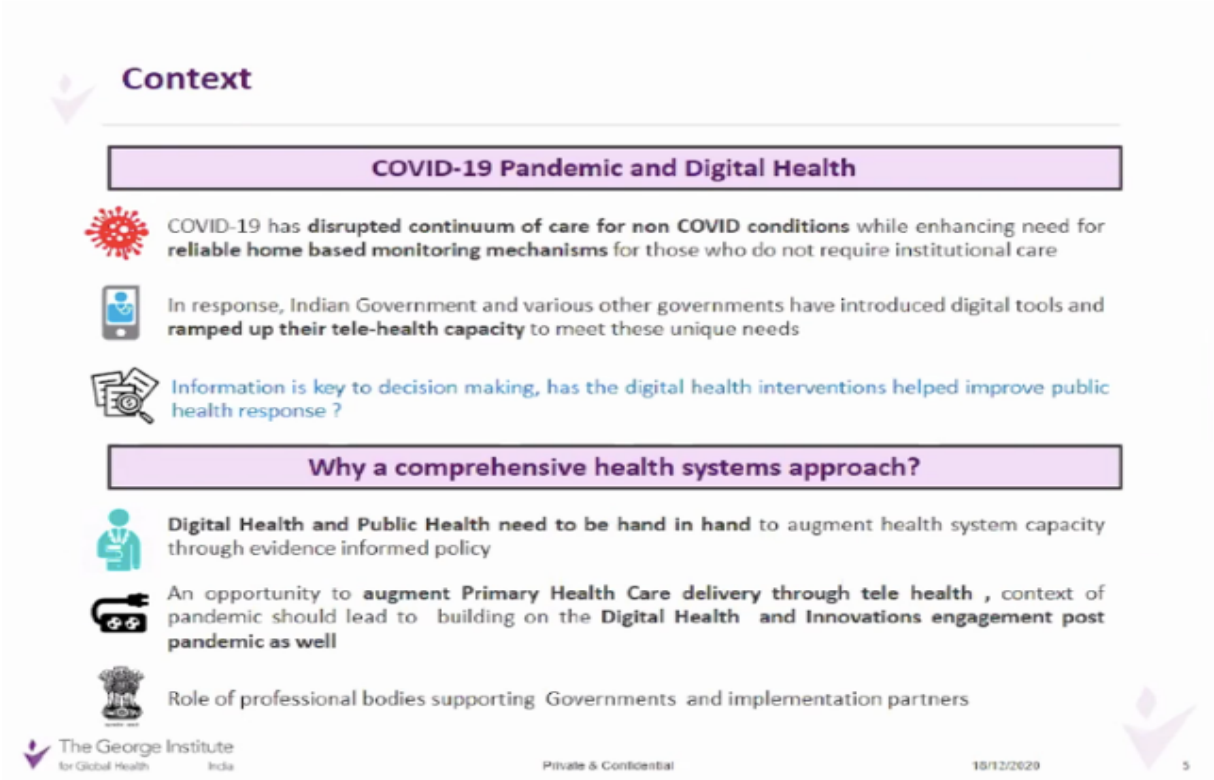
How are they supporting the health systems and what they are?

Are they being translated into reality in terms of improving outcomes, and bringing in efficiency?

So we were not surprised to note that most of these M-Health systems were being used as very low key intervention. So you call it a mobile health intervention, but you actually what you're

doing is just sending SMS's to participants telling them that you can come for your appointment or follow up or you have to have an AMC visit or something that is really not the power of digital, right. So it is not leveraging the full power of digital. So we have to move. If we are going to succeed in leveraging digital Health Solutions beyond the pandemic, we have to think beyond just rudimentary message type or just call centre type activities, we have to really see what is the power of the digital tools and how they can actually be powerful interventions to improve efficiencies, enhance the engagement and put the citizens at the centre of this whole ecosystem.

So from that perspective, we've been also working towards understanding how can this enabling ecosystem or a sustainable telehealth ecosystem come into perspective so we consulted with end users, patient groups, as well as experts with a couple of people who were actually part of the group that drafted the Telemedicine practice guidelines as well. So, what we realized early on when through this systematic review of the mobile applications to support the Coronavirus disease in India is that a large number of them were just focused on again, communicating messages to people saying that these are the symptoms These are what you should do, but can it be more engaging, can it be more interactive, so that is where we, along with the set of partners conceptualized telehealth response in COVID-19, and this telehealth response also included as an IVRS based system for continuum of care for non-communicable diseases and glad to report back that this whole concept was adopted by partners, those partners who were interested and the government of Andhra Pradesh and it has been implemented to scale in Andhra Pradesh and I will come to that specific example a little later down the line.



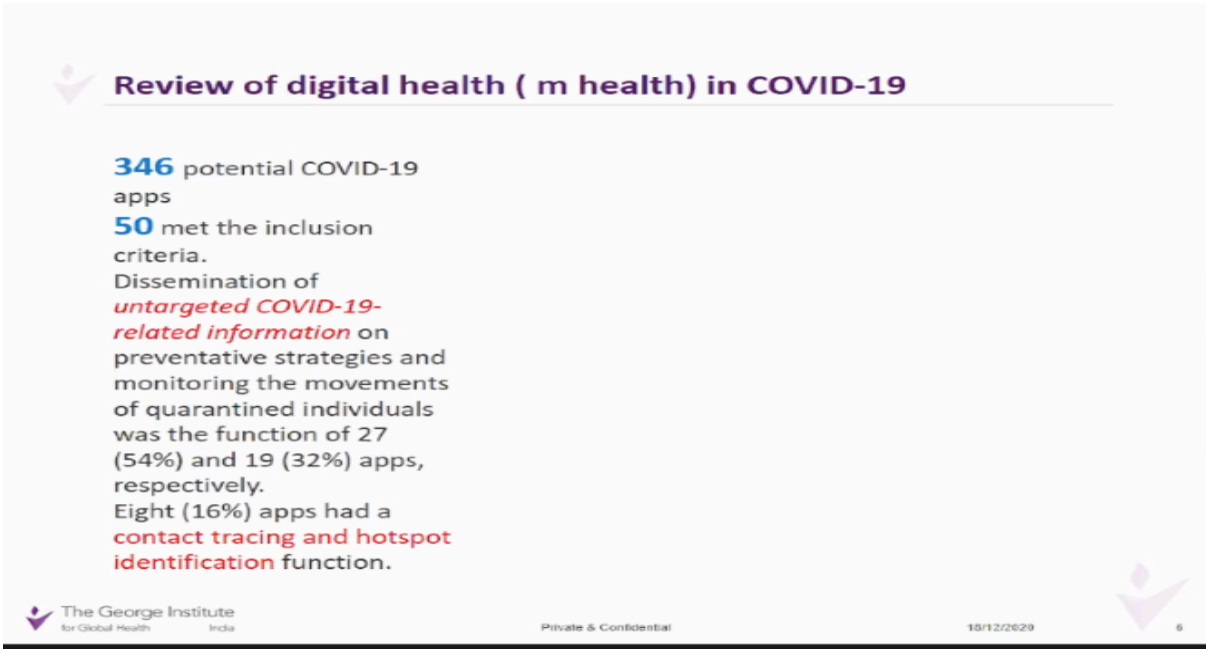
So, as to set a context of our conversation for the next 10 minutes or so, so COVID-19 pandemic came, and here we saw an opportunity for digital health tools or tele medicine as we are particularly interested in in this context. So, what has COVID-19 done it disrupted the continuum of care for non COVID conditions. Also it created a whole set of panic among people who were at risk for, let's say being infected with these are people with chronic conditions or with non communicable diseases, those with diabetes, comorbidities, and all of these. So there was absolutely no focused attention towards this as part of the pandemic response in the early days. And that is where, really, we saw an opportunity and several other partners saw an opportunity. So if somebody gets a complication that is related to their ongoing medical conditions, what do they do, healthcare establishments are telling Don't come here. And all of the public health response is geared towards contact tracing and finding who are at risk and testing them, and doing contact tracing and response to that testing. So what did the government do in in the context of the COVID pandemic? So, particularly Indian Government introduced several digital tools. And they also ramped up their telehealth capacity. Of particular note is the government sponsored app that **Aaroyga Setu** is a tool that was introduced that was a proximity tracing kind of application using Bluetooth enabled infrastructure, we have to keep in mind that the approach for proximity tracing really depends on the number of people who have this application with their Bluetooth enabled and who are coming in contact with other and in the context of a lockdown where everybody was expected to stay at home.

How effective is such an intervention? When enabled, nobody is actually coming into contact with anybody else. So can we use a tool that is really relying on proximity based notification when actually people are not moving? So that's a question to answer.

But on the other side, we should really appreciate that there were instances where state governments used their contact rates, tracing and mobile based interventions to actually inform where those hotspots are, and to find effective responses from a public health perspective. So if you know from your contact tracing, digital tools, and then a response that is targeted to your insights, but it still remains to understand whether large scale platform based approaches to proximity tracing whether the numbers were enough to be able to warrant and inform a public health response or not. So evaluations retrospectively will only help us to understand that. So here, there are a couple of key questions, okay, from Telemedicine society, and our viewers and participants perspective.

So information being the key to decision making, have the digital health interventions in the context of COVID-19 helped improve public health response. So why do we need a comprehensive health systems response? Because digital and public health needs to be hand in hand, okay, so just by launching an application, or by just making sure that there everybody is downloaded an app is not enough, it has to result in a comprehensive public health response. And this has to be guiding how to augment health system capacity and that is evidence based informed policy. Right. So here is an opportunity that in the context of the pandemic and beyond where perhaps, primary health care delivery in our country could be supported through telehealth, and digital health and innovations engagement post pandemic should focus on that.

So what is it? I would like to pause here for a question, what is the role of professional bodies such as TSI, in supporting government and implementation partners?



Do we have the capacity to come?

Look here is the technology, here is how it will work, here is the kind of embeddedness that it needs to have in the context of health systems, and actually guide and support governments and decision makers in that. So this is a challenge to all of us and perhaps we could do better on this. So going to the results of our review we looked at this was done in towards the end of April. So that was when we had scoped and found that there were 346 potential COVID-19 focused applications. So these are primarily M-Health applications, but they fall under the broader digital health definition. So we had a criteria in terms of including them for the analysis as if they were focused on any of the functions for public health as defined by who and the public health response criteria or We're going to address any of the health systems framework that has been out again outlined by WHO.

So what we found is that 50 of from among these 346 apps met the inclusion criteria. So we looked at each of these apps in detail using a framework. And then we found that most of them about 54% of these apps, the primary function of them was providing untargeted COVID-19 related information. So we know from other studies and from research anywhere else that untargeted information is usually not needed too. So each of us get several 100 SMS's in a day, or maybe not hundreds, but several, several SMS's in a day, it could be a notification or bank,

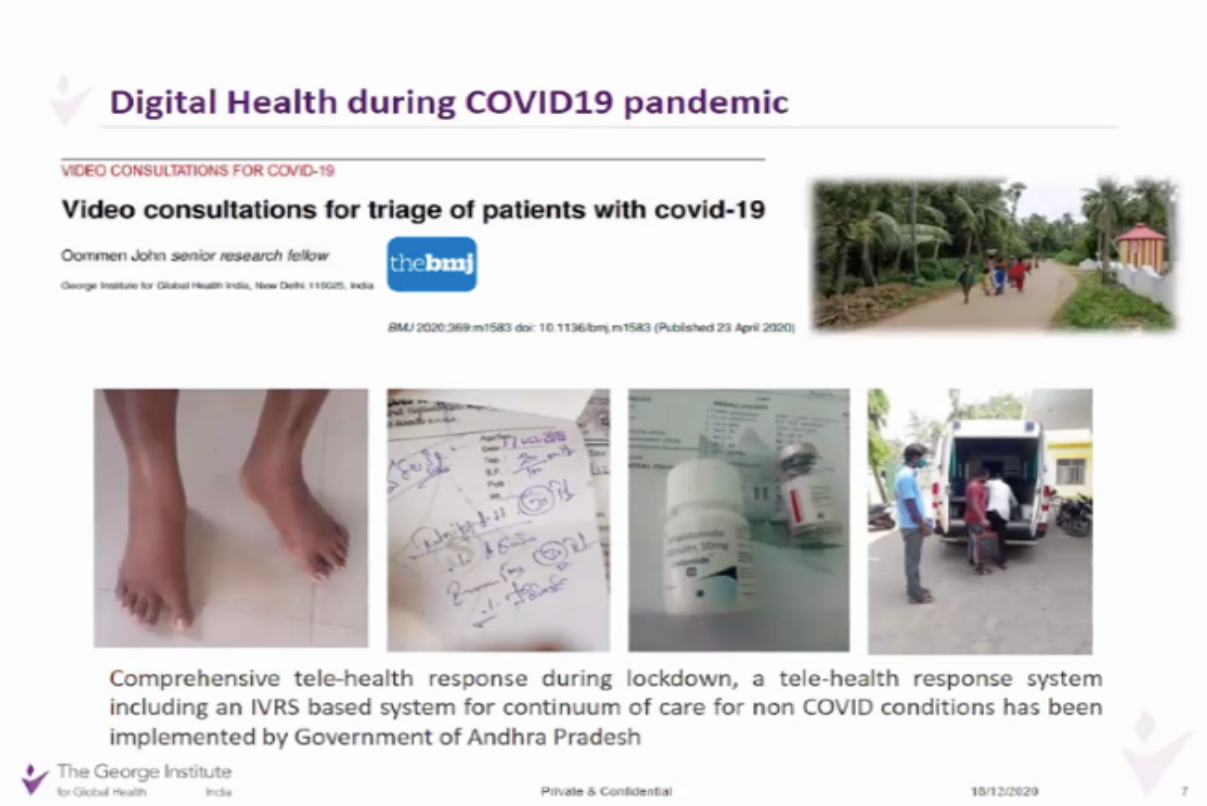
it could be saying that you are eligible for a loan, blah, blah, blah, we just ignore it. No, we reach a stage of alert fatigue, or this SMS fatigue, as we call it, and we just ignore it. So if we do untargeted, COVID-19 related information or anything else, in spite of the fact it is a pandemic, it is unlikely to improve any outcomes. So, but the primary function of most of these apps, as we found was this untargeted information dissemination, okay. And the other function was monitoring the movements of quarantined individuals, which in one sense is useful. But again, here, the percentage of apps that did this function was only up to 32%. Okay, 19 of the 50 apps were doing this. And eight of the apps, or sorry, eight of these apps that we reviewed had a contact tracing and hotspot identification function, but none of them had anything to do with deep embedding into the health systems.

Was there a comment?

JOHN,

We are exceeding the time could you please conclude?

Yeah, sure.



So I will just talk about one particular intervention that we were involved in, the context of the pandemic with the state of Andhra Pradesh here. Like I mentioned, we helped put up Telehealth response during the lockdown. And this was primarily focused at the non COVID conditions. And through this IVRS based system. The aim was to provide continuum of care for non COVID conditions, as you can see from the pictures here as a patient with heart failure and kidney failure, and because they were able to transmit the images, and also give us insights into what prescriptions what medications they were on, we were able to quickly triage these people and actually facilitate them going to see a doctor or have dialysis facilitated at a facility. So I will stop here in the interest of time, and pause for questions.

Thank you, Dr. JOHN. It was indeed a wonderful presentation and a lot of insight into COVID-19 and use of technology. as you rightly pointed out that it took us a pandemic to use the technology. That's the best way you have put in one line for us to understand how we haven't been using the technology

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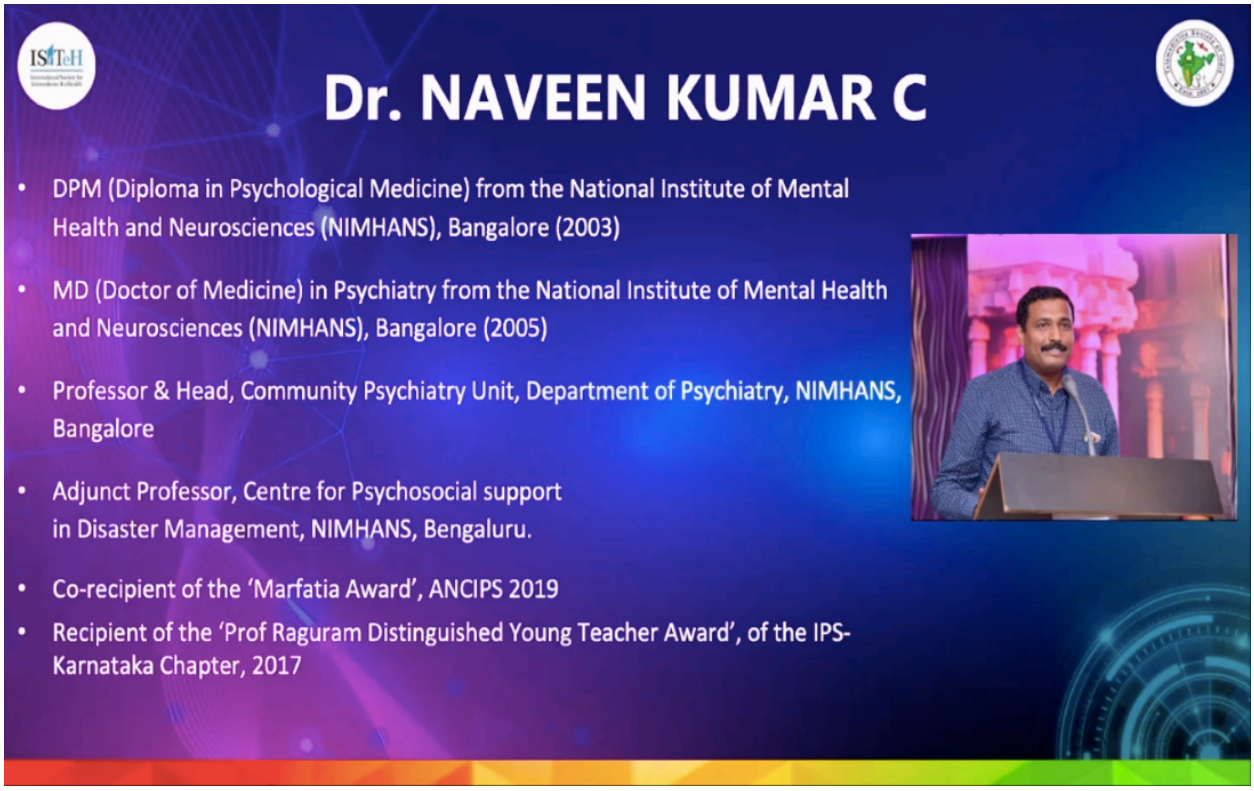
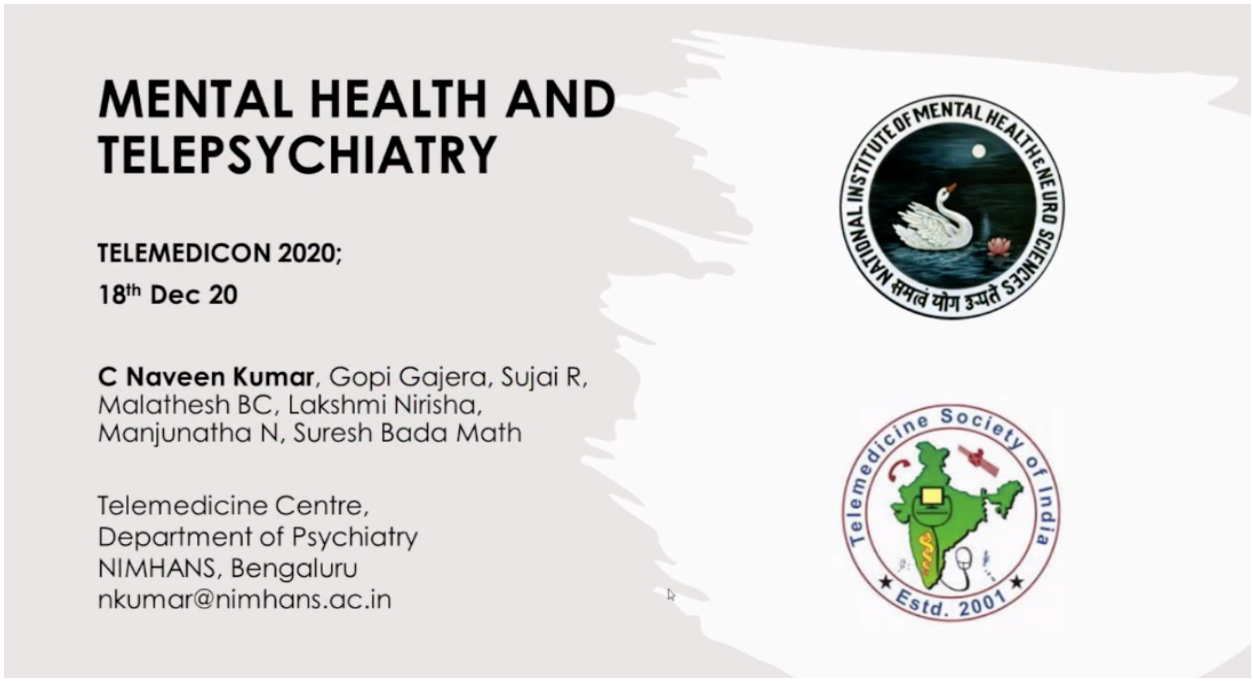
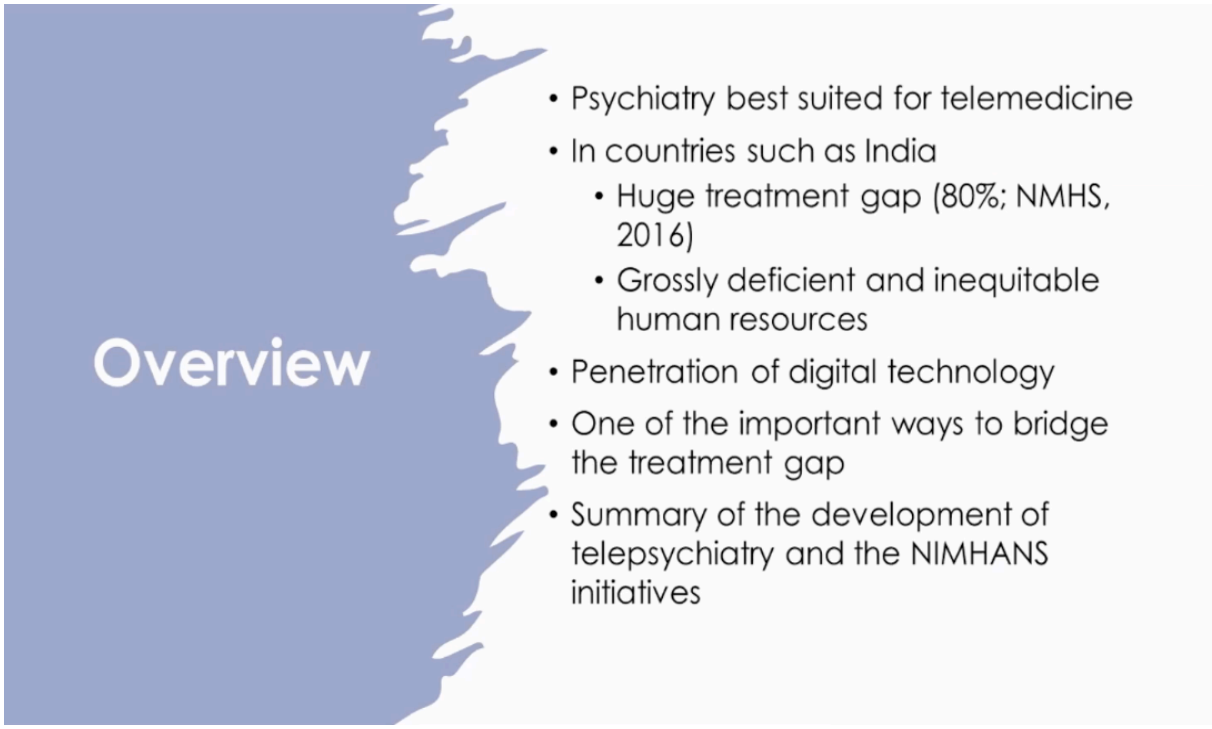
Day 1	Topic	Speaker
• 18th December 2020 (Friday)	• Mental Health and Telepsychiatry	• Dr. Naveen C Kumar



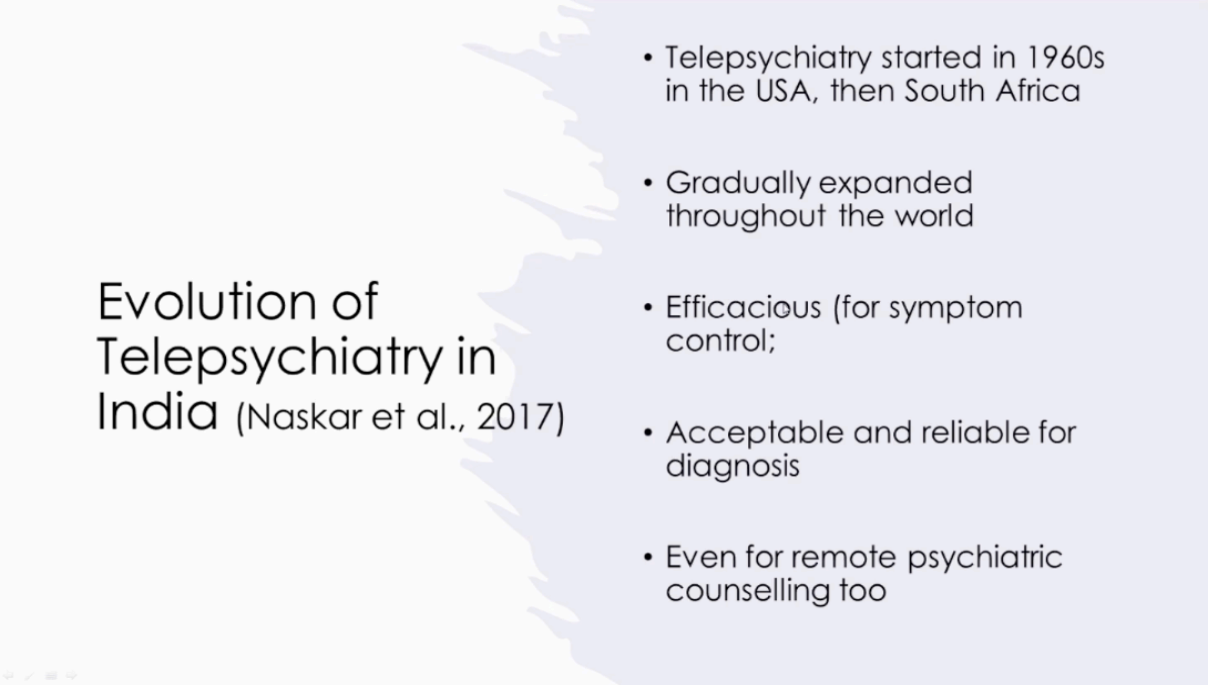


Good morning everyone. I am Dr. Naveen and thanks for the wonderful introduction. Today I am going to talk about the mental health and Telepsychiatry and initiatives that NIMHANS and the country has taken actually, as the previous speaker pointed out, there are a lot of initiatives in telehealth, particularly during COVID and recently the eSanjeevani platform of the Government of India has seen more than 1 million consultations, the latest.

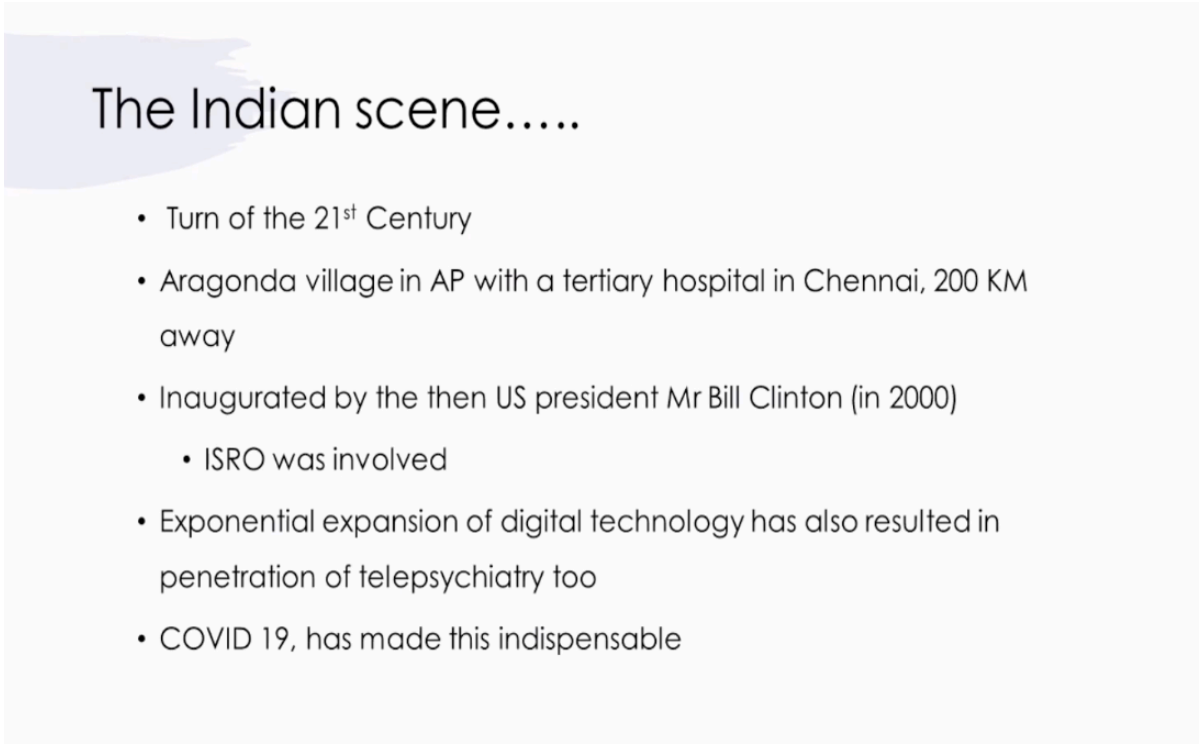


So, yeah, so that was one thing I wanted to tell that in my brief presentation, I'd like to start by saying that psychiatry is one of the best suited for Telemedicine, particularly in a country such

as ours, where the treatment gap for psychotic disorders is huge. That is four out of five people. They go out of treatment, you know, that's the scenario here.



Now, when you look at evolution of Tleelepsychiatry, it all started in the 1960s it was shown to be efficacious and acceptable and reliable for diagnosis, even for remote psychiatric counselling also,



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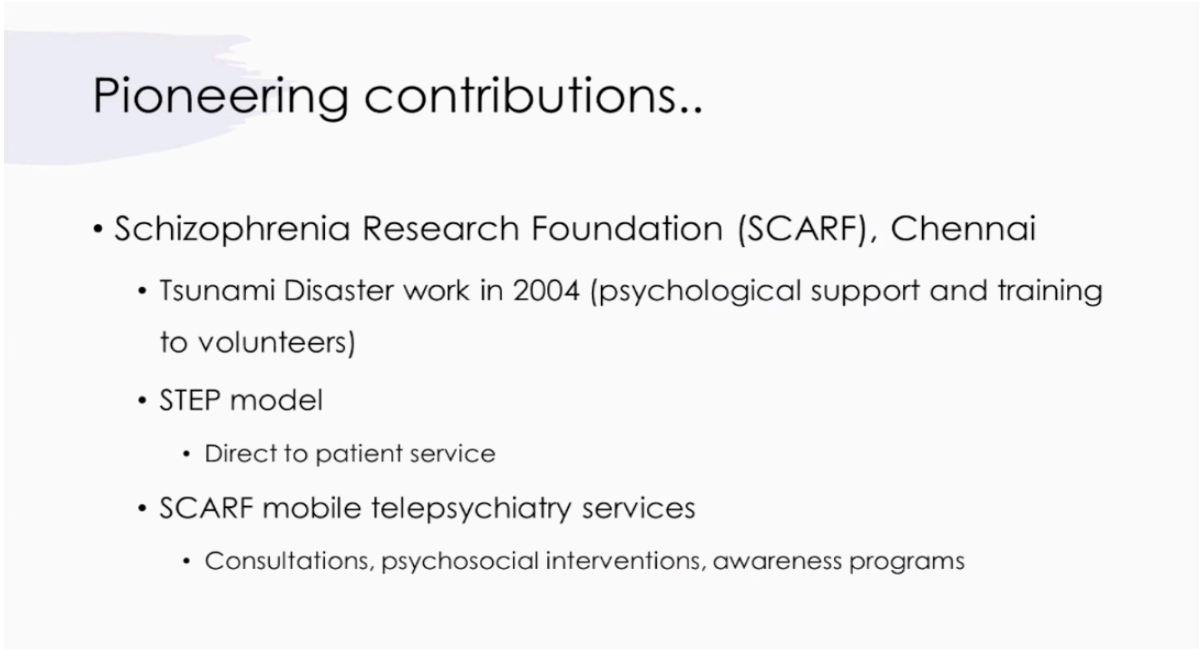
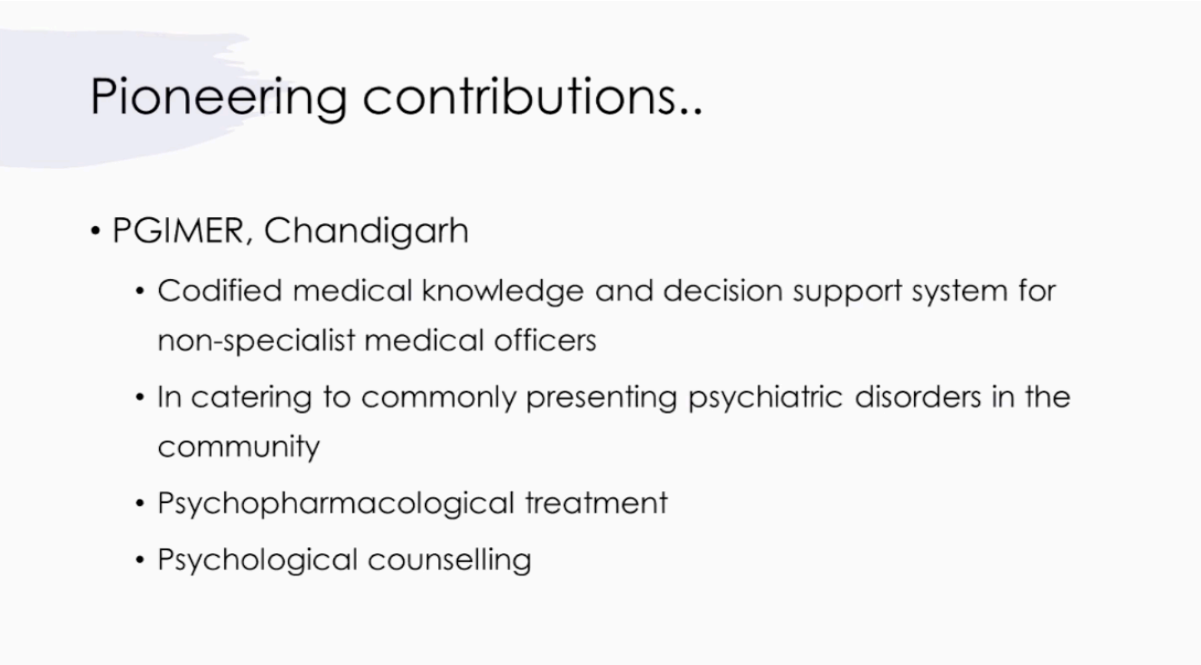
but in India, during the turn of the 21st century, it started in a remote village in Andhra Pradesh, you know, it got connected to Chennai, the then US President Bill Clinton, you know, inaugurated this and after that there has been an exponential expansion of the digital technology. And so as the Telepsychiatry also has developed and of course, COVID-19 has made these things, you know, inevitable. A couple of pioneering contributions before I come to the NIMHANS initiatives.

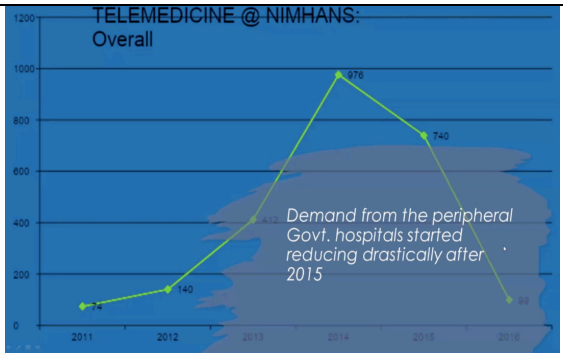


The first one is the schizophrenia Research Foundation, an NGO in Chennai. They did the tsunami disaster work and they also came up with the two models. One is the Pudukkottai model to patient service and also the mobile telepsychiatry services for consultations and psychosocial interventions, the postgraduate Institute of Medical Education Research,

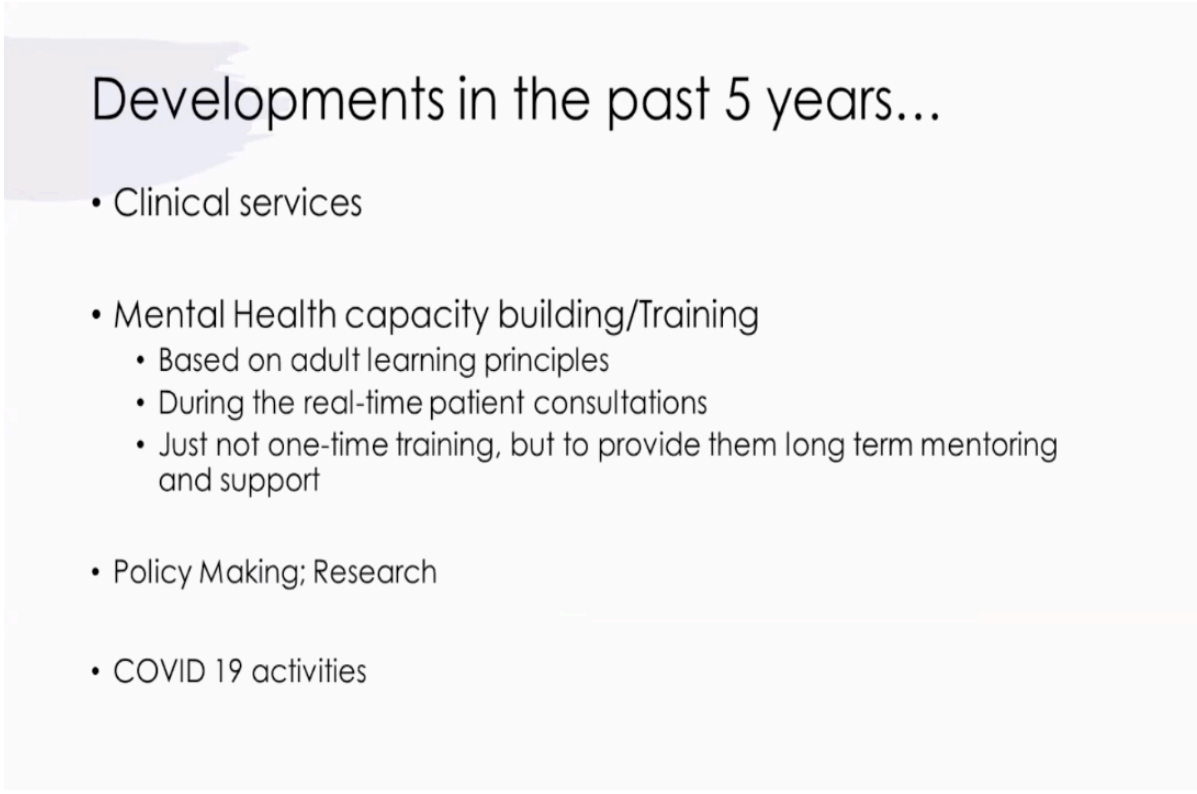


They came up with codified knowledge and decision support system for non-specialist medical officers, enabling them to provide Psycho pharmacological treatment as well as psychosocial counselling, when it comes to

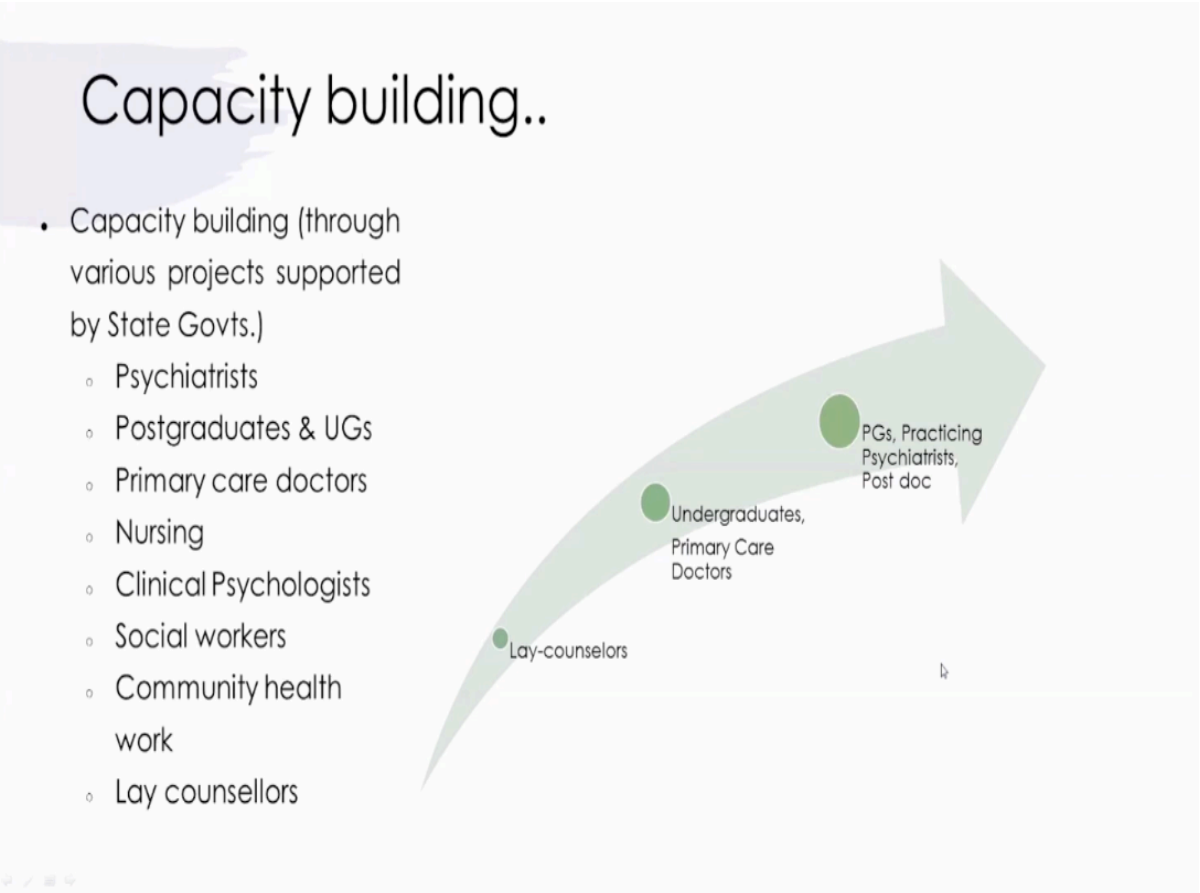
NIMHANS it all started in 2006, when we acted as a hub for neuropsychiatric disorders for all the districts in Karnataka, and a couple of Tehsil places also these are some of the glimpses of the initial, you know, years,



the number of consultations it is primarily adopted to doctor consultations, it rose to about 1000 in 2004. And gradually, the demand came down, you know, because the peripheral government hospitals start reducing the calls from that, you know, started coming down.



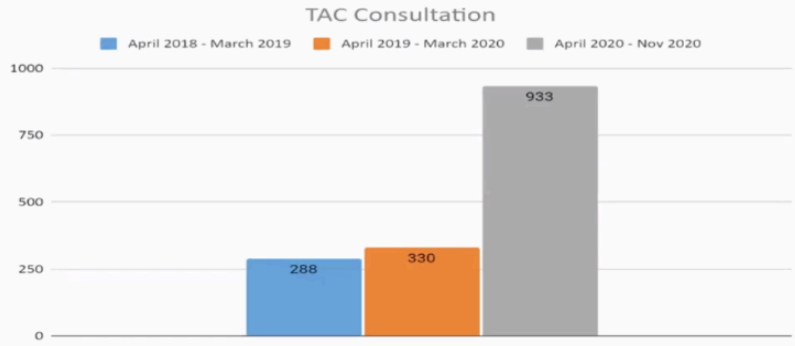
So, that was the initial part and then the development of the past 5 years, we have been able to make some contributions with regards to clinical services and majority of the contributions has come in the area of capacity building for various states.



and, of course, some of the policymaking initiatives and research also I'd like to add well upon, when it comes to the capacity building, we have been able to incorporate you know, lay counsellors, till undergraduates to primary care doctors to PG's practicing psychiatrist, postdocs, etc. So all of these people have been able to build capacity to when it comes to the clinical services.

Tele After-Care (TAC)

- Online live face-to-face interaction via digital platform for patients needing VIDEO consultation
- Follow up consultation of NIMHANS registered patients with UHID/MRD number

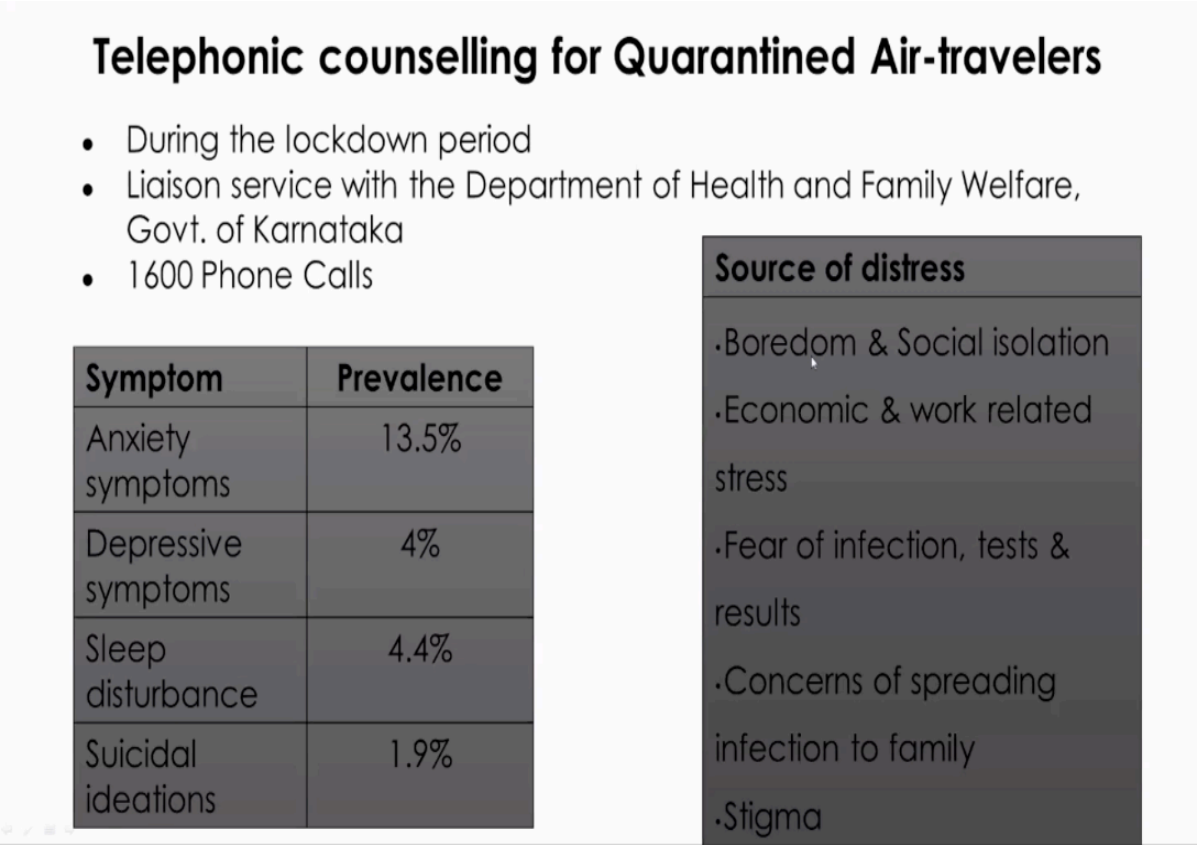


This is one I think we have started which we are offering follow up consultations of NIMHANS registered patients you can see the number of consultations that have gone exponentially more in this COVID time. This is just follow up consultation, new consultations, we have still not started because a lot of our logistic issues are there and as the previous speaker also was talking about the continuum of care

Continuum of Care (COC) Program

- April - June 2020
- AUDIO-based telephone calls for NIMHANS registered patients
- Karnataka DMHP for delivering medications at their doorstep
- Medical Council guidelines for teleconsultations
- Over 15,000 phone calls
- 1,600 benefitted with free drugs

program, we have been able to reach out to our you know our patients who were not able to come to NIMHANS for follow up consultations, over 15,000 phone calls were made and you know, both audio and video consultations we were able to provide to patients and as regards quarantined daily travellers in Bangalore, more



than 1600 phone calls were done and you know, counselling and of course, medication management also was provided telecare, teleconsultation was used for this as well during the lockdown period.

National Helpline for Psychosocial Support and Mental Health Services (080-46110007)

MOHFW; Govt. of India; 24*7 helpline

- Services in 13 languages
- 185 Faculties and students from NIMHANS, CIP Ranchi and LGBRIMH Tezpur are part of helpline
- 661 Front line mental health professionals from 20 States & Union Territories
- 200 – 250 calls from past 2 months.
- **333854** individuals approached, Professional care to **52352** individuals pan India

This initiative I would like to mention briefly This is a national helpline for psychosocial support and mental health services initiative of the Government of India demands is coordinating with more than 600 frontline mental health professionals from 20 states and union territories. More than three lakh individuals have approved this helpline it's a 24X7 helpline and more than 50,000 individuals have been provided some sort of support, you know, using this helpline which is one of and even the high court. The court has lauded this initiative and of course, now the number of calls have come down. Now clinical care coming, you know,

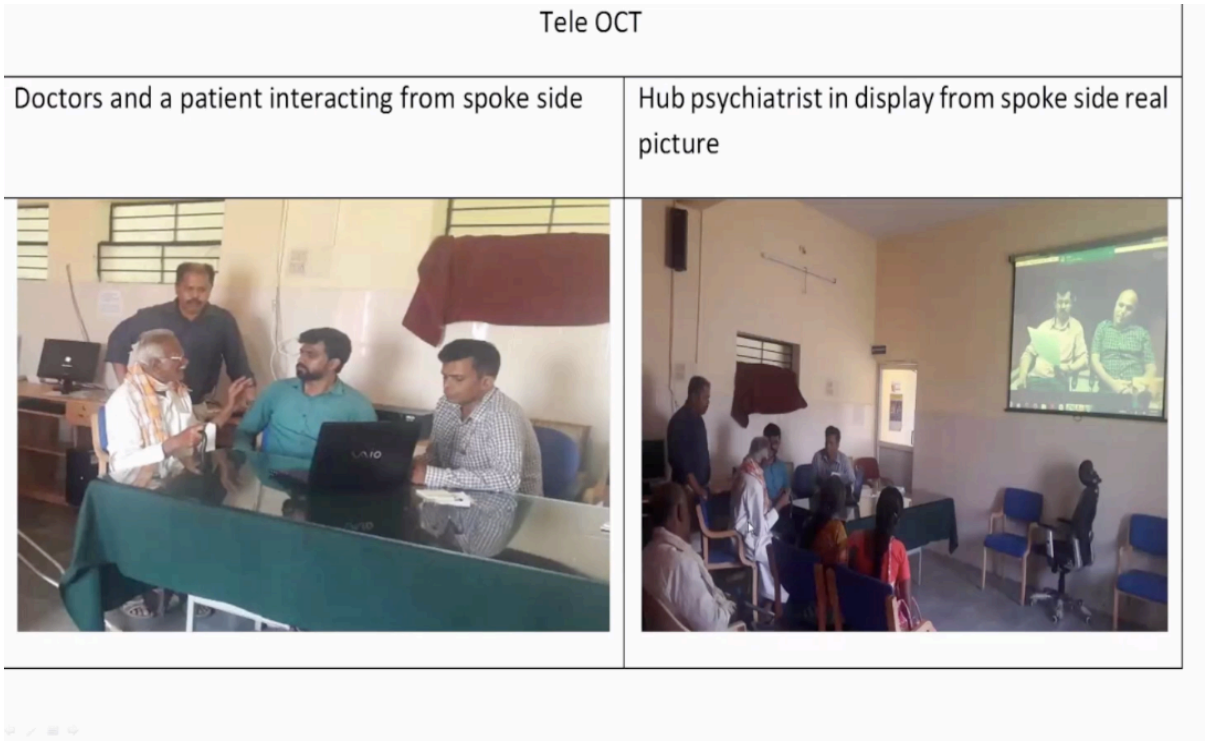
Clinical care during training

Tele- On Consultation Training (Tele- OCT) module

A Tele-Psychiatrist trains PCDs during their real time consultations in clinics. Each training sessions for two hours evaluating 15-20 patients for Mental illness from their regular OPDs.

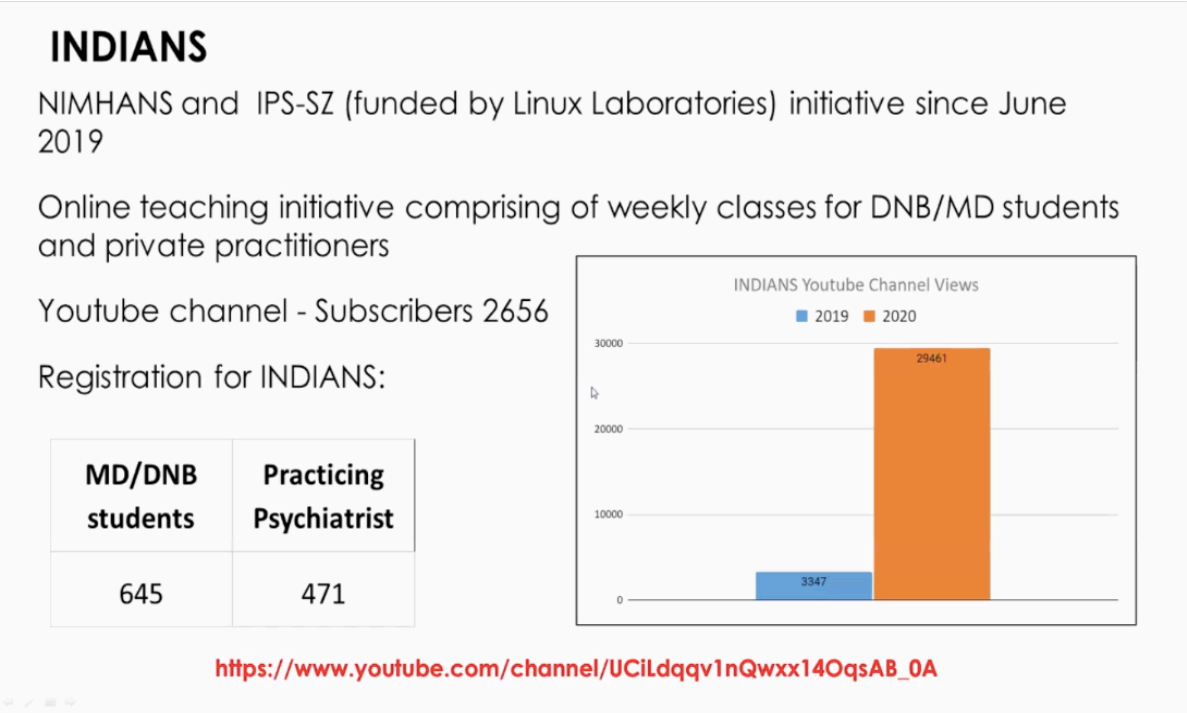
- Bihar - 338 (since 10 months)
- Karnataka - 4449 (since 2 years)
- Uttarakhand - 936 (2019-20)

clinical care during training as part of the capacity building also with various states we are doing, including Bihar, Karnataka & Uttarakhand more than 5000 to 6000 teleconsultations are provided as part of the clinical training.

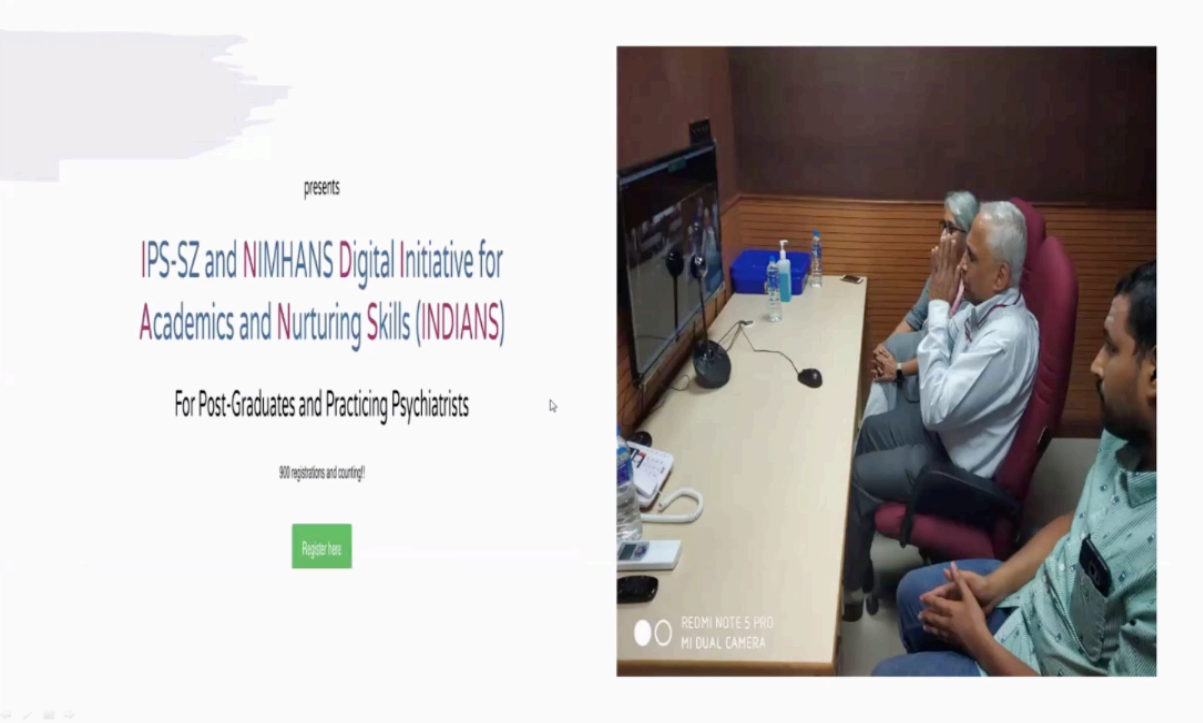


This is just a glimpse of Tele on consultation training. The left side is a primary care doctor and is the patient and this is a Telepsychiatry team of NIMHANS. The Telepsychiatry team is interacting with the doctor sector primary health care now coming to the proper.

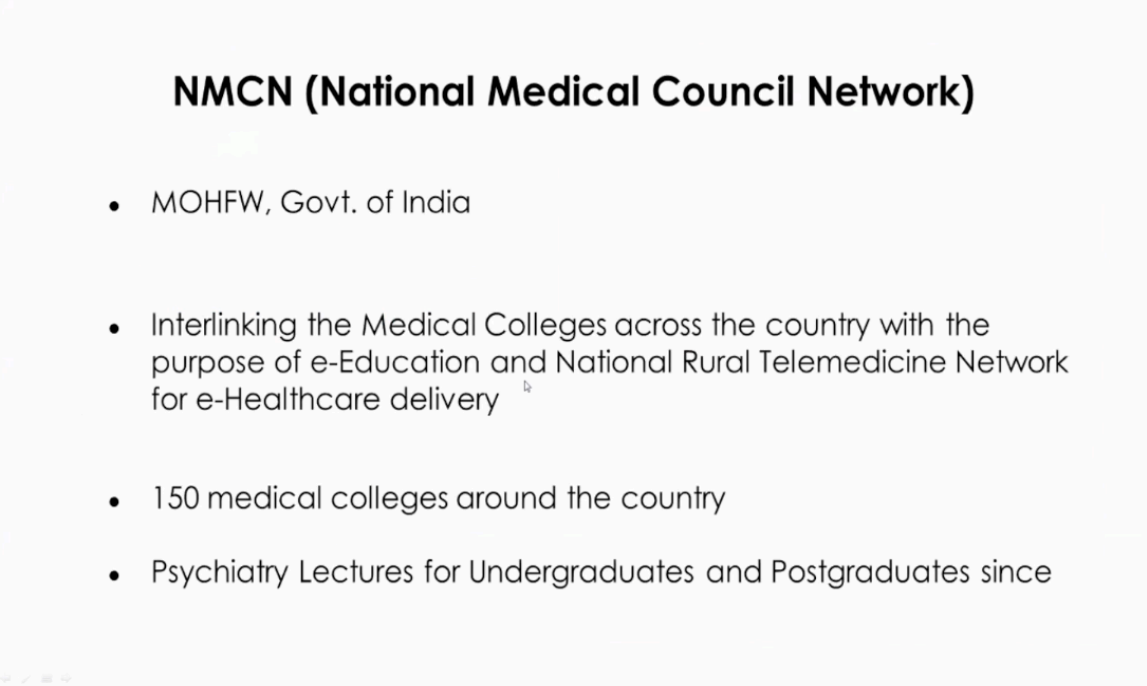
Mental health capacity building initiatives. This is the NIMHANS and IPS-SZ (Indian psychiatry society South Zone) initiative since we are doing this since past June 2019.



It's an online teaching initiative for postgraduates of psychiatry in India, with restrictions of more than 600 NBS MD and by DNP students and practicing psychiatrists 471. We can see here the number of channel views that YouTube views that have gone up in this current year and we plan to continue this in a bigger fashion.

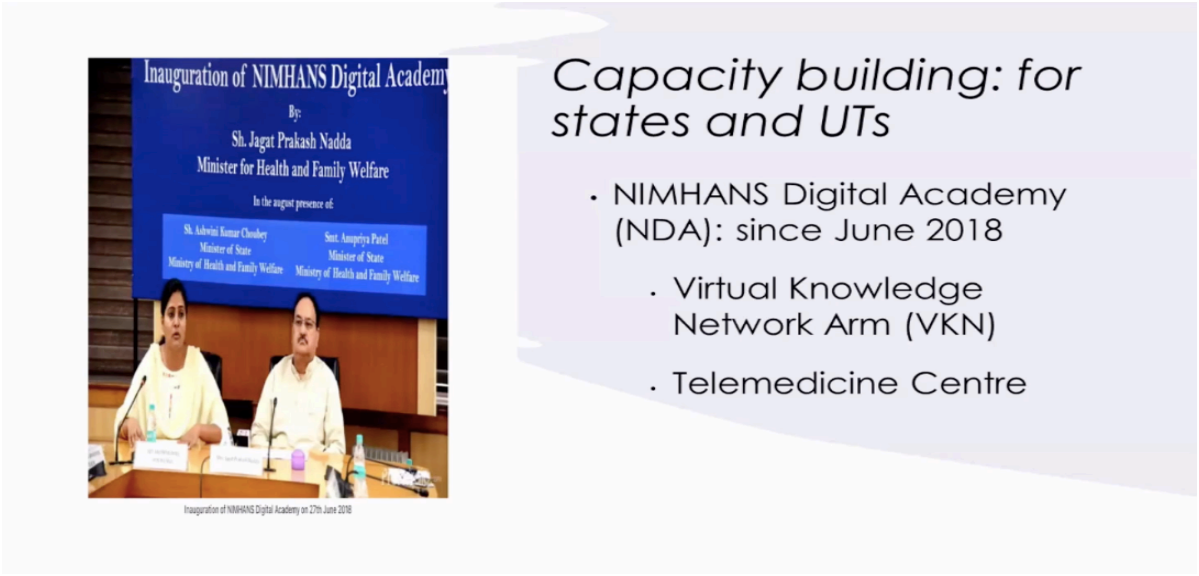


This is just a glimpse of the inaugural session of Indians,

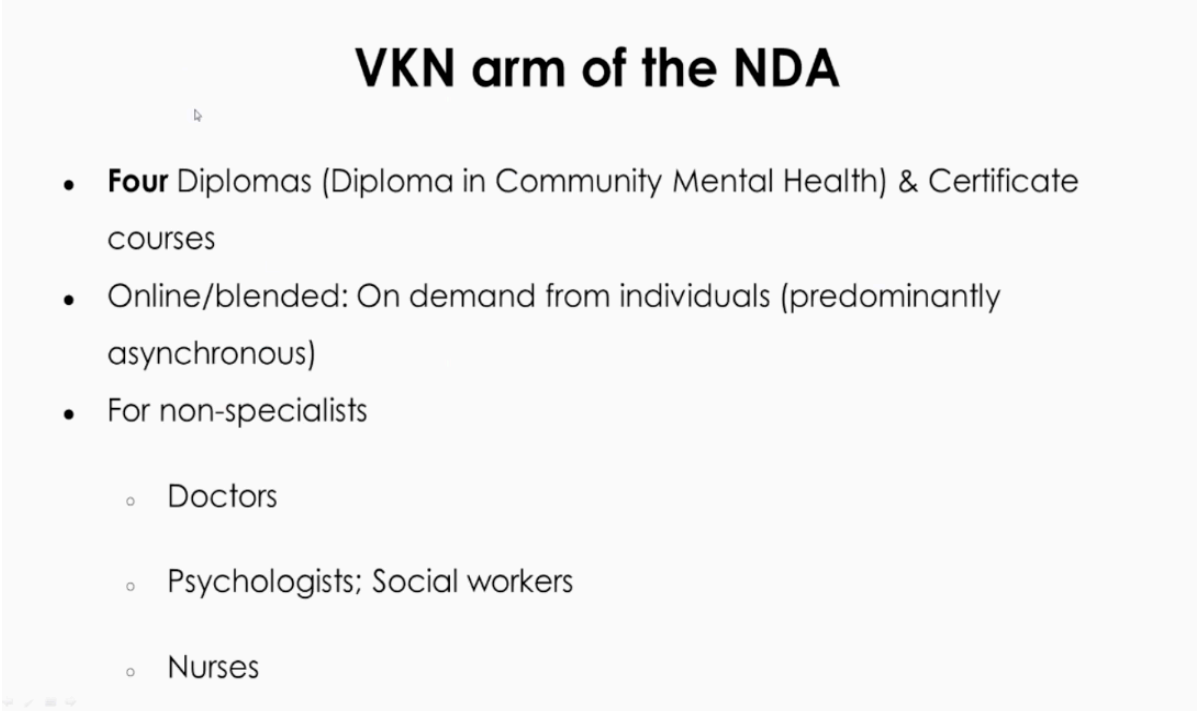


The National Medical College Council network, this again initiative of Ministry of Health and Family Welfare government of India, where we are connected to 150 medical colleges around

the country and psychiatry lectures for undergraduates and postgraduates who have been taking in the past one year.

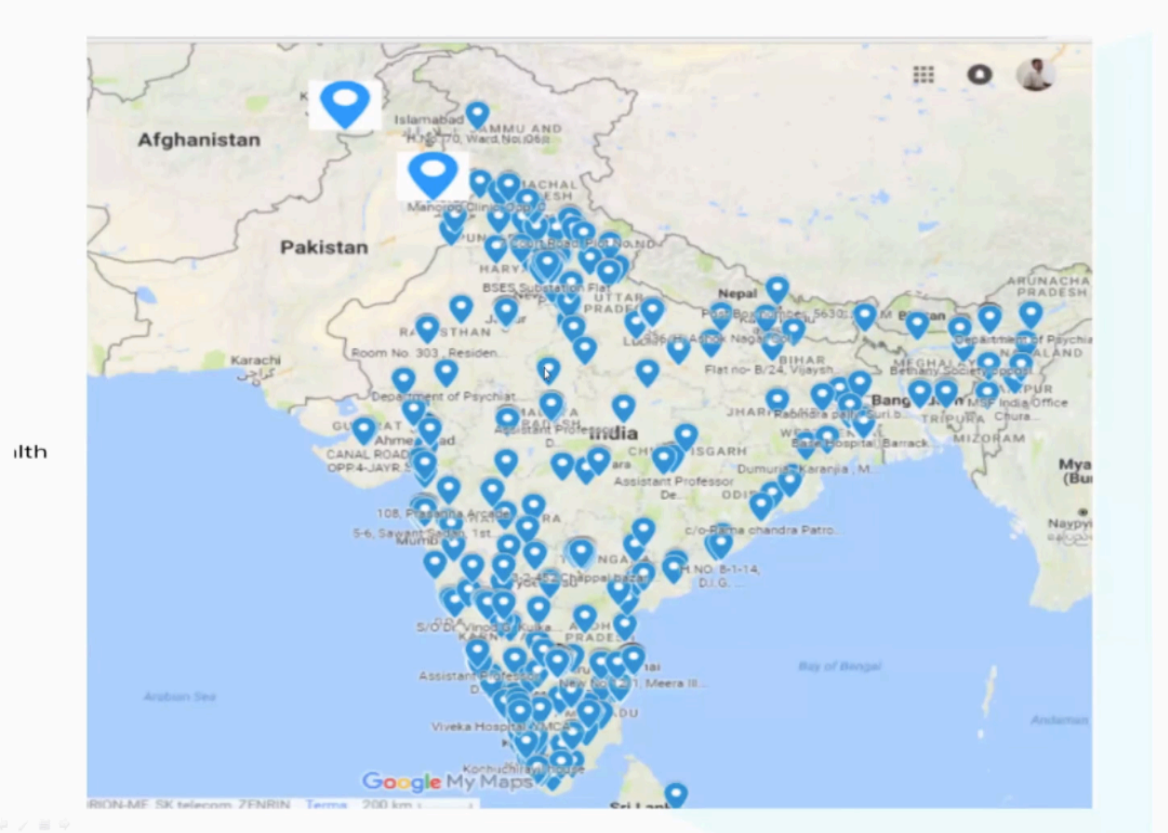


Coming to other kinds of capacity building. I'd like to mention NIMHANS Digital Academy, which was inaugurated by the honourable health minister in June 2018. So two arms are there for this NIMHANS digital Academy.



One is the Virtual Knowledge Network arm, that's the VKN arm, the other one is at Tele Medicine Centre on the VKN arm of the NDA is offering for diplomas, which is primarily

asynchronous mode. They're offering these diplomas for doctors, psychologists, social workers and nurses and this you can see almost all places of India people are on demand.

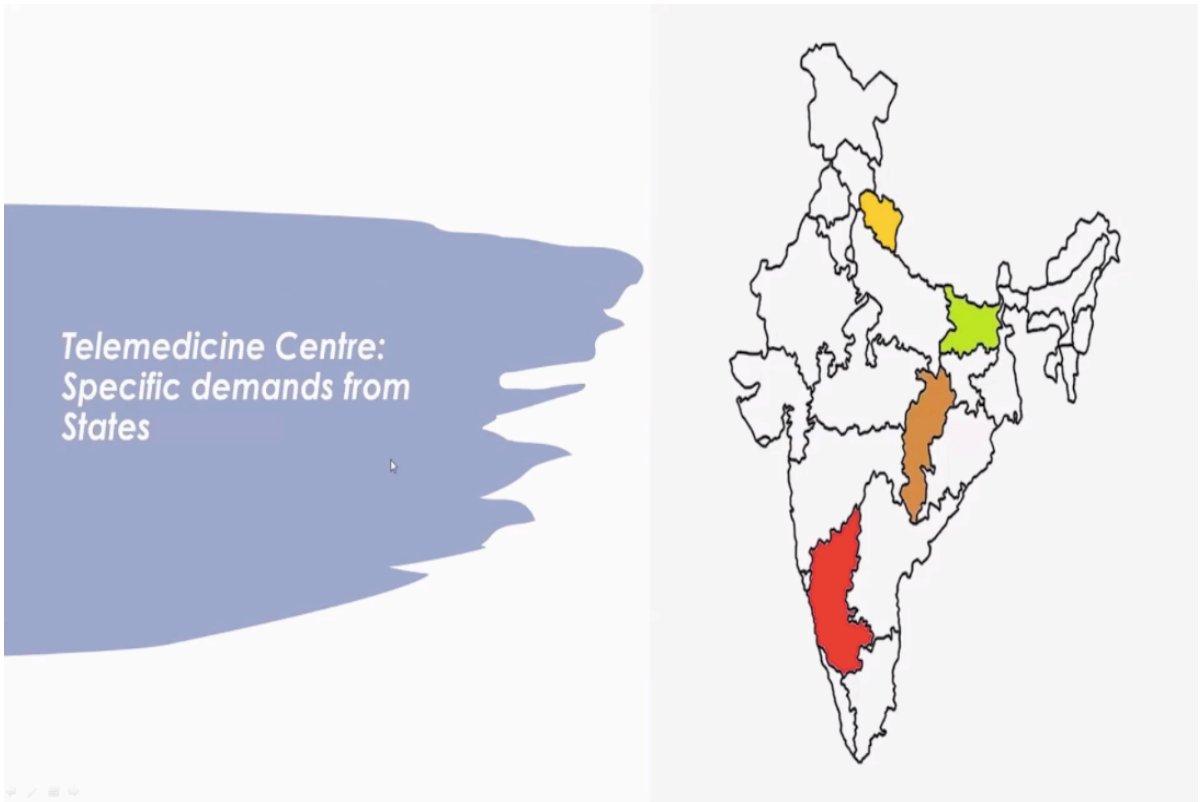


They are coming and enrolling into these diplomas

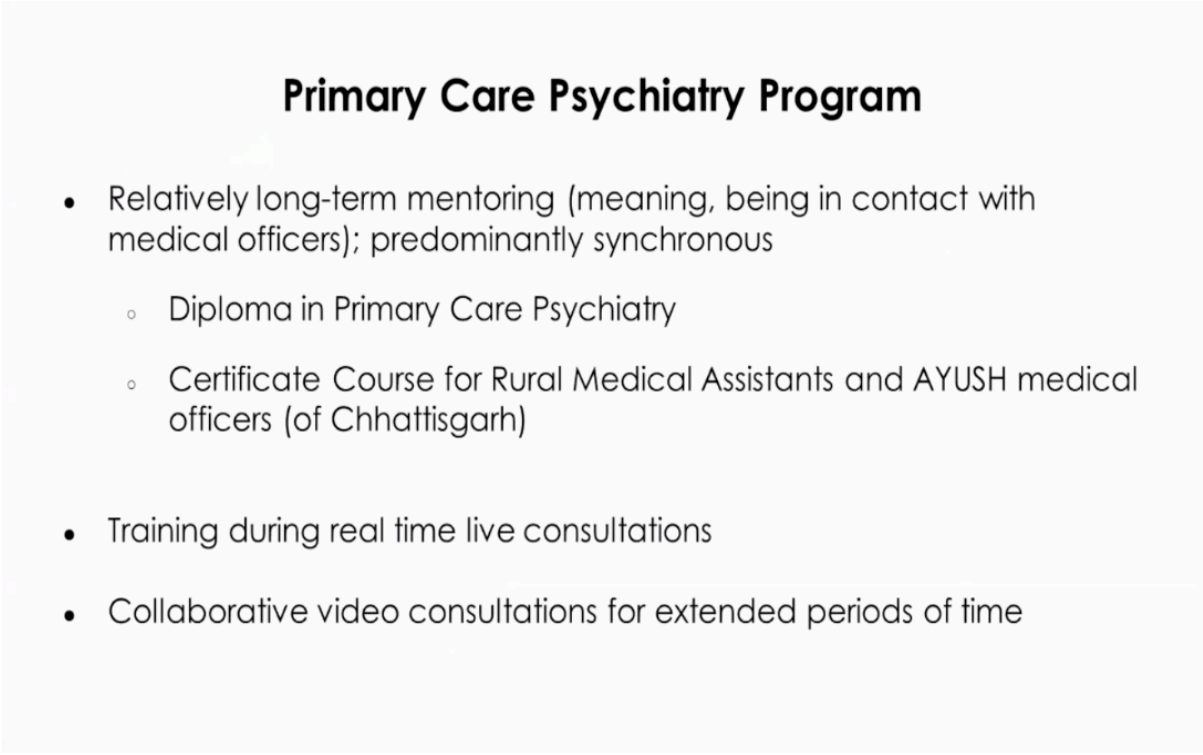
Diploma in Community Mental Health: Accreditations from June 2018 till date

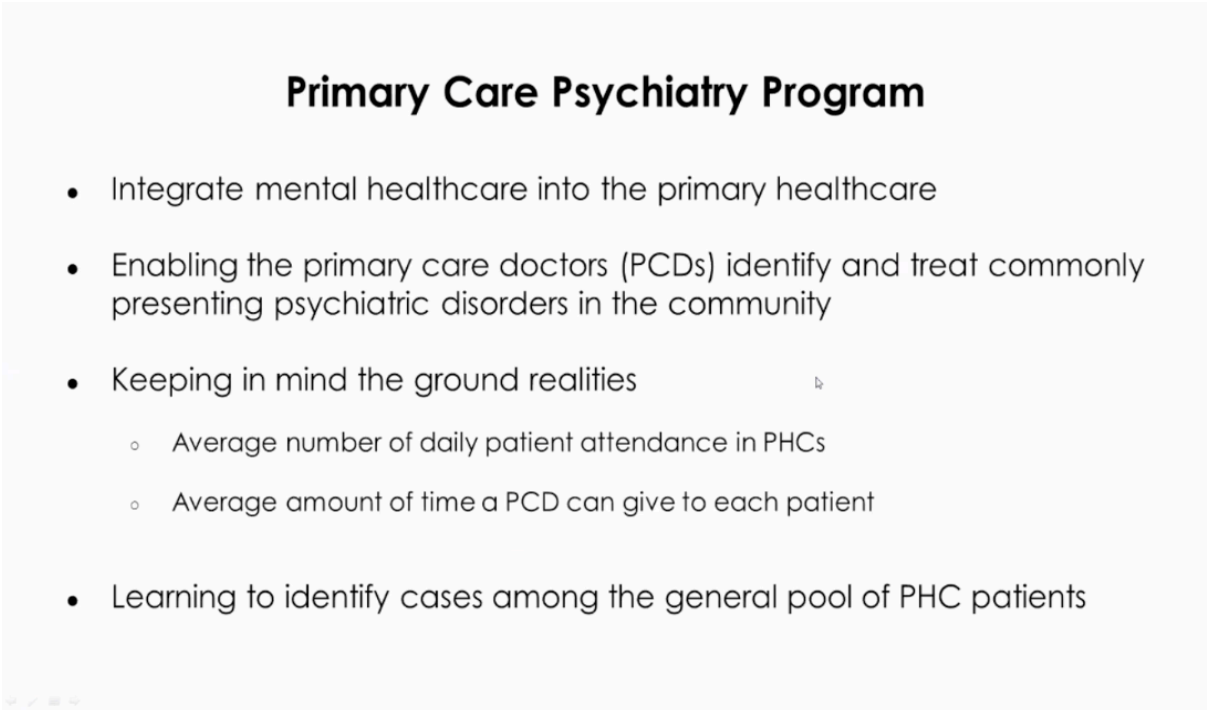
MBBS Doctors	634
Psychologists	270
Social Workers	120
Nurses	168

and in the past two years, more than 630 doctors 270 psychologists social workers 120 nurses have been accredited with diplomas in community mental health as regards Telemedicine centre arm of the NIMHANS digital Academy

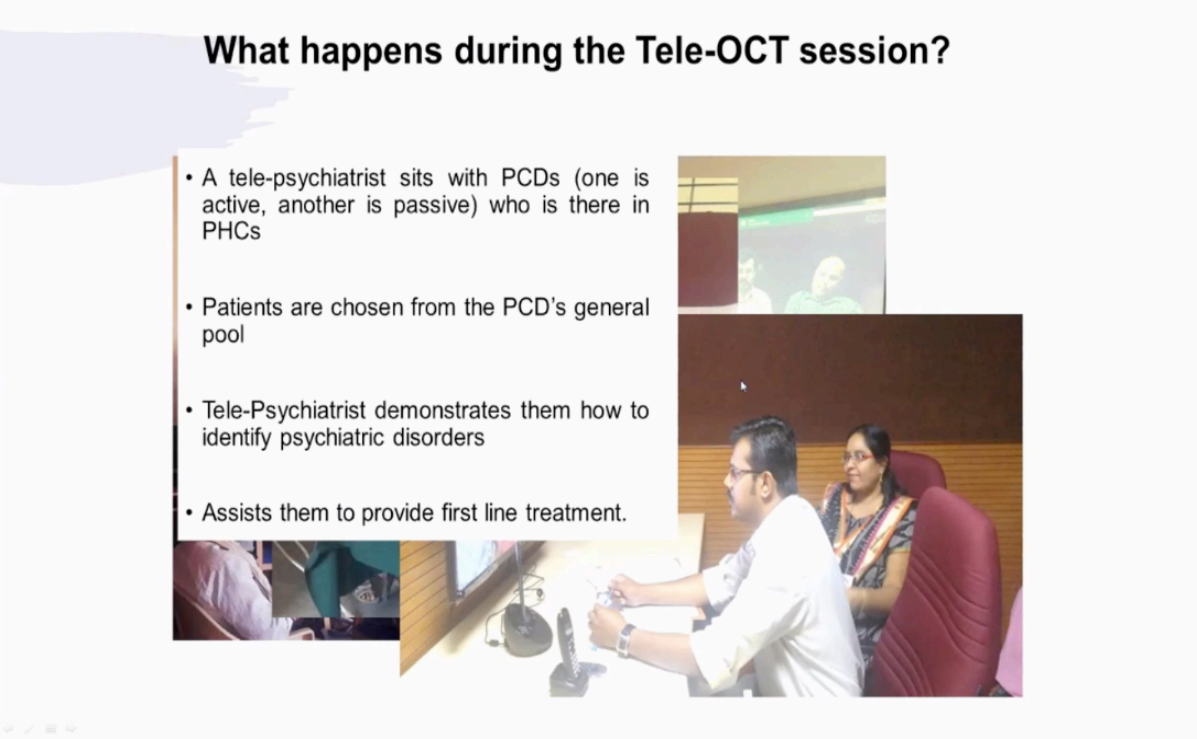


here you can see the coloured states it is we are actually engaging Karnataka, Chhattisgarh, Bihar as well as Uttarakhand and a couple of more states are on the online like Goa or Punjab may also you know, enter into this kind of program with NIMHANS

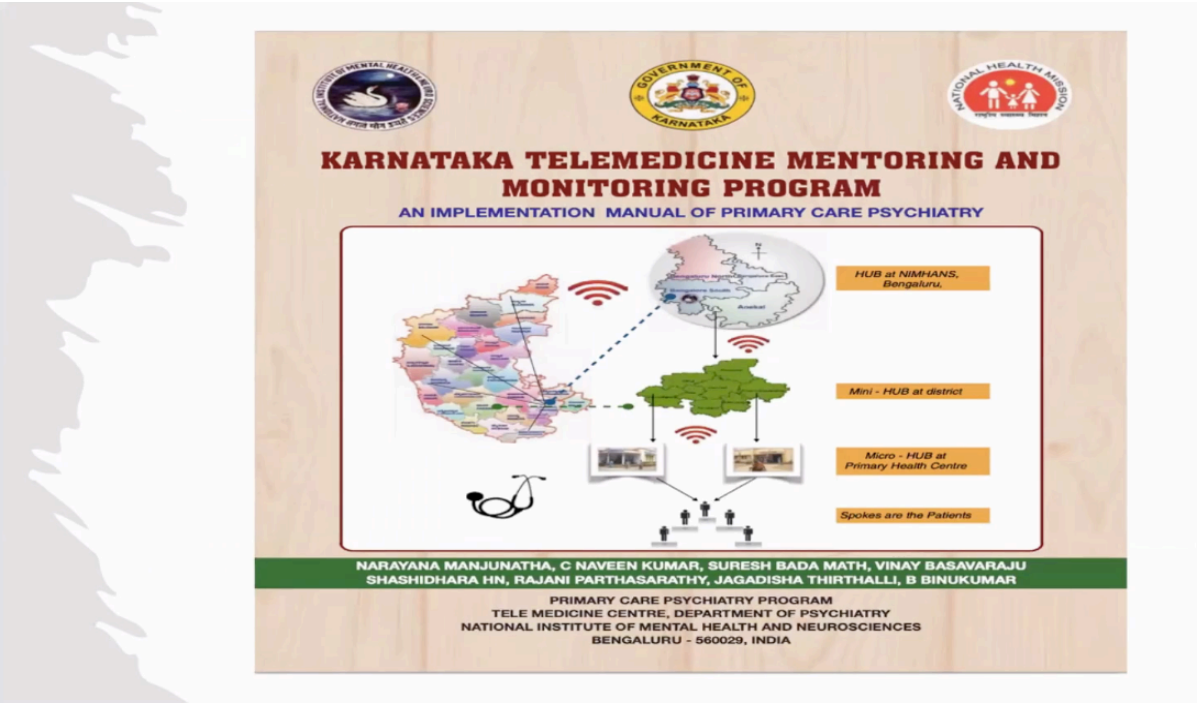




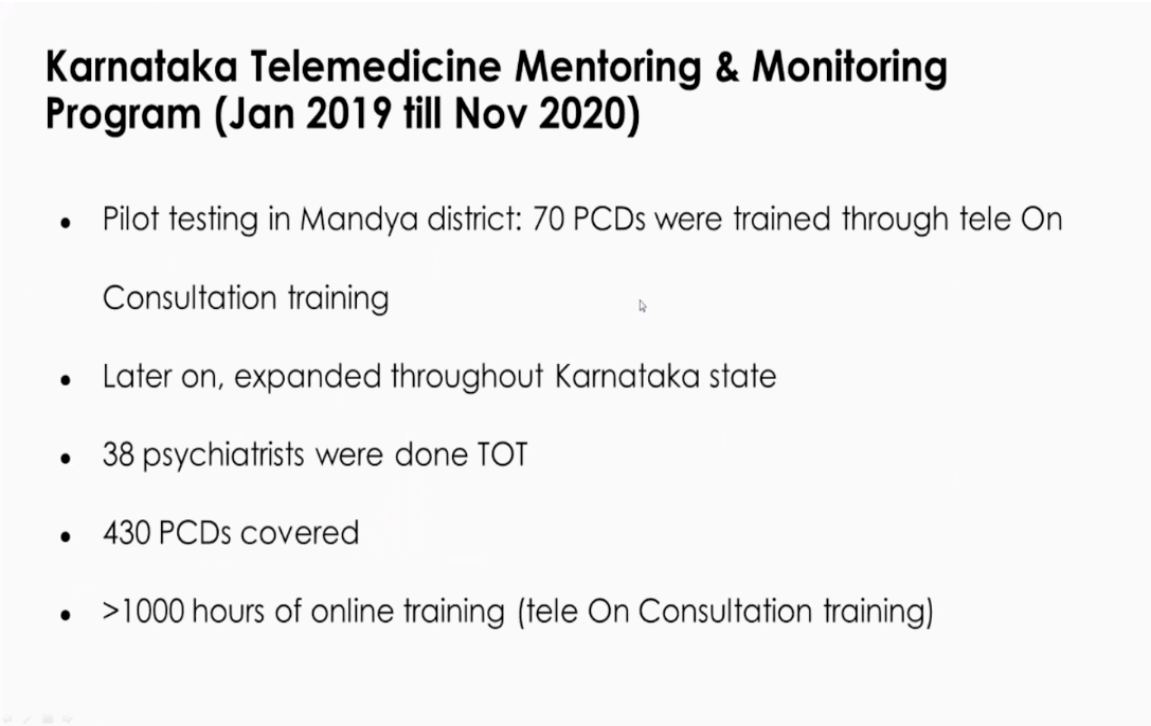
where we have termed the capacity building initiative as the primary care psychiatry program wherein we offer predominantly long term mentoring and which is predominantly synchronous. And we are also offering the Telemedicine centres offering two kinds of courses. One is a diploma in primary care psychiatry, which is a one year part time course. The other one is a Certificate course for rural medical assistance and AYUSH medical offices. The important part here is training during real time live consultations and collaborative video consultations. So, of course, I'll skip this slide. So what happens during that basically the crux of the primary care psychiatry programs are tele-consultation training,



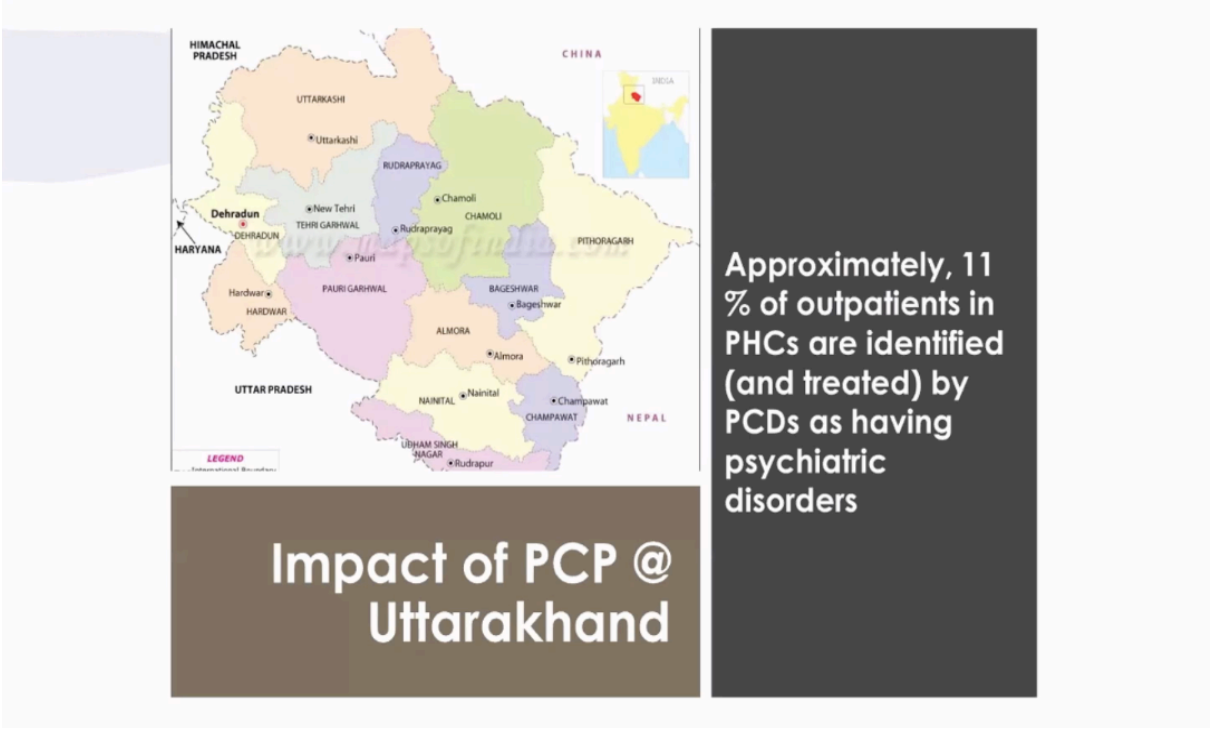
wherein the Telepsychiatry sits with the PCDs patients are chosen from the PHCs general pool and the psychiatrists demonstrates them how to identify psychiatric disorders, assist them in providing first line treatment. This is the module that we have developed which is a very simple trans-diagnostic module, which can be easily used by your primary care doctor.



Now, coming to the state specific initiative, this is the KTM program or the Karnataka Telemonitoring program,

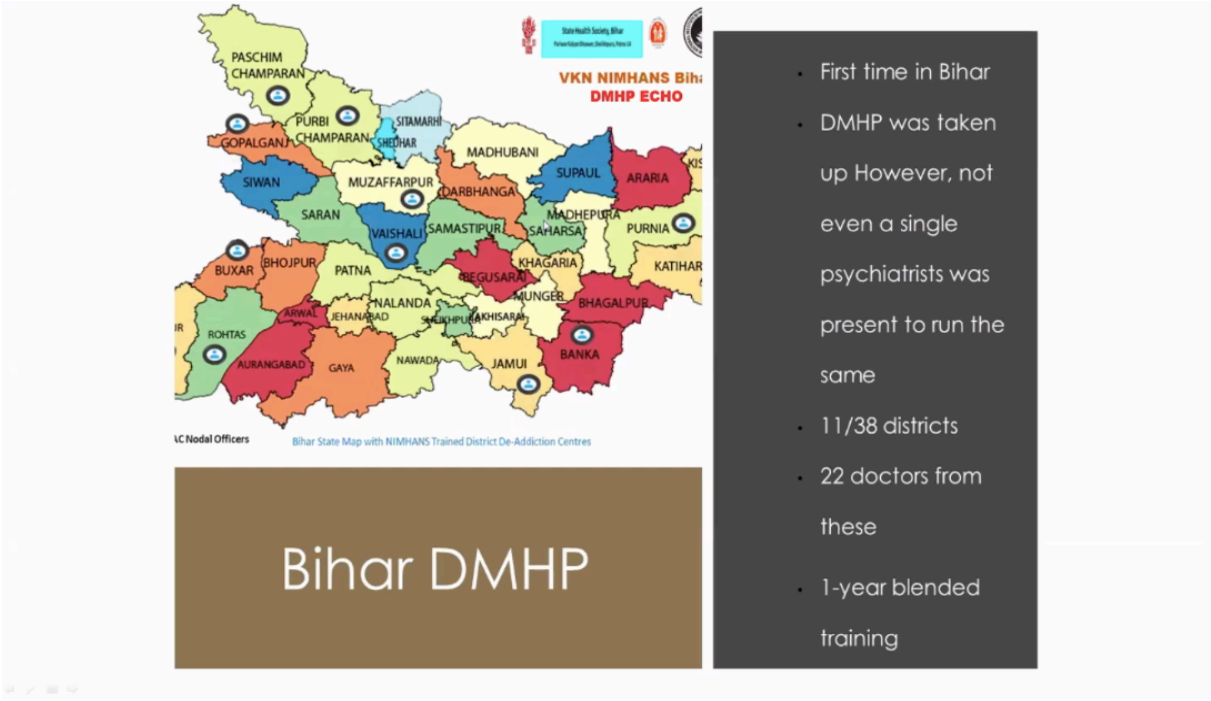


which we have started where in 38 psychiatrists throughout the state are trained as a trained you know, they are master trainers, we have trained them and they have covered more than 500 you know,



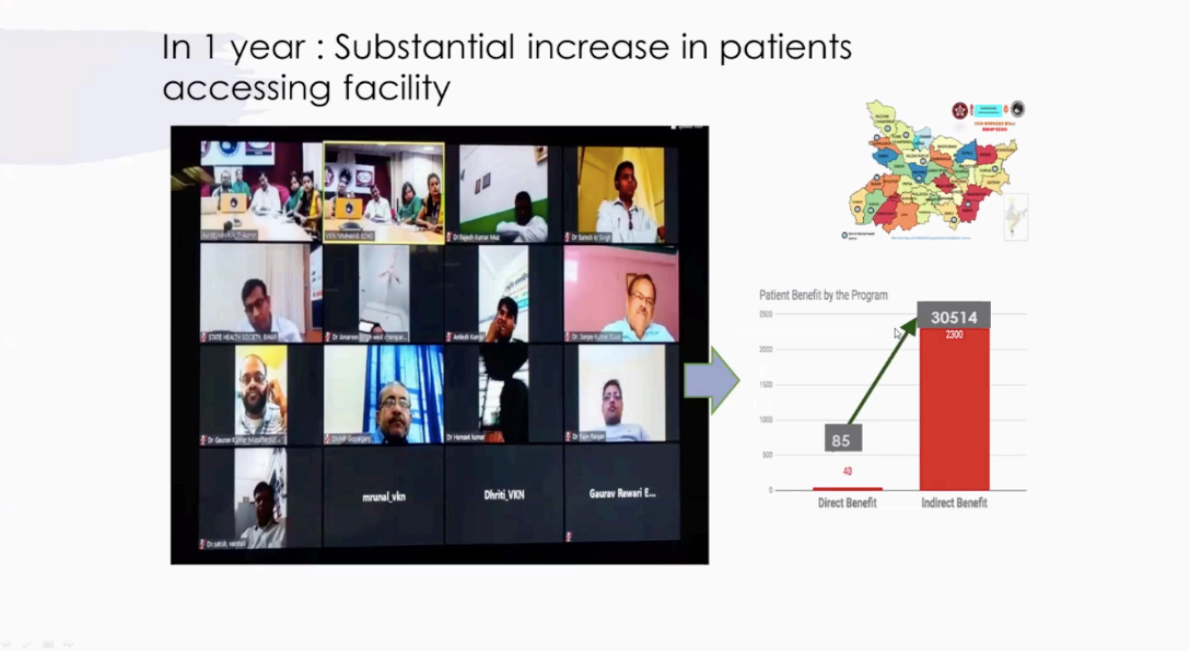
primary care doctors in the state of Uttarakhand two batches of you know, two batches of one year each that we have completed and the impact you can see, they have been able to identify 11% of their outpatient consultations as having some sort of psychiatric disorder disorders and have you know, been able to provide treatment. Not only this, we have entered an MOU entered into an MOU with the government of Uttarakhand as well as AIIMS Rishikesh in order to take this initiative forward.

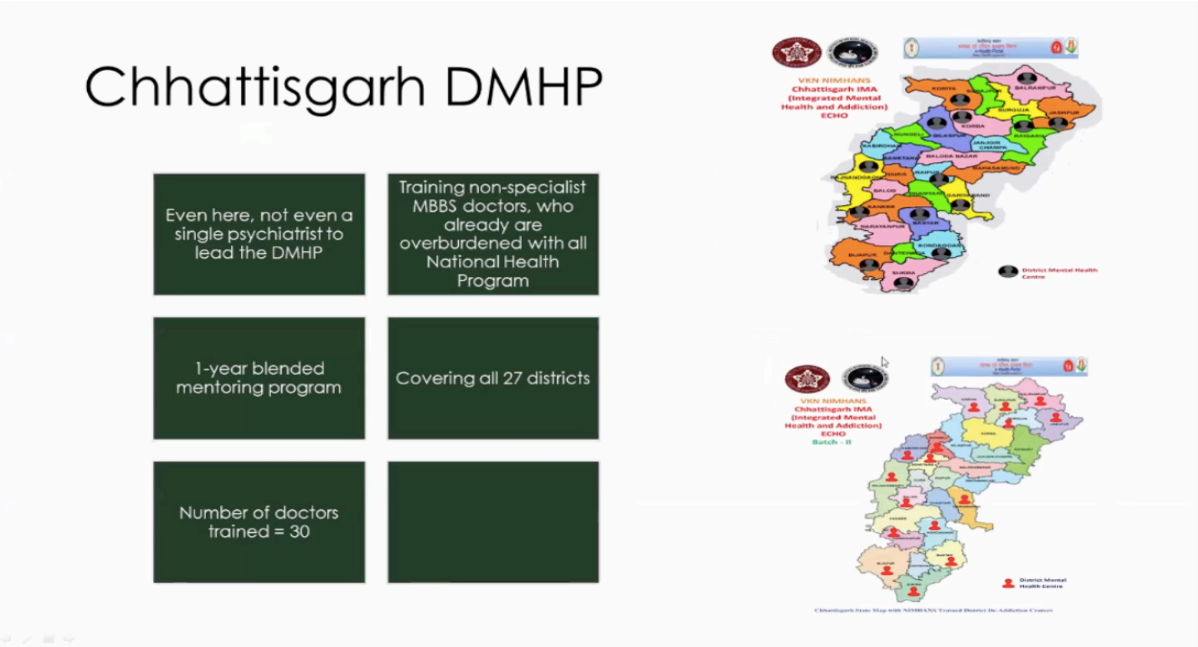
And I'm happy to share that from this year onwards about two days back, a third batch of training program has been initiated.



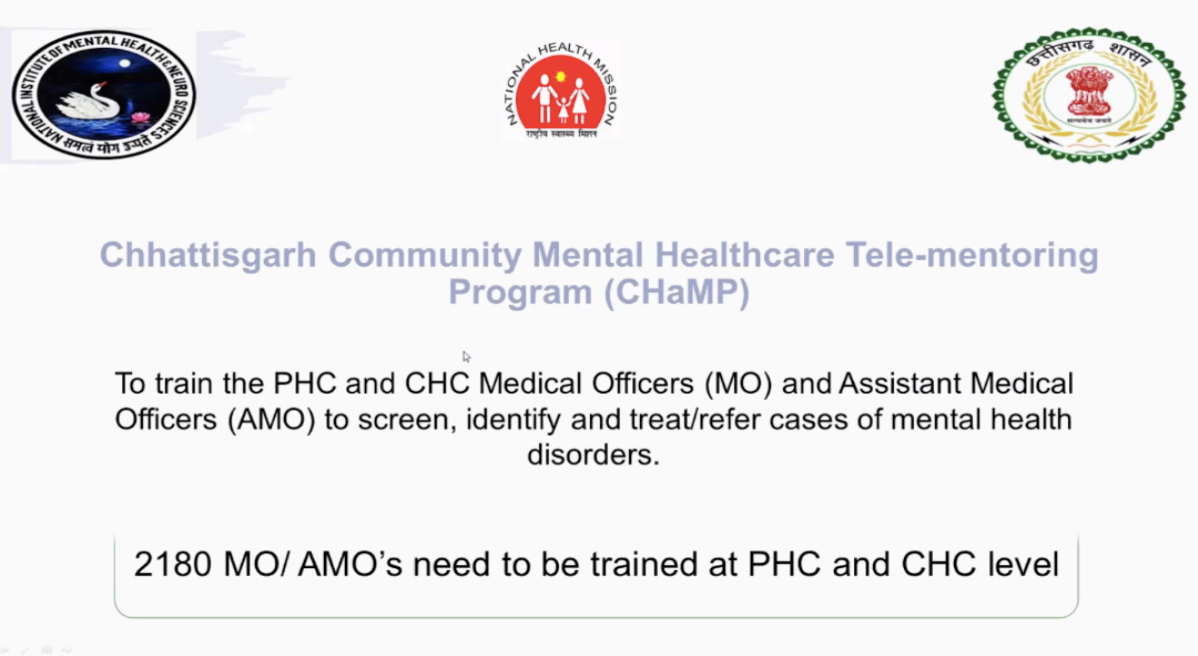
Same thing with Bihar, we have been working with the state of Bihar since the past three years 2017 two batches we have successfully trained and the third batch is running here you can see the after one year of you know program, their knowledge scores have increased as the number of patients also have increased phenomenally,

you know, after this kind of training with NIMHANS.





So the same kind of thing, which Chhattisgarh are actually we have trained district level doctors. This is a picture showing the district level doctors that have been trained 27 districts are there here as well. There are a significant increase in the pre post score and after completing the district level program.



We have been requested to cover even the primary health care you know, adopters and that is about to cover up to about 2000 medical offices and rural medical assistance.

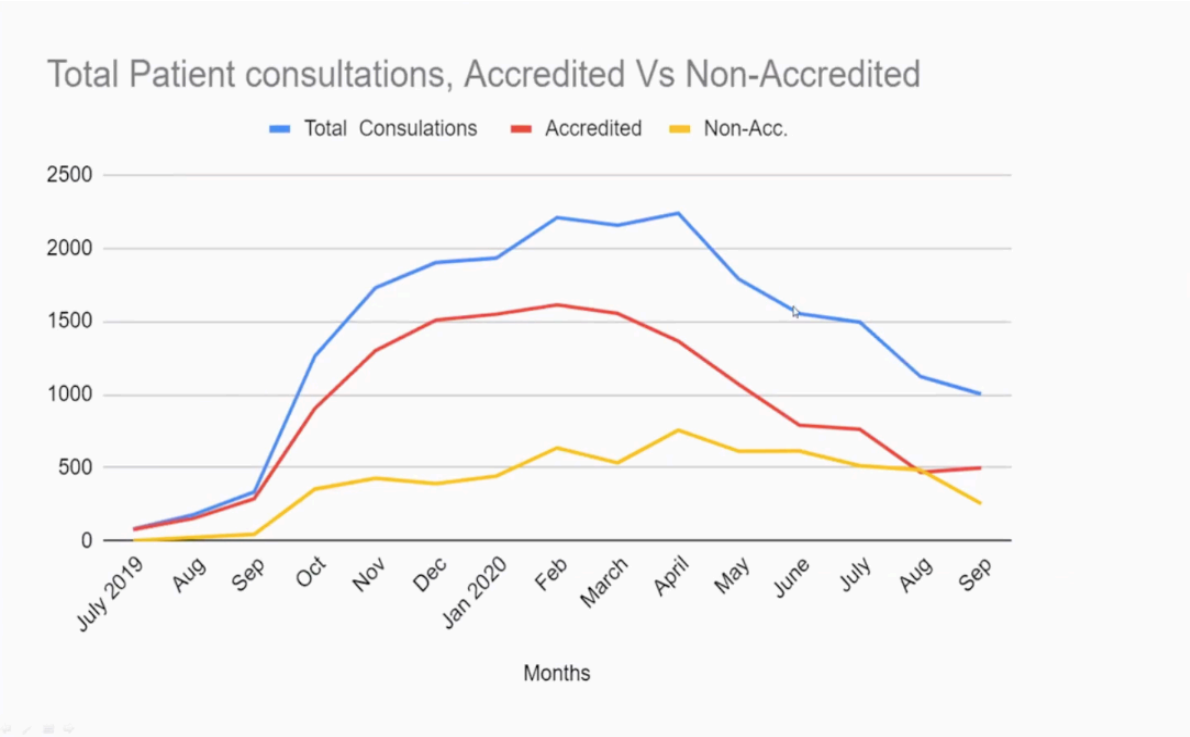
So, this program started in April 2019. And till now, we have trained you know,

Progress so far

- Total 16 out of 27 districts covered

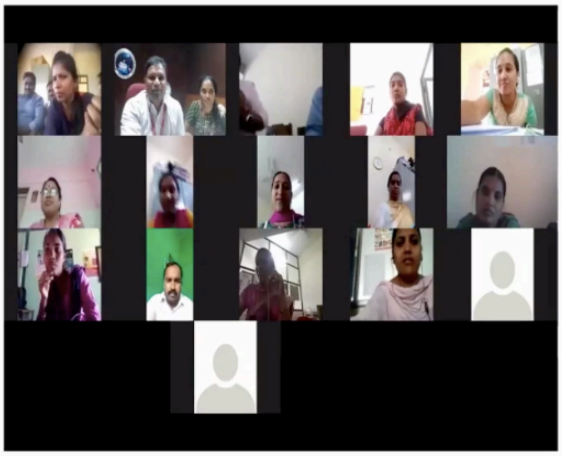
	Total	MBBS	AYUSH	RMA
Enrolled	905	278	42	585
Accredited	257 (28.4%)	48 (17.3%)	16 (38%)	193 (33%)

on 900 doctors, including MBBS, AYUSH medical officers as well as well as the rural medical assistance. And these are the graphs that can show that is showing how many patients they have catered to after the training.



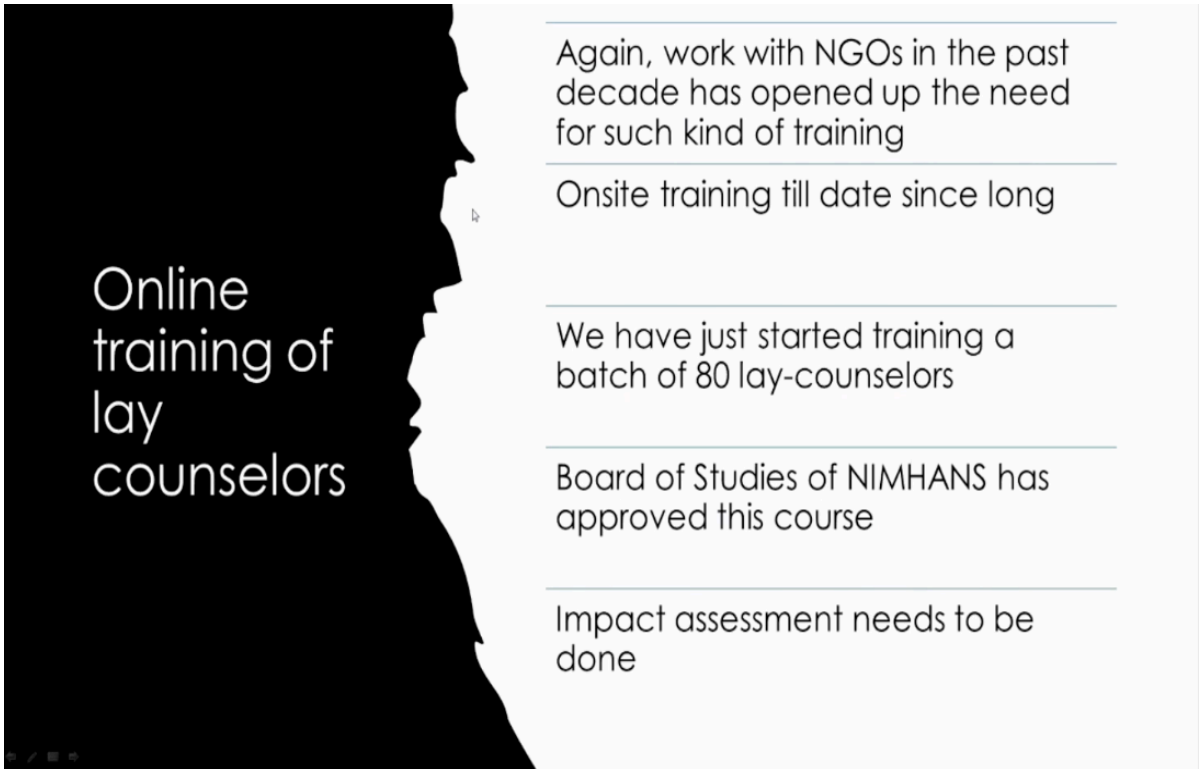
But of course, you can see the COVID pandemic has reduced the number of cases that have been seen and this is the variety of cases that they have seen in most of the common mental disorders as well as some severe mental disorders are covered.

Skill development Program for Social Workers, Psychologists and Nurses of DMHP Karnataka

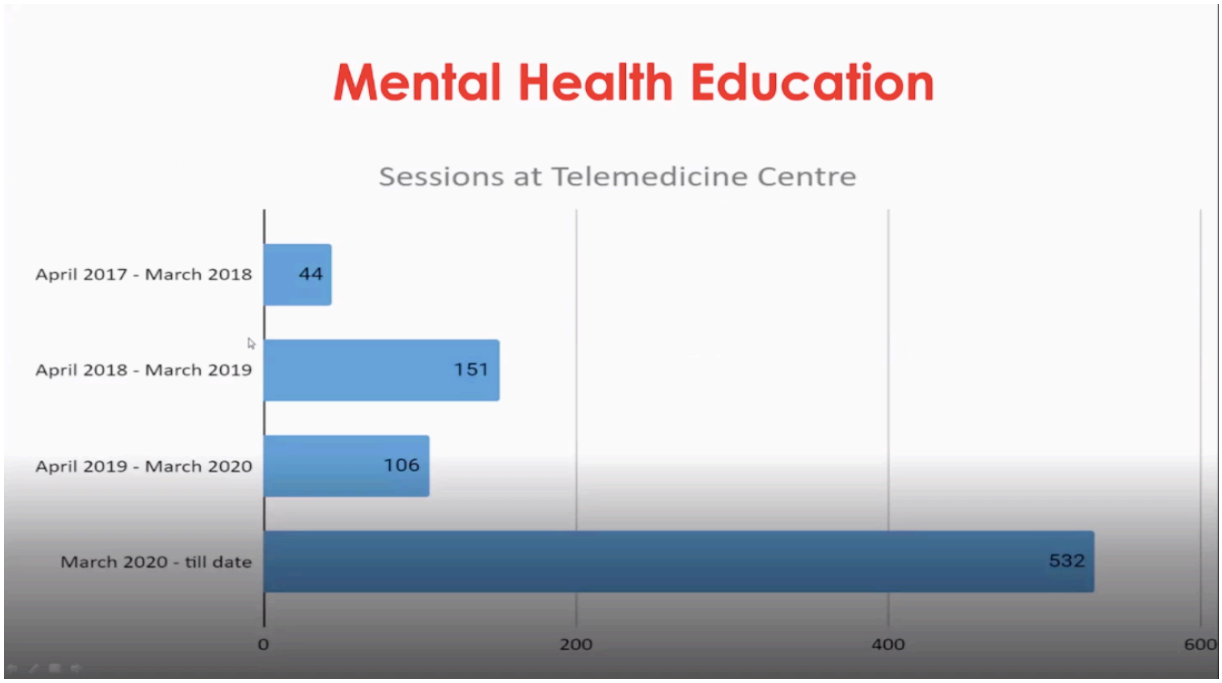


SL No.	Training Program	Number of sessions
1	Psychologists	50
2	Nursing	30
3	PSW	30
Total		110

Not only have this various skill development programs for the Karnataka districted mental health program of psychologists nursing and PSW.



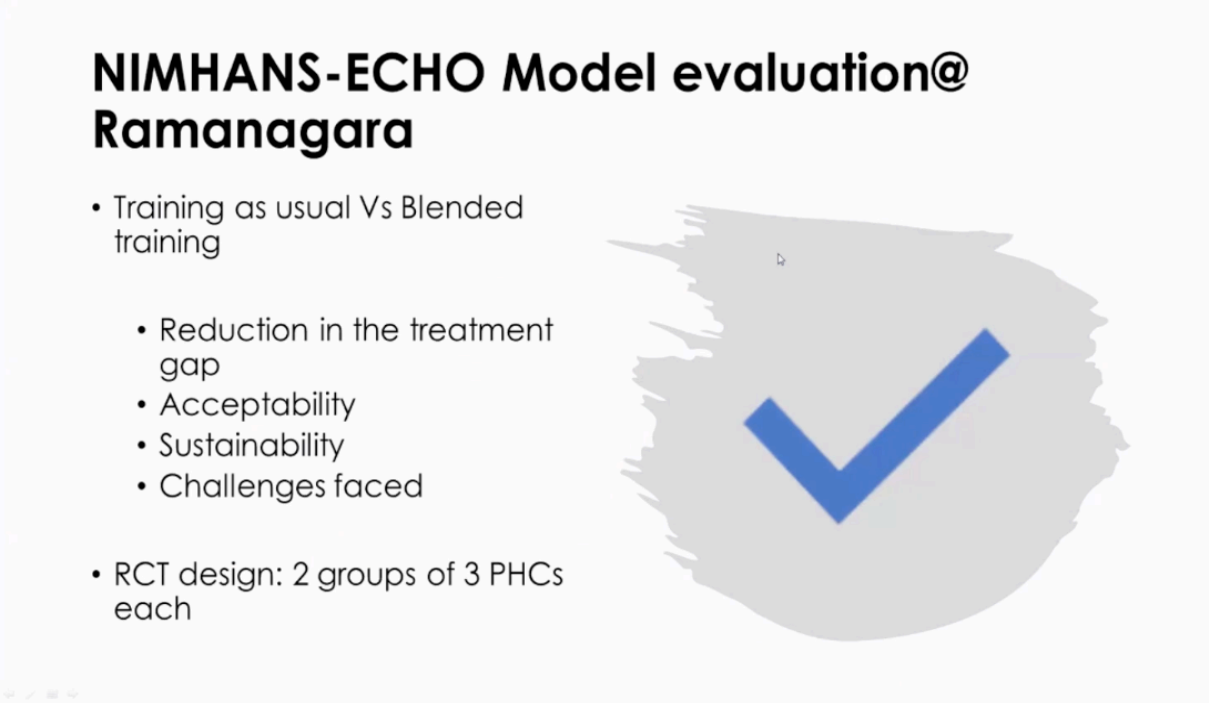
That is a psychiatry social workers and nurses we are doing not only this the online training of lay counsellors also, we have had experience of in person training over the past decade now we thought why not introduce it in online mode and the first batch has already started and it's on the verge of completion.



Very good response we are getting as regards mental health education, can see the number of webinars that Telemedicine Centre has done and it has increased exponentially as regards policymaking. At this one initiative. I'd like to mention that the

Karnataka mental health management system, which is an online system developed by NIMHANS in association with IIITP and government of Karnataka basically to administer the new Mental Health Care Act 2017. So that is one initiative and of course, we have worked to come up with guidelines, Telemedicine Telepsychiatry operational guidelines to enhance certainly nursing practice guidelines and their guidelines of tele psychiatric social work also has been we have been able to come up with and of course guidelines for tele psychotherapy yoga guidelines.

Also, we have been able to come up with I end, I will take a couple of a couple more minutes and couple more slides. Talking about the research activity.



This is an RCT designed to groups of three PSCs.

Each ICMR is funding this particular research to see what happens with online training versus you know, training as usual. We've been able to come up with a couple of publications,

including the methodology of it. And there are certain problems also, you know, by embracing technology at the grassroot level,

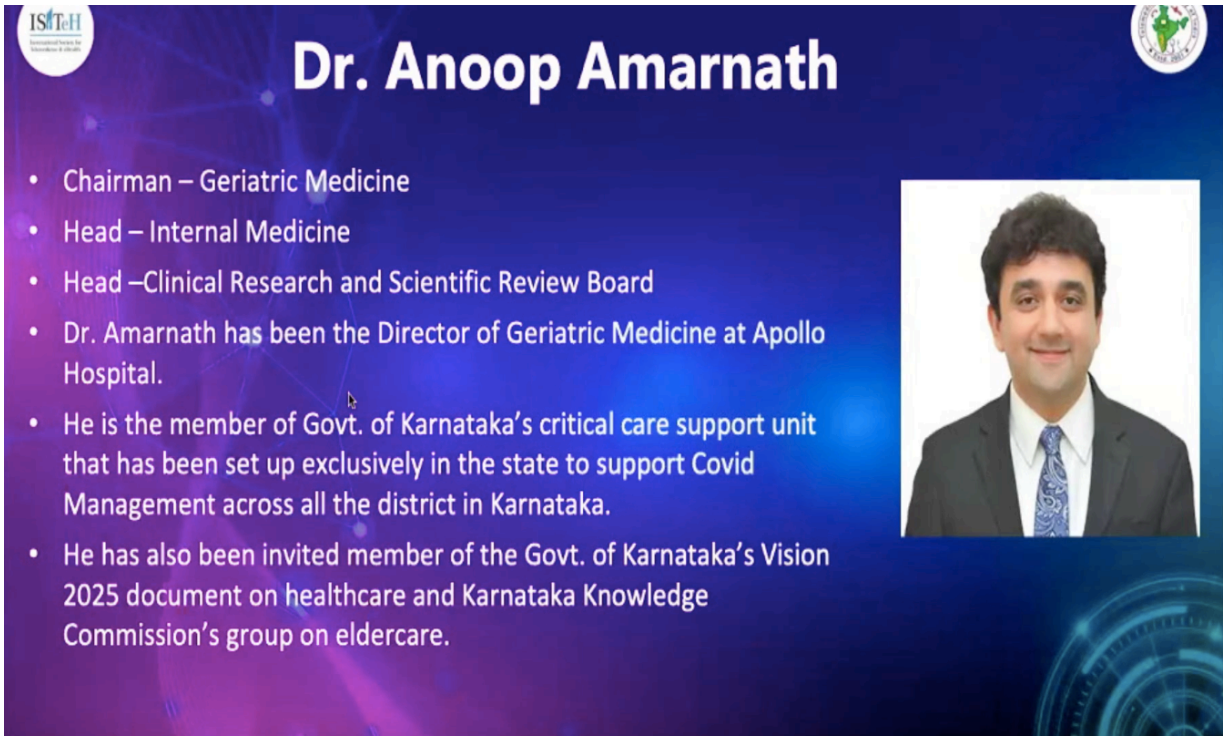
we have been able to come up with some paper on that. And of course, the quality of identification, utility of the grassroot level workers in identifying psychiatric disorders. And, of course, a couple of papers on impact evaluation, you know, designing and implementing our

primary care psychiatry program. And of course, what can happen with collaborative consultations, not only psychiatry,

the Telemedicine Centre also has been collaborating with other departments like neuro rehab, neurology, you know, in the NIMHANS in order to take forward this services. So I think these are some of and of course, this is Telepsychiatry after care clinic that I mentioned. So these are some of the publications also that we have mentioned.

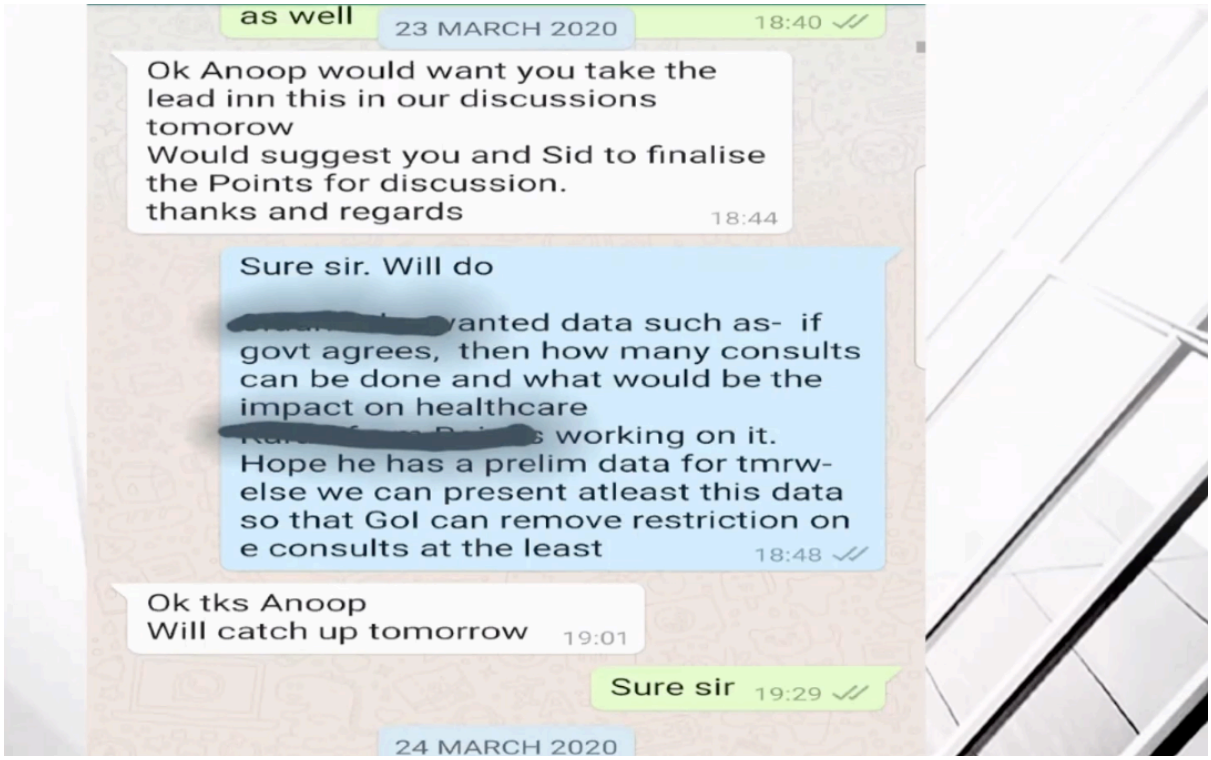
I'd like to end by acknowledging a host of, you know, institutions and people who are responsible into NIMHANS administration, the Department of Psychiatry, other departments, and governments of various state states, as well as NGOs. Thank you very much for having given this opportunity, and like I'd like to take up any questions if they are there. Thank you.

Day 1	Topic	Speaker
• **18th December 2020 (Friday)**	• Telemedicine **During Covid 19 - The Karnataka Experience,**	• **Dr. Anoop Amarnath**

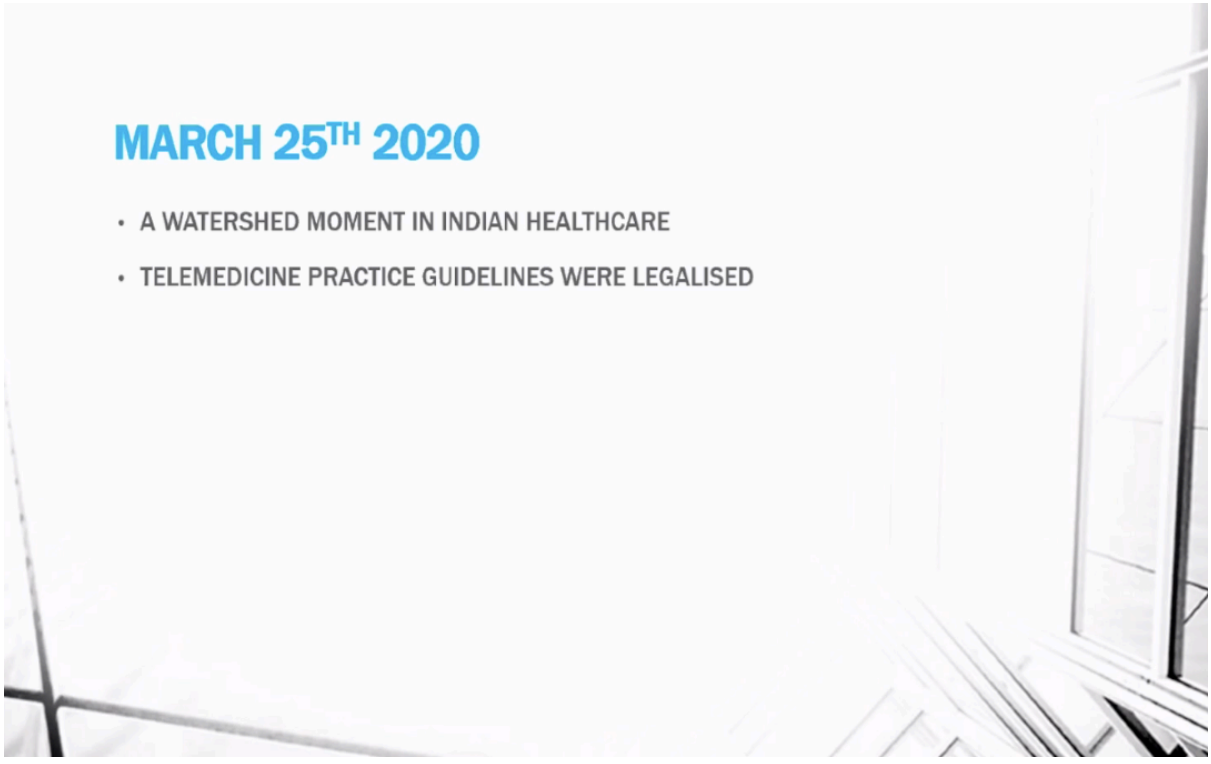


Thanks to the Telemedicine Society of India, Dr. Shroff, especially for having me here. So the topic was the clinical experience. And, you know, I'll give you a brief about the preamble, the build up to the Telemedicine guidelines, and the technology pandemic is what I would call it and then we'll look at where do we go from here. Now, it's a very interesting story about how the build-up happened in the morning, we had Dr. Ashwini Goel talking about the Telemedicine guidelines, which came up in March. And, of course, a lot of people were involved in setting up these guidelines and a brief about you know, It wouldn't be an exaggeration to say that March 25 is a watershed moment in digital health in India, and how the build-up happened to that and how the Karnataka experience happened thereafter is a very interesting story. So I'll stick to my 10 to 12 minutes divided into two parts the build up and then what we did in Karnataka thereafter.

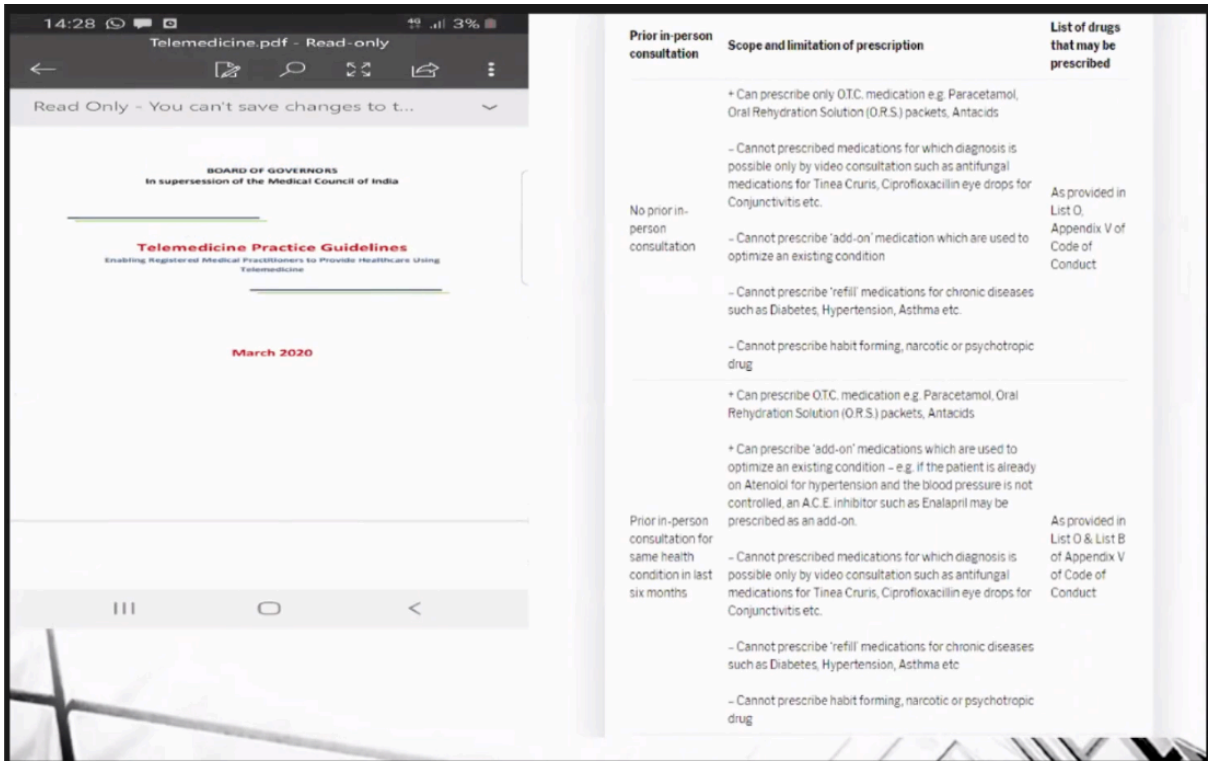
So prior to 25th Of March 2020, Telemedicine was not legal, we couldn't prescribe as clinicians, we couldn't prescribe anything over phones, emails, or any other type of medicine platform. So what changed thereafter. So this is a brief WhatsApp note, which I had circulated internally.



This was on the 23rd of March with you to meet the government and over the next day. And as we were discussing you know, the COVID pandemic was already there. 22nd was the lockdown and the jump cut curfew, and thereafter the lockdown happened after that. And, you know, as expected, everything was hit, healthcare services were hit. And we had a discussion with the NITI Aayog the next day. And then this was a message which I had sent to my colleague saying that I hope a prelim data is there so that the Government of India can remove restrictions, and at least allow E-consult. So this happened on the 23rd of March. And you know, a lot of teams, we were part of , which is Healthcare Federation of India, we have the Telemedicine Society, we had FICCI, CII all of them leading up to the government the next day. So it's a very preciout WhatsApp message, I have still stored that. Because this would, in due course change the entire way healthcare, especially digital health care would be handled in India thereafter. So what happened on the 24th was the discussion with NITI Aayog, and a lot of people as I said, See FICCI, CII, TSI, we all met together. And of course, it was a digital meeting and a local man from NITI Aayog was there. And we have to emphasize the fact that Telemedicine has to be legalized and guidelines have to come out saying that, you know, as clinicians its the only way we could reach out to the masses in a large scale, technology was the means. And then we wanted to emphasize that this had to be legalized, and the guidelines have to come. And, you know, as

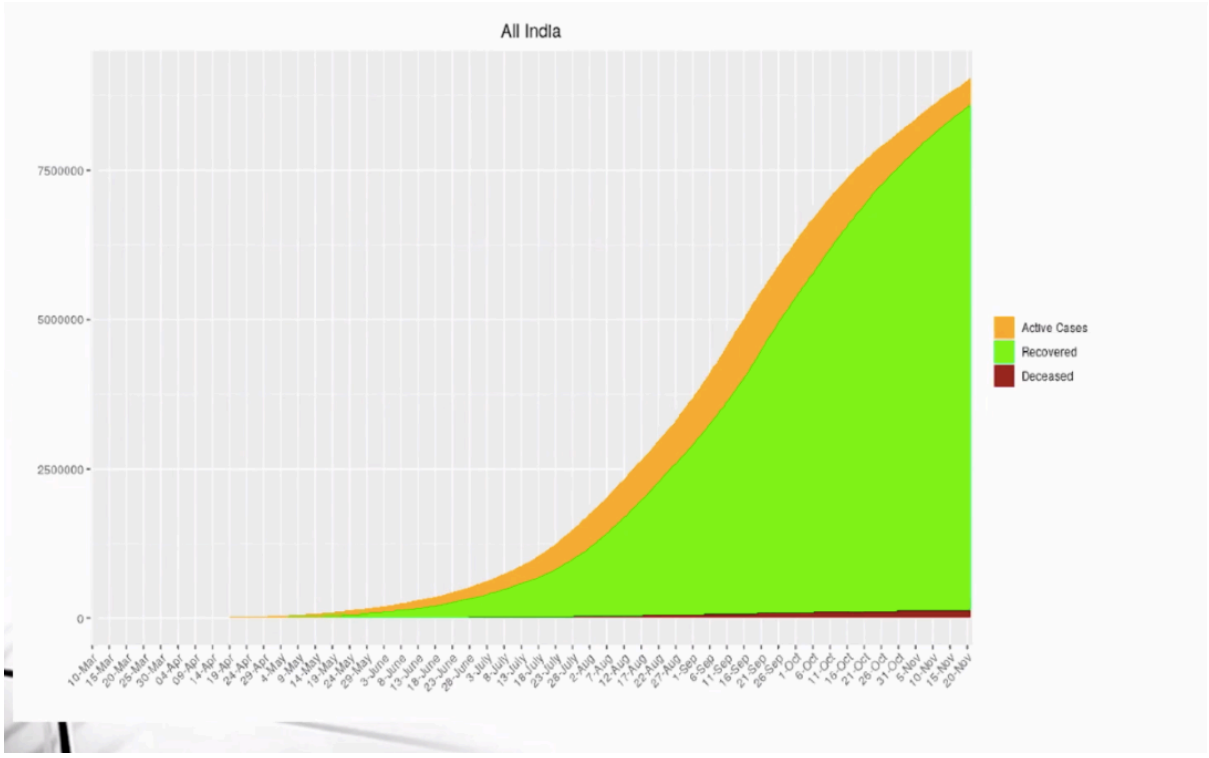


I said earlier 25th of March is indeed a watershed moment because the speed at which the government moves after the 23rd and 24th meeting was that by 25th, the Telemedicine practice guidelines were legalized, and that this kind of actually opened up the floodgates for Tele consults and which was the need of the hour, especially with the Covid 19 pandemic. So the reason I call it as a technology pandemic was that exactly was the date when it opened up and made us clinicians feel comfortable within, you know, consulting patients over any technology platform. So in the watershed moment, and thanks to a lot of stakeholders, the bulk of the work was done by the Telemedicine Society of India, and I think it was serendipity everything came together. And then digital health took off in a big way from March 25th.

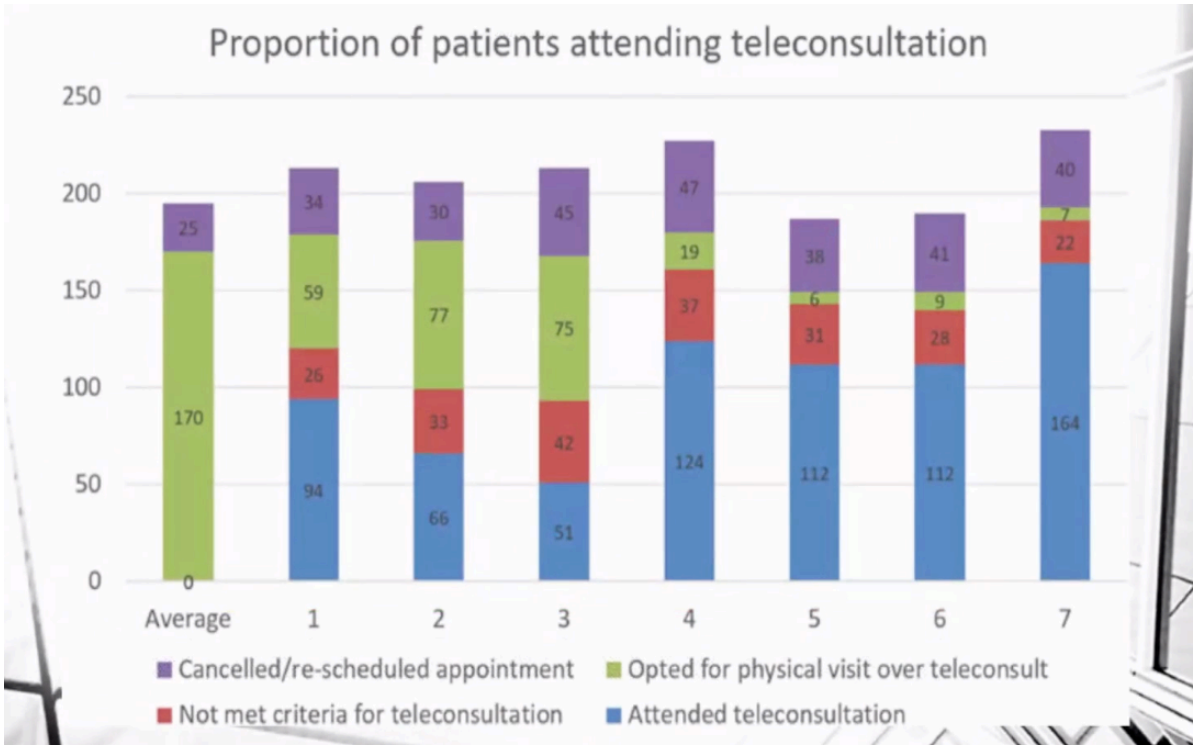


So this was what was published Telemedicine practice guidelines superseding the MCI Board of Governors. And what happened next was even more interesting, you know, with the covid 19 pandemic.

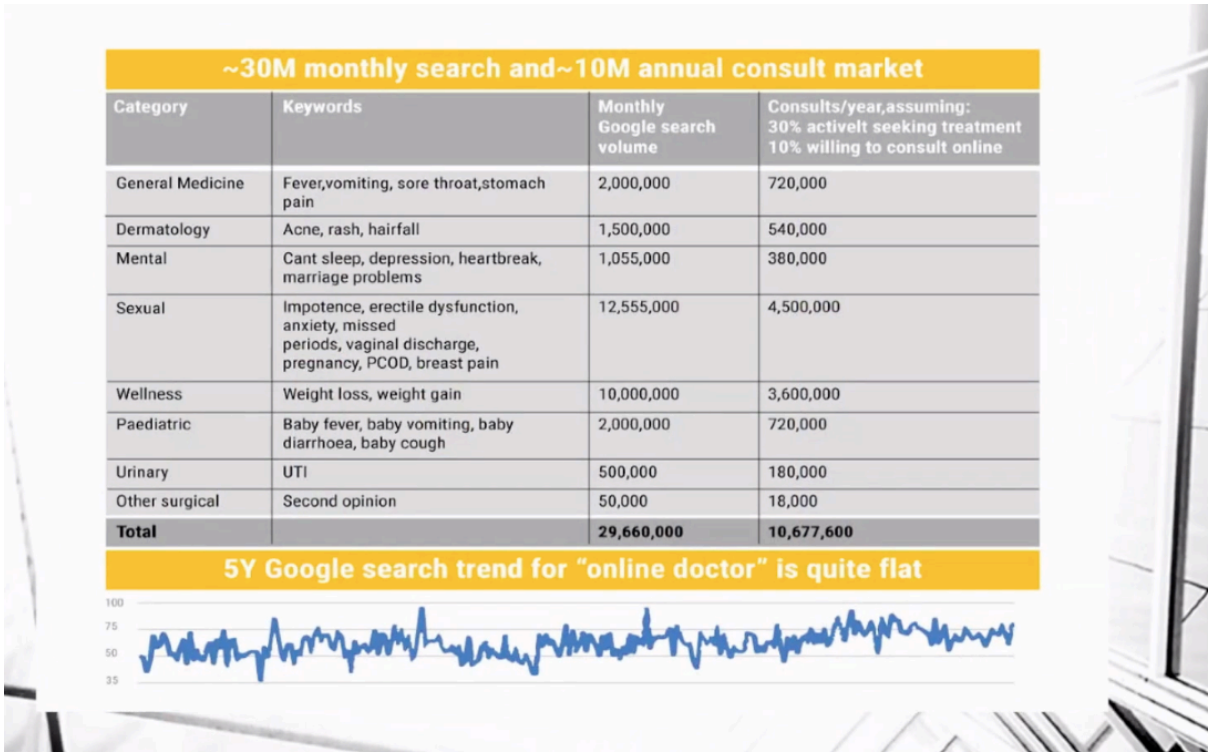
I think now it is for me to put this slide up is stating the obvious about healthcare workers being able to access patients and patients being able to access health care workers and a huge improvement in the uptake of Telemedicine platforms. thereafter. So this is this is one of the, you know, this was the pick of pandemic, if you see March 25, it couldn't have come at a better time the Telemedicine guidelines. And as you can see, this is the COVID curve.



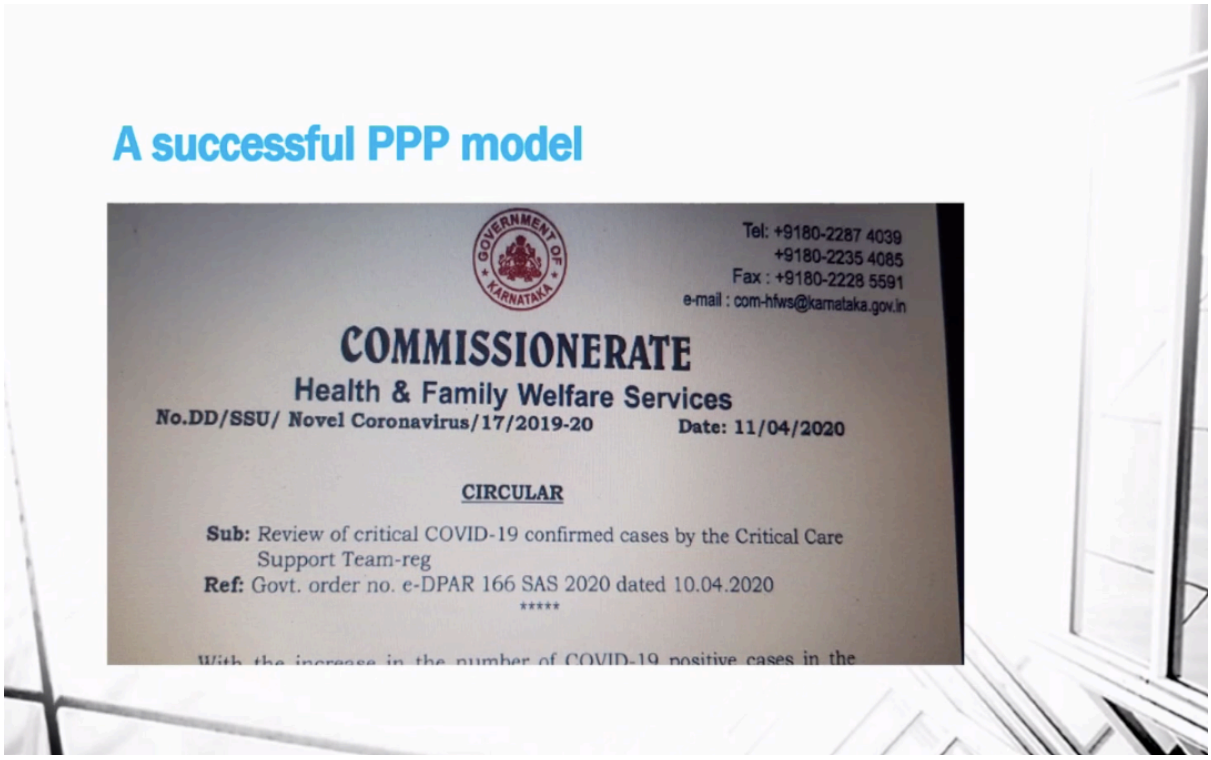
And then what happened there was a bulk of these patients now you know that along with the RPC Apps, and a lot of private apps, which came up, a lot of people could access health care. So bottom line, I think that discussion on 24 was a watershed moment. And I think this is something which is not just COVID related, but this is the future of medicine, and it is here to stay, and thanks to all stakeholders who made it possible.



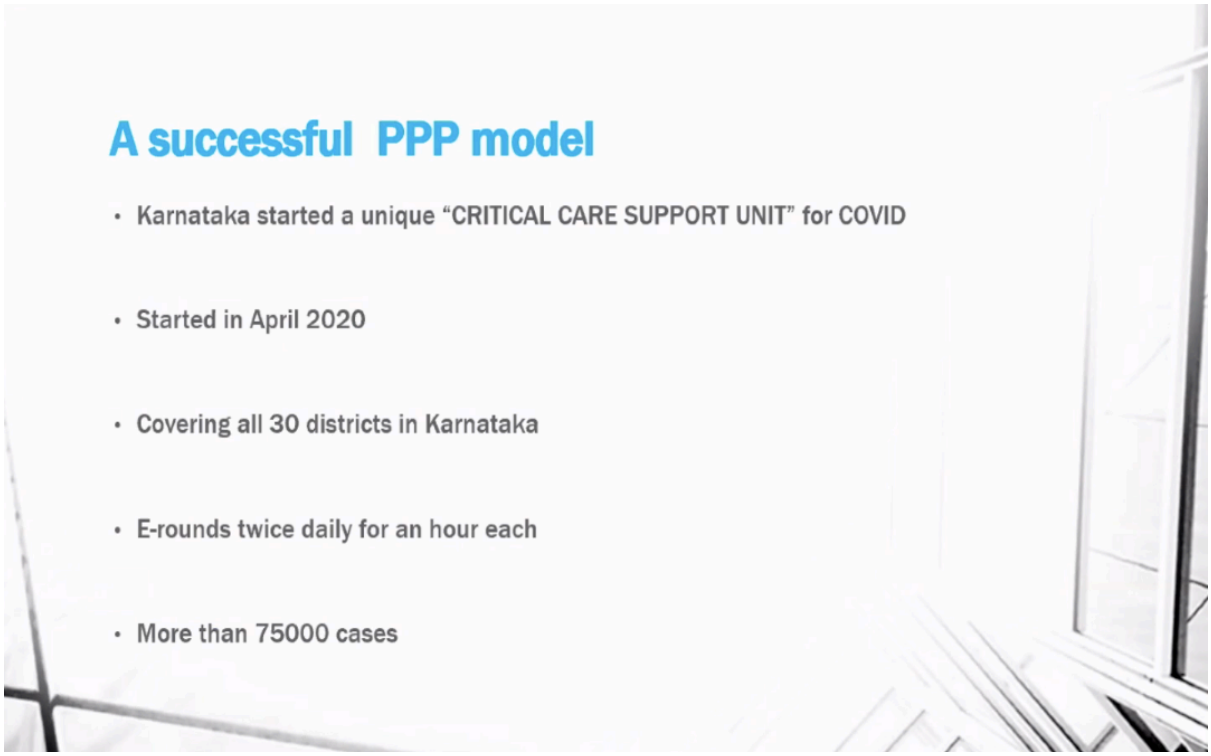
Now, this is some of the data which has been published and in terms of the number of people opting for Tele Consults clear this is one centre in one state with one specialty of Rheumatology. Clearly you can see the number of Tele Consults increasing. And this is not just COVID related, this is non COVID related specialties. And if you can imagine that non COVID related specialties having an increase in the Tele Consults, with one centre publishing the data in one state across the country, it's a clear indication that this is a way to stay. And it is not a flash in the pan.



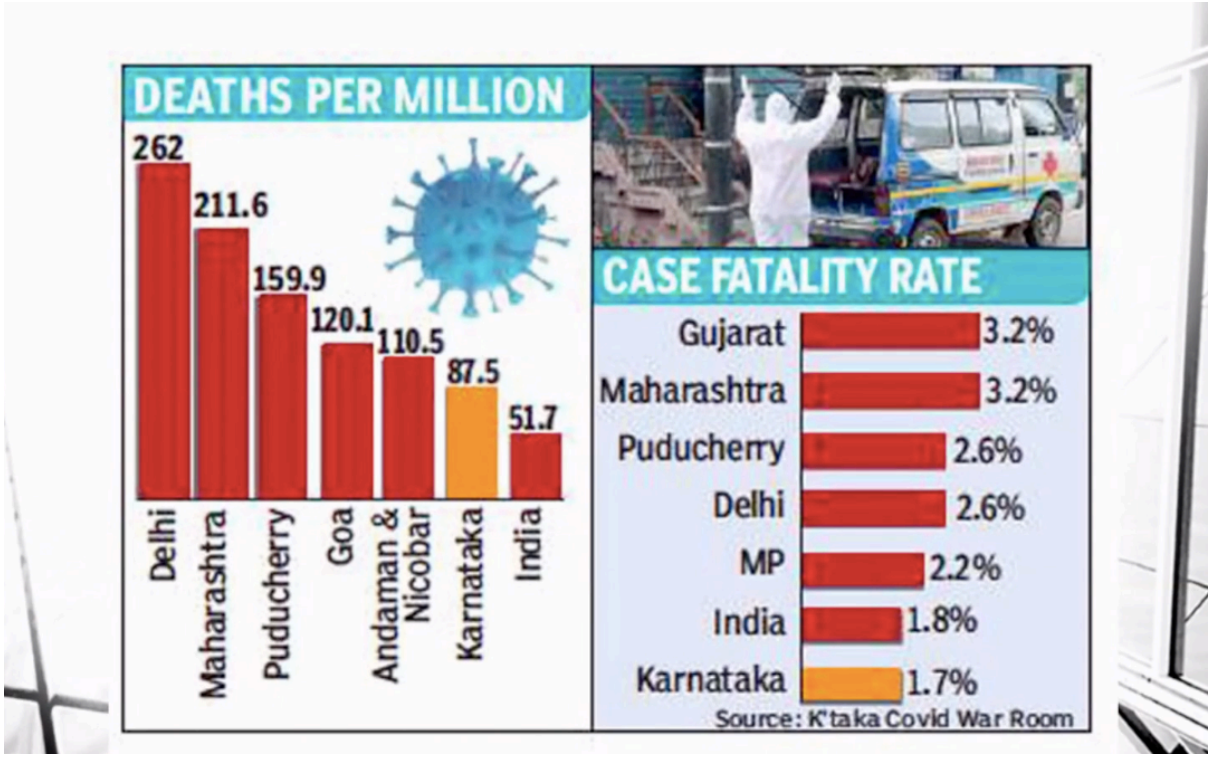
And this is what is going to go in the future. It's about a 10 million annual consult market medicine is one of the specialties which has been seen a big uptick, dermatology, we just thought about Psychiatry, actually, I'm sure all specialties are something which would definitely benefit from this entire opening up. As I say, if 1991 was opening up the economic market, I think March 25 2020 was the opening up of the digital healthcare market. I think there is definitely a kind of analogy in terms of these two days.



So next coming on to the Karnataka model. I will talk very quickly about that. As soon as these guidelines were opened up, the 11th of April, the government of Karnataka reached out to us because we were seeing a lot of mortality in COVID-19. And then the government of Karnataka wanted to set up a critical care Support Unit. And this was you know, we started off with a Crack Team of about six, seven doctors. And then we managed to put together this team of critical care geriatric medicine pulmonology. And the idea was to cover each and every district of Karnataka. And what we did was to select those COVID hospitals which were admitted COVID patient because if you remember the outset, you had only a few hospitals, which were accepting COVID patients. And then we identified those hospitals across each district in Karnataka, there was a district surveillance officer District Health office and the district surgeon, and we created this team, which would meet on a twice daily basis, once in the morning and once in the evening, identify those critical care patients, especially those admitted in ICU, and we brought up certain standard operating guidelines in terms of diagnosis, treatment follow up. And this was started off in April. And this was a mandate which the government of Karnataka needs to set up the critical care support unit.



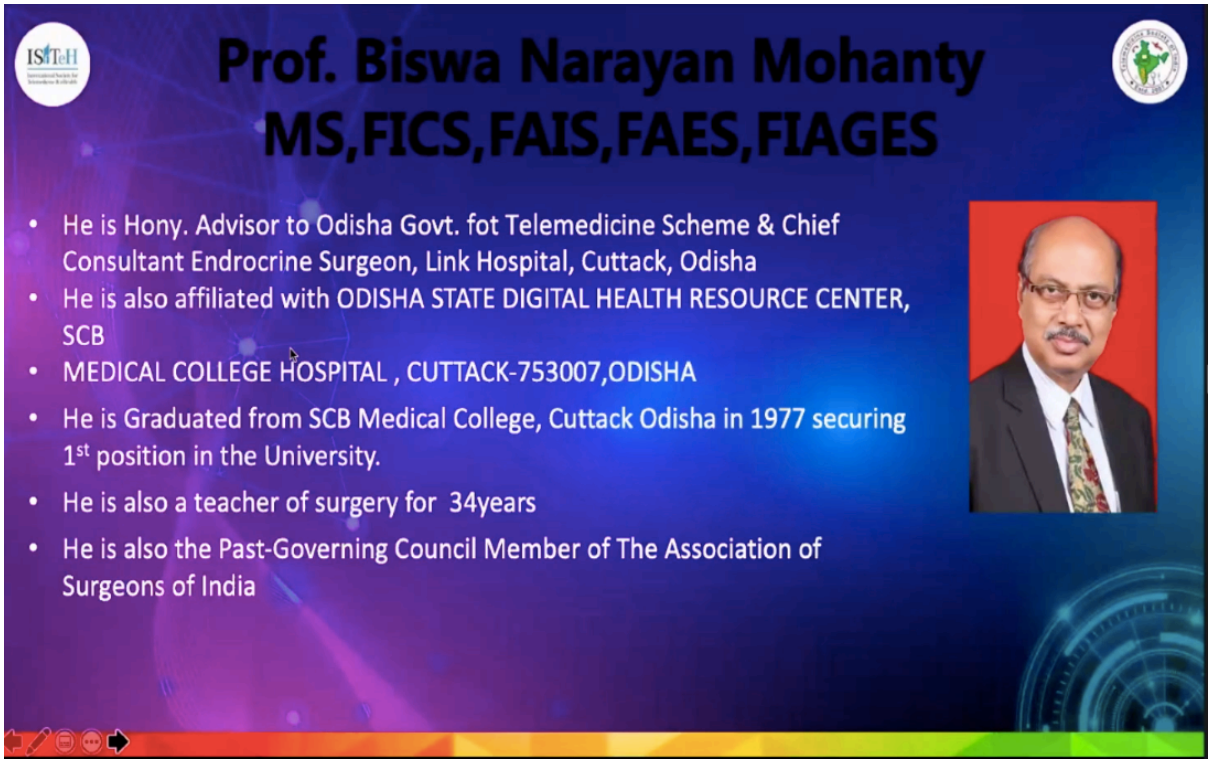
So it's a successful public private partnership model. The critical care support unit we started off in April covering all the 30 districts in Karnataka. And we started off with E-Rounds twice daily for an hour. And once in the morning, once in the evening, and we used to support rather not used to in the past, and we still support all the district hospitals. And we created a standard template in terms of how they would present the cases. This is like a peer reviewed rounds on twice daily basis. So the doctors there would present the cases. On the clear template of background was there a specific COVID markers where you know, there was four specific inflammatory markers, which we wanted to look at IL6, D-dimer, Ferritin and MDX. So each district would provide this data it was which patient? How many of them in ICU? How many had the specific treatments like Remdeisivir and (???). So basically standardizing treatment and giving them access to tertiary care as sitting in Bangalore and monitoring this entire thing. So we've covered more than about one and a half lakh cases. This is a slightly older number of 75,000.



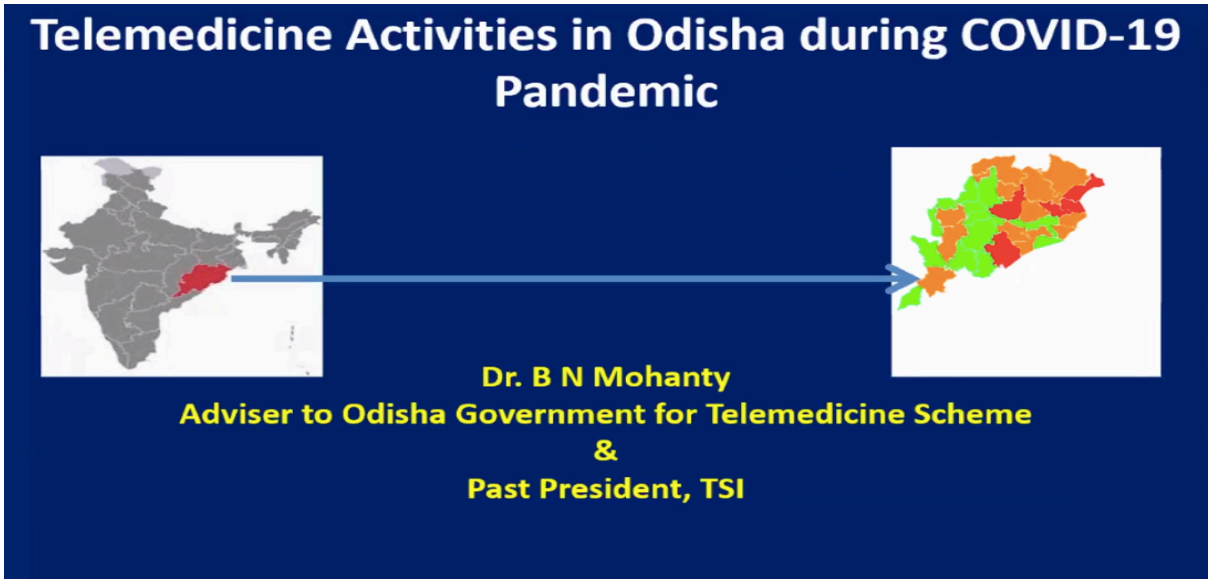
But this is a take home slide to know what was the effect of these earrings, I wouldn't take an entire credit for the critical care Support Unit. But just look at the mortality numbers, the case fatality rate, and this is the data coming from Karnataka governance model which was set up in Bangalore, the case fatality rates interrupt we've managed to keep the Less than 1.7%. And this is slightly old data, the latest data shows that it's less than 1.5%. And if you can see the average across India, you can identify, you know why what we are doing is quite significant. As I said, we wouldn't the critical care Support Unit wouldn't take the entire credit, a lot of factors have been involved the type of testing that has been done, the intensity of testing, putting up standard treatment guidelines, but the idea was each centre, you know, whether you go to any district remote district in Karnataka or whether you're in Bangalore, you would receive a standard set of treatment and management protocols are standardized. And then we sitting in Bangalore are able to monitor this entire thing across all the districts.

And so I think that's a very good example of a public private partnership. And in terms of where we go from here, as I said, it has opened the floodgates for digital health and digital medicine, Telemedicine is here to stay at the risk of sounding repetitive, I would say that this is not a flash in the pan, this is a paradigm shift in the way Healthcare delivery is going to happen. And then, you know, the bottom line is we have to embrace technology. Otherwise, you know, we would remain as dinosaurs. And I always say that healthcare is the holy grail of technology, you know, we as doctors, you know, we are very averse to technology. And the only technology we use is a pen and paper. But then I think that this is this is the right moment for us to address the fact that you know, technology, there are only going to be two sets of doctors as people say doctors who use technology and doctors who don't use technology, and it's very obvious that we're going to survive. So thanks very much. I think I'm on time and thanks once again to TSI for hosting me specifically.

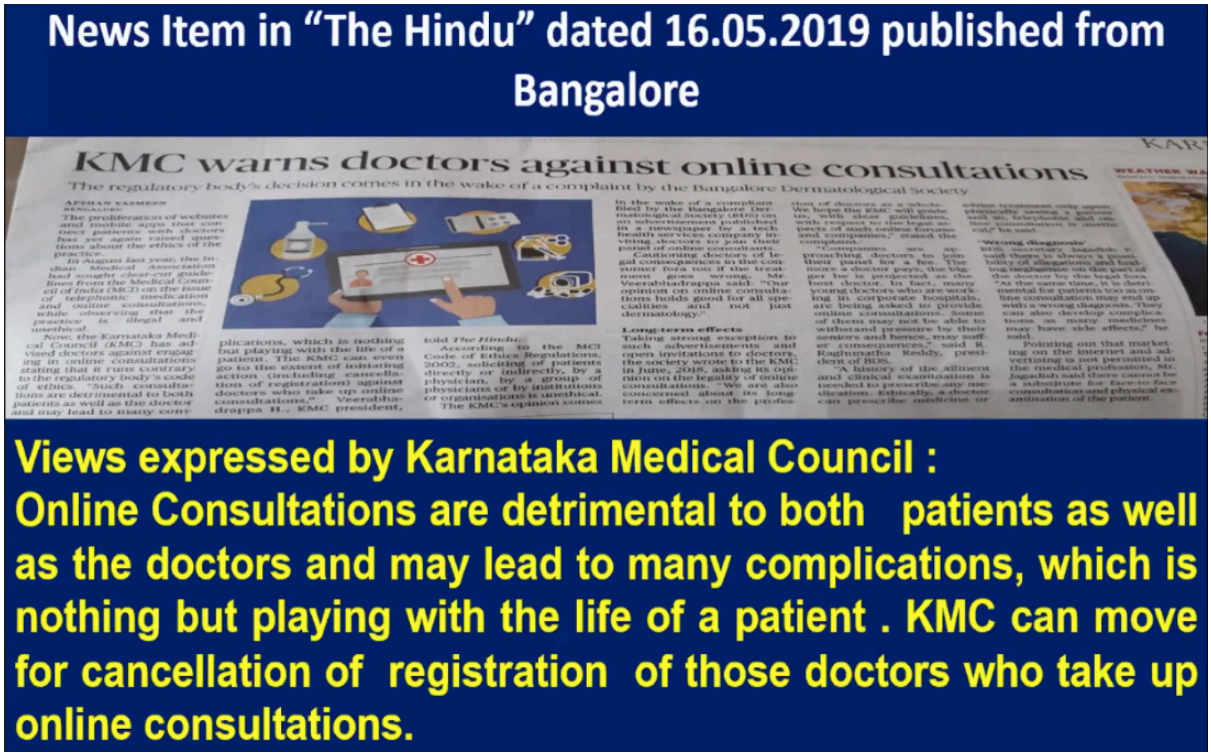
Day 1	Topic	Speaker
• **18th December 2020 (Friday)**	• Telemedicine **Activities in Odisha during Covid-19 Pandemic.**	• **Dr.B.N Mohanty**



I have been offered this opportunity to talk on the telehealth activities that have happened in the state of Orissa during the COVID pandemic. Friends Covid 19 pandemic brought this revolutionary changes in the healthcare delivery system through rapid adoption of Telemedicine best medical care. I would like to share with you the Telemedicine activities undertaken in the state of Orissa during this pandemic.



it will not be out of place to mention here, the news item that was published in the Hindu in May 2019, in which the views of Karnataka Medical Council was expressed that online consultations are detrimental to both patients as well as the doctors and may lead to many complications, which is nothing but playing with life of a patient. Karnataka Medical Council can move for cancellation of registration of those doctors who take up online consultations



Friends in just eight months, the scenario entirely changed in this Indian subcontinent.

In just 8 months

The scenario entirely changed . The apex regulatory body notified the TPG

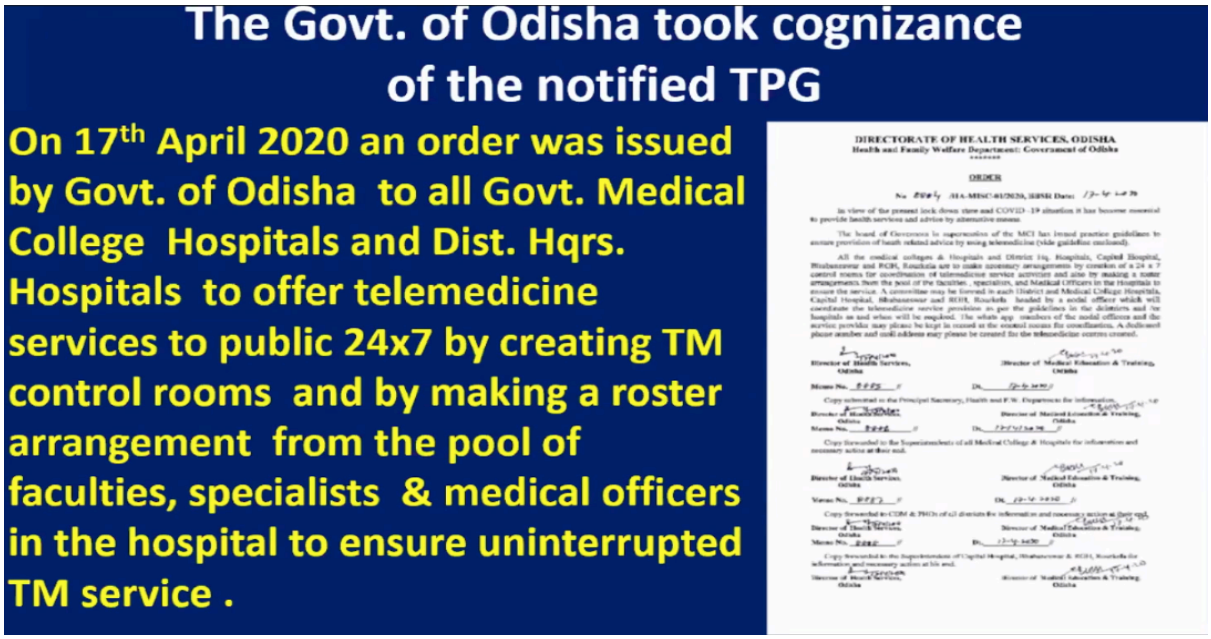
(BOARD OF GOVERNORS in supersession of the Medical Council of India in partnership with NITI Aayog)

The Apex regulatory body notified the Telemedicine practice guidelines. And that was a boon to us to the medical professionals. Now the aim of notifying the practice guidelines was to enable the registered medical practitioners in this country who have been struggling hard to practice Telemedicine for last 20 years. Now to practice this new medical technology with the dignity.

Goal

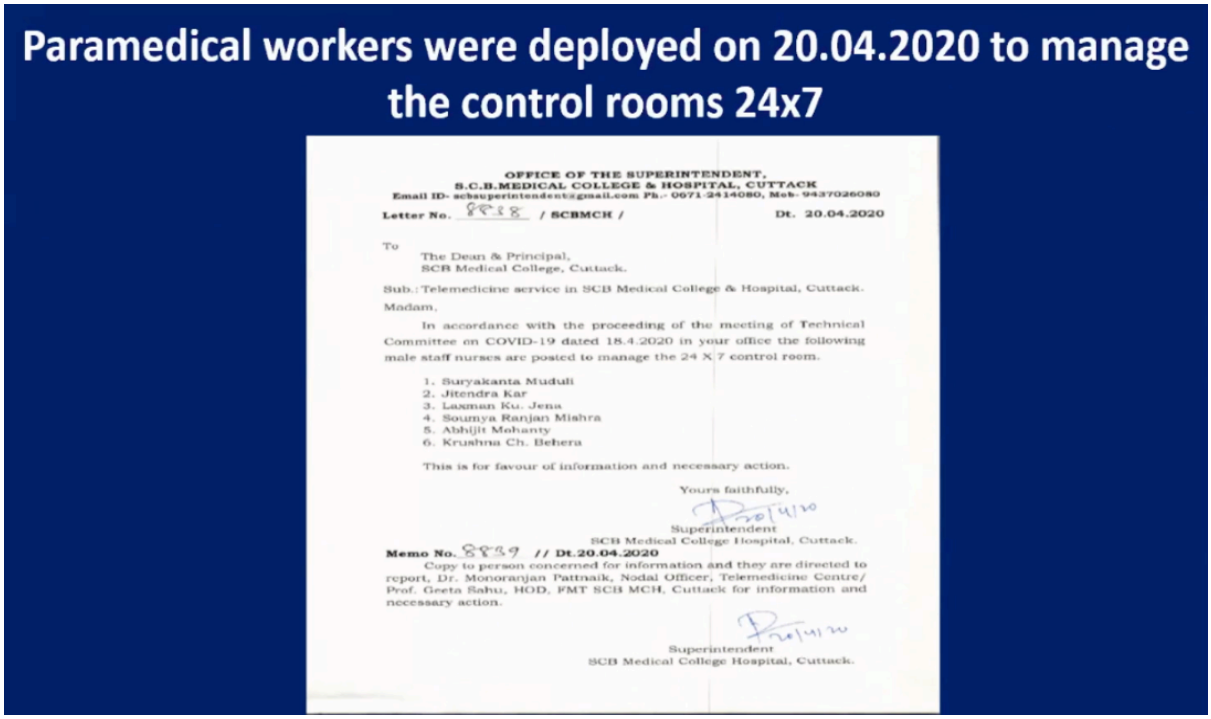
To enable Registered Medical Practitioners in India to practice telemedicine

The government of Orissa to prompt continuance of the notified Telemedicine practice guidelines and itself in April 2020. An ordered issued by Government of Orissa to all government medical colleges in the state and all district headquarter hospitals to offer Telemedicine services to public all through the day and night by creating Telemedicine control rooms and making a roster arrangement from the pool of faculty specialist and medical officers in the hospital to ensure on interrupted Telemedicine service.



The state digital Health Resource Centre which is located in the premises Medical College of the state that is the SCB Medical College, Cuttack was declared as the hub to undertake and monitor all Telemedicine activities in Orissa during this pandemic.

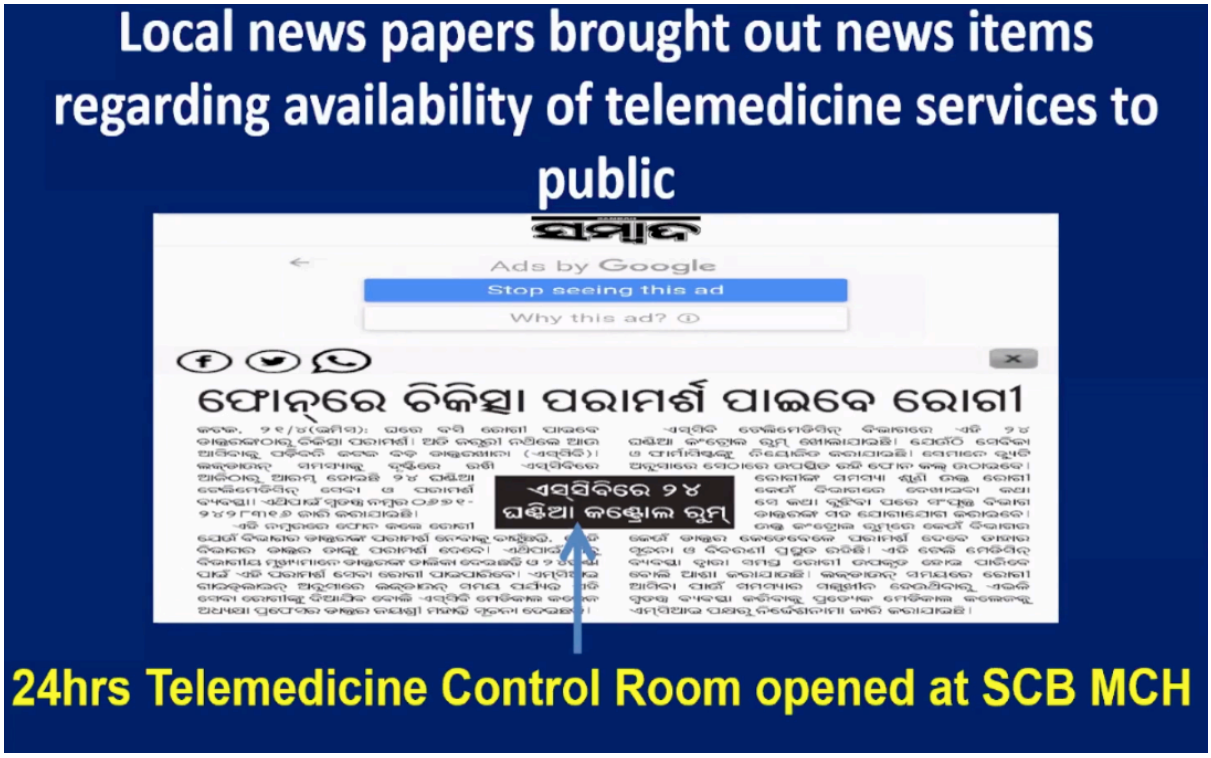
Banners were prepared and displayed at various locations in and around the government hospitals of the state to inform the people regarding availability of Telemedicine services, through phone and other social networking sites from these last week of April.



Immediately paramedical workers were deployed to the control Telemedicine control rooms to manage these rooms 24 into seven. So for example, at SC medical collars, six male nurses were posted to an eight hour shift. So that 24 hours they covered the Telemedicine control room.

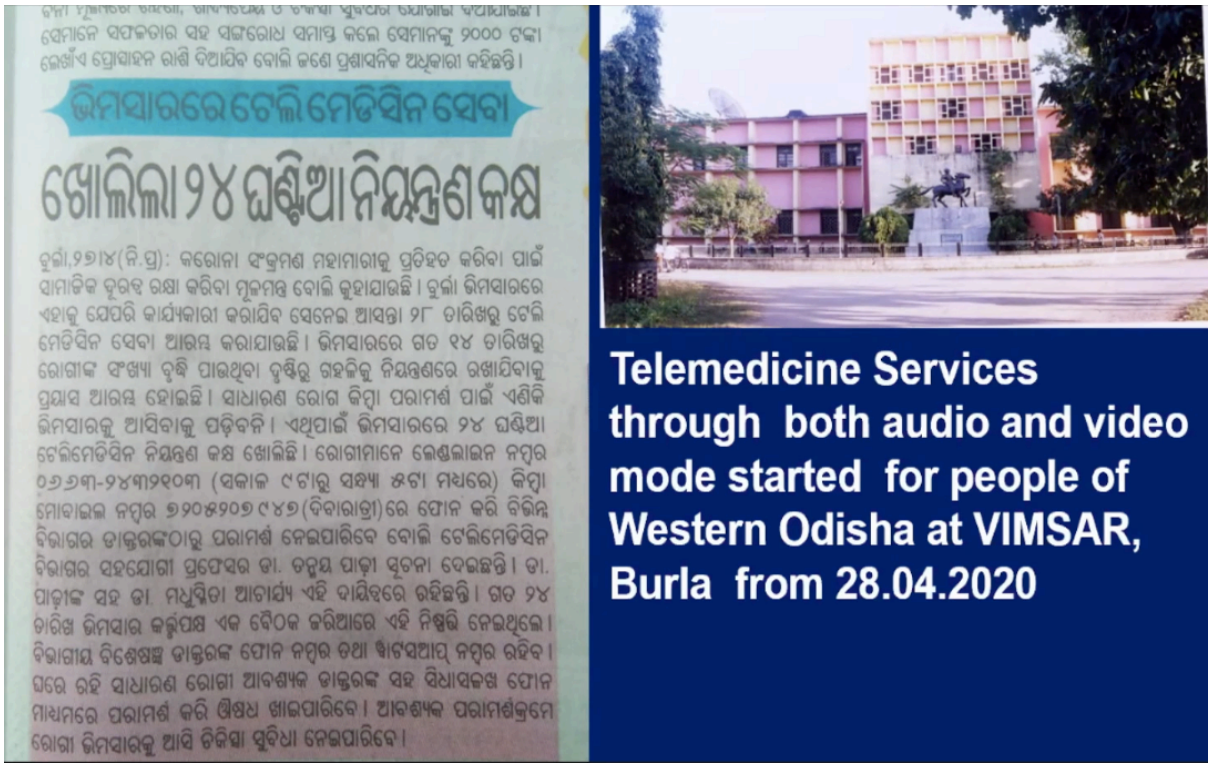
Now these Telemedicine control rooms in all government hospitals started functioning from this fourth week of April and this is the Telemedicine room at SC Medical College Cuttack, where these paramedical workers have started working.

Now, news items were published in all local daily's in both in central Orissa



This is a newspaper which brought the news regarding availability of service at medical colleges, Cuttack,

This is another this is a news item which was published for people of Southern Orissa regarding availability of service at MKC medical currents Berhampur located in southern Odessa.



ଭିମସାରରେ ଟେଲି ମେଡିସିନ ସେବା

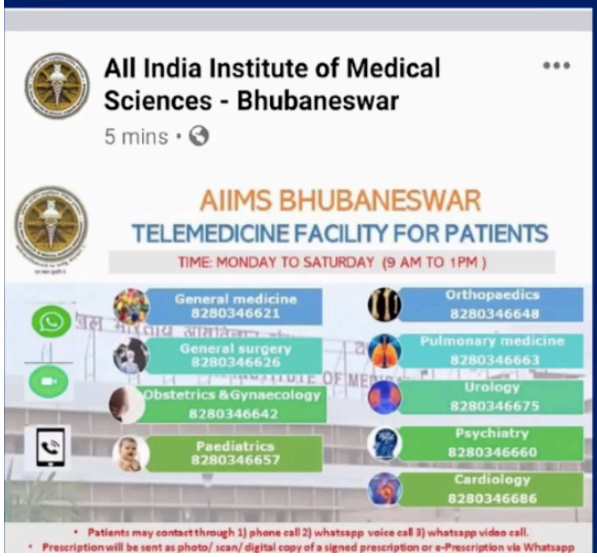
ଖୋଲିଲା ୨୪ ଘଣ୍ଟିଆ ନିୟନ୍ତ୍ରଣ କକ୍ଷ

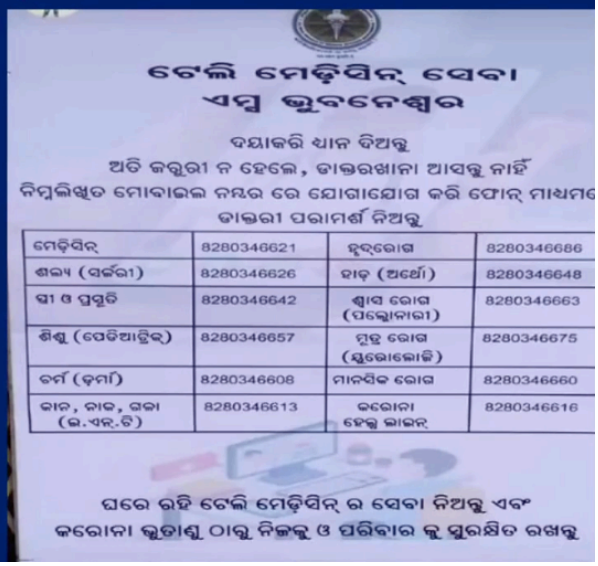
ବୁର୍ଲା,୨୭।୪(ନି.ପ୍ର): କରୋନା ସଂକ୍ରମଣ ମହାମାରୀକୁ ପ୍ରତିହତ କରିବା ପାଇଁ ସାମାଜିକ ଦୂରତ୍ୱ ରକ୍ଷା କରିବା ମୂଳମନ୍ତ୍ର ବୋଲି କୁହାଯାଉଛି। ବୁର୍ଲା ଭିମସାରରେ ଏହାକୁ ଯେପରି କାର୍ଯ୍ୟକାରୀ କରାଯିବ ସେନେଇ ଆସନ୍ତା ୨୮ ତାରିଖରୁ ଟେଲି ମେଡିସିନ ସେବା ଆରମ୍ଭ କରାଯାଉଛି। ଭିମସାରରେ ଗତ ୨୪ ତାରିଖରୁ ରୋଗୀଙ୍କ ସଂଖ୍ୟା ବୃଦ୍ଧି ପାଉଥିବା ଦୃଷ୍ଟିରୁ ଗହଳିକୁ ନିୟନ୍ତ୍ରଣରେ ରଖାଯିବାକୁ ପ୍ରୟାସ ଆରମ୍ଭ ହୋଇଛି। ସାଧାରଣ ରୋଗ ବିମ୍ବା ପରାମର୍ଶ ପାଇଁ ଏଣିକି ଭିମସାରକୁ ଆସିବାକୁ ପଡ଼ିବନି। ଏଥିପାଇଁ ଭିମସାରରେ ୨୪ ଘଣ୍ଟିଆ ଟେଲିମେଡିସିନ ନିୟନ୍ତ୍ରଣ କକ୍ଷ ଖୋଲିଛି। ରୋଗୀମାନେ ଲେଣ୍ଡଲାଇନ ନମ୍ବର ୦୬୬୫୩-୨୪୩୨୧୦୩ (ସକାଳ ୯ଟାରୁ ସନ୍ଧ୍ୟା ୫ଟା ମଧ୍ୟରେ) କିମ୍ବା ମୋବାଇଲ ନମ୍ବର ୭୨୦୫୨୦୭୯୪୭(ଦିବାରାତ୍ରୀ)ରେ ଫୋନ କରି ବିଭିନ୍ନ ବିଭାଗର ଡାକ୍ତରଙ୍କଠାରୁ ପରାମର୍ଶ ନେଇପାରିବେ ବୋଲି ଟେଲିମେଡିସିନ ବିଭାଗର ସହଯୋଗୀ ପ୍ରଫେସର ଡା. ଚନ୍ଦ୍ରଭ ପାଢ଼ୀ ସୂଚନା ଦେଇଛନ୍ତି। ଡା. ପାଢ଼ୀଙ୍କ ସହ ଡା. ମଧୁସ୍ମିତା ଆଚାର୍ଯ୍ୟ ଏହି ଦାୟିତ୍ୱରେ ରହିଛନ୍ତି। ଗତ ୨୪ ତାରିଖ ଭିମସାର କର୍ତ୍ତୃପକ୍ଷ ଏକ ବୈଠକ ଜରିଆରେ ଏହି ନିଷ୍ପତ୍ତି ନେଇଥିଲେ। ବିଭାଗୀୟ ବିଶେଷଜ୍ଞ ଡାକ୍ତରଙ୍କ ଫୋନ ନମ୍ବର ତଥା ହ୍ୱାଟସଆପ୍ ନମ୍ବର ରହିବ। ଘରେ ରହି ସାଧାରଣ ରୋଗୀ ଆବଶ୍ୟକ ଡାକ୍ତରଙ୍କ ସହ ସିଧାସଳଖ ଫୋନ ମାଧ୍ୟମରେ ପରାମର୍ଶ କରି ଔଷଧ ଖାଇପାରିବେ। ଆବଶ୍ୟକ ପରାମର୍ଶକ୍ରମେ ରୋଗୀ ଭିମସାରକୁ ଆସି ଚିକିତ୍ସା ସୁବିଧା ନେଇପାରିବେ।

Telemedicine Services through both audio and video mode started for people of Western Odisha at VIMSAR, Burla from 28.04.2020

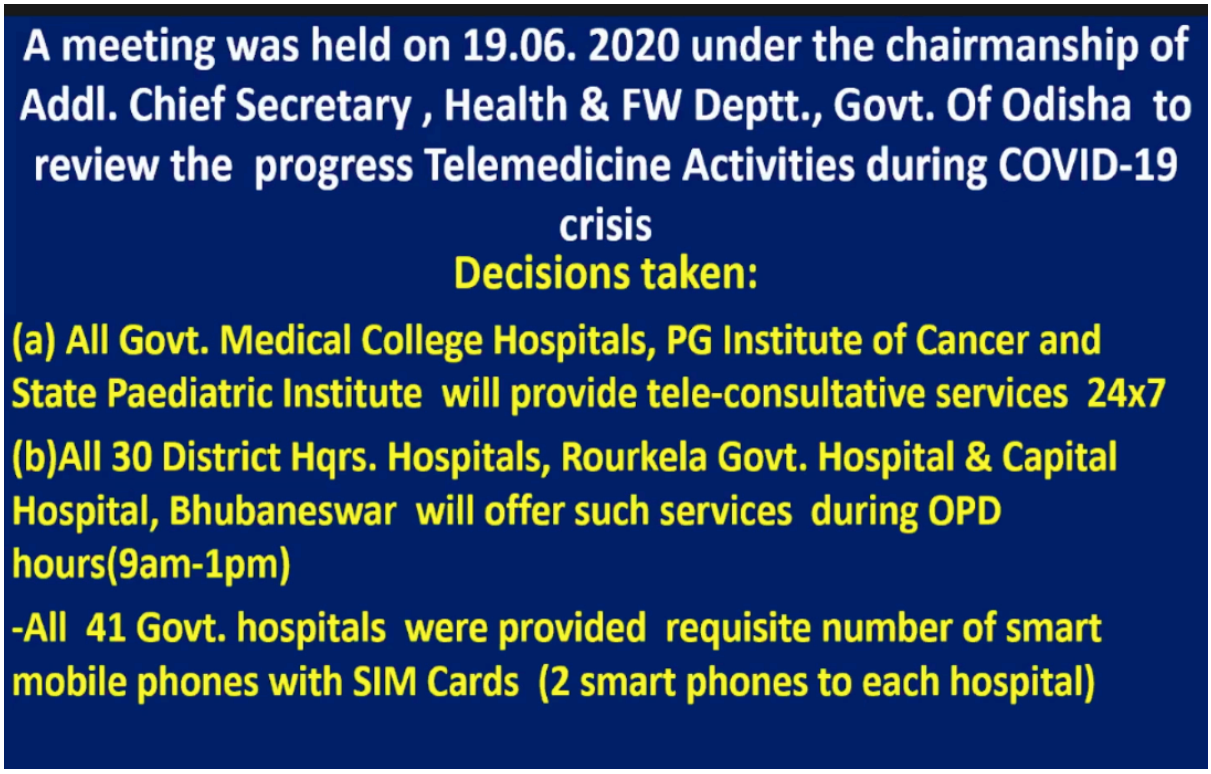
This is the news item, which was brought out in the local daily's have question what is information of people in that part of the state so that people all over the state were sensitized regarding availability of Telemedicine services around the clock for their benefit.

AIIMS, Bhubaneswar used social networking platform to disseminate the information about TM services both in English & Oriya.





Now, AIIMS Bhubaneswar, All India Institute of Medical Science, Bhubaneswar also started providing such services and they released such information's through local daily's to social networking sites, both in English and Oriya, for benefit of people and they started with providing services to start with from 9:00 to 01:00.



Now, soon after all these things started The additional Secretary Department of Health and Family Welfare Board is set to a meeting to review the progress of Telemedicine activities in the state.

The decisions taken in the meeting were all government Medical College hospitals PG Institute of cancer and the state Pediatric Institute will provide tele consultative services 24X7. All district headquarter hospitals, including one at Rourkela and Bhubaneswar will offer services However, during open hours only because of constraint of the specialists for 09:00 am to 01:00 pm. However, all these 40 government hospitals were provided requisite number of smart mobile phones. So we purchased mobile phones immediately and supplied them with SIM cards. So you can take us for so providing such facilities or services.

Incentive for Covid-19 Warriors was declared by Govt.

Honorarium for their services in Government Hospitals is as follows :

1.	Specialist	-	Rs.5,000/- per day
2.	Medical Officer with MBBS Degree	-	Rs.3,000/- per day
3.	Microbiologist (Medico)	-	Rs.5,000/- per day
4.	Microbiologist (Non-Medico)	-	Rs.2,500/- per day
5.	Staff Nurse	-	Rs.1,000/- per day
6.	Laboratory Technician	-	Rs.1,000/- per day
7.	Pharmacist	-	Rs.1,000/- per day
8.	Radiographers	-	Rs.1,000/- per day
9.	MPHW (Male/Female)	-	Rs. 850/- per day

Now incentives are declared by government for these COVID 19 warriors so as to encourage them to take up such activities both day and night.

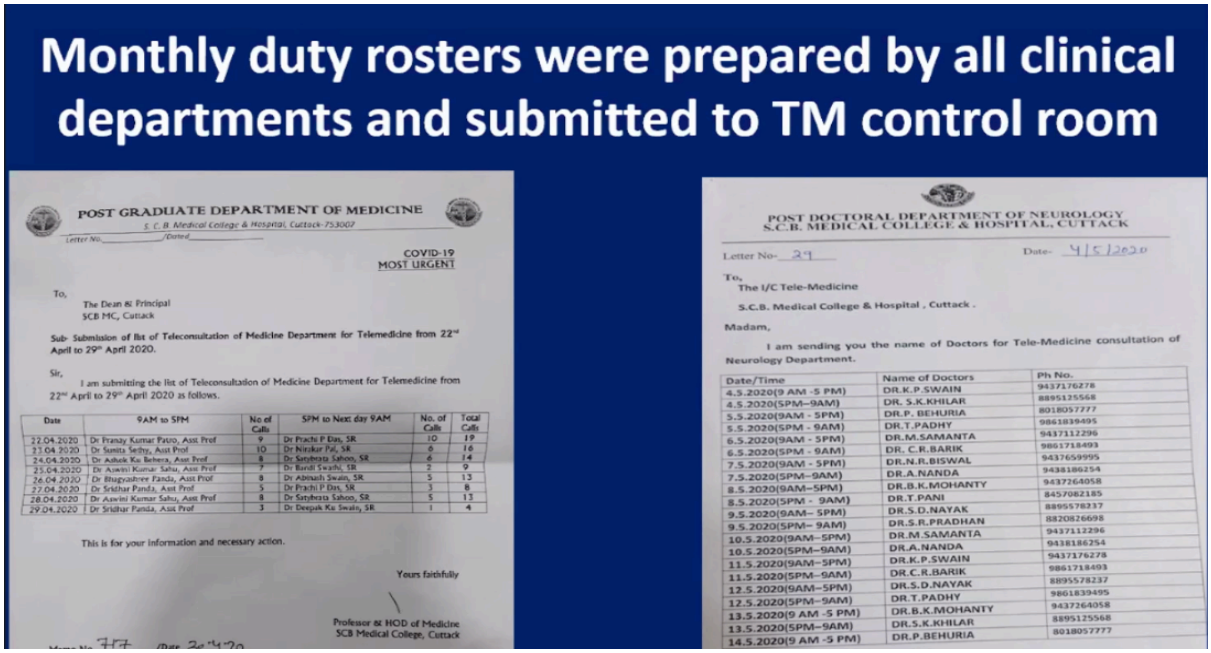
Patient Registration records included information regarding disease, medical expert and specialty

From 12 Noon of 26.04.2020 to 12 Noon 27.04.2020

.	Date	Time	Name	Age	Address	Complain	Department	Dr.name	Designa	Ph. No	Remark	
#	26.04.2020	07.55Am	Mukti Prava Sahoo	23F	CDA, Cuttack	Cold	Medicine	Dr.Bhagyashree Panda	Asst.prof	8.764E+09		L.Jena
#	26.04.2020	8.52am	Rjendra ku sahoo	32m	kujanga,jagatsingpur	Headache	Medicine	Dr.Bhagyashree Panda	Asst.prof	8.764E+09		surya
#	26.04.2020	9.13am	suni begam	30fm	Dargha bazar,cuttack	Trocanto fracture	orthopedic	dr.Ramesh ch maharaj	Asst.prof	9.438E+09		Abhijit
#	26.04.2020	9.24AM	Abdul sajad	44m	Tulasipur,cuttack	shoulder pain	orthopedic	dr.Ramesh ch maharaj	Asst.prof	9.438E+09		surya
#	26.04.2020	10.37am	Dillip ku parida	57m	Nimapada,puri	Burning sensation in urinati	urology	dr.s swain	Asst.prof	8.896E+09		Abhijit
#	26.4.2020	11.02am	siba prasad mohanty	61m	Bhadrak,bhandaripokha	stiffness of leg	Rheumatology	dr.manoj ku parida	Asst.prof	9.438E+09		surya
#	26.04.2020	11.41am	sourav dash	39m	Ali,Kendrapara	Brain synus	Paediatric	Dr.subhashree kar	Asst.prof	9.438E+09		surya
#	26.04.2020	12.00pm	Titatu behera	26m	Hyderabad	weakness,drowsy	Medicine	Dr.Bhagyashree Panda	Asst.prof	8.764E+09		Abhijit
#	26.04.2020	12.13pm	madhusmita behera	31f	jajpur,jenapur	Edema on lt arm	surgery	Dr .N.k rajsamant	Asst.prof	9.438E+09		surya
#	26.04.2020	12.22pm	Rajalaxmi mohapatra	45f	Jagatpur,cuttack	stiffness of leg	Rheumatology	Dr.manoj ku parida	Asst.prof	9.438E+09		surya
#	26.04.2020	12.36pm	saswati ghos	54f	Balesore	alchohol withdrawl syndrom	pshychiatric	Dr.satyakam mohapatr	Asst.prof	8.895E+09		surya
#	26.04.2020	1.05pm	chinmay ku mishra	47m	rourkela	spots on face	skin	dr.subhashree madhu	sr	8.25E+09		surya
#	26.04.2020	1.13pm	subhashree mishra	27f	jajpur,jenapur	miscarrage	GYAN	Dr.Tusar Mohapatra	sr	9.438E+09		surya
#	26.04.2020	2.04pm	Debasish dash	36m	jajpur,jenapur	Headrelling,rigor of body	Medicine	Dr.Bhagyashree Panda	Asst.prof	8.764E+09		surya
#	26.04.2020	2.49pm	Manisha Mohanty	30f	CDA, Cuttack	Skin Rash	Skin	Dr.Subhashree Madhu	SR	8.25E+09		soumya
#	26.04.2020	2.51pm	Naresh Kumar Sahoo	32m	Angul	Redness Skin	Skin	Dr.Subhashree Madhu	SR	8.25E+09		soumya
#	26.04.2020	3.14pm	Dillip Kumar Pattanail	50m	Jagatpur,Cuttack	Headache,Weakness	Medicine	Dr.Bhagyashree Panda	Asst.prof	8.764E+09		soumya
#	26.04.2020	3.27pm	Hadibandhu Khandua	79m	Khandagiri,Bbsr	Fever,Headache,Cough	Medicine	Dr.Bhagyashree Panda	Asst.prof	8.764E+09		soumya
#	26.04.2020	3.31pm	Murali Dhara Behera	51m	Sundharghar	Urology	Urology	Dr.Samir Swain	Asst.prof	8.896E+09		soumya
#	26.04.2020	4.44pm	Jayshree Swain	30f	Jagannathpur,Ganjam	Fever,Headache	Medicine	Dr.Bhagyashree Panda	Asst.prof	8.764E+09		soumya
#	26.04.2020	5.01pm	Khageswar Behera	24M	Panikoili,Jajpur	weakness,Headache	Medicine	Dr.Abinash Swain	SR	9.438E+09		soumya
#	26.04.2020	5.41pm	Ashish Kumar Pothalo	14M	Potapokhari,Cuttack	Fever,Headache	Medicine	Dr.Abinash Swain	SR	9.438E+09		krushna
#	26.04.2020	5.59pm	Chanchali Behera	46F	Jajpur Town,Jajpur	GYN	GYAN	Dr.Tusar Mohapatra	SR	9.438E+09		krushna
#	26.04.2020	6.15PM	Priyambada Sahoo	28F	Jajpur	Fever,Cough	Medicine	Dr.Abinash Swain	SR	9.438E+09		Soumya
#	26.04.2020	7.55pm	Sumitra Prusty	25F	Dhenkanal	Throat Pain	ENT	Dr.M Patsani	Asst.prof	9.862E+09		krushna
#	26.04.2020	08.59PM	Prakash Chandra Sahc	58M	kalahandi	Harnia	surgery	Dr .N.k rajsamant	Asst.prof	9.438E+09		L.Jena
#	26.04.2020	10.33Pm	Manjubala Pradhan	68F	Khuhudi, Khurdha	Psy	Psy	Dr.Bhakta Bandhu Das	Asst.prof	9.937E+09		J.Kar
					Total Patient = 27							

Now the patient registration was started in all the Telemedicine control rooms, we asked them to not only to mention the patient name, the address, but also to mention the complaint, the department or the specific to which this complaint relates to the name of the Physician to whom

this consultation is being called what this request is forwarded, what is the designation what is the phone number and the name of the paramedical workers who forwards the name to the particular physician so that subsequently we can find out if there is any problem.



Now monthly rosters, duty rosters are prepared by all clinical departments and submitted to the Telemedicine control room for information of those people working there. So they have their lists. They was who is on duty on which date and what the telephone number is. So all these information were made available to the paramedical workers managing the Telemedicine control rooms.

Now, this is for example, one list from the Department for dermatology where the name of the doctor on a particular day the designation telephone number email id all administer.

In district headquarter hospitals, they all the telephone numbers of Medicine, Surgery Gynae, Pediatric specialists were also there were placed in the government of Orissa COVID-19 web portal and newspapers so that anybody can contact any specialist as per need.

Odisha Govt prepared SOP for effective telemedicine service use on July 22, 2020

A Standard Operating Procedure (SOP) was prepared and released through print & electronic media for information of public after Odisha Government decided to activate the Telemedicine Centres at all 41 health care institutions across Odisha to provide virtual medical care during COVID-19

Government of Odisha are prepared standard operating procedure and released through print and electronic media for information of public after government decided that all these 41 Telemedicine centre would start working in the to provide virtual medical care.

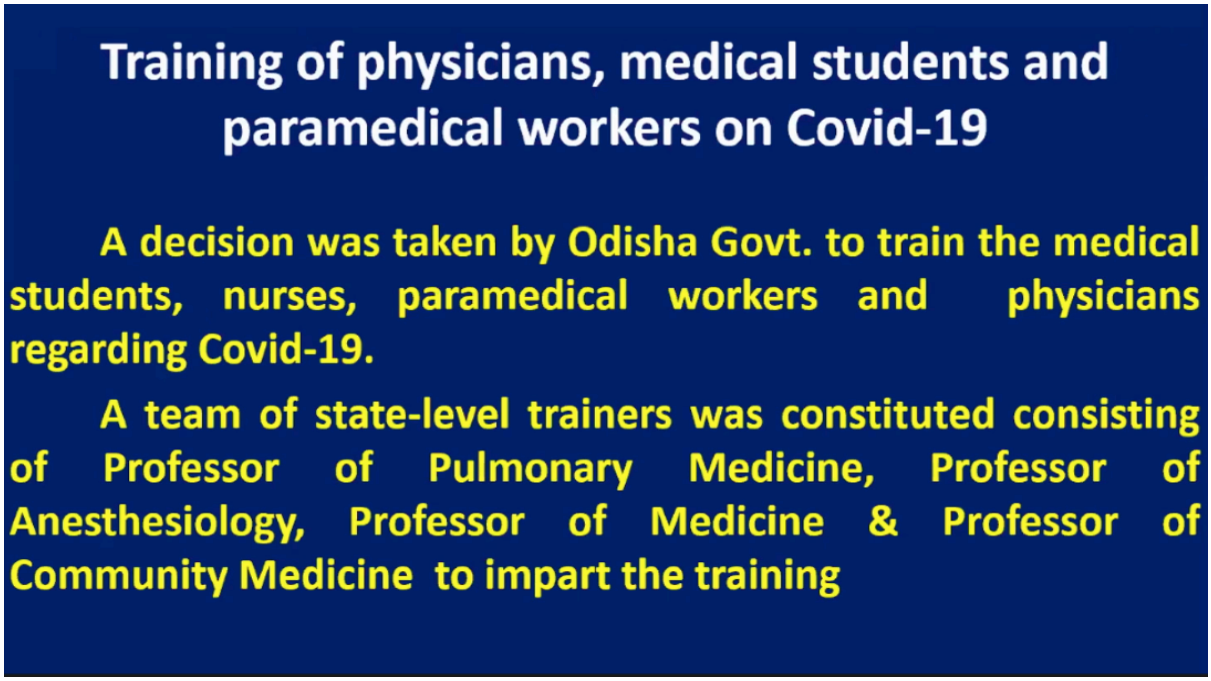
Day-wise number of patients offered service through TM Control Room at SCB MCH,Cuttack

TELEMEDICINE	
Date wise Data	No. of Call
21.04.2020 after noon to 22.04.2020 after noon	66
22.04.2020 after noon to 23.04.2020 after noon	157
23.04.2020 after noon to 24.04.2020 after noon	92
24.04.2020 after noon to 25.04.2020 after noon	51
25.04.2020 after noon to 26.04.2020 after noon	32
26.04.2020 after noon to 27.04.2020 after noon	30
27.04.2020 after noon to 28.04.2020 after noon	33
28.04.2020 after noon to 29.04.2020 after noon	23
29.04.2020 after noon to 30.04.2020 after noon	31
30.04.2020 after noon to 01.05.2020 after noon	26
01.05.2020 after noon to 02.05.2020 after noon	27
02.05.2020 after noon to 03.05.2020 after noon	25
03.05.2020 after noon to 04.05.2020 after noon	24
04.05.2020 after noon to 05.05.2020 after noon	25
05.05.2020 after noon to 06.05.2020 after noon	20
06.05.2020 after noon to 07.05.2020 after noon	28
07.05.2020 after noon to 08.05.2020 after noon	31
08.05.2020 after noon to 09.05.2020 after noon	32
09.05.2020 after noon to 10.05.2020 after noon	37
10.05.2020 after noon to 11.05.2020 after noon	31
11.05.2020 after noon to 12.05.2020 after noon	34
12.05.2020 after noon to 13.05.2020 after noon	28
13.05.2020 after noon to 14.05.2020 after noon	29
14.05.2020 after noon to 15.05.2020 after noon	31
15.05.2020 after noon to 16.05.2020 after noon	27
16.05.2020 after noon to 17.05.2020 after noon	36
17.05.2020 after noon to18.05.2020 after noon	27
18.05.2020 after noon to19.05.2020 after noon	25
19.05.2020 after noon to20.05.2020 after noon	28

B38

A	B
7.05.2020 after noon to 08.05.2020 after noon	31
8.05.2020 after noon to 09.05.2020 after noon	32
9.05.2020 after noon to 10.05.2020 after noon	37
0.05.2020 after noon to 11.05.2020 after noon	31
1.05.2020 after noon to 12.05.2020 after noon	34
2.05.2020 after noon to 13.05.2020 after noon	28
3.05.2020 after noon to 14.05.2020 after noon	29
4.05.2020 after noon to 15.05.2020 after noon	31
15.05.2020 after noon to 16.05.2020 after noon	27
16.05.2020 after noon to 17.05.2020 after noon	36
17.05.2020 after noon to18.05.2020 after noon	27
18.05.2020 after noon to19.05.2020 after noon	25
19.05.2020 after noon to20.05.2020 after noon	28
20.05.2020 after noon to21.05.2020 after noon	18
21.05.2020 after noon to22.05.2020 after noon	25
22.05.2020 after noon to23.05.2020 after noon	31
23.05.2020 after noon to24.05.2020 after noon	29
24.05.2020 after noon to25.05.2020 after noon	25
25.05.2020 after noon to26.05.2020 after noon	27
26.05.2020 after noon to27.05.2020 after noon	
27.05.2020 after noon to28.05.2020 after noon	
28.05.2020 after noon to29.05.2020 after noon	
29.05.2020 after noon to30.05.2020 after noon	
30.05.2020 after noon to31.05.2020 after noon	

Now, Day wise data was stored in the Telemedicine control room, the date, and the number of calls received on particular date. So this is all this information were stored. Now initially, they day wise the data was being transmitted to the government Odisha but subsequently, for convenience, the control rooms were asked to submit weekly data.



Then we started training of physicians, medical students at paramedical workers for COVID-19 because by that time, most of the medical professionals or paramedical, workers didn't know much about COVID-19 particularly the clinical picture, the preventive measures, all these things they were not very aware of. So decision was taken to train the medical students nurses paramedical workers regarding COVID-19 at state level trainers team was constituted consisting of specialists from pulmonary medicine, anaesthesiology, medicine, their general medicine and Community Medicine.

First program was held in the Telemedicine Resource Center, SCB MCH , Cuttack on 3.04.2020 over zoom virtual platform and 500 Medical Students were trained regarding COVID-19

କରୋନା ତାଲିମ୍ ନେଲେ
୫୦୦ ଡାକ୍ତରୀ ଛାତ୍ରଛାତ୍ରୀ

ସମ୍ବାଦ

କରୋନା ତାଲିମ୍ ନେଲେ ୫୦୦ ଡାକ୍ତରୀ ଛାତ୍ରଛାତ୍ରୀ, ଘରେ ବସି 'ଜୁମ୍ ଆପ୍'ରେ ନେଲେ ତାଲିମ୍

BY SAMBAD BUREAU
APRIL 4, 2020

କଟକ: ଏସ୍‌ସିବି ମେଡିକାଲ କଲେଜର ୫୦୦ ଛାତ୍ରଛାତ୍ରୀ ଆଜି କରୋନା ପାଇଁ ତାଲିମ୍ ନେଇଛନ୍ତି। ସେମାନେ ଘରେ ରହି 'ଜୁମ୍ ଆପ୍' ଜରିଆରେ ତାଲିମ୍ ନେଇଛନ୍ତି। ଆଜି ସକାଳ ସାଢେ ୧୦ଟାରୁ ଗୋଟାଏ

Now the first program was held on 3rd of April in a virtual mode and 500 medical students were trained regarding COVID-19 were informed regarding everything about COVID-19 disease.

State-level training of master trainers of Covid-19 Hospitals

Department of Health & Family Welfare
Government of Odisha, Bhubaneswar
State level training of master trainers of COVID-19 Hospitals
Date: 13th April 2020, Time: 3:30pm-05:30pm
Venue: Tele Medicine Centre, SCB Medical College, Cuttack

Agenda

Moderators: Prof. Jayshree Mohanty, Prof. Annada Patnaik, Prof. BN Mohapatra, Dr. Thitta Mohanty

Time	Topic	Presenter
03.00pm-03.30pm	Registration	
03.30pm-03.40pm	Introduction & Welcome	Prof. CBK Mohanty, DMET
03.40pm-04.00pm	Global/India update and epidemiology and hospital preparedness	Dr. Deepak Kumar Kar (WHO)
04.00pm-04.20pm	Infection prevention and control, disinfection and biomedical waste management	Dr. D. P. Mohanty (Microbiology)
04.20pm-04.40pm	Clinical case management	Dr. Jayanta Ku. Panda (Medicine)
04.40pm-05.00pm	Critical care management at ICU	Dr. Nibedita Pani (Anesthesiology)
05.00pm-05.20pm	Managing the pandemic- A sisters view point	Ms. Bijaylaxmi Das (Community Nursing)
05.20pm-05.30pm	Questions and Answers	All faculties

Then subsequently, the state level training of master trainers we decided that this particular team cannot train everybody in the state. So we identified master trainers of different districts and then the state level team that trained the master trainers and COVID-19.

So then, we also trained to strengthen the lab diagnosis. 97 Microbiologist and Virologists are also provided online training from the Medical College at Cuttack.

Now 252 medical practitioners attended the COVID-19 training program on a day on 8th May so similar activities who are held on every week, every Thursday, so that people could get the benefit to attend. . If somebody is busy on a particular day can attend another day.

The more than 300 participants attended a webinar from SC Medical College Hospital on advance management of COVID-19.

Then subsequently, we wanting to hold those programs for benefit of doctors have all Govt. Hospital, the private hospitals, nursing homes for all then the COVID care centres and COVID hospitals, the list of the doctors manning the COVID care centres and COVID hospitals was also released the their helpline numbers for benefit of people.

Then we also conducted sometime in October, we held a webinar on haematological. As you know, thrombotic complications happened and took the life of many patients suffering from COVID-19. So wanted to update the medical professionals on the haematological complications of COVID-19 and how to manage.

Virtual Training Program for government private hospitals Post Covid 19 complication management.

Utilization data Analysis in 1st week December 2020 (data obtained from 30 DHHs & 7 MCHS)	
Month	**No. of consultations offered**
April	531
May	743
June	998
July	1287
August	1538
September	2885
October	3989
November	1884
Total	17,168

So then we analyse the data in the past to cover December to find out how what is the number of consultations we have offered and we found that month wise, we have mentioned that over the more than 17,000 consultations we have offered during these five months.

Conclusion

i. Covid-19 pandemic triggered the use of telemedicine
ii. The pandemic reduced the gap related to the poor compliance in use of health-related digital tools.
iii. Covid-19 pandemic offered an opportunity to users and providers to recognise utility of telemedicine.

To conclude I would like to say that COVID-19 pandemics, triggered the use of Telemedicine. The pandemic reduce the gap related to poor compliance in the use of health related digital tools.

Finally, COVID-19 pandemic offered an opportunity to users and providers to recognize the utility of Telemedicine. Thank you all.

Day 1	Topic	Speaker
• 18th December 2020 (Friday)	• Coronation of Digital Pathology during Corona pandemic	• Dr. Sangeeta Desai

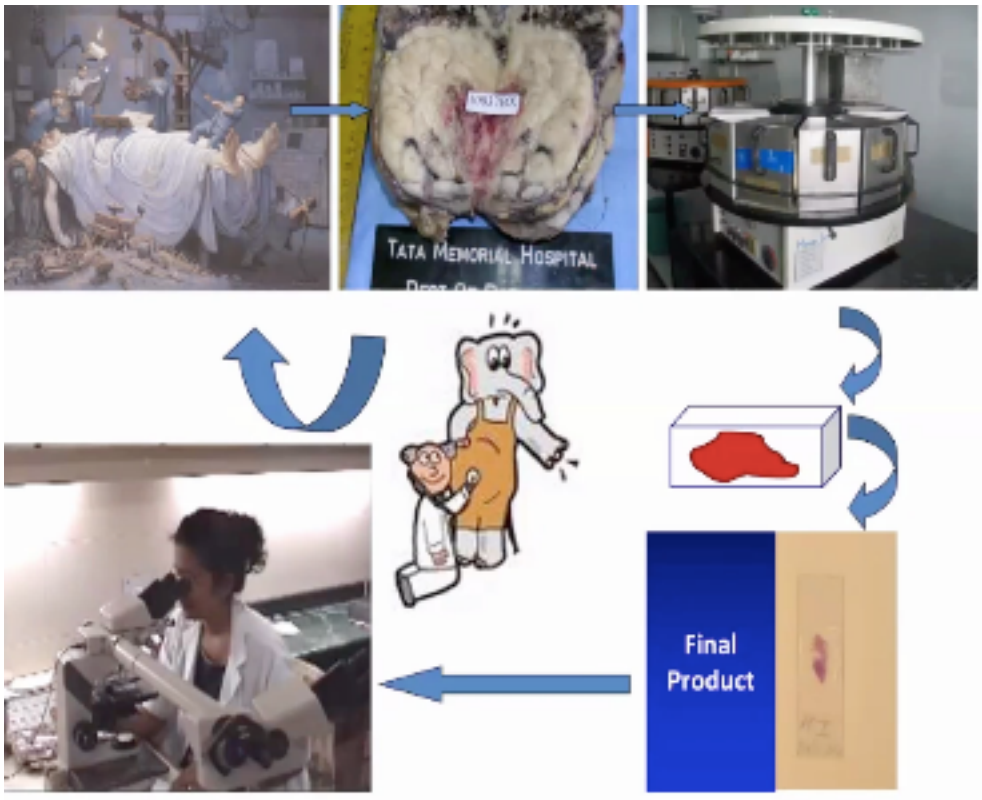
Very Good morning, and I think I barely have some very few minutes left for my talk, the topic is coordination of digital pathology by Corona

Coronation of DP by Corona

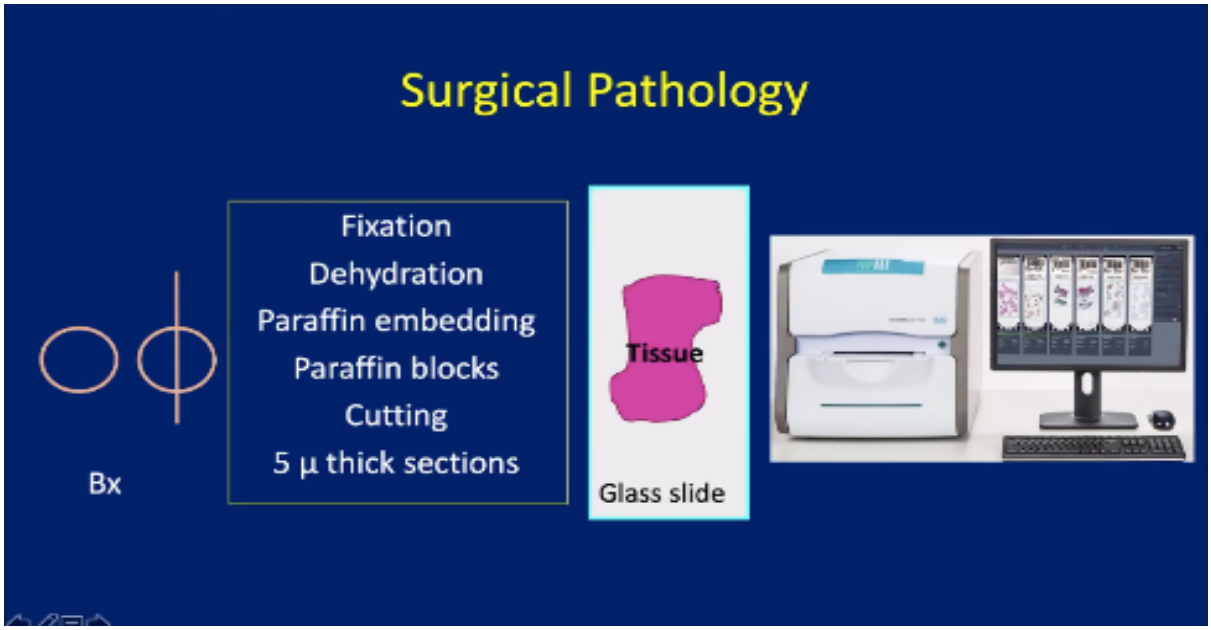
Sangeeta Desai, Vidya Rao, Rajiv Kumar, Swapnil Rane

Tata Memorial Centre

First let me give you some idea about what a surgical pathologist does in a cancer hospital. Basically, we are involved in a diagnosis of cancer when we get the tumour tissue in the laboratory and we process the tissue and what we get is the paraffin block and the final product is the glass slide, which is viewed on the microscope and a diagnosis is rendered.

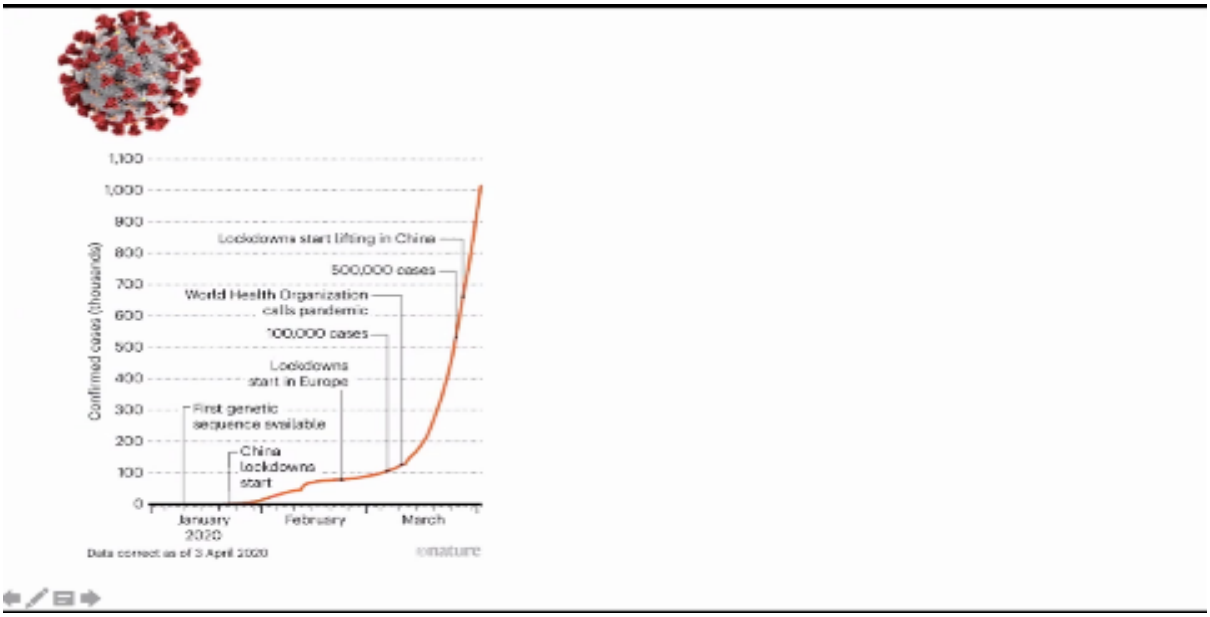


So in cancer hospital no one has cancer unless pathologist says so. So that's the importance of surgical pathologist in a cancer hospital. And so, this is the entire process of making the slide. And if this microscope gets replaced by a whole slide imaging system or a digital scanner, then what we get is the virtual slide and once we get the virtual slide, we can either view it, we can share it, we can analyze it, so there are so that is called Digital pathology.

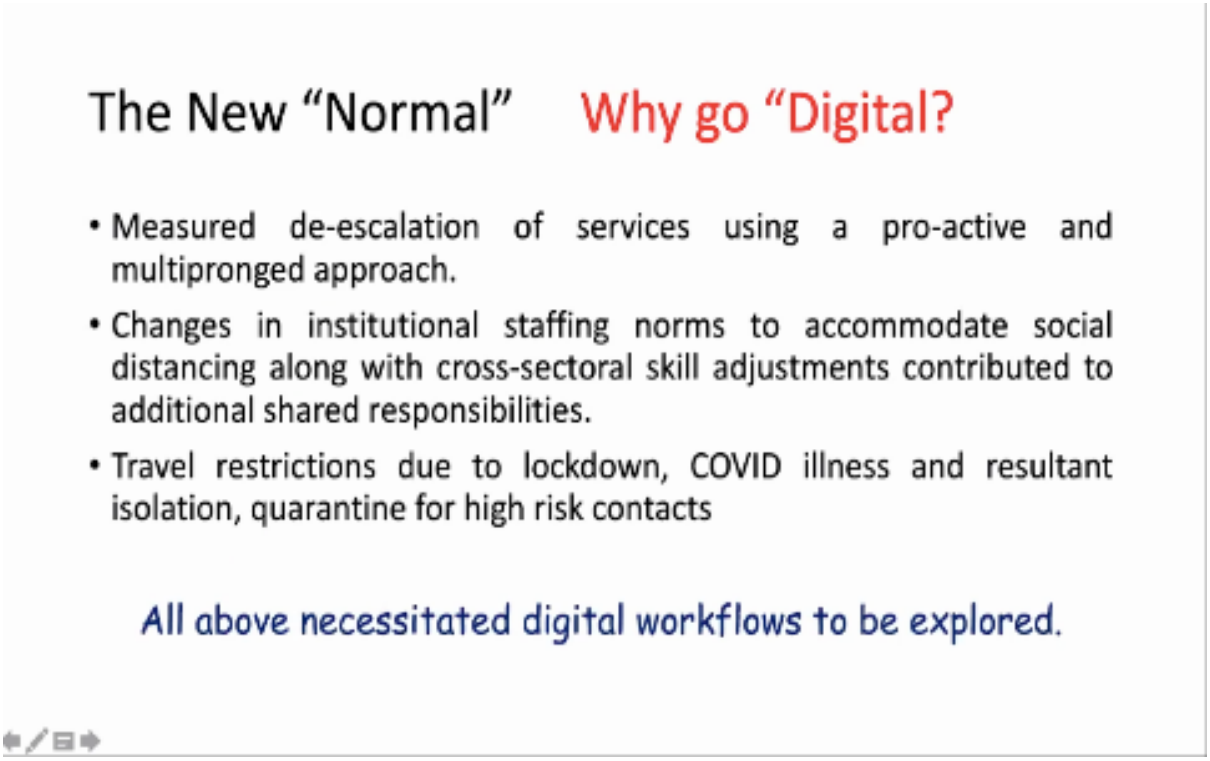


So, after this brief preamble, let me take you to the applications of digital pathology.

The primary applications are education, quality assurance, and for of course, artificial intelligence and computational pathology. And since 2018, we have been using digital pathology for these applications. However, as far as primary diagnosis is goes that is dealt with pathologists with little apprehension and anxiety. Now, recently, there have been numerous publications which have established non inferiority of the diagnosis rendered on digital pathology as compared to the conventional microscopy diagnosis. And we have had a lot of experience in dealing with digital pathology and we have publications based on performance of various digital pathology, offline imaging systems. validation of digital pathology for process section diagnosis and validation of digital pathology for surgical pathology, diagnosis of prostate cold biopsies.

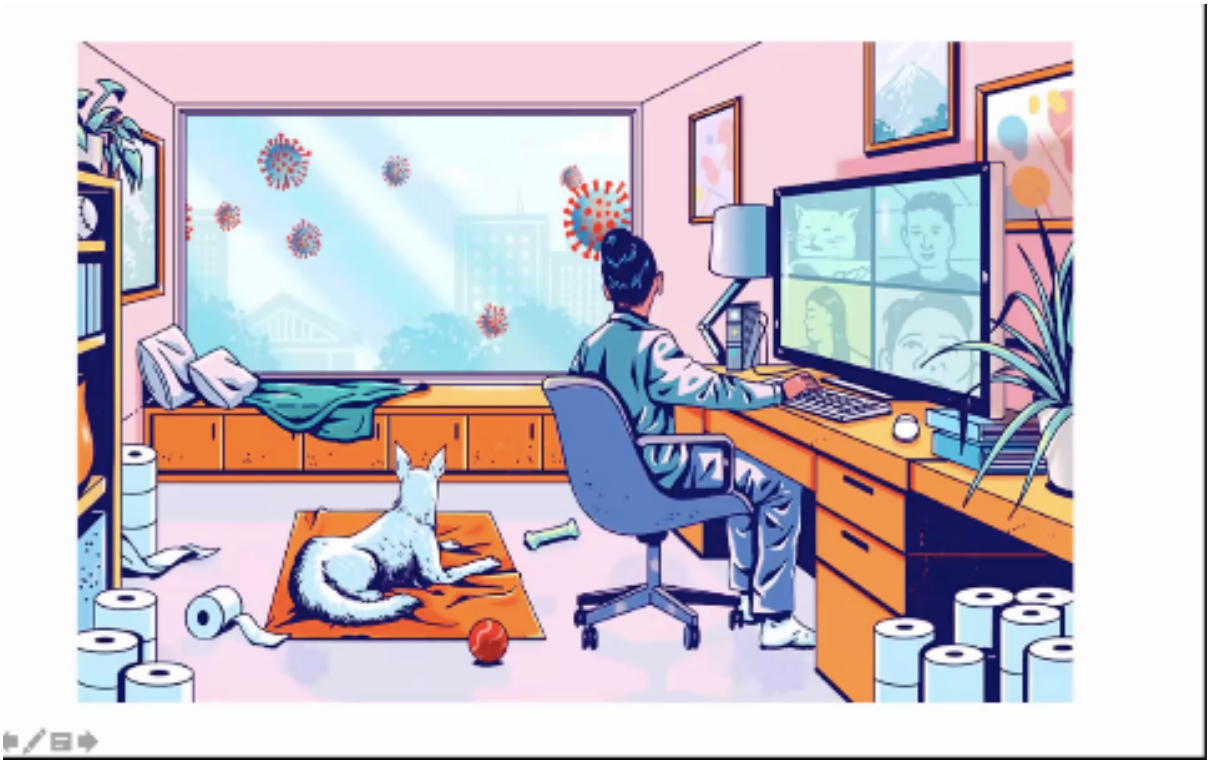


Now with this preamble, let's go to the pandemic scenario when it struck us with the first patient diagnosed in Kerala on 30th Jan 2020. And then of course, we progress towards the lockdown on 24th March and this was preceded by public curfew on 22nd of March and the lockdown started from 24th of March and somewhere at around on 20th March we decided to go digital.

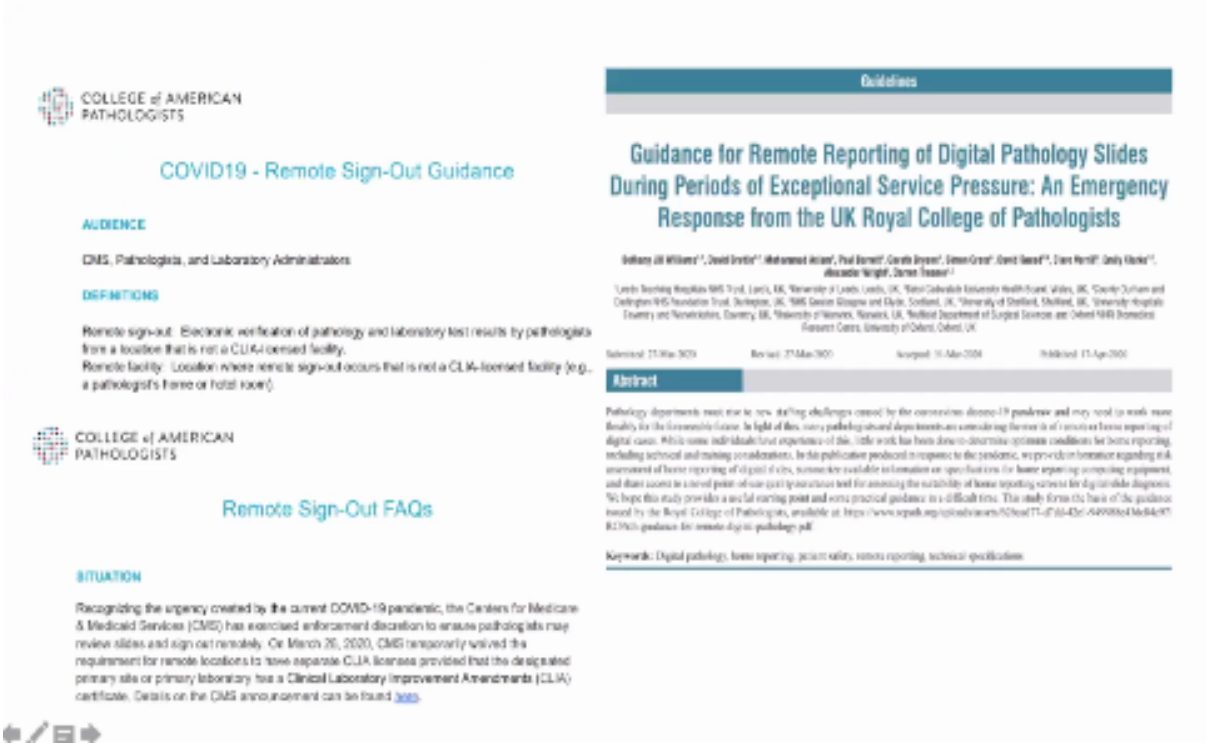


Now this is of course the new normal and the reasons for why go digital way in pathology in a cancer hospital was for a cancer patient, compromisation or compromising cancer care is

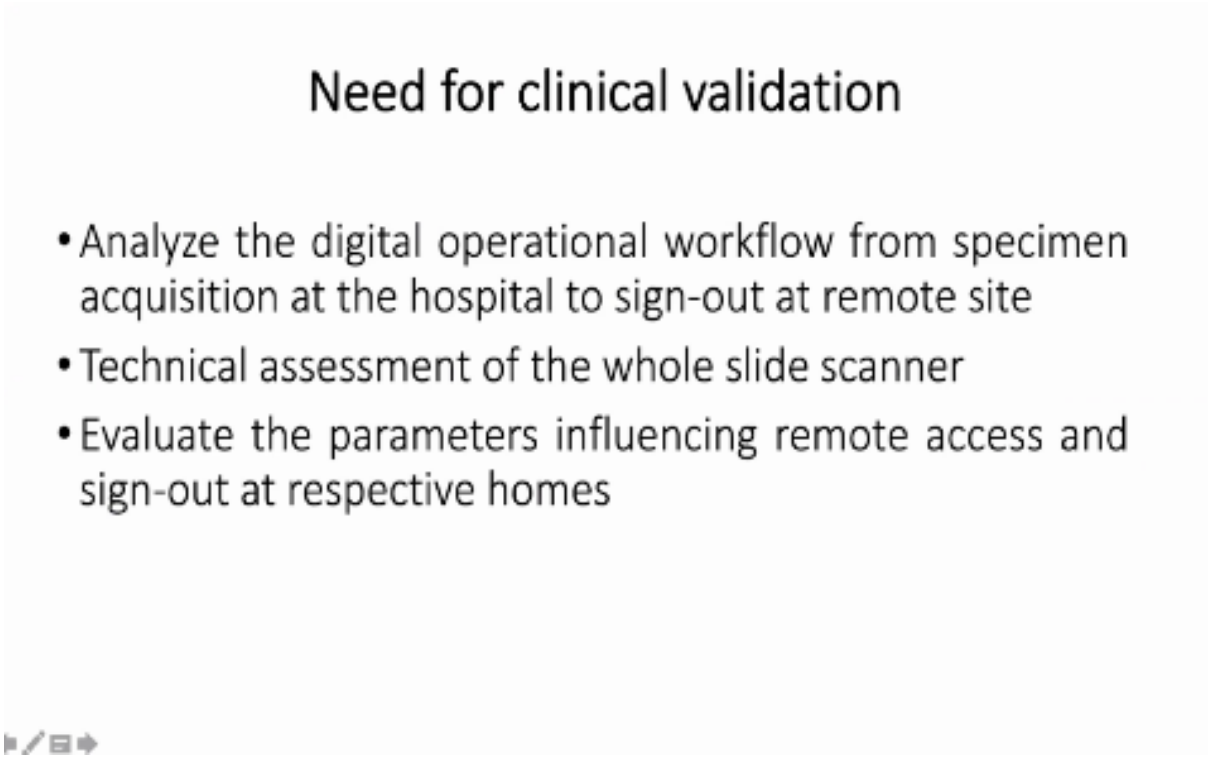
more. The cancer patient fears that more than getting COVID. So in Tata Memorial Hospital where we have more than 75,000 patients or new patients registered for treatment per year, we had to deal with cancer and COVID and how we dealt with that we dealt with by major de-escalation of services using very proactive and multi-pronged approach. This multi-pronged approach was directed towards patience towards staff and many other aspects. There were changes in institutional staffing norms to accommodate social distancing along with cross sectoral skill adjustments. What do I mean by that? oncologists serving as infectious diseases specialist, surgical pathology technician becomes warrior for COVID testing. So there were additional responsibilities. There were travel restrictions due to lockdown, and because of staff turning COVID positive, the result and isolation high risk context we're getting quarantined.



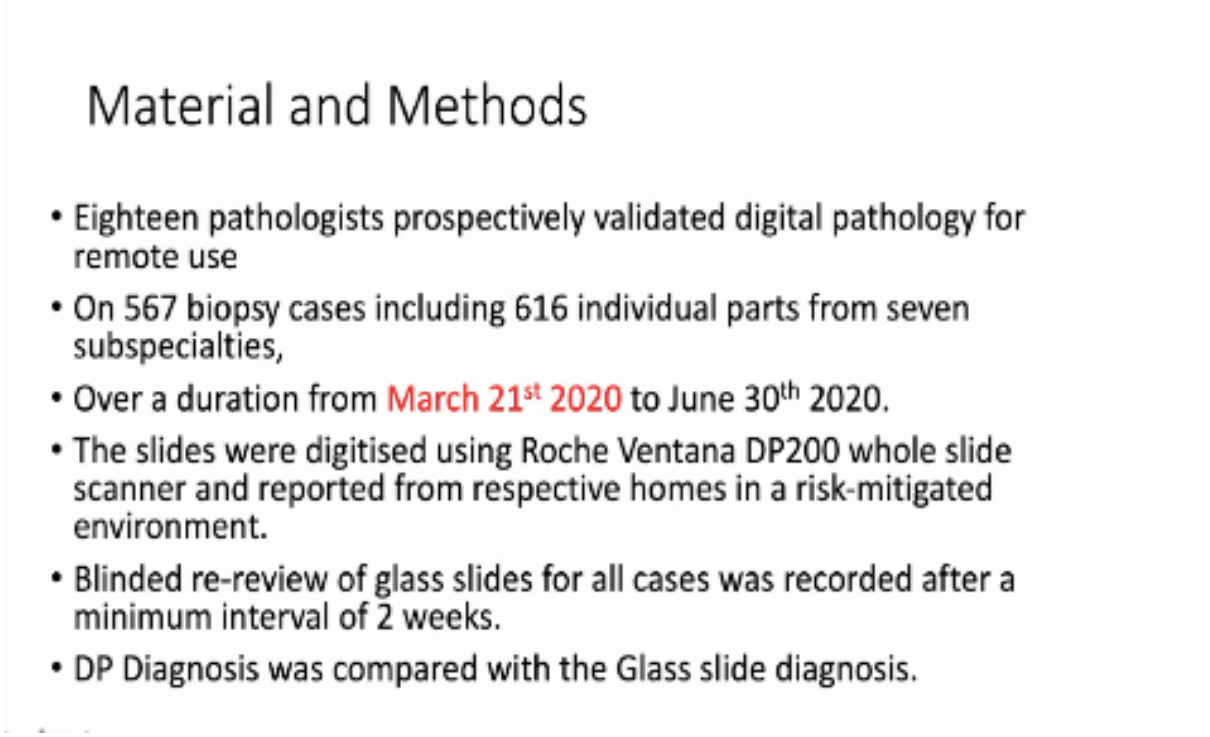
This was the story everywhere. And that's the reason why we decided to explore digital workflow in pathology. So this is how it started. And it has become the norm for many of us, that you get out of the bed and go to the keyboard.



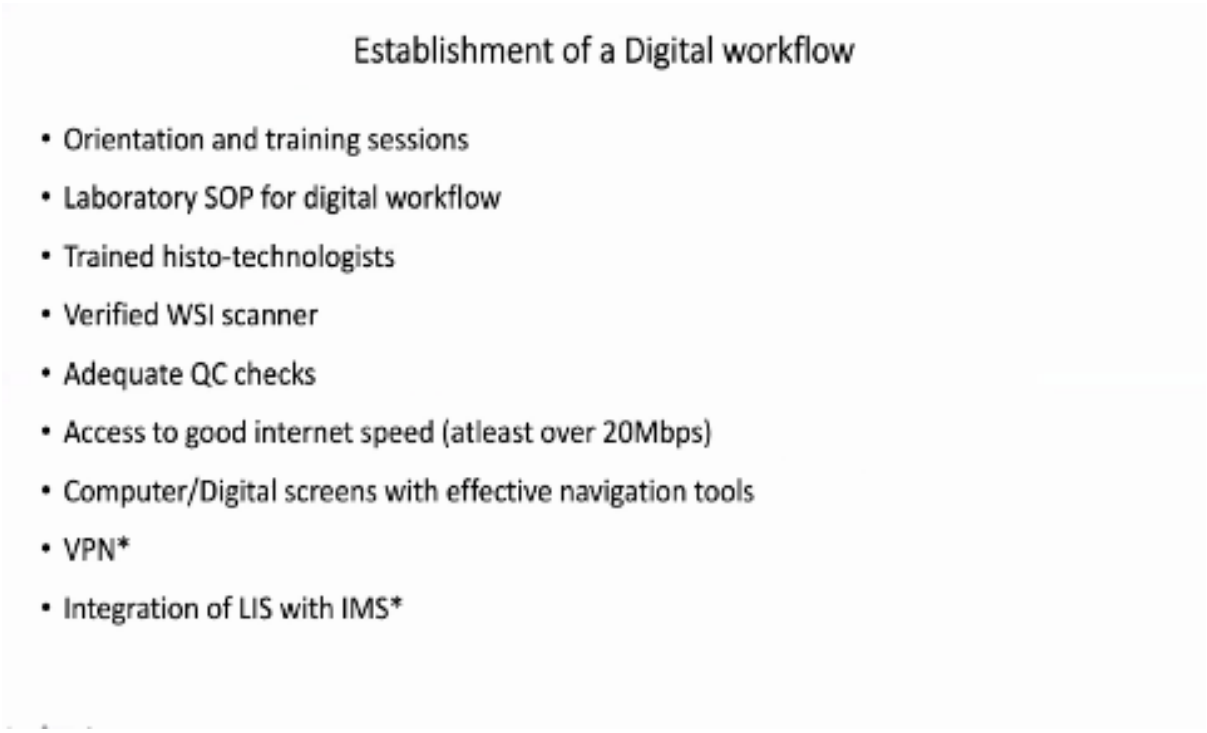
so at the same time, there was international guidance developing regarding remote diagnosis if you see the deaths this this was happening on 26th march in the US and US FDA also issued a non binding recommendations for use of digital pathology for remote diagnosis. College of American Pathologists and also UK group of pathologists issued their guidance. And this guidance was mainly related to offering more liberty or more freedom to pathologists for remote diagnosis using both conventional microscopy as well as digital pathology.



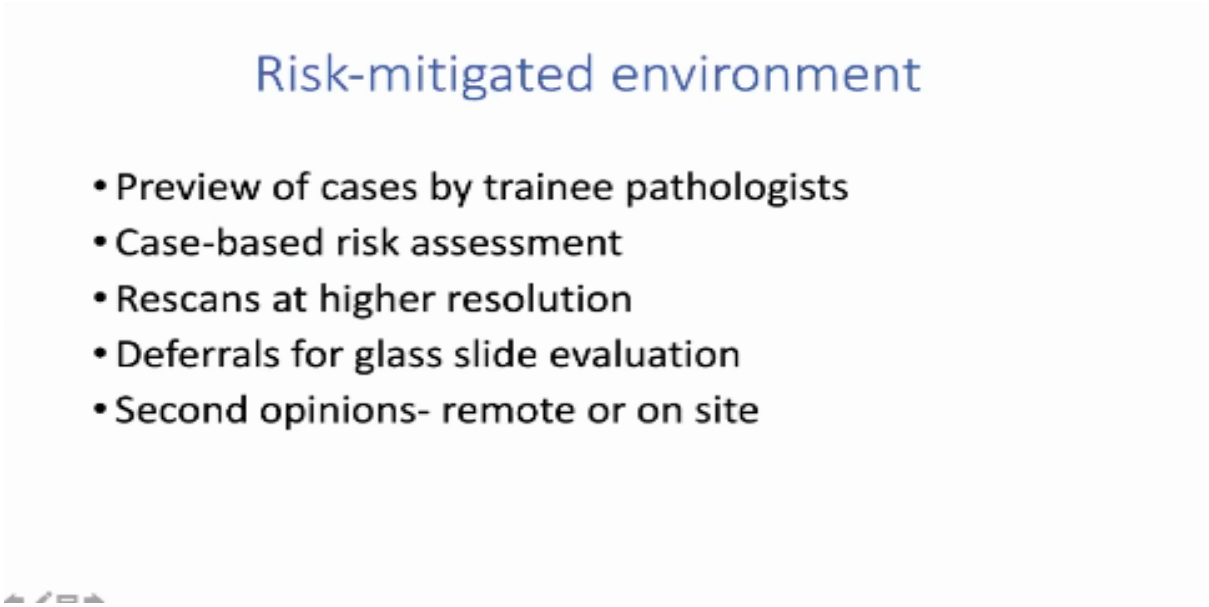
So still, there was need for clinical validation, which involves analysis of digital operational workflow from specimen acquisition at the hospital to sign out at remote site, technical assessment of the whole slate scanner, and evaluation of various parameters influencing remote access and sound sign out at respective homes.



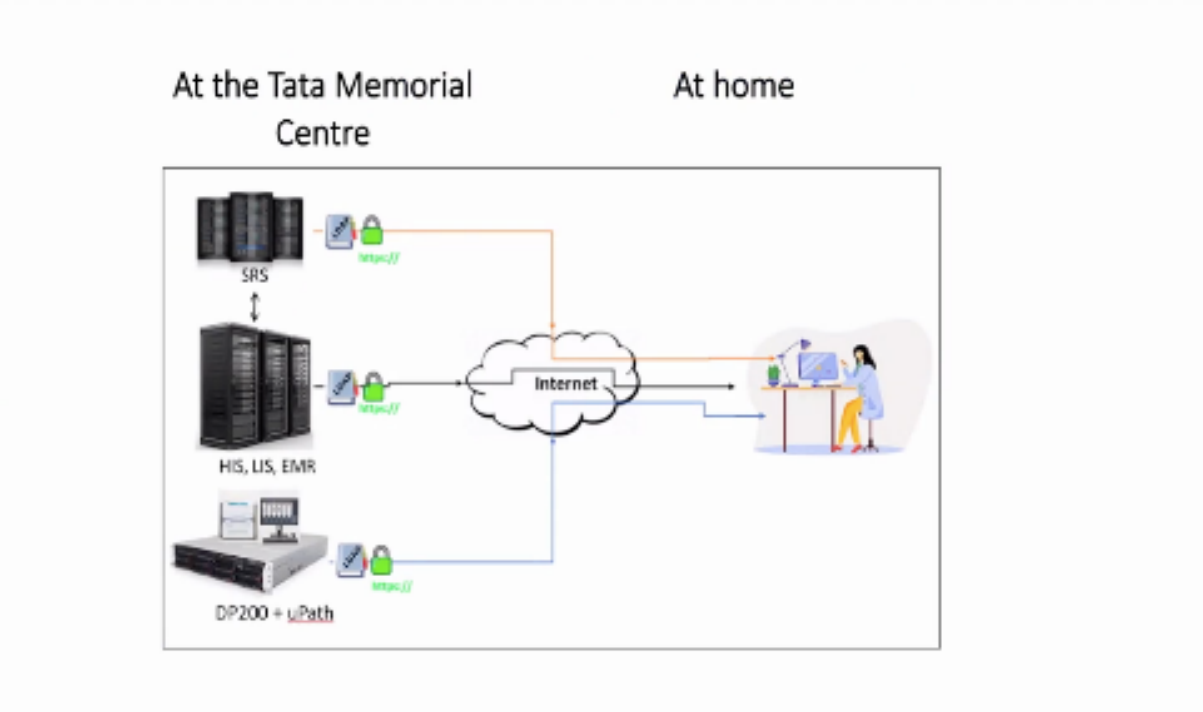
So there were 18 pathologists prospectively validated digital pathology for remote use, there was a total of 567 biopsy cases, from seven subspecialties. And actually, this generated over 1500 slides, and this we dealt with from March 21 2020 to June 30 2020. And the slides are digitized using Roche Ventana DP200 whole slide scanner. And the cases were reported from respective homes in a risk mitigated environment. And what we did was since we wanted to, this was a part of ongoing validation. After a minimum interval of two weeks, we reviewed the glass slides in a conventional way to establish non inferiority or concordance of the diagnosis.



And this was our workflow. We had to conduct orientation and training sessions for those who were not yet initiated into digital pathology. We developed a SOP's we trained more technologists, we already had verified whole slide scanner with us. We perform adequate QC checks at the level of technologists and at the level of training pathologists, we ensure presence of relatively good internet speed at home. And of course, we use digital screens with effective navigation tools and what was desired but we could not achieve because of because of sudden transition into digital pathology because those two aspects were virtual private network and integration of allies with image management software of the scanner.



what is risk mitigated environment, the cases were previewed by trainee pathologists, there was case based risk assessment. So if the case was found to be extremely challenging, even on conventional microscopy, we did not submit it for digital pathology. Some of the cases were again re scanned at higher resolution for clearer picture. We deferred some of the cases for glass slide violation and the cases with which were deferred. The examples are suppose there was a cancer case and inside to carcinoma and we were doubting presence of invasion, that focus was very small, we did not take this up for digital pathology. And of course, we also tried to obtain second opinions either remotely or on site. And this is how we create a risk mitigated environment.



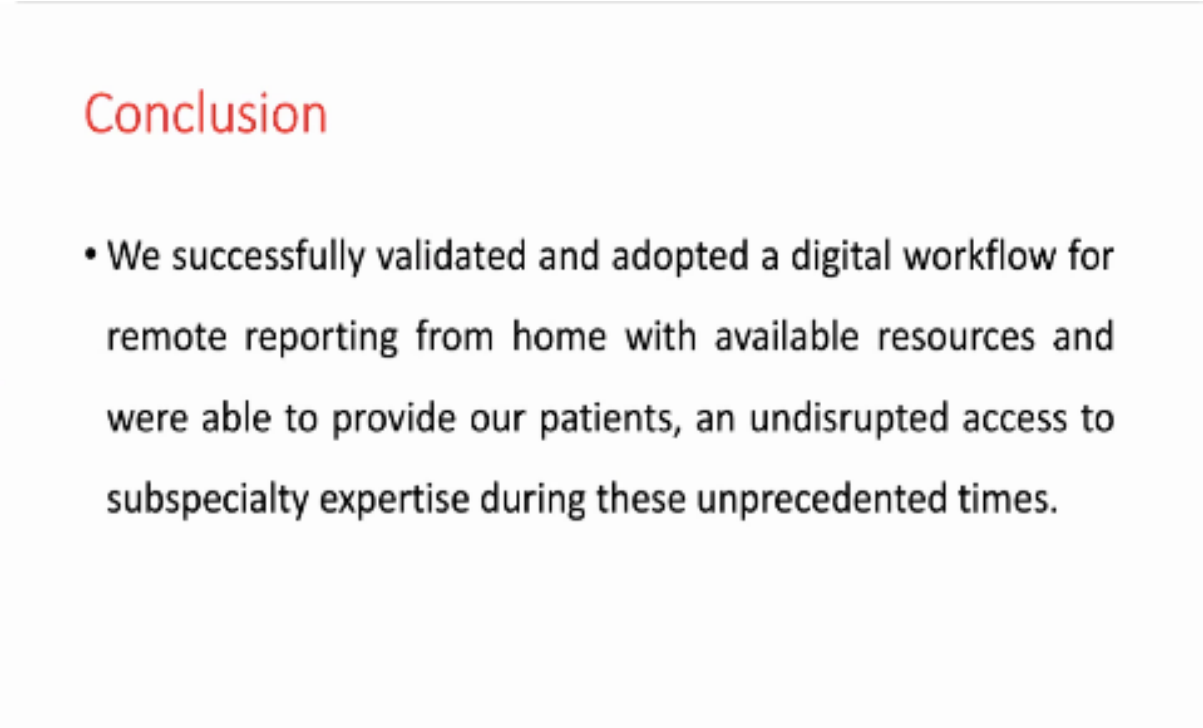
Now at Tata Memorial centre, we are already paperless. And we have our Sinopec reporting software, which is integrated with hospital Information System laboratory information system and EMR. And the third new part which was new was the scanner and scanner associated software, that integration we could not achieve by 21st of March, but we managed all this sitting at home. Before all this was web based.

Results

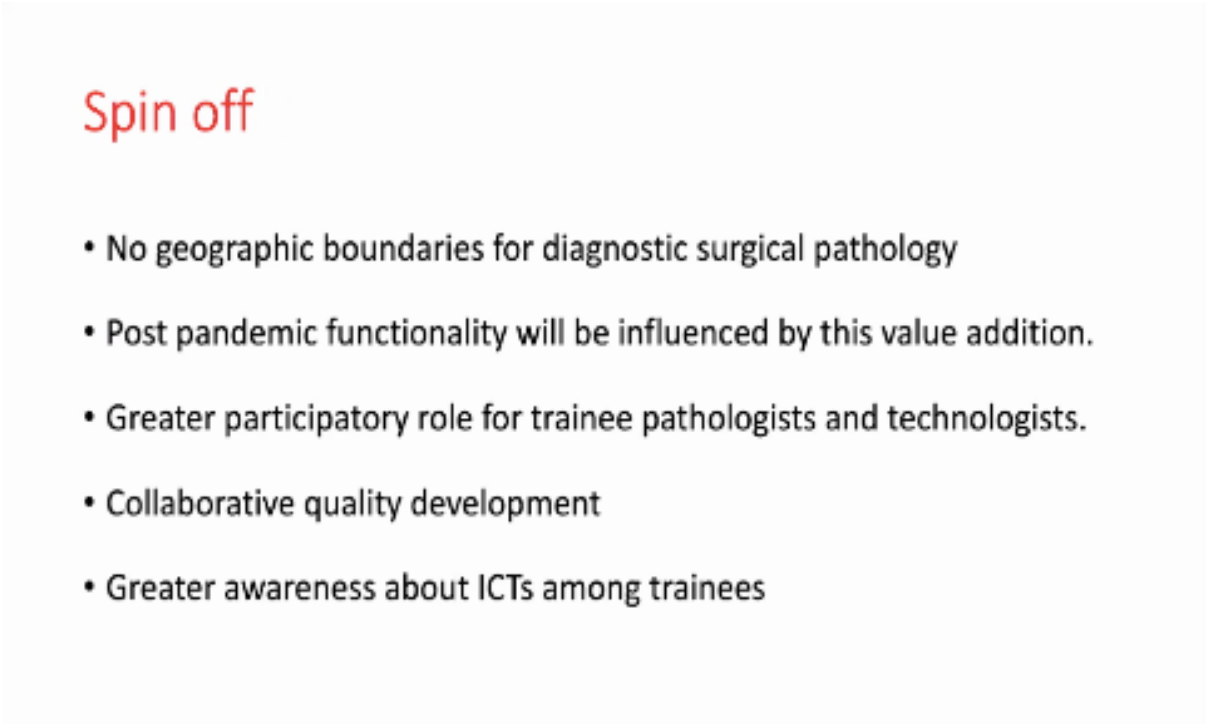
On comparing WSI Vs Conventional microscopy diagnosis,

- There was no major discordance and 1.2% (n=7/567) minor discordance.
- The deferral rate was 4.5%.

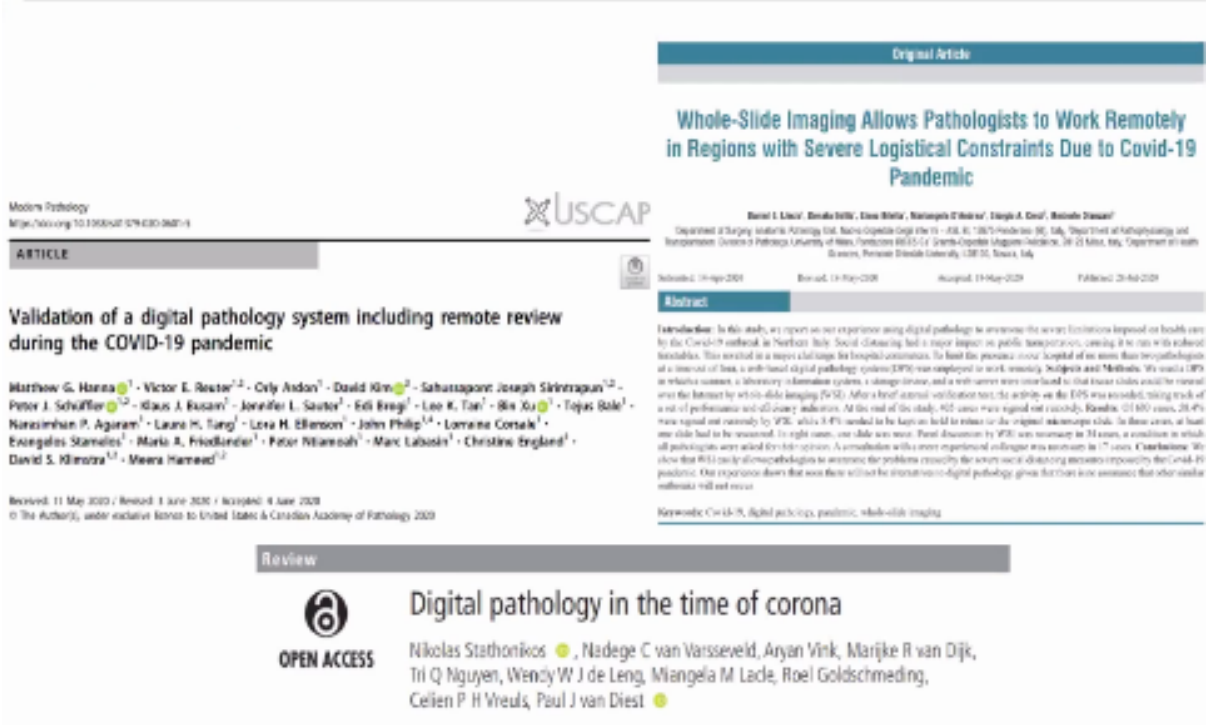
So the results are, there was absolutely no major, major discordance. This is on comparison of conventional microscopy, diagnosis versus digital pathology after a gap of four washout period of two weeks. And there were minor discordances of only 1.2%. So seven cases out of 567 the deferral rate was 4.5%.



We successfully validated and adopted our digital workflow for remote reporting from home with whatever was available with available resources. And we're able to provide our patients and undisrupted access to subspecialty expertise during these unprecedented challenging times.



So what are the spin offs? We know that there is there are no geographic boundaries For diagnostic surgical pathology, post pandemic functionality will be influenced by this value addition, the pandemics is still on. But there is 100% unlocking and 100% attendance in the hospital, but some of us are still reporting digitally greater participatory at all for any pathologist and technologists, there was collaborative quality development because if you have to have good image, you have to have good slide. To get the good slide, you have to have good processing and good fixation. And there is now greater awareness about information and communication technologies among trainees.



Modern Pathology

ARTICLE

Validation of a digital pathology system including remote review during the COVID-19 pandemic

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Received: 11 May 2020 / Revised: 3 June 2020 / Accepted: 4 June 2020

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USCAP

Original Article

Whole-Slide Imaging Allows Pathologists to Work Remotely in Regions with Severe Logistical Constraints Due to Covid-19 Pandemic

Abstract

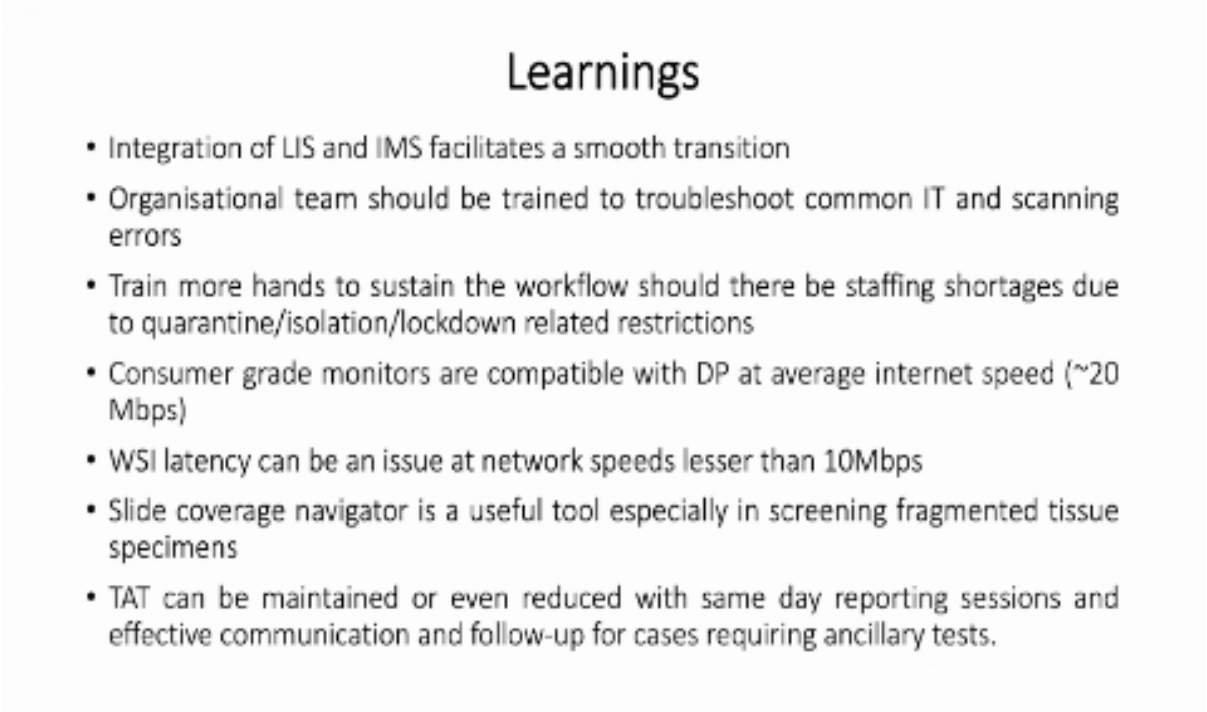
Review

OPEN ACCESS

Digital pathology in the time of corona

Nikolas Stathonikos, Nadege C van Varsseveld, Aryan Vink, Marijke R van Dijk, Tri Q Nguyen, Wendy W J de Leng, Miangela M Lacle, Roel Goldschmeding, Cellen P H Vreuls, Paul J van Diest

Now there are many publications coming up related to experience of digital pathology during Corona pandemic. And even our article is in press describing this experience. So this is the gist of what we did.



Learnings

- Integration of LIS and IMS facilitates a smooth transition
- Organisational team should be trained to troubleshoot common IT and scanning errors
- Train more hands to sustain the workflow should there be staffing shortages due to quarantine/isolation/lockdown related restrictions
- Consumer grade monitors are compatible with DP at average internet speed (~20 Mbps)
- WSI latency can be an issue at network speeds lesser than 10Mbps
- Slide coverage navigator is a useful tool especially in screening fragmented tissue specimens
- TAT can be maintained or even reduced with same day reporting sessions and effective communication and follow-up for cases requiring ancillary tests.

Learnings our integration of allies and scanner associated software facilitates smooth transition. Organized organizational teams should be trained to troubleshoot common IT and scanning

errors, we have to train more hands to sustain the workflow because of staffing shortages. Due to quarantine isolation lockdown related restrictions, consumer grade monitors were used and they were compatible with digital pathology at very average internet speed. whole slide imaging latency can be an issue at network when we are dealing with network speeds less than 10 Mbps. Slide coverage navigator is a useful tool especially while screening fragmented tissues like QRBT specimen bladder tumors, and transurethral resection specimens and turnaround time can be maintained or even reduced with the same day reporting sessions and effective communication and follow up of cases requiring ancillary tests. So the biggest learning or biggest lesson me we want to convey his preparedness during peacetime makes us ready for the war. We were using digital pathology since 2018 for various other applications like education, and we manage primary diagnosis sitting at home using digital pathology and AI. Think I will end over here by acknowledging the team of 18 pathologists, the technologies and the Tata Memorial Hospital IT team and Mrs. Anuradha and Mr. Sameer from Roche diagnostics. Thank you very much for patient hearing.

Thank you, doctor. They say it was a great presentation. Now I'd request our chairperson, Dr. Meenu Singh to conclude the session. Dr. Meenu Singh just Could you please conclude? Thank you very much all the speakers, I must compliment all of them for the excellent talks. We know that just to borrow from Dr. Sangeetas notes that the Corona pandemic has actually led to coronation of Telemedicine as a mainstream medicine. Actually, it's not just in pathology or in cancer pathology. It's everywhere. And as we had started, in March or April, when we started, we had the guidelines and we thought that we have now become more legitimized for using Telemedicine. We know that the guidelines had allowed the use of telephone, the WhatsApp, the email and everything is, you know, which was there in the tele technology for using Telemedicine?

Now, my question is for Dr. Mohanty, and for other speakers who would if they would just like to tell us as to what proportion of their teleconsultations were based on standardized EMR and what proportion was on, you know, these other modalities which were there, because we in Chandigarh in PGI, also use this technology and we had 1000s of consultation being done every day for Telemedicine those days, you know, when it was totally locked out. So I would like to have your experience on this?

I think the answer is it was not in the standardized EMR format. It was otherwise.

Yes.

So I think for future we have this task to be done that we formalize it. And because I don't know, the medical legal part, you know, which always used to come in our way of practice of Telemedicine, you know, in general, was that there are certain security issues or there are certain issues which can, you know, the court cases etc, which had come up and those are the hurdles. So those were the challenges, but I think those challenges would still be there and they have to be overcome and some of them actually been overcome now that Telemedicine is taken of the country by storm, I think they would be taken up. So, any other questions which have come in the chat box?

Ma'am, we do not have time to take a question because we are really running short of time for the next session, so I think we would that we would like to close the session. I thank all the speakers and the moderator for conducting the session. So well, thank you very much. Let's go to the next session. Thank you, everyone. I thank the chairperson Dr. Meena Singh for chairing the session and all the speakers, we are running short of time we will move on to the next session. Thank you.

Day 1	Topic	Speaker
• 18th December 2020 (Friday)	• Cyber Security for doctors	• Dr. Krishna Kumar

I would now like to invite Dr. Krishna Kumar. Dr. Krishna Kumar currently is the CEO at knacks in life sciences. A Telemedicine startup focused on delivering healthcare services through a digital platform clinic on clinic.com, healthcare executive and entrepreneur with 22 years of experience in the pharmaceutical industry, medical supply chain and productive labs, continuously working for rural healthcare with innovative digital platform organize many webinars and live sessions on various social cultural activity for common people. Especially specialties, product development, business operations, brand activation, medical and pharmaceutical marketing and distribution North India hospital supply chain I would now like to hand over this session to Dr. Krishna Kumar.

Good morning to all of you. Welcome all delegates and speakers to this second session of Telemedicon 2020, which is the first big virtual event of Telemedicine Society of India after

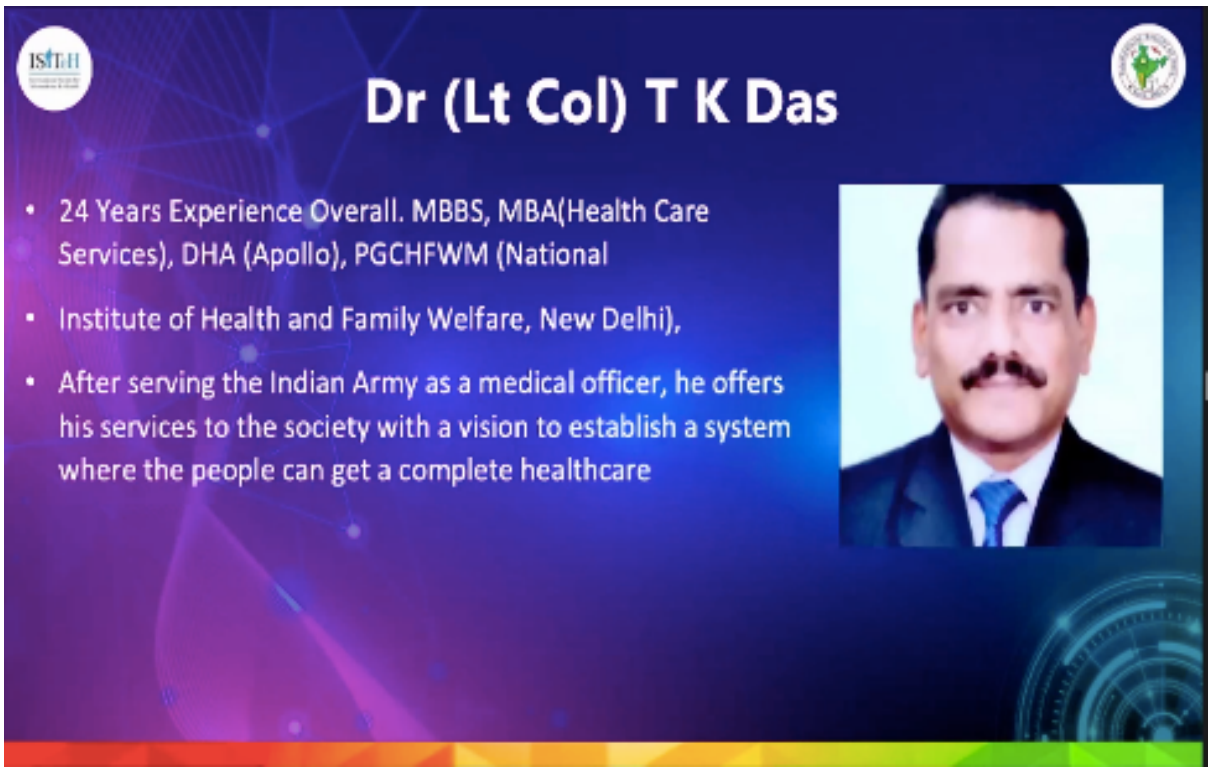
the pandemic situation. Thank you TSI and organizing committee for giving me the opportunity to chair this session. We have eminent speakers here today. I am privileged to welcome our speakers. I also welcome participants and our viewers who are watching us live. Our session is also live on other social media platform. I welcome all of you.

We are here to discuss on data breach cybersecurity, for doctors, basic precautions and how to keep consultation and records secured. Cyber Security is not just a technical and policy issues. It is a patient safety issue. Even in a country where people might not seem to care for the security of their information. We are witnessing great advances in digital healthcare technologies and also the need of Telemedicine because of COVID-19. However, there are issues like data breach and privacy of patient information, which are very much important for reliable and successful Telemedicine practices.

Today, we have three exceptional panellists to talk about the basics and the relevance of this subject for doctors first time in new normal scenario.

The session has two sections. First, a series of 20 minutes and second session is of 30 minutes, followed by a question answer session. It's my pleasure to introduce our speakers on this platform.

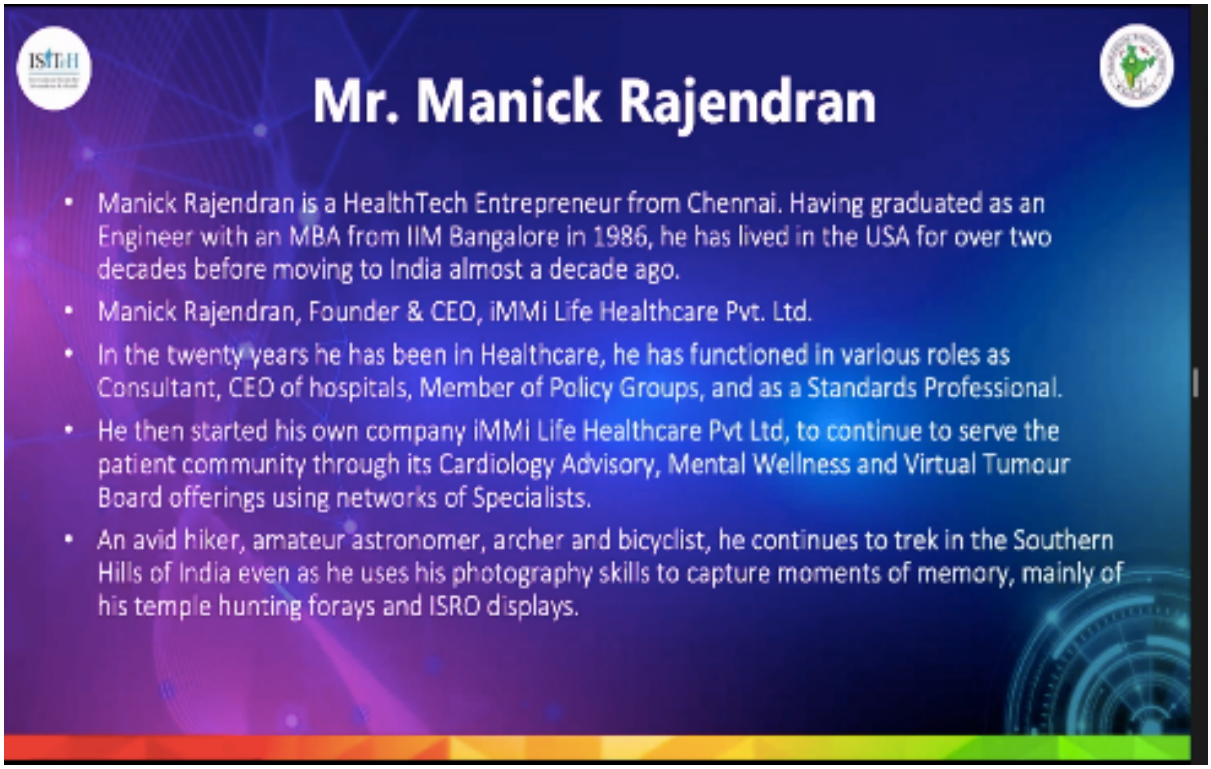
Our first speaker is Retired Officer Commanding Commander KK Chaudhary, who is CEO Data Resolved Technologies is president of CIO club Delhi NCR region and mentor of **Weseso.org**, which is a learning Foundation, a cyber Safety Awareness initiative for school students. He has over 35 years of experience in developing it and security blueprint for the organization in alignment with the business objectives. He is Alumni of IIT Kharagpur and MBA from NIMS Mumbai. He is CISSP C star Diploma in cyber law. He has been a recipient of multiple awards from industry. He has authored two books, why cyber criminals succeeded, and his stories of cybercrime and protection mantra. He's a respected speaker at various industry and Academy forum. Welcome Dr Chaudhary



Our next speaker is Dr. (Lt Col) T. K. Das. He did his MBA after doing MBBS, a healthcare professional with 26+ years' experience in providing comprehensive care to patients. He started Indian Army in various capacities worked as a clinical care coordinator in the past Apollo hospitals, New Delhi, presently working as consultant, emergency medicine and Delco Hospital, Madhya Pradesh.

Our next speaker is Mr. Alok Jha.

Mr. Alok Jha is having over 17 years of experience in cybersecurity, a strategist, planner and leader with distinctive abilities of value creation by attractive customers relationship, mentoring and leading IT security team. He is PGDIP from symbioses CISSP, ISO 27,001, lead auditor ITI limited, Ethical hacker of ISO 27,001 Trainer, social engineer and recipient of customer Choice Award of Excellence from employer.



To moderate the session. We have Mr. Manick Rajendra. He is an health tech entrepreneur, who has done his engineering and has an MBA from IIM Bangalore, when he was working as a vice president and Dutch bank on Wall Street, and Indian investment he made in EMR company brought him into healthcare. Since then, he has been in the healthcare industry for over two decades. Serving as a co chairman of a Tiger team. His committee reported into Obama administration of meaningful use of IT in health care. After being in the USA for over two decades. He has come back to India for the last decade, starting off as CEO of two back to back hospitals. He currently is a founder of a company that provides cardiac advisory to patients presenting with symptoms of heart attacks. As chairman of the Standards Committee at Bureau of Indian standards, he has led the Indian delegation to ISO meeting internationally. Now, I would like to invite Mr. Manick Rajendra, please proceed the session. Thank you.

Dr. Krishna Kumar, wonderful introduction to all of us. And I'm very happy to be the moderator for this session today. We will keep it tight. We as we have outlined, we have three sections to it. We will try to do the question and answer as much as possible. Those of you who want to ask questions, please go ahead and type it down on the chat. Throughout the course of a normal day, doctors use several critical information systems at the hospitals or places of work. They use patient records, test results, surgical monitoring, information and other information

at play are not just humans, but physical devices such as phones, tablets and desktops. Making doctors a productive part of security solutions requires not just a robust technology suite, but also a rethinking of their relationship with the security apparatus themselves. Doctors form the core component of the frontline defence of cyber, their reputations are tied to those of the hospitals and establishments they work in. We have a great challenge ahead of us. Today, The cyber experts we have Cmnd. K.K. Choudhary, Dr. (Lt Col) T. K. Das and Mr. Alok Jha. May I invite you all three to come on to stage and because you're already there, Commander. Please go ahead and take the proceedings. And let's see what you are able to take us through for the next 45 minutes.

Thank you very much. Mr. Manick and Dr. Krishna Kumar, for the wonderful introduction of all of us. Special Thanks to Dr. Shroff for giving this opportunity to speak to the medical practitioners and those who are in the health care world.

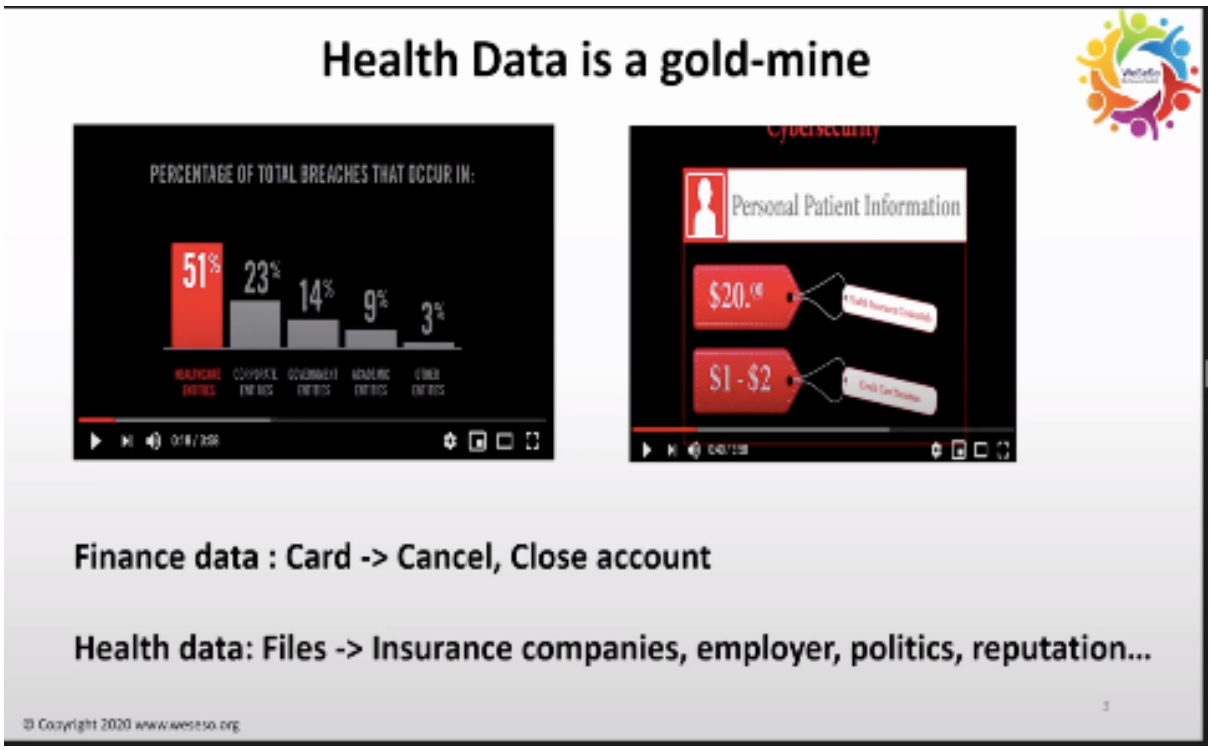
First, share my screen and then take you through my presentation.

I was listening to many presenters and all of them have made one common sense of the morning was that the corona epidemic has made us more digital than what we were as a CEO of a data security company. I never imagined that I will be able to sell the product with don't go into the

street without going to the customer site. But that is the reality today, the world is moving very fast towards digitization, and now it is going to be a new normal. Now with that, you know there is a saying that when you ride too much on technology, sometimes technology takes you for a ride. And that ride is very, very costly. And that ride is the worry about the security breaches as you go digital. So in about 30 to 35 minutes, all three of us will present to you the cyber security aspects which are important for doctors to understand.

There are quite a lot of bad news in the market, in newspapers throughout the internet. And a few of them I have just invested over here. And most of them belong to Indian these things won't be services for 8 to10 doctors have experienced cyber-attack Healthcare data leaks are plenty. I've just brought a few of them. Mumbai, Breach Candy hospital had data leak incident over there, what 120 million medical images of Indian patients were exposed. Hackers attack Indian Health Care website steal 68 lakh reports. This is happened with the Indian Health Care System. Two Indian hospitals leaking Patients information without even knowing about it. That means the hackers had complete control over their data. Very recently during Corona days, there was a prescription floating around on the name of AIIMS doctor and a doctor from Gangaram Hospital giving suggestions on the medication today.

Recently in October Dr.Lal Path labs suffered this attack again and millions of distance reports were leaked out. More worrying things which are coming from the international research scenarios that some researchers in Israel there have shown that, How 3D medical imaging systems like CT scan and MRI scan etc can be Intruded and the tumors can be you know, intruded into the images and thereby fooling the doctors on the real test reports. So, all these things have really created a big worry for the medical fraternity and realizing this, obviously, governments cannot sit behind. So government have also brought out a lot of Acts, rules, guidelines, etc. Telemedicine guideline is of course, one of them. Health Care Law is very, very stringent in international market with HIPAA being implemented all across and the use of penalty and you know, actions being taken against those medical establishment for data breaches have taken place in line with that Indian Government is also now working very hard. And we will be discussing a little bit about that aspect. Right, get onto that aspect.

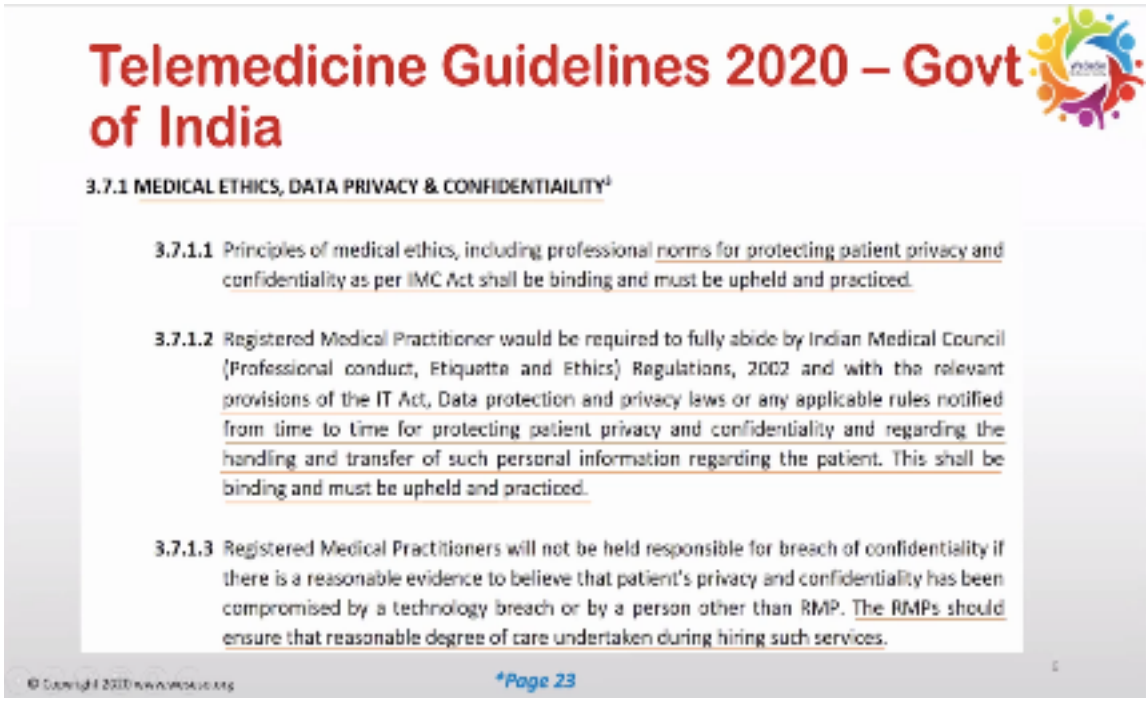


Why health care data is a Gold mine. As survey says that more than 50% of this security breaches are or hackers attempts towards healthcare entities. And that is basically because the cost of the medical healthcare record it's 10 to 20 times more than the financial records. A credit card record with get sold in one to $2 in the black market, which is called as you know, in the Medical scenario we have got a dark web, where a lot of underworld trades are going on. And if you see the survey on the dark web, you will find that the biggest trade is on the pornographic material and second biggest is on the medical you know, prescriptions drugs, etc.

Now, why is that, if you see financial data, if a fraud happens, if my credit card gets stolen or my credit card number etc gets hacked, what will happen I will lose once, twice, thrice, but the moment I am informed, I make a report to the bank I blocked my card I cancelled my account with the bank and my loss is limited to that even if I'm not able to recover it from Bank whether it is from my now bank will return based upon whether it is my fault or the hackers, intelligence and banks weaknesses. So, there is some RBI guideline on that, most likely if you report within three working days, you will be able to recover your remote point here is that when a financial data gets lost or hacked, the loss is limited, but when a health data gets lost, supposing a digital health file gets lost, if it goes to the insurance companies, they have got their own advantages out of that very difficult to recover from there because it has already gone out if it goes to the employer, the employment of the affected person can have affect political figures if their data gets out, all it will have a different connotation and very, very difficult to stop this. This is the reason why Health data is very costly as compared to the financial data.

Just if you focus on 2020 from January onwards, I have just taken six breaches of 10 which has been which is available on the surveys available on the internet. And basically I have picked up to bring out what are those aspects where we need to focus upon. So for example, the healthcare of Oregon, 6,54,000 patients data got breached and why it happened, just because a laptop of that hospital was lost, and the laptop was not encrypted and somebody took all the data. Very simple thing, people who would never have thought that you know, losing a laptop

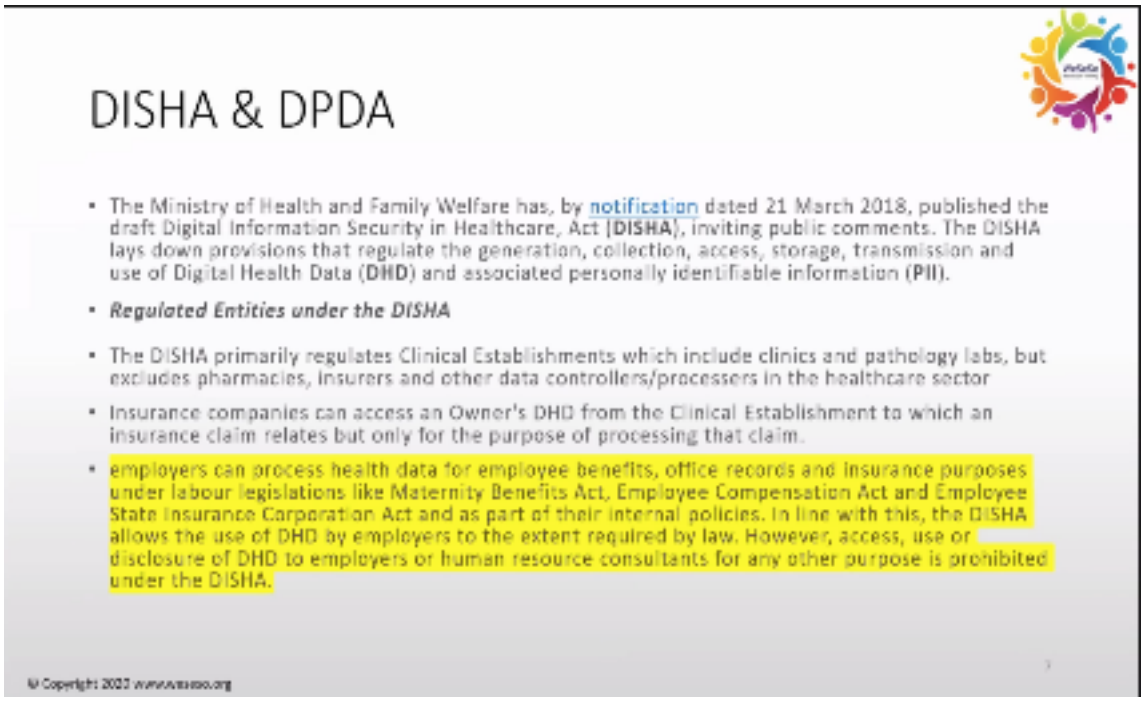
can result into such a scenario, Elite emergency physician, 5,50,000 patient data got lost, why? Because they improperly disposed persons records, including the records of emergency physicians. Now, again, we have to be careful that how we dispose our systems and when supporting scanners or any healthcare systems your laptop got corrupted, you have handed over to someone for repair. But data is still there. So these are very small things, which people probably did not take care and such things happen and be genetics, again, lots of patients data got lost. Why? Because there was an email hack. So a doctor was given some email and he clicked that mail and the malware was put there Trojan was put there and data could be accessed from there. There have been you might you all are doctors who must have heard about these things. Ransomware attack is very, familiar in the healthcare system, there was an operation going on and when the doctor wanted to access some data in ICU or on surgeon table, whatever you call, you know that is the time and pop up game that you'll need to pay some Bitcoin to access this particular information. So these things are very, very popular over there. Similarly, targeted phishing attack, somebody giving a phone call and, you know, appearing to be another doctor or CEO or the superintendent of the hospital and asked him for some information that information gets shared. These are the kinds of breaches which have become so familiar and so costly, or also that in just last about 7-8 months, these have figured in the top data breaches in healthcare.



Now let's see that how doctors have the least Go to binding on this. You'll see the Telemedicine guideline which came in March 2020. I have just taken some paragraphs from there, paragraph 3.7 point one is speaking about medical ethics, data privacy and confidentiality. Now let's see what is important there.

In the first section it says that principles of medical ethics including professional norms of protecting patient privacy and confidentiality as per IMC, shall be binding and must be upheld and practiced, this is for the IMC.

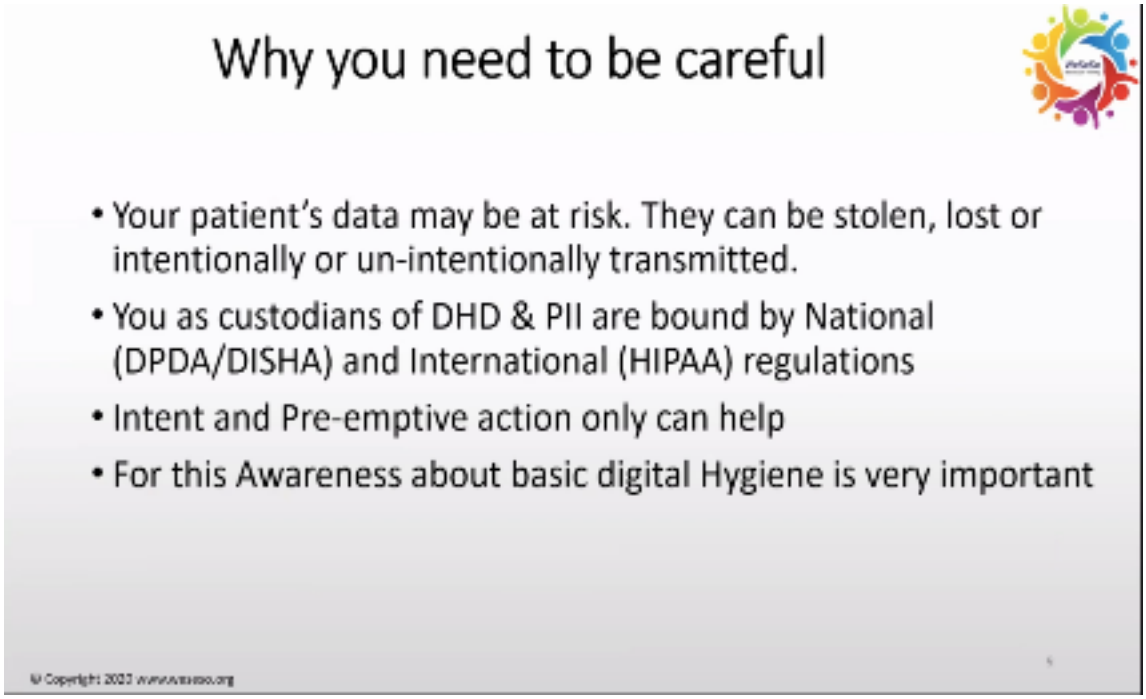
Similarly, it says that Medical Council regulation and with relevant provision of IT Act data protection and privacy laws or any applicable rules notified from time to time for protecting patient privacy and confidentiality and regarding the handling and transfer of such personal information regarding the patient, this shall be binding and must be upheld and practiced. So it is binding on the doctors or the clinical institutions. And the safety belt, which Alok Jha will bring out later, is stated over here that it says that The RMPs will not be held responsible for breach of confidentiality, if there is a reasonable evidence to believe the person's privacy and confidentiality that has been compromised by technology breach or by a person other than RMP. So there's a very good safety belt over there, but a rider is there that the RMP should ensure that reasonable degree of care undertaken during hiring such services. So, that was the Telemedicine guideline.



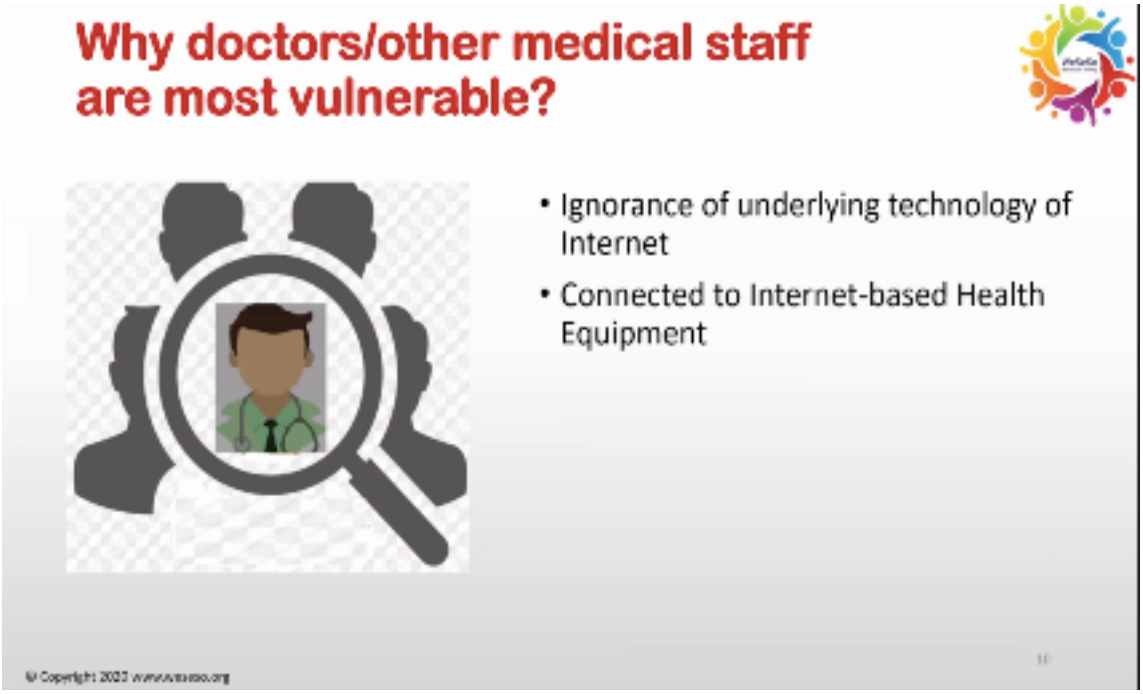
But even before the Telemedicine guideline came. the government had already started working on the **Digital Information Security Health Care Act, (DISHA)** and ministry of health and Family Welfare have issued a draft also on this. DISHA basically regulating how the clinical establishment will share confidential data to different entities wherever they are required. It says that for employees benefit office records and insurance purposes under Labor legislations like maternity benefit act, employee Compensation Act, employee state Insurance Corporation act, etc. There may be that other entities can seek these data from you. Now, while you are giving this particular data you must know what is to be given what is not to be given I'm sure Alok Jah will give you some example or some sort of, you know, scenario to discuss about on this.

DISHA also talks about or defines the breach and serious breach. and, you know, simple breach is basically in case some action which has happened in contravention to any act like IT act, EPA or DISHA or Telemedicine guideline for that in a manner, that violates rights of the owner that means owner of the data that is the patient himself and results in damage deletion or alteration of data. In case there is any damage or deletion happens.

But a serious breach is more important to understand that any breach of data that is carried out intentionally, dishonestly, fraudulently or negligently doctors may not do it, but their staff can do it under some pressure, some quartz on some sort of greed or whatever the breach of data that relates to data that is not the identified or anonymised. So, when you are sharing some data digital data, if it has not been anonymised, or for example, some sort of masking has not been done before transferring, then it is quite likely that it will be a serious breach. The use of DSP for commercial purposes or commercial gain, if you have shared your personal data for some commercial purposes or your own commercial gain, it is a serious breach. Repeated breach of digital health data by any entity clinical establishment or health information exchange. These have been defined as the serious breaches and it says that serious breach of data is punishable with an imprisonment which may extend from three to five years or fine, whereas simple breach is just fine. So as the medical entity as a medical practitioner, it is very, very important. That you will understand the responsibility of keeping the data of person safe.



Question Is that why you need to be careful as I said your patient data may be at risk they can be stolen, lost or intentionally or unintentionally bought off me, you as a custodian of these Health data and personally identified with information on by national and international regulations. Intent and primitive action only can help. So, in case they breach all that you have to show that you had taken care of preventing such loss and if you can prove that probably the penalty will reduce and for this awareness about basic digitalizing hygiene's, very important.



Now, I will like to call upon Alok Jha, who is basically a cyber security specialist working with me, because of his passion on cyber security and my Weseso learning Foundation, which is Vsecure society. We are doing the cyber awareness program for the schools for medical professionals and for the corporate staff and out of this person he has got associated with this foundation, I will now call upon him to talk about how doctors are basically targeted by the hackers, he himself is an ethical hacker. Thank you,

Thank you very much KK Sir and Good morning everyone. So, till now KK Sir has shared what risks can be there, what kind of hacks have already been done, and what are the damages lurking open healthcare industry. So as KK Sir has very rightly said that healthcare health data, the goldmine for the hackers, and you know, why this is called the gold mine and what is the importance of health data? So, it is and why this is happening? Technology, itself you we can't mitigate or we can't control any kind of attack only by fixing the technology. It is every individual who has to be more aware about and aligned himself with the technology and with the day to day activities which they are doing while connecting to the internet. They have to follow the best practices to secure any health data related to any patient or anybody who whose data, the medical practitioners are handling.

I will take you through a couple of methods through which hackers are targeting any medical practitioners or whoever having the health data. It is not hackers are basically using a social engineering attack. Social engineering attack, which is an attack on human psychology. They don't use any technology. Very minimal technology they are using but they manipulate the hackers or attackers manipulate in a way that they very easily exploit human weaknesses, psychological weaknesses, in which Phishing and Vishing is one of the most common attacks which is happening on day to day basis. Phishing is basically email based attack where hacker collect harvest millions of millions email First of all, and they craft or draft an email in a way that maybe it will be related to some recent incident or recent kind of event which is going on and they draft, they put something very, very lucrative in the subject line and drafting a put some messages in that and embed a link a malicious link into that phishing email. The moment somebody will click the email, two things can happen. One thing a form will be presented and where it will say that can you please fill your personal information or medical information or whatever that email is intended to it will be very related and very focused on to what the hacker is trying to get what kind of information he is trying to get from you. The second thing can happen that the moment somebody will click the link the malicious software will be installed on his device whatever the device is using and it will keep sending all the data whatever the property of that device malicious software will be there. So, this is the phishing attack, and it is most common hacker do not need to be very technical, the templates are very publicly available, they just have to pay some of the amounts and they register from some as cases of acid that the dark web is there, they can get such kind of template onto the form from the dark web.

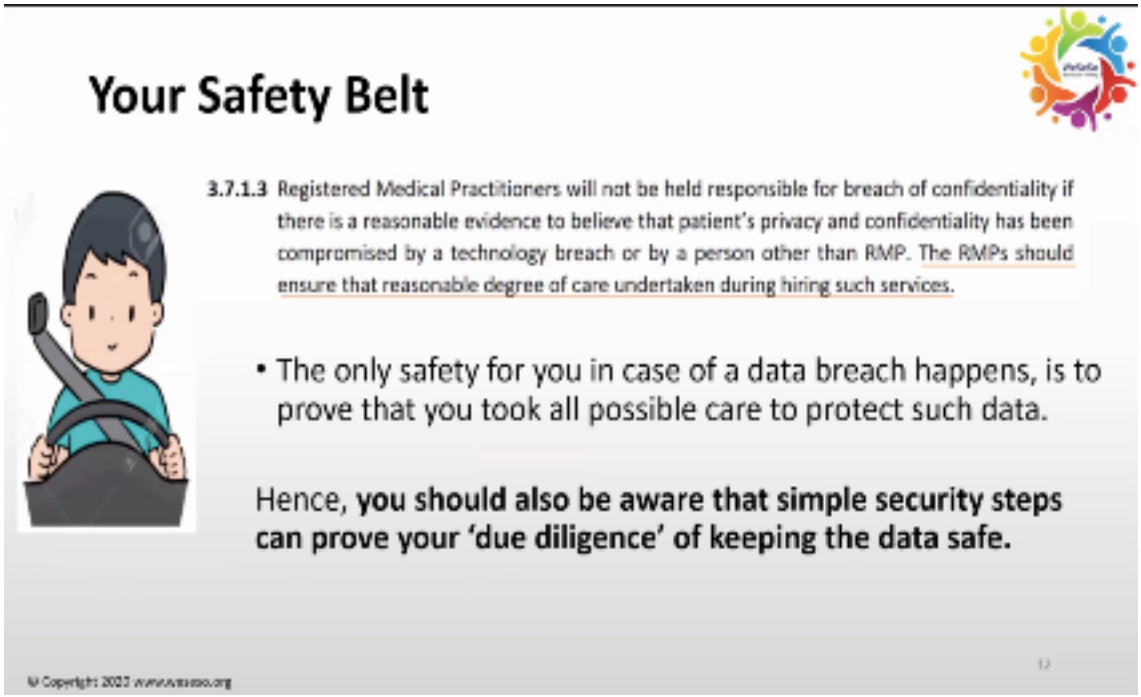
Similarly, a Vishing attack, phone telephone based attack, in which the attacker again harvest lots of lots of phone numbers and they call the victim and try to manipulate him and try to get some kind of try to seek some kind of information from the victim and they present in a way that it seems like if the victim doesn't share the information, something wrong will happen with him or something wrong will happen with in years and to near and dear ones.

The second kind of very common attack is a spoofing, spoofing is mainly It is said that somebody can spoof something that somebody can steal your personal email address. So, whatever spoofing happens in two ways, one is through the email and one is through the phone, in this spoofing, I can use your email address and there are so many public websites where I can if I know your email addresses, I can type your email address and send some kind of email

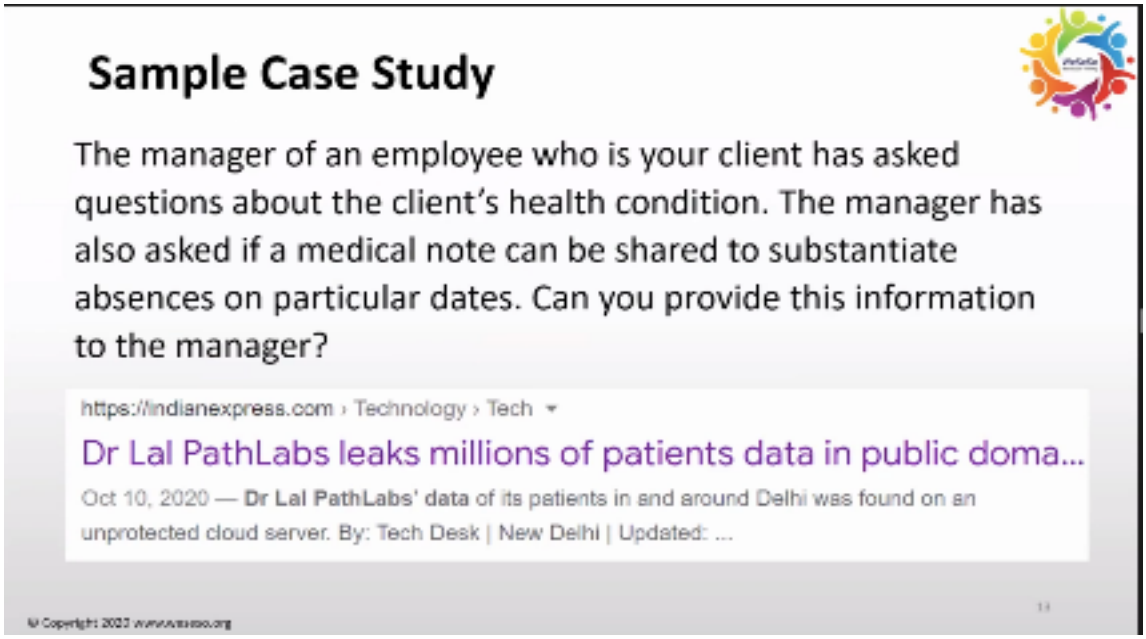
to your friends. So, your friend will understand that this mail is coming from my friend. So, we have to be very careful that whenever we are sharing our email addresses, we should not share our email address here and there, we have to be very choosy and very careful whenever we are sharing the information or email address, secondly, the phone numbers as well there are so many technologies are available hacker registered themselves and just paying couple of 100 rupees or 200 rupees per month and they get a website or they get a platform there they can put my number and they call my children, my daughter, my son and my son will understand that if the call is coming from my number. So, this is the way the hackers are working. And these days and the hackers are trying to exploit, whatever is going on the current situation like at the moment we are all connected through social media posting earlier it was a little bit less since COVID situation came we all are almost connected on social media and we are using highly very frequently using social media. So again, the social media platform is one another place where they are putting some kind of malicious link, malicious message and they influence the victims to log on over there share some kind of sensitive information personal information, personal identifiable information and health data.

Then another is hacking computers again, this is little bit tricky for the hackers. what they do of course is the physical security, there, hacker could not go directly to reach to your computer or your smartphone, what they do is they just dropped some of the USB drives near to your office entry door or somebody will pick the USB drive and connect to the your laptop. Now your laptop or machine will get infected.

The next one is the hacking the internet connected device I was using on my smartphone, Apple Watch and I saw that due to these smart watches. Smart watches are collecting all health data as well. It can collect your heartbeat it can collect your sugar level and all those things and those information and going over to some of the servers. Now if the that server is not secure, you can believe that whatever the smartphone how many people are using those your smartphone, those sensitive or personal health related data will be revealed due to some kind of lack of awareness or less protected devices.



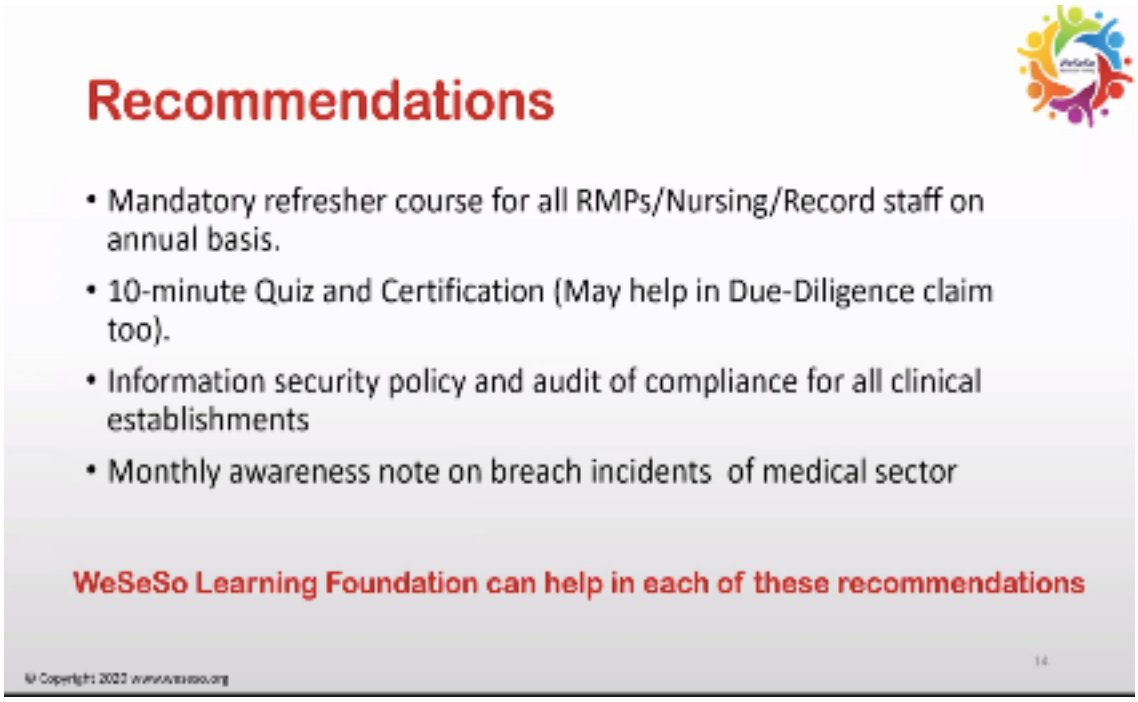
So as K.K. Sir has said that there are so many regulations. As I have said that it is not only the technology who can protect. It is ourselves who have to be aware about the current situation and the ways and methods of the hacking and We have to keep learning similarly, as there are penalties and the jail terms if some breach happens, but all the medical practices can protect themselves by just following few of the security practices and they can show due diligence that yes, they have done all the things to understand and to protect any kind of data, personal data or healthcare data. And whenever some breach happens, they should have some kind of evidence that they had gone through some trainings, they have encrypted their devices, they had, they had password protected laptops, and all those things they have to present. So, it says that the registered medical practitioner will not held responsible for breach of confidentiality, if there is a reasonable evidence to believe that the patient privacy and confidentiality was protected, and it has happened due to some kind of technical fault, it is not due to some individuals fault or due to the negligence of the personal individual, medical practitioner. So, we have to be very careful.



I will, take you through a couple of sample case studies where it is very common these are the very common practices which is happening on day to day basis and you all are the doctors and the professionals you must be facing such kind of situation on day to day basis like some employee, who was on leave for a couple of days and his manager or his boss calls you and asked you can you please share me some kind of details that it was he really sick or what kind of medical condition he was. So, in this case, any medical practitioner is not supposed to share any medical related information. He must have some kind of awareness that what all in necessary information should be shared with the employer, the manager and what all information should not be shared and it is one only can share only those information after getting consent from the patient. So, in this scenario, what I understand that if somebody if medical practitioner getting call from employees manager, he should not share any medical related data, he should just share that yes, he was admitted or he had some kind of medical problem medical issue, but he should not suppose any kind of medical related information. And in this way, if he can show the due diligence and he can explain that, yes, he has followed some kind of guidelines, medical related guidelines.

The another example is Dr.Lal Path Lab, this is a very recent incident that happened , Dr. Lal Path Lab was migrating their data onto the cloud server. In this case, what happened was that all the information had been migrated to cloud, but they had not followed the due diligence because anybody can access lots of millions of patient data in a excel sheet, and that Excel sheet contains lots of information about the appointment about the medical condition of the

patient, and the number of patients were there, what kind of medicine was prescribed to that person. So, in this case, what happened of course, they knew that these data sensitive but they had not followed any kind of security practices norms like they had not got a contract from the cloud provider that they have to secure they have to encrypt the data, which is going on to the cloud server, they have not protected the access to with any password anyone can access. So, here it is, we can see that the due diligence was not followed. And that company most probably will have to be face legal charges against these data breach.



So, the next thing to understand all these things, is always recommended that all the medical practitioners should have either one of the courses or all of the courses to make aware because these cyber criminals are very intelligent. I had given you one example about this phishing email or the spoofing calls is likely now, you understood that okay, I don't have to click on any of the links which is coming on from the unknown sender. But yes that will become an old thing, hacker will innovate and come up with new ideas and he will present himself with the new technologies and tricks. So, you have to make yourself aware on day to day basis on the monthly basis or annual basis. So, these are the courses, recommended courses that you should mandatory courses that they should know that what are the policies and procedures in the horizon or wherever it is, whether it is a hospital, whether it is any kind of place where the sensitive data or personal health data is out there. So, maybe 10 minute quick course who can work for the users. So, anybody can have such kind of courses , lots of courses are there you

can go over there, you find that these are the few questions what you will do in the time of such an incident happening or some hacker is calling you and asking, Can you please share some information about that person?

The next one is information security policy and audit compliance for critical establishment. So, these are the courses which will give you the guidelines, what government says what are the local laws and regulations says and what organization or the hospital is asking you to do on a day to day basis. And of course Wesesa learning foundation can help you in all these courses or anybody who is looking for getting a cybersecurity related awareness, we can definitely be able to help you or we can we can connect you somebody who can give you a better understanding about the cyber security kind of thing.

Now, I will ask Dr. T.K. das, you know, he has been interacting with me for quite some time and we discussed quite a lot of cybersecurity related issues whenever he has bought any doubt. So, Dr Das, anything that comes to your mind that you want to share as a medical practitioner, which probably we can reply to you,

Sir, as we all know, data breaches, targeting hospitals constantly are very high. So, what are the ways that we keep our records safe?

Sir, there are couple of things that you should keep in mind, one is that you should have the sort of security policy in your organization, if it is a medical entity kind of thing. So that one thing is very clear that you know what you are supposed to protect. So in that security policy, you will keep those assets identified that these are the assets that I have to save, and how you will be saving those assets that should be clear. The second is basic hygiene. For example, when your laptop, if you are using this laptop to restore the discharge data, you must ensure that the USB drives are disabled, nobody else will be able to put the USB drives over there, as Alok said that this is one of the good way of doing social engineering and putting the trojans on your machines, your antivirus software should be quite well updated, your OS patches should be updated. So maybe a weekly, you don't have to do anything just installed on a weekly basis that somebody have some stuff just confirms that this thing has been done. And most importantly, all your staff should be aware of what are the different tricks that hackers can play. And that is where the awareness comes. Now, if you keep these three four things in mind and implement them effectively, then you have done your due diligence when if there is any breach,

you don't have to worry much. But to prove that you did take those basic precautionary steps and beyond that was not your responsibility and you will be saved. In any case, you will be able to save the data.

So the second question, that most of our medical equipment's are registered online these days. Even simple like our BP instrument or other equipment. So how can we save those data's?

Yeah. So again, if they are the medical equipment's which are connected to internet, as I said they're vulnerable, an IoT in medicine is picking up quite a huge space for example, in pacemakers, your insulin meters and all those devices which are now internet based that doctor can monitor remotely. So, one is technology. So, technology wise it has to get more improved. So the protocol to access is different and server synking comes on a secure channel with a you know, proprietary kind of protocol, those things technology developments are happening all that you have to do as a medical practitioner, that knowing that your equipment may be at the target of the hackers, you should take those precautions as to who can take out the data from there if that medical instrument goes faulty, what is the process or whom will you go for repair, is that chap understanding the security aspect of that or not, or if you have to disclose those medical equipment's, whether you have been able to clear their internal memories etc or not, they are the minor things that you have to keep in mind as a medical practitioner, I just told technologists are working on that to make the IoT more secure than what it is today.

But I would like to conclude this particular system from my side showing you this particular Hindu methodology very important and very familiar, you know, picture where in Arjuna refuses to fight against his own relative saying that it is not my enemy. And Lord Krishna says that Arjun realize the change are not your enemy. As a matter of past, today, they all are your enemy, if you ignore this particular change, you are getting killed. And if you accept this change, then probably you are the winner. And that is where is the essence on this session is that we all have to realize this change. if doctors say that information security is not my worry, it is a matter of past dear doctors. Today, it is certainly your responsibility to ensure that your digital data, that is there in your custody is safe. If you ignore this particular change,it's a bane and it's a boon if you accept it. Thank you very much.

The new normal has been the new normal for quite a while. And we have been experiencing that as Alok Jah said, simple phising and vishing and all of those. And thank you Alok for

highlighting that hackers are usually using social engineering, not some technological hacking. But that's not the big, big thing that comes much later on in person for common doctor for common health worker, it is the simple social engineering that will be the trap for them. And that was very well highlighted by me, what was told. And commander, you also have said very clearly that intent and primitive action can be the only help that will be there. For every one of us. We need to have primitive actions and in that you cited a tool called Simple security policy. A security policy is a good tool for us to show that we have a good primitive strategy. And your recommendations were right on. And I think all the doctors here who are watching us would be able to understand the difficulty they're going through but also they do have great help from people like you who can make it simple. We it's not a major thing. It's a simple thing. We just have to have the right kind of hygiene and get on with it. So we have a few more minutes and we have some very interesting questions. Now I'm just going to throw open a few questions. And the first question I'm going to throw open to Alok Jha , is by Dr. Ratta from Pune.

He said how safe are the healthcare apps and platforms? What should doctors look for before onboarding such as Apps?

So of course,for the apps , whenever we are installing any free apps, first of all, we need to check whether these are the free app, or we are registering or we are paying something. So free apps are always vulnerable and be careful. And we need to see that what all information those health apps are asking, we have to provide very limited, we should provide very limited information, which is not necessary, never give those kinds of information to the apps, particularly paid apps are secure one. But non paid or free apps are not very secure. So you have to be careful what information you are sharing to that app. Okay. There you go. One more thing. I would like to add here that whenever you get these apps, buy it from the reputed sources. Yes, exactly. Thank you,

Commander, you had mentioned DISHA, it's an initiative that was created, there was a lot of public comment, there was feedback. And then of course, we are integrating that to the IT Act, and this whole bunch of things happening. So what are the legal issues? If a breach happens?

As far as doctors are concerned, this is very, very clear that as long as the due diligence has been taken care of, you are protected. Now, what is that due diligence ? Did you know that

you are responsible to keep this data safe? Did you know what data you have to keep safe? Did you know what is for example, Alok give you a scenario wherein a manager asked that my staff was hospitalized with you, can you give me details of this? To what extent you can give details? Yes, you can certify that this guy was hospitalized with you, he was admitted to your clinic for three days for some ailment. But if you along with that, give the symptom which was found and this was the health condition this was the medicine given this was a suggestion given, you are violating!. So due diligence is understanding what you have to say ,what do you have, what you are storing with you, what you are going to share with others and whether you have bought a security policy around so that your people who are handling this particular data know about their roles and responsibilities. If you add chill to that, then you also can show that every six months or every one year, I get one security auditor to see whether my policies are being successfully or impactfully or effectively being implemented in my organization or not. If you can show these three things, whether it is PDPA, whether it is DISHA, whether it is a Telemedicine guideline, you are safe, because you are not expected to be a security professional, all that you are supposed to be is security aware.

Excellent, thank you, you're not a professor you are not the IT person, you are the one that is safeguarding by way of having simple safeguarding procedures. Now, to that somehow, , in spite of all the anti spyware and malware, that we do get breached and is there a place where a doctor or an organization can go and complain to will that help?

Yes, most certainly.Government has given you a platform, there is the government organization called as CERT this is computer emergency response team. So, in case you have suffered any breach, there is a site you can log in or this thing that also is one of the important steps that you are supposed to do once you get breached. And second thing is that you should have some consultants in your known circle from whom, you can take immediate guidance as to once you have detected, how to stop that. So, because there is a time lag between a breach that has happened and it has been reported to somebody and somebody has come and given you a call you know or deleted. So, during that particular hour then when you have reported and somebody has come and mitigated that, you are supposed to ensure that no more intrusion takes place. So you should be knowing that in case some intrusion comes to your notice, what should you do? Should you stop using that or do you have any alternate arrangements To continue our work and the things get stopped or not. So, one is the that reporting to the government organizations and second is taking help of your consultants who are under you, who can

immediately come and at least give you some sort of I would say in your terms that emergency medical help ,emergency help to ensure that the breach is not affecting too much.

I would ask a simple question to Alok Jah. How do I ensure a prescription App is certified for me?

So, it would be given on that particular app itself, somebody who is using any kind of prescription, they have to look into the terms and conditions, they have to find about that particular app, the authenticity of that app, that how, whether it has some kind of authorization to collect any present information or not like lots of apps like banks, we are using some kind of bank so they have to be certified with PCI DSS kind of compliance righ,t that is they must have to be compliant. Similarly, for having such kind of data being collected by that app should be authorized from the government or from the medical fraternity that yes, these person these apps are authorized to collect such information. This is the only way I think you have to first understand .

So what we will do is, we will ensure our TSI members, will take this task, we will hold hands with cybersecurity people like yourself, and we will come up with recommendations that we can potentially have on our website. And we have held for the general actually that is the right way. In fact, just to add here, I was the president of CIO club, any IT app coming in or any IT solution coming in, we had a very good platform of sharing each other's experience and views. And based on that the entire CIO community used to take a view that this app is safe and this app is not safe. Your fraternity medical fraternity can also select few of such apps and then throw an open discussion amongst yourself involving the security specialist to find out which one is the best from all points of view, whether it is user interface or it is security, and that you yourself can certify how much data they can collect, whether they can store all the information somewhere or it is just on the fly and it will remain on to the person's app while itself or that information is not going somewhere onto the apps provider network. Thank you,

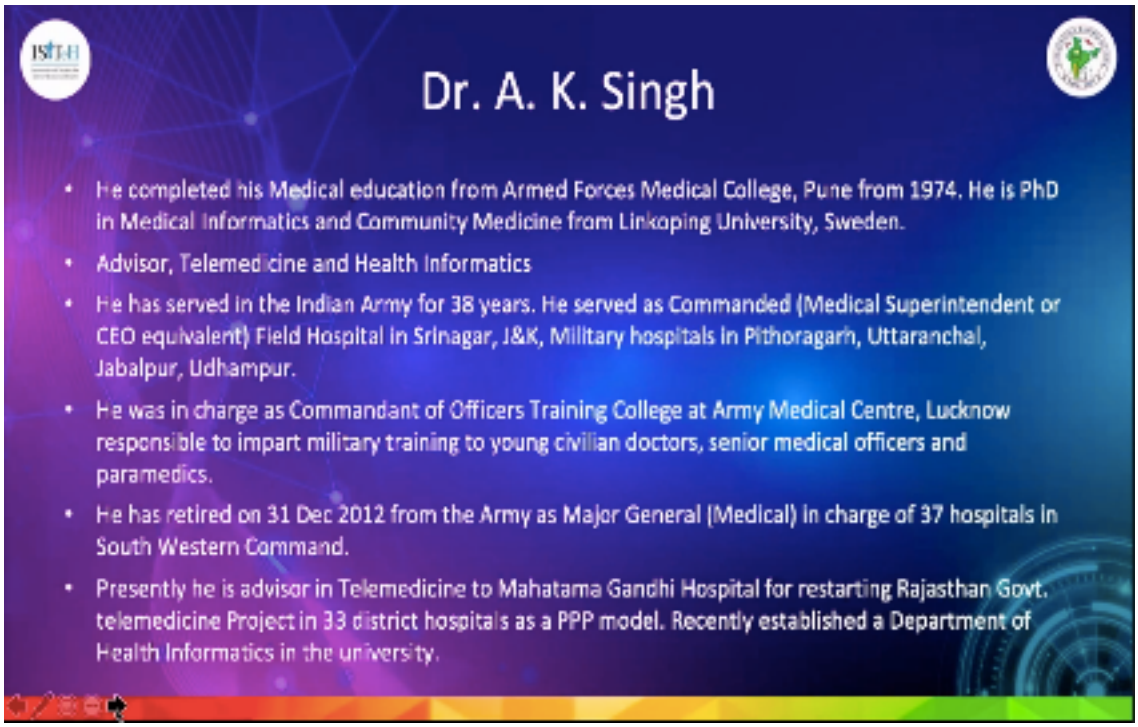
Thank you. So what we can do is we will ensure that the TSI takes note of this and we will take appropriate action and we will help our members and the community at large.

Thank you all for one question. Mr. Manick, Commander has alarmed medical faculty about the breach of the data and they are not aware right now, then they will lose, I think in future they will suffer. So can you name the few agencies or few auditors leader in this area?

There are plenty, see ISO 27,001 is a very versatile standards of international standards organization. Most of the compliances our audits take place on that platform. So you have ISO 27,001, lead auditor almost in every corner of your city of your listing, and then we can help 27,001 lead auditor and am lead auditor I wanted so many organizations. And there are plenty of them. There are plenty of security organizations themselves who can come and help you on that data information to medical parity again.

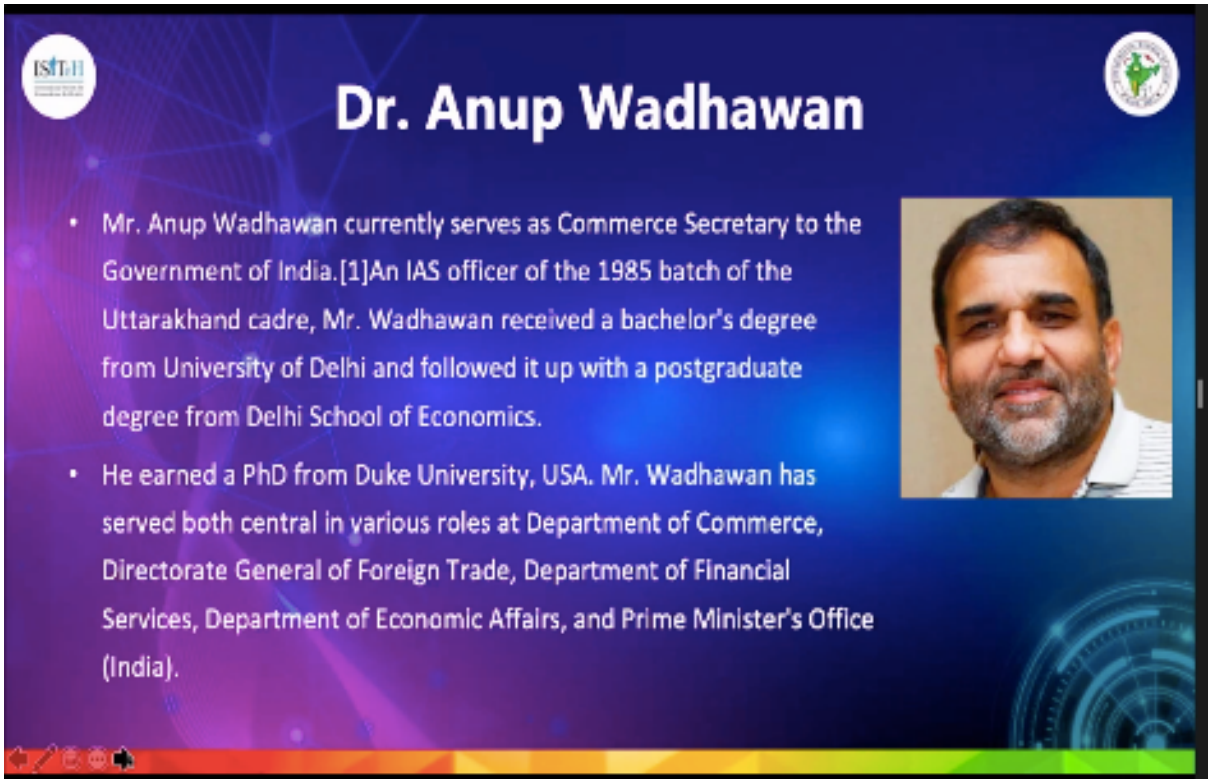
Thank you, all of you have covered well and thank you, thank you. Thank you. It's great pleasure. We headed back. You could take over please. I'll be live or I think it is my keynote. Yes. so I need to share my screen. Just one second. Just do an introduction to Okay.

Well, good morning, ladies and gentlemen.. I am Mr. Vimall Wakhlu. I'm the former Chairman and Managing Director of Telecommunication Consultants of India Limited., I am currently a board member of International Society for Telemedicine and E health and am a MBA and have got about 43 years experience in the domain of ICT. Thank you.



Now, I would like to introduce Dr. A.K. Singh who would be chairing this session also. He has completed his medical education from Armed Forces Medical College Pune in 1974, his PhD in medical informatics and Community Medicine from Linkoping, University Sweden.Is an advisor in Telemedicine and health informatics. He has served in the Indian Army for 38 years in different parts of the country. He was in charge as Commandant of Officers Training College at Army Medical Centre Lucknow, and was responsible to impart military training to young civilian doctors, senior medical officers and paramedics. He has retired in December 2012 from army as Major General in charge of 37 hospitals in the south western command. Presently is advisor in Telemedicine to Mahatma Gandhi Hospital in Rajasthan, Jaipur and also involved in a project in 33 district hospitals on a public private partnership model . He has also established a Department of Health Informatics in that University. Thank you.

Our next speaker would be Col. Dr. Ashwini Goel, he is the founder member and President Elect of the Telemedicine Society of India Convener and Secretary Telemedicine Society in North India chapter is the past Secretary National Executive Committee of TSI and of course, past Vice President of the Telemedicine Society of Rajasthan chapter. He is an accredited external assessor and senior consultant quality assurance and quality improvement technical advisor automation of NQAS and certification government of India Ministry of Health and Family Welfare and NHRC is a visiting faculty and external examiner BSc and MSC medical informatics at Mahatma Gandhi University of Medical Sciences and Technology Jaipur. He is a member of International Society for Telemedicine and E-health. Academy of hospital administration, Chairman and convener Subcommittee on Telemedicine Standards, health informatics, sectional committee, Bureau of Indian standards, health informatics sectional committee for BIS Standards MHD 17. Government of India medical equipment and hospital planning departments and is also involved with you UAI Technical Committee on a accreditation of tele health programs. Thank you.



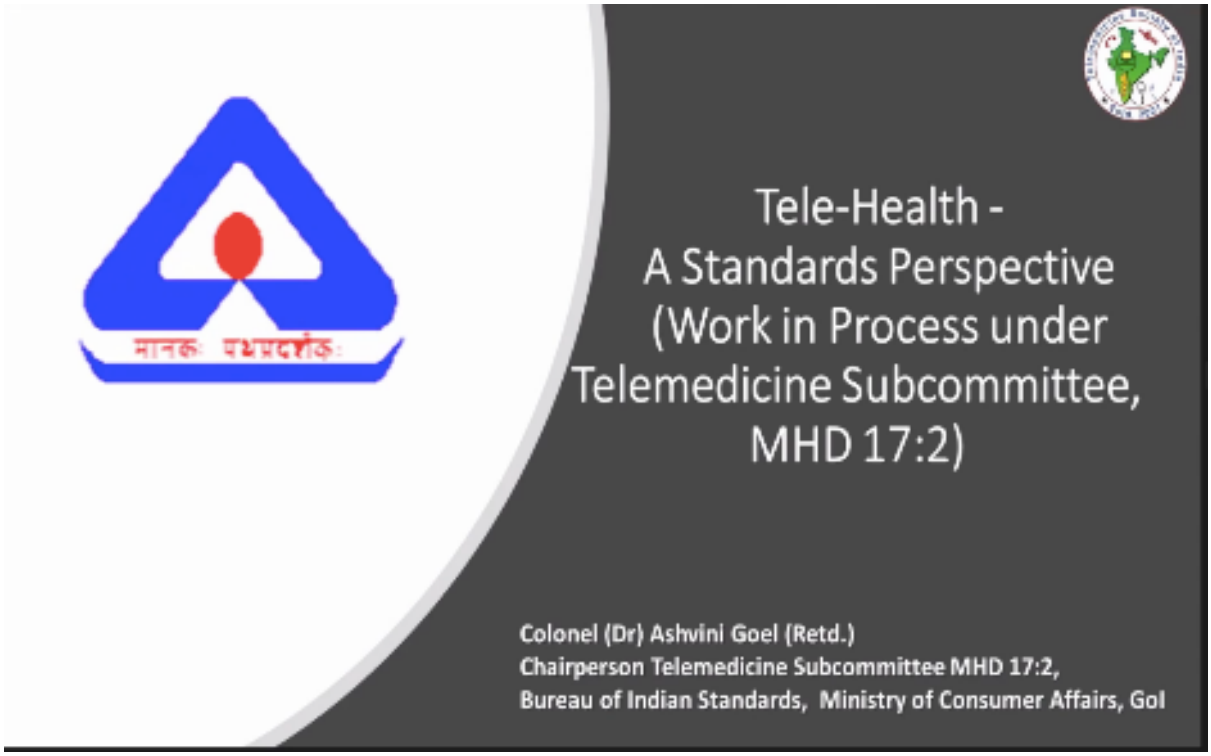
Our key speaker would be Dr. Anup Wadhawan. Currently serves as Commerce Secretary to the Government of India is an IAS officer of the 1985 batch of Uttarakhand cadre. Mr. Wadhawan received a bachelor's degree from the University of Delhi and followed it up with a postgraduate degree from Delhi School of Economics. He earned a PhD degree from Duke University US. Mr. Wadhawan has served both Central and State in various roles at Department of Commerce, Directorate General of foreign trade, Department of Financial Services, Department of Economic Affairs, and the Prime Minister's Office of India.

It will be a pleasure to listen to all the speakers. I hand over the platform to Major General, A.K. Singh. Thank you.

Hello to all of you. and it's a great pleasure and believe it or not, I never thought this could be that perfect. This is a fantastic launch. I congratulate the LOC for organizing such a beautiful setup. We are now in to very important keynote addresses. One will be by Col. Ashwini Goyal on standards that they are planning to set up for Telemedicine. The second will be by Mr. Wadhawan. He is well known to the TSI. He's been with us and he supports us to quite an extent. I welcome both of them. Thank you very much.

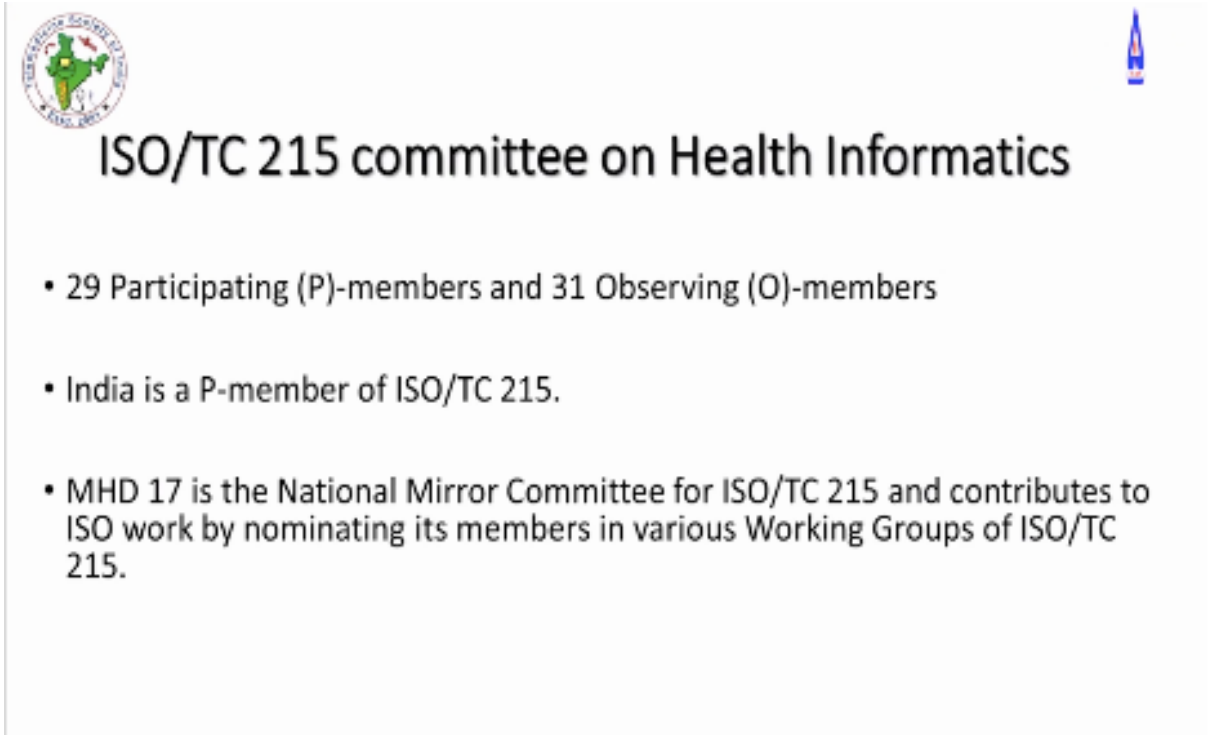
Next speaker, Dr. Ashwini Goel. Request the organizers to put up his presentation.

As you all know well, I am currently the President Elect of the Telemedicine Society of India .

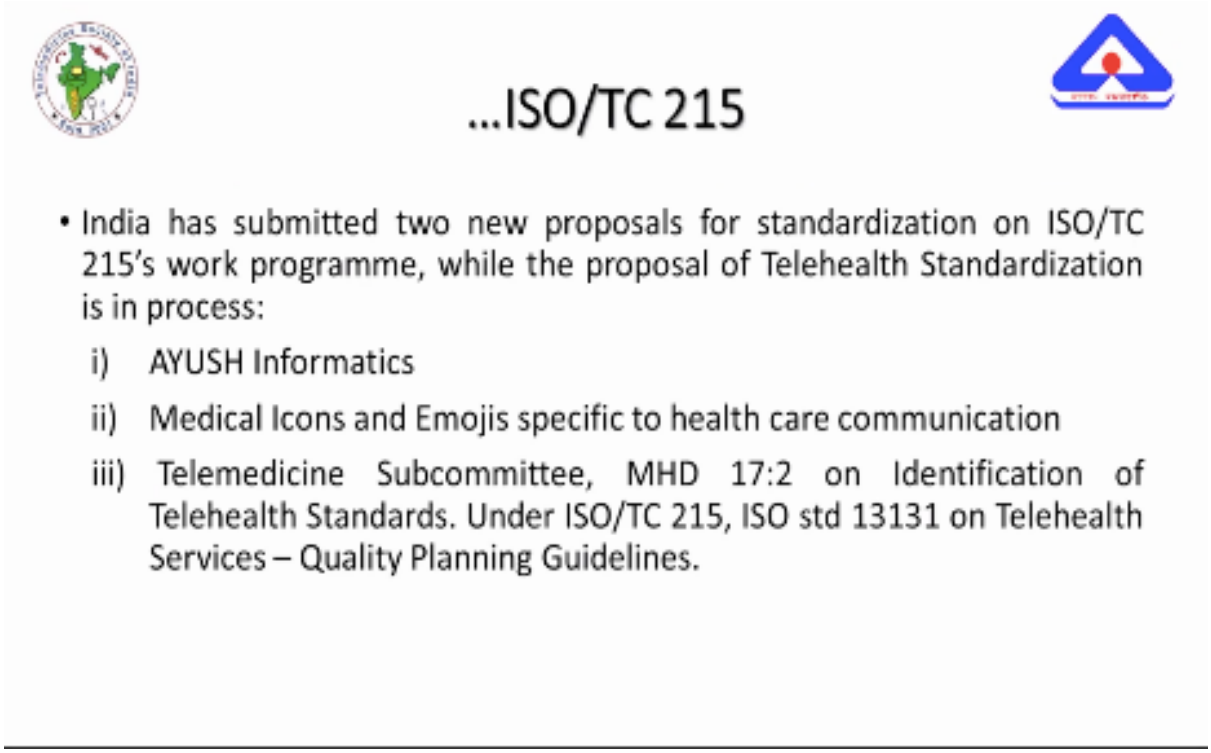


I believe a lot and good things happen when they have to happen. So, very recently, I was nominated as the Chairperson of the Telemedicine subcommittee under MHD 17. So this is subcommittee MHD 17. Two of the Bureau of Indian standards, which comes out of the Ministry of Consumer Affairs, Government of India.

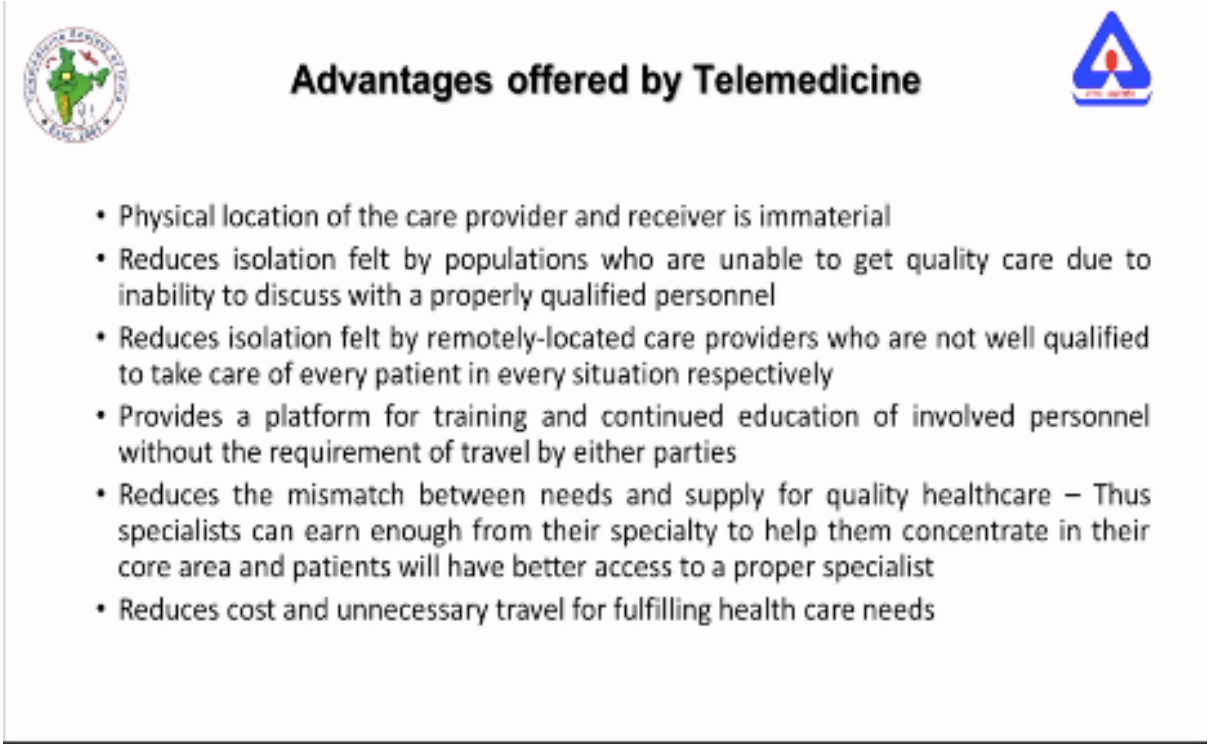
Let me tell you a little bit about the health informatics section committee which is MHD 17, under which the subcommittee of the Tele health standard comes. The scope of the committee is centralization in the field of information for health and health information and communication technology to achieve compatibility interoperability between independent systems. It is also to ensure compatibility of data for comparative statistical purposes for example, classifications and to reduce the duplication of effort and redundancies. This includes members from all relevant stakeholders like the Ministry of Health and Family Welfare, Healthcare IT vendors, hospitals and hospital chains, medical device manufacturers and so on. 34 Indian standards have been published so far by the committee and 25 or little more than 25 are currently under print. Also all the ISO standards recommended in the document EHR standards for India 2016 have been notified by the Ministry of Health and Family Welfare and taken for adoption as Indian standards.



There are 29 participating members and 31 observing members. India is a participating member of ISO Technical Committee 215. MHD 17 is the National Bureau Committee for the ISO Technical Committee 215 and it contributes to IOS over by nominating its members in various working groups of the ISO Technical Committee 215.

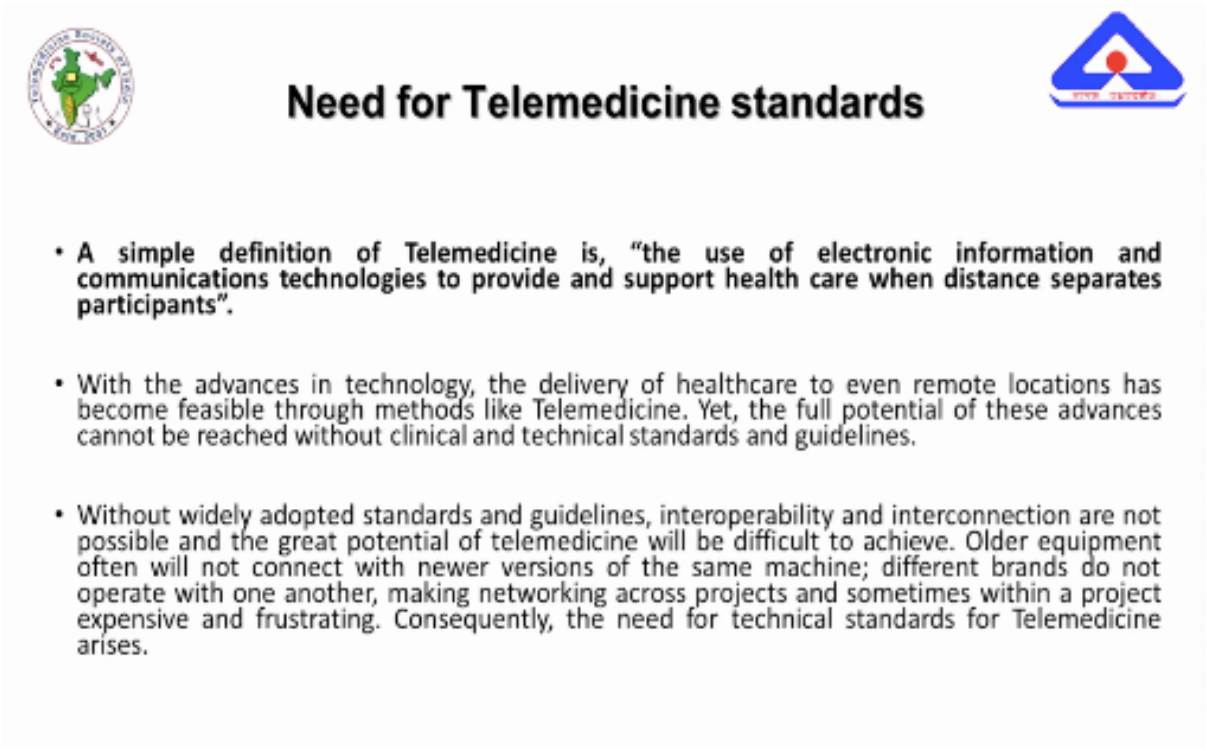


India has recently submitted two new proposals for Standardization on the ISO Technical Committee 215 work program. While the proposal for telehealth standardization is in progress process. The first one is AYUSH informatics. The second one is medical icons are emojis which are specific to the healthcare communication. The third Telemedicine subcommittee emoji 72 on identification technical standards, under ISO Technical Committee 215 and ISO standard 13131. On telehealth services quality planning guidelines.

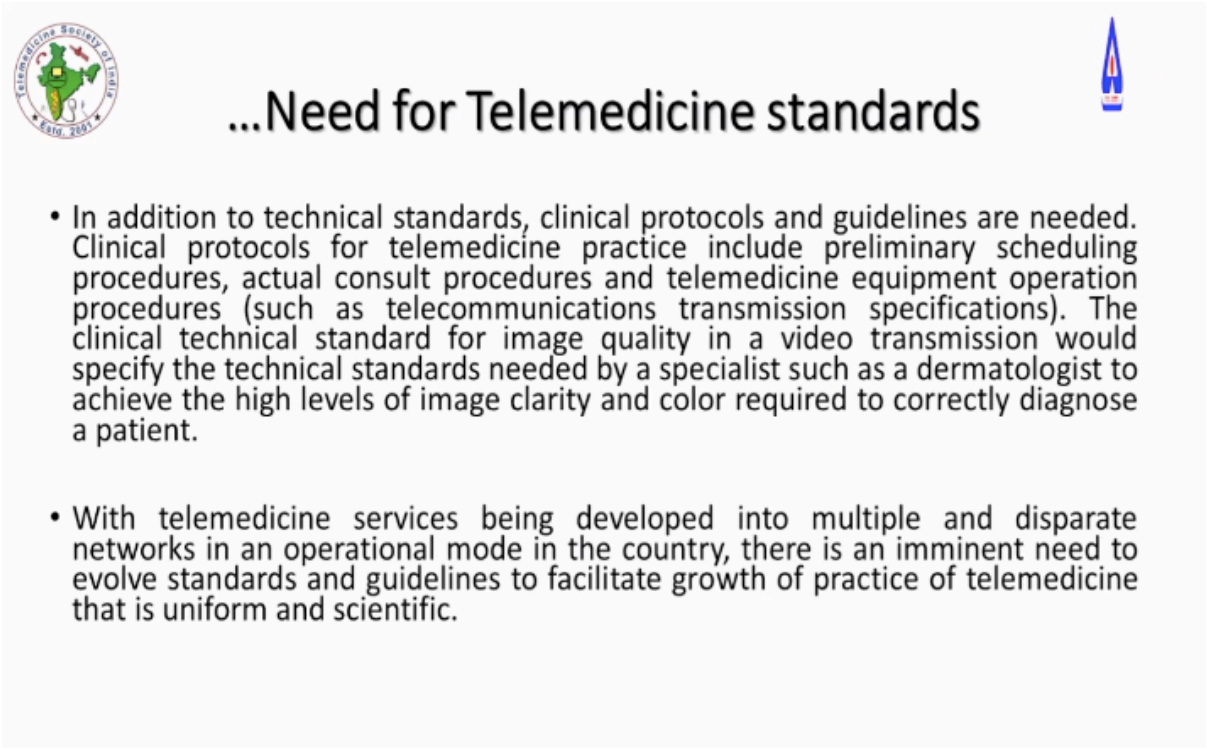


Now, well we are all people who are aware of Telemedicine, so, but I still had the pain of repeating everything. The advantages offered by Telemedicine why we go in for Telemedicine, this is very important to know. The physical location is immaterial of the care provider and the caregiver. It reduces isolation by people who are unable to get quality care due to inability to discuss with proper, properly qualified personnel. Reducing isolation felt remotely or not well qualified to take care of every patient in every situation respectively. This pertains to the caregivers and it provides a platform for training and the CMEs for involve personnel without the requirement of travel by either parties. Reduces the mismatch between the needs and supply for quality health care. Specialists can earn enough from their specialty to help them concentrate in the core areas and patients will have better access to proper specialists. It reduces the cost and unnecessary travel for fulfilling healthcare needs a lot of economy gains in built into this technology.

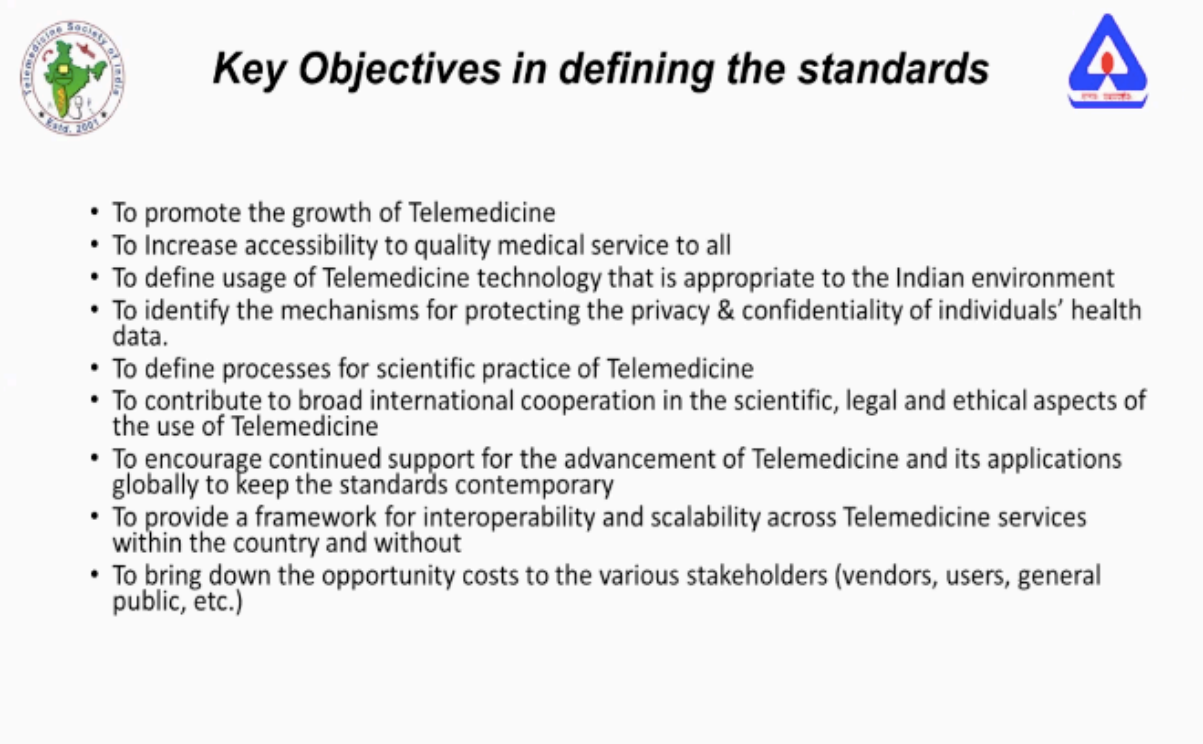
Now the felt need for telehealth standards is that the use of telehealth and Telemedicine is rapidly growing in India. That's given. So in March 2020, the Board of Governors superceding MCI in partnership with NITI Aayog, released a Telemedicine practice guidelines to give practical advice to doctors so that all services and models of care used by doctors and health workers are encouraged to consider the use of Telemedicine as part of normal practice. Under ISO/TC 215, the ISO 13131 telehealth services the quality, practice, planning guidelines is under formulation in which BIS has also contributed through regular technical inputs and comments. A subcommittee on telehealth and Telemedicine has been created under MHD 17 to formulate Indian standards on the subject incorporating national requirements and use cases while duly considering the existing national guidelines and the ISO standards. This is going to be for India per se. About 90 standards dealing with various aspects of digital health. For example, architecture, semantics, data security, privacy, interoperability, etc. have been published on MHD 17 which will act as a reference set of standards or documents for the standardization work on Telemedicine and telehealth.



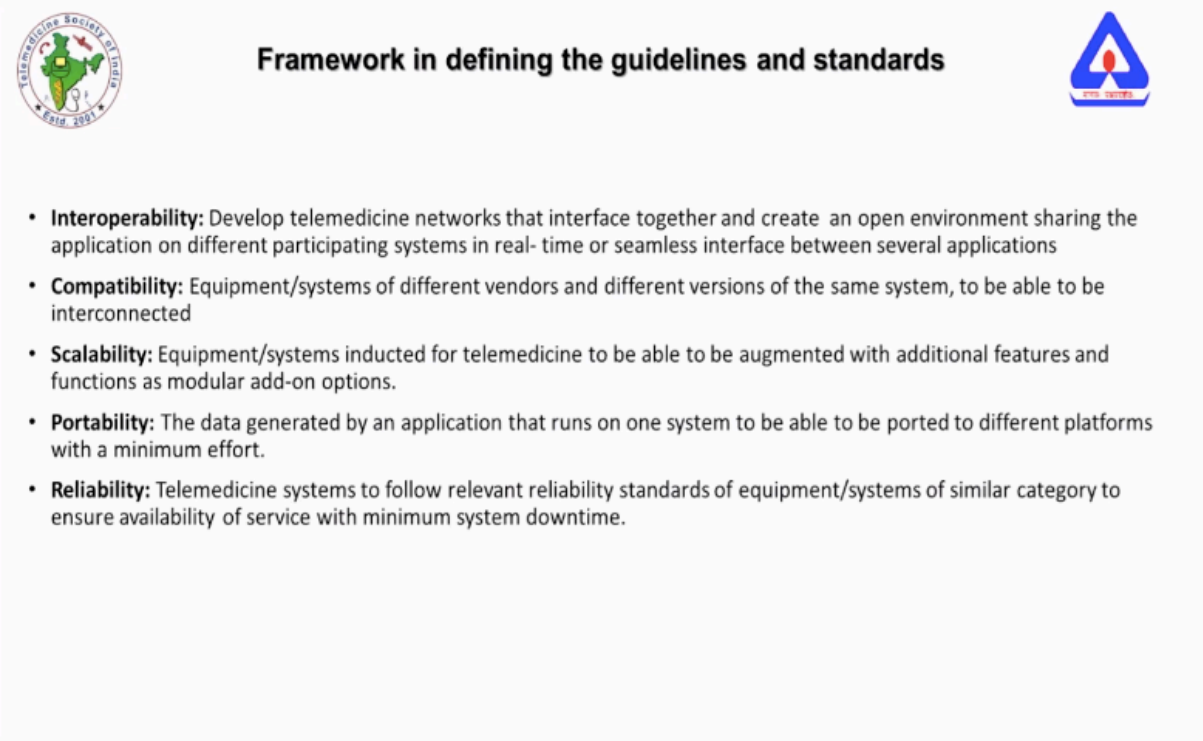
So, why Telemedicine standards. So, as a as a simple definition of what elements medicine is the use of electronic information and communication technologies to provide and support to health care where distance separates participants. So with the advances in technology, the delivery of healthcare to even remote locations has become feasible. Yet the full potential of these advances, it cannot be reached without clinical and technical standards and guidelines. Because we have to ensure quality into whatever the kind of healthcare that we are important to our health seekers. And without adopted standards and guidelines. interoperability and interconnection are not possible, the great potential of Telemedicine will be difficult to achieve. So, because older equipment often will not connect to the newer version of the same machine, different brands do not operate with one another, making networking across projects and sometimes within a project expensive and very frustrating. So consequently, the need for technical standards for Telemedicine arises so that all devices can speak to each other all platforms can speak to each other. All the software can speak to each other.



In addition to the technical standards, clinical protocols and guidelines are needed. Clinical protocols for Telemedicine practice include preliminary scheduling processes, actual consult procedures, Telemedicine equipment operation procedures such as telecommunication transmission specifications, the clinical technical standards for image quality in a radio transmission would specify the technical standards needed by a specialist such as a dermatologist to achieve the high level of image clarity and the colour required to correctly diagnose a patient. We all know that much of diagnosis and dermatology goes by visually examining a patient or the lesion and this is it is highly necessary that the same quality be duplicated on a system when we are doing a telehealth consult or in, in dermatology or for the pattern pathology, where we see slides or in radiology where we see x rays and images, every in all such clinical specialties, high quality of standards is mandated. With the Telemedicine services being developed into multiple and disparate networks, then operation on more than one country, there is an imminent need to evolve standards and guidelines to facilitate growth of practice of Telemedicine that is uniform and scientific.



Now, what are the key objectives in defining the standards? It is to promote the growth of Telemedicine Yes, to increase accessibility to quality medical services to all the care seekers and care providers to define the usage of Telemedicine technology that is appropriate to the Endian environment. To identify the mechanisms for protecting the privacy and confidentiality of the individual's health data. Define the processes for scientific practice of Telemedicine to contribute to broad international cooperation in the scientific, legal and ethical aspects of the use of Telemedicine to encourage continued support for the advancement of Telemedicine and its applications globally to keep the standards contemporary to provide a framework for interoperability and scalability across Telemedicine standards within the country and without to bring down the opportunity costs to the various stakeholders. That is the vendors, the users, the general public, the caregivers, the care seekers, and so on.



Now, the framework of defining the guidelines standards, which is what we are considering in our subcommittee MHG 17/2, we will be considering the development of standards under the headings of

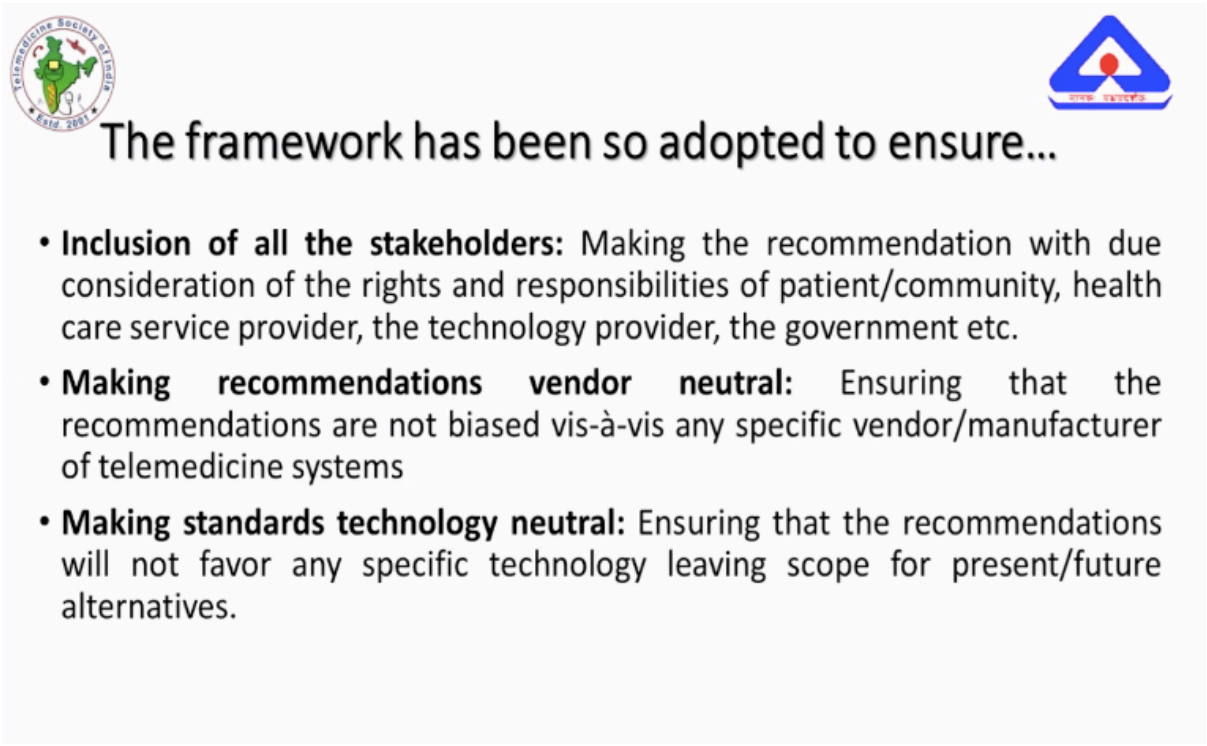
Interoperability: Develop Telemedicine networks that interface together and create an open environment sharing the application on different participating systems and a real time or seamless interface between several applications.

Compatibility: Equipment and systems of various vendors and different versions of the same system to be able to be interconnected

Scalability: Equipment's and systems and inducted for Telemedicine to be able to be augmented with additional features and functions as modular add on options as and when the need arises.

Portability: The data generated by an application that runs on one system to be able to be ported to different platforms with a minimum of effort.

Reliability: Telemedicine systems to follow relevant reliable standards of equipment and systems of similar category to ensure availability of service with minimum system downtime.

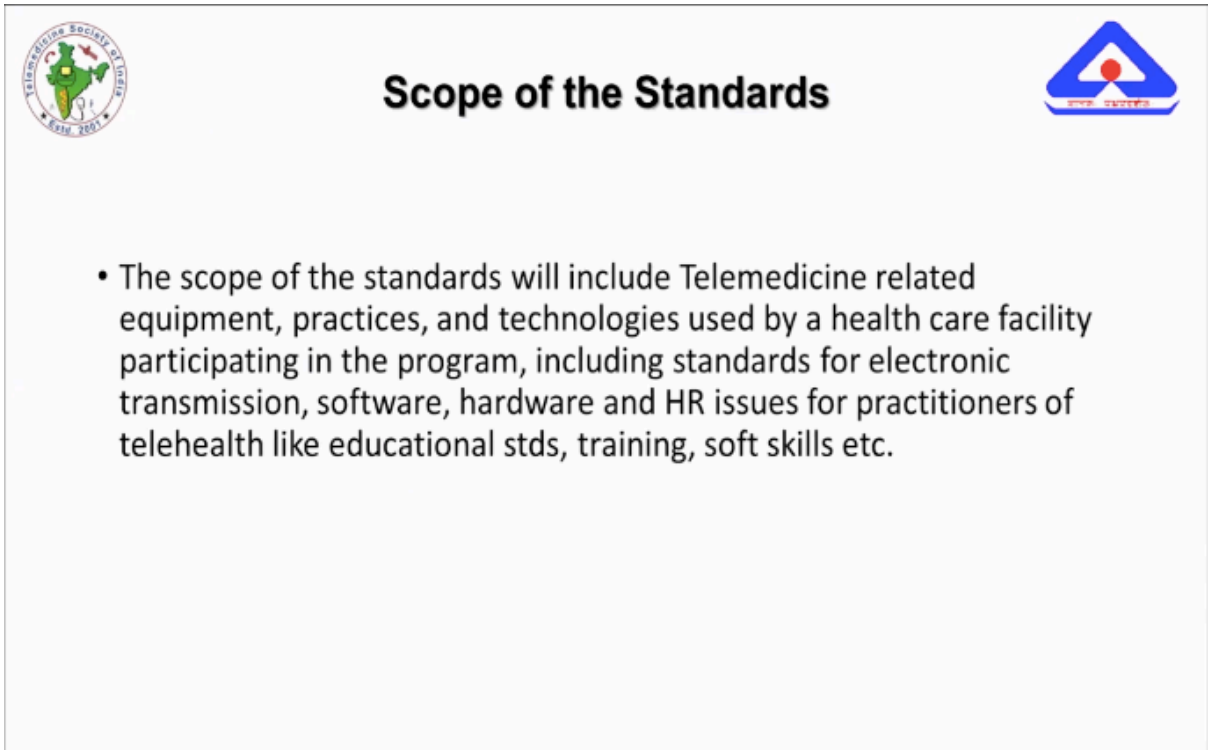


The network has to be adopted to ensure certain things which the key promises that we are holding on to our stakeholders is

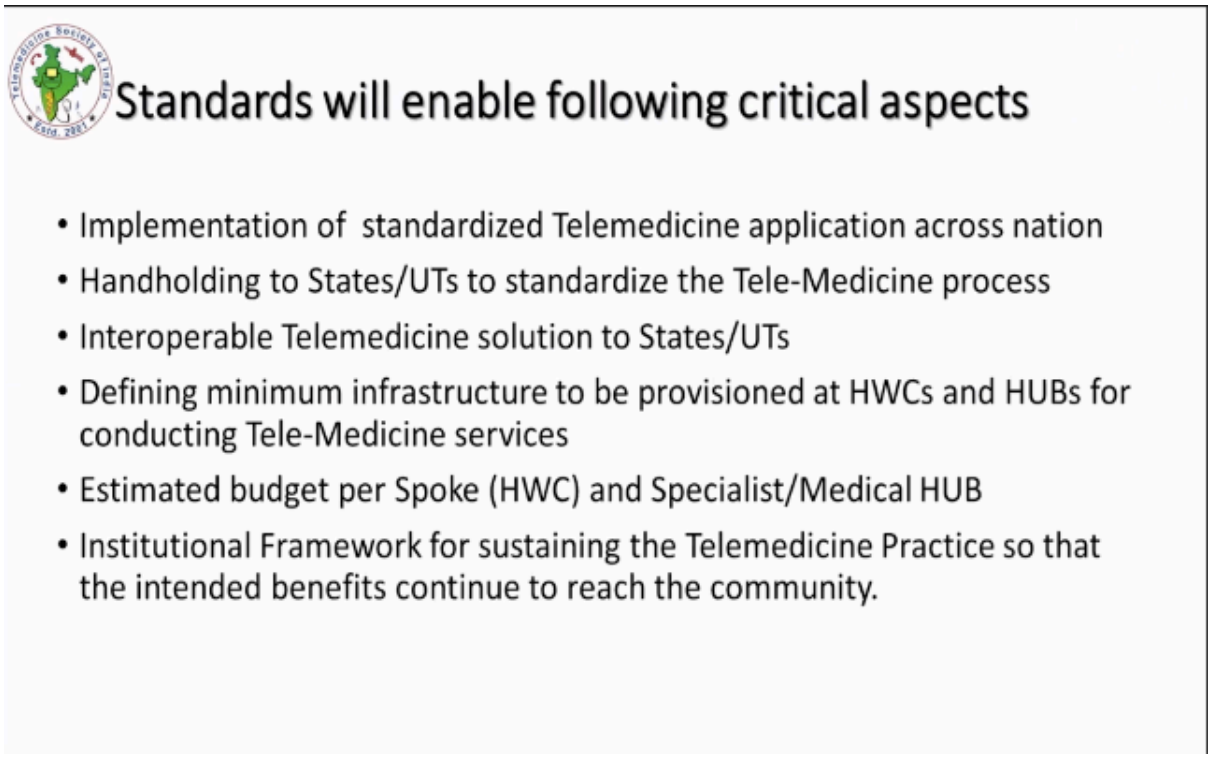
Inclusion to the stakeholders - which is making the recommendations with due consideration of the rights and responsibilities of the patients and the community health care service providers, the technology provider and the government and so on.

Making the recommendations vendor neutral - Ensuring that the recommendations are not biased visibly any specific vendor or manufacturer of Telemedicine systems.

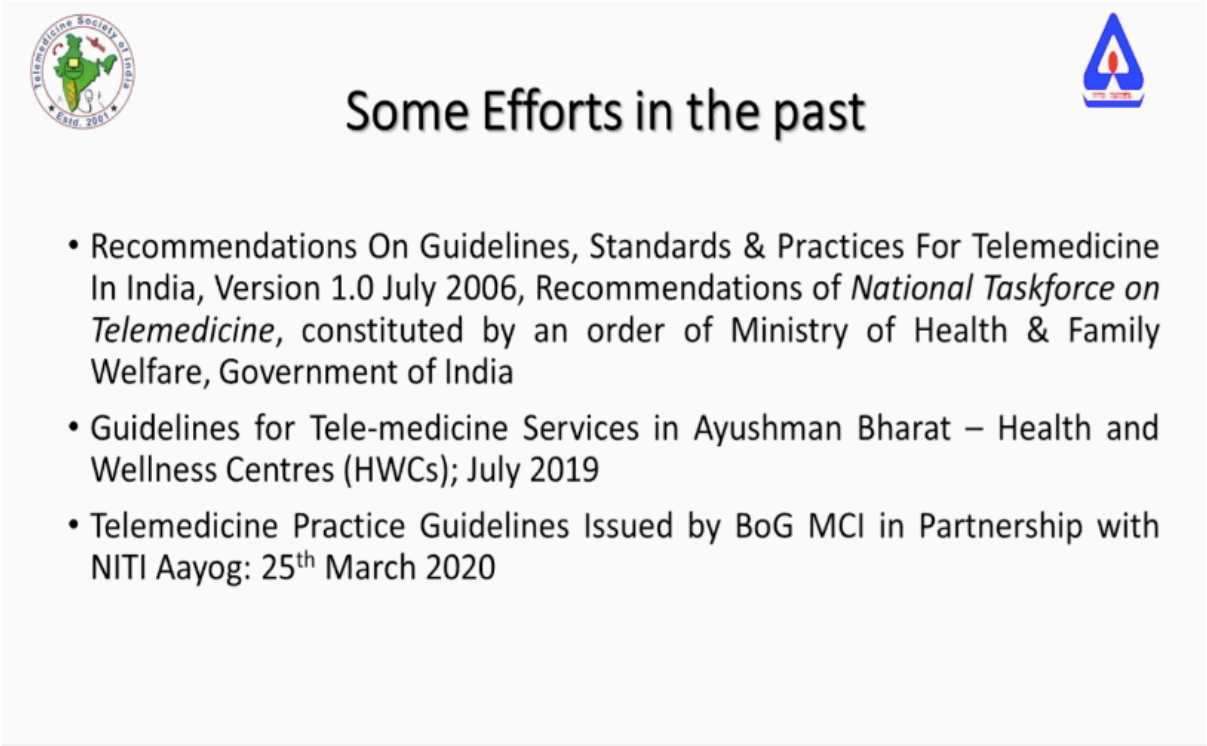
Making the standards technology neutral - This is to ensure that the recommendations will not favour any specific technology, leaving scope for present or future alternatives.



To the scope of standards will include Telemedicine related equipment, practices, and technologies used by healthcare facilities participating in the program, including standards for electronic transmission, software, hardware, and HR issues for practitioners are telehealth like Educator Standards, training, soft skills etc.



They will enable the following critical aspects implementation of standardized Telemedicine application across the nation. Holding two states and union territories to standardize the Telemedicine process. Interoperable Telemedicine solution to states and union territories. Defining minimum infrastructure to be provisioned at the health and wellness centres and hubs for conducting Telemedicine services. The estimated budget per spoke and specialist or the medical hub. Institutional framework for sustaining the Telemedicine practice so that the intended Benefits continue to reach the community.



There have been some efforts in the past as well from where the need for reviewing the standards that were developed in the past arises. So these were the recommendations on guidelines, standards and practices for Telemedicine in India was in one July 2006. The recommendations of the national taskforce on Telemedicine constituted by an order of Ministry of Health and Family Welfare government of India. Unfortunately, these standards were not adopted and they could not be put into practice, for various reasons that we will not go into The guidelines for Telemedicine services AYUSHMAN BHARAT released recently by the Minister of Health and Family Welfare for the health and wellness centres in July 2019. And, of course, very recently, the Telemedicine practice guidelines issued by the Board of Governors superstition of the MCI Act 1956 in partnership with the NITI Aayog on the 25th of March 2020.

This is all about the Telemedicine standards committee that is in process. It's a work in process. We have a lot to do. And let's hope with the blessings of all those who are present here and the good wishes. We shall be successful. Jai Hind.

What do you think that's a fantastic article talk given by you? And yes, like I told you earlier, I have been talking to all of you that after the TPG what. So, what we have been doing is we are collecting interviews from a lot of people as to what is going to come and my book is ready. The Telemedicine live diaries and the aftermath. The summary that is coming up is what you have said, we required to set standards, we are required to have a regulatory body which can handle Telemedicine guidelines. So I think it's a fantastic beginning. Well done. Thank you very much.

I think set standards is the needles are because she now the Telemedicine practice guidelines has enabled the entire world, the healthcare industry, the entire paradigm of healthcare is getting onto the bandwagon. And in all this hectic activity, I'm sure we will Mr. Rockler will agree with me that telecommunications is nobody's private domain and anybody and everybody can get onto it. So with so many players getting onto the bandwagon, it will be of paramount importance to ensure quality in all our efforts. And that is the question of standards comes in and if we can develop a robust set of standards, not only for India, in conformity with the ISO, which is a global organization, and we are the big work in tandem and under the with the conformity of ISO standards, I think it will be a great effort, great work done in assuring quality in provisioning of health care. What do you say?

Definitely.

Dr. Wakhlu, let's have your views.

Yeah, there is absolutely no doubt about the fact that standards are important in every domain, for that matter. But since health services concern I mean, they are critical from the perspective of the citizens held directly so they become more critical and standards are very important from that perspective.

I find a question from Ashraf. It's mentioning that and using prescription app for Digital Prescription. how safe is it?

It is safe. I want to know whether it is certified. I mean, how exactly does he address that? Dr. Goel? Question is from Ashraf. He says that He's using a prescription app as a doctor, but digital prescription, of course it is safe. But he wants to know how, whether it is certified. So what is the procedure for doing that?

Yes, I think it's a, it's a wonderful question and very important to the current scenario of the practicing telehealth under the ages of the under the overall ambit of the Telemedicine practice guidelines recently issued by Government of India. Now, I would like to tell you that at the moment, what is required is to basically ratify all such digital apps and that is where the question of benchmarking comes in. Unfortunately, in India, we do not have any projects or any application for benchmarking of digital tools for digital prescriptions, or healthcare apps. But I can assure you pretty soon we will be having it. In fact, we are the TSI are already working on a project on this. And pretty soon we will be able to have a repository of all the vendors who are providing such kind of apps and tools, and we would be able to benchmark them. And that is where quality can be will be assured and all such things but at the moment, I'm sorry to say there is no way to certify it. And it all depends on the user and the providers, innate sense of security and privacy to provide safety standards at the moment. Thank you,

There is a question from Madhuri. I would request her to ask the question directly. Please unmute yourself. Yes, Madhuri, I've been waiting looking forward to thank you so much for the good talk. I just expressed that these guidelines have been sort of really a game changer and have come in in time. But my concern is how can we link them up for better data privacy at the back end? I mean, when we are using apps, we are using these platforms, the patient data gets back into some kind of a system and how that is anonymized. How it is not hacked by this because it's not yet. I mean, we've remained quiet on this aspect and the patient data privacy policy is now coming in. So, how do we link this up?

Yes, with the PDP bill and which is due to be converted into an act by an Act of Parliament. This has been hanging fire for a long time now. So, your question is very relevant, because the issues of data privacy and security are a burning issue the world over not only in India. So, now, the question is the issue is how to link these issues and the back end processes to the elements and practice guidelines. I think that is what you are referring to Yeah, which have been issued which have been issued recently. So, Madam, you are very well aware, we are

being a part of the process yourself that the practice guidelines were issued in a hurry, okay. Now, also, in the very body of the Telemedicine practice guidelines, a review has been mentioned. So the Telemedicine practice guidelines are to be reviewed after some time. And it is in that review, that such efforts like the standardization the different standards, and such technical aspects of the provision of health care, where technology goes is integral to the provisioning of health care. So these aspects will be dealt in by while developing the standards. I would seek the blessings and cooperation or the powers that be in the government to ensure that these standards are married with the guidelines. And that is what is required. So the next version of the guideline that is version two that comes in. So what I was saying is that such standards and such efforts to define such standards, various aspects of technology, which are integral to provision of healthcare should be married with the next version of the guidelines. So that the next version, the guideline that comes out is much more robust, more relevant, and much more enabling, and, of course, much, much safer. I hope I've addressed your question.

Absolutely, absolutely. And it would, it's a very important point that all of us would have to when we are, you know, helping formulated, put it as a top agenda to ensure that these things happen.

Yes, because that is that is what is ultimately will culminate in giving quality health care to our health seekers.

Yeah, yeah.

That is the ultimate aim.

Well, I would like to add something over here, the international perspective, right now. To protect data, the patient data. There are a number of countries are which using a blockchain? Yes, beauty about this blockchain technology is that, you know, there is a public key and a private key. So whenever you want to consult a doctor, you have to give access to him to your data. And when that happens, the doctor sees the patient. And after that, once the consultation is over, even doctor cannot access that data. I mean, it's over. So that is how we ensure data protection in health services. I think that's one major technological solution. Yes, problem, regulation is fine. But then we have seen people also violate regulations. In a country of the size of India, it's almost impossible to do that. And we have seen how there are breach of data,

our regular data happening in the country and internationally. So this, I think, is one of the best solutions we can have.

That's a wonderful solution. Dr. Wakhlu, because you see your blockchain the entire system of blockchain, it provides you with an audit trail as well. And that is something that we that can ensure, you know, responsibility, accountability, most importantly, in the entire concertination of events as far as the data approach and data dealing with the data is concerned. Yes, this is an expert that we need to keep in mind while drafting the standards, in fact, with you with your vast experience of telecommunications. Maybe as an aside, I would love to have you in my subcommittee as an advisor, will talk about that later.

There is a very, if I may just add , a very nice comment, which was going to be my next thing that this is going to be very important with the NDA and NHA, which is putting out EHR and tele consultation. So our own government Portals of like e Sanjeevani and such other platforms would have to be integrated with this blockchain, ensuring that the data privacy is kept with the patient. I think that was a very valid point.

Yes. So a question from Dr. Meenu, How NDHM conforming to Telemedicine Standards and guidelines?.

I said Actually, that's the same question with Dr. Madhuri. just mentioned. Yeah, we know that NDHM is in the offing and we had national digital health blueprint earlier and now we have the mission. We have launched e Sanjeevani OPD and e Sanjeevani EHR all over the country. Although it's being used all over the country, in fact, in several states, including UP, Haryana, Punjab and other places and PGI is a hub for that. What I find is that there is a lack of standards there although security and other issues were supposed to be looked after as the whole standards at the moment there are no standards, you know, for which e Sanjeevani was built because, it is SL7 compliant It is also got some because all CDAC people were linked with it. So it does have some inherent standards, which are there for EHR.

Yeah, everybody ,just to remind everybody that the union commerce secretary is here if we do not have any more questions.OK we have a couple of things. It's small. Yeah, I think we can. And when Madam Dr. Meenu Singh herself is heading the Telemedicine department at the PGI, Chandigarh, of course, she is most suited to answer the question that she has posed. I

think this is just to start a discussion on this. Maybe we'll take it up in the subsequent sessions. Yes. But it's actually a national issue at the moment that they have to have quality standards, even in the, you know, government based systems which are there and which are going to be all pervasive in all the health and wellness centres. It's very true.

Yeah. We have another question from John. There was a NDMH meeting which took place and where they were giving, inquiring about some consultations and all I attended that meeting. And they said that Telemedicine would be in the backburner for some time. Just for information. I've attended that meeting. And they are now into that EHR and standard that they are thinking about Telemedicine right now. They said they'll be launching it a little later, just for your information. If things have changed, I have no idea. Thank you.

When was this meeting? If I may ask you,

I don't remember it must be somewhere about two months back, but it was there.

Stress is on. In fact, just today morning, I have spoken to Dr. Praveen Gadam, who's heading the NHA. And he also said they are concentrating on rolling out the EHR and taking in the union territories and you know, first these regions, so I think Telemedicine they would go in later.

Yeah. In fact, it can be a parallel processing as well, because of course, EHR is an integral part of the entire Telemedicine, Tele Consult experience and a robust and a uniform EHR. is a necessity and we've been talking about it for the past almost two decades now. And with no nothing fruitful coming up. So this presence of the government on the EHR primarily is the need of the war. But of course with the COVID pandemic on and likely to be so for quite some time. I do not think that Telemedicine or Telehealth can be on the backburner because that has become now the same code on for provisioning of healthcare across the world. So maybe it's an exaggerated statement for some people, but then, let's hope for the best.

We have a question from Sheila john. There are various specialties in medicine both clinical, as I heard a very good talk on pathology in the morning, which is So, if you want to implement pathology, you will have to have that correct microscope and others to connect. So, various

standards have to be said which equipment to be used for each clinical standard on the digital stethoscope has come so many instruments also have come up.

Madam so sorry for cutting short, I can I understood the gist of what you're asking you see, the thing is, any standards can not be all encompassing and the first out at the outset, you know, so, I understand if we will have to have a cutting mic like you yourself using of technology, you use operating microscopes, and there are so many kinds of them, we use x -ray machines, there are so many kinds of them imaging. So, see, right at the outset, we will not be possible to include anything and everything into the standards, it will have to be generic standards to begin with. And thereafter, the various specialties, the speciality specific standards can come out. And that is the way I would recommend that we do because to have an exercise to to be an all inclusive exercise is not at all possible. It's not humanly possible. So we will have to come up with generic standards. and thereafter, it will have to be clinical speciality relevant standards. I think that is the way to go about it. I hope that satisfies your query. Thank you.

Well, I just want to add here that yes, Dr. Sheila John's point, I want to emphasize that, you know, diabetic retinopathy being a common thread for many detection of many diseases. I think fundus camera is going to be on the top rarity. That's my feeling. But it helps in detecting 15 diseases including cancer. That's the beauty about it.

Welcome. Dr. Wadhawan. It's wonderful. It's so wonderful to see you here. And as always, you have been a friend of the society, mentor, and of course, great hand holder. And we always look forward. Thank you. We always look forward to your talks, wherever we hear, we are thoroughly impressed with that

I don't have a very extensive presentation slide, let me just make some remarks at the outset said let me thank Col.Goel and all other functionaries, very distinguished members of the Telemedicine Society of India. And i also acknowledge the very distinguished participants in this engagement in this meeting. And let me say that I am delighted to be here. And my thanks to all of you for making that possible. I think much has changed. in many senses, since we last met a couple of years ago, I think, you know, there was always a long standing realization about the importance of having digital communication technology for Telemedicine, to reach out to far flung sparsely populated areas that can not be prudently served through permanent brick and mortar establishments to enable you know, quicker service provision in these far

flung areas, waiting for brick and mortar arrangements of a permanent nature to be made. Take time and of course, they are impossible to run subsequently, when the underlying logic is not there, placing the sources on a permanent basis where the need is intermittent and low volume is not a very prudent approach. Telemedicine, as we all know, enables leveraging the best resources of the world and making them available to the most inaccessible and far flung places. So even you know, in some remote, far flung locations in India, someone can get access to a pathology laboratory in the US or someone there can get access to the best pathology laboratory in India or get access to the best clinician in the world for that particular disease. So it enables huge leverage in something which a person in that situation could never have imagined earlier. And the imperative for you know, speeding up our effort to extend Telemedicine services, that imperative has become even stronger as a result of our recent In fact, our ongoing experience with the COVID pandemic.

It has magnified this imperative for us, to quickly expand and achieve the full potential of Telemedicine services. It is heightened the importance of society wide access to preventive and curative medicine. We always knew that in many senses, your health is not secure until the health and hygiene of the last person in society is secure. And the COVID pandemic has magnified the importance of that aspect that everyone needs to be within the ambit of Basic preventive health measures within the ambit of basic hygiene measures. And to that extent reaching out to the last person in society in the most far flung areas is more important today than ever before or its importance is realized in a more pronounced manner today than I think before COVID. And so in that sense, it is heightened by imperative for us to use technology to make preventive and curative medicine available to the last person in our society. We must, in this context, you know, double our efforts, and I commend the efforts in this regard of the Telemedicine Society of India and we need to double these efforts. We need to proactively I think I said this last time also, we need to proactively make our institutions and services, Telemedicine linked, we might be running a very prestigious, very successful hospital. But it might not be you know, so. So to say Tele linked, those resources may not be available to far flung areas where there is need, we might be highly qualified practitioners. But to the extent we don't offer our services through some Telemedicine network, then those services are not achieving their full potential, those capacities and capabilities are not achieving their full potential and it can be a matter of life and death for millions. You know, someone who's being under treated, mistreated, wrongly treated, has access to these resources can be a lifesaver. And I think that makes it all the more important that we, in a sense volunteer our institutions, there

might be no impetus or incentive for us to do so. But we must add the conscious duty volunteer our institutions to get linked to the Telemedicine system and magnify our reach magnify the utilization of our capacities and abilities. And of course, for this, we need the government has to play a role in that fill the gaps in the digital infrastructure, systematically create outposts systematically across the country, because you need an outpost through which the Telemedicine services need to be extended some outposts where a sick person can report and then be diagnosed through Telemedicine services. Then based on that diagnosis, we need the backup arrangements for the follow up referral and treatment that might be required in a rare case elsewhere. In many cases, maybe the treatment is possible on site through that link person, Link paramedic. And here again, you know, we can train our field workers whether they are the Anganwadi workers or the primary health workers, we can train those workers to become tele medicine trained, so to say use that equipment helped the doctor to diagnose the patient in the work through the virtual processes. And of course, I'm happy to note that there are government of India stressing the importance of you know, Telemedicine government of India has a significant and substantive program to promote Telemedicine. I was reading some data that the number of consultations under the eSanjeevani Telemedicine service has gone beyond 1 billion beyond 1 billion consultations. It's being used by patients in over 550 districts of India, of the 730 odd districts that we have in India and 550. They are being used. Clearly these need to be mainstreamed and extended to all districts. States have designated you know very innovative applications around the eSanjeevani OPD Telemedicine facility. In Kerala I'm told in Palakkad District jail they are using a Telemedicine approach. In Himachal Pradesh, in all the old age homes across the state they have rolled Telemedicine services. So, clearly a beginning has been made.

A beginning has been made and some states are you know setting an example, you know states like Tamil Nadu, Madhya Pradesh, Gujarat, Kerala, Himachal, Andhra, Karnataka , Uttarakhand and Maharashtra. They are leaders in this field. So, clearly we have demonstrated our capacity you know, successfully put the services in place. So, clearly we mean to upgrade them, in terms of their capacity in terms of their you know quality and mainstream them also in terms of spreading them to all the unserved areas which are yet to be served. And of late various other sort of IT applications have also gained prominence. The Aarogya Setu app has become widely recognized as a means of controlling, you know, over contagious diseases like COVID. it was very successfully used in some countries like you know, South Korea or Singapore. Without a lockdown, they were able to control the disease by tracking potential

patients, testing them and then of course, doing the tracing and doing the distancing. And all the follow up activities. There is a talk now of having a National Health stack of a centralized health record for all citizens so that no matter where you are, the doctor can access your record. You might be getting treated virtually through Telemedicine, but that doctor has access to your complete record. So this national health track is also a major sort of development. There is also this application called CO WIN .You must have heard of for real time monitoring of the COVID-19 vaccine delivery program. So I think we have come a long way in recognizing the need for Telemedicine, recognizing the capacity that Telemedicine has to solve many of our public health issues and in demonstrating our ability to put these arrangements in place successfully. So it's a great sort of achievement. It puts us in an ideal position to quickly mainstream, scale up these efforts and achieve their full potential. I was reading in preparation for this talk that you know, Telemedicine extends to things like teleconsultation, Teleradiology, Telepathology e-pharmacy, so, the sky's the limit to its potential. The National Medical Commission is proposed for monitoring Telemedicine regulations.

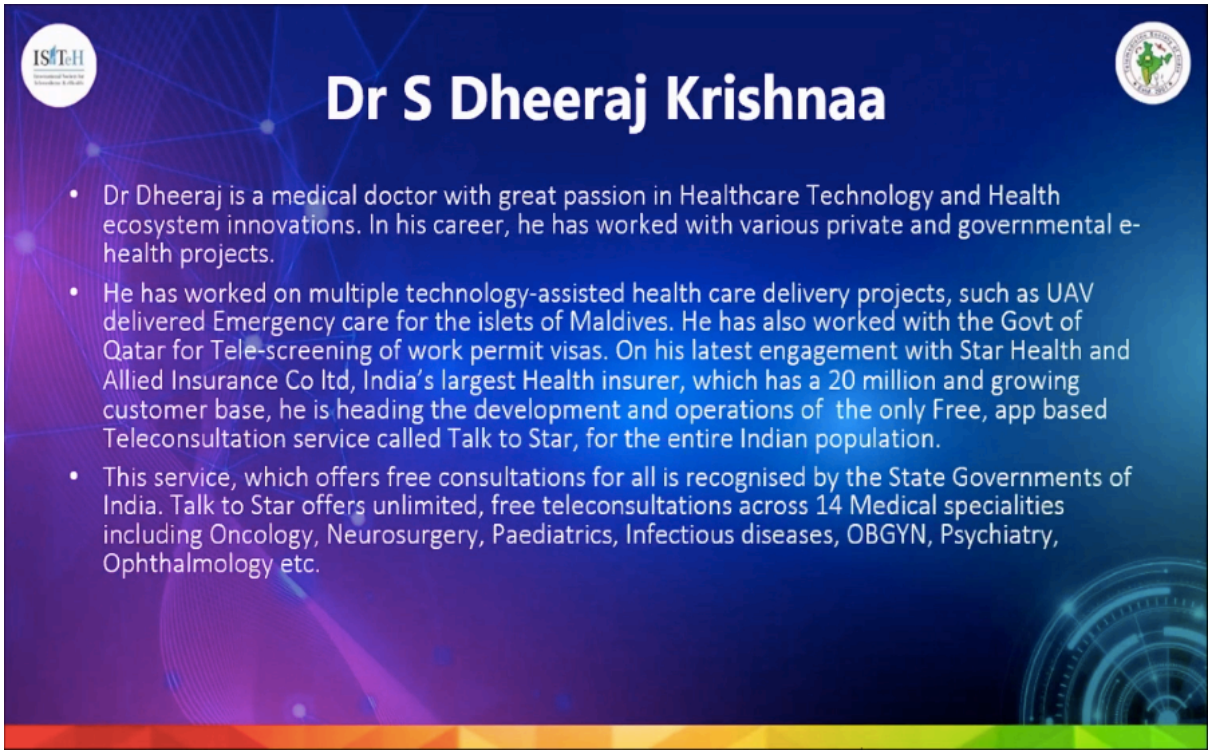
I think some Telemedicine regulations have been put in place also in the past 2020. So these are all very positive developments. Since 2010, the Telemedicine market size in the country has seen a gradual increase and expected to grow at a compounded annual rate of 31% from 2020 to 2025. That's the projection and the Telemedicine market size in India has grown from US dollars 640 million in 2018 to US dollars 830 million in 2019. And the global Telemedicine market in 2018, which stood at $34 billion is expected to reach about almost $200 billion by 2026. I'm told that a majority of patients may be as high as 75-80% patient in the next 5 to 10 years will get treated through Telemedicine options. You know COVID has demonstrated that COVID has challenged many old paradigms, things which is thought could only be done in physical mode we have realized can be done in a virtual mode meetings. This event itself you know, the last time we met face to face in the in a physical setup. But now, I think without losing any functionality with much convenience for everyone, you know, the speaker doesn't have to travel somewhere you don't have to waste time receiving someone you know, so many with full functionality and so, many efficiencies, we have realized that the virtual mode is better in this instance than the physical mode. That is what is going to give impetus to a new way of life and as you see, many things will return to normal Once COVID is over, many things will return to normal, but some things will change forever with this thing that substitute what is done in the physical sense with the virtual option, that realization has become very strong. And companies have realized it, you know, that without losing functionality, you are able to, you

know, achieve so much saving, and so much convenience. So, it is truly a revolution. I mean, it's a hard way to learn a lesson, I want to be sure to ever happen again that you learn a lesson in such a hard way but then this seems to be one of the silver linings in terms of a lesson we've learned and and it'll certainly impact the medical field the Telemedicine field. To go through my research which I did for this occasion, let me also mention that our doctors to population ratio is **1:1540** compared to the World Health Organization standard **1:1000** so here again, you know, if you want to bring this down to 1:1000. it is going to be a huge task involving huge resources and Telemedicine can help us to magnify the reach of the existing medical resources. Almost 70% of India's population of course, lives in villages, and 60% of hospitals and 80% of doctors live in urban areas. So, this mismatch also if you want to start curing, by setting up you know, physical locations, with doctors in them in far flung areas, you will never achieve it. So, achieving the basic minimum goals of public health provisioning, even then necessity Telemedicine there is no option it appears and I have seen you know, I was in UP Cadre, I've seen the UP medical system where most places are reasonably accessible. They're also non Parkland blocks, the doctor would never be present they would all be sitting in headquarters. So we have to recognize this reality, and you know, two more Telemedicine options and make everyone happy, while achieving the full functionality the doctors are happy, the paramedical staff are happy the patient is happy. So without compromising on functionality, you are achieving its full potential.

You know, even some services like psychiatry services counselling services where one thought physical proximity makes a difference, you know, someone talking to you earnestly someone talking to you with empathy, but apparently, that also Zoom does, not undermine that element too much the personal touch of the physician the personal touch of the caretaker wherever required can be largely achieved through modern you know, digital technology. So that again, is a very encouraging sign. Then, you know, even applications of these modern technologies are huge artificial intelligence. Since everything is happening in a digital mode, you automatically develop a database, the database automatically becomes amenable to so many tools being applied, all the artificial intelligence tools can be applied to the database to quickly take, you know, corrective action understand trends, and you know, reallocate resources. Then even for things like, addressing the issue of counterfeit medicines, things like self-care through, IT enabled devices that I believe there are 60,000 healthcare related applications now on Android, which again, is in a sense, that application of Telemedicine, you know, use some, you know, application or some device and then which is IT enabled and then access the world of

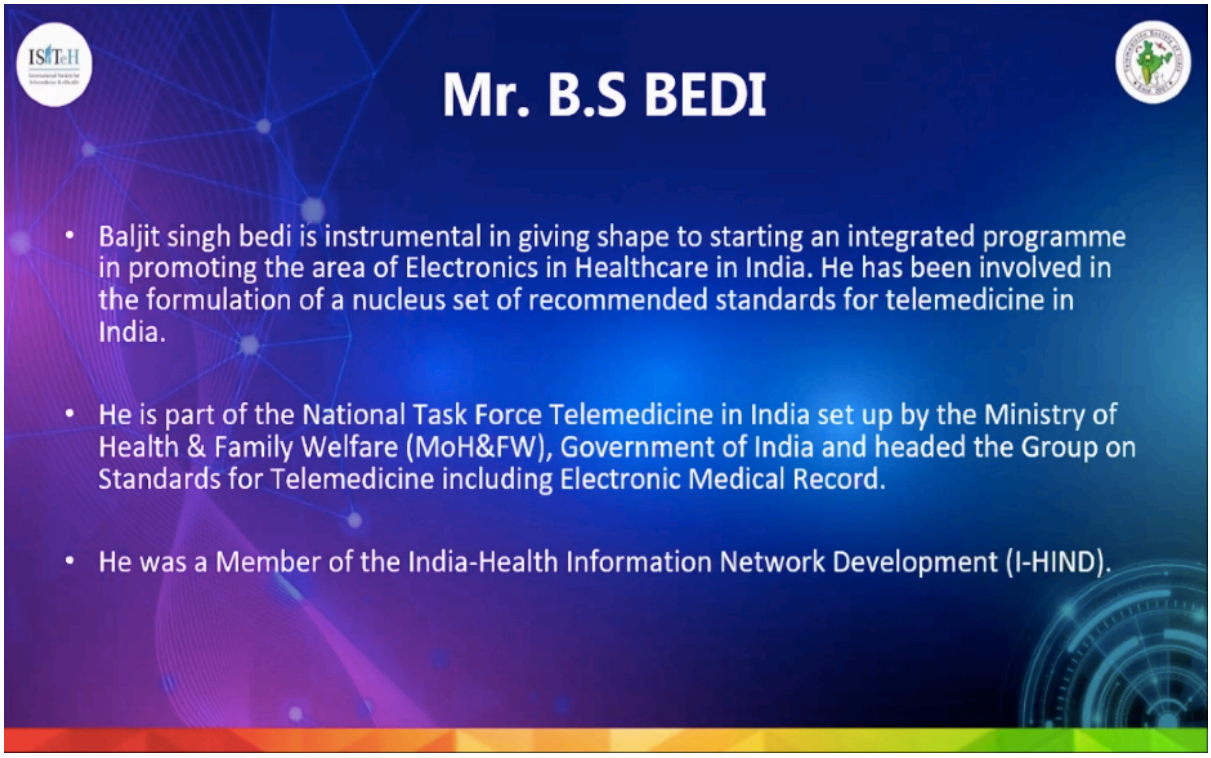
Telemedicine to address any problem that comes up. And of course, health monitoring.is another area where if you need expert monitoring of a patient at a distance to take timely action, you can do health monitoring through the IT infrastructure from a distance so I think it's a huge potential that we have begun to achieve the very heartening signs and I think thanks to activities and actions of entities like the Telemedicine Society of India, we've come this far and I'm sure with your efforts which will be redoubled on account of our recent experience with the COVID pandemic, we'll achieve even greater progress, quicker progress. And I think the world of medicine will be unrecognizable, a decade or two from now, in terms of the kind of access people. The last person society will have, and in terms of the efficiencies with which the best medical services in the world would be delivered to the last person in our society.

So let me conclude with that. And thank you all once again, for all your effort for your dedication for your passion, and I would urge you to, build on that and encourage the entire medical fraternity all medical institutions, laboratories to become part of the Telemedicine network and magnify the impact of their efforts. So thank you so much. Thank you,



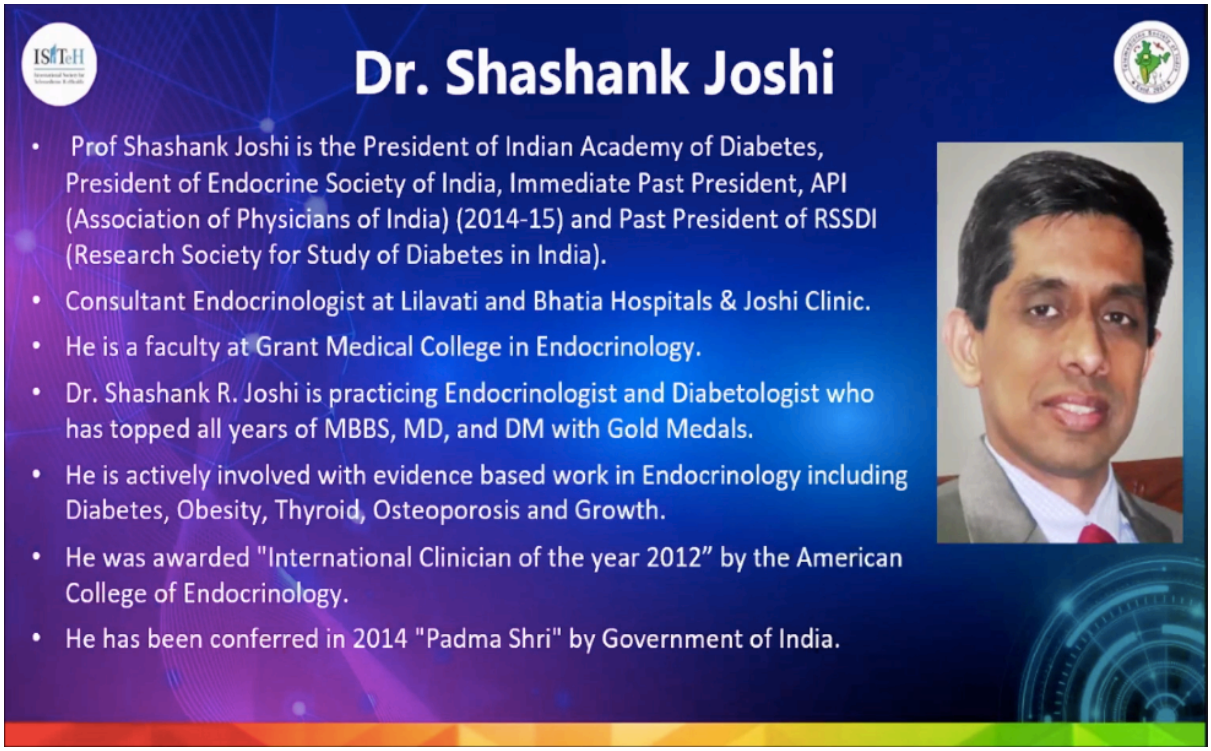
Good afternoon , thanks for joining this event and i would like to welcome you all to the session three of day one of Telemedicine 2020. Let me introduce myself. I am Dr. S. Dheeraj Krishna, head of Telemedicine star health and allied Insurance Company Limited. I'm going to moderate today's event. We have three great topics in this session presented by three dynamic doctors who are stalwarts in their field. Before that, I would like to take the privilege of introducing our chairpersons of this session. so the three chairpersons of today's session are Mr. L .S. Satyamurthy, Dr. S. K. Mishra and Mr. B. S Bedi.

Dr. L .S. Satyamurthy is doyen in the field of Telemedicine. He was one of the pioneers of Telemedicine in India. His contributions to the Telemedicine industry during his tenure as the project director of Telemedicine ISRO, had laid the foundation stones in establishing Telemedicine in many medical institutions. Pre broadband era, the contribution of a ISRO had made the Telemedicine industry right. There was a special request from Dr. K. Selvakumar to ordain him as the Godfather of Telemedicine in India. He is still very active in the Telemedicine field and heading many private organizations.

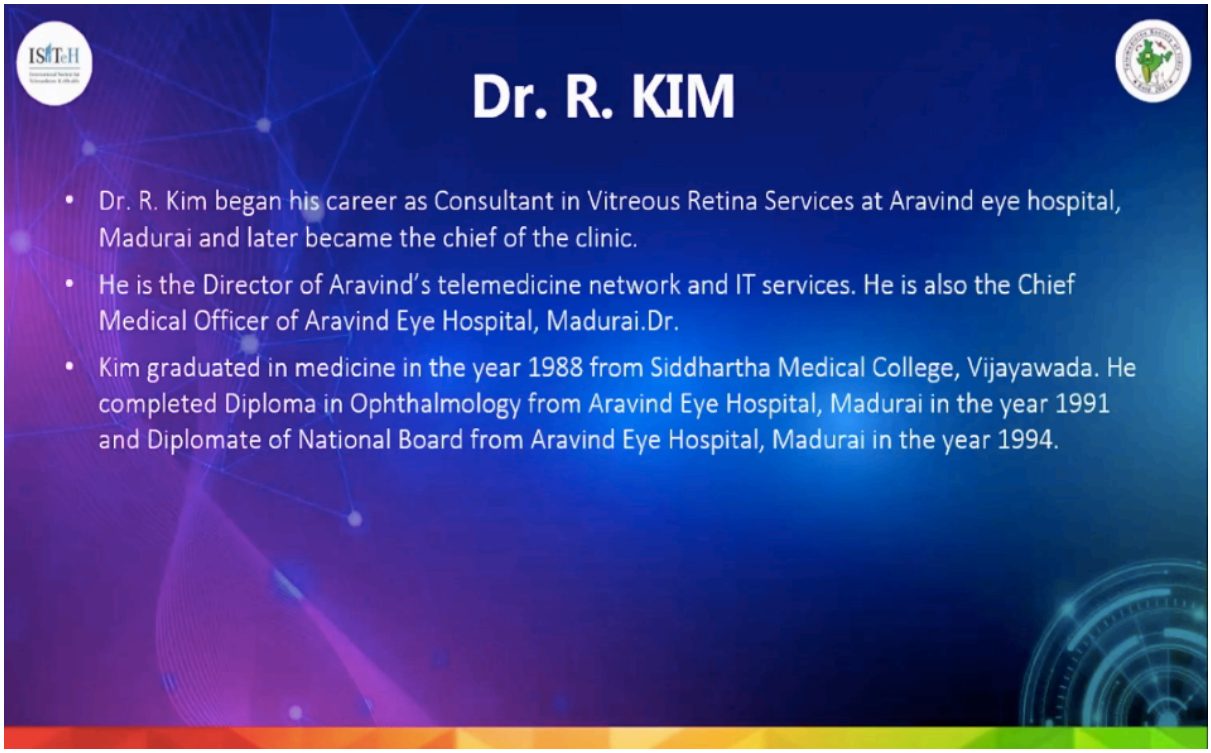


Mr. B.S BEDI. A past president of TSI and its current CEO, Mr. Bedi has helped in standardizing the practice of Telemedicine during his tenure as the advisor in CDAC. He has helped in shaping up many Telemedicine facilities as a member of multiple governmental task forces. Mr. Bedi has implemented highest standards of practice in the Indian Telemedicine industry.

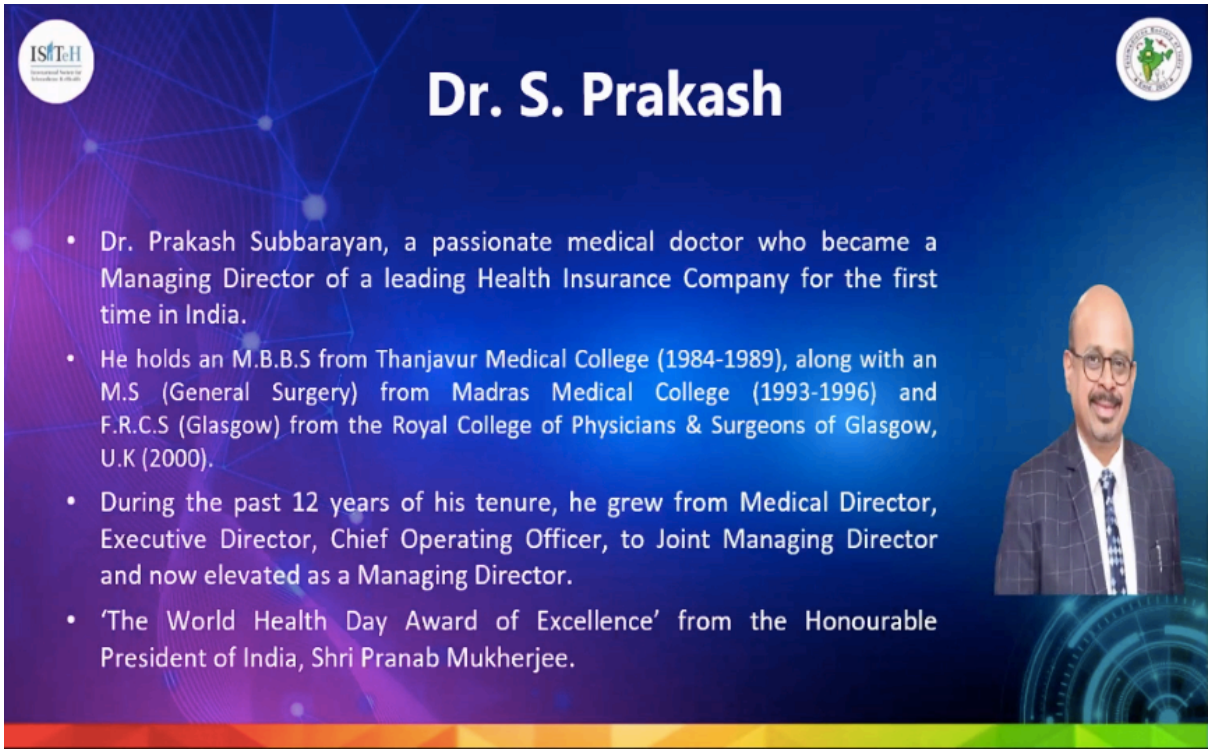
Dr. S.K Mishra is a senior Endocrine Surgeon and the Dean of the famed SG PGI Lucknow. Under his leadership the SGPGI has become premier Institute of Telemedicine. He is the father of Telemedicine and help grow TSI by incubating it in Lucknow. He is also a Past President of the Telemedicine society of India



The first session is on diabetes reversal. Twin wave empowering doctors using telehealth and AI by Dr. Padma Shri Shashank Joshi, consultant endocrinologist Lilavati and Wadia hospital Mumbai. Dr. Joshi is a world famous endocrinologist and is a Telemedicine and technology enthusiast, is actively involved in bringing advances in the field of endocrinology and non communicable diseases, is the president of two important organizations, the Indian Academy of Diabetes and Endocrine Society of India. He is also the Chairperson of the Indian chapter of American Association of Clinical Endocrinology.



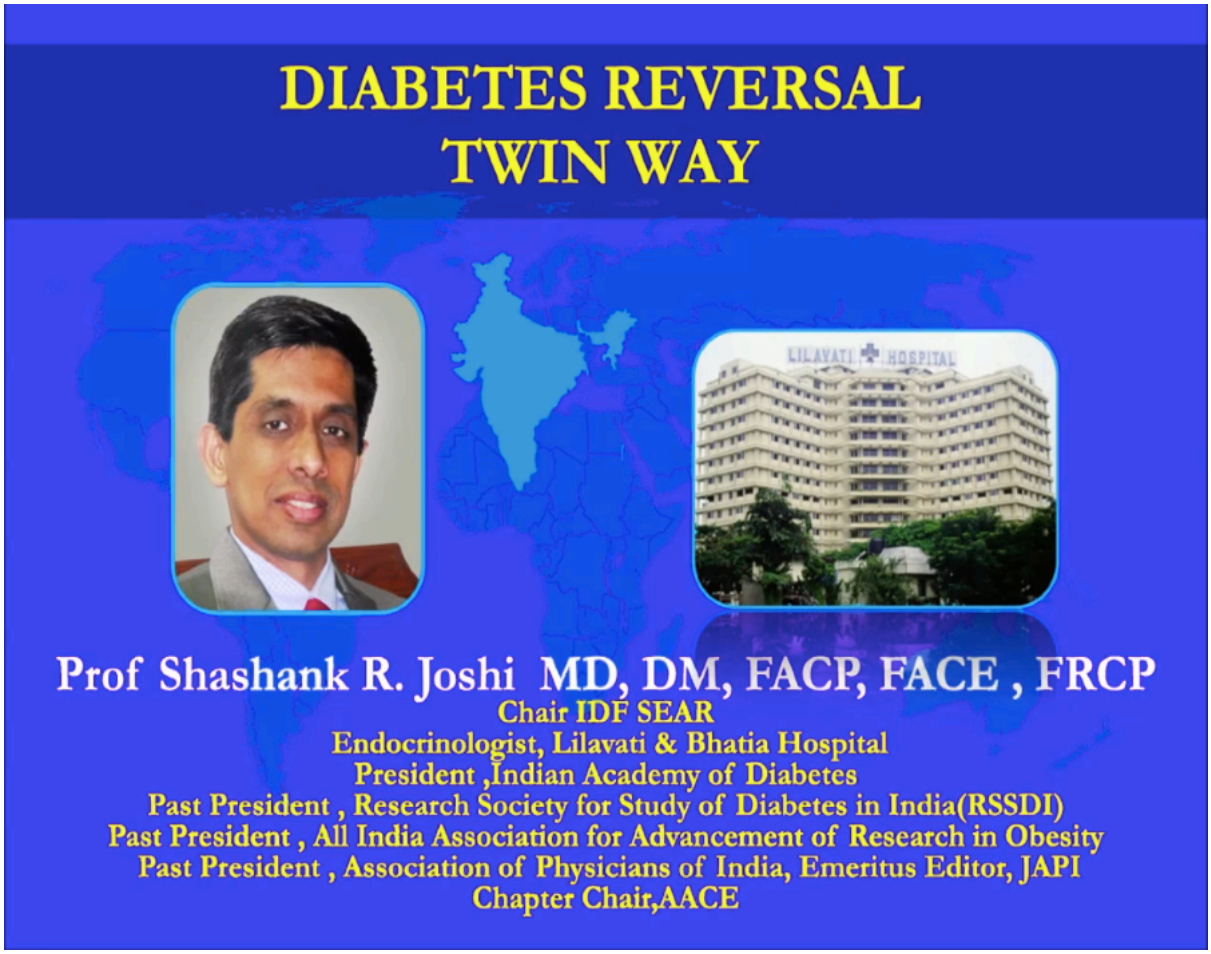
Second speaker is our own Dr. R Kim. The topic is on tele screening for retinopathy of prematurity. I don't think there can be anyone in the Telemedicine fraternity who doesn't know Dr. R. Kim. He is the Chief Medical Officer of Aravind Eyecare Hospitals, is the director of Aravind Telemedicine network and IT services. He is being presented with many affiliates like the Lifetime Achievement Award by a APO. Best doctor award by Tamil Nadu government. He has also been an avid organization of the Telemedicons of the past.



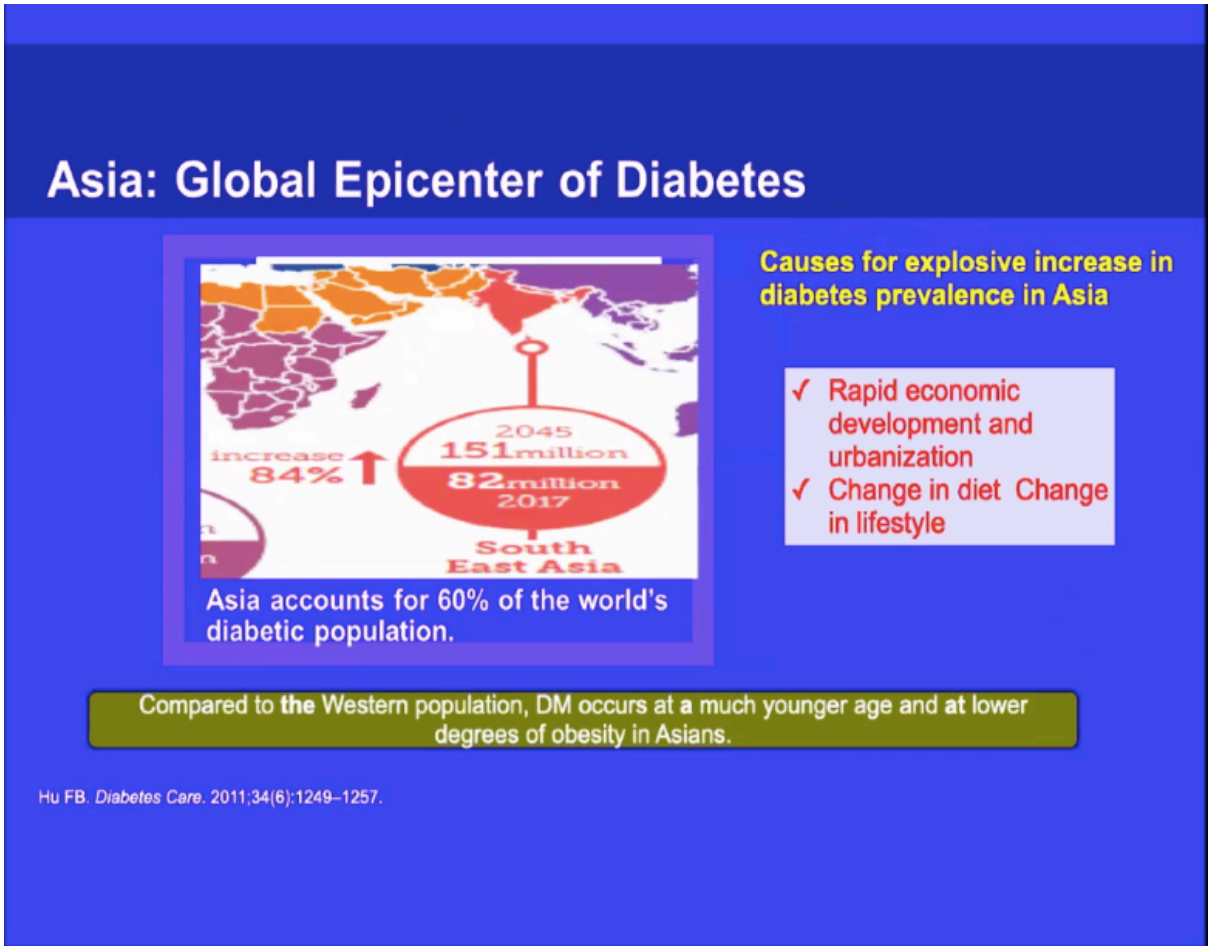
The third speaker for this session is on health insurance coverage for telehealth is by none other than my mentor and my own boss, Dr. S. Prakash, Managing Director of Star H,ealth and allied Insurance Company Limited. Dr. Prakash Subbaryan, is a passionate medical doctor and surgeon who became the managing director of a leading health insurer for the first time In India. He has the best of both worlds, two decades of experience in clinical practice of medicine, and more than a decade of experience in health insurance. His efficiency in contributing to the functional growth of star health insurance has reflected in the gross underwritten premium growth from US dollars, three millions in 2007 to $ 903 million in the financial year 2020. He leads product innovations in style and his vision of providing health care to all led to the development of tough to start, a free Telemedicine service available for all through doctor staff. He has helped more than 1.5 lakh individuals, enabling no cost consultations across 14 medical sub specialties including psychiatry, ophthalmology, neurosurgery and oncology. He is the chairperson of CII Tamil Nadu, healthcare panel consecutively for the past four years. Under this leadership star has received many accolades including the World Health Day Award of Excellence in 2017. From the honourable President of India, Shree. Pranab Mukherjee trends in corporate governance award in 2019 from the honorable government of TN Shree Banwarilal product.

So, I would like to hand it over to the chairpersons to inaugurate this session

Day 1	Topic	Speaker
• 18th December 2020 (Friday)	• Diabetes Reversal Twin Way : Empowering Doctors using Telehealth & AI	• Dr. Shashank Joshi

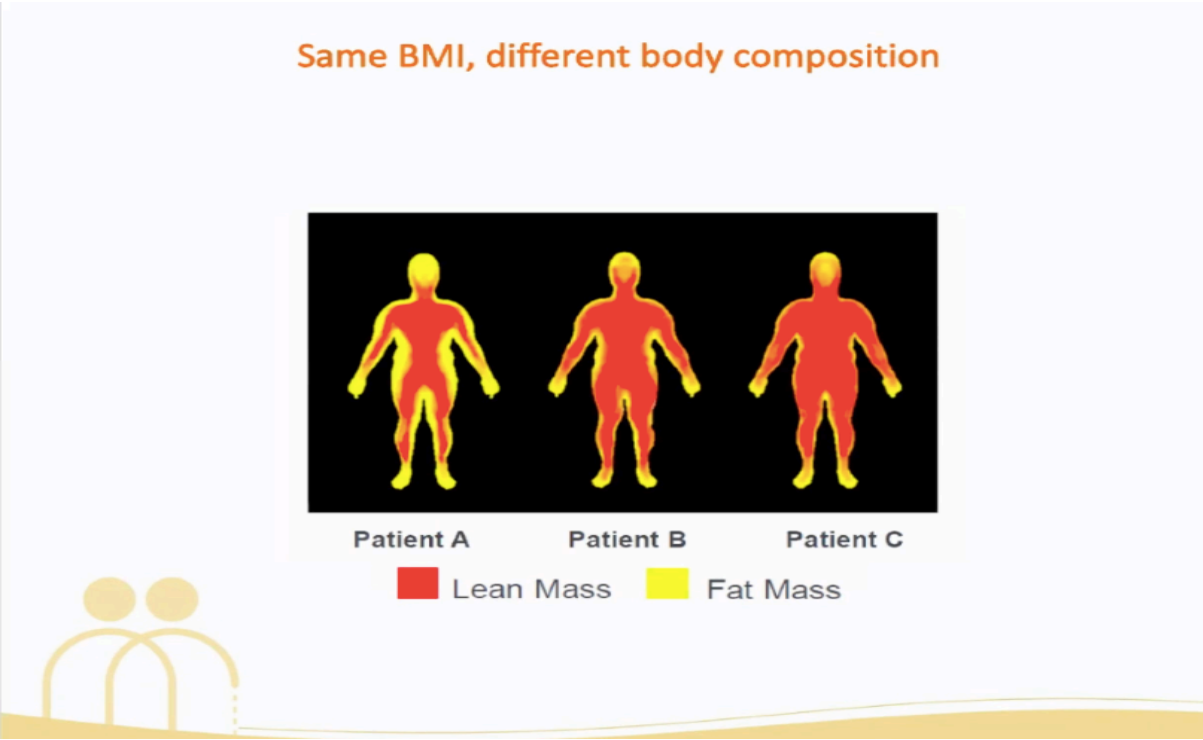


I want to thank all of you at this Telemedicon. It's my first time I'm appearing in a Telemedicine meeting, which is there in India to discuss in 15 minutes. How we can reverse diabetes using artificial intelligence, that twin wave?

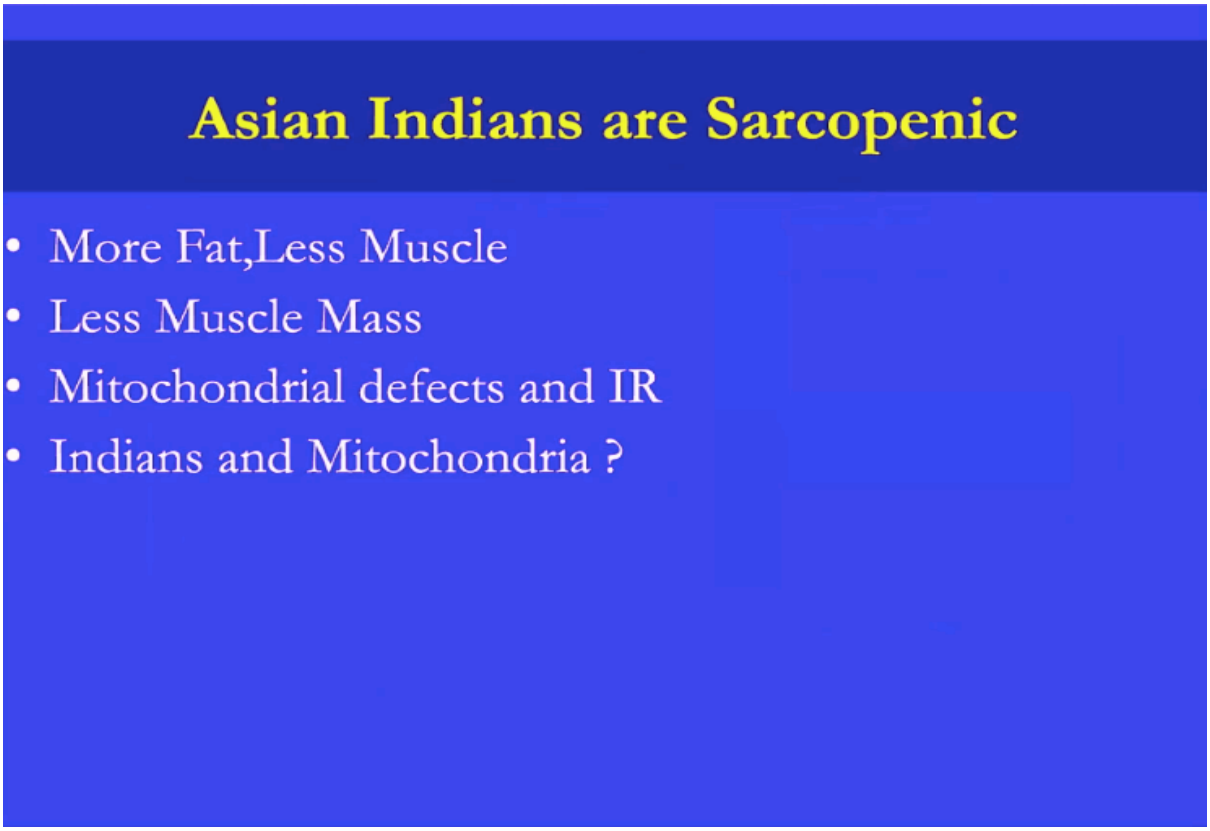


I'm going to go through the journey that we know that we are the global world number two in diabetes. We have an explosive prevalence of diabetes in Indonesia with rapid economic development, urbanization, change in diet and lifestyle. Can we use some of the phenotypic features which we see in Indians which are there?

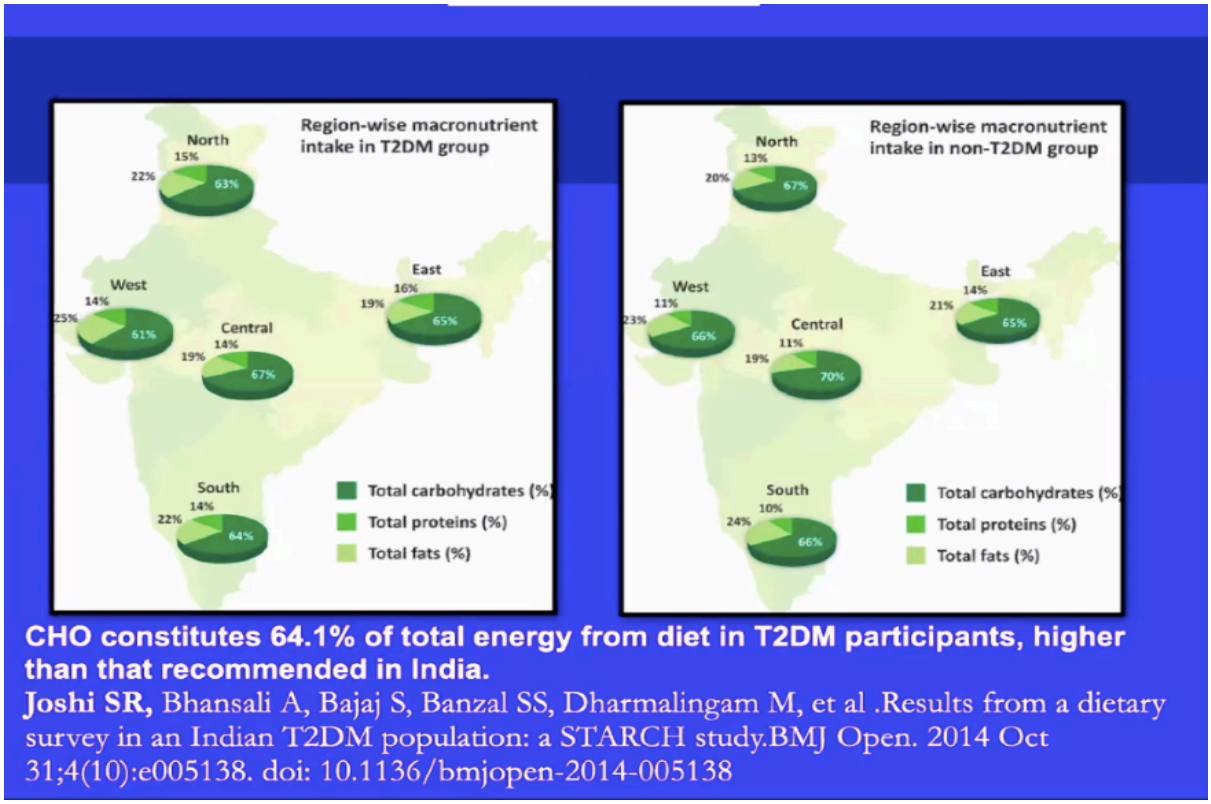
We are thin fat Indians, we have more fat, we have less muscle, we have less muscle mass, which is called sarcopenia. Is it genetic? We don't know is it environmental, probably. We are sedentary and we are affluent. And that's why we are seeing this whole explosion. And we know that for the same BMI we have different body compositions in lean mass and fat mass.



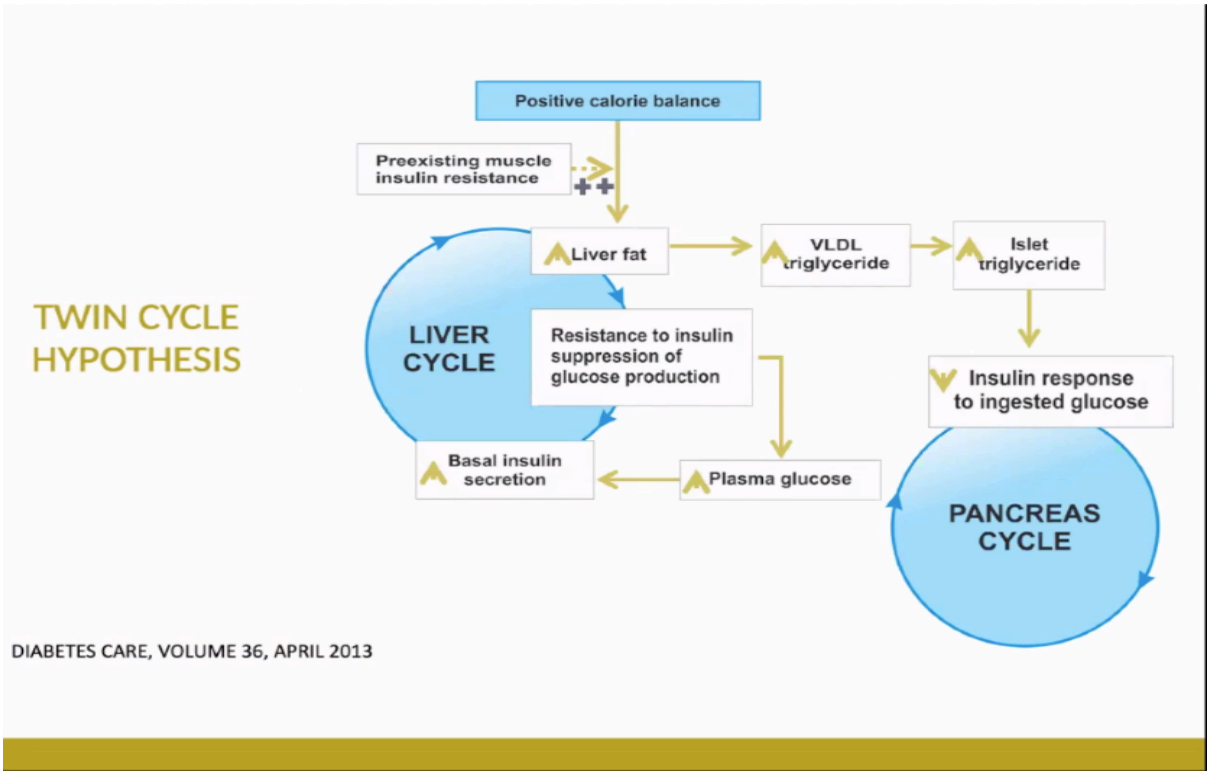
For example, here you can see three cases, the patient A has more fat, and less lean mass while patients he C has more lean mass and less fat mass.



So obviously, the reason we get diabetes is because we have more fat, less muscle, less muscle mass neuron mitochondrial defects.



And across India, this was a study we published in British Medical Journal almost six years back, that we are a carbohydrate and fat country. In the good old days, we thought only South India had diabetes, only South India had carbohydrate. But that's not true. Across India, you can see here, including northeast meet a lot of carbs and fats and little proteins. And obviously, you know, to reverse diabetes.



We saw that if we eat too much, we actually activate a hypothesis that we eat too much. It actually, you know, attacks the liver and causes liver fat, and it activates a liver cycle which leads to insulin resistance. And then the fat goes into her pancreas, making fatty pancreas. So we get fatty liver and fatty pancreas. And that's really the story, why we are able to get diabetes. And if we have to reverse diabetes, probably we need to reverse this trend. And this is hypothesis generated by Professor Roy Taylor and his group in United Kingdom, which has been validated for the last decade. Clearly we know this twin cycle distinguish.

THE BASIS OF CORRECTING ENERGY BALANCE
BARIATRIC SURGERY

- The first hint that type 2 diabetes is a fully reversible syndrome came from bariatric surgery.
- Almost a quarter century ago, Pories et al. demonstrated that blood glucose levels normalized in obese people with type 2 diabetes undergoing bariatric surgery and that 10 years later, almost 90% remained free of diabetes

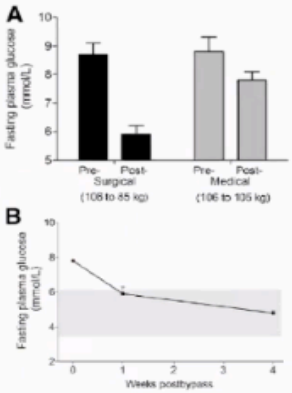


Figure 1—*A: Fasting plasma glucose and weight change 2 years after randomization either to gastric banding or to intensive medical therapy for weight loss and glucose control. Data plotted with permission from Dixon et al. (13). B: Early changes in fasting plasma glucose level following pancreatoduodenal bypass surgery. A decrease into the normal range was seen within 7 days. Reproduced with permission from Taylor (98).*

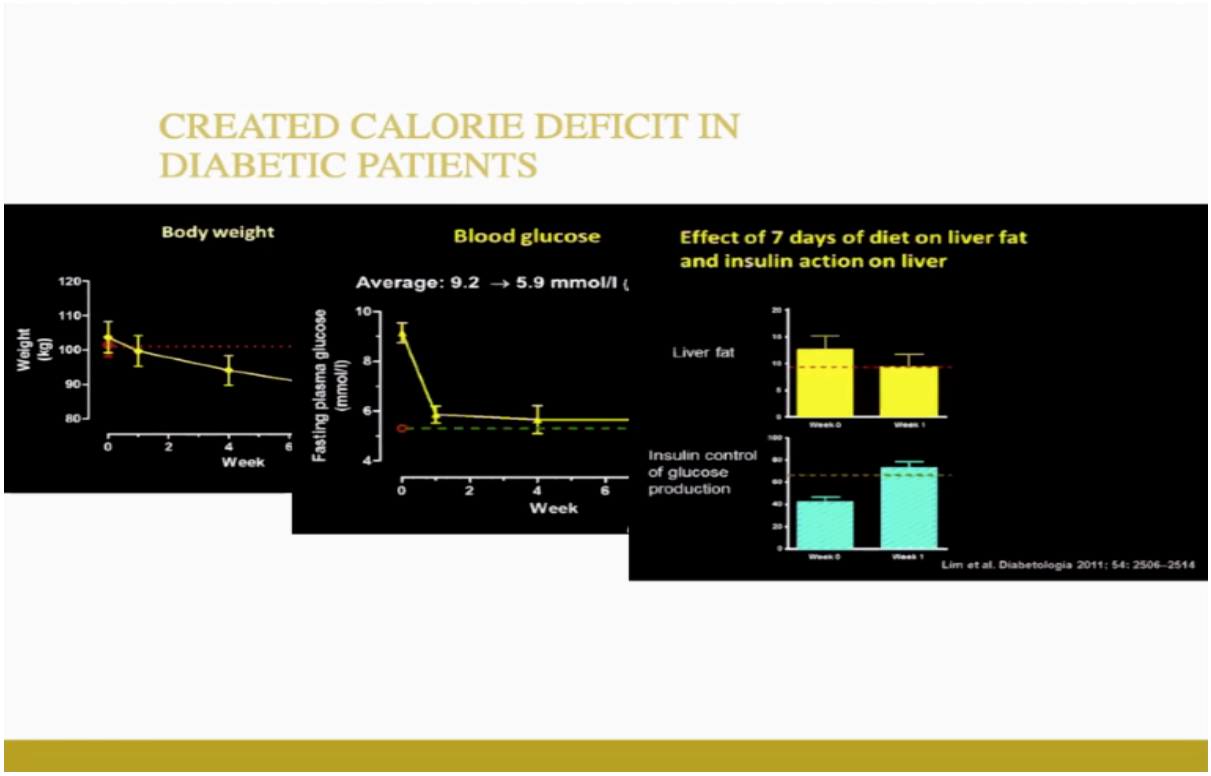
The first evidence that diabetes could be reversed came from bariatric surgeons, and almost 25 - 30 years back Pories et al did some very elegant surgeries, where he was able to reverse diabetes by doing bariatric surgery, and 90% remain diabetic free for 10 years after the bariatric surgery.

NEGATIVE CALORIE BALANCE & DIABETES REMISSION

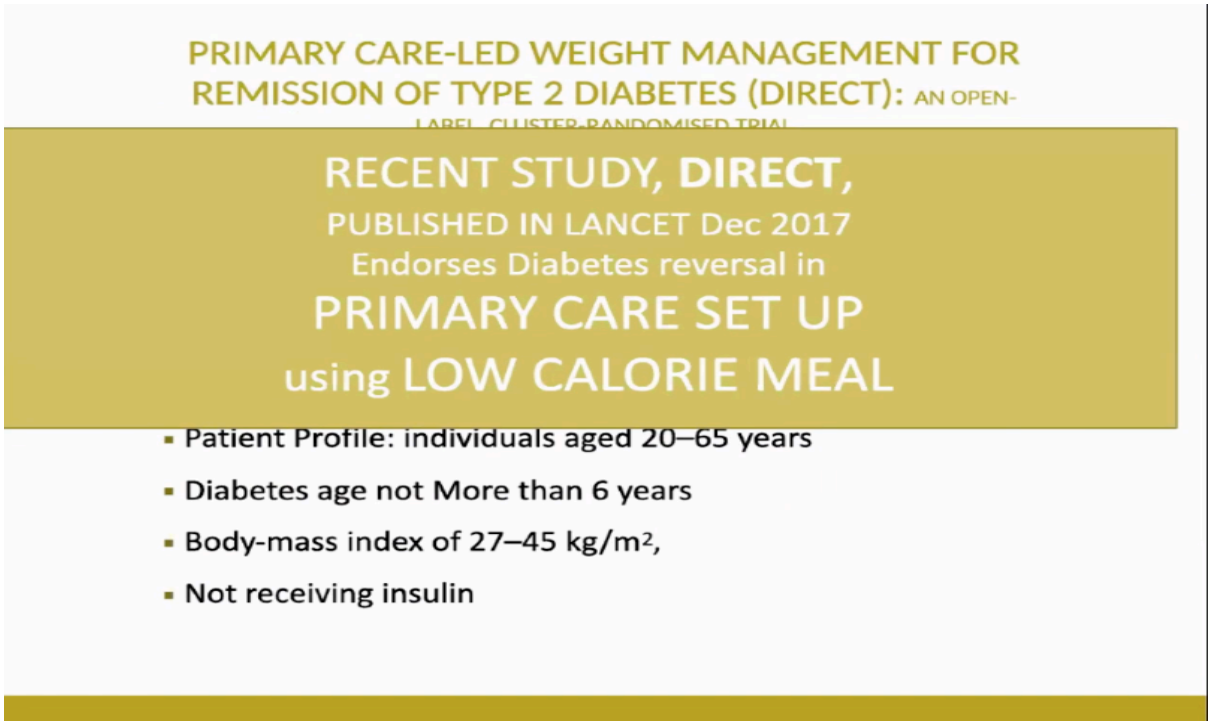
Prof. Roy Taylor

- **DR. TAYLOR SHOWED THAT SEVERE CALORIE RESTRICTION IS SIMILAR TO THE EFFECT OF BARIATRIC SURGERY IN CURING OR CONTROLLING DIABETES.** Within a week of either intervention, liver fat content is greatly reduced, liver insulin sensitivity returns, and fasting blood sugar levels can return to normal. During the first eight weeks after intervention, pancreatic fat content falls, with associated steadily increasing rates of insulin secretion by the pancreas beta cells

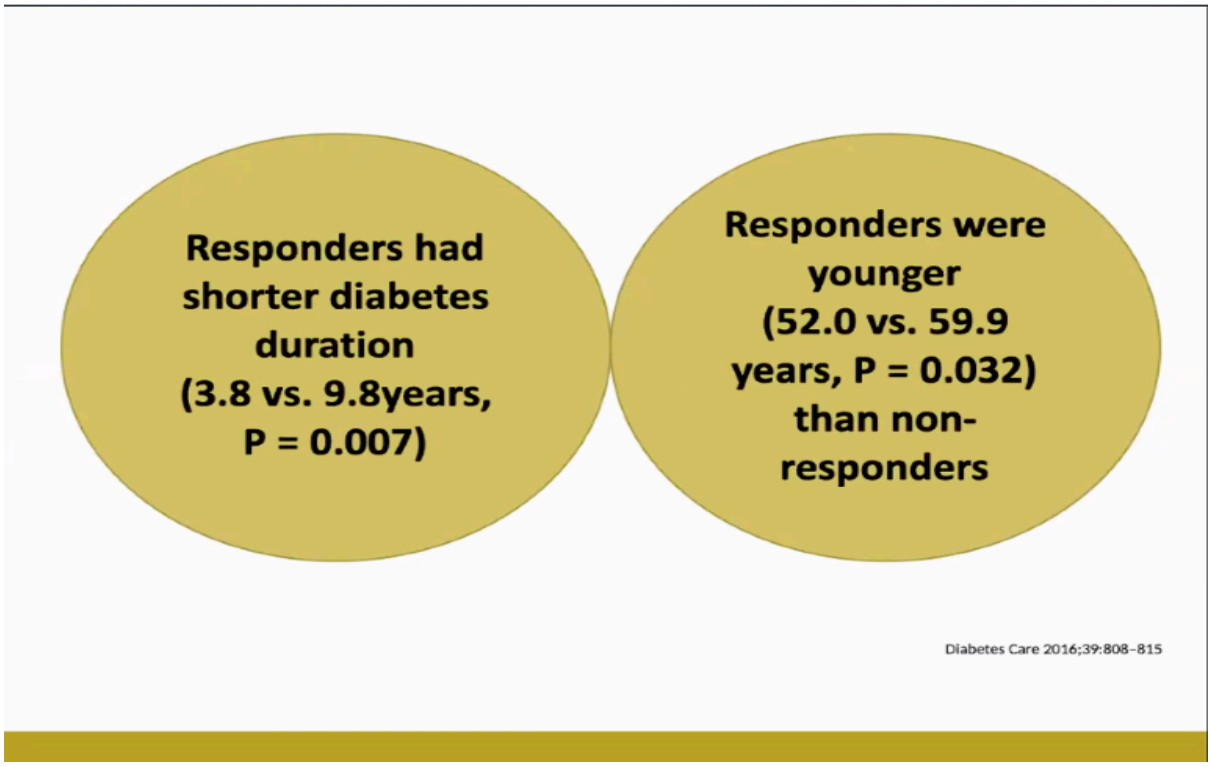
Professor Taylor decided that by severe caloric restriction, we can get a similar impact what bariatric surgery could do to control diabetes.



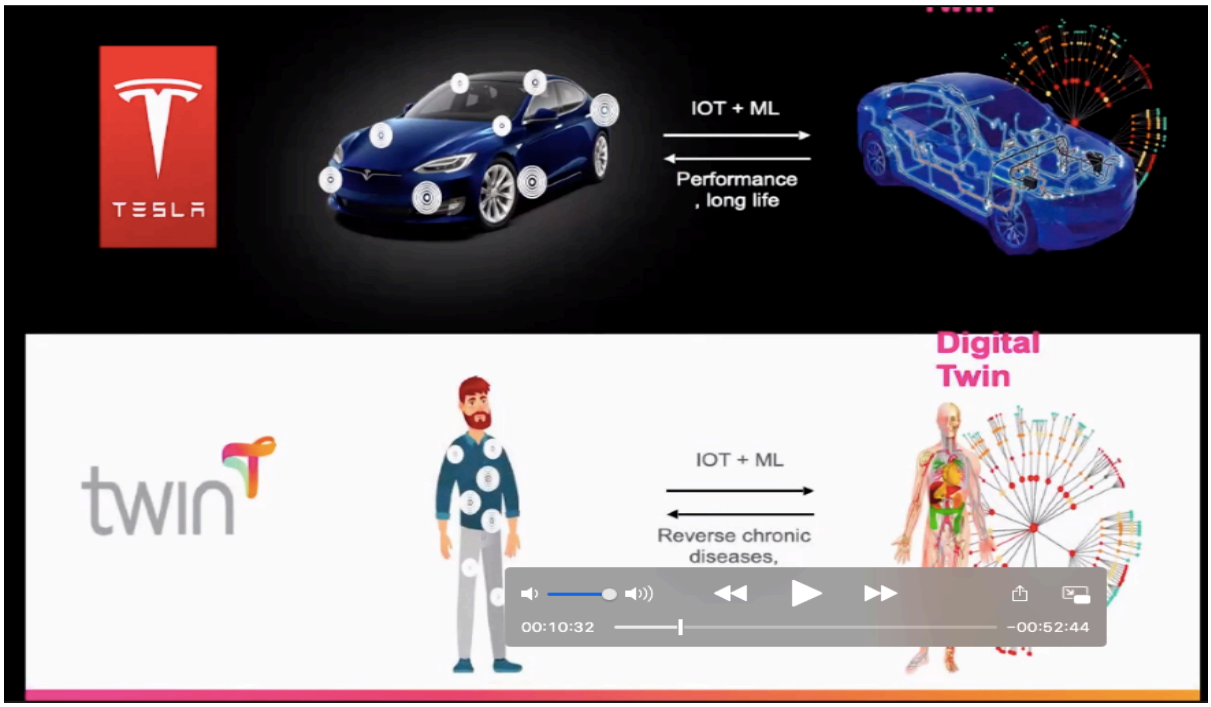
And by just reducing calories and creating a caloric deficit, you can reduce body weight, reduce blood glucose and improve the action of fat and action on the liver.



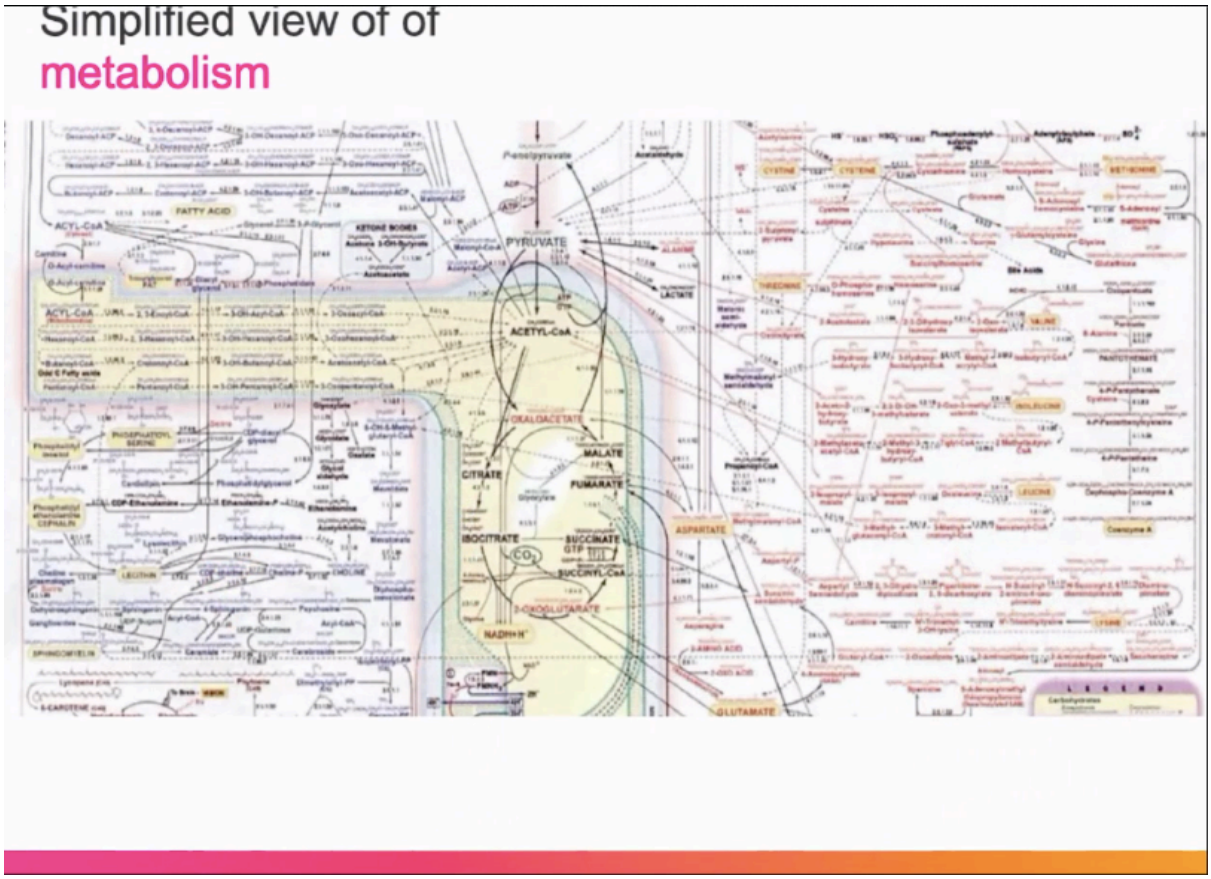
So we need evidence because we live in an era of evidence based medicine. And in December 2017, he published the direct trial which was in a primary care set up in young diabetics less than six years of duration, people between 20 and 65 with a BMI of 27 and 45, not receiving insulin. They were randomized to two groups and obviously you know To see that there was a demonstrable remission of diabetes in primary care, at least in 50% of the individuals who got it,



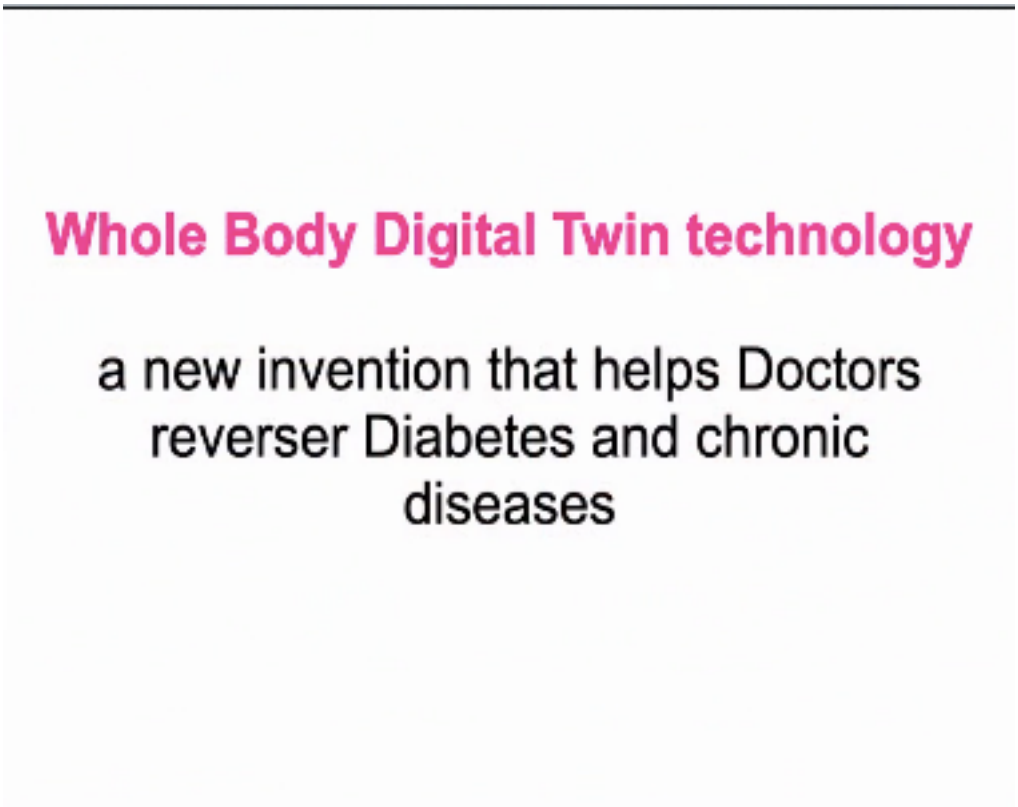
who responded better, people with shorter duration of diabetes, people who are younger, they responded better. So obviously, we know now from the natural history of type two diabetes, that diabetes can be reversed.



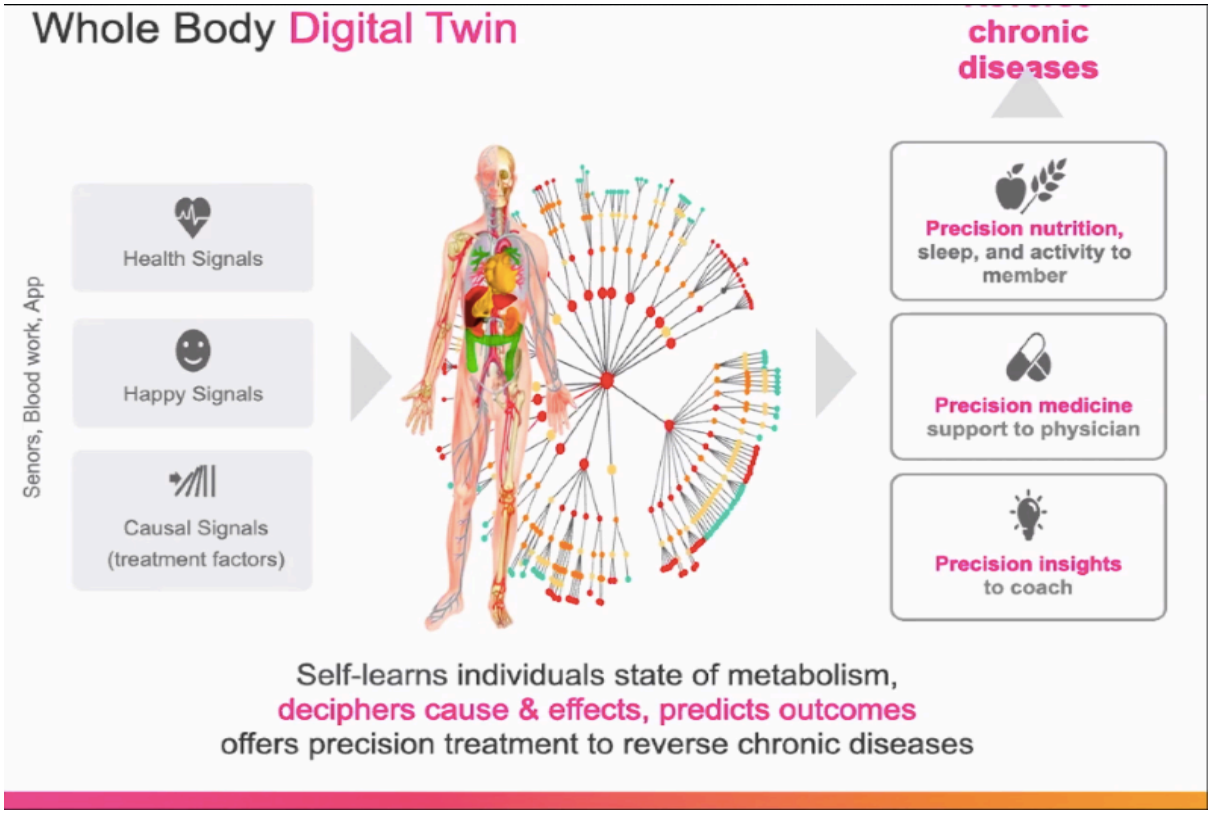
Now I'm closely working as a scientist with the twin technology, and twin health is a technology company. And here you can see that we are trying to create artificial digital twin of a human body and see whether it is possible and plausible, to reverse chronic diseases for a healthy lifestyle.



So we all know that metabolism is not an easy thing. As an endocrinologist and dermatologists, we see a lot of complex biochemical reactions. And we know that it is different for each individual. And it changes over time. And it's quite intractable when diabetes sets in.

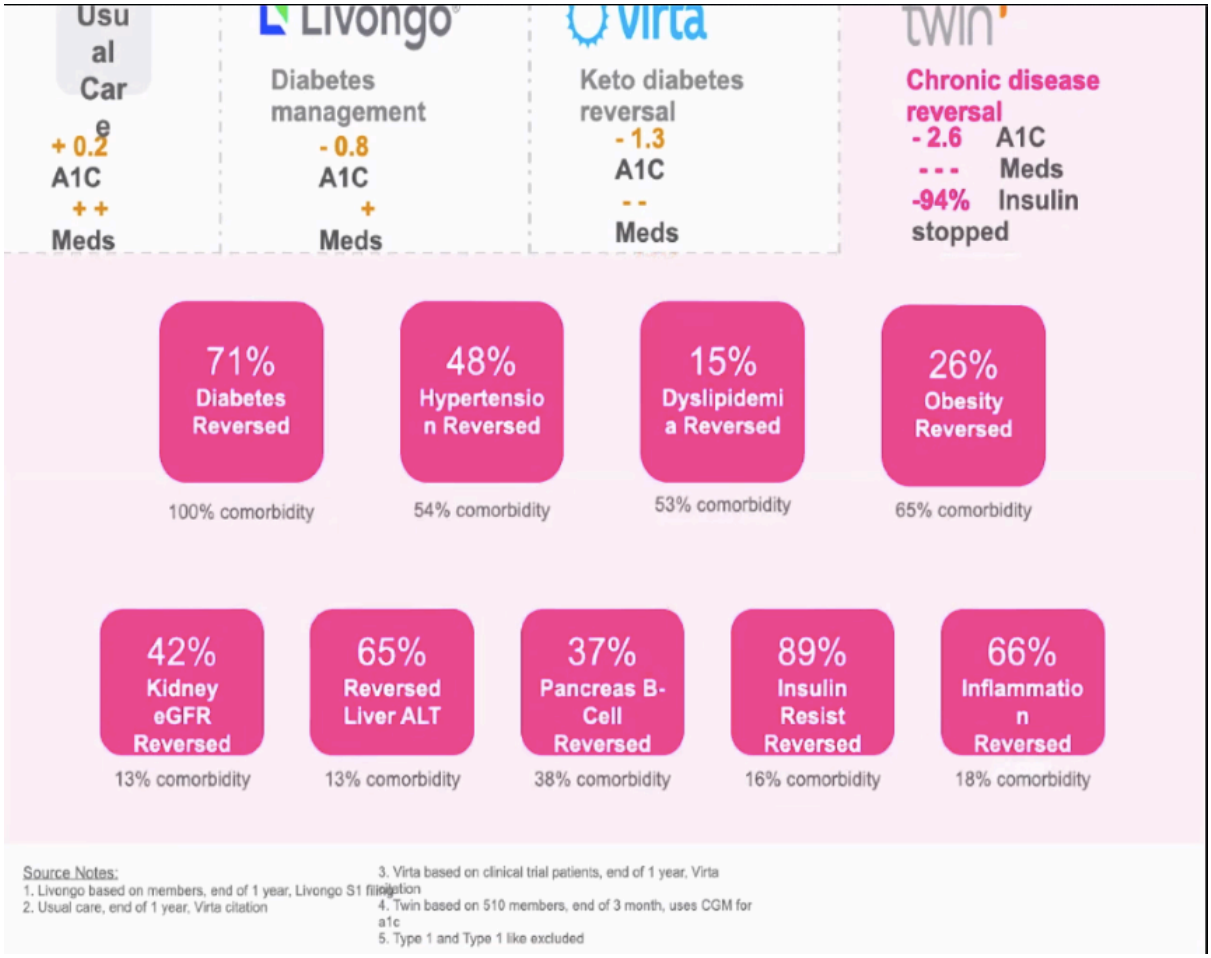


So obviously, using technology, we are trying to devise invention, which helps doctors to reverse diabetes and chronic diseases. So the whole idea of this whole body digital twin is actually to do pattern recognition, by applying some gadgets on the patient, which self learns the individual state of metabolism deciphers the cause and effects and predicts outcomes with precision treatment to reverse chronic diseases. So obviously, we attach some gadgets, which are health signals, we also look at mental health signals, which are happiness signals, and we look at causality factors, which I'll allude to a little later. And then use techniques like precise nutrition, sleep activity, precision medicine to support a doctor and precision insights to you know, support coach.

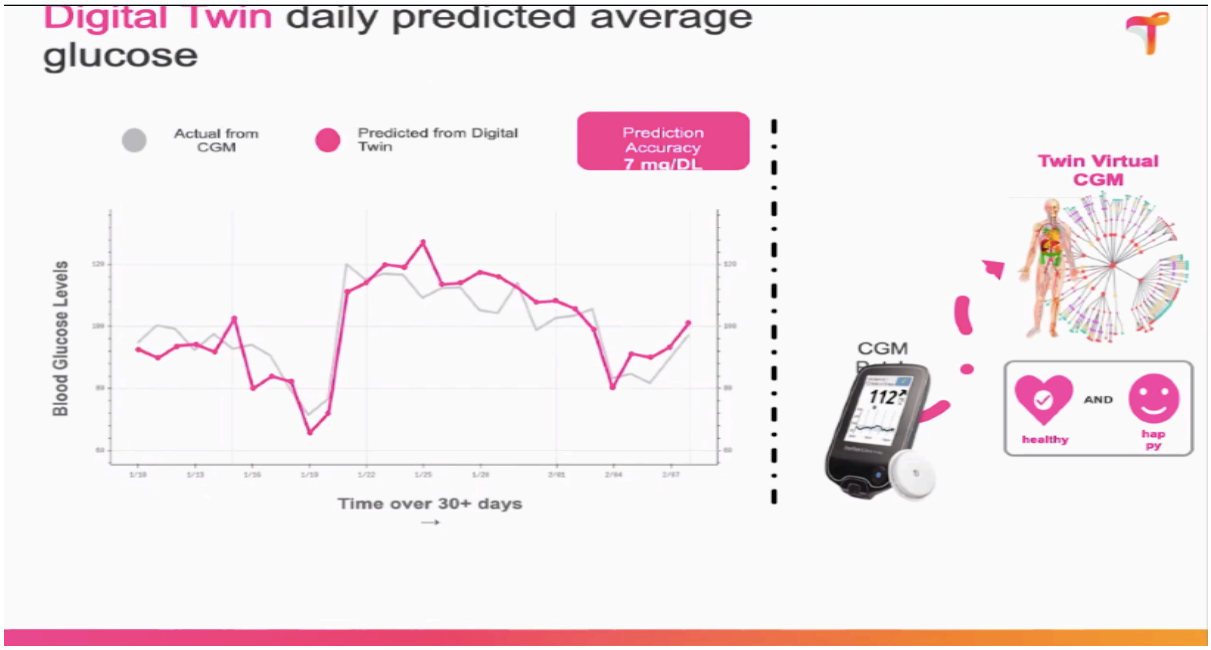


So obviously, it's a very integrated system, where we use technology we use coach, we use a case manager and a doctor in partnership with the person living with diabetes and look at a possibility and probability of creating a digital twin.

So we are in this in an era of evidence based medicine, usual care, we know people need medicines, and they even see doesn't drop down and there have been liked when similar data was created in the US like Livongo and O Virta which have been able to be diabetes management systems do some reversal with a drop of a bunch of 1.3. But in a small cohort, which we are analyzing now, predominantly based out of Bangalore, and now all over India, as well as now we have expanded it to the United States is got reversal with an agency coming down to 2.6 and medications and insulin being stopped to 94% of people.

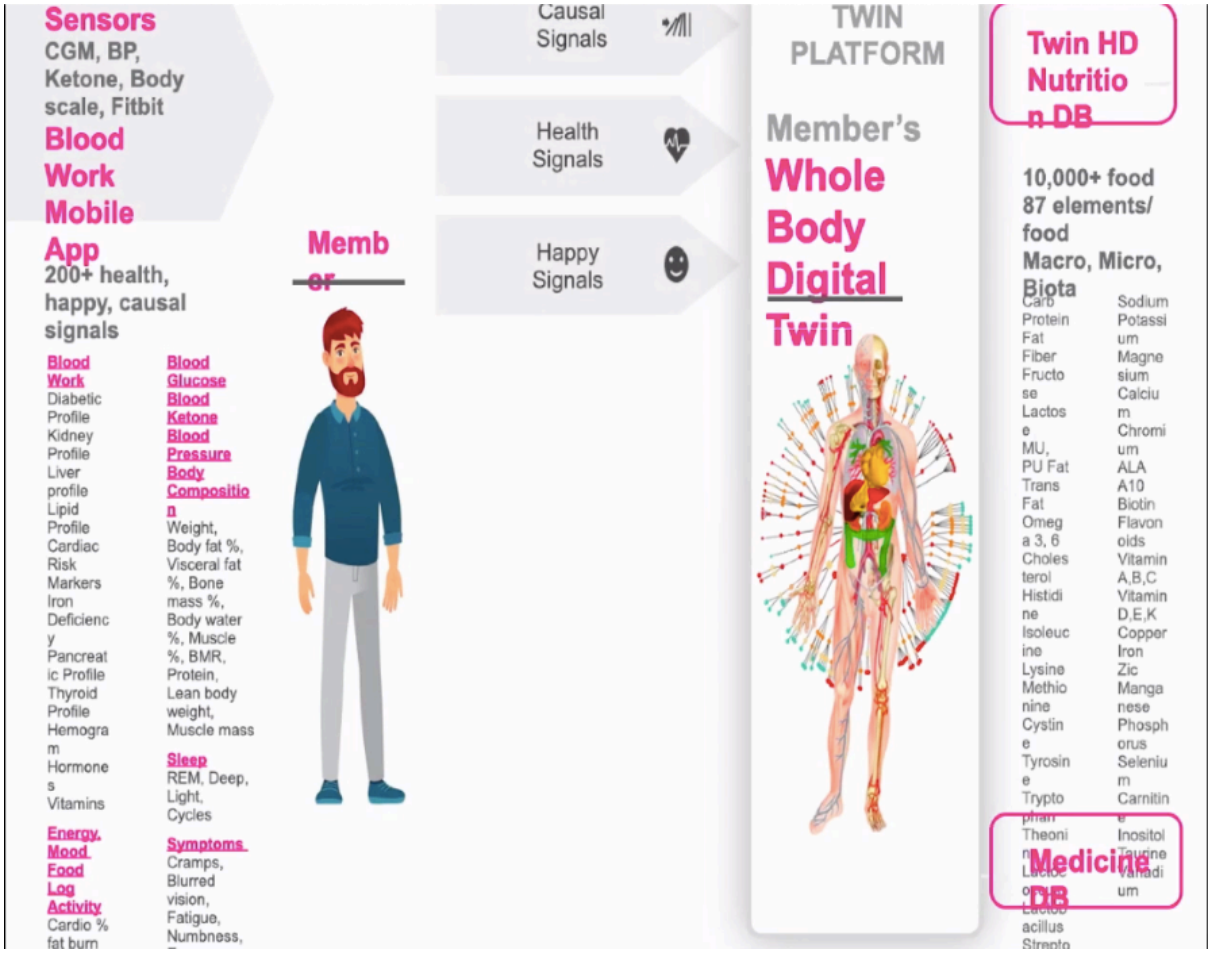


So obviously, you know, in the small cohort, which we have, and some of it is published data now, we have been able to reverse diabetes in 71% hypertension in 48%, dyslipidemia and 15% Obesity in 26% kidney function has been restored in 42%. liver enzymes in 65% pancreatic beta cells 37% and insulin resistance reversed in 89%, which is our key and inflammation 66%.



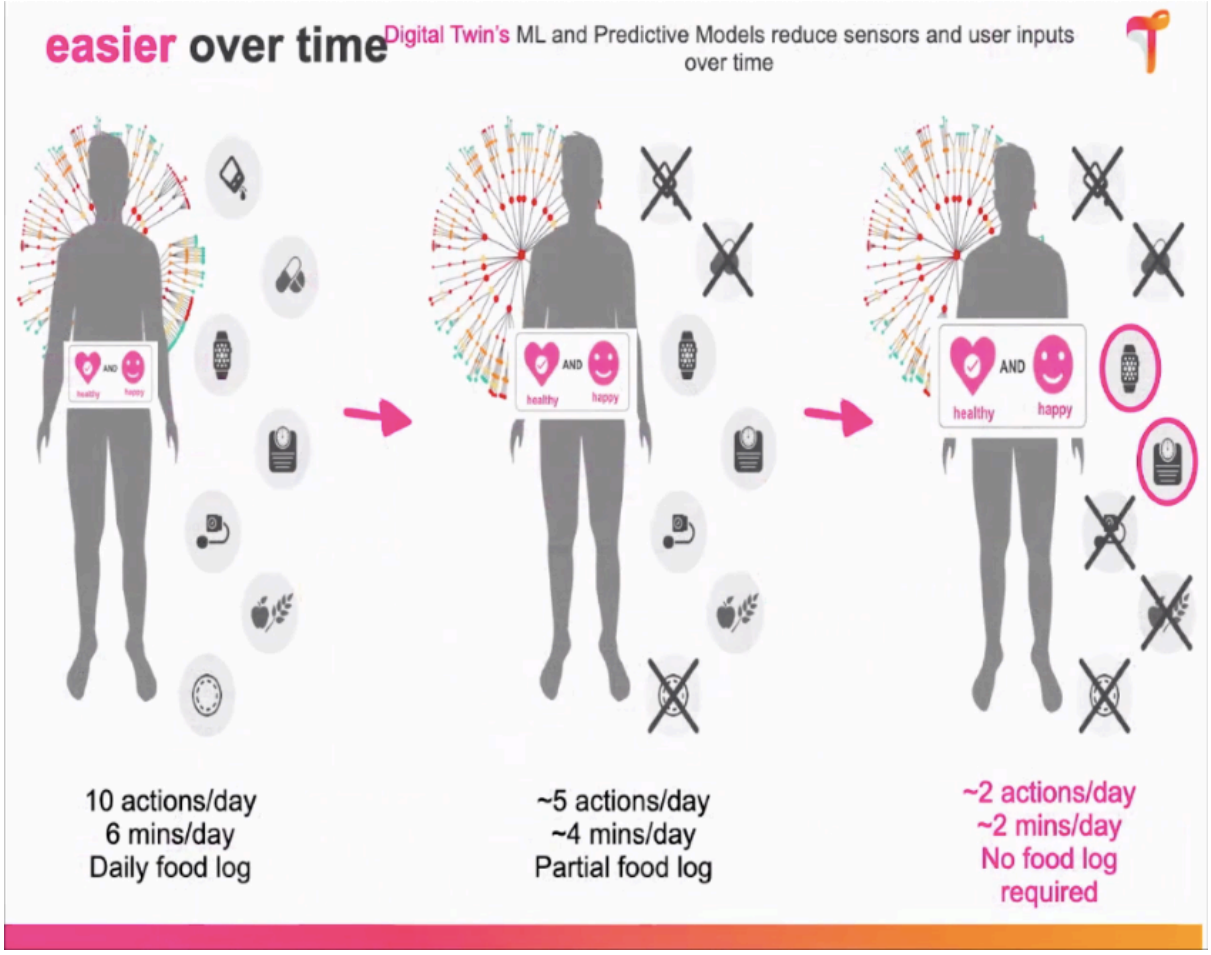
So we basically first thing we do is predict glucose spikes. And we use for that the continuous glucose monitoring technology. Many companies now have the continuous glucose monitoring technology, which is the CGM and we have for India we have used the Albert liberate pro and which is a 14 day cycle. And now we have the libris system which is there and based on the actual CGM values, we then try to use a prediction algorithm to predict and create a virtual CGM and then integrate it with the health quotient and happiness quotient, over 30 days. And probably we will be able to get that similarly, we use 24 hour blood pressure monitors. And from the blood pressure readings, we are able to predict with a reasonable accuracy of 4 millimetres a virtual blood pressure twin and that's the second thing which we do.

But the biggest challenge we face as Indians is the food insights and what we try to do is we look at the metabolic response of food which is unique to each patient for the same food somebody may have a good response somebody may have a fair response, somebody may have a poor response, and based on the food tolerance over a period of time, you can see here everything we want to green it out based on the various foods and obviously everything is integrated with our health quotient and happiness quotient. So obviously the taste is what decides food. So what is the type of food the calorie content of the food, the car content, the food the type of meal the type of combination and how often is based on a system and a prediction accuracy of the taste preferences on a digital twin is almost 0.42 stars clearly obviously, so we try to see that we use learning algorithms to do some precision medicine. So this is something which we are trying to recognize.

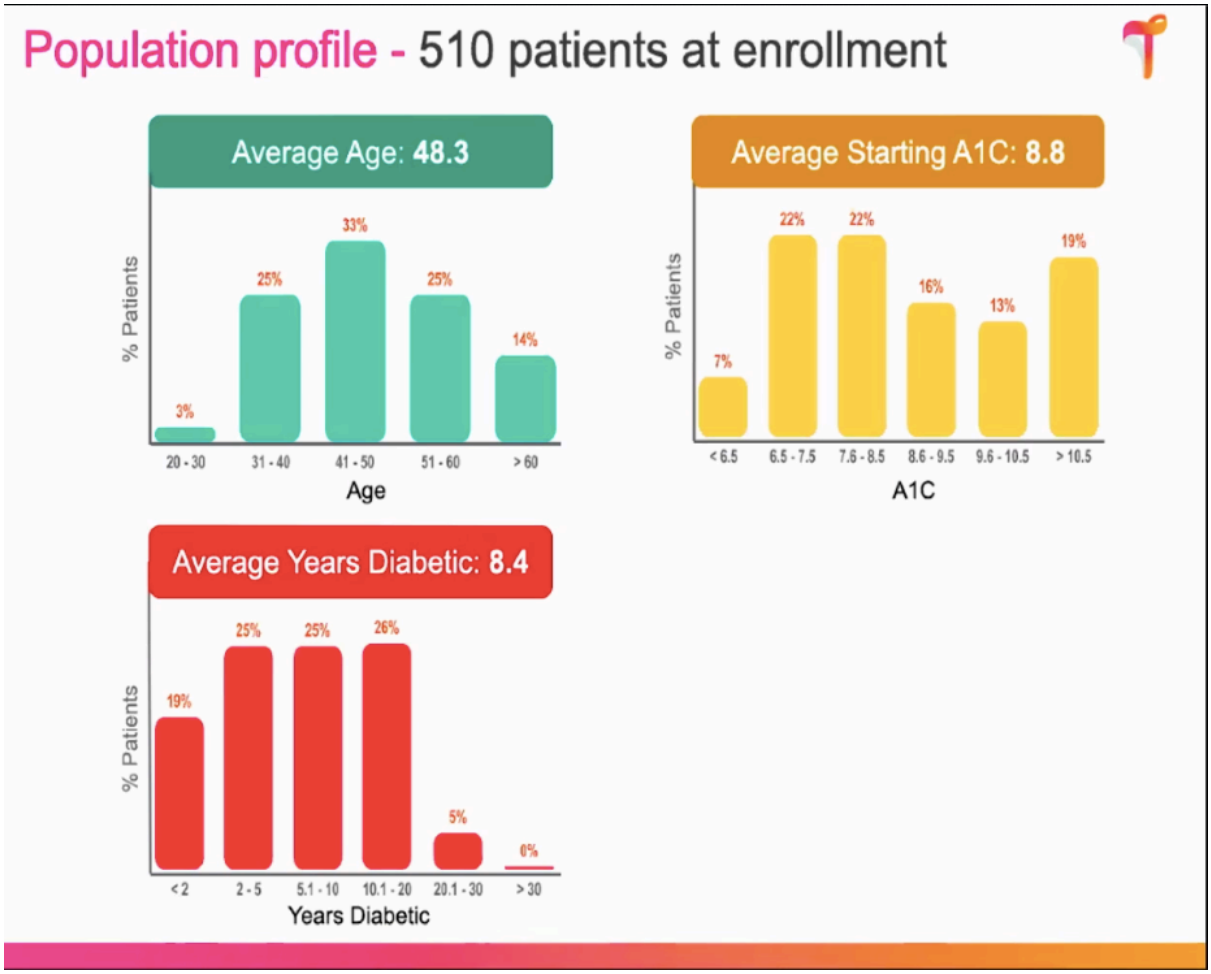


So how do we create it? Obviously the twin is a platform and each member will go through a continuous machine learning so we sensors for the continuous blood glucose monitor, blood pressure, ketones, body scale and a Fitbit. Then obviously, there is a mobile app, we do blood work for all the patients for diabetic profile kidney profile liver profile lipid profile cardiac risk factors, more than 200 parameters analyzed, we looked at the energy mood for activity log, which a nutritionist and a coach will collate and record. And then we also look at the blood glucose, ketones, blood pressure, body composition, and the sleep patterns, whether it's REM sleep, deep sleep, light sleep, and various symptoms like cramps, fatigue, blurred vision, so on and so forth. And obviously, we integrate all these signals with the food. And we have now got a database of more than 10,000 food types within India, you know, food is cooked in different places, we look at the macronutrient composition of food, the micronutrient composition of food, and even the gut microbiota. And many patients may be taking medications. So we have our medical team looking into the doctor component of it. And based on all these integrated inputs, which is big data for that particular human being, we then come with a precise solution, both in terms of nutritional advice on macro, micro, and the gut microbiota, on sleep and on

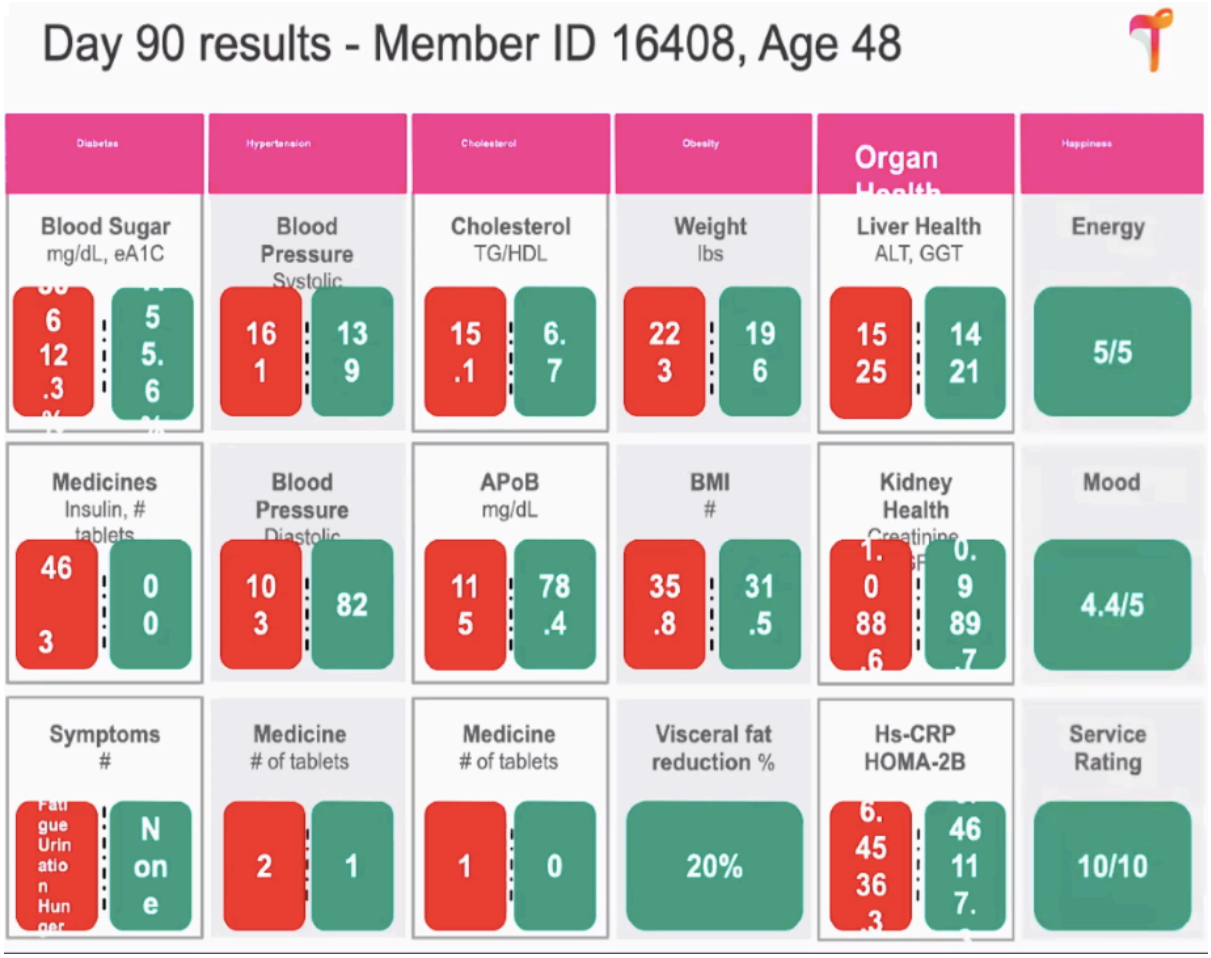
activity, the medications to be downscaled or upscaled, and, of course, the insights on coaching, in terms of happiness and behavioral change. So obviously, all this is an integrated program, which is carefully supervised by the coach, the doctor and the expert.



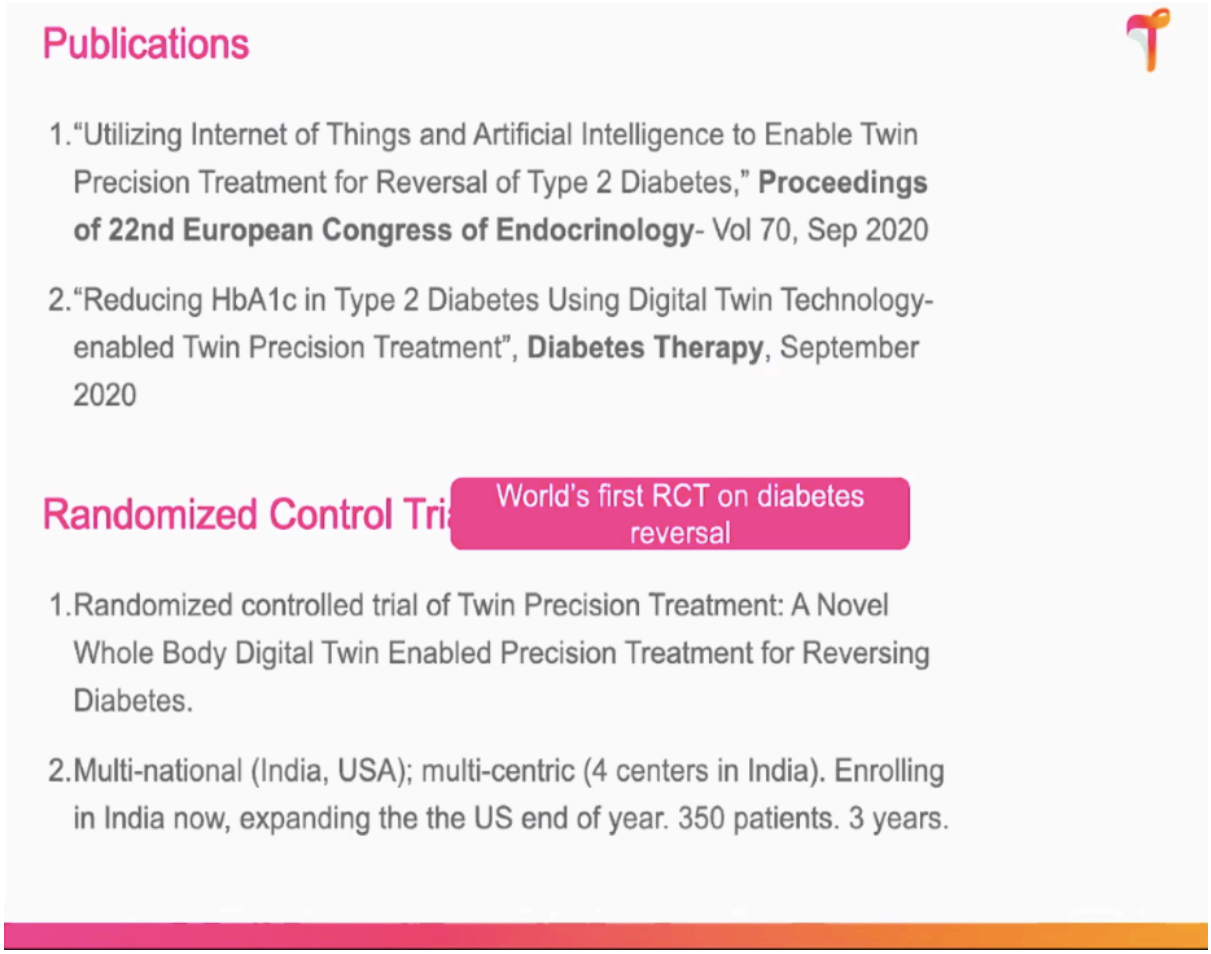
Obviously, over time, we are able to predict better. And we then reduce the need for sensors and user inputs. So obviously, when it comes to say glucose monitoring, and the food activity, you know, over a period of time, as we learn more and more, we are able to remove the you know, the gadgets, which are there. So initially, you might have all the gadgets, and you might need 10 actions per day, six minutes per day daily food log, it will reduce maybe after three months to five actions per day, four minutes a day partial food logs. And eventually, most people need to actions per day, two minutes per day with no food log required.



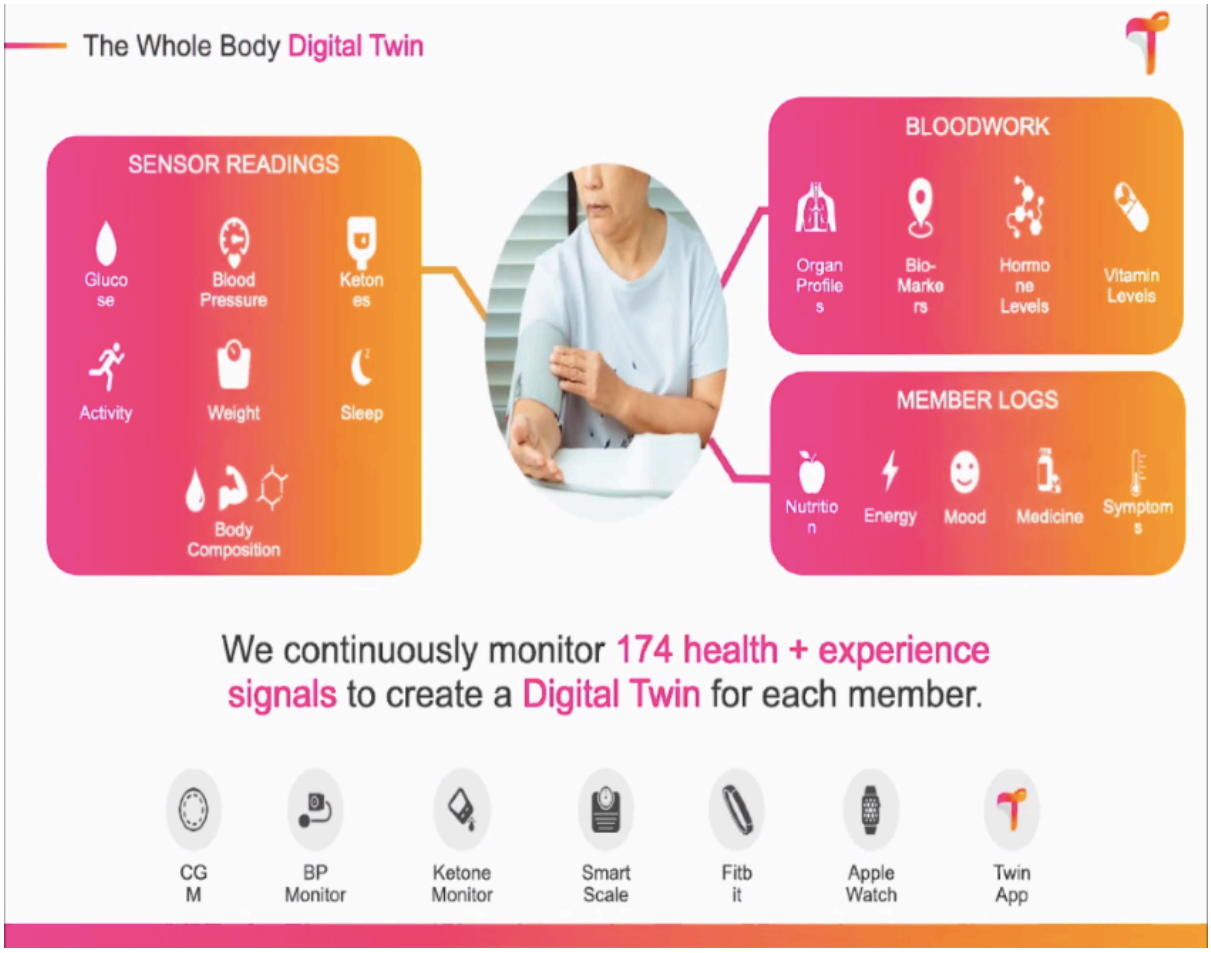
So obviously, we need to study health outcomes. And we have enrolled 510 patients This is published data, which is in public domain, we have a larger database coming up. Average age is 48.2 average starting agencies 8.8 average years of diabetes is 8.4 years, and there are 27 physicians in treatment right now. And the 90 days results are all put out here you can see whether it's glucose, blood pressure, cholesterol, weight, liver, liver functions, meds, blood pressure, lipids, BMI, kidney health symptoms, meds, visceral fat and inflammatory markers like insulin resistance HomaB and HSCRP. You can see the greens coming out very, very gradually and consistently. And then of course, looking at the mood, and the energy and the happiness quotient also being coming out in a much better way after 90 days.



So we are getting some better results, we are getting some very good outcomes. In fact, we presented our data and published it in diabetes therapy. And at the European congress of endocrinology. Just last week, we presented at the World Conference on insulin resistance on testosterone impact of that.



And now we have initiated a randomized control trial using the twin precision algorithms, so that we will be able to show some database. This is a global trial. It's a multinational trial using four centres in India and a couple of centres in the US. And it will be enrolling patients in India now already started. And it's approved by the ethics committee and expanding to the US by the end of the year. And we'll have probably 350 patients over three years which will be studied.



So obviously using this twin technology, what we are trying to do is we are continuously monitoring 174 Health experience signals, and creating a digital twin for each member looking at CGM blood pressure monitoring, ketone monitors, smart scale Fitbit, Apple Watch and a twin app. And we get all the sensor readings, we get all the blood works. And then of course, we have the member logs.

And we are trying to see based on all these inputs which we get, can we really look at all the sensor readings, member logs that reports and use machine learning artificial intelligence medicine database, and nutrition database. And obviously, using all this we will we are providing individually curated nutrition, medicine and lifestyle plan, which is delivered by a team of doctors, coaches and a mobile app. And I think initially we thought it would not be a reality. But now clearly we can see it as a reality.

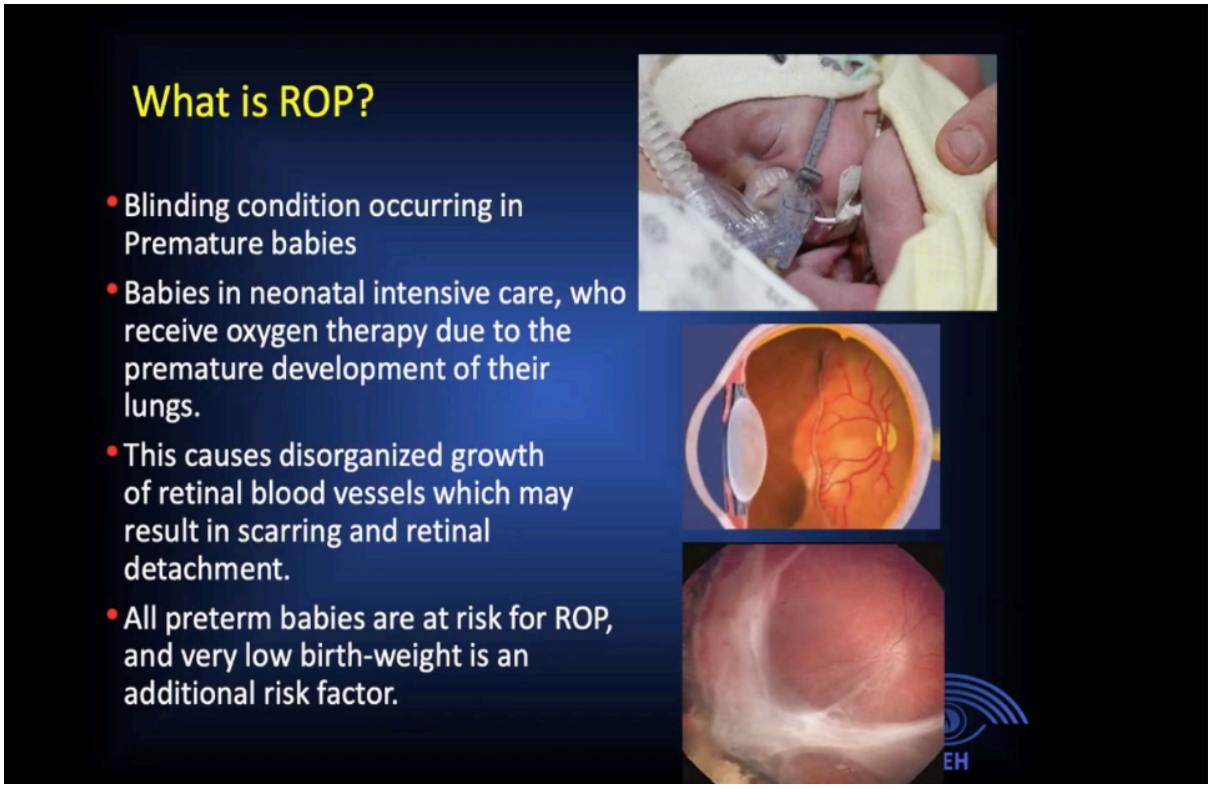
Obviously we are, you know in times of plenty, but our body engines are still running in a famine mode. And we need to reverse diabetes and to reverse diabetes. We can't supplement lifestyle. So we have learned from these learning algorithms that we need to eat less we need to eat on time. We need to eat in the morning. We need to eat right, walk more at least sleep for seven hours and smile. So obviously I hope that you have learned a few insights from this. We are in good times and I'm very thankful that I got opportunity to present here. And you will see much more data coming up from our team in times to come couple of our publications on

diabetic clusters are already accepted by four publications. But we can't share that data here. But I'm certain that now technology will provide enabler in a very complex world of metabolism, so that it can listen, it can learn, it can adapt, and we can make a change. So thank you for the opportunity once again.

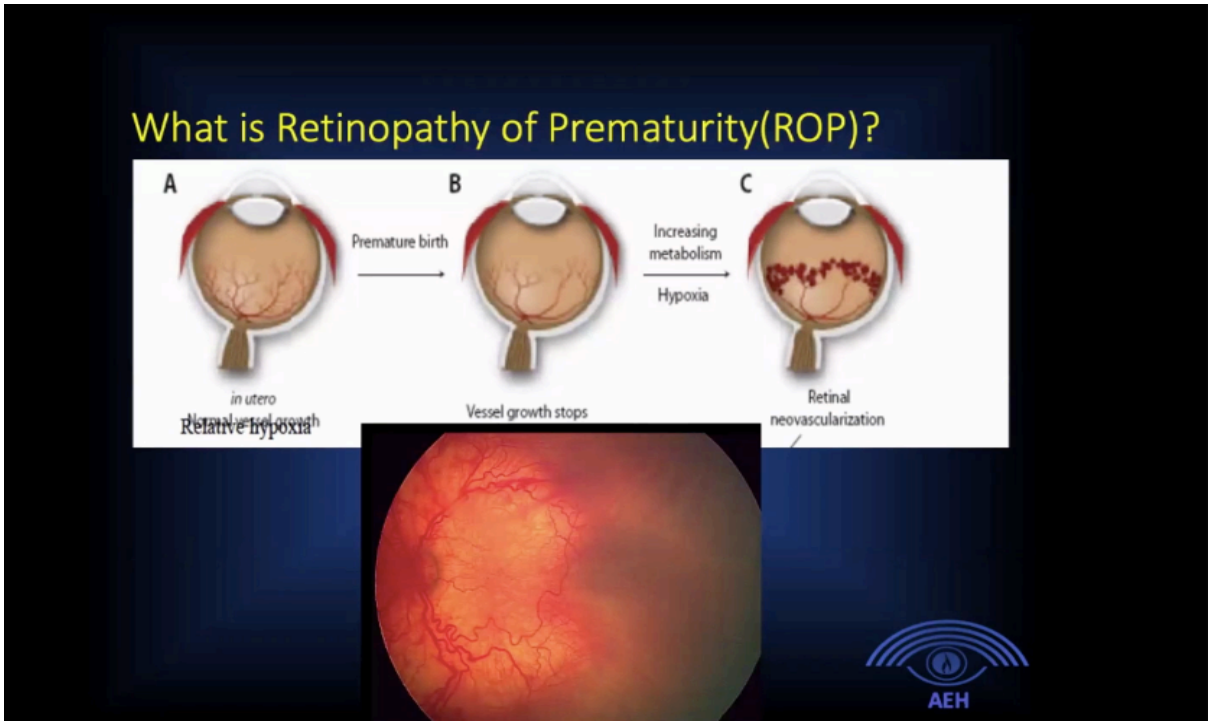
Thank you, Dr. Joshi. Thank you, Dr. Joshi. Thanks for this very enlightening presentation. We would like this industry to we would like the industry to take this route and you know, take a lot of advantages to using the newly invented AI and ml technologies. And that's very happy to look at the presentation. It was a great presentation, and due next to

Day 1	Topic	Speaker
• 18th December 2020 (Friday)	• Telescreening for Retinopathy of Prematurity	• Dr.R. Kim

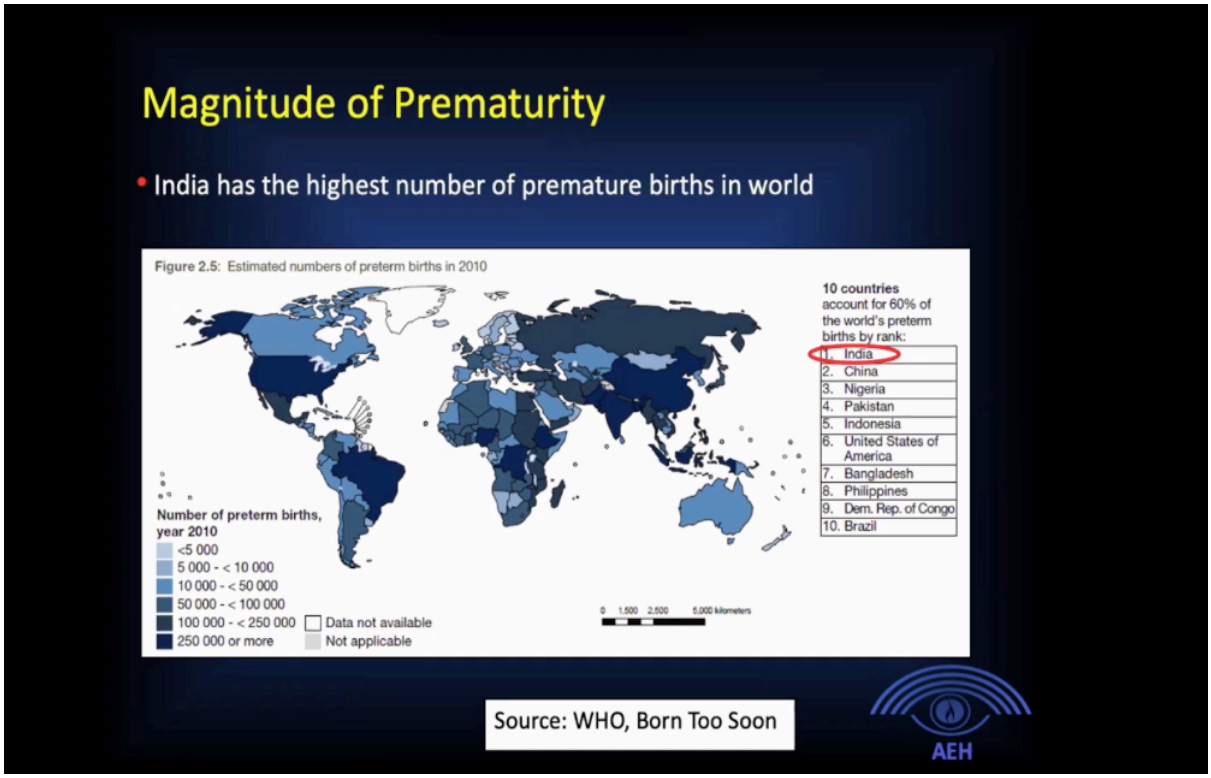
So this is a topic on retinopathy of prematurity. This is a condition that happens in children. So what is this retinopathy of prematurity? This is a blinding condition that occurs in premature babies. So just talking about retinopathy of prematurity.



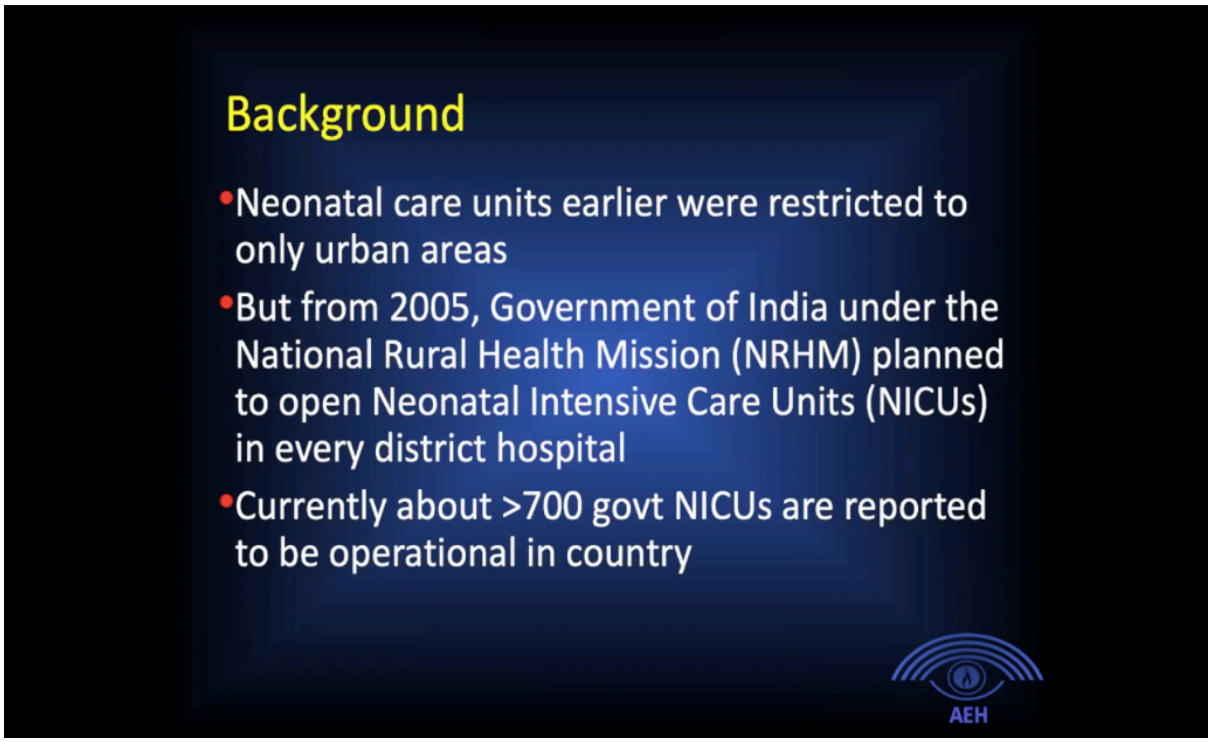
This happens in children I mean, in the babies who are born prematurely, especially in the intensive neonatal intensive care units and receiving oxygen therapy due to the premature development of the lungs. So this actually causes abnormality in the growth of the blood vessels, the retinal blood vessels, which does not go into a complete development into cells and scarring and subsequently retinal retardation. Yeah, so all preterm babies are at risk for retinopathy of prematurity, especially those who are very low birth weight. There are having additional risks.



As I mentioned, these blood vessels, which grow in the retina, during in vitro does not reach its full, complete growth, it stops shot. And then this, is what happens is there's a lot of ischemia and then this, there are abnormal blood vessels that develop which grow inside which causes bleeding, traction of the retinal detachment. As you can see on the picture, here, the blood vessels are stopping shot. So this is a very serious problem, which leads to blinding in condition in the babies if they are not identified early.

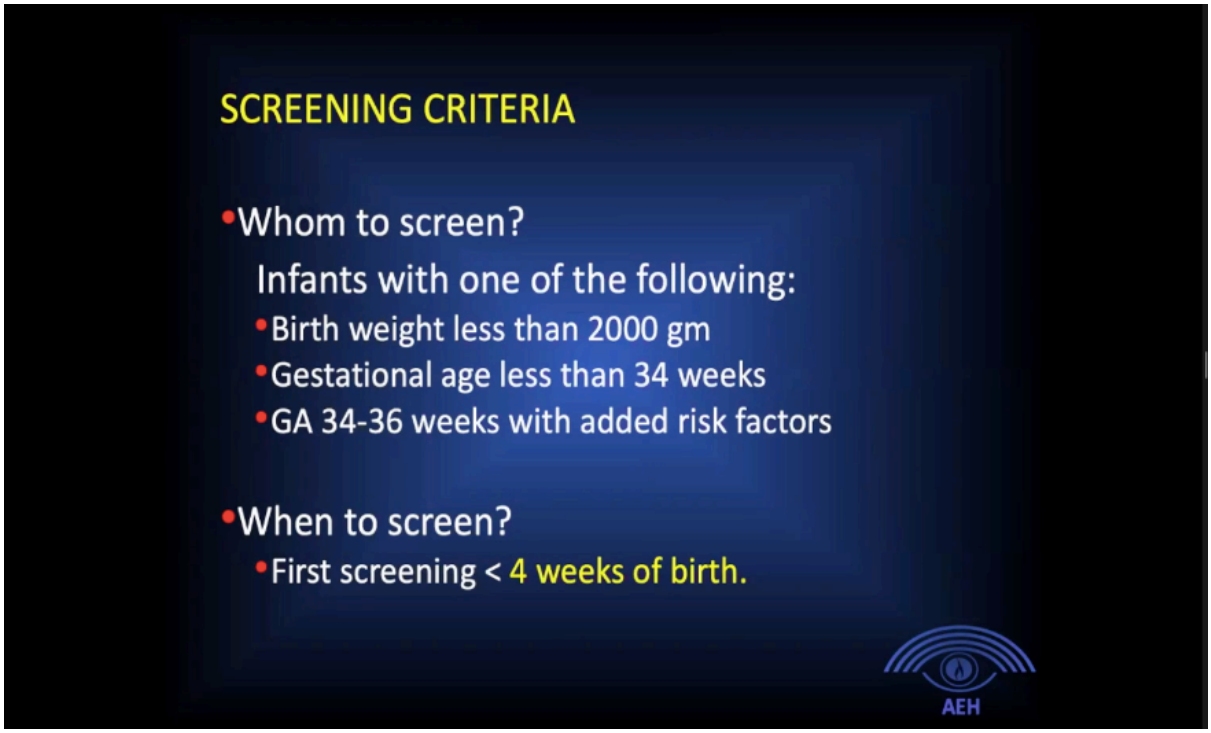


Unfortunately, like in diabetes, India has the highest number of premature births in this world in today.

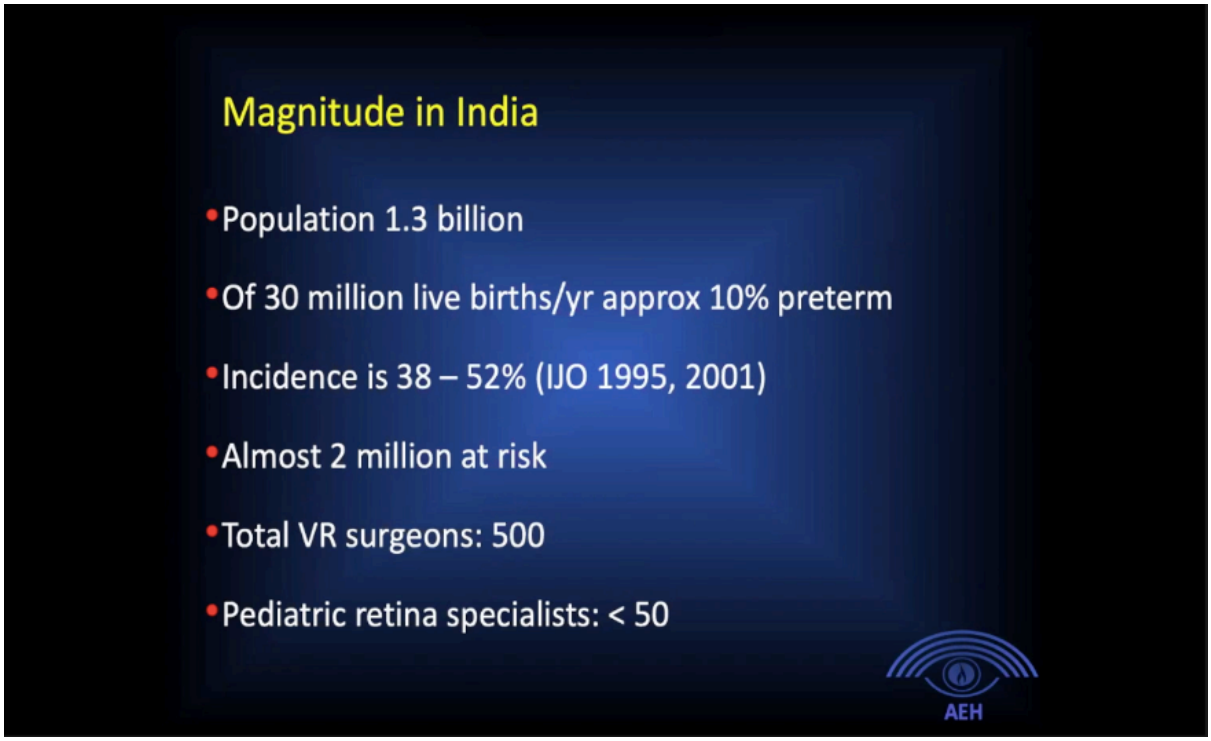


The neonatal units are not only restricted to the urban areas. But today, because of the government's initiative, we have Neonatal Intensive units in almost every district hospital. And there are also extensively a lot of private hospitals, which are not only in Tier One cities, but you see this NICU is available in tier two, tier three, which is very good. But what has happened is because of this increase in the incidence of ROP, we do not have enough people or at least the retina specialists who can identify this and treat them, we do not have enough in our country.

So we do have to reach out to other technology to identify these patients. Because this disease is time bound, if not identified early and treated early that babies are likely to be continue to become blind and irreversible, blindness happens. So usually, when a baby is seen, they're in the NICU, the ophthalmologist or the retina specialist, who do an indirect ophthalmoscopy or use these imaging devices. This is something you have to do in the incentive units, you're misusing blood vessels and they decide on further treatment.

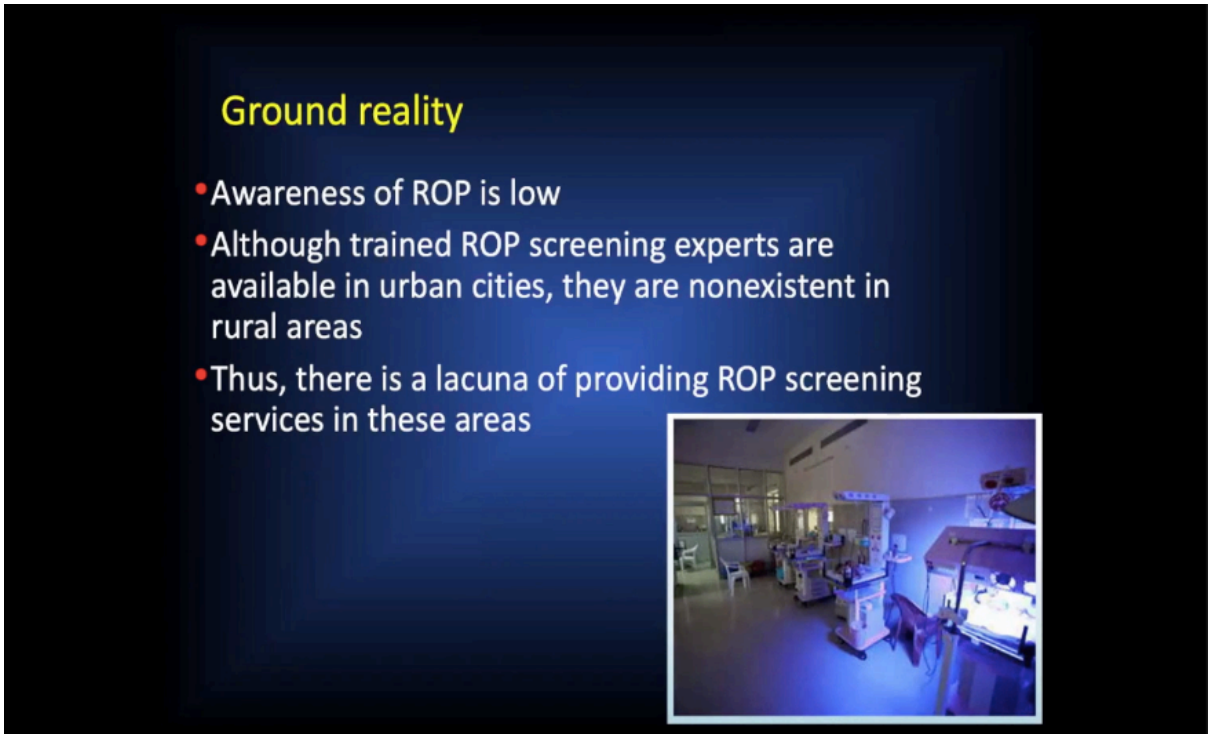


So there are certain well laid out criteria as to who has to be screened. As I mentioned, the it is very important that it's time bound. If you do not screen them within the prescribed period, it's most likely these babies who have our ROP are likely to lose their vision.



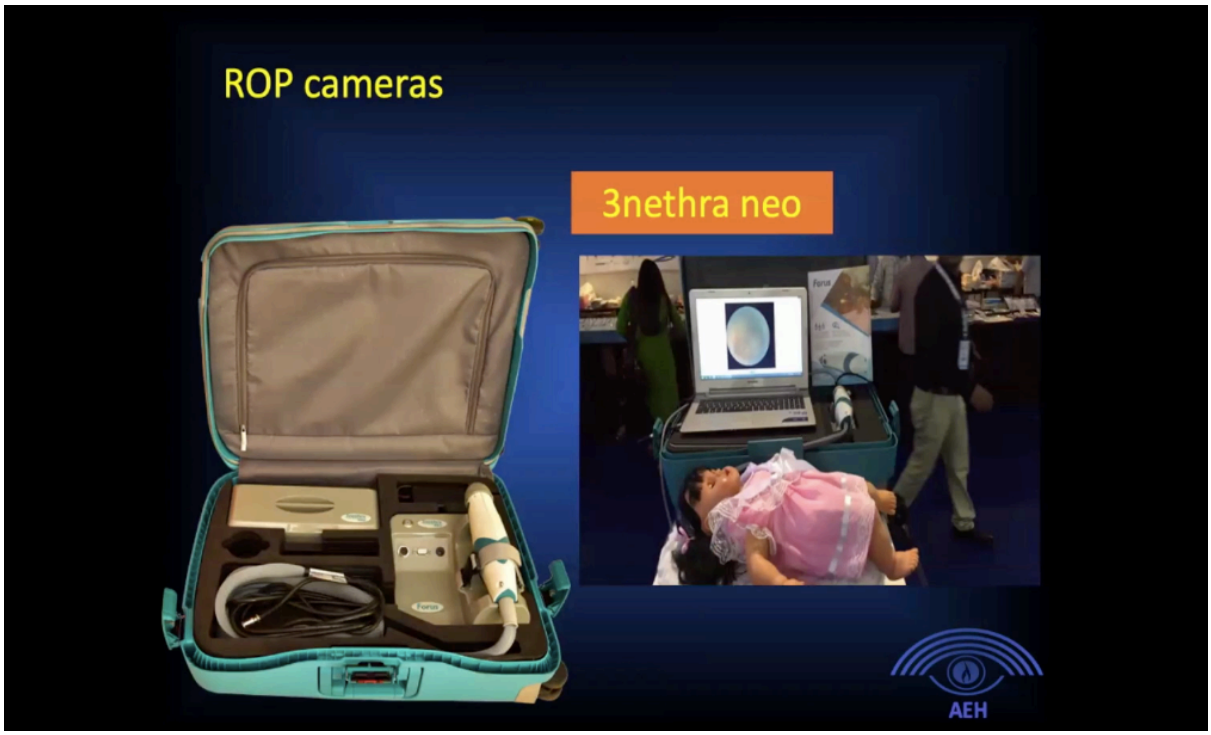
So in our population, we have a very huge number of babies with premature babies being born almost 2 million are at risk. But we have very few surgeons right now it's about 8 and the

Pediatric retina specialists are very, very few who manage this. So it's important that these babies are identified early on or at the right time before they actually lose the vision.



So generally the awareness about ROP's is low in most of the NICU it's it these facilities are not available. So there is a lack of for providing a ROP screening and most of these places. So the one way is to go for this tele screening.

So we started this our op project way back in about 6 -7 years back a little more than that, where we started going into the NICU and started screening these babies using technology. So, these are the devices like what we call as Red Cam shuttlers Of course, these are expensive devices almost crossing about one crore for this fundus camera to be but fortunately in India, there is a company in Bangalore which is brought this for 15 lakhs which we are able to use it in the NICU is for screening for imaging the retina.

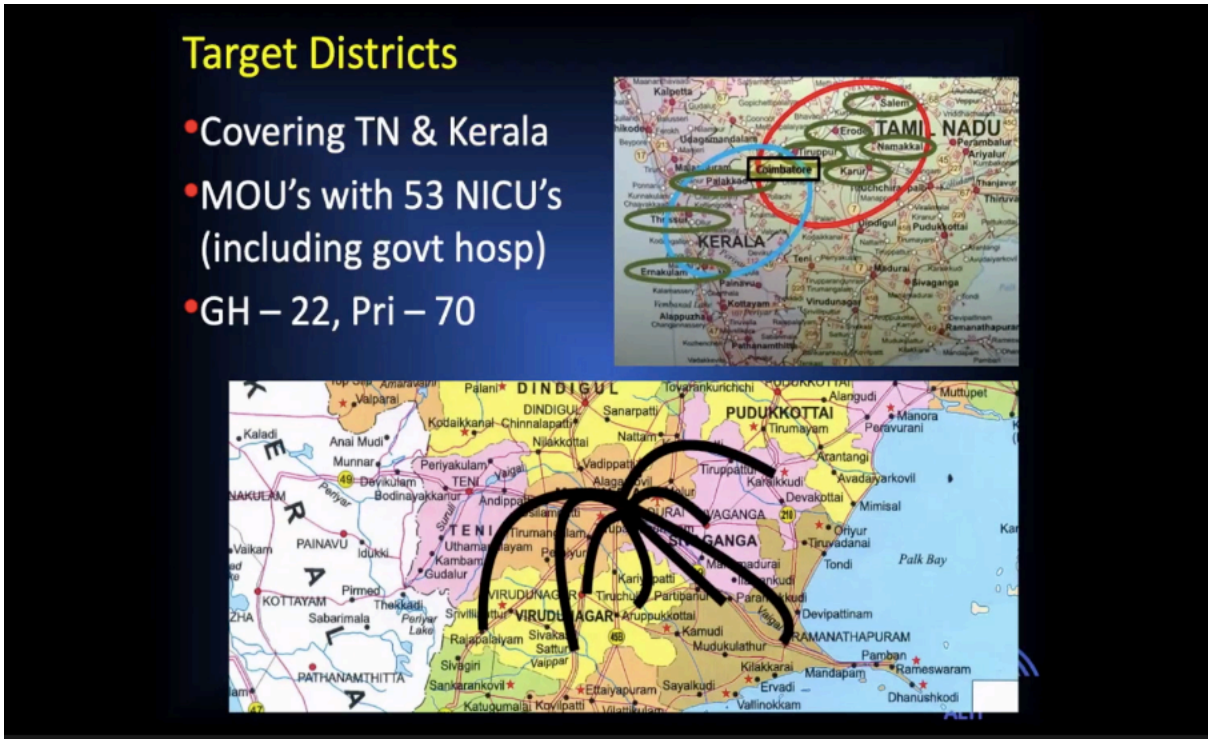


So all we need to do is to send like this camera just takes the pictures and then we can send these pictures to the ophthalmologist in the base hospital.

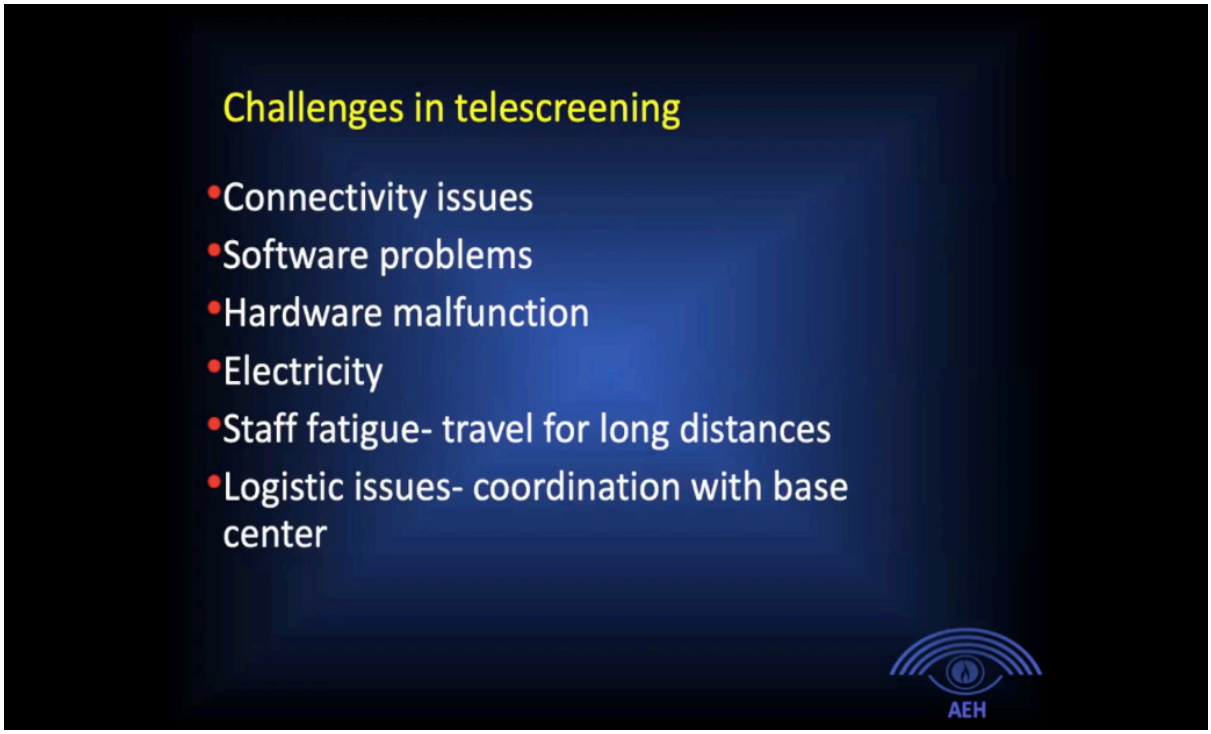
So what we are doing is this retinopathy of prematurity eradication save our site project is what we started. It was first started on our Coimbatore Hospital and then no we it is available in all our hospitals in Tamil Nadu and Pondicherry.

What we have been doing is we have been training the technicians in using these cameras. Understanding the different stages of retinopathy of prematurity. The technicians goes through an extensive training.

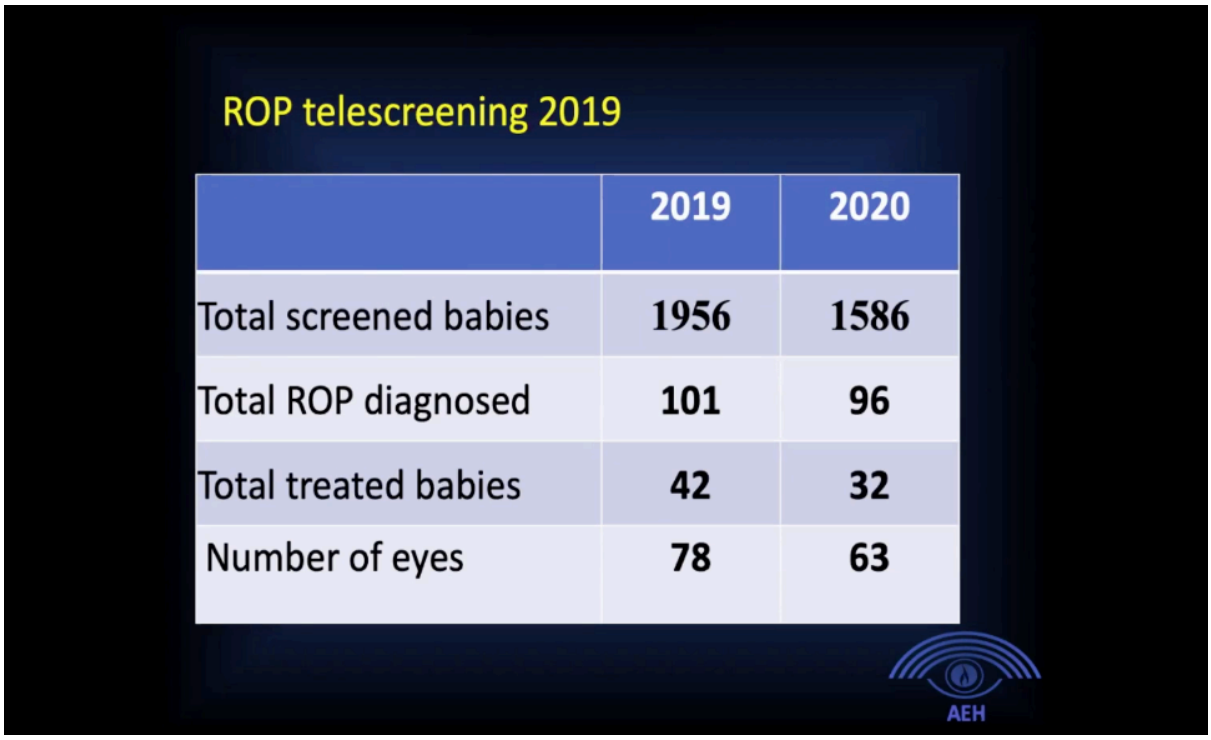
we have a mobile mind designed to carry these special cameras because a lot of optics are involved in it. So the cameras taken into the in the mobile van to be we even go to a lot of the government hospitals NICU as we cover all the district hospitals, in Madurai, Coimbatore and various other districts hospitals. Doctor does not go live, the technician goes there sets up the camera takes the images send us to the base hospital. The images are taken then, in the NICU itself, we use our we developed our own software for transferring these images and for grading these images. So the doctor once he receives it in the base hospital, picks up the best images, grades them using a certain protocol, and then sends a report back to the to the place where they are the NICU where the images were taken. And based on the advice by the doctors that the counselling person there advises the parents on further management if they haven't, some of them may need a repeat screening. So they are asked to come at the right time for this purpose. So we continue to do this, this is a regular work that happens in all our Aravind hospitals on a regular basis.



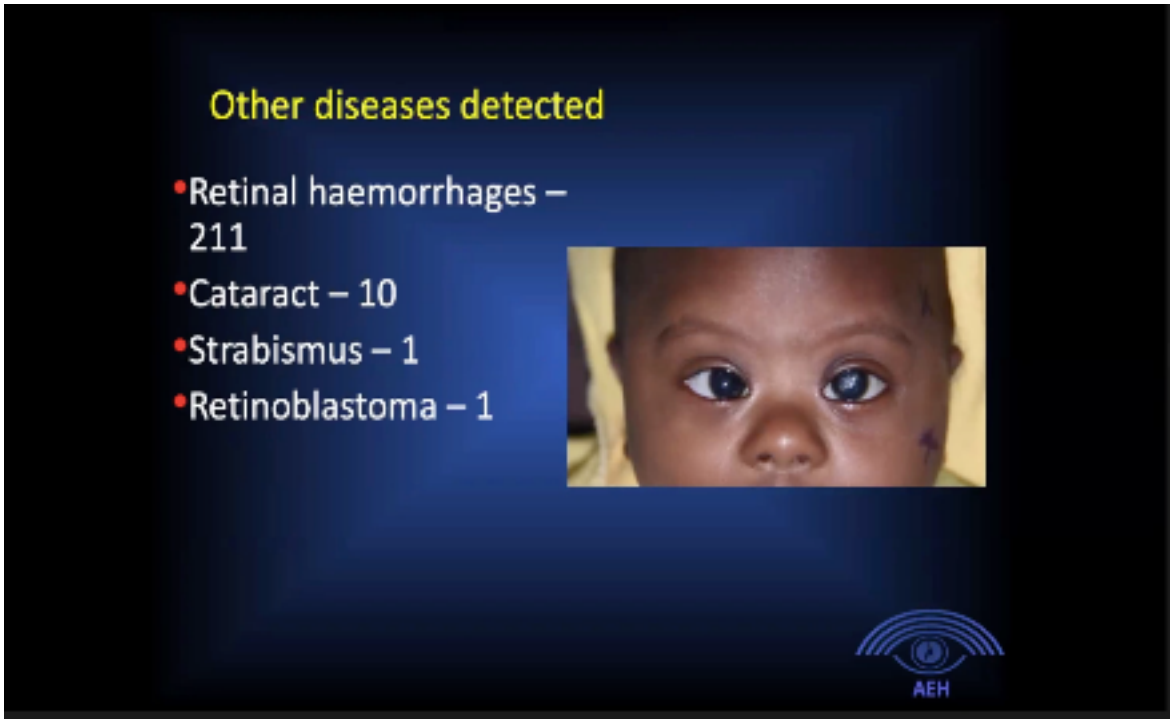
So even during this period of COVID, our team was going around because we couldn't prevent the babies were being born to and these were need to be seen. So we take all these things. So this is just to show the various districts that are covered by our Coimbatore and Madurai hospitals.



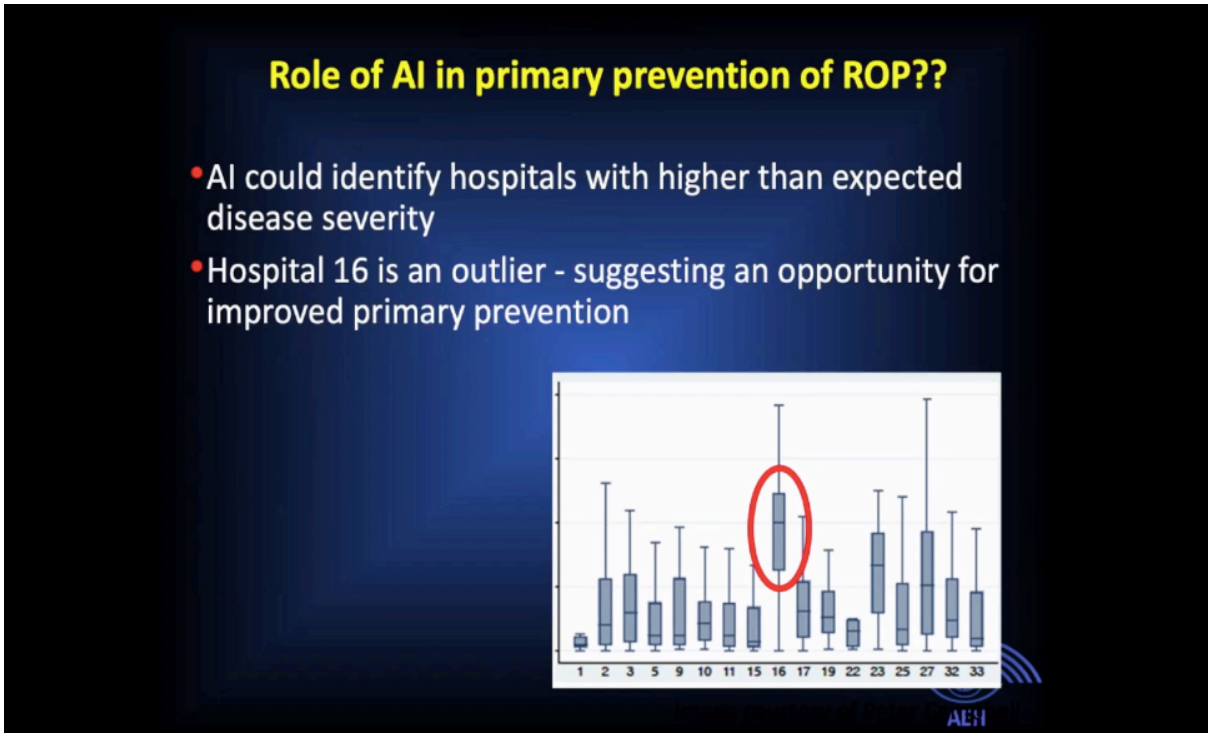
But there are certain challenges like connectivity issues, software problems. Of course, like with any technology, we do have this stuff it takes sometimes has helped, I mean cross some problems in in the identification of the images, and logistics.



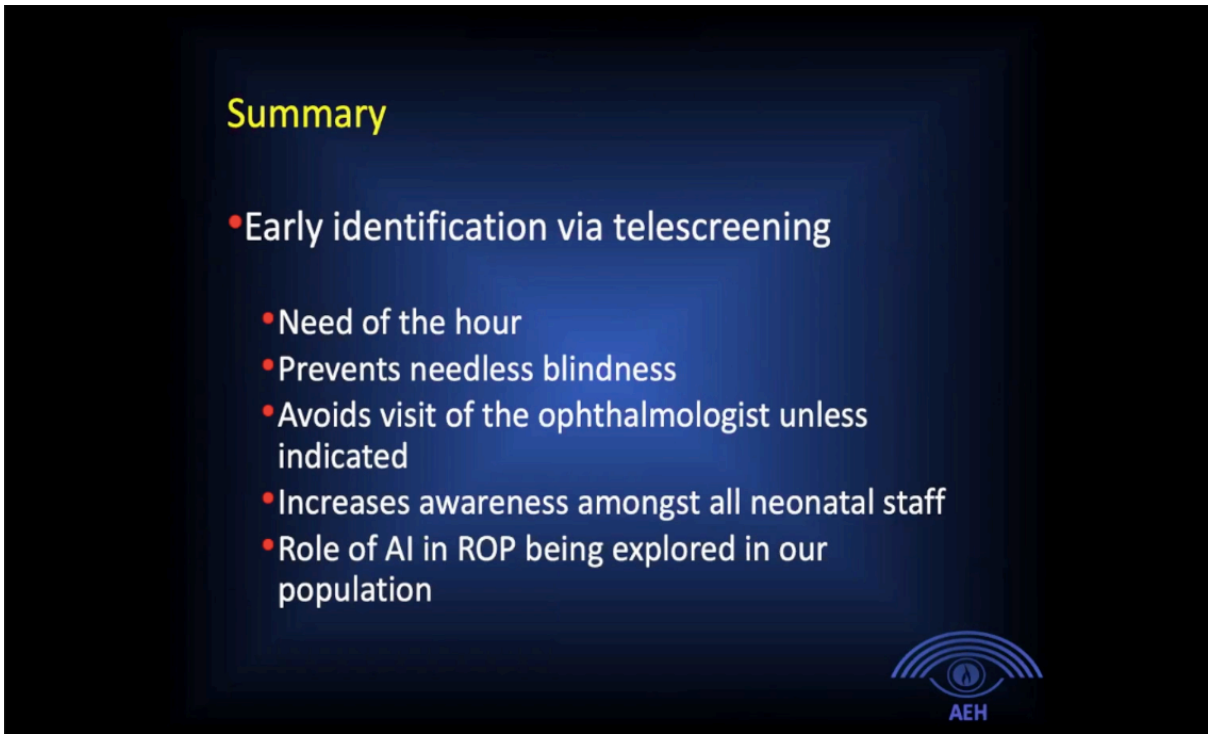
But the best part is we could even you know even if the ophthalmologist is in the not in the hospital, he could do this tele consultation over a phone, he can look at the images on the mobile phone and identify these abnormalities and tell them the need for further screening or further treatment. So this just to show you the number of babies that have been screened in the last two years, and the number of babies that were asked for treatment. So it's very important that we need to detect this early on. In the process.



We also detect other conditions like retinal hemorrhages, cataract and various other condition. We do a very strict awareness creation, both for the NICU people and very often for the parents. Periodically there's a counseling that happens for all the babies who come to that bingo once a week to each district hospital, we created a lot of wellness materials to be shared. And today, our ROP screening program has extended almost all the hospitals where our Aravind located we cover almost all the districts in that area all the patients. Now beyond that, as I said, there are challenges one of the problem is in the inconsistency in grading the availability of the doctors for grading. And today with artificial intelligence which we have deployed for the condition called diabetic retinopathy. We are now working with the University of Oregon, and the team there they the algorithm has been developed. We are now deploying it in our hospitals. To validate this along with our human grading. We are continuing to grade these images to diagnose ROP. Just like how they are experts. And it is I am working as good as physician or retina specialist would do. But more importantly, it could identify also those hospitals which have a higher degree of retinopathy of prematurity, which means these hospitals should monitor their oxygen saturation and this babies or, you know, the way the babies are being handled. So we could alert them just by using these artificial intelligence based results.



So it's very good potential, of course, it still has to go through a lot of validation process before it can be used in real time as a standalone device. So I think the potential to do this is I mean, the need to do this is very, very high.



It prevents needless blindness, awards, unnecessary risk for every baby. And of course, these babies and when in NICU cannot travel to an ophthalmologist. More importantly, it has created the awareness. And of course, the timely saving of these babies.

The national program for control of blindness and visual impairment that wants to reduce the prevalence of blindness 2.3% by 2020. I think we've reached up to point four 5% now, I think so almost most of the macroscopic changes have been done, but for for reducing 1.45 2.3 where we need a lot of microscopic changes to be done, I feel these Telemedicine is the way forward.

Day 1	Topic	Speaker
• 18th December 2020 (Friday)	• Health Insurance Reimbursement for Telehealth	• Dr. S. Prakash

We have been talking about , India being the capital of lot of diseases, and all that. But today, I want to tell you that managing a patient is not just managing the physical, physiological or pathological aspects of the disease, it is also the financial well-being. We thought we make him alright financially.All our efforts to cure the disease is of no use, unless the patient and their family have a financially pleasant outcome after the treatment.

So I'm here to just mention to you to this limited audience, I want to give a very essence of information on the importance of health insurance. This is something which is not being regularly taught in medical colleges. But I'm very confident that next five to six minutes, I am going to enlighten you with a lot of information, which as a physician, or as a successful physician every one of us should know. But unfortunately, we failed to recognize the importance of health insurance. And now, health insurance is going to design the success of any advancements that happened in the medical field, as it has been happening in the Western world.

In India, these are not for our health insurance is going to recognize and approve the advancements that are happening in the medical field. So we may have less number of people compared to the Western world in any speciality be it neurology or psychiatry or anywhere. Compared to the Western world we have a limited number of doctors, but still if you want to make this limited number of experts available to the needs of the common man, we need Telemedicine and Telemedicine as a speciality before it became popular reading from Star health insurance we introduced our own Telemedicine setup where we can reach the customer and promote health awareness. Give them the right guidance and advise them on what is really required. If need be in this era where people do not trust the hospitals and doctors and run pillar to post when they are diagnosed with any major ailment. We also had specialists to give unbiased medical Second Opinion. So my dear friends Telemedicine as a speciality now, it is very popular compared to what it was last year in December the same time. And before this in

the month of September October we have started our own Telemedicine unit and today we are proud to say that Telemedicine has gone leaps and bounds and star health insurance has recognized the importance of Telemedicine and we have started covering the expenses for Telemedicine under reimbursement.

Now, our young doctors like Dr. Dheeraj, who are in our system, they are trying to build a platform where we want to cover Telemedicine as a cashless, approval. So if you want to tell your insurance, has evolved from different stages. Before, it used to be like insurance pays only for a reimbursement then they introduced a system of cashless, then eventually they said it has to be 24 hours inpatient compulsory. But now, insurance is covering not only IN patients but also OUT patients. And there is no need for 24 hour stay in a hospital insurance pays for day-care services.

And my dear friends insurance before they used to pay, take only people who are otherwise well under the insurance cover. But now in this modern era, health insurance companies are coming forward to talk to cover people who are already suffering with diabetes. The last two sessions you have been hearing about diabetes, the implications of diabetes, the modern armamentarium that are recovered in monitoring diabetes and in controlling diabetes. So and the diseases of the new-born which my previous speaker was brilliantly talking about insurance now today covers people immediately after birth from wanting to talk And health insurance has come to cover not only normal people but also people living with the disease, people diagnosed with heart disease, people who are undergoing PTC or CBG, or even people who are diagnosed with cancer.

That is a reason why before health insurance we may have to go solid state or require someone to buy an health insurance. But now from what they used to be a push market, now it is becoming a limited pool market. And these are not for when people are going to knock the doors of insurance companies to get an entirely health insurance coverage. Today although it is less than 10% things are moving fast. And insurance companies are also moving from manual to digital to see that more and more people are covered under health insurance. And when Health insurance which is evolving so fast, and when they are going to cover Telemedicine.

Ladies and gentlemen, I can proudly say that Telemedicine as a concept will reach much, much greater milestones with the recognition of insurance. So I will say that the evolution I have

been talking about from catalysts to reimbursement, and coverage of day-care and all that it is not only those evaluations that are happening on the insurance front on the medical front When we were graduated, we used to see our professors teaching his clinical medicine and most of the diagnosis used to happen based on a strict clinical evaluation and clinical examination. But today clinical medicine has moved much into investigative medicine without much clinical investigation. There is no greater role for diagnosis today. And evidence based medicine. What we have been reading a about has now moved into value based medicine. In India, we have the expertise infrastructure and facilities to treat any ailment at par with the Western world with the same outcome at a much lesser cost. This is what I'm trying to say is value based medicine. The surgeries which are traditionally used to be open surgeries became laparoscopic surgeries within laparoscopic surgery is also the simple not really you know we used to do it conventional suture in laparoscopic myomectomy and other things. I myself have taken a lot of time to do with conventional sutures which are now replaced by barbed stitches where we don't see the knot. It's a knotless barbed sutures the open surgery to laparoscopy to robotic. This evolution is recognized by insurance and In India health insurance comes forward to cover robotic radical prostatectomy to robotic diaphragmatic surgery to thoracic surgery to now even bypass surgery. Most of the surgical oncology and gastroenterology units are invested on robot and insurances covering robot because later we understand that with Robo there is much greater manoeuvrability, higher magnification and better outcome and comfort and safety to the patient. So amputation if I can say , I can keep talking about the evolution in amputation which we used to do those days. Now. Mostly most of these cancer surgeries on the extremities are treated with limb salvage. conventional treatment radical nephrectomy has been largely replaced by partial nephrectomy or nephron, sparing nephrectomy, or most of these radical surgeries are moved into conservative surgeries, organ preservation procedures. As an insurance as a medical person in the insurance sector, it is our duty to recognize all these advancements.

We closely look into the advancements that are happening in the medical field and health insurance have to embrace advancements. The reality familiar is these advancements in the minds of all the 4000 plus advisors who are only working for health insurance by introducing a particular speciality for example, in the recent past, we introduced an ambulance, an ambulance for airlifting the patient or organ for transplantation. We are the first introduced bariatric surgery that we said it is no more a cosmetic surgery. It is a metabolic surgery and it is going to helping control of diabetes hypertension, heart disease or degenerative joint diseases

much more than any other non-pharmacological or pharmacological mechanism means of addressing your morbid obesity. So as any health insurer I'm trying to say that we have recognized the use of air ambulance, bariatric surgeries the sufferings of people diagnosed with the disease only after a diagnosis in India they think about the importance of health insurance. So, we have gone forward to cover people diagnosed with heart disease and cancer disease and we have offered health insurance coverage, then we are so innovative now, we are looking at you know, we are covering not only for basic life support, but also extracorporeal life support. And with modern advancements happening extracorporeal life support has been given 2 - 3 celebrities in Tamil Nadu recently, it doesn't stop there, when insurance company recognizes these expenses and when they come forward to cover these expenses under insurance, that particular field or specialty becomes popular. We are coming forward to cover homecare, because we know that availability, the lack of availability of number of ICU beds, ICU, so moving into care continue and long term care units that we're coming forward to cover long term care units and Home Care Centres also.

So, in India, we are seeing you know, a lot of wonders happening in the medical field. Finally, you know, before I want to conclude I can say, Human Immunodeficiency Virus aids and AIDS, which was once upon a time considered to be a death sentence. Now, we call it as a chronic manageable disease, and in one of the conferences are surprised to hear that diabetes is more dangerous than HIV and when it comes to treatment, HIV can be cured. So, to that extent, whatever advancements happening in the medical field, as health insurance, we are very keen to participate and understand and know the advancements and it is our duty. It is our duty, not just as part of the health insurance industry, but as a fellow citizen in this country, that if there is an advancement in the medical field, which is going to help the common man in this country, I insist again that it is a duty of health insurance companies to come forward and cover these advancements in the same day. We have recognized the importance and the advantages and merits of health, Telemedicine, Teleconsultations, and we are brought in the required technology expert days an instance to participate in our Telemedicine program and we're very keen to interact with you all and know from you how we can enhance the coverage of Telemedicine for all over we have close to two crore plus customers who are covered under health insurance and we have only 14% of the market share. So imagine the number of people who may record these teleconsultation services through health insurance.

So naturally we are recognizing the importance of Telemedicine and we are coming forward to cover Telemedicine under health insurance. And I'm very glad to see that the organizers have come forward to promote awareness and spread information on Telemedicine through this beautiful conference.

I thank the organizers very much for the opportunity for us to add our views on the coverage of Telemedicine and health insurance and we promise that we are starting now with reimbursement for Telemedicine expenses, very soon in a month or two. We make our Telemedicine and cashflow services, which is going to help people because people with chronic and non-communicable diseases, they need not unnecessarily go to the hospital for a follow up. They can have the consultation done at their comfort from home and we are willing to come forward and pay not only for the teleconsultation but also the associated e-Pharmacy. That procurement and investigations done through electronic alignment with the diagnostic services. Further on, We are closely watching also that one things that are happening in this area and we are willing to extend our coverage to all those advancements. I wish you good luck. Thank you.

Thank you. Thank you so much. Thanks for this wonderful presentation and you're speech was very inspiring and actually the vision style and you have on Telemedicine is a great step forward for the Telemedicine industry by its effect, and to the Telemedicine fraternity, I would also like to add any day in the health sector insurer is the largest payer. And that has to always be ingrained in whatever programs we create, right? Because when I have a look at most of the presentations, most of them keep bringing things up even in praise for the today's conference. The title of integration of health insurance into these programs could actually help everyone gain something out of their programs. And, and I think that's a great partnership, which will have to all envision together. Thank you.
I will also request the chairpersons and Dr. Sunil to have Mr Bedi and Dr. Mishra, you're in the room. Can you take questions the other questions we can take and comments from Dr. Mishra and Dr. Bedi

Dr. Mishra India is a diabetic capital, I'm sure being a technologist, you are very well, this technology that you have been working on a lot of potential Sure, can you just give information to us where this has been deployed, any health system has adapted these systems are in their care program. So that we know that will become educated for other people also to adapt.

Dr. Joshi: Currently, we are applying it only in the private sector and we are trying to see whether we can make it more affordable and accessible for doing a pilot in a small governmental sector. Also we are applying it in community care in the US also. Because I think it will have an impact because if we can reverse diabetes, then the saving of costs on complications will be huge. And which is why we want to generate some good science on it. So once we have an RCT, then you will be able to do it better and implied because you know that AI and technology enabled stuff is much easier to handle and manage. So give me a huge cost savings. So currently we are operating in private sector in Bengaluru, Mumbai, and in the US, and in the community space, we are looking at doing it first in the US and probably then upscale it to a pilot within a public health system within India, like a closed public health system like ESIS, or Army, or these are the potential targets or CGHS.

Dr. Mishra: He may have to showcase at least in one small pilot somewhere with Ayushman Bharat health and wellness, you know about Ayushman Bharat health and wellness. So these are the models actually the government is looking for so I'm basically working with the government for promoting such kind of public health topics into technology. And very soon I think you'll find a white paper from the government already and NDMH is working that area so that they're looking for their protocol actually to have this kind of what we call Theme based corporates. So I'll suggest you Maharashtra wherever you're staying is closed by me some people just take a small island with Sonic tuna, tuna 20 North just to give a showcase so that people understand how it works off, we'll definitely come down due course of time when the volume comes up and now the insurance sector is coming up. So they may also have a chip in here. So first, I think a very simple thing making the tele diabetic program then of course the a come to the next phase. Now a lot of people to take care of such program physically unemployed people, you can really engage them don't require a lot of education, even the school dropout also you can engage them to collect the responses to collect the data.

Dr. Mishra: Dr. Kim next suggestion for you, there is Aarogya project is part of the health system especially premature baby care program anyway, I don't know about your organization plus Narayana and other people working in this areas. But I've been deployed with a lot of ground level workers. So you may be applying somewhere but any other program has included this Aarogya program and you are a spoke person from the government.

Dr. Kim: Tele screening part is not done in the government yet they are actually working on we are doing a lot of training also on this but not yet happening. There are a few other institutions of course private institution which are doing the screening.

Dr. Mishra: No I might I think only Ayushman Bharat analyse now we are looking for such kind of models. So please forgive me. So I know you people done excellent work. What about the ground level actually what is not happening there what their aim is to reach out millions. Individually all of you doing very well. with due respect all of you timely, just get one project or whatever with Ayushman Bharat nearest workplace. Let that model be seen by the government. And then you can really multiply to a very high level and the cost limiting factor is I remember Ayushman Bharat project Many years ago, I was supposed to give an opinion for a researcher for diabetic to therapies, We could not sanction that one crore rupees is now with kryptonite stepping down. Its global. It's possible. Yes, so please, please think about that.

Last question to the people also start, because she, you know, this COVID has made all these rules, I guess, in everything disrupted us also they update their insurance policies. And in India, when you talked about this insurance coverage, now, we understood that only the patient has to hospitalized to be covered with insurance. So have opened up to the outpatient care, the most of the NCDS are OUT patient best care systems. So you've heard through that, do let us know about that, so that we can really approach you for any small pilot project for that., but that's all I wanted to.

Dr. Prakash: Actually insurance companies have come forward to cover outpatient services now, like you know, because a huge hospitalization cost is on outpatients. So insurance companies are covering for outpatient services, outpatient pharmacy, cost of the medications and the diagnostic services also. So but in a very limited way, only certain policies, you know, it is not like you know, rampant maybe 10 to 20% of the policies have a limited number of outpatient covers available. But we have come forward to the cover when exclusively somebody can buy only for outpatient, only for outpatient services relating to consultation and pharmacy charges and diagnostic charges. And now the same outpatient services we started we started designing this product two years before and we are made known to the public that outpatient services can also be covered under insurance. Now the same product, we wanted to extend it for Telemedicine also, because outpatient services, whether they go physically, or they haven't consultation through Telemedicine, we are covering under our existing health

insurance coverage. So number one health insurance covers outpatient health insurance pays for day-care, there is no need to stay in the hospital 24 hours to get a health insurance coverage and the healthcare expenses in India is close to 10 lakh crore. Public spending on health care you know it is hardly 1.5 lakh crore there is a huge money that is spent on healthcare. Majority of the expenses are on outpatient consultations. So, naturally outpatient consultations will be covered in a bigger way in the years to come. And today, it is available under health insurance but in a very limited way. As long as you're going to develop more and more technology platform which can enable the insurance to be cashless and other services as long as we are going to build a transparent system which can allow the insurance to believe the health care services. Now today there is always a trust deficit, because not all rates are 100% transparent and straightforward. If we can create a transparent technology platform and make things evident, so naturally health insurance will come forward to cover more and more of these OPD services. So today it is in a limited way to answer your question. It is not for that insurance will cover outpatient equal to as you have been covering in patient services.

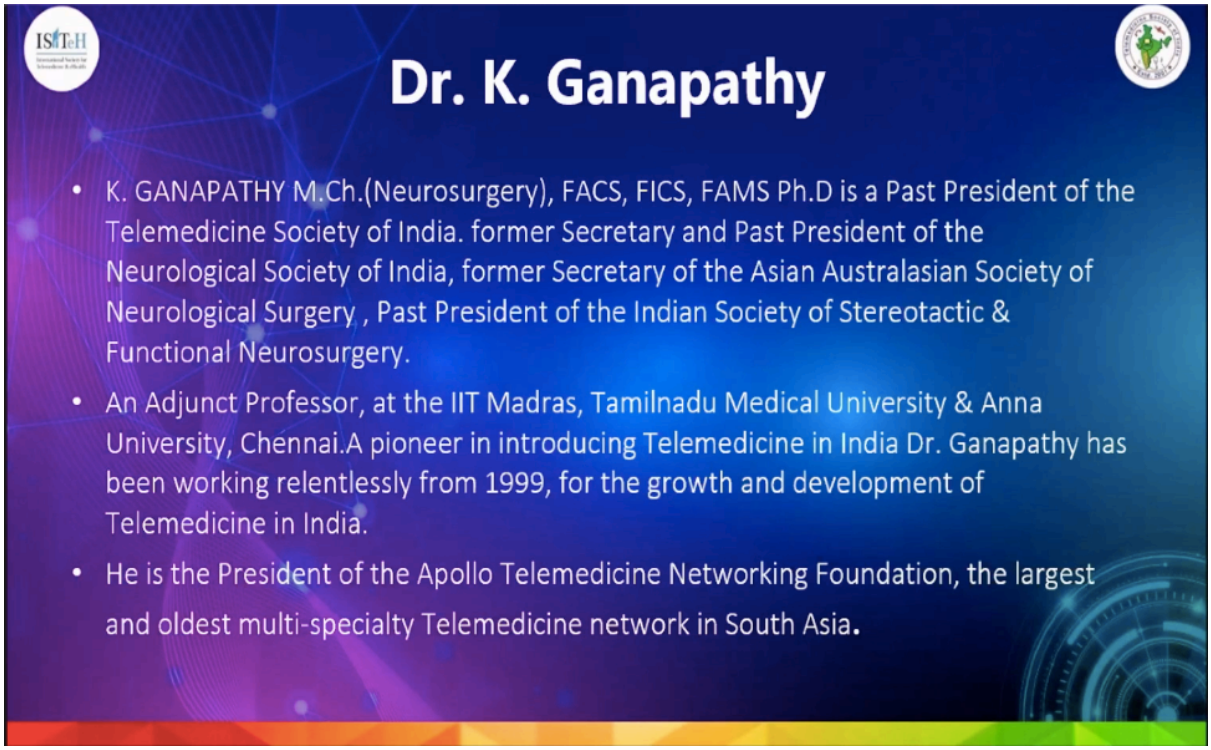
Mr. Bedi: It is very interesting to hear Dr. Kim you know talking about reduction in the retinopathy in premature kids in question as there is a lot of diabetes, as a main screen in India of maximum diabetic patients and we thought of a small experiment which we did. Earlier this year I was probably part of the Ministry of IT and I could only use my grants etc for showing showcasing a small activity we can be do , that is it was in Kerala we did experiment with Malabar cancer care society joining hands with the RCC Trivandrum and also you know, technology support for my CDAC centre Trivandrum. It was interesting ,there is a mobile van going and screening the possible vulnerable section of the females Around five squad , to start with the results you know, after a couple of years which came what astounding about 10,000 cervical cancer were located through these mobile screening and all and supported by RCC Trivandrum. And out of that 50% of the cases were curable and cured. And others who are, you know, went through, you know, the cervical cancer had taken root. Question is the power of Telemedicine screening and all and really benefiting the people in no small way. is the greatest thing you know, detecting a child who becomes blind? Can you imagine the troubles and all the dependency and all the few cases also, I hope, these experimentations and even are very impressed with the problem solutions, the rechargeable power solutions are being found by using artificial intelligence for the haptic patient. So, I hope this kind of experiments will keep on happening, and we will be able to roll it out. That will be the biggest challenge. As Dr.

Mishra also said, somewhere we will have to integrate these programs in the national healthcare program. Thanks.

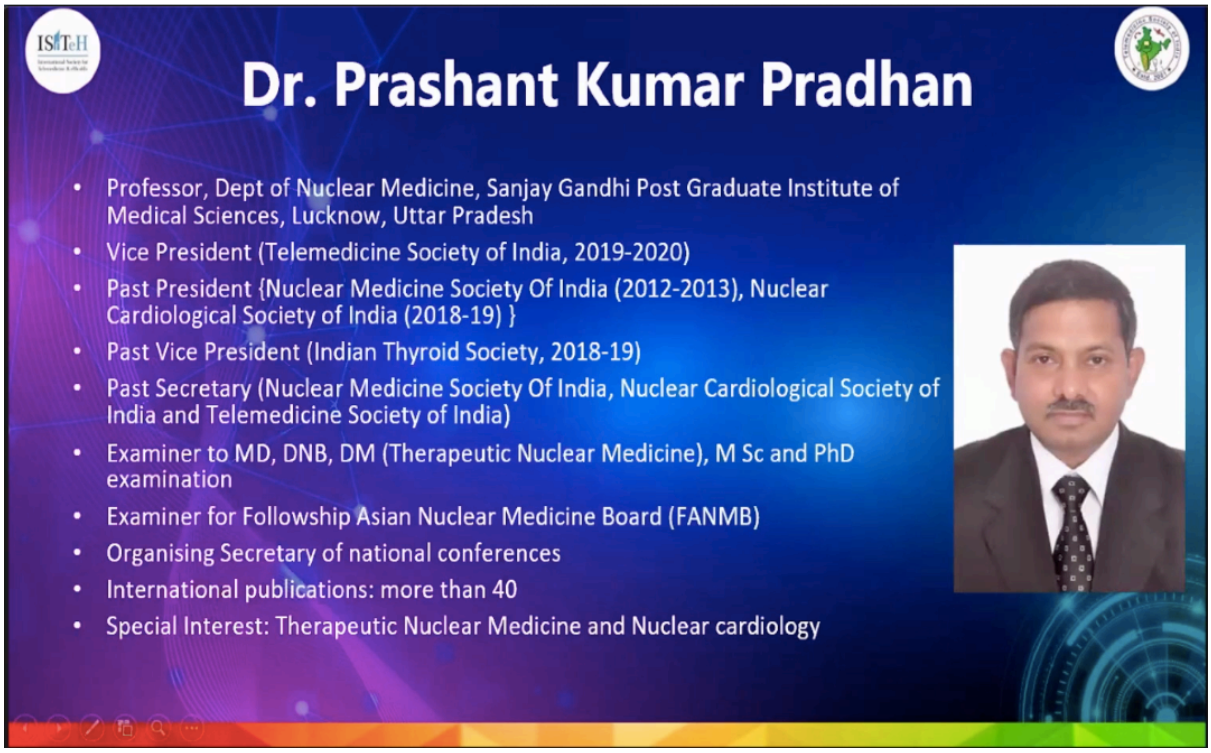
Dr. Naveen Kumar: Dr. Kim, have there been any situations that require one having to repeat image acquisition? Or is the photographing and analysis done in real time so that if there's any errors, it's rectified immediately?

Dr. Kim: Usually the screening in the sense is not really real time. It's actually what the technician actually sends the images. And before they leave the place, the report actually goes back. So which means it's almost like instantaneous that they get it? Of course, yeah, there have been situations where we have to repeat the images because the quality of the images or and the limitations, by the way, the technicians actually handled the cameras. So there have been situations where the ophthalmologist or the retina specialist had to travel to those places. There are situations like that. Yeah. I don't know if I answered the question that he was looking for unreadable images.

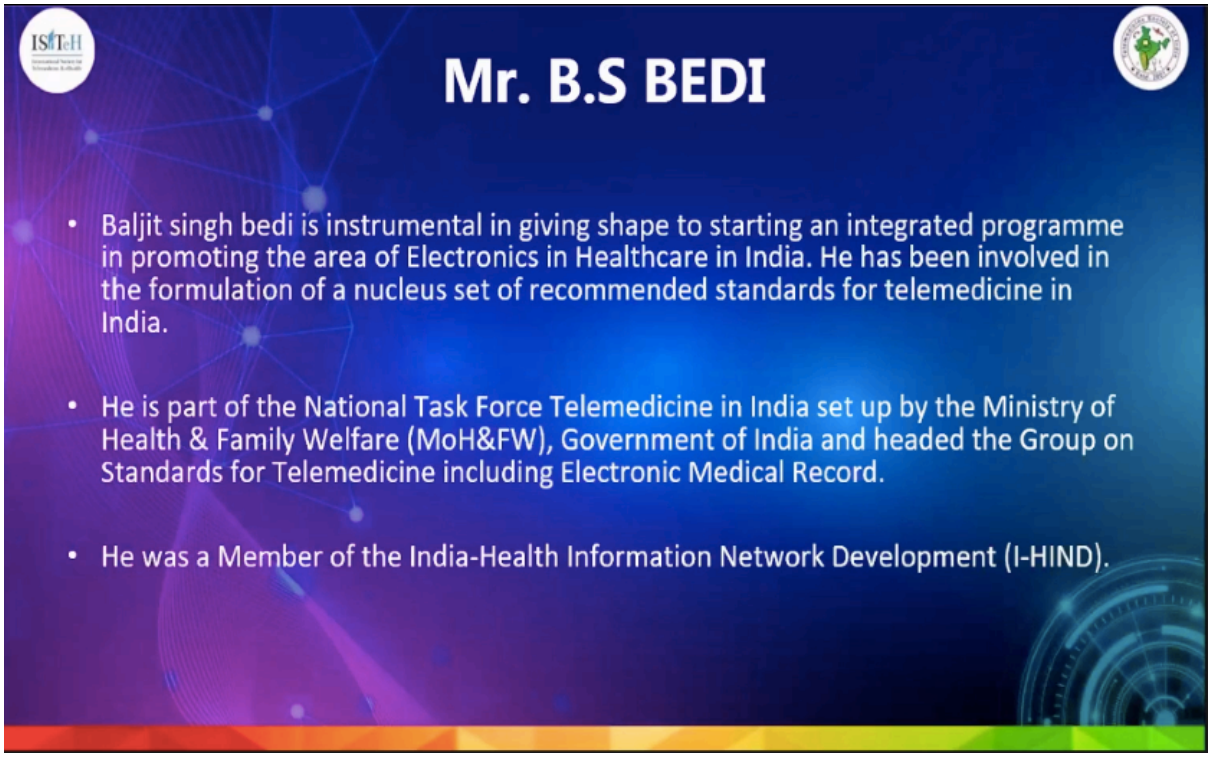
Dr. Ratta: we've been bombarded since morning with some beautiful lectures from everyone. It's been a fantastic day of the virtual meet so far, covering Telemedicine and COVID, Telemedicine practice guidelines, Telemedicine and mental health, Telemedicine data security, Blockchain in the offing as an introduction, I think it has been an excellent session. Beautiful work done by the Scientific Committee Dr. Sunil Shroff, the main anchor behind the entire process.



Dr Ratta .. Without much ado, let me introduce some of the chairman for this session. Professor Ganapati, who is not here right now, but will be joining us around six o'clock. He is a neurosurgeon by profession, Past President of Telemedicine Society of India, former secretary and Past President of the Neurological Society of India, former Secretary Asian Australasian Society of neurological surgery, I can go on and probably the list will never end with Dr. Ganapati. He's already leap frogging his CV.

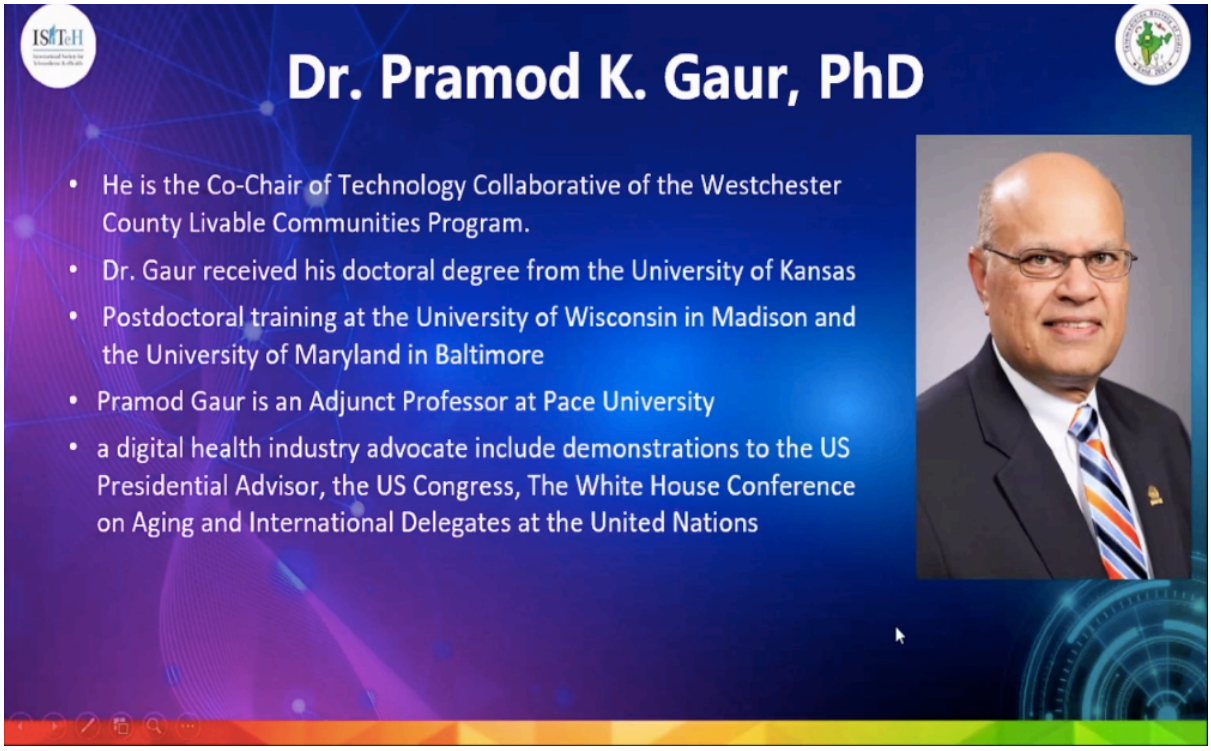


Dr Ratta ..So let me introduce the next person Dr. Prashant Kumar Pradhan. He's been a pioneer in the field of Nuclear Medicine and has headed the Nuclear Medicine Society in various forms and been an examiner. And currently he is the Professor Department ofNnuclear Medicine at SGPGI Lucknow. He's also the Vice President of Telemedicine Society of India.



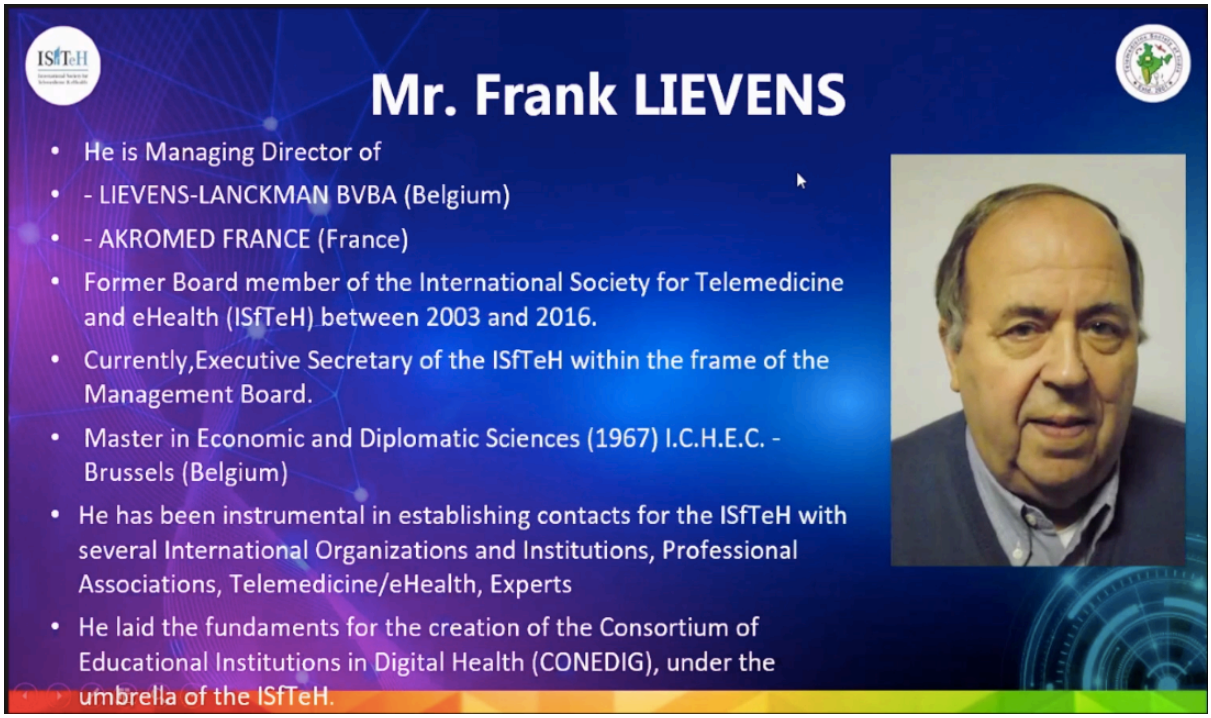
Dr.Ratta …Mr. Bedi, he has already been introduced in the previous session, but just to tell you a few more things about him. Not only has he been the main backbone or the spine of Digital health in this country, he is the person tasked to introduce EMR as one of the very major event after national Task Force was set up. And then of course, he's been a friend, a brother, a father figure to all of us in TSI , we've always depended on him.

Dr Ratta ..Dr. Sunil Shroff needs no introduction to this audience.He is the president, Tamil Nadu chapter of TSI, President Elect of ISOT 14.



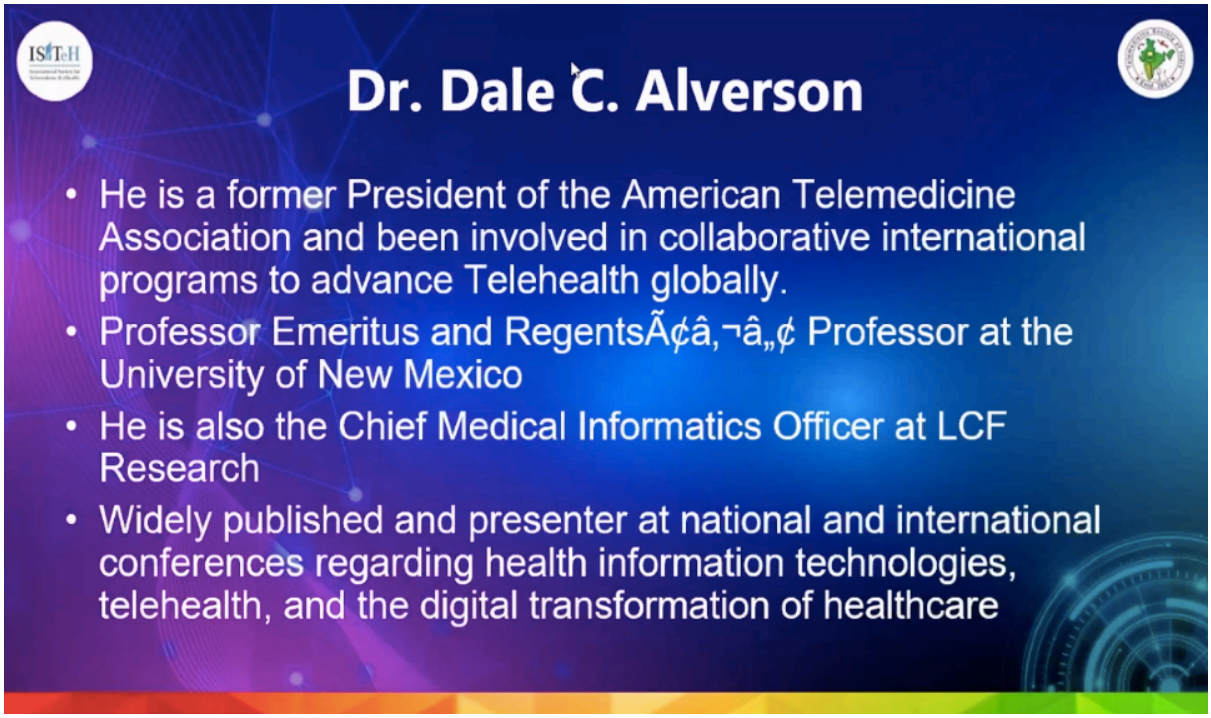
Dr Ratta ..Now, friends, we have a very distinguished panel of international speakers. We've known Dr. Pramod Gaur ever since TSI, started conducting its annual Telemedicon way back in 2006, with Dr. Ganapathi in Chennai and thereafter, I think Dr. Gaur has probably attended most of the Telemedicons, physically or remotely. Currently, he is the co-chair of technology collaborative of the Westchester County liveable communities program. Dr. Gaur received his doctoral degree from the University of Kansas. his Postdoctoral training at the University of Wisconsin in Medicine at the University of Maryland in Baltimore. Dr. Pramod Gaur is a Professor at Pace University. He has even held demonstrations on digital health industry, to the US president, adviser to US Congress, White House Conference on Aging and international delegates at the United Nations. Welcome, Dr. Pramod it is so rejuvenating to see you here with us

Dr Ratta …Dr. Matteo Berluchhi. In fact, he flew to Italy this evening from England, so he could make it to this, conference. So thank you. There's a lot of interest in AI and ML, he is the CEO of Healthily, which is the world's first personal health assistant, which combines artificial intelligence and machine learning. And the information he has received for using this is from NHS. So this is the first free type of information for global audience. Mr. Berluchhi also is the Chief Digital Officer of Northern and Shell. And you know he has a degree in theoretical physics, is a mentor for many of these companies. He is also the founder and CEO of aNobii the Social eBook .He is also a Mentor at Seedcamp advising new start ups.



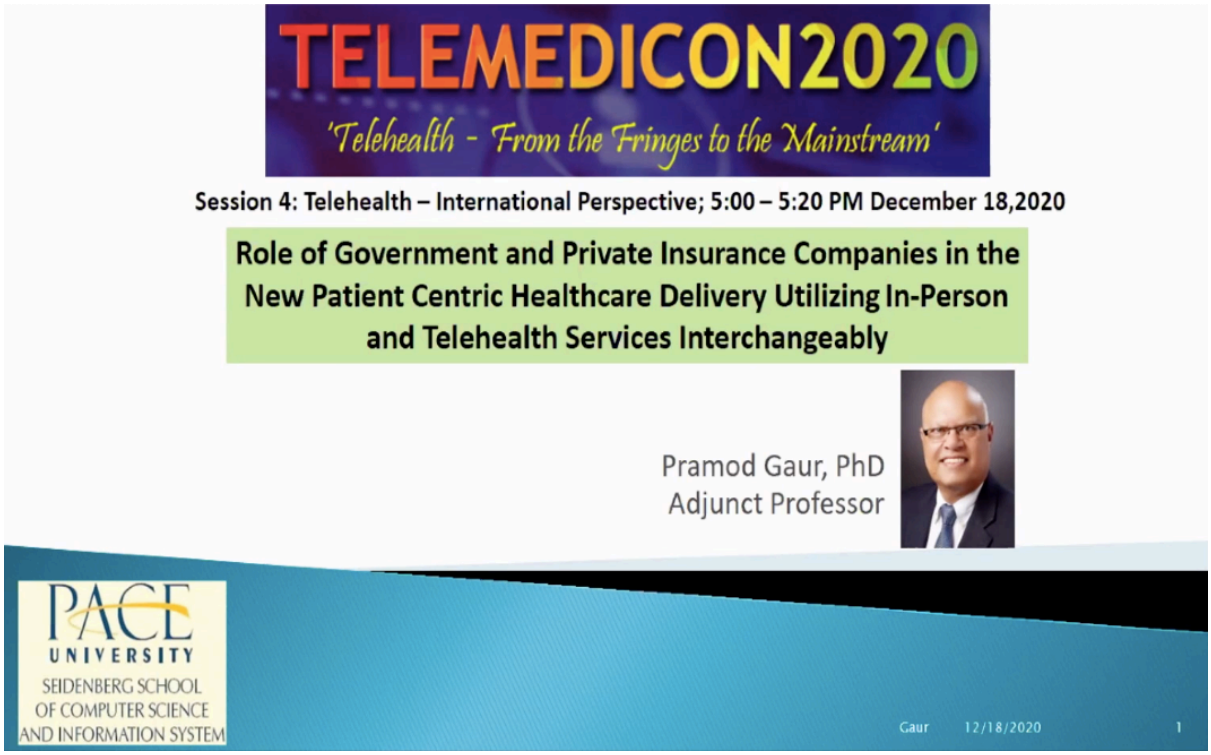
Dr Ratta ..We also have amongst us Mr. Frank Lievens. He is a managing director of Lievens-Lanckaman BVBA, Belgium and Akromed France. My first introduction to Frank was in the year 2006, when he attended the First International Conference on Transformation of Healthcare through Technology. And Frank gave us a keynote address in Pune right here. And my association with ISfTeH goes back to 15 years with him. And I've seen him working his way up in the organization and how he has brought together the international society bringing so many countries so many educational lectures, digital health, education, etc. So, Frank, welcome to the Telemedicon virtually eventually, your desire to present virtually in Telemedicon has succeeded after 15 years of watching this baby ,our TSI.

Dr Ratta ..We have Dr. Peter Eisert the visual computing Professor at the Humboldt University Berlin. He is head of Vision and Imaging technologies department from Fraunhofer HHLLn. , Berlin Germany. He is published more than 200 conference and journal papers and is an associate editor of the International Journal of image and video processing, as well as the editorial board of the Journal of visual communication representation. His research interests include 3D image analysis, and synthesis, medical imaging, deep learning, computer vision, and computer graphics. It would be wonderful to hear from you Dr. Peter and welcome this evening to Telemedicon 2020.

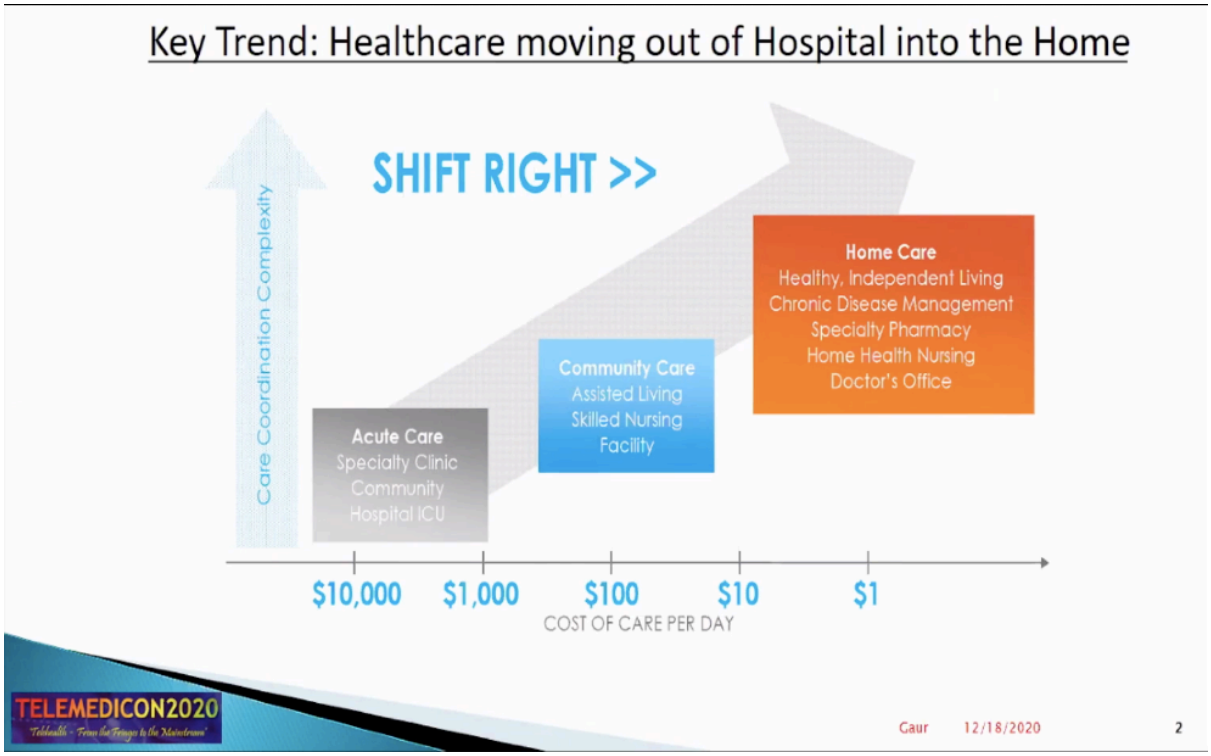


Dr Ratta ..And last but not the least, we have the former President of the American Telemedicine Association, Dr. Dale C Alverson, who's been involved in collaborative international programs to advance telehealth globally. He's been, the Professor Emeritus at the University of New Mexico. He's also the chief medical informatics officer at BMC research. He is widely published and presented at national and intenational conferences regarding health information technologies, telehealth and digital transformation of healthcare. Welcome Dr. Dale to this evening.

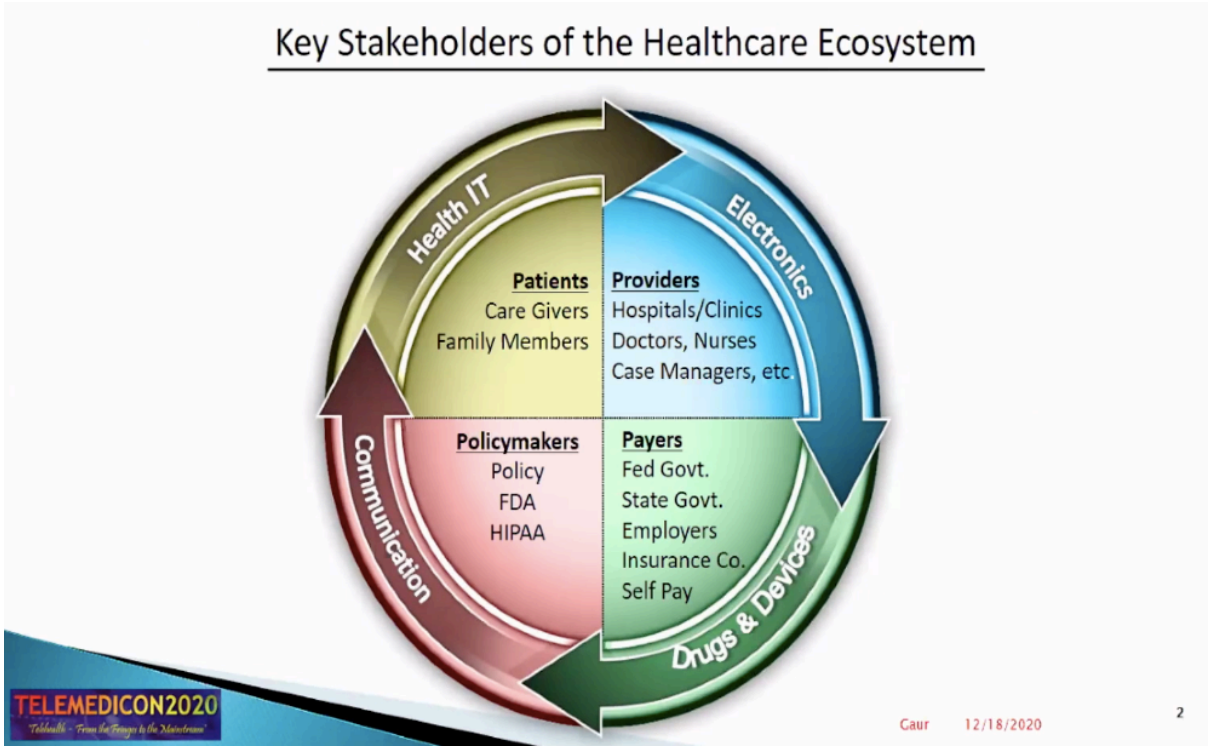
Day 1	Topic	Speaker
• 18th December 2020 (Friday)	• Role of Government and Private Insurance Companies in the New Patient Centric	• Prof. Pramod Gaur (USA)



What I've been asked to cover today is to look at insurance company's role in emerging new models for Telemedicine. previous speaker, Doctor Prakash spoke about the changing role of insurance in the Indian market. And I'm going to cover a little bit more of the international perspective and just give you the highlights for this emerging field, how do you make it sustainable? How do you fit in the payer aspect?



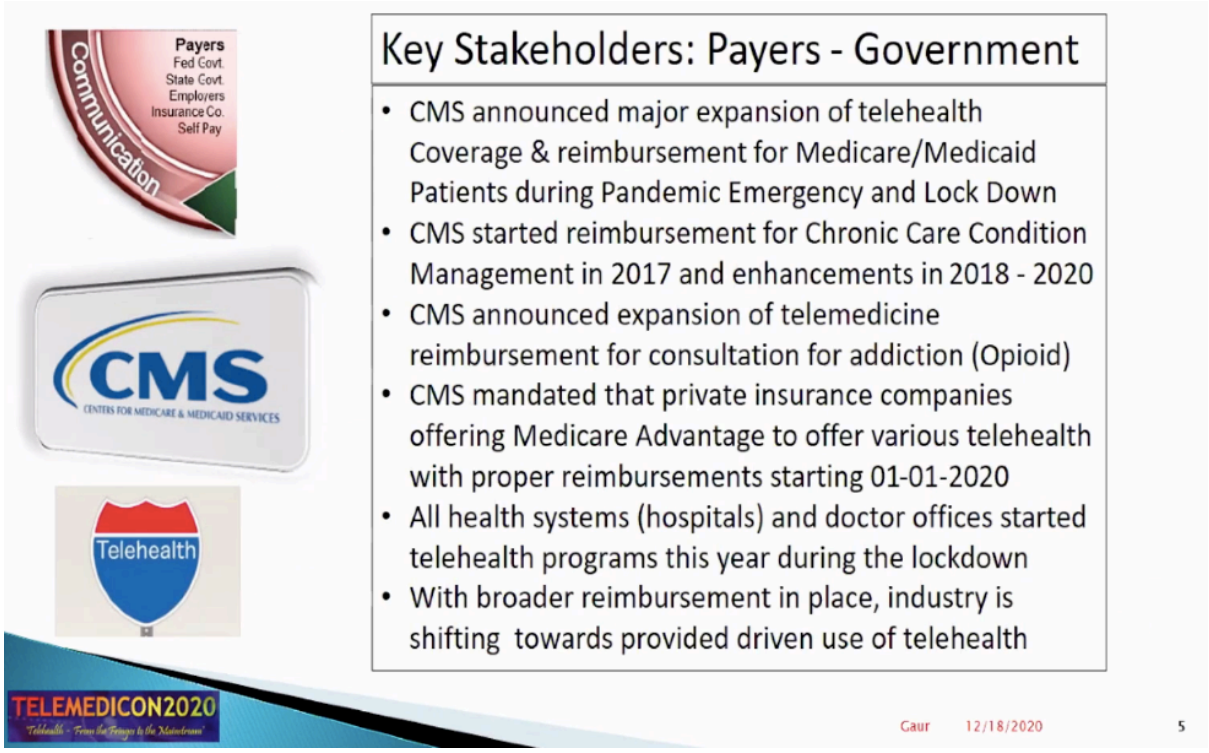
So, before even the pandemic, the trend over the last decade has been moving care from acute and highly specialized facilities on the left towards the right where community base or even at home. And what this graph is showing is showing the cost from 10s of 1000s to a single dollar per day range when you are providing a care in the less sophisticated facility. However, the care coordination and delivery in blacks, we are for so many decades, we are used to developing quality control and delivery methods in the in the large hospital setting, but with the with the advancement of technology is possible to move some of the care to the community and home. And so that is the trend and obviously with Corona COVID pandemic that has really pushed much, much harder because of lockdown, and people have to obtain care at the local level.



So what I wanted to do first, very briefly talk about the four key stakeholders when you look in the centre the four quadrants, and I'll come back to that as far as the focus on the payer side. So on the top left, you have the patient and the caregiver. So this is the piece that was missing in the past, because we didn't have easy way of getting voice of the patient, what was their experience, or their satisfaction. And now with the advancement of technology, smartphones and social media, it is very possible that in real time you can get the feedback of the patient's experience. And so that's the first part. On the top right, you have the provider organization, you have hospitals and clinics, but also professional doctors, nurses and case managers. And their focus is how do you optimize their workflow? How do you make sure that the all the tools they need for giving efficient care delivery are available in terms of their workflow, not a standalone. We'll talk a little bit about telematics in a minute, but other services as well. And then the bottom part, on the top bottom left, I put the policy maker, this is where you have the state and local government but you also have the regulatory organizations like FDA and others that comes into and then bottom right is the pair which is I'm really focusing on today that you have the government both the federal and the state governments in this in the US also a large portion of health insurance is provided by the employers and then insurance companies and also self-pay.

So looking at the payers in general In the US, as I mentioned, the largest payer is the federal and state government, you have Centre for Medicare and Medicaid services that they provide Medicare to any US citizen over 65. Or if they have some disability, they qualify for Medicare Services, then that's controlled by the federal government. But then you have Medicaid that each of the 50 states they have their own Medicaid program, and that is providing primarily for low income citizens who cannot afford to buy private insurance. And oftentimes below the age of 65, then they cannot get the Medicare. So that is the biggest part. But also federal governments provide insurance or coverage for Veterans Affairs, that's a very large health system in the United States, and also, as the TRICARE health services also covered, so is. So if you look at the whole block of federal and state government is a very large chunk, and that has traditionally and continue to have influence or rest of the insurance that we're going to talk next. So the second group is the large employer and the insurance companies. Sometimes it is not as obvious. Even the large employers hire private insurance companies to administer health insurance. So if, for example, if you're an employee of IBM, but you may be carrying insurance card of United Healthcare or signal and so forth, but what is happening is that these employer are paying for the health services, but they are not capable of administering themselves. So they hire insurance companies and insurance companies playing role of administrator they have relationship with the service provider and pharmacies and they make the payments and address but the risk is taken by the large employer. In addition, the insurance companies also provide

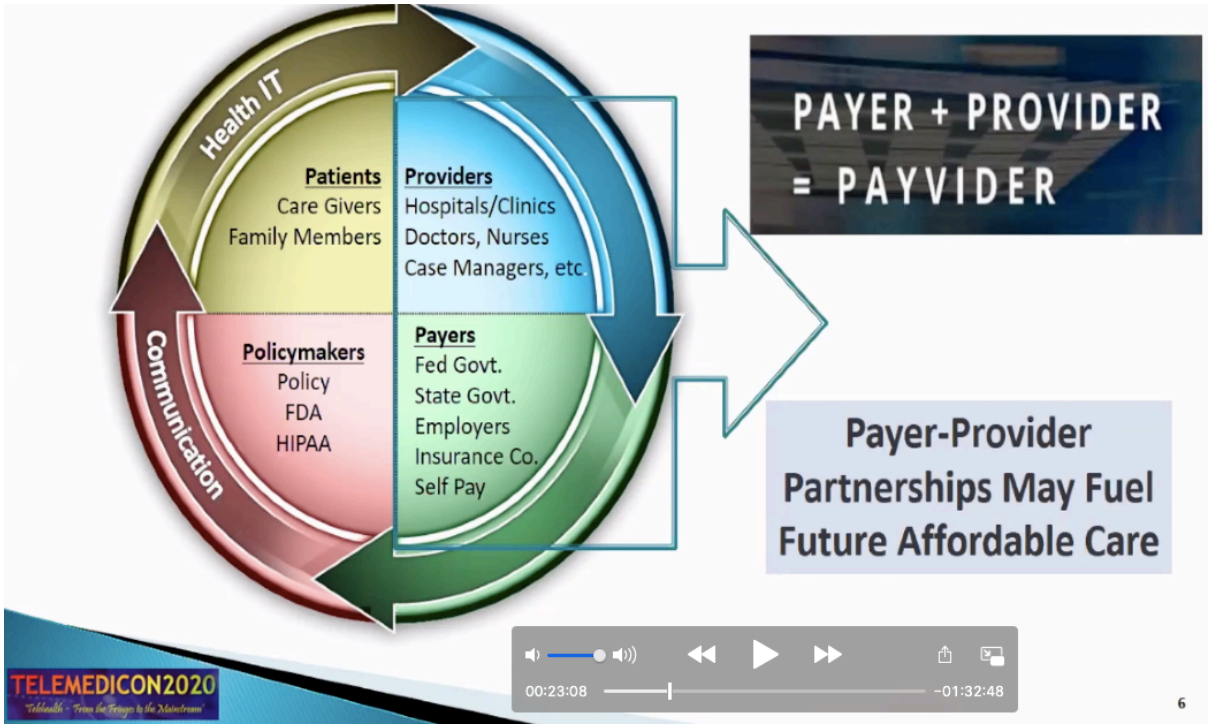
policies with where they take the risk for individuals and small businesses. And then the last is the increasing on self-pay. Both people who don't have insurance, but a lot of insurance policies have what we call it high deductible. So, consumers still have to pay large portion to begin with and then then it was the deductibles are met, then it's gone on to the policies.



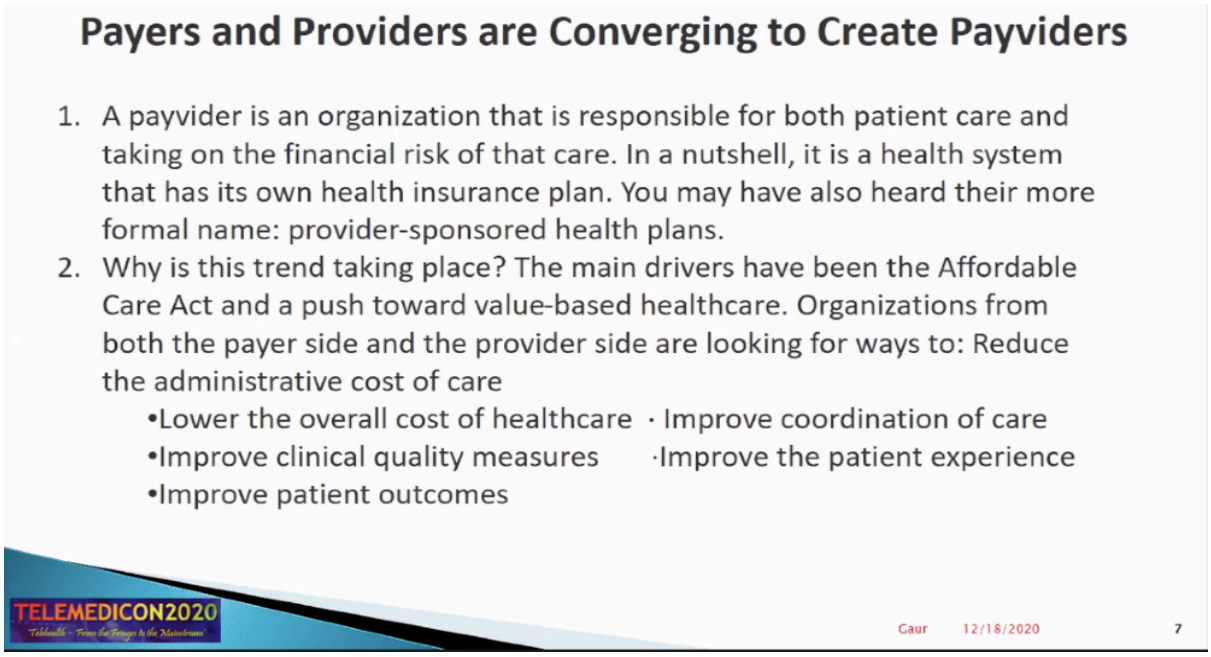
So just to cover some of the key driver for changes that are occurring is through the government policies. Right, After the lockdown in March of this year, the CMS provided a series of emergency regulation that allowing patient and provider to use telehealth and Telemedicine to receive the care and provide that reimbursement in most cases at the same level as they would get in person. They also provided waiver for the site of origination where the patient is and also relax some of the privacy and security requirements which we call HIPAA, into during this period, so for example, the patient and consumer can use the commonly available video or even audio consultation using FaceTime and other which typically we do not use because they don't have enough encryption to meet the standards. But during this pandemic period that is allowed. But prior to the pandemic, CMS had already for last three or four years started reimbursement for chronic diseases as was discussed in the previous session, diabetes and other heart cardiovascular diseases. These are the major chronic condition that is consuming large amount of healthcare dollars now So there has been already movement and into chronic care management and using both remote patient monitoring as well as virtual care that has really

emerged in that. In addition, CMS also made some expansion of Telemedicine for substance abuse, addiction and mental health. Those are these process are already in place. And what happens is, since CMS, the government as well as the large employer, are the majority of the pair, and that forces the insurance companies to develop insurance product and the policies to accommodate these different services and in this case, Telemedicine. So, for example, once CMS introduced the Chronic Care Reimbursement starting in 2020, this year, beginning of the years, CMS mandated that even the private insurance companies who are servicing Medicare population we call Medicare Advantage. They must also reimburse for the Telemedicine and telehealth services, which CMS has started already two years ago. So, that's the trend has been and also

the broader reimbursement is being provided, as we have now gained some experience from lockdown and delivering the care. But I want to just one other area want to focus that that trend has been developing and now has accelerated for the last four or five years. Government, CMS in particular was encouraging how do we bring the payer power and also the provider? How can we make it more of a partnership and initially, they had a financial incentive built in we called it the US Accountable Care Organization. And basically what is happening is that two or three different stakeholders, provider, maybe pharmacy, the insurance component, they all partner and they set the threshold based on historic the cost and they say if you can get a better cost structure, but more Most importantly, the component was patient experience and satisfaction also has to be in place.



So that what was happening and now what is happening is that the both the provider and the payers are beginning to partner and there's a new term we call PAYVIDER where you have payers and provider are forming partnerships today really provide more affordable care. And so what is wider is really is an organization that is responsible for both patient care and also taking a financial risk of care.



In a nutshell, it's enough is the health insurance plan that also have the responsibility to provide the care and then as I say, this is started with the demonstration through the CMS and yes, Accountable Care Organization. They also try a few other models, sometimes they will say a bundled payment system or prospective payment for one episode of care. And, and also in the private sector. We have some examples that has also come to play. On the private sector in the West Coast. We have Kaiser Permanente system started in California but they are in multiple states. And they provide both the insurance and the care. So all the hospitals and doctors are employee of this organization and also they are the insurance so many years of experience has led to this becoming more and more prevalent now. We are one of the big one in the last five years has emerged on the East Coast of the United States University of Pennsylvania. UPMC where they have taken the health insurance responsibility as well as the health care delivery. And so, what is happening in this world sometime we call it value based care, these organizations have to provide all aspects of the care. And so this there are two key component on this, as I mentioned earlier, the most significant component is the patient experience, we have tried managed care 20 years ago, and at that time, we were, we were calling as managed care, we were just rationing the care making it harder. And as a result, the patient did not really have a good experience in this becoming very, very hard to get it now, with the very strong component of patient experience and satisfaction. Then the second important part is the interoperability of the technology, where you can have the information whether a patient in OBD, whether it's inpatient, or in the community, and that you are able to see what is the overall care of the person rather than individual service point. So, this is the area where a lot of effort is happening. In terms of the care. I mentioned earlier, the employer aspect, in this country, Amazon's together with two other partners Chase Bank and Warren Buffett's organization three years ago decided to take all their self-employee, self-funded employee insurance, and try to look at how can we change the healthcare experience for their employee. And then after three or four years now, they are starting to change Amazon has launched last year, they call Amazon care. And they are expected to further improve. So in this case, the employer who pays for the health insurance, but also incorporating the provider component. I might also mention, some of the insurance companies I used to work at United Healthcare, they have an organization called OPTIM, with part of United, who owns the largest urgent care facilities and employee doctor practices. And so they are in this case, one arm of the United Health Group is providing the insurance. The other arm is providing the health care services including they have pharmacy as well as the health care delivery votes, urgent care and the physician office. And so the message I wanted to leave here with is that we did with the, with the understanding of the

patient care delivery workflow is this is where the newer model are emerging for the payment is no longer just a separate organization because if you have a payer and you're separate, and the provider, oftentimes they don't have trust, they don't have transparency as a previous speaker was saying, if we have the tools and transparency, the insurance will pay for PD, outpatient clinic and so forth.

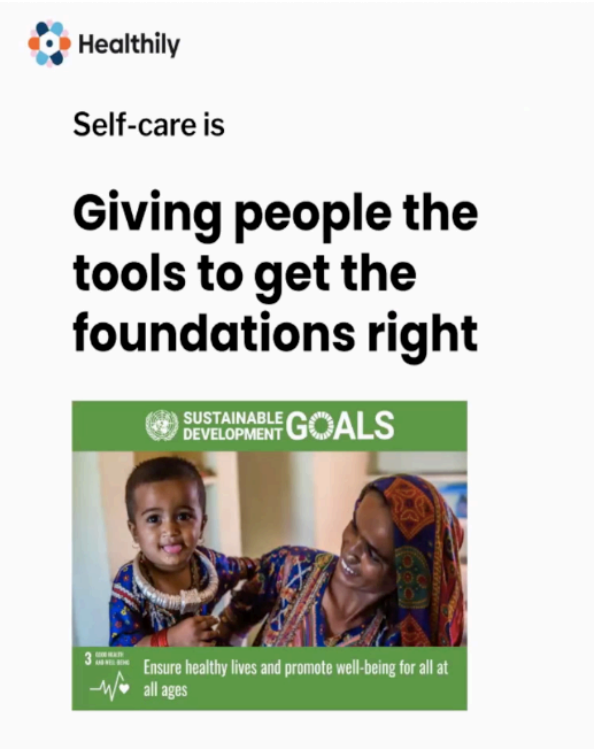
So, in summary, the new model will require the lower per capita costs, better care for the individual and overall better health for the population that we can provide. So, what we have discussed is that the provider experience is very important and continue to be very, very heavy in terms of decision making. But as well as the patient experience, you need to be able to see their satisfaction. And as I already discussed, the government plays a major role in terms of pushing the policies and then the private insurance and employer has accepted the Telemedicine and telehealth and we just introduced you the term provider where basically there is a form partnership between payer and provider, I given you a few example. So the vision is the many people in this audience already know, we have been saying that there will come a day where Telemedicine telehealth will not be a separate specialty. It will be the tool in the toolbox in this case delivering the health care. And that's really where I envision is happening. Before it was one of the biggest barrier was the payment. But now if you are paying for the overall care, then the end you have the technology with interoperability. You can imagine so many use cases where you use interchangeably. Sometimes you see in person sometime you

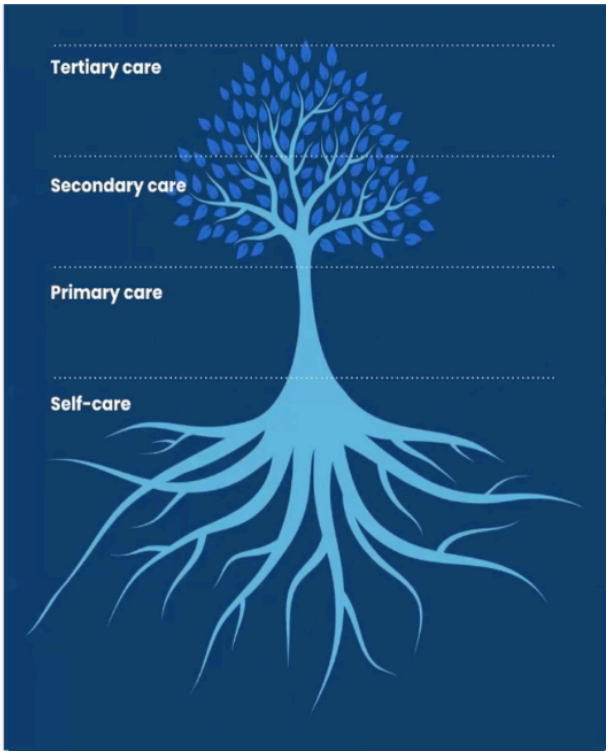
have a quick virtual resist and not worry about is that covered insurance or not. So with that, I'm going to stop here. And again, thank you so much for the opportunity to speak with you.

Day 1	Topic	Speaker
• 18th December 2020 (Friday)	• How self-care via smart tech can amplify the value and impact of Telemedicine	• Mr. Matteo Berlucchi (UK)

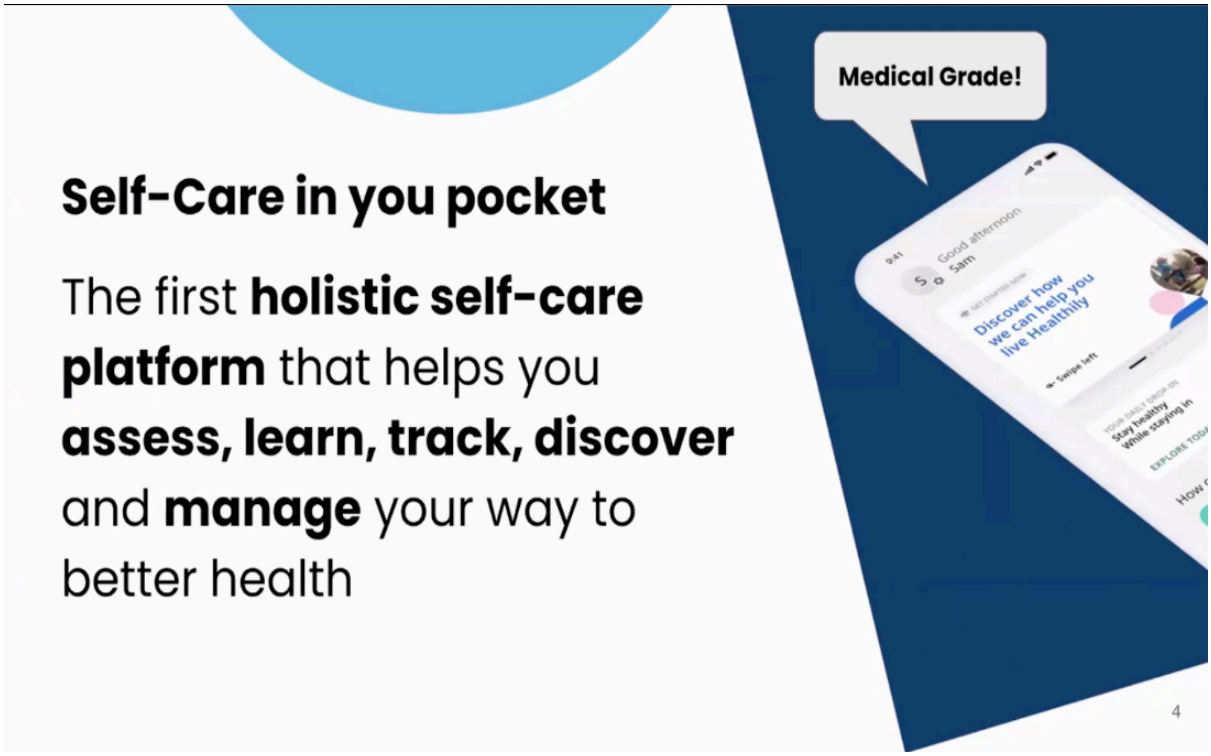
It's an honour to be invited to this conference, I am going to present something a little bit different from what you are used to. First of all, I am a doctor in physics. So I'm not a medical doctor. Very important point, because you most of you are real doctors. And I have huge respect because it's much more difficult to be a real doctor than a medical doctor than a doctor in physics. But what I wanted to show you is what health fillings trying to do, to trying to bridge the gap between primary care and patients or people because we all are patients. It’s really great timing, because we have commissioned research a survey on Telemedicine in the United Kingdom. And we just got the results last week. So I'm going to show you exclusively the results we have from 200 GP’s in the UK, and 2000 patients. So I have some very interesting insights that I will share with you. So first of all, tell you briefly about what we're trying to do.

What's interesting about Healthily? Healthily is a platform online, it's free to use. And it consists of two components. There's a website, which is at livehealthily.com, which is designed to help people understand what they need to know. And what they can do in terms of getting their health under control. So is when they're worried of their need information. Most of the original information was sourced from the National Health Service in the UK. And we have also started translating the website in Hindi. So if you go to livehealthily.com, you might get it automatically in Hindi, if you're in India, you can change the language to Hindi. We're trying to give a very high quality resource for anyone in India when it comes to finding reliable health information. The second part is an app, which is also free of charge, which is designed to help people self-care. So it's about empowerment of people, self-reliance, and taking more control of their own health. Obviously, up to the point where you need a health care professional to support you. We use artificial intelligence in there. This is how I met Dr. Shroff in Geneva as part of the AI United Nation advisory for good Consortium. So we've been pioneering artificial intelligence on the consumer side since 2015.

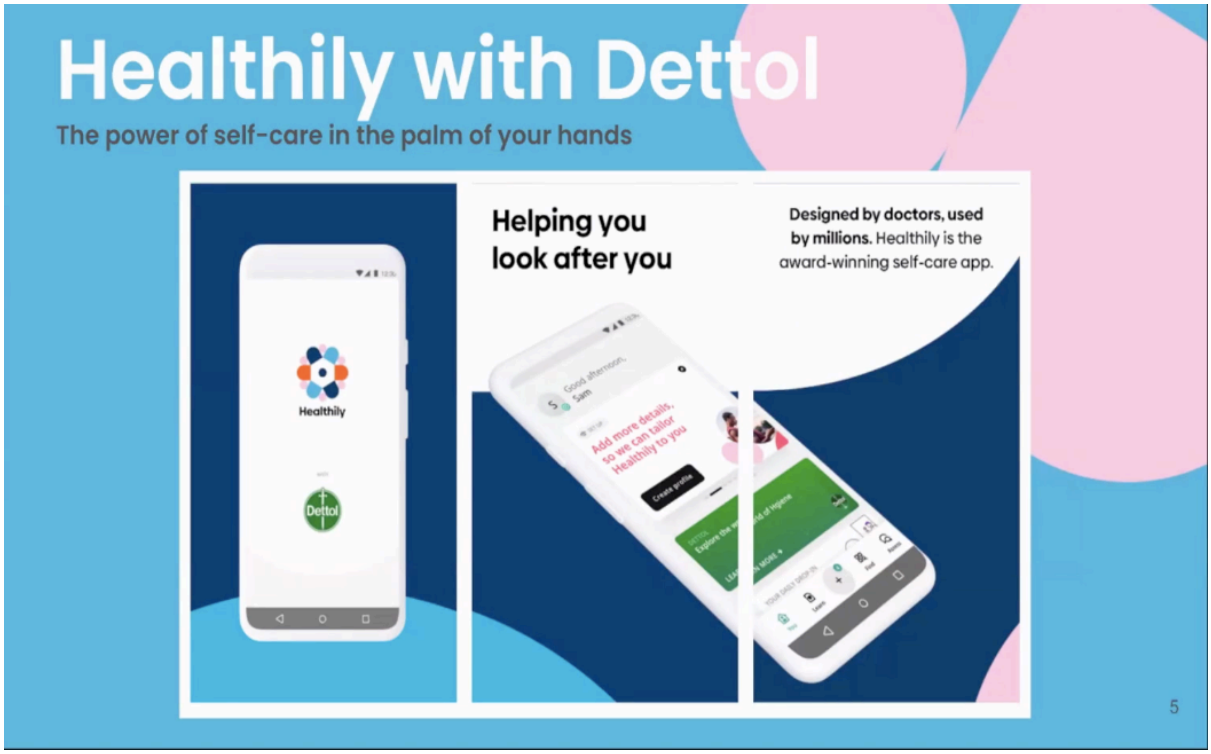




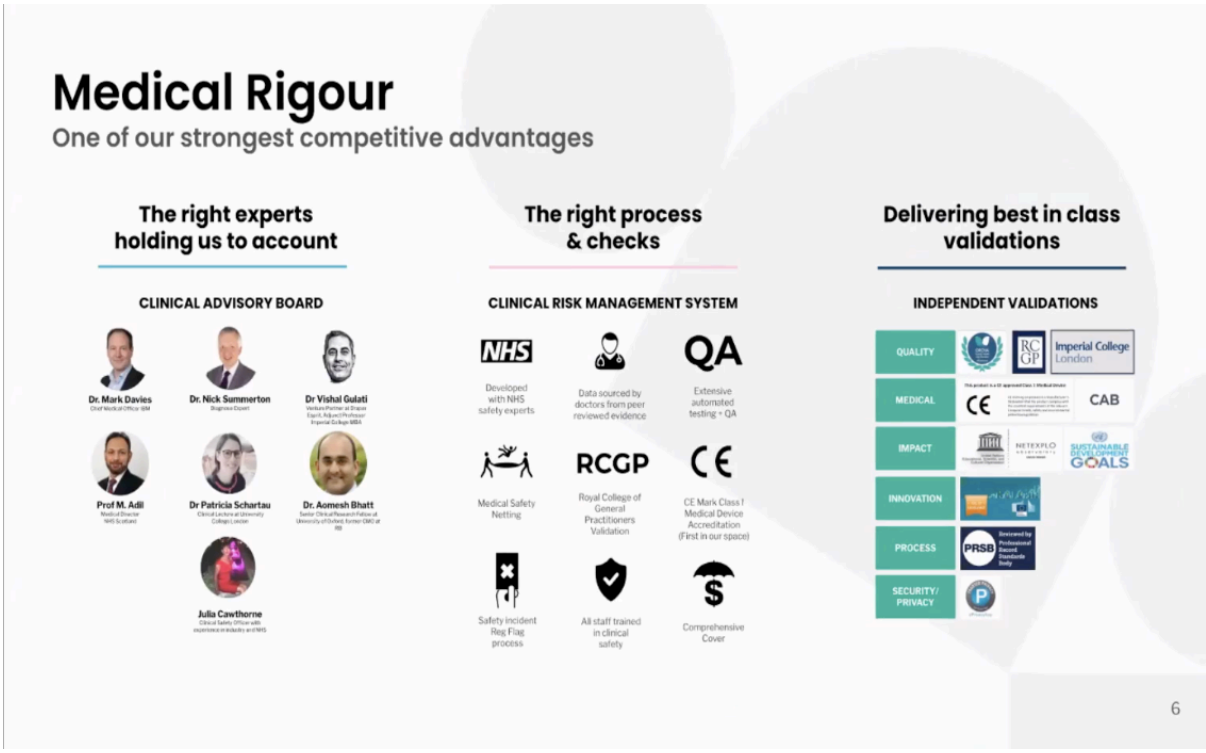
So why is self-care? and what is self-care? self care is we think is probably one of the biggest opportunities that has not been harnessed. And I love this picture of the tree. Because you know, health care as a tree doesn't have very solid roots because people do not self-care enough. So if people could have better information, more personalized information, their health journey, this patient experience that Dr. Gaur were talking about before, Professor Gaur, it's so important, so But if I don't have the information, the knowledge that I need, it's very difficult for me as a patient to have a good experience. So this is also SDG. Number three, as you can see, it's all about ensuring healthy lives, and promote wellbeing for everyone at all ages. This is where mobile technology makes it really accessible because most people have a mobile phone. So we want to combine the best simplest health information with smart technology to empower people to self-care more and better.



Now, in order to do that we have created this platform that is a is holistic. So we believe that health is a very personal thing. Everyone has different health profiles and health stories, and histories. So everyone is on the same journey to better health. And that's why the platform that helps you self-care needs to be holistic, it needs to cover all the aspects of self-care, where we use artificial intelligence, for assessment. So we can help people understand if they need to see a doctor or not. And this is where you find the link with Telemedicine, you have great information, tracking how your health develops, and then also find products and services that can help you in your situation.

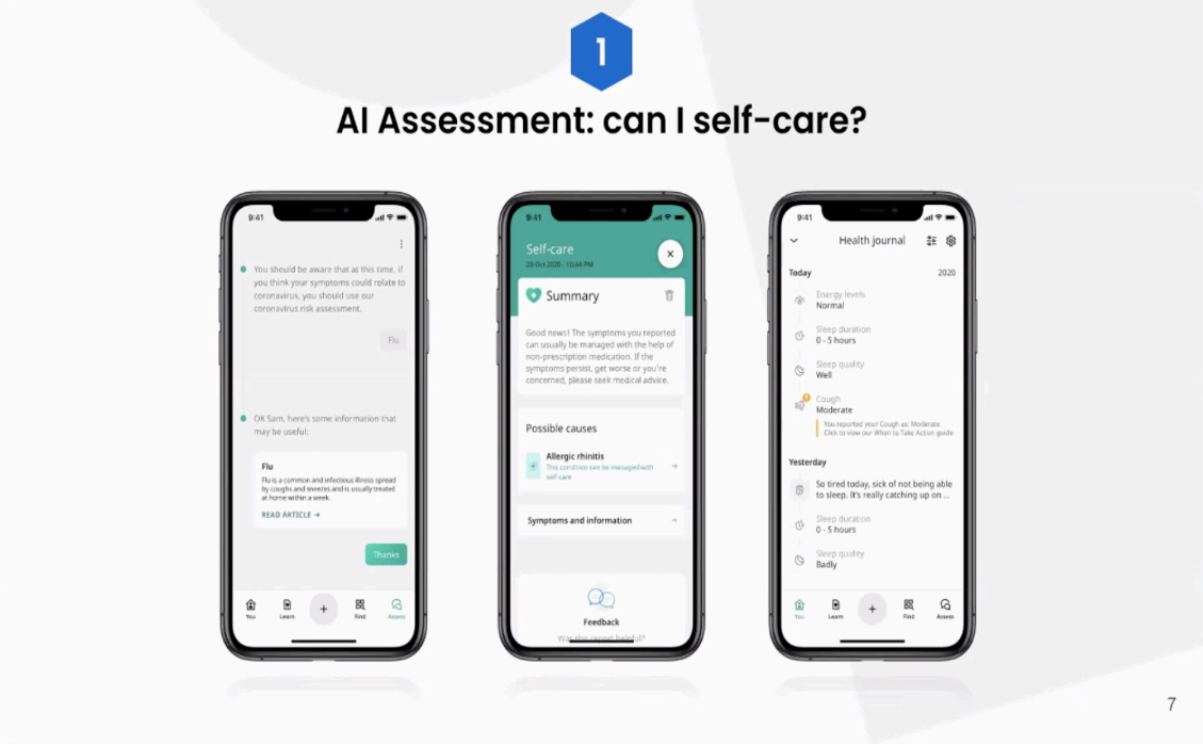


So we're also very proud of something that you might not be aware of that we launched Healthily in India three weeks ago, with Dettol, so Dettol the company behind Dettol is Reckitt Benckiser RB is one of our investors. So we have teamed up with Dettol to help people really become empowered more in self caring. And so if you go on the app store, you will find that Healthily is actually Healthily with Dettol . We are doing some great work with them to really bring great health information to everyone in India, for free.

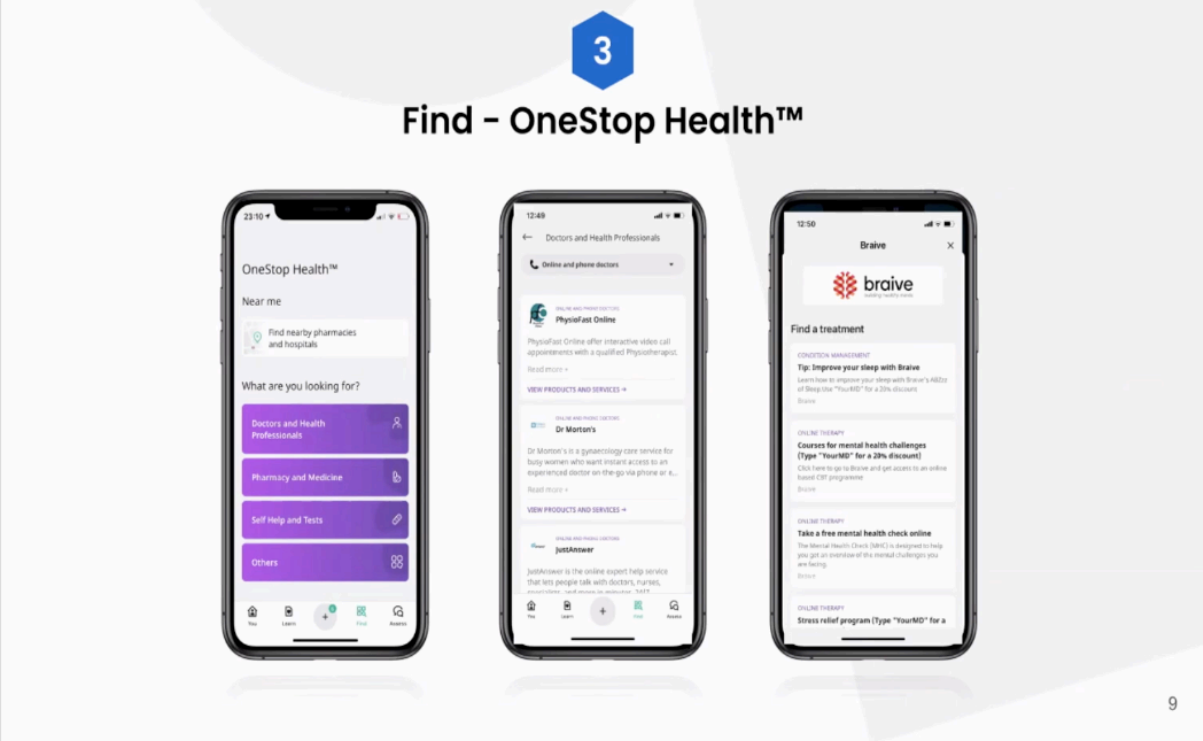


One of the things that is important in digital health is that I don't think there is enough Medical Rigour yet. I'm talking about apps in particular and website. Because clearly Telemedicine, you're speaking to a medical professional. But when it comes to the web, and apps, it's a bit of the Wild West, there's a lot of things, but they're not really regulated or assessed for quality. We're very, very keen on patient safety, patient safety is one of the key priorities for us. So we have invested a lot. And we have a great clinical advisory board with the Chief Medical Officer of IBM, the former Chief Medical Officer of Reckitt Benckiser who is a senior fellow at Oxford University, and so on.

We've also have medical device accreditation for our apps, which is quite unique for apps. And we have a lot of independent endorsement. This is just to say that even if you're doing apps, you shouldn't compromise patient safety, as I'm sure you will agree as doctors.

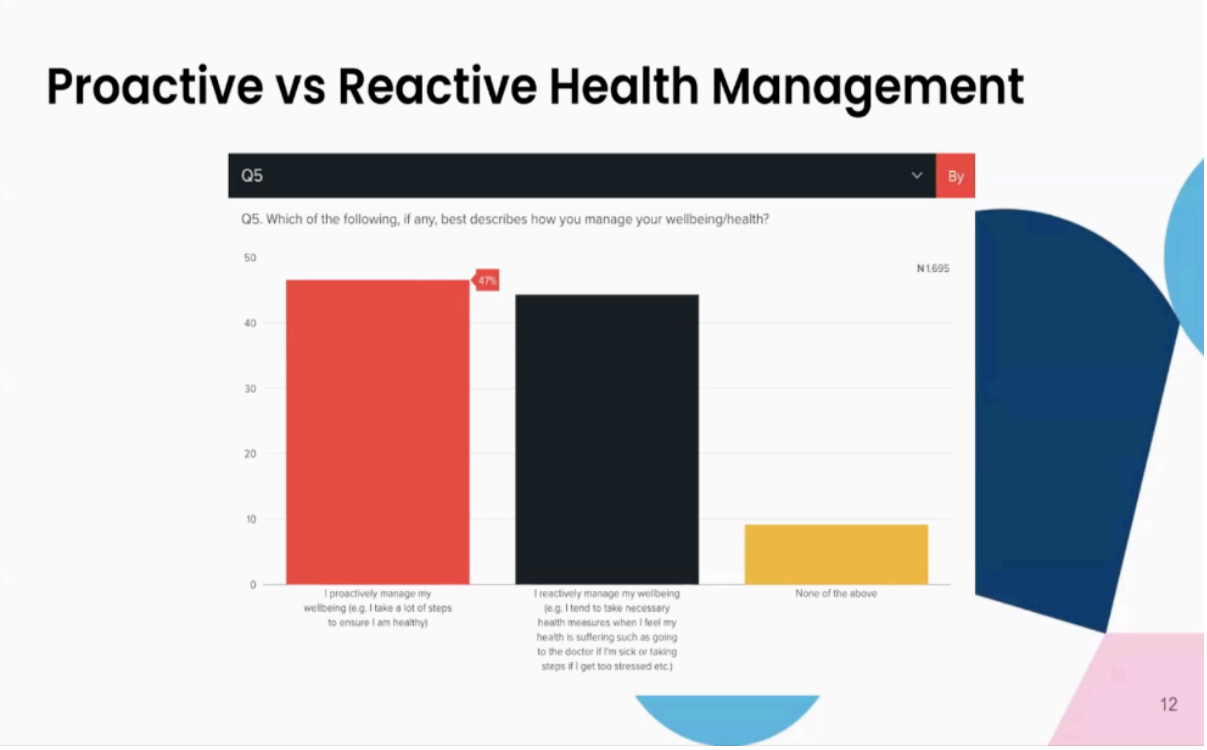


So the app very quickly, we have this artificial intelligence assessment that is completely automated, free of charge, medical grade, that can tell you in a simple interaction, if you need to see a doctor, or if you can self-care, we think this is better than a symptom checker. Because the problem with these symptom checkers is that they don't give you an answer. They say, Oh, you could have A, B or C. And then what do I do? You know, I don't really you know, I'm not the doctor, you tell me A, B and C, I still need to speak to a doctor. So you're not really helping people with symptom checkers. But if you tell people that their symptoms require to see a doctor or not, that's a lot more useful. So we focus on the triage. And we have completely automated it. And we made it available through the app also in India with that. So this is what it looks like now. The second step is the content. We have a fantastic library. We also believe that for India, this is very important, because we looked around and we didn't find the equivalent of WebMD in India. So we think there's an opportunity to give people an excellent medically validated and simple resource of information.

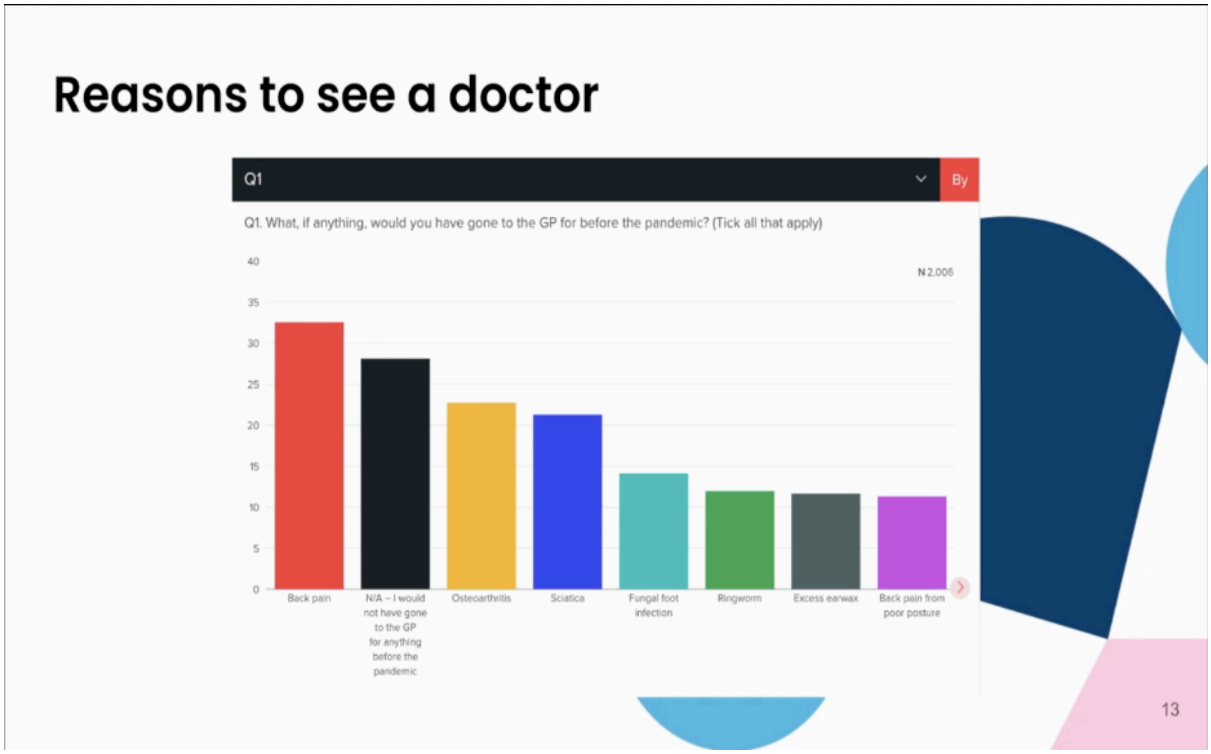


So this is what we're doing. And it's very important to elevate the knowledge of the user. And the third is this is where we work with Telemedicine is to help people discover products and services that can help them. And in this example, we work with a lot of Telemedicine companies, because you can use Healthily to decide what to do. If you need to speak to a doctor, then we can say, Well, here's your options in terms of Telemedicine available in your market. And it could be, you know, premium could be part of your insurance package. But you can see in these slides how our connection to Telemedicine works. And you have things like online doctors, mental health, physical doctors, you can order tests, and so on. So in this case, I'm showing you, the online doctors near me in the UK, if you use the app in India, you will see the online doctors near you in India, we have a number of partners in India, like 1mg, Medlife, and a few others. And then in this case, I'm showing you the offering of mental health online company in the UK. In India we work with inner as our Telemedicine partner for therapy. So we're trying to create that patient experience from self-assessment, to education, to resolution and finding products and services.

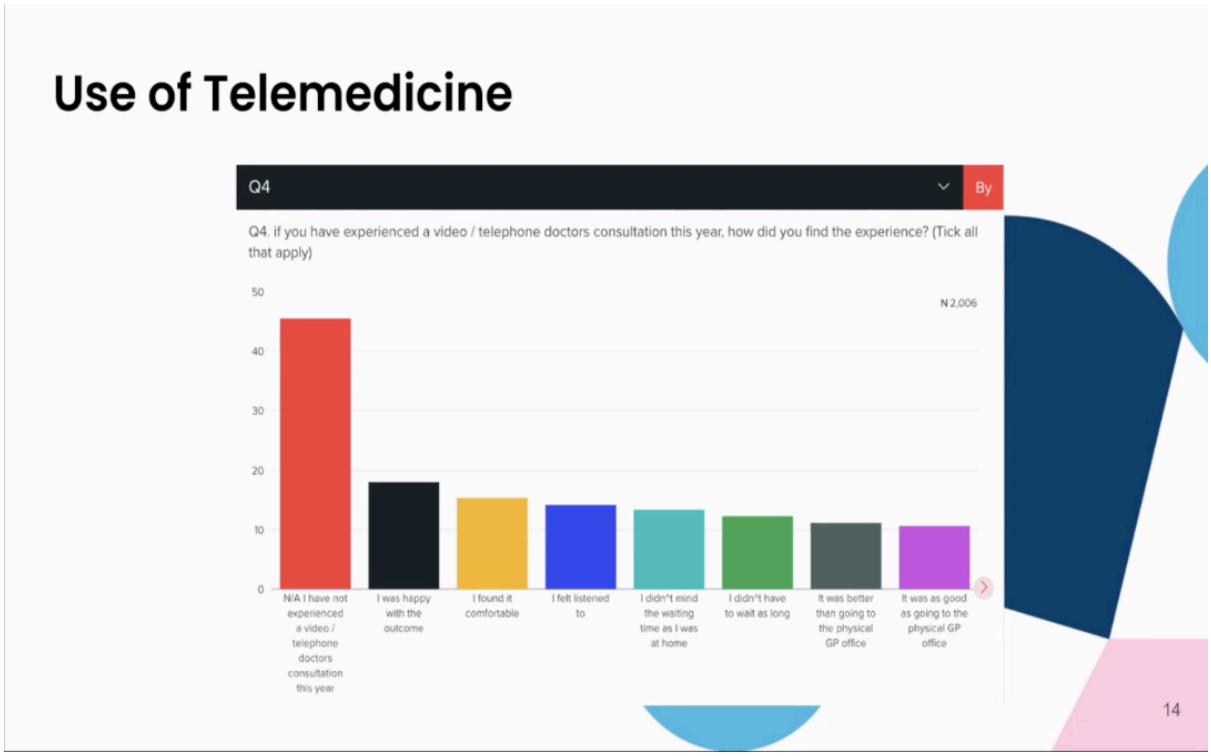
So that's what we do. And I want to show you the results of the survey, which are very interesting, hopefully, and this is fresh off the press. So first, let's look at what users said.



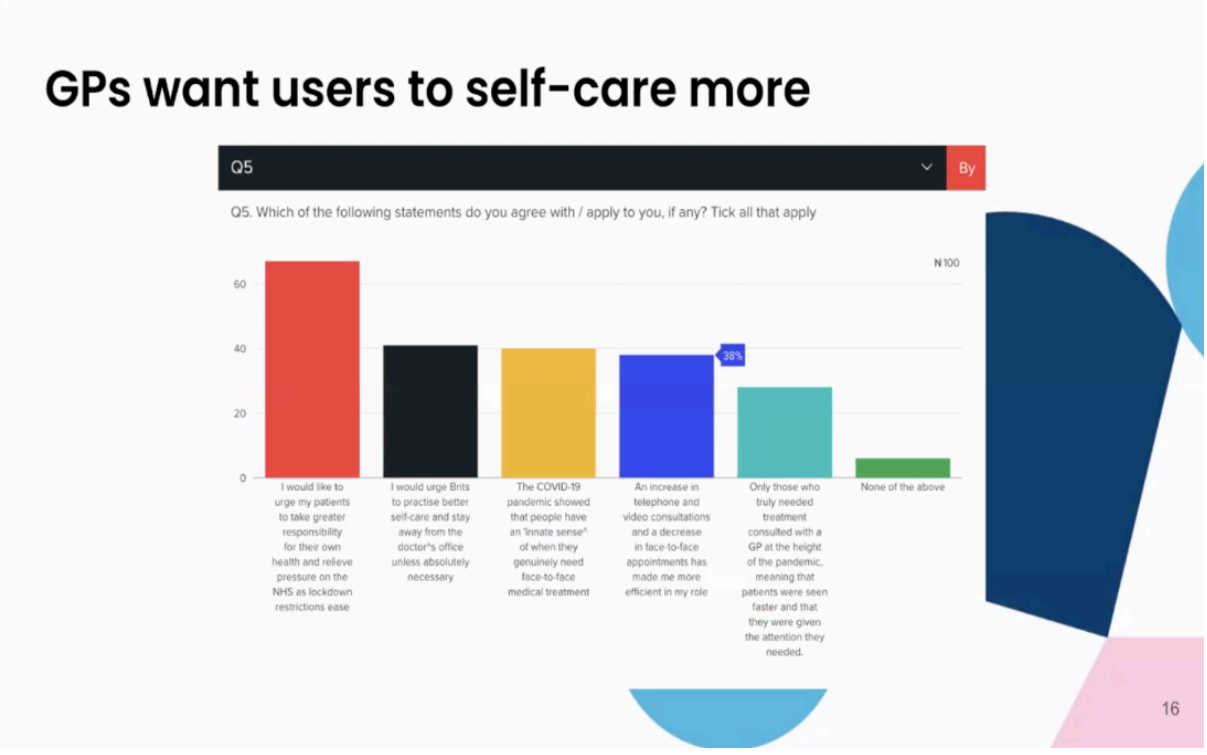
So the first question was, how do you manage your health? And this is interesting, because 47% of people, and I think this is a trend, also in India and in other countries, they're trying to be more proactive in managing their health. You know, in countries like the United Kingdom, where the health care, it's a given. It's free comes from the NHS, people are always been quite reactive to health management. But you can see that with the new generations, there's a big trend towards being more proactive, which is very important also for prevention. So this is a point on the role of self-care in all of this. We asked people why event for any reason you went to the GP before the pandemic because this was done during the pandemic.



You can see hopefully you can see the writing on the screen the under the bars. The main reasons why people contact the primary care physician are quite simple problems, the back pain or still trying to sciatica, fungal infection, ringworm, and so on. So there's nothing that is life threatening, in the reasons why people when asked contact a doctor.

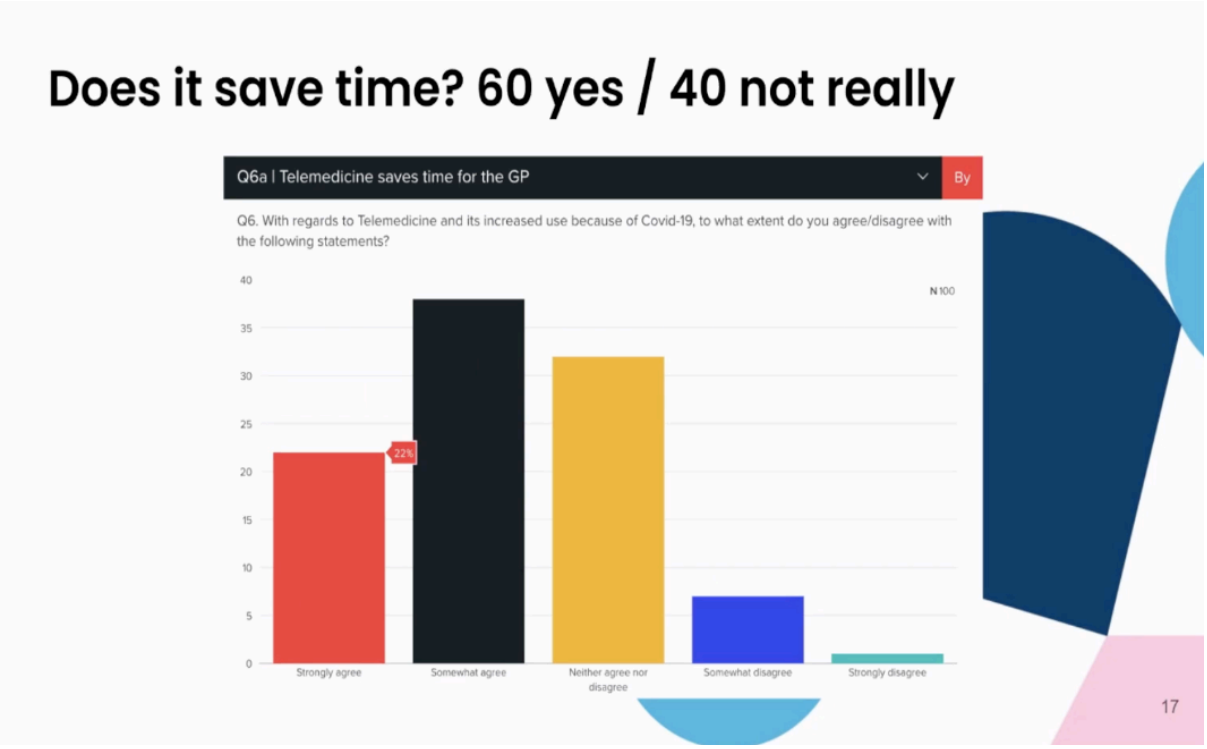


Then we asked them if they did Telemedicine? How was their experience on it? And this is multiple answers. So you know, user could have answered more than one. So you see that more than half sorry, less than half around half did not use Telemedicine here in the UK here. Telemedicine is quite popular as you know. But you can see that the number of people that were overall satisfied with the experience, it was less than 20%. So only one in five people said they was happy with the outcome of the session. Around 50% said they always find it they found it comfortable. Same number of people didn't feel felt they were listened to which means that 85% felt that they were not listened to. I didn't mind the waiting time as I was at home again, not too many people like that. I didn't have to wait as long. And I it was better than having to go to the physical GP office only 12% said. So what's emerging from here is that from the patient's point of view, the Telemedicine experience while clearly convenient, from a logistic point of view because they don't have to move but users are very aware that the face to face meet in visit is of much higher quality. So I think that's the main reading for me from this data. So people still prefer if they can to have a face to face. connection with the doctor in terms of the quality and not the convenience.



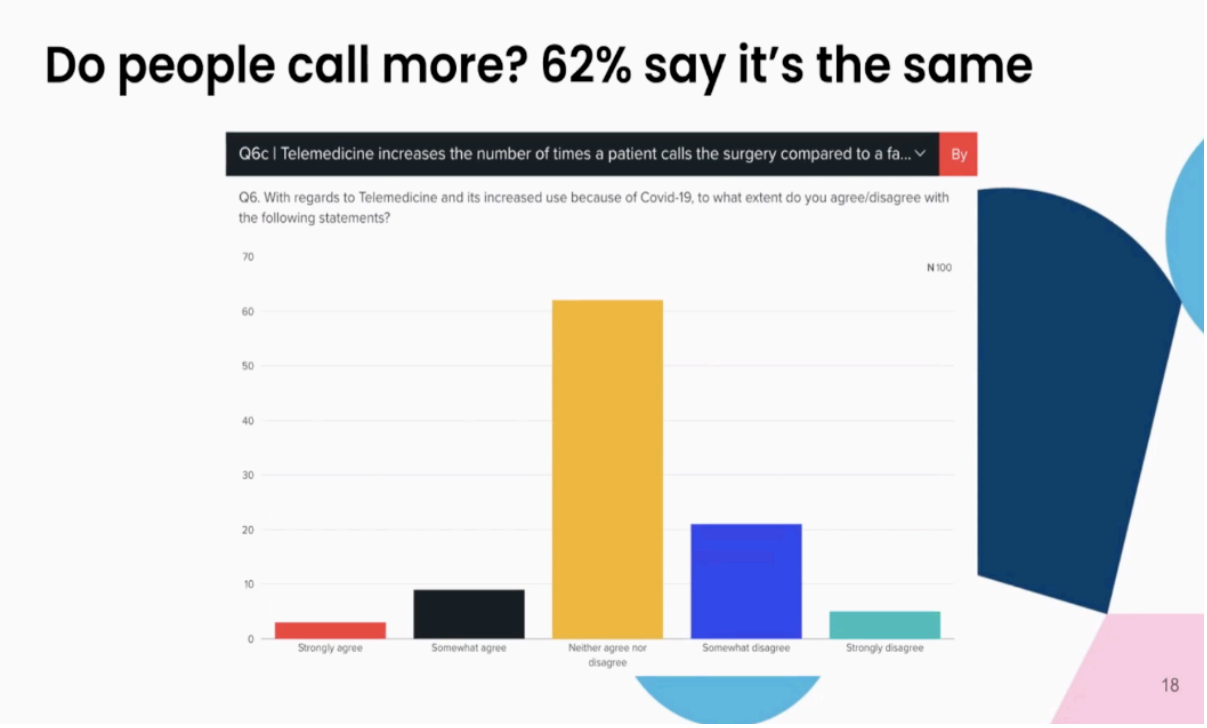
So let's see what doctors said. There's more answers here. They're more detail. So the first question was, which of the following statement you agree with is that most of the doctors on 70% said they would like to urge their patience to take greater responsibility for their own

health and relieve pressure on the National Health Service, especially as locked down restrictions ease. So there is an overwhelming majority of doctors that would like patients to start taking a bit more responsibility for their own health. In other words, they would like them to try to resolve minor ailments with self-care. This is because clearly in England, the cost of the NHS is very high and there is not enough the GPS, the number of GP's is quite limited. So you can see here that the recommendation from the doctors is, you know, they would urge breeds practice better self-care. The COVID-19 interestingly, around 40% of doctors said that the Covid-19 didn't show that people have an innate sense of when they genuinely need face to face medical treatment. Which I totally believe you know, people because, you know, COVID made it more difficult to see doctors. So this choice of seeing a doctor or speaking to a doctor became more rationalized, people were thinking a lot more before deciding to call or see a doctor, which is what GPS confirmed that.

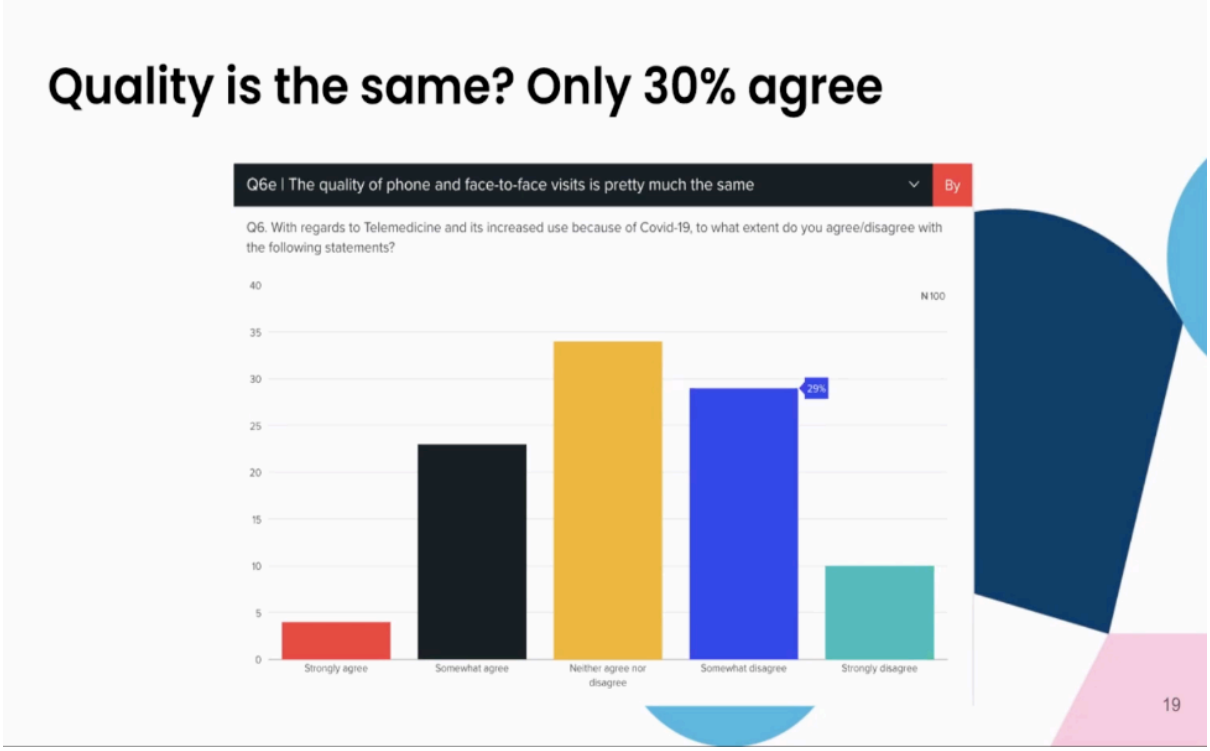


So then we asked to doctors, does it save time? If you're a doctor, you Telemedicine and I would expect it 100% of them saying yes, it does save time, but only 60% said yes. So 40% said, you know, not really, you know, there's some What didn't agree or disagreed. I think he's kind of logical, because if you're a doctor sitting in your office, and you have a patient coming in and out next, next, next, there is some dead time between the changes, but in reality doing that face to face, or on the telephone or the video call, it doesn't change dramatically the length of the session, you still have to say hello, how are you good morning to the introduction. So

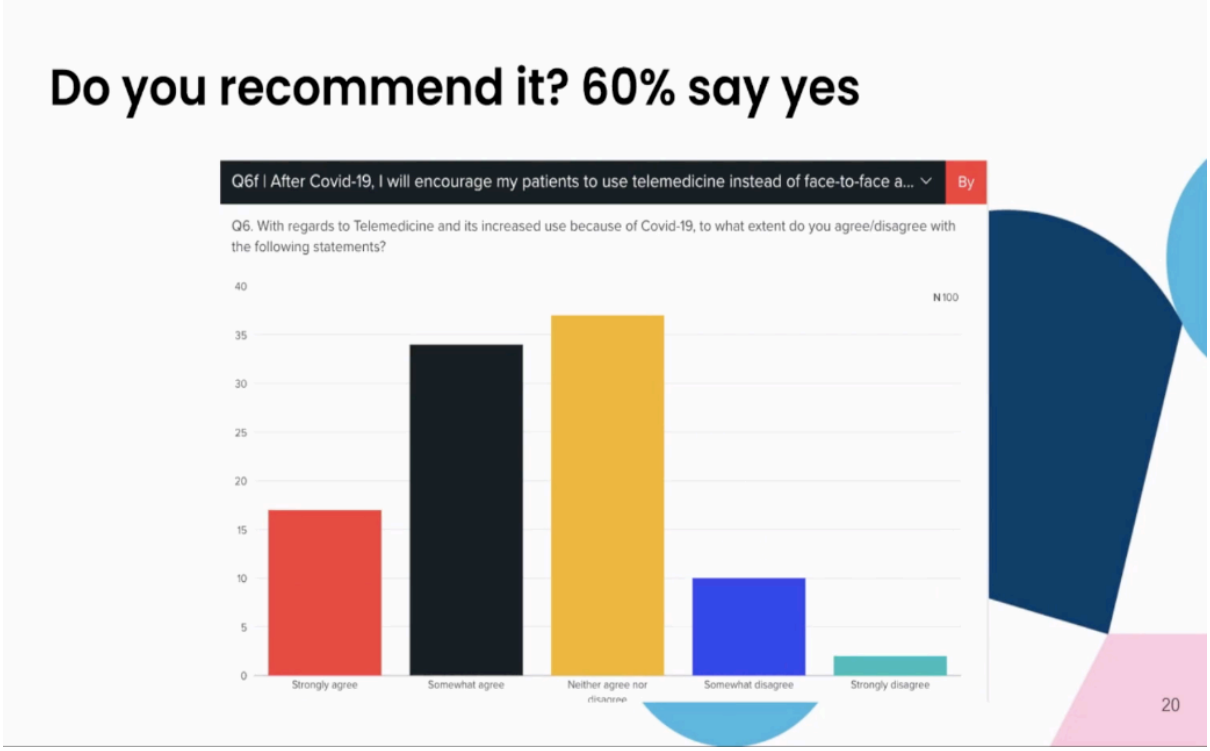
the doctor, you know, the person that really saves time is the patient, because instead of taking the bus going to see the doctor taking half a day of work, they can do it like that. So the real saving is for the patient, so the doctor doesn't save that much time. We're using Telemedicine.



Then we SAS then do people call more so the fact that I can just set up a video call with the doctor instead of having to take time off, or to say is that creating more demand in 62% of doctors said that that's not really the case, it's pretty much the same. So that's actually great news because one of the things to look out for would be an increase in the number of times patients seek medical advice because we've the strain or radio most medical systems, if Telemedicine increased, the number of times people want to speak to a doctor would make the problem even worse. So it doesn't seem to be the case, which is great. I was very happy with this with this answer. Because people again, they seem to be quite sensible and they don't want to bother the doctor too much.

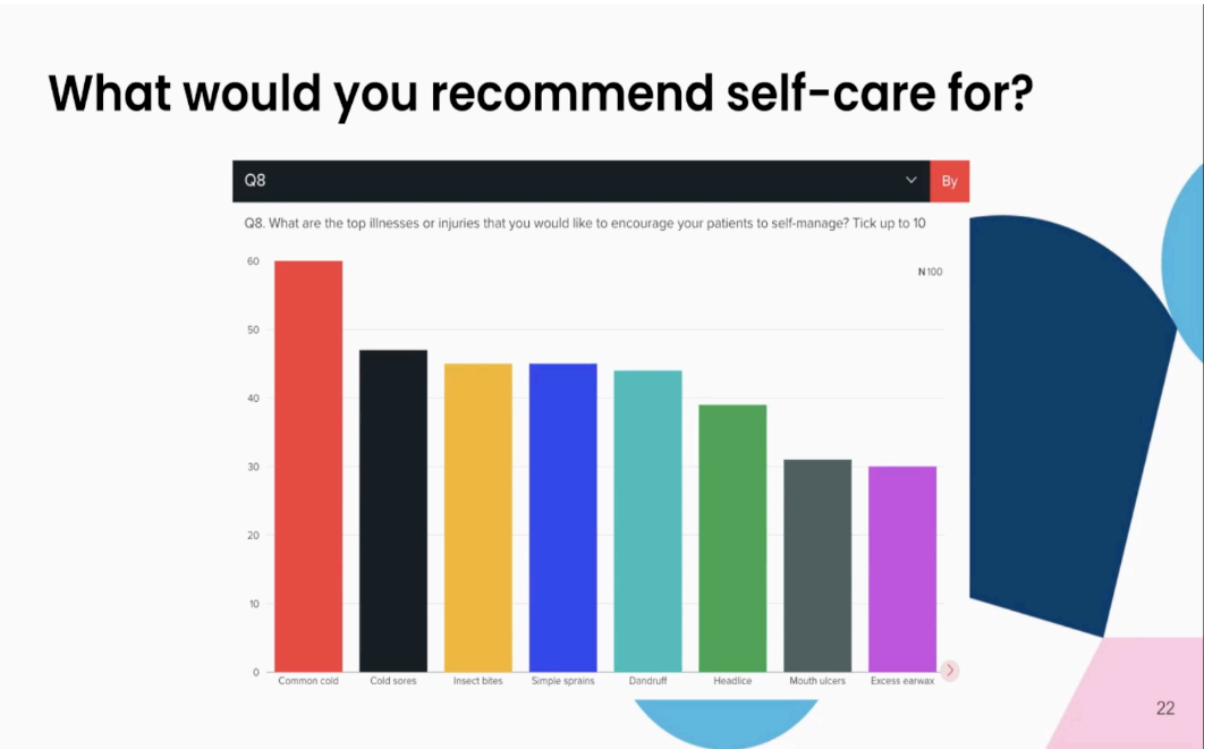


The next question was to the doctor, what do you think is the quality of your phone face to face visit is you know, easy to say or not. And here you can see that that only 30% of doctors believe that a Telemedicine consultation was on the same quality of a face to face what I think that's pretty obvious because the signals that a doctor can take by seeing a person face to face and together with you know just looking at them or you know touching their skin or you know taking the listening to the heart and do all these things clearly. You know the face to face visit is still much better. So that's the view of the GPS here in the UK.



Then we asked after COVID-19 will you encourage your patients to use Telemedicine instead of face to face? and you know 60% said yes. Which is good to know. So I think there is strong backing from the medical profession UK to have Telemedicine as a recommendation so that was a pretty clear answer.

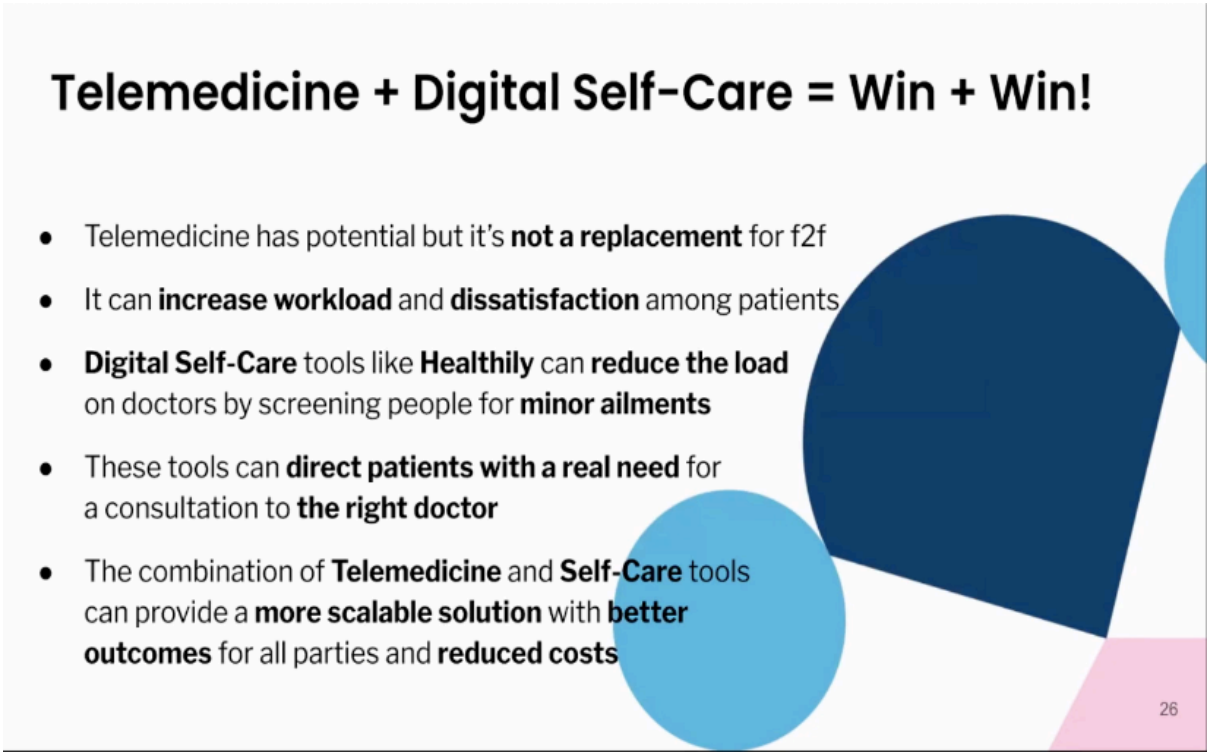
Then we asked, what are the most common reasons for visits here in the UK? And this is a bit depressing because you have you know that if you look at the list of reasons why people went to see the doctor really in many, many cases, if they had the right information, they could have saved themselves the cost of the trip down the doctor or the call. So common call being number one in the UK, this is UK data. sprains. You know, shockingly dandruff. Number three is I always love thinking of that, because why do you have to go to the doctor for that? I don't have that problem clearly. But you know, why? Why? Why do you want to waste everyone's time with your dandruff? You know, having said that, there are conditions like hypothyroidism or thyroid related problems that could have dandruff as a symptom but it's this is kind of interesting so that all these are self-care option and in fact.



Then we asked the doctors would you recommend self-care and what conditions would you recommend people self-care for? And so this is the list again, which is clearly very similar. So doctors will be very happy for people not to go and bother them with headlights or, or instant bikes.

Then we asked, Has your work increased because of digital adoption? They use digital channels and Telemedicine has that increased? And for 50% of doctors, they said, Yes, it has increased. So I think he's maybe because it's a little bit like all of us doing so you have less that time between things. So you're kind of constantly there in front of the screen. And you know, you go go go. So they think that their work has overall has increased.

In fact, the following question was if Coronavirus was wiped off the face of the earth tomorrow, which hopefully will be with the vaccine soon. Which of the following Are you more likely to do? and the choice was to go back to face to face consultation, continue using a digital first approach, we use a combination and the overwhelming over whelming feedback was that doctors here in the UK see a future of an integrated fight face to face and Telemedicine sort of digital coexistence, which is I think it's pretty obvious for many reasons, but that's what they expect.



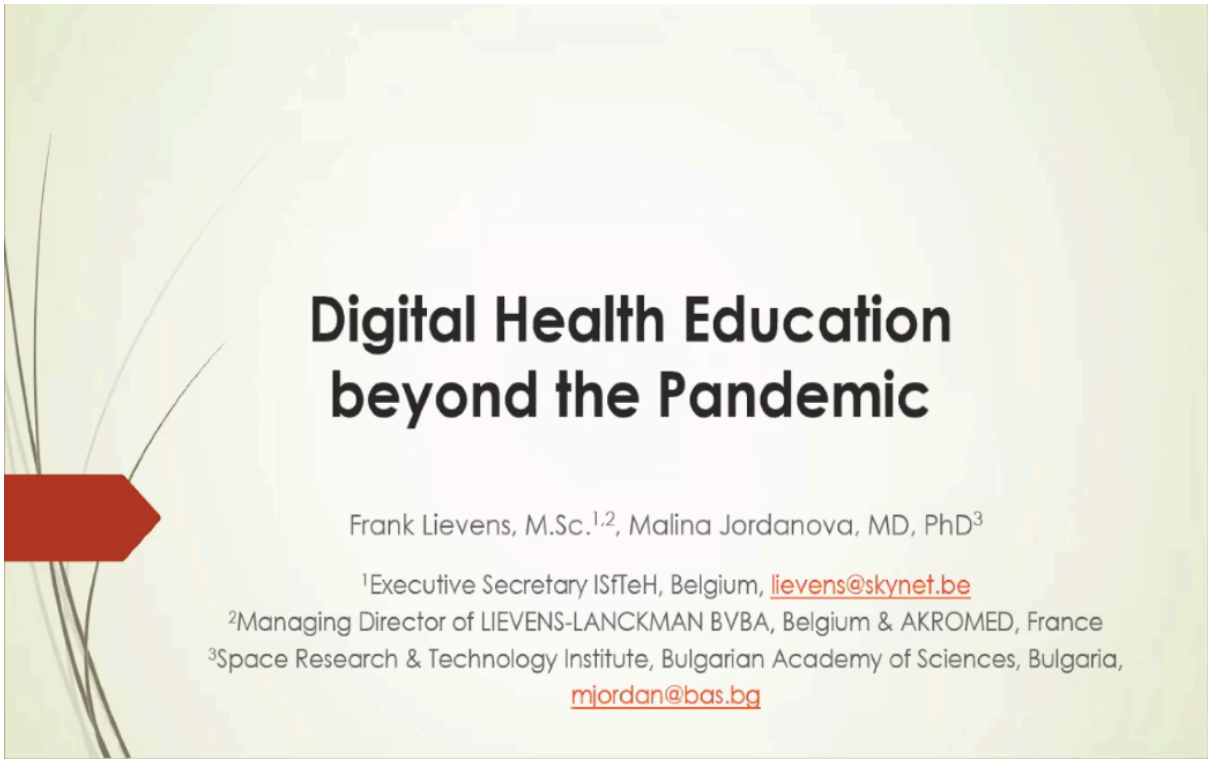
That Telemedicine and digital self-care, I think has a huge potential. If integrated, it's a win-win. medical advice, because Telemedicine, it's a an enhancement has got a lot of potential, but it's not a replacement for face to face, we'll never I don't think we will ever be a complete replacement for face to face. So it will be you know, exist together for all the situations in which you have to do Telemedicine maybe because you're bedridden, or you're too far from a doctor practice. But it does increase workload and there is dissatisfaction among patient. That's why on its own, I don't think you will ever be able to exist in a completely standalone offering. And I think that digital self-care tools like Healthily can reduce the loads, because that's the compensation because if people self-care with digital tools like Healthily, then that can compensate for the load. And make sure that the minor ailments are treated directly with technology in an autonomous way, the self-care way, giving more time and resources for doctors to deliver a high quality service.

These tools have can and can be used to direct patients because they artificial intelligence can say you need to speak a doctor, here's your Telemedicine option now. Or maybe you can you know, you should see a doctor the next two weeks and here's your offline option. So this direction is very important this guidance because you can sort patients by sort of three hours, you know, by grade of urgency and type of speciality you need, you know, very often you go and speak to the wrong doctor. And then you need to go back and find another doctor that knows that problem better. And I think so my last point is that the combination of Telemedicine, Telemedicine and self-care tools can be more scalable can provide a more scalable solution with better outcomes for all parties and reduce costs.

So that's my contribution. And we have a vision to help 1 billion people find their health and be more empowered with their health. And we're doing great work with Dettol in India. So thank you for your time and listening to me If you want to have any questions happy to answer or how you can more.

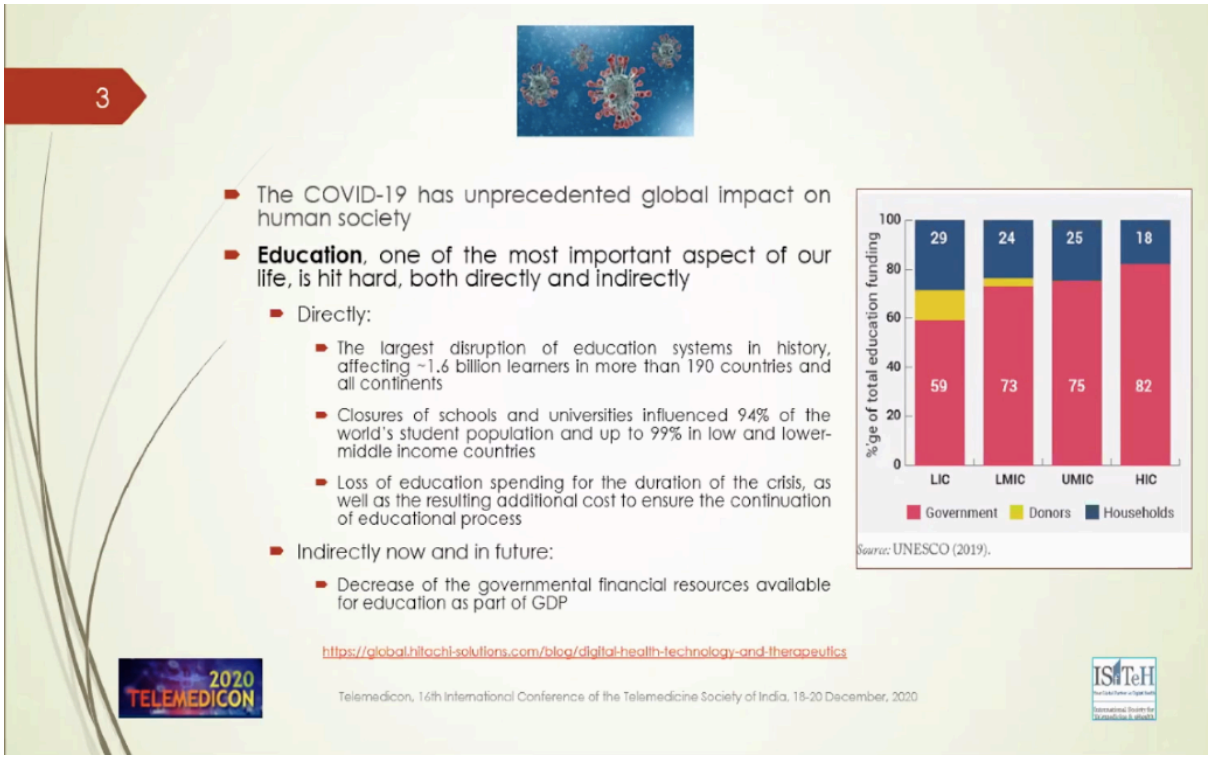
Dr Ratta..Thank you, Matteo. It was an excellent presentation and a beautiful survey done. I think we are running just a little short of time because of the previous session, we'll come back with the questions towards the end for all of you.

Day 1	Topic	Speaker
• 18th December 2020 (Friday)	• Digital Health Education Beyond the Pandemic	• Mr. Frank Lievens (Belgium)

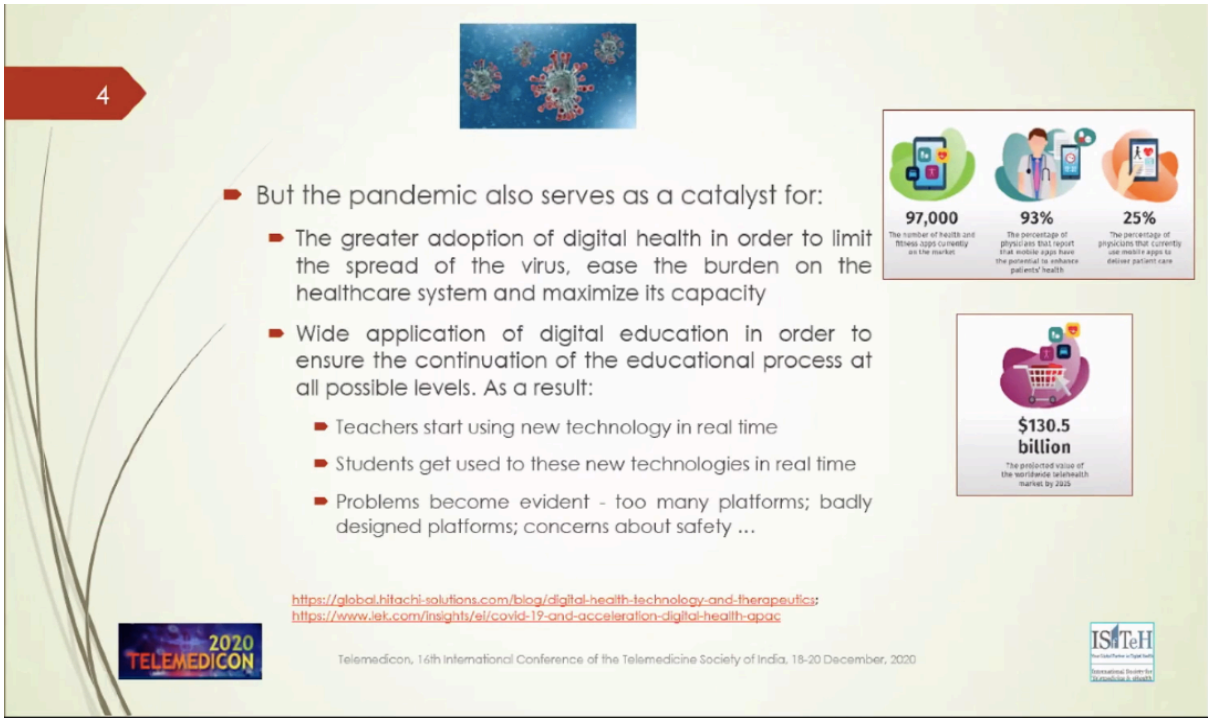


Well, my dear friends in India, I've missed you for years, or the last years anyway, but I'm glad that I can tie up again, with you in this . Congratulation for keeping it going already so many years, I remember 2005, which is now 15 years in Bangalore, and all the other ones. So we, the Telemedicine Society of India is doing a great job. And it's been also one of our very faithful national members in the international society. So there again, and today, I will tackle the issue of education.

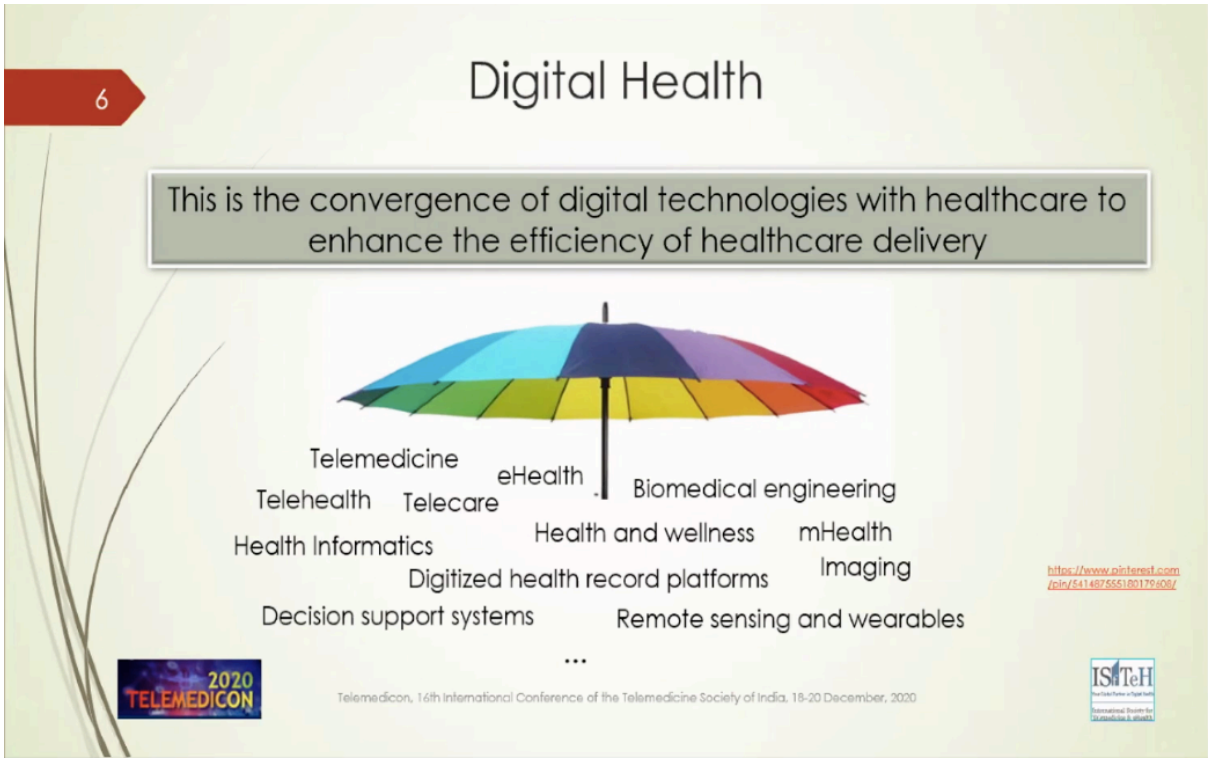
First, I'm not a medical doctor, I'm even less a computer guy. I'm from the old generation that was still educated with a pen, and definitely not with a computer. But I've now been around in this Telemedicine world for about 20 years and within the international society, and I've been blessed to meet with so many interesting people and projects and, seeing the evolution, even if it's only in the last 20 years, though, history goes back for 100 years, you know, as soon as even before the telephone, the Telegraph, though that was leading to telehealth amongst others.



So let's talk about education also put it in the light of the corona virus situation, which has unprecedented global impact on human society. In education, which is one of the most important aspects of our life has been hit very hard, both directly and indirectly. Directly, I'd say the largest disruption on education system in history affecting 1.6 billion learners in more than 190 countries. I mean, in all the countries of the world, which are about 200. Cause the closure of schools and universities, which influence 94% of the world's students population, and almost understanding low and lower middle income countries. The loss of education spending for the duration of the crisis, as well as the resulting additional cost to ensure continuation of the educational process. Indirectly, already now, but also in future, we can fear a decrease of the government financial resources available for education as part of the GDP.

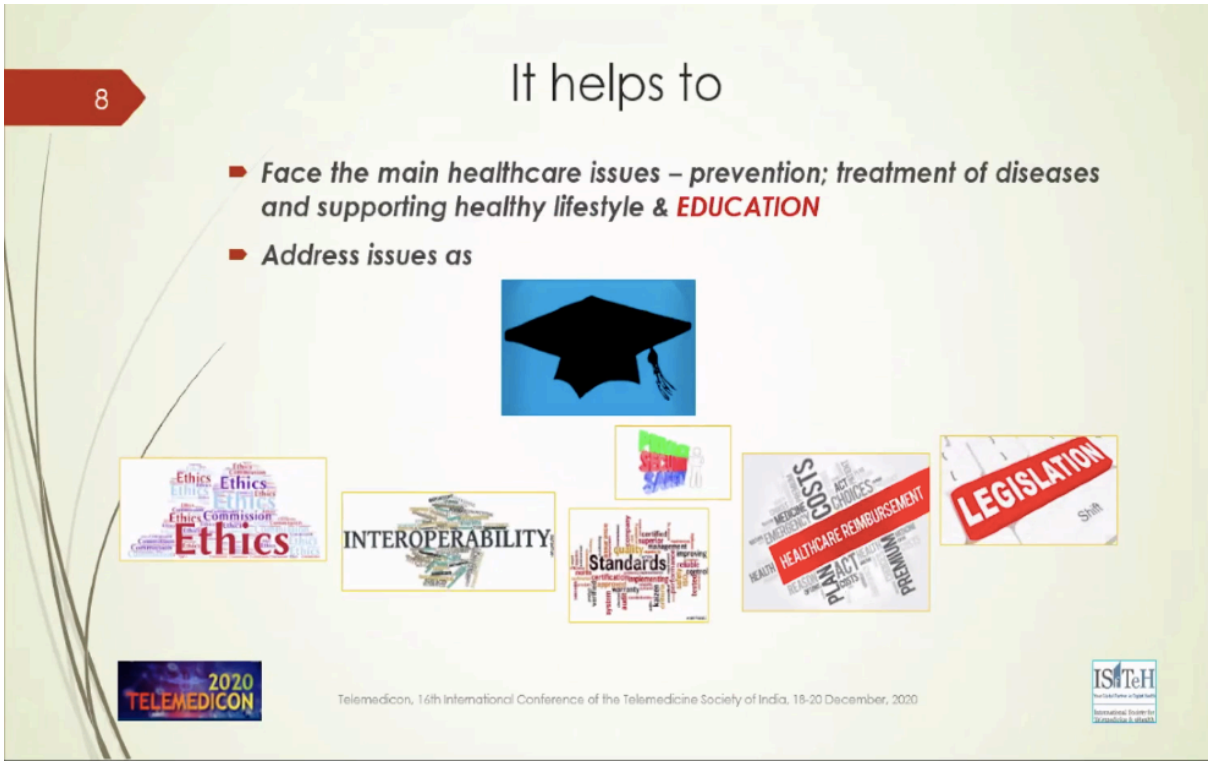


But let's stay positive and optimistic. The pandemic also serves as a catalyst for the greater adoption of digital health in order to limit the spread of the virus, ease the burden on the healthcare system and maximize its capacity. What the previous speakers have already pointed. Yeah, we have been advocating we've been preaching for so many years and that okay, yes, but and then all of a sudden, in I know, India, specifically, all of a sudden, you know, a lot of things went through the legal system and were adopted, whereas only a year ago, it was still wishful dreaming or wishful thinking. And also, there's a wide application of digital education possible in order to ensure the continuation of the educational process at all possible levels. As a result of that teachers start using new technology in real time, students get used to these new technologies and problems also become evident to many platforms badly designed platforms, concerns about safety. Yeah, I mean, we are still in the learning process. And as far as events are concerned, and I remember organizing MediTel for 15 years, you know, physically and being able to meet with 500 people coming from five continents every year, we missed that. But then we have no other choice. And thank God there has been this solution. Otherwise, all the events that have been cancelled physically this year, because they had to, at least we found a another way to do and we were still in the learning process. And thanks to the development of platforms, like zoom, for example, the one that we're using right now, that has allowed us to do something, rather than being totally stuck. So and obviously, all these meetings and these conferences are part of education.

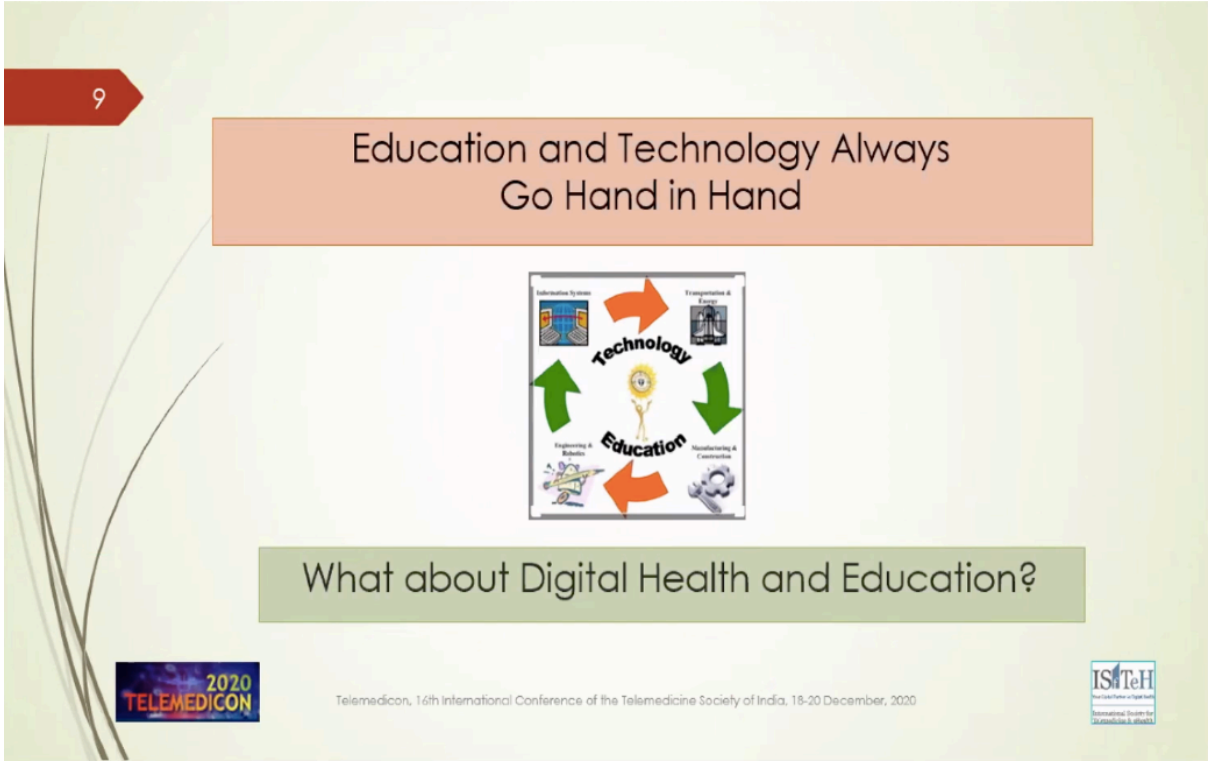


So, for us, how do we define digital health? Yeah, before we were talking about Telemedicine, ehealth, telehealth, telecare and mhealth etc. For I tried to resume digital health is the convergence of digital technologies with which was heavily enhanced the efficiency of healthcare deliveries. Now, the old terminologies do not disappear. On the contrary, they are all now under the umbrella digital health. And as in the past, I know that we will still be discussing the word itself or ever, mind you, it doesn't matter as long as we accept you know, that now as opposed to the face to face health that was part of our life for so many years. We now also the digital part, which is already accepted in other fields like finance and whatever banking now also applies very heavily to health.

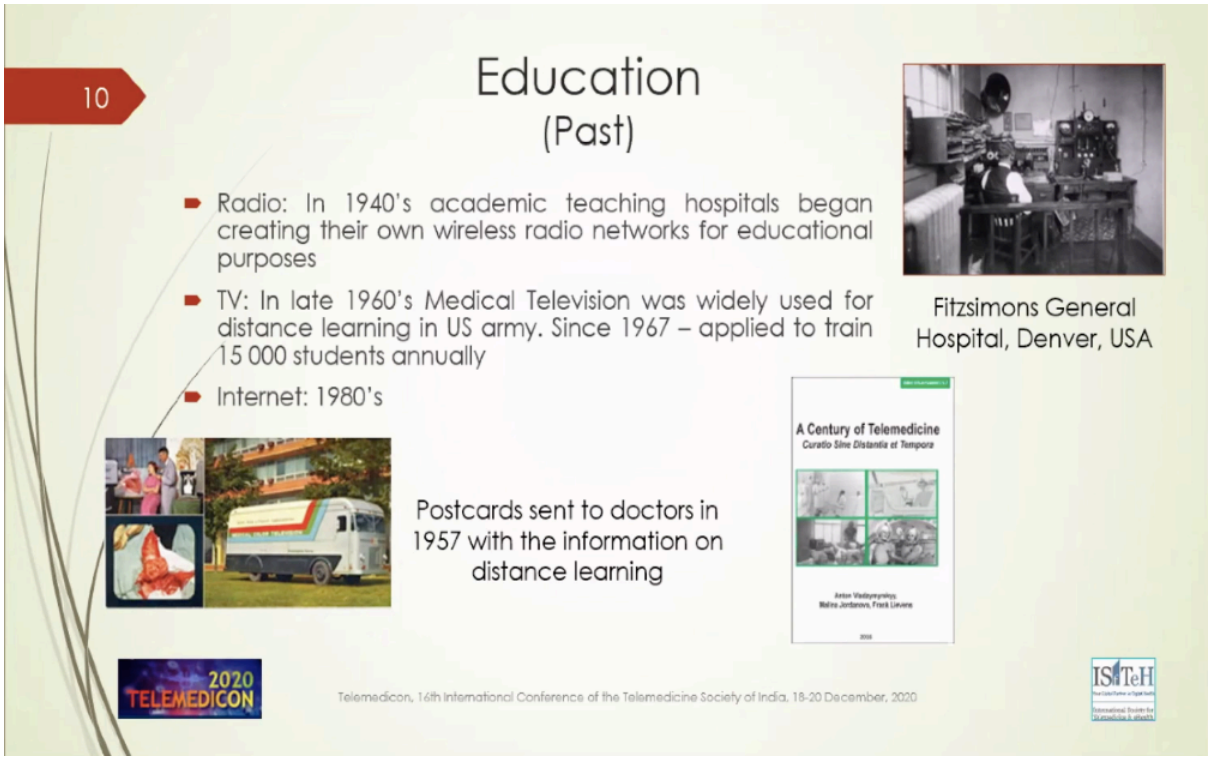
Digital health is everywhere, influencing the entire system, providing health care everywhere and reach everybody that are in need on land at sea and in the air. So that has always been the definition already or the scope of action of Telemedicine, telehealth, ehealth.



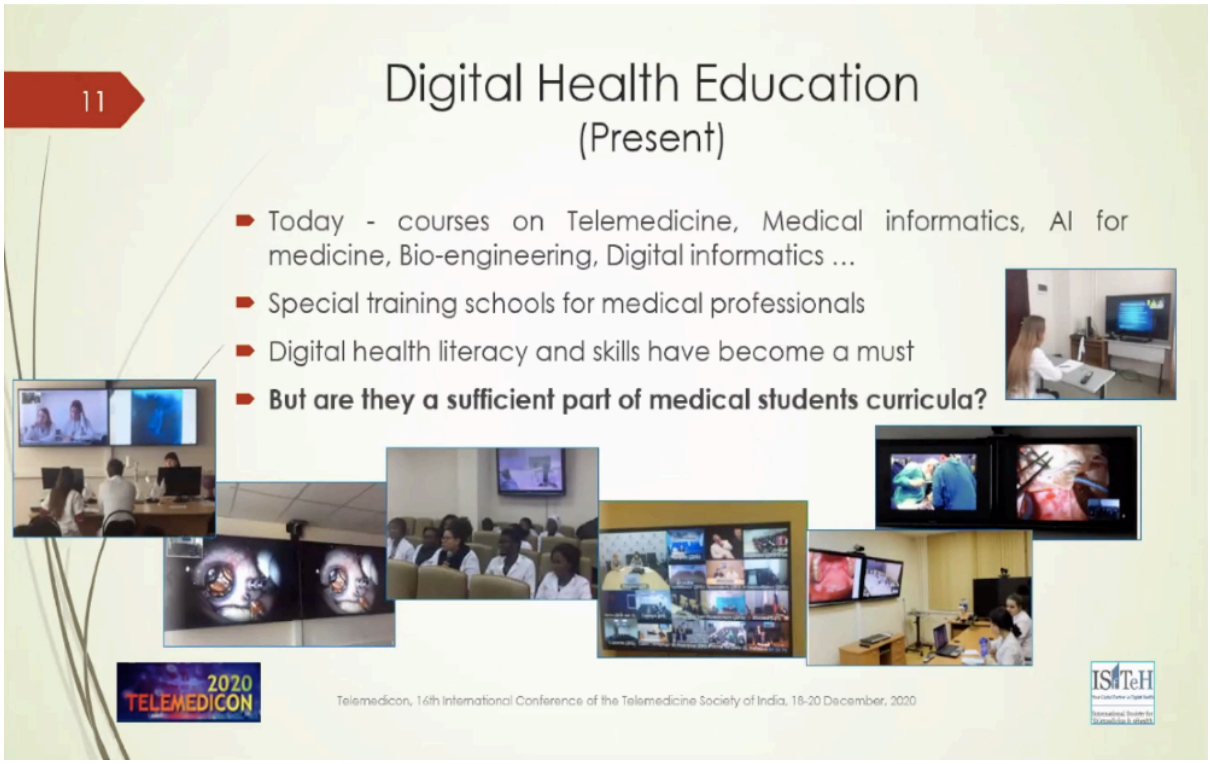
It helps to face the main healthcare issues as well at the level of prevention, the treatment and supporting healthy lifestyle in also education. And it does address topics like the ethics interoperability standards. We all know what is part of that. I don't need to define that further.



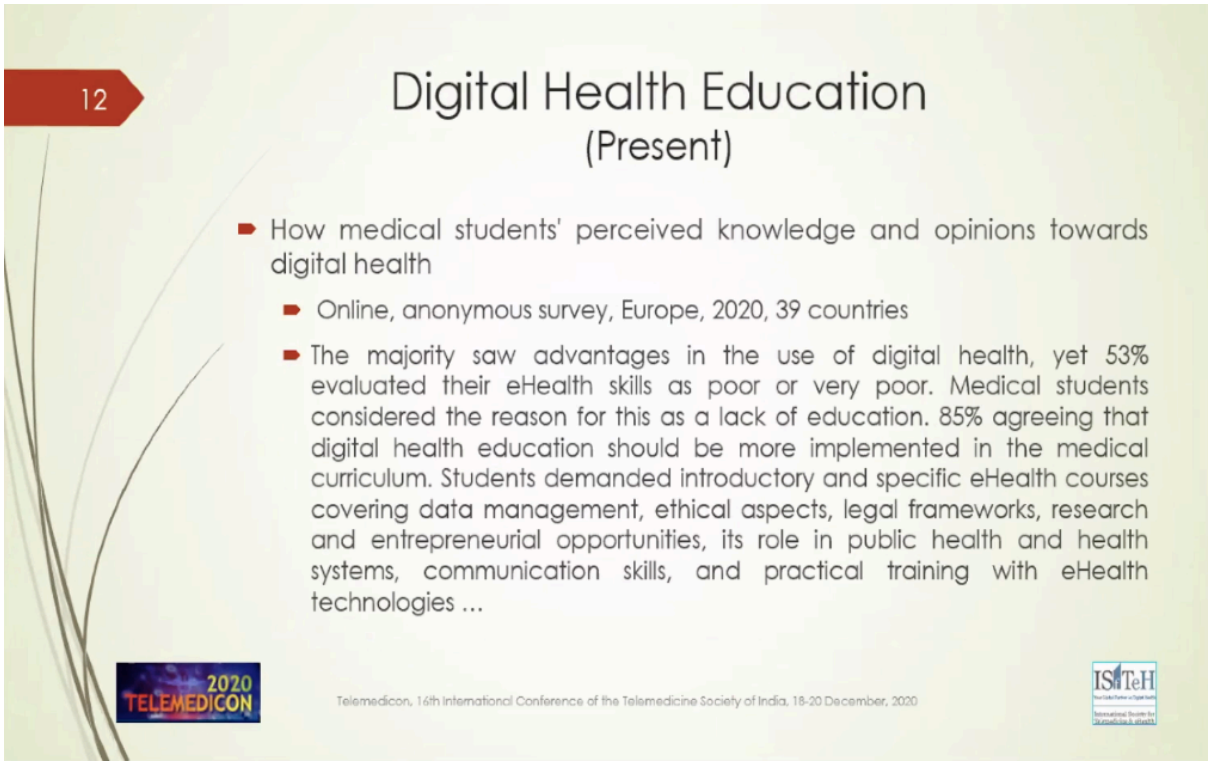
Education and technology always go hand in hand. That is proven. There's no argument about that. But what about digital health and education?



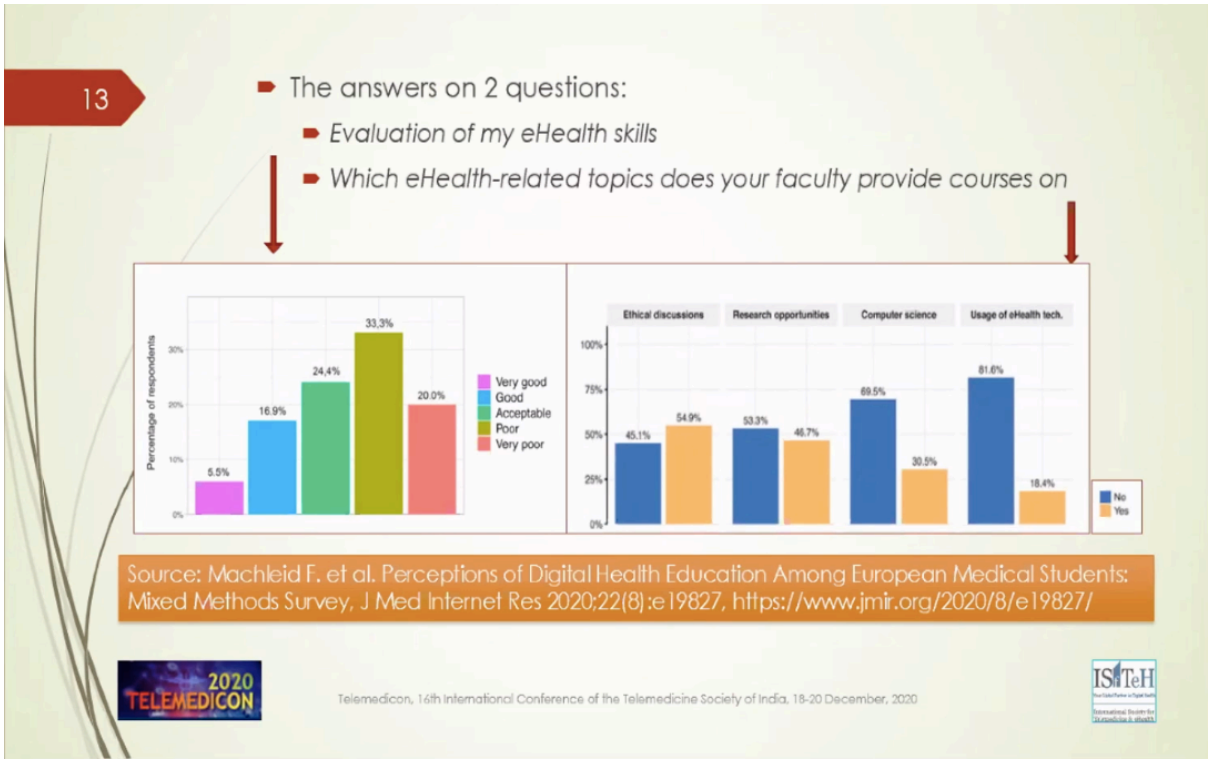
Now in the past, where do we come from? Yeah, back in the 40s. Even via the radio, there was some academic teaching, hospitals that began creating own wireless radio networks for educational purposes. After the radio came the TV, medical television was widely used for distance learning by the US Army. And of the 60s it applied in the plains to train about 15,000 students annually. Then of course, since the 80s, we have the internet. And that opened again so many doors. I just put posted here, the image of a book that we published some years ago on the centre with the history, a century of Telemedicine that is accessible Open Access on the ISfTeh website, under media in history.



Today we're reaching a level on digital health education, with courses on Telemedicine medical informatics, bioengineering, digital informatics, etc. With special training schools for medical professionals. People who are already in the profession after their initial studies, digital health literacy and skills have become a must. I know I'm from the old generation where again, when it's only I think, in the year 2000 or 2001 that I first touched a computer because that was not what I was educated for. But I had to be in business I'm talking, you know, compared to the typewriter that we were using or, or the handwriting. So it was either abandon everything or go on and then adapt to the new technology and God knows since, indeed, the 80s. And when internet came in, you know, how fast everything has evolved with the tools in the enormous capacity of our small laptops and smartphones, etc.

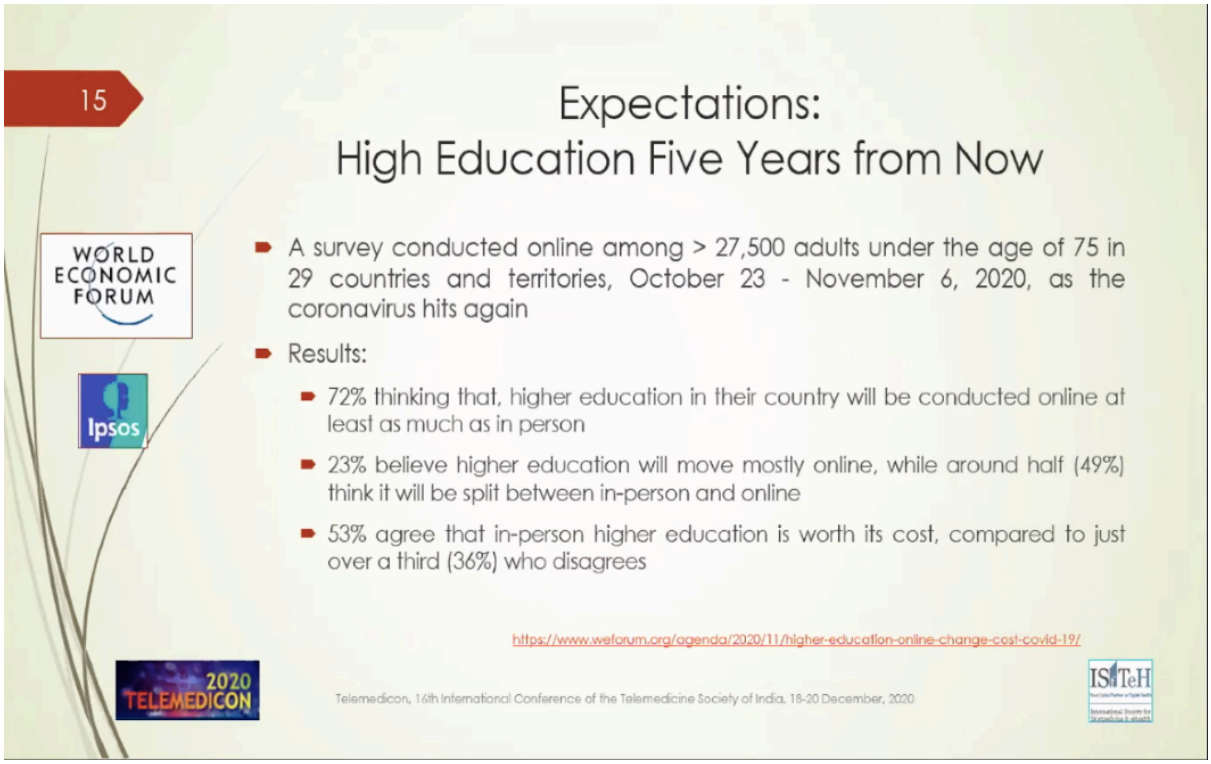


But one question I'd like to put at this stage is, are all these things sufficient part of medical students curriculum? At this time? The answer is NO. And some survey recently made in Europe for around the European students and medical students. The majority saw advantages in the use of digital, but they evaluated their health, eHealth skills as poor or very poor. In the concert, they considered the reason for this as a lack of education and 85% found that digital health education should be more implemented in curriculum 85%. And the students themselves demand that introductory and specific I think that covering data management, the ethical aspects, legal framework, etc, all the aspects in other words, and practical training as well, around the technologies.

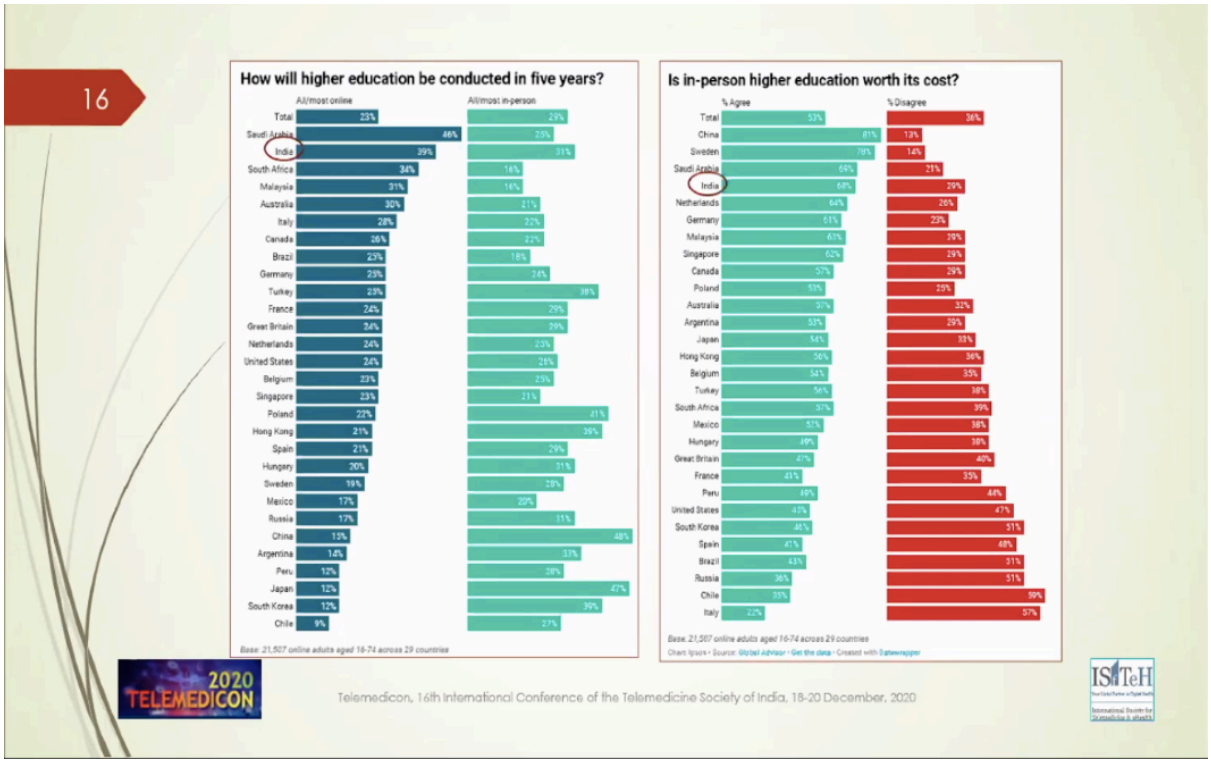


This is the graph showing, you know, the poor and very poor as is the results of the service great answering the questions about the eHealth skills, and which ehealth related topics the faculty provided currently. So there is a an enormous way to go. And that's good news, there is enough to do, we won't be at the end of our road. before soon on the country.

The outside of Europe, there's also service made in other parts of the world. And also a survey interesting that not only among students, but again, among medical students things that indicated a lack of impact of Telemedicine education, and training despite positive attitudes toward so there is a demand for it. That's it, and now it's a matter of organizing properly. The offer and there is also no way back on this we have to accept it. Will it solve everything? Of course no, no way. The we are human. So we need also that personal contact wherever possible whenever, and definitely also in schools. And now with the lockdown in so many countries, including our here in Belgium, I have a grandson that is at medical school, well, he has hardly put a foot in the all out because they're all close. So it's all done by computer. And again, it's better than nothing. Imagine that, because they couldn't go physically to a meeting or to a lesson that they would have no education whatsoever.



So some expectations in the next five years, let's say a survey also resulted in the 72% thinking that higher education in their country will be conducted at least as much digitally as in person. 23% believe will be that it will be mostly online, but yet the health thinking it will be split between in person and online. In 53% agree that in person Higher education is worth the cost and with only 30 seconds and this is an evolution, you know, certainly not in the last year under the reality of COVID-19. A lot of people as well from the teaching side as the learning sight, you know are fine trying to find a proper way let time do its work. We experience we build up experience every day. So it can only get better till it reaches a point that it's fully accepted. And

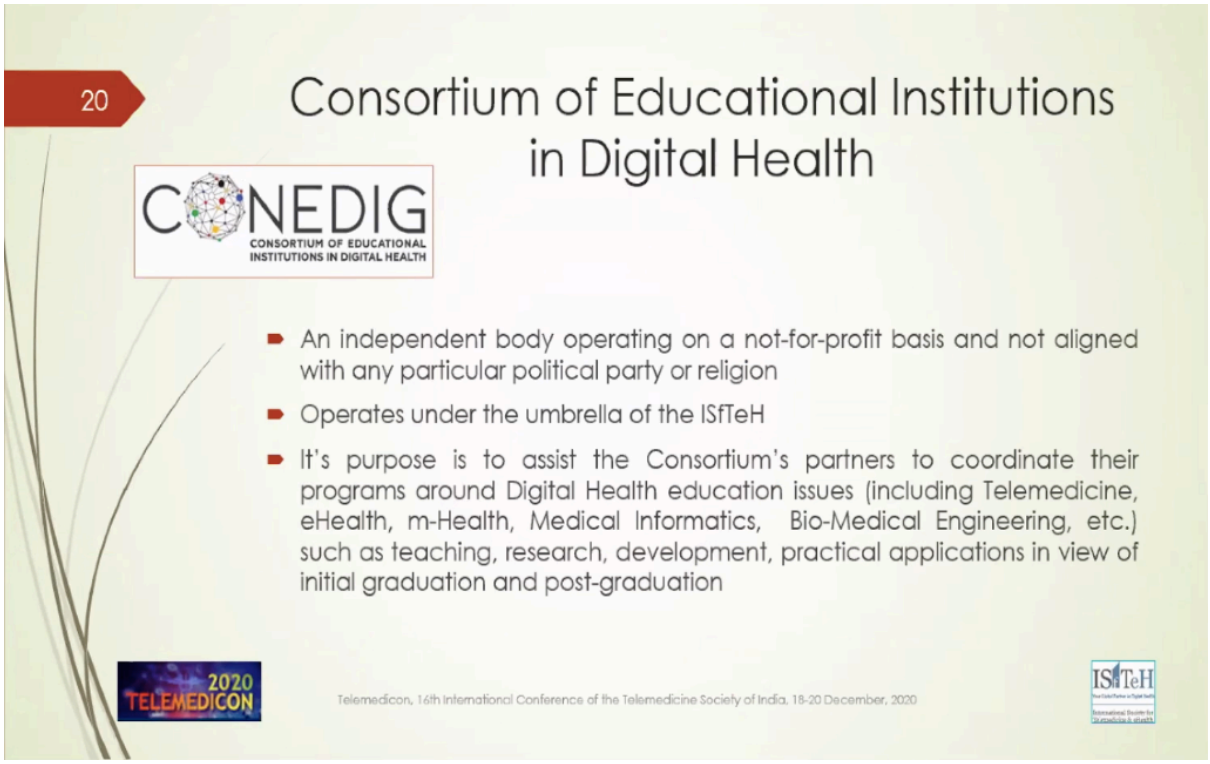


I also took this slide because India is shown to be quite advanced as far as to the question. For example. How will higher education be conducted in five years and 39% of India answers will say that or will be most online also in person higher education is worth the cost. And even there, India is scoring very high and you see almost every country what some are not and they will have to find their own way and again, let time do its work.

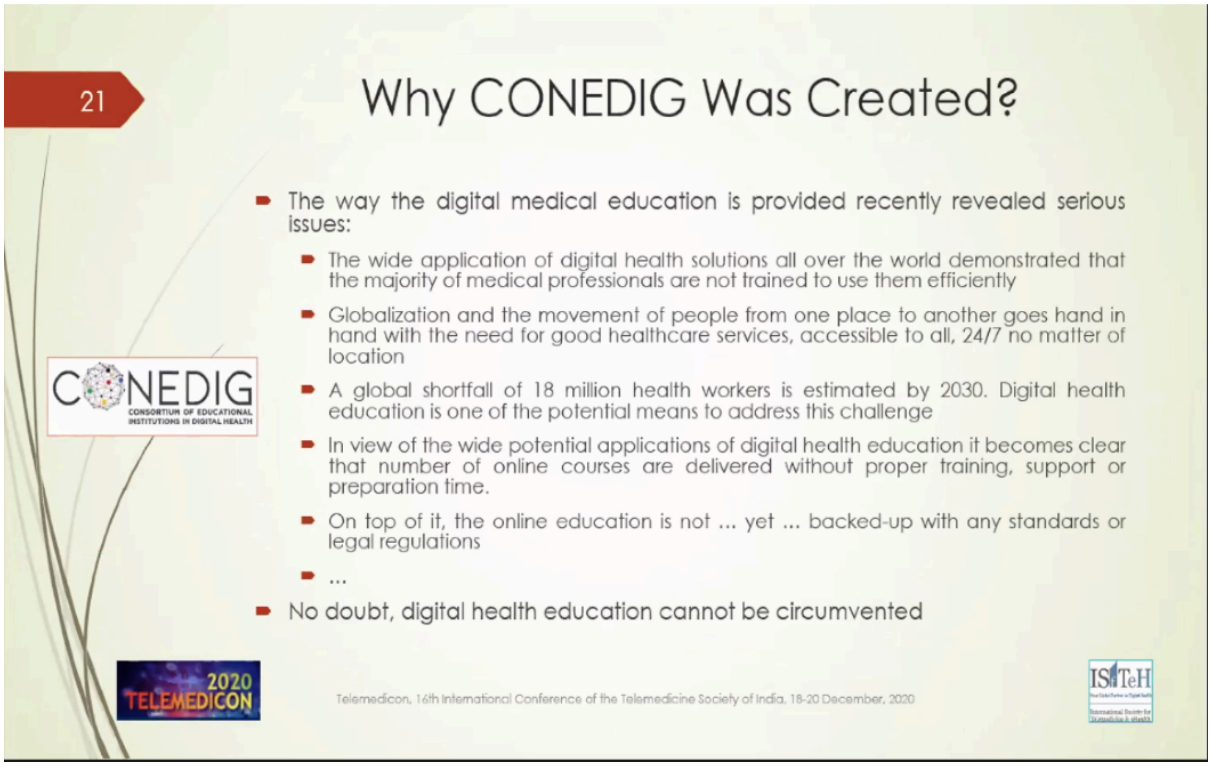
So, consideration philosophy, it depends on our decision today, but there is no future without education and that was said by a very wise men Confucius and who said that if you plan is for one year, just plant rice, if your plan is for 10 years, plant trees, but if your plan is for 100 years, educate the children, which I think requires no further proof.

Nowadays, the Covid 19 pandemic once again to reveal the necessity for international cooperation and collaboration in all areas in education, this is the only way forward in order to make the best of science information technology, and to make it available to all in.

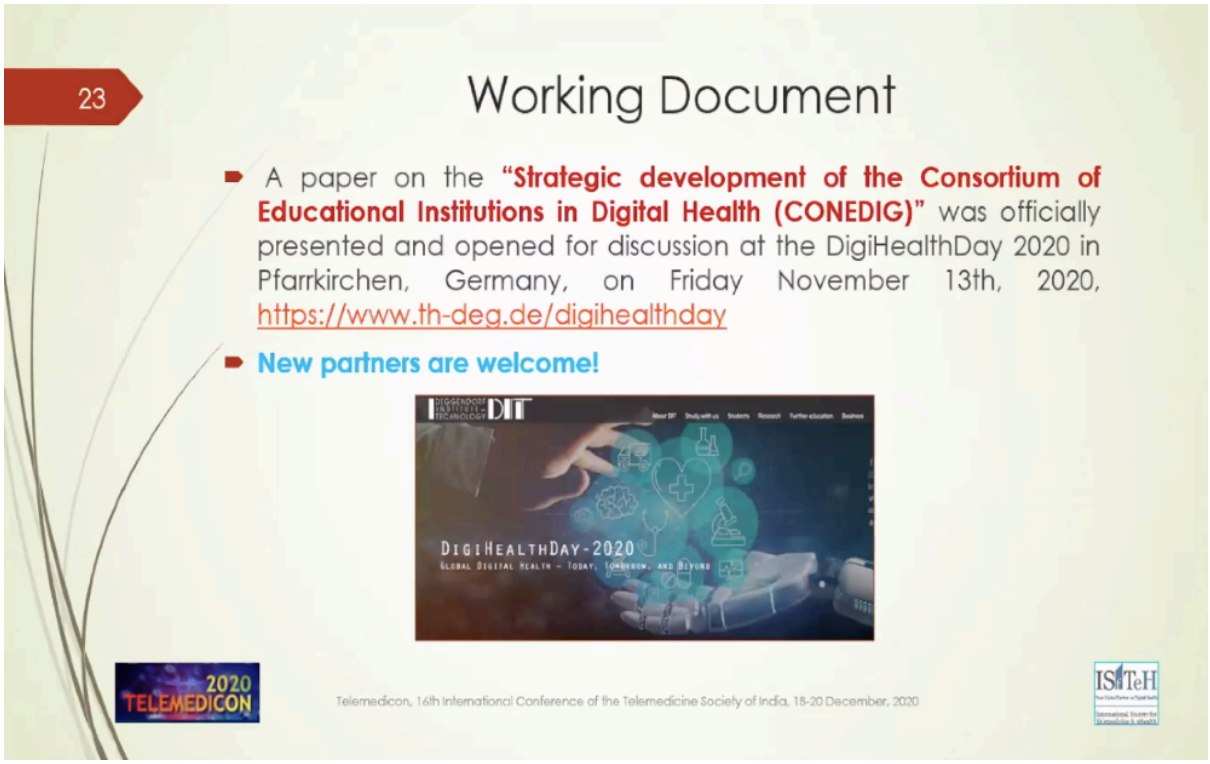
Allow me at this point to introduce it or form a major international forum, which is the International Society for Telemedicine eHealth, which was created back in the end of the 90s and exists to facilitate the international dissemination of knowledge and expertise in Telemedicine and Ehealth and to provide access to recognized experts worldwide. We are a non-governmental and non for profit society. We have created primarily an umbrella for national Telemedicine and eHealth associations, but also in our scale of memberships, we reach out to other associations, institutions, corporations, individuals, nurses, and students. We have currently members from 103 countries.



Now, our recent initiative from the ISfTeH as far as education is concerned, we already have certain amount of educational institutions, universities, high schools, etc, as institutional members, but specifically education in digital health, an independent body under the umbrella of the ISfTeH was created by a few institutions so far to assist the consortium partners in that means that we are open of course to get in some more more partners than possible to cooperate on programs around digital health, education issues. There is a need you see, the danger that we see is, as it this will grow and because it's enormous, there are 1000s of institutions, educational institutions, which will provide in one way or another education around in and around digital health. The risk of course, that if everybody does in its own way, it will create a sort of jungle and that of course needs to be avoided. Now, we also recognize the difference you know, between continents between countries, and there is a sort of individuality in each of them, but there is a common base as well. And that is what the consortium that we abbreviated in the word kinetic, it will try to achieve.

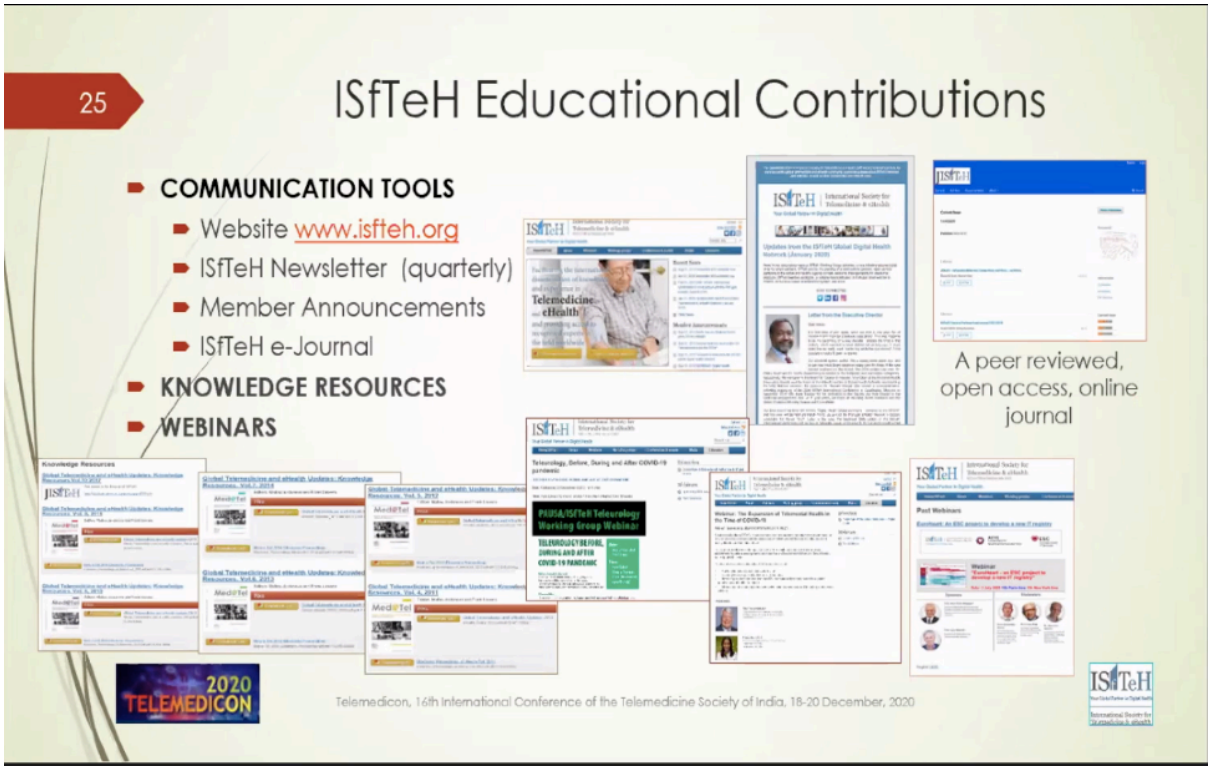


It has just been created recently and maybe the initial plan was somewhat delayed because of the corona situation. So wide application of digital Health Solutions all over the world deserve the majority of medical professional, we see that they are not trained to use them efficiently. Also, the globalization and the movement of people from one place to another requires you know, good healthcare services accessible for 24/7 and everywhere in there is a shortfall of 18 million health workers and in view of potential, so many applications of around linked with digital health. It will need proper courses and curriculum adapted curriculum. On top of that, the online education is not yet backed up with any legal regulation. So, there is a lot of work. But initial conclusion is the digital health education cannot be circumvented. So, the Conedig will aim to develop an ala carte training courses in digital health evaluation categorization frameworks for digital health programs to advocate for the development of guidelines recommendations of good international practice in digital health, and for the advancement of global digital Ehealth education in developed and developing countries, and as a consortium of education, digital health, Conedig serve as a global platform for advancing digital health Telemedicine education.



So refer the working document has been officially launched at the meeting that took place last month in Germany at the Deggendorf University. That event was a one day also virtual event called DigiHealth Day. And if you go to that link, and on their website, you will find also a copy of that paper. You will find it also by the way, on the ISfTeH website under education.

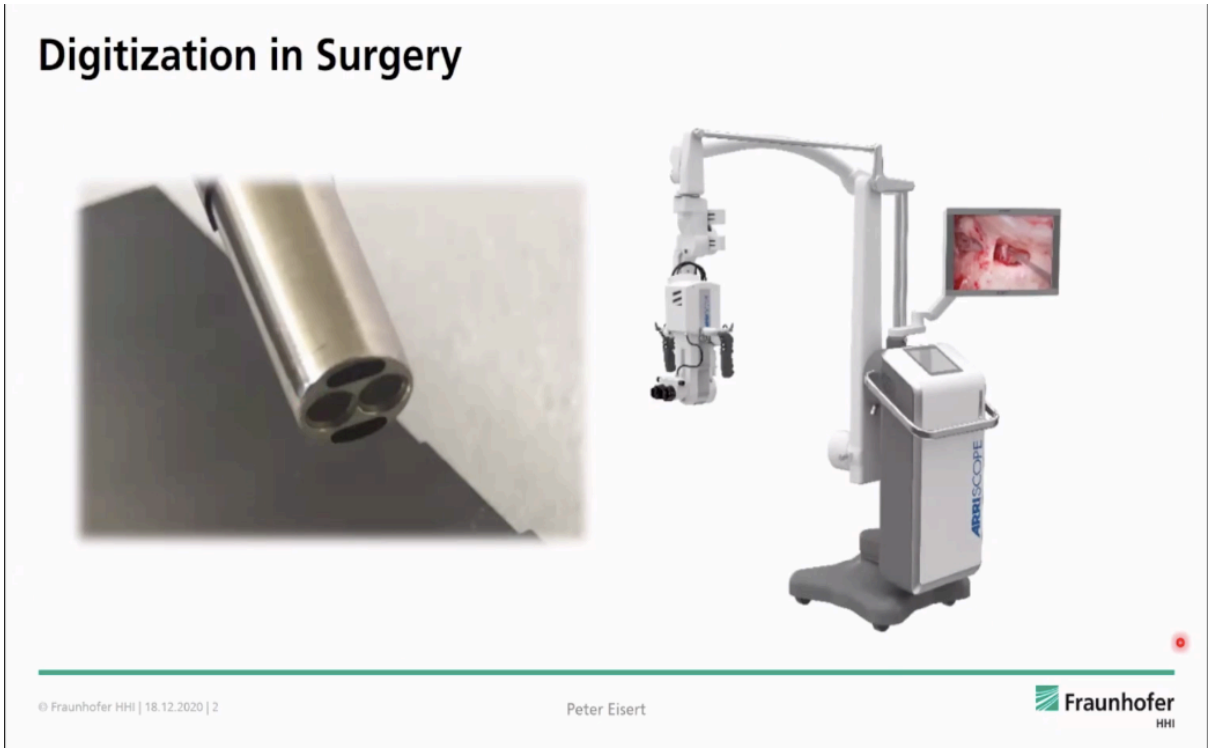
Then this is the list of founding partners one from them. The so the founding partners are in Brazil, in France, in Germany, in Russia, in South Africa. And this is only a start, we are going up to all possible institutions around the world. And we're open to it further.



Just last few slides just to direct you to the other educational contributions of the ISfTeH issue or website or newsletters, etc, You'll find it all to the website and then the list also of the specific working groups that are part of the structure of the ISfTeH and then again, direct to the history books that are published. Good Practice and national health strategies. Yeah, this is it. And thank you very much for listening.

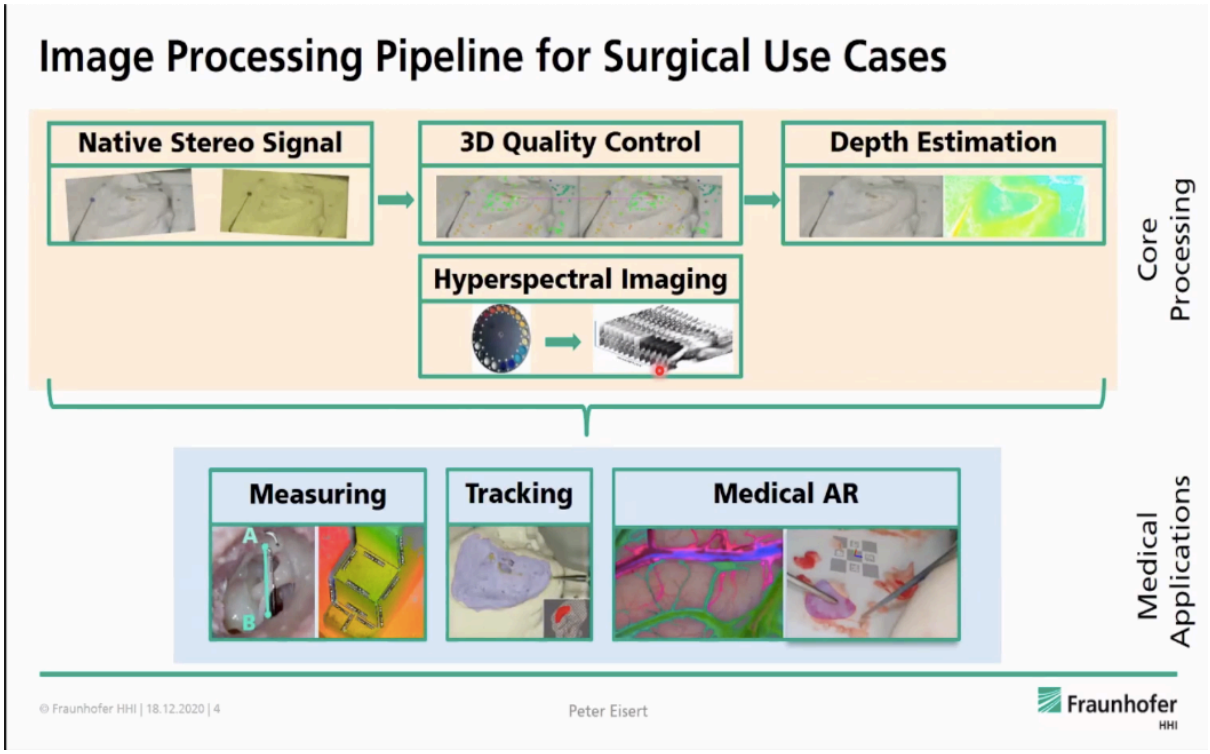
Day 1	Topic	Speaker
• 18th December 2020 (Friday)	• Telepresence for Surgical Assistance and Training using Augmented Reality, Augmented Reality (AR)	• Prof. Dr.-Ing. Thomas Wiegand (Germany),

I'm very honoured to be here and to speak a bit about our opinions and views on Telemedicine. Yeah, I will also give a slightly different talk. So I will focus on technical view on different aspects. I have a background also in engineering and computer science. So I'm not a medical doctor either. But we are working together with medical doctors in order to get new technologies into medicine. We are working in a research institute mainly on communication aspects video communication, video analysis and also AI especially on explainable AI which is very important in the medical field. And in this talk, I will give you some examples how we can use imaging and communication technology in order to help surgeons in their daily work and how this can be used for telepresence in education and training.

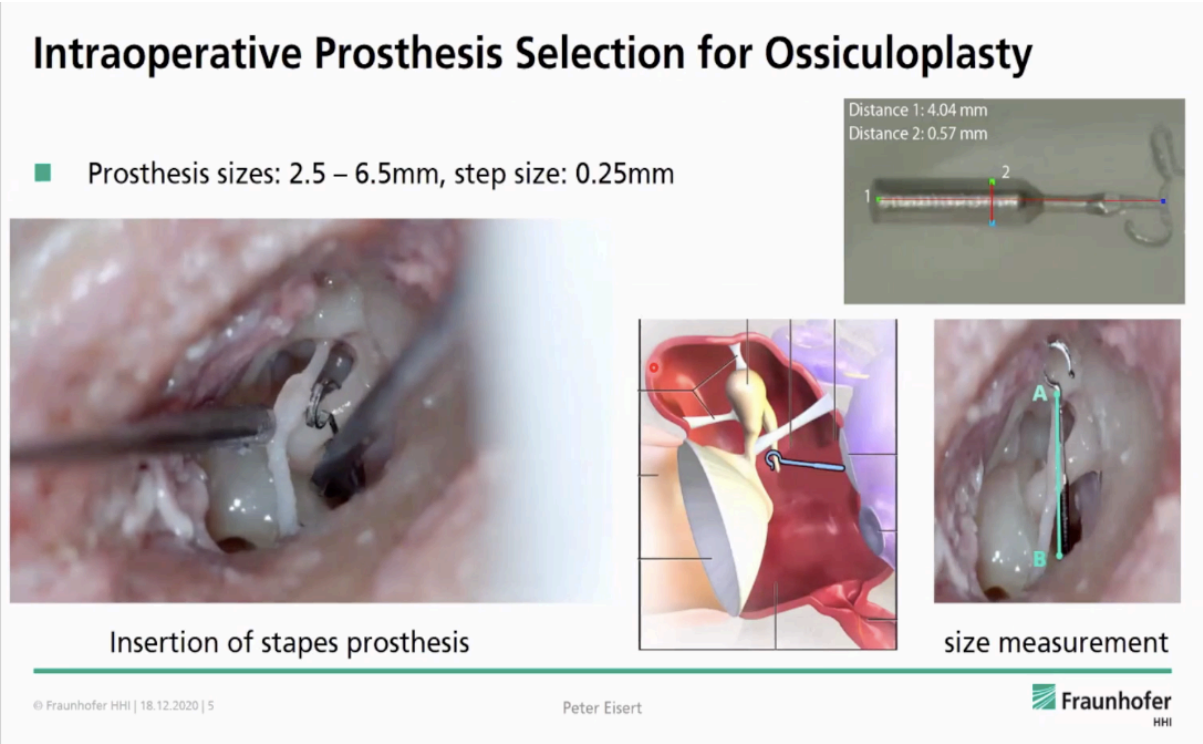


So, we are in working or in this talk, I will focus on optical instruments and on surgeries that are performed using such devices and here we have a lot of benefits because of the digitization in surgery for the endoscopes. This is true for a long time. So we have cameras in the tip and then we convert the results on monitors, but this is also true. Now, for digital microscopes, which are now coming up and we are also working together with companies that build such devices.

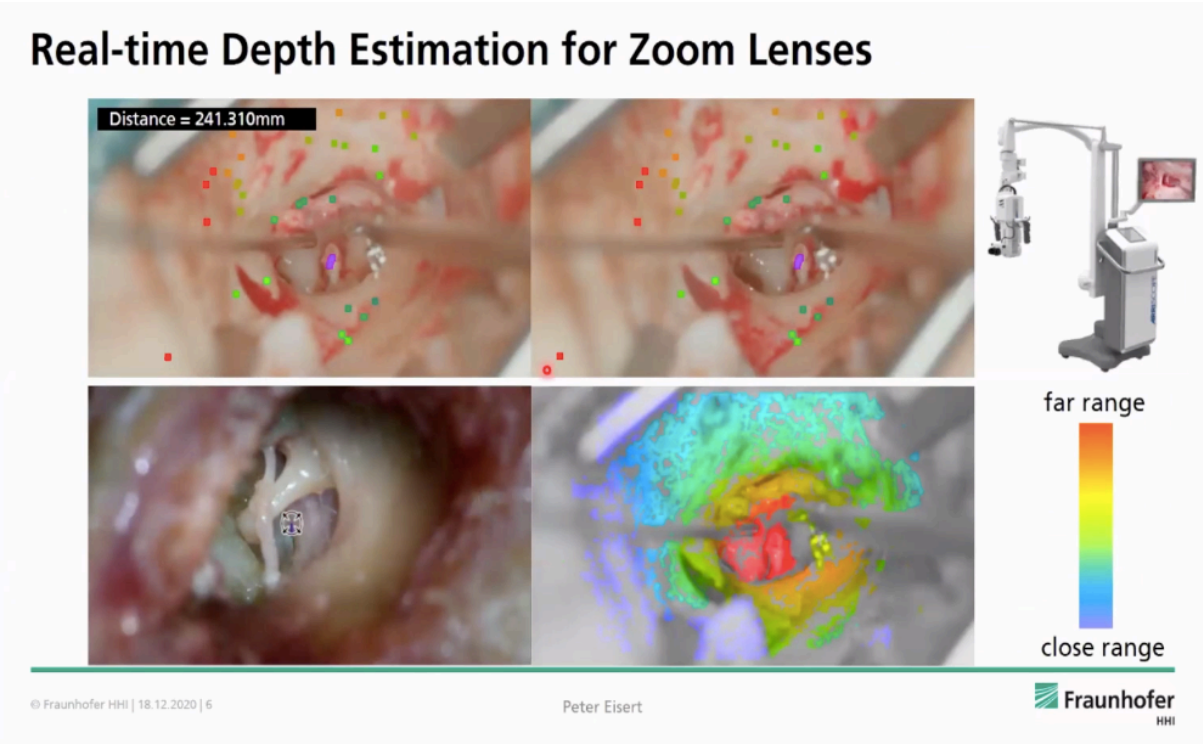
And once you have such a digital instrument, you can apply different kind of additional features for Telemedicine and for training for education and so on. So, what is different here, so, the optical part of the microscope is removed, and again you have cameras watching into the interior of the patient and you have a digital display at the binocular and for this digital transmission, you are now able to do a lot of modifications to the content to do augmented reality assistance by providing additional information to the surgeon and also to stream the content that is captured to some remote audience.



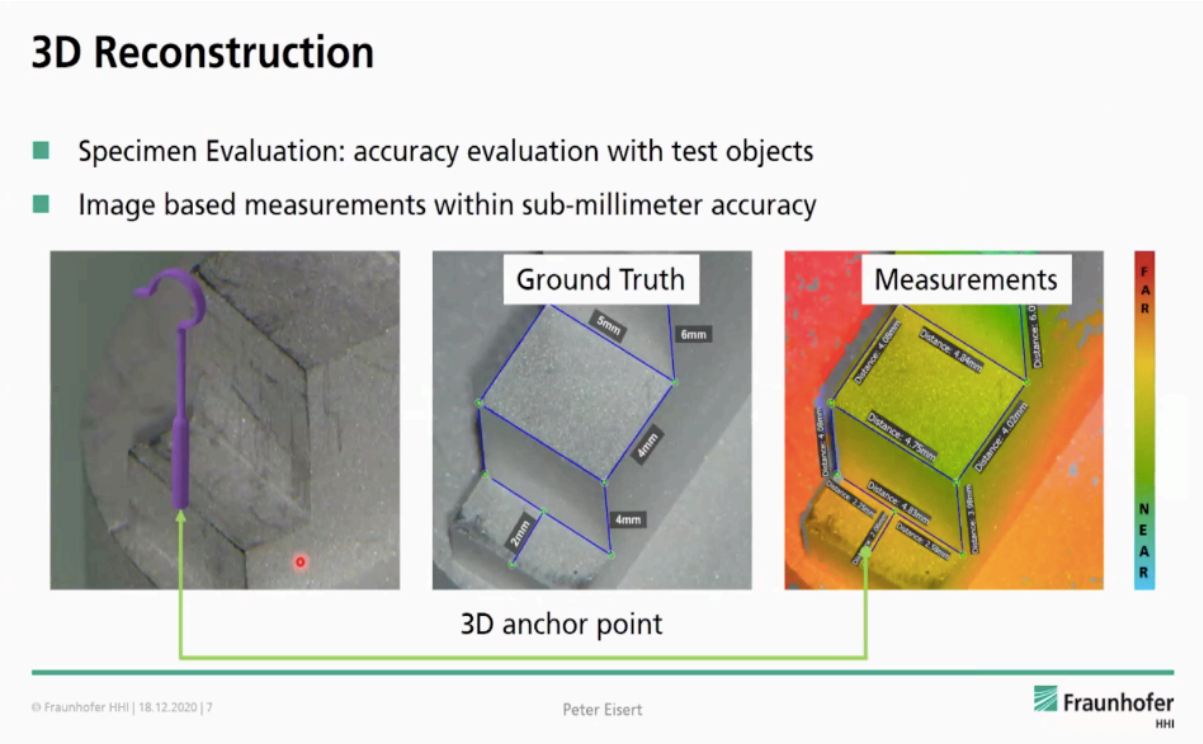
If you capture now, these what you usually see in an optical instrument as a digital image, you can apply many things you cannot do with analogue instruments, first of all, you can correct everything, creating a view that is less tiresome to the surgeon, but you can also enhance the image quality, you can do measurements you can do visualization of things that you cannot see in an analogue instrument, you can track instruments and much more and I will give you a few examples where you can exploit such techniques.



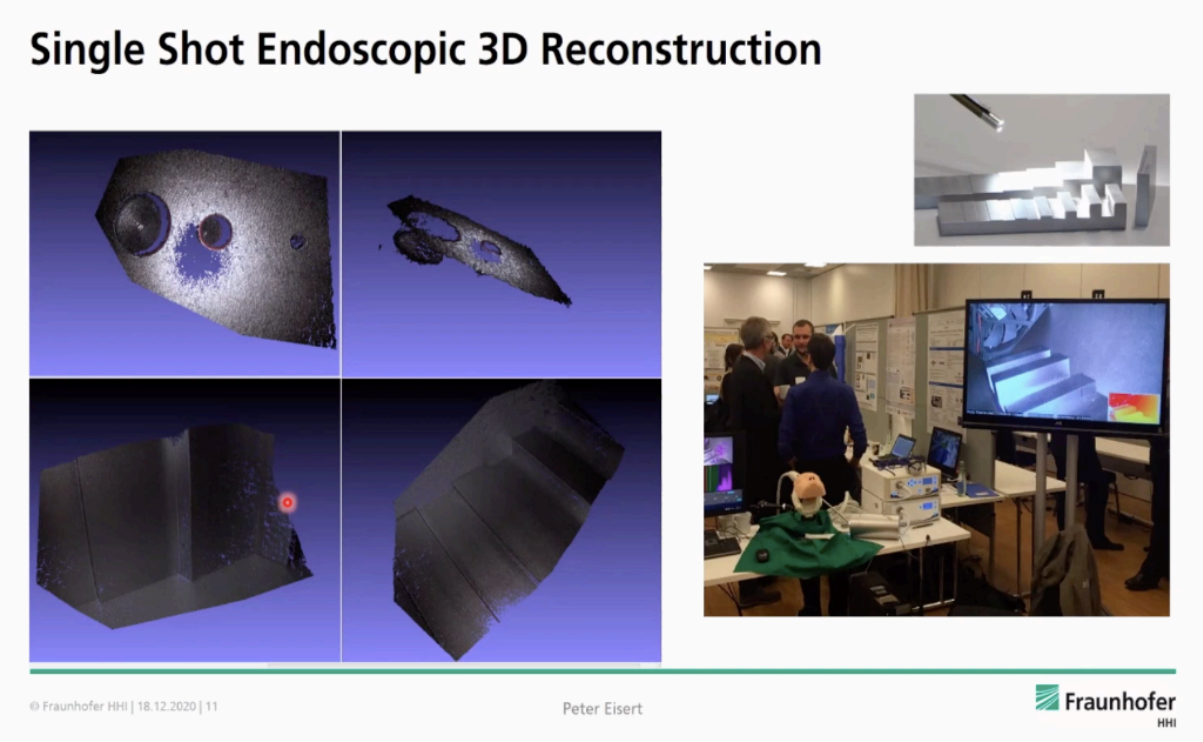
So, the first example is the surgery. So, here we are inside the ear, it's a insertion of staplers processes. So, the surgeon has here the task of finding a correct implant that he can insert into the year. So, the problem is getting the right size of the implant and there are different sizes available and it usually requires a lot of experience for surgeon to find the right size and also a lot of trial and error and with using digital techniques you can overcome at least to some extent, these trial and error operations by measuring 3D distances and this is possible since the optical microscope has to basically two eyes as the human and you can measure 3D distances similar as the human can detect different distances of objects.



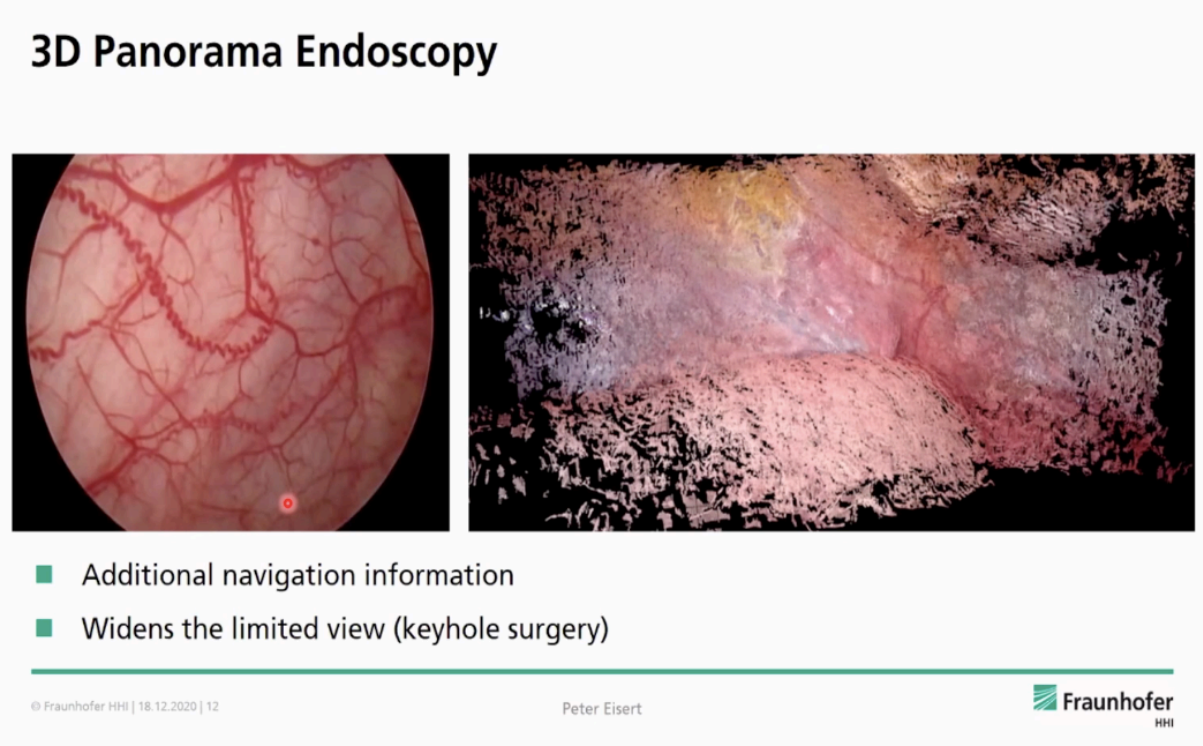
So, we have been developing together with this microscope company methods for analyzing the stereoscopic views computing distance information in the field of view, and then the surgeon has the ability to measure distances with a joystick within the field, he's actually looking at the patient. So, this is an AR visualization on top of what he actually sees. And he can directly measure the 3D distances and determine the correct size of the implant.



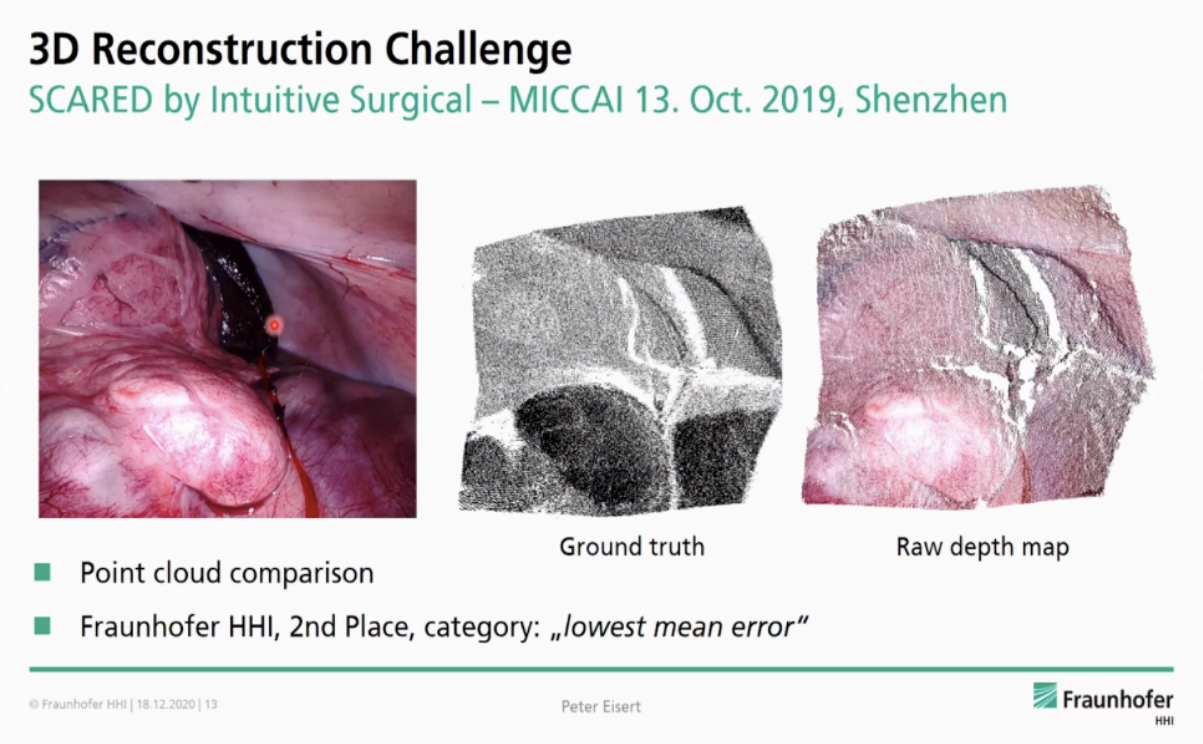
We have also evaluated how accurately this can be done. And even though this is just purely image based measurements, by testing that with well-defined test objects, you can find out that accuracy within such a measuring lies within sub millimetre accuracy, and this is much more precise than the human eyes can actually detect such distances. Another example also the determination of the size of an implant here we are still in the air. So this is an ear drum that is has to be cut out by the surgeon and inserted into the ear. So the problem that is realized in this task is to determine the right size of the eardrum. So the surgeon looks at the microscope and then cuts the new his drum from some tissue from the patient, and the problem is getting the right size. But if you're in the digital domain, you can then also track the instruments in the field of view of the surgeon here in the example. This was done without any additional tracking devices just under the ocular of the microscope, we can track the tip of this instrument in 3d and then determine the right size. of the eardrum. And that can be, of course, then projected on the sides to help the right cutting or even in the future system done being automatically cut out of the tissue. And of course, there's also crucial that you get the right size. But we have performed also comparisons of the size with CT scans and found out that the size of the drums were correctly tracked in 3D and they matched the patient's individual anatomy.



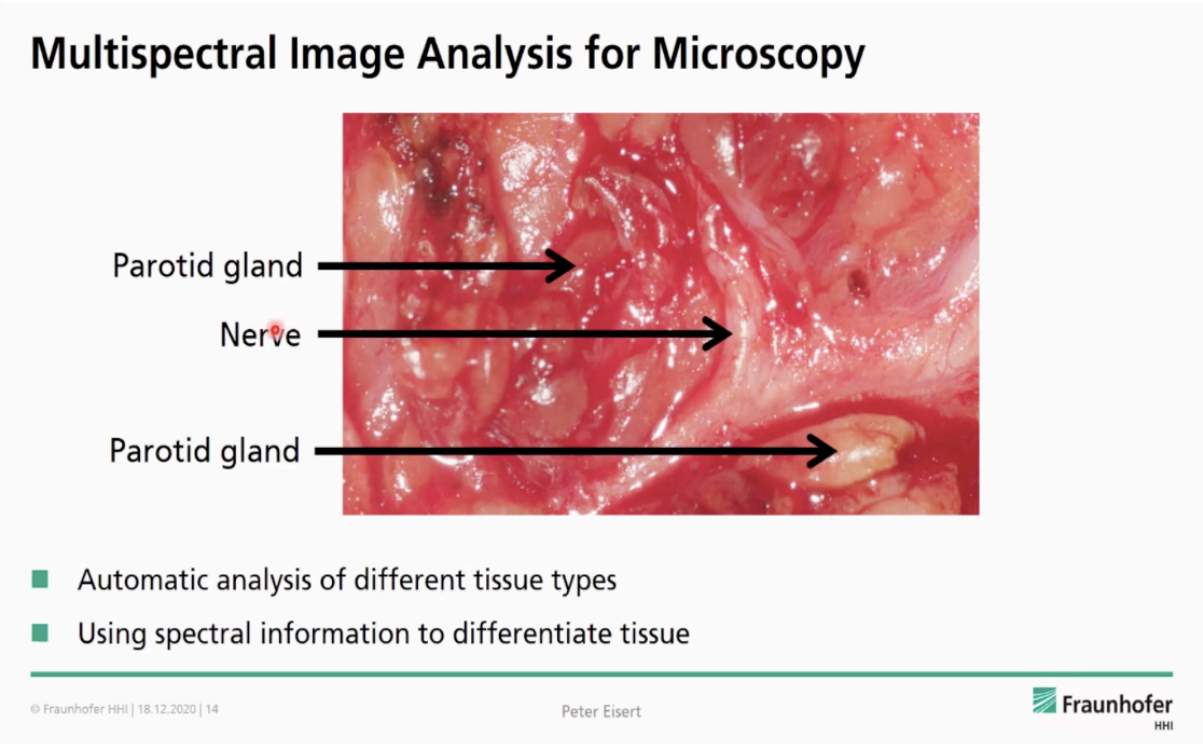
Similar things just to give you a few more examples can be done not only for medical microscopes, but also from for endoscopes and laparoscopes. Here we work with stereoscopic versions of endoscopes and you can also create three dimensional models of what you are seeing. This is a bit more challenging, since the baseline the distance between the cameras is much smaller if you have a five millimetre or even smaller and the scope than the cameras are very close by. But still, you're able to reconstruct the full geometry, you can do measurements within the field of the search. But you can also do other things that help the surgeon in order to navigate through the field.



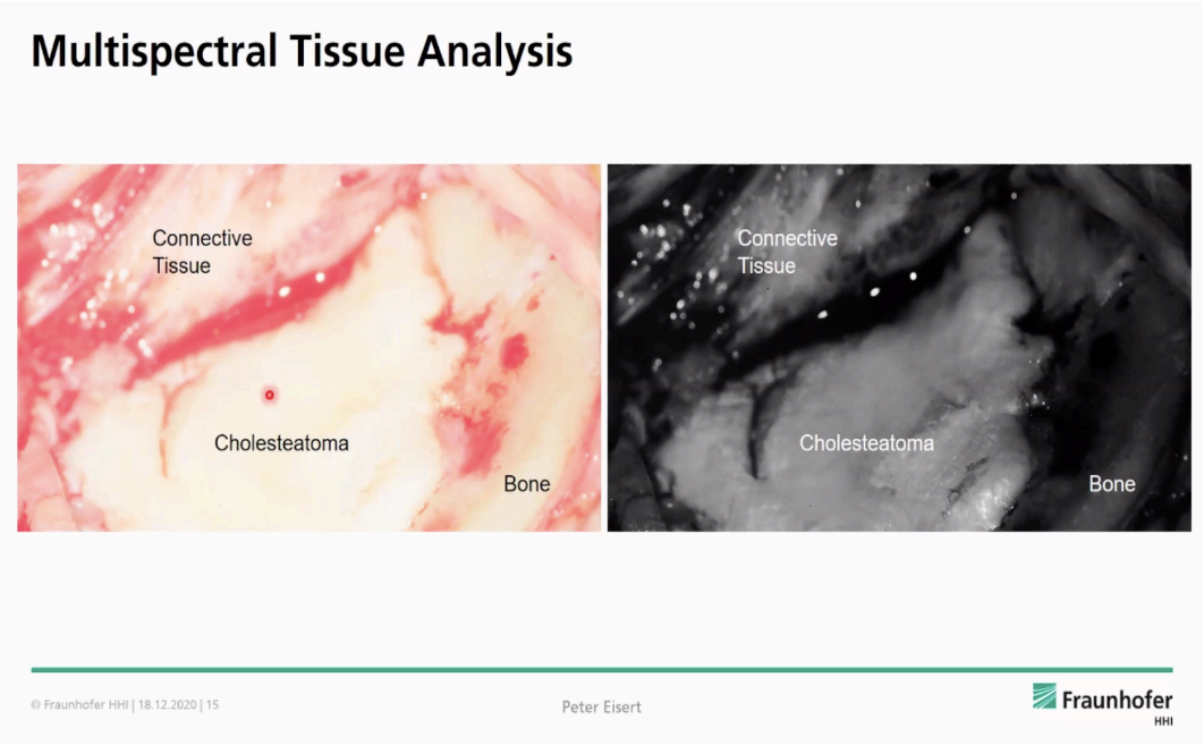
One example is the creation of 3D panoramic views of the entire area. And to help them the search localize where he is actually in the field because this endoscope usually has a very limited view field. And this is one way in order to help them navigate within the system.



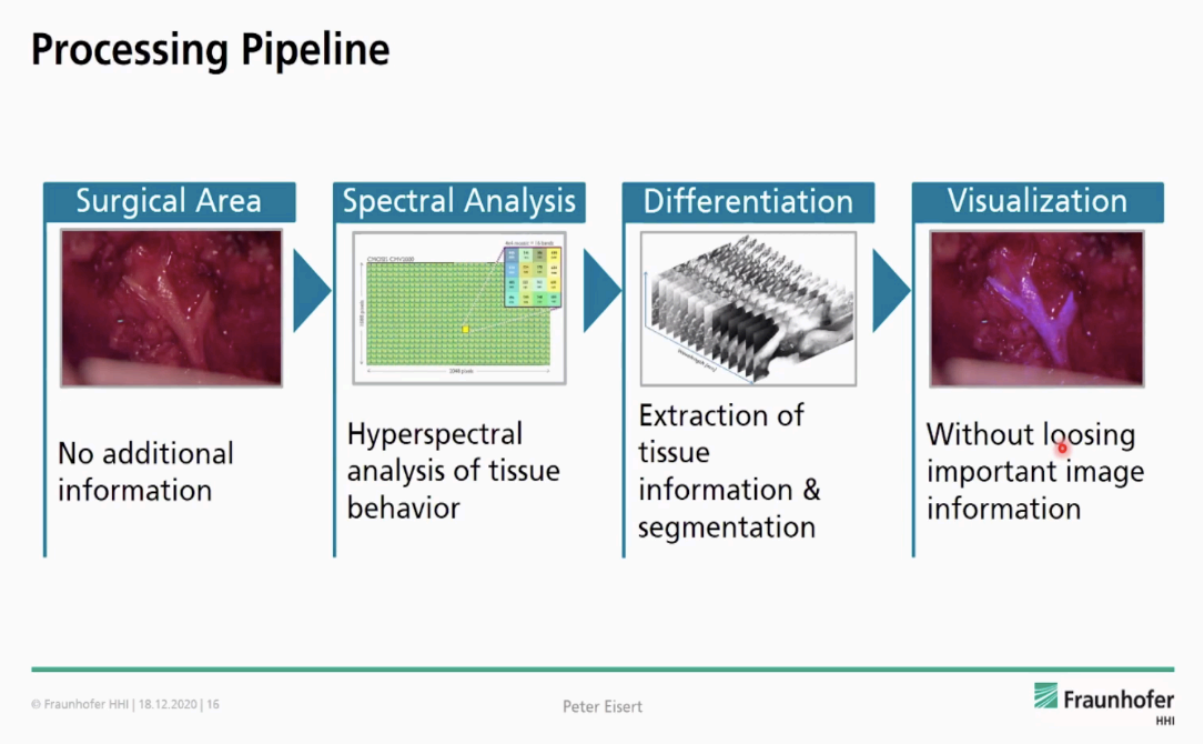
We have also check the accuracy there on participated last in last year's International challenge for endoscopic measurements, there was SCARED challenge in Shenzhen. And here, these methods have won second prize in terms of accuracy. So you can see that even though the cameras are close by then you can get very high resolution measurements.



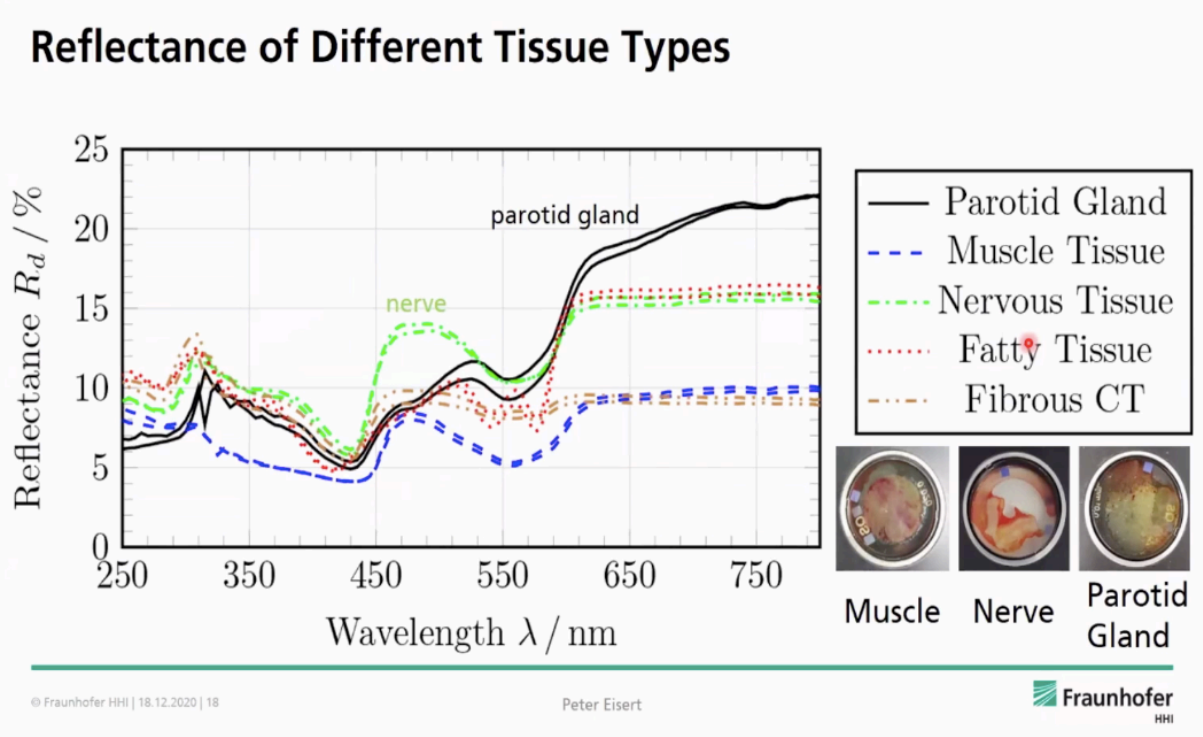
Measurement is one aspect that can be provided to search and in order to help him in the daily work. But you can also visualize things that are difficult to see Otherwise, this is a view. Here you can see the parotid gland, it's a humorous version that you have to remove. But then there's the facial nerve that you have to, to keep and not to injure. And here we use multispectral imaging in order to see things that the surgeon cannot see with the human eye.



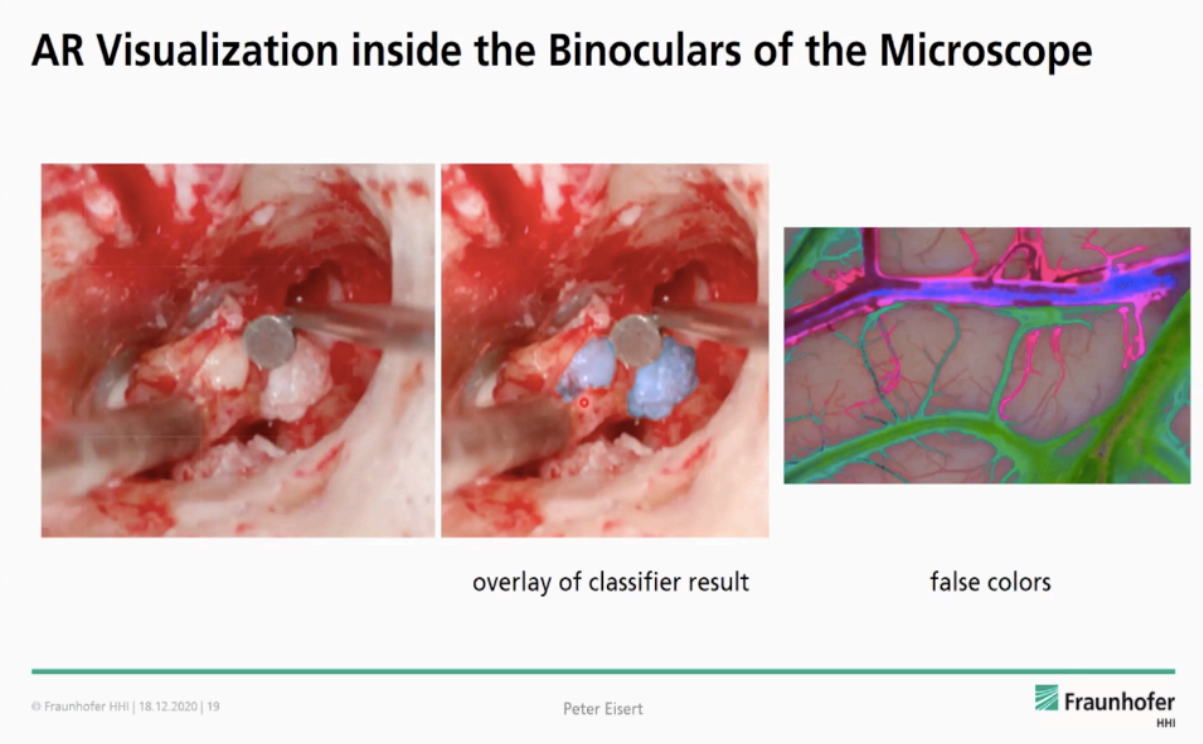
And similar thing here for another surgery here, this is the removal of cholesteatoma was. And this is cell growth in the skull that need to be removed, but it looks very similar to the underlying bone structures the skull, and the problem is that you have to remove every single cell of this cholesteatoma. Otherwise it will grow again and then at some point, kill the patient. So you have to remove all these, this white stuff and keep the bone it's difficult to distinguish. But just by looking at different wavelengths here, for instance, at 400 nanometres, you can see clear differences and you can separate that.



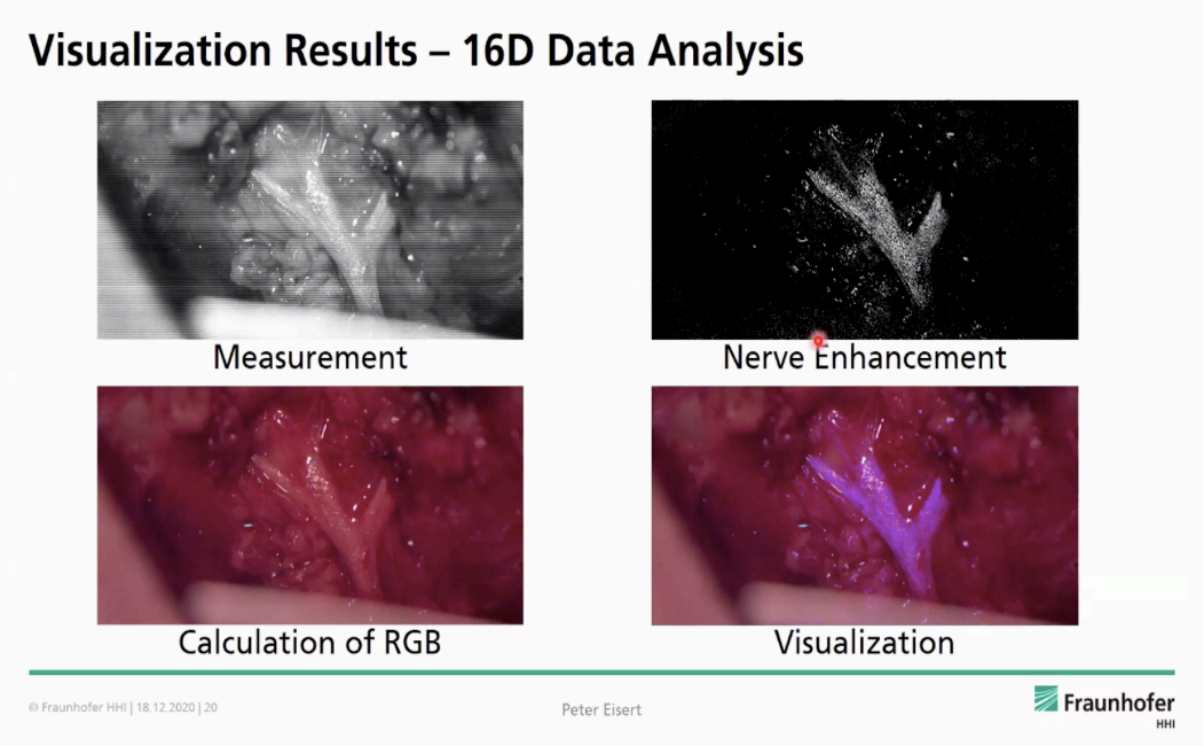
That's the goal also behind this technique. So you replace the usual sensor in the tip of the microscope, but by a multi sculptural sensor that can see more than the human eye can see, you can compute the visual image for the search and in the same way and visualize that, but you have additional information that you can exploit to differentiate between the different tissue types and to visualize that in an augmented reality overlay to help and to guide the search.



For that we have worked on analyzing different tissue types and you can see that a particular wavelength they have they distinguish or it has differences between each other and those you can use for visualization effects.

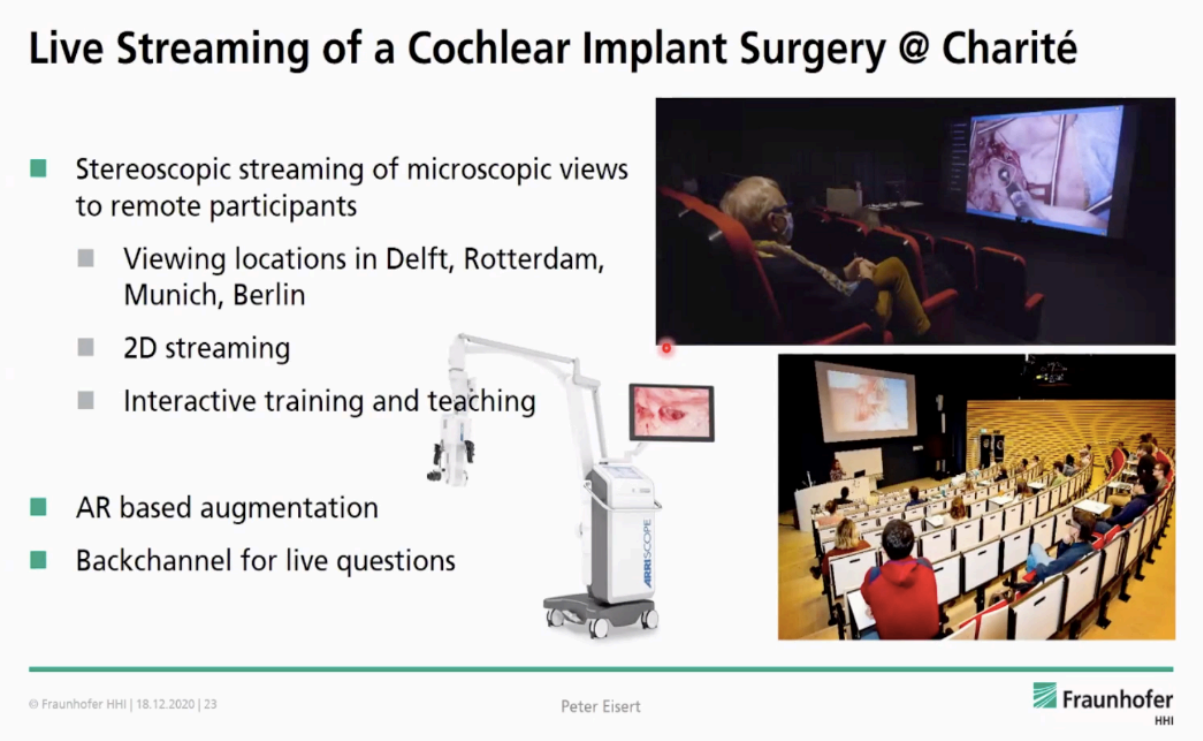


So either you run some kind of classifiers on top of that to segment the images or you do for instance just a false color visualization in order not to take decisions On, on the tissue type, and this can lead to enhanced visualizations which are shown here.

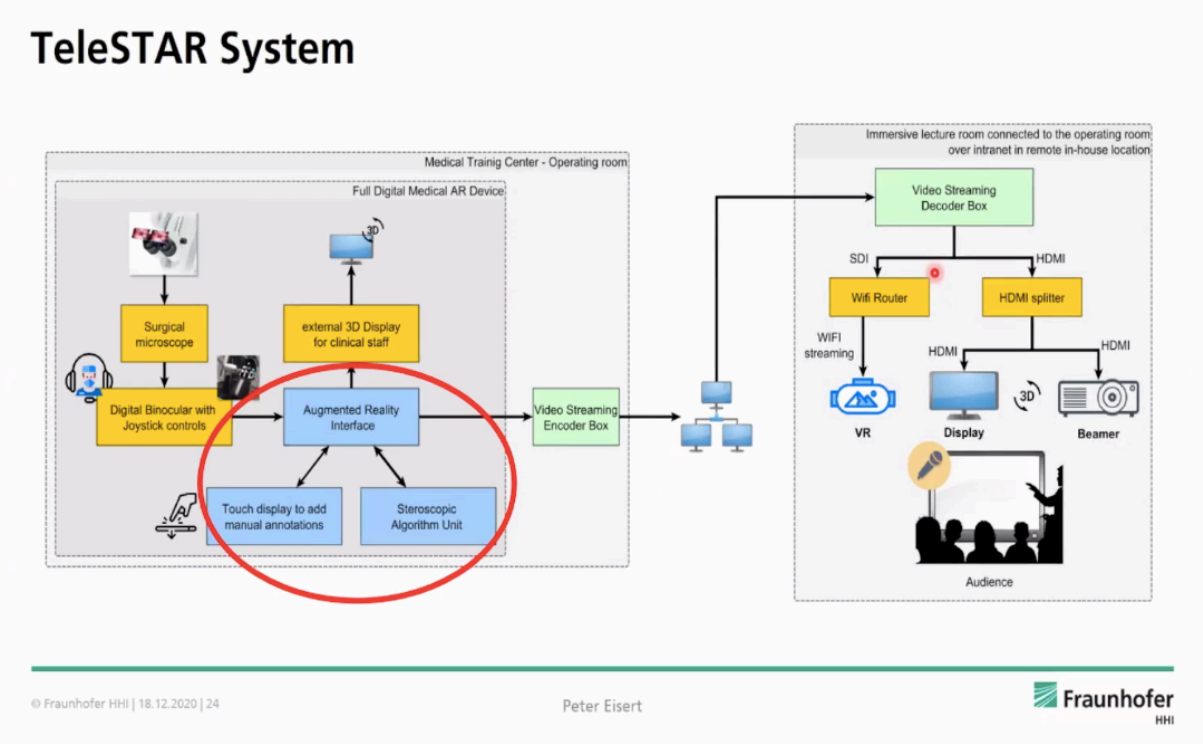


In this example, here we have, we see the same facial nerve that we have seen before, we capture that in 16 different bands, we compute RGB, this is the typical image the search and sees. And then we can use AI methods in order to use the additional information to visualize the, the structures, the medical structures on top of the view inside the microscope. Here, just as a temporal switch, you can see that the overlay then clearly highlight the facial nerve.

So these are different tools that can be used once you're in the digital domain. But you can also use now other techniques for distribution of the material. And that's something that we use in the TeleStar store project. This is a project where we work on using streaming methods for training and education by streaming the contact directly from the operating room to remote participants.

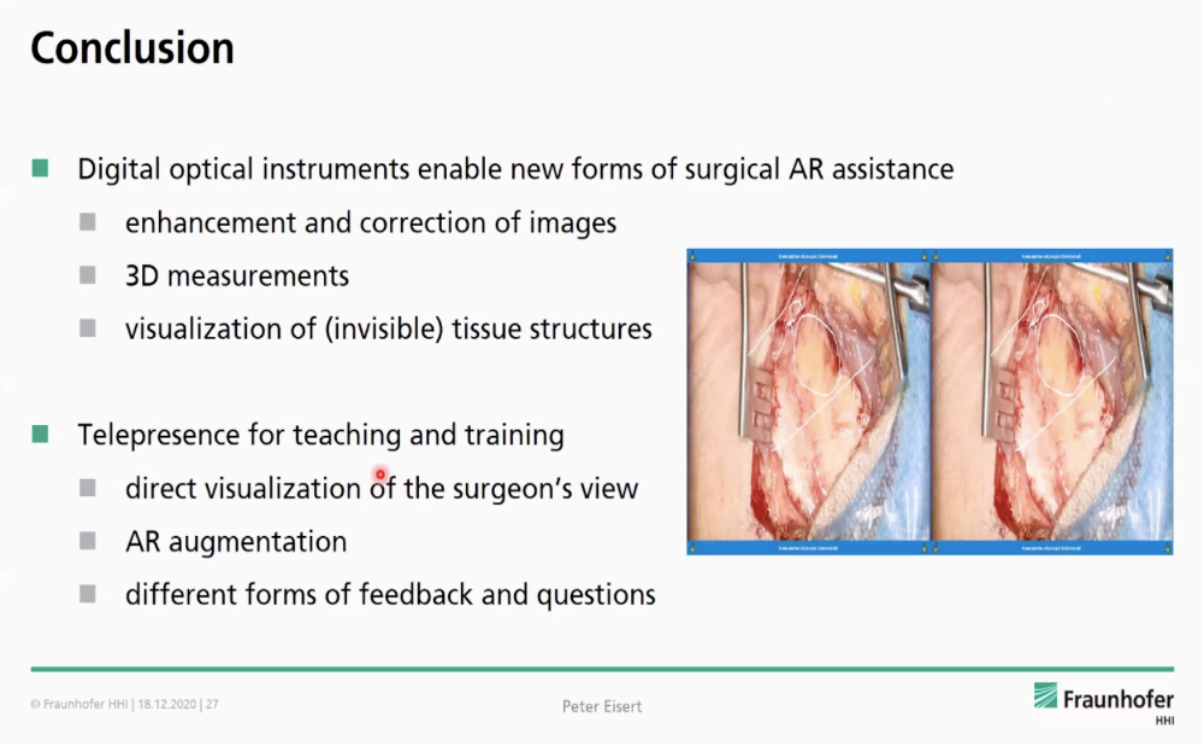


Here we have also conducted last month, a live streaming event from surgery, it was a Cochlear implant surgery, which was conducted at the University Hospital Charity in Berlin, Germany. And here we have used such digital instruments in order to capture directly the surgeons view and to stream that to a remote audience. And here we had viewing locations in different spots in Europe. So we had them in Delft, and Rotterdam in the Netherlands, in Munich, Berlin, in Germany, and the difference here that we was that we directly streamed the view of the search in 3D to the remote audience. So we had 2D fallback, there was additional documentation and AR overlay in order to help the training effect. And it was also possible for the audience to post questions in the feedback channel.



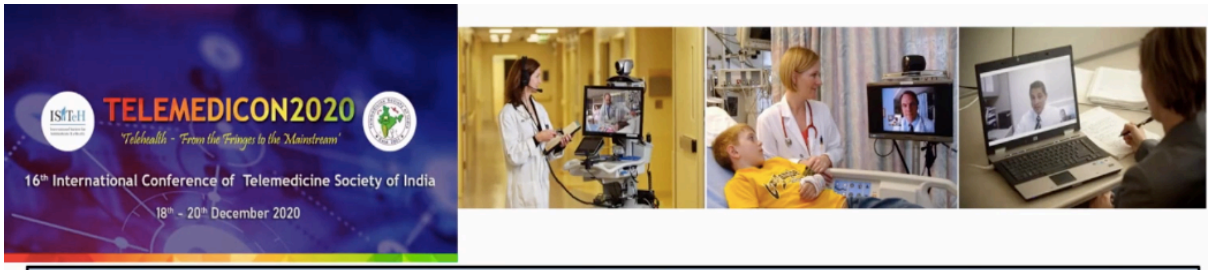
So and in order to realize such a project, we equipped the operating room with additional technologies of the digital microscope was capturing the view, we had additional touchscreen displays that allowed a second surgeon to annotate the material and to help to improve the content and material that was streamed to the remote participants, then we had a low delay streaming to remote locations. Here, it was possible to join the event with different devices being a VR device, regular monitor, stereoscopic monitor, beamers, and so on. And on top of that, we have the feedback channel and so the audience could also post questions. And then there was a chat implemented, all the questions were sent back, there were some editing before, but they could be passed also to the operating room for the second search in order to answer them. And as I mentioned, we implemented also some kind of AR tools in order to explain the

life stream of the microscope. So you could annotate that and explain things to remote students and so on. Of course, this could also be Yeah, not only used for training to students, but also to stream the content to a remote expert. And then ask him for device because on one hand, the remote participant can see everything and very high quality on and on the other hand, can provide feedback and they remote and local participants can communicate wire annotation and touchscreen. And you can see that we have different types of audience, both on lecture halls and on small places, and they could all join the lecture session.



I would like to conclude my talk have shown you very briefly because of the time. Yeah, different types of AR technologies that you can use to assist and to guide surgeons. By using optical microscopes or endoscopes. This could be 3D measurements of implant navigation, visualization of tissue structures, and all these kinds of information, the high quality view and all these augmentation information can also be streamed to remote participants using telepresence techniques, for visualization for training of students, but also to add to experts during a surgery. Yeah. With that I would end my talk.

Day 1	Topic	Speaker
• 18th December 2020 (Friday)	• The International Digital Transformation of Healthcare:	• Dale C. Alverson, (USA),



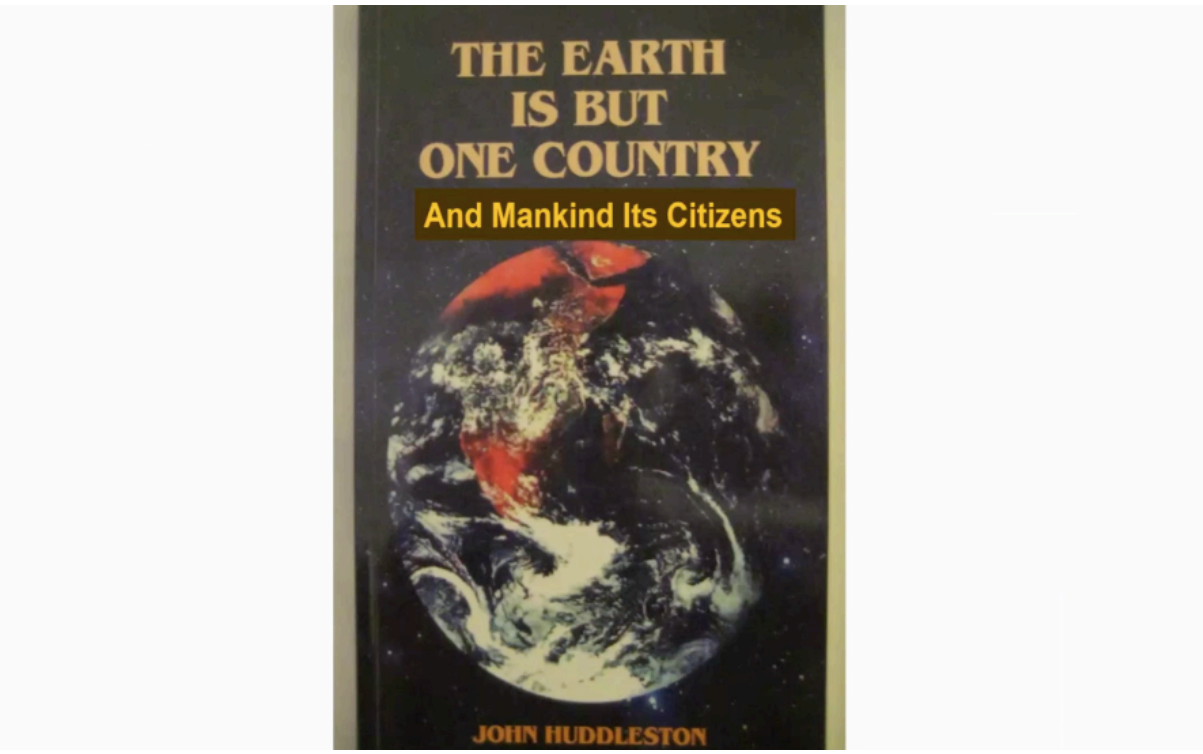
The International Digital Transformation of Healthcare: Telehealth Development in the Global Community

December 18, 2020

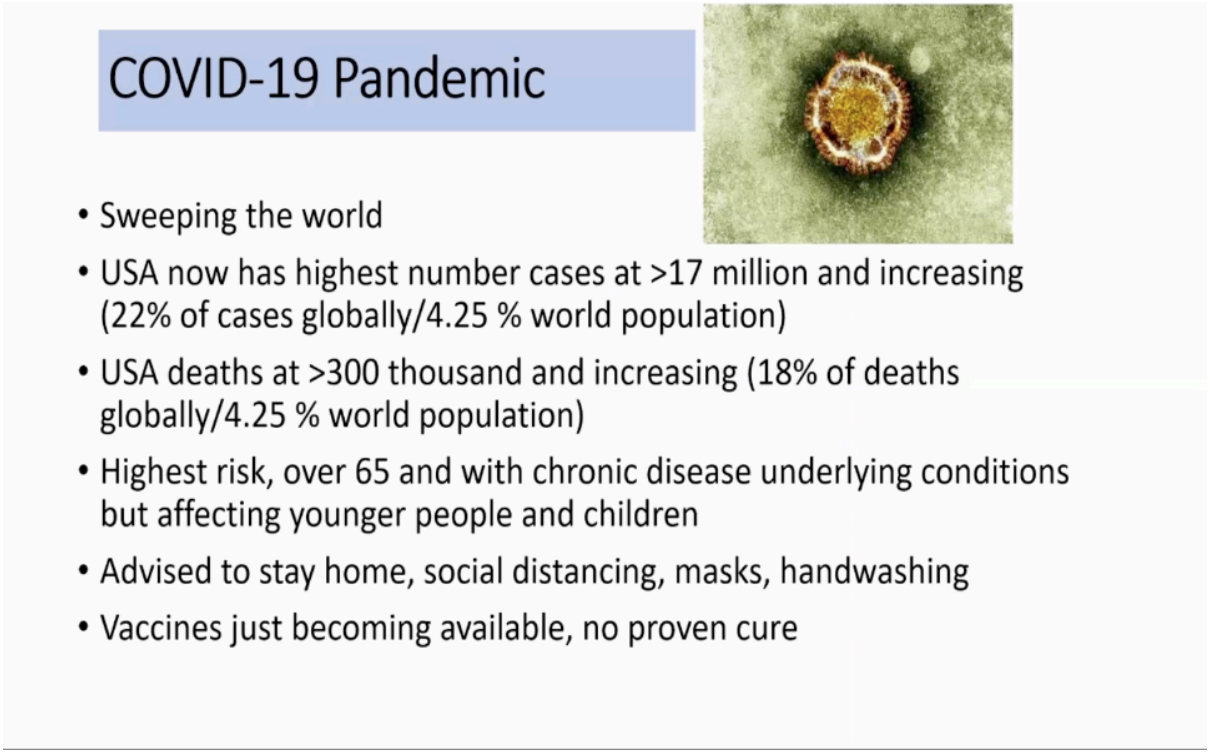
Dale C. Alverson, MD
Professor Emeritus, University of New Mexico
CMIO, LCF Research: SYNCRONYS
Director, Health Information Associates International-TOUCH
Albuquerque, NM USA
Past President, American Telemedicine Association (ATA)

The first of all, just so you know who I am. I'm professor emeritus at the University of New Mexico. Here in the United States. I'm also the chief medical informatics officer for our State wide Health Information Exchange called Synchronous. We have a group that provides consultative services in developing and planning telehealth called HIA, I touch and I'm the past president, one of the past presidents of the American Telemedicine Association. And it's great to see a lot of my dear friends who are also been presenting at this meeting.

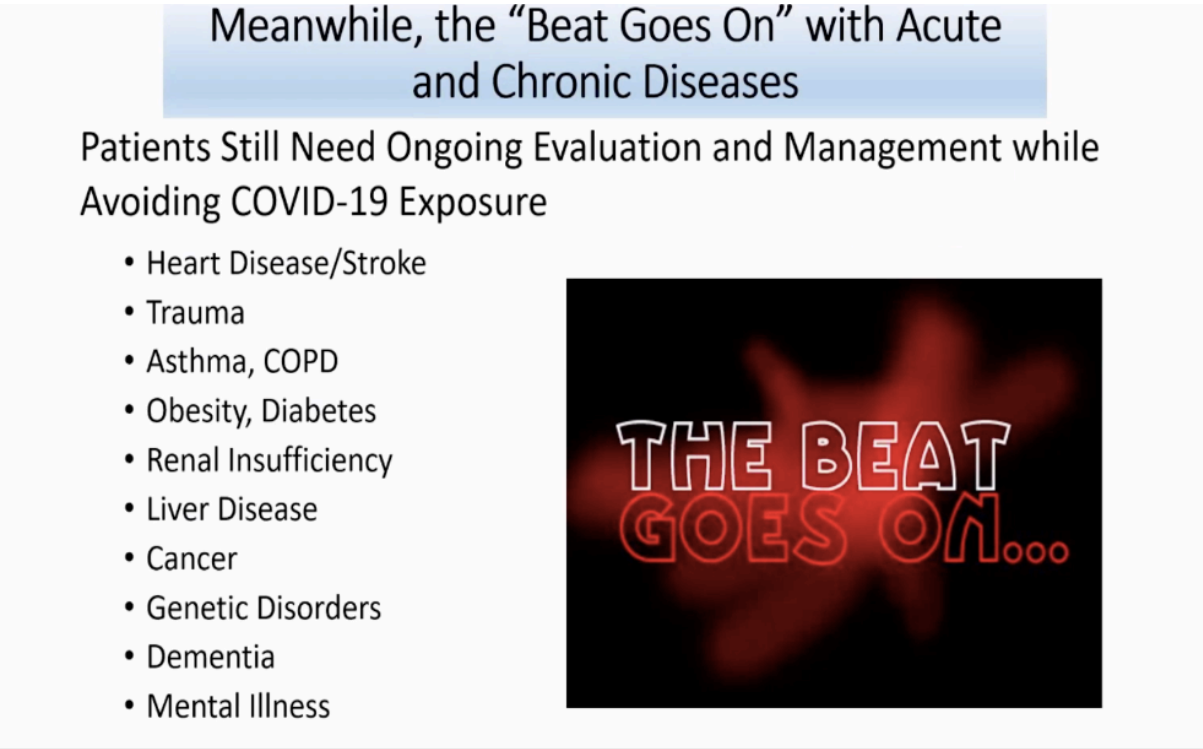
Well, international Telemedicine and eHealth. It's clearly as you can tell from the presentations, transforming systems of care in the global community. And the reasons that we do international telehealth. Most health issues are global example being COVID-19. And a pandemic.



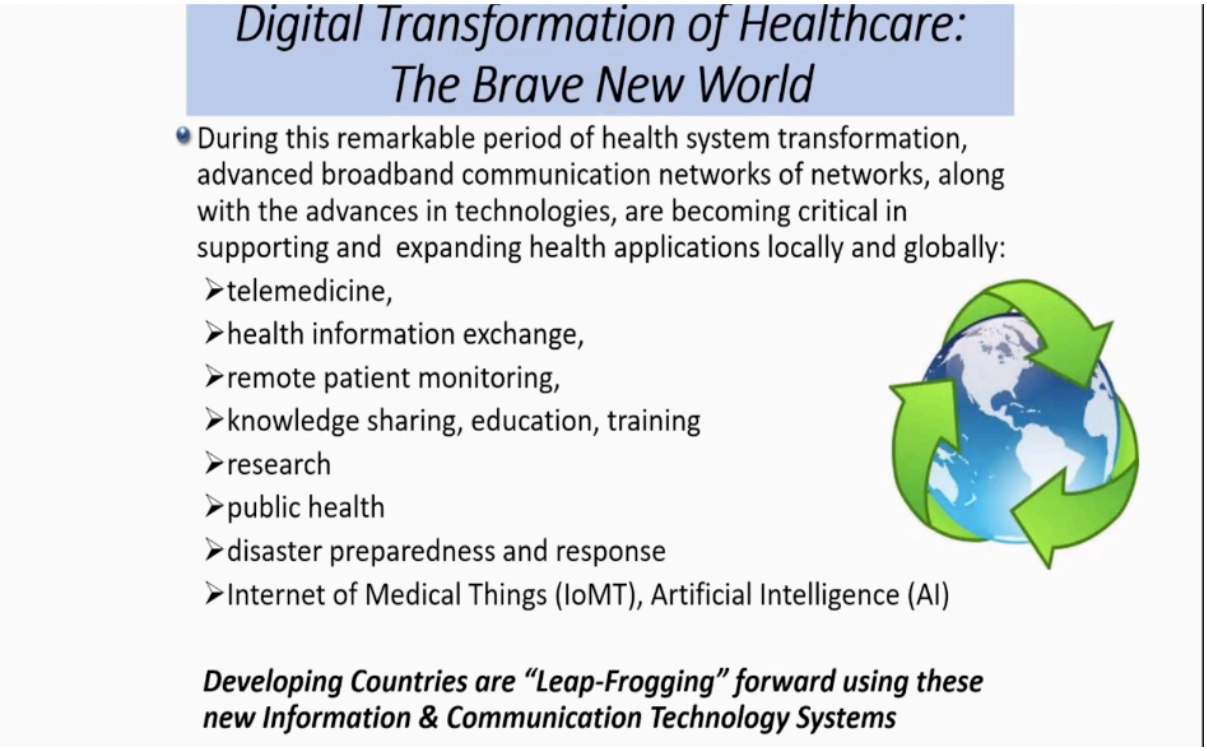
I took this picture of the cover of a book, actually when I was in India, and by John Huddleston. And it points out that the earth is but one country and mankind its citizens. So we have an opportunity using telehealth and digital health, to work together and share our experience and expertise. That's the essence of what I think we're trying to do. This conference is an example of that. And if you look at what's happening now, with COVID-19, a pandemic, as you all know, it's sweeping the world.



United States now has the highest number of cases greater than 17 million and increasing, that's 22% of all cases globally. Yet, the United States only has 4.25% of the world population. The United States also has greater than 300 thousand deaths, and it's increasing. That's 18% of all deaths globally. And of course, we know that the highest risk or over patients over 65, particularly with chronic disease and underlying conditions, but it is affecting younger people and children as well. At this point, we're still all advised to stay home as much as possible. Participate in social distancing wear masks, and frequent hand washing. Vaccines, fortunately, are just becoming available. There's still no proven cure. So that's an example of a global problem that we all share in.



But meanwhile, the beat goes on with acute and chronic diseases. Patients still need ongoing evaluation and management, as well as avoiding COVID-19 exposure. So heart disease and stroke, trauma, asthma, COPD or emphysema or obesity and diabetes, renal insufficiency, liver disease, cancer, genetic disorders, dementia, mental illness, all these problems continue. And so telehealth plays a role in maintaining continuity and coordination of care for those problems as well independent of COVID-19.



So, there's an overall digital transformation of healthcare, what we might call a brave new world. And during this remarkable period of health system transformation, advanced broadband band communication networks of networks, along with the advances in technology, as you've been hearing, and seeing are all becoming critical and supporting expanding health applications locally and globally. Whether it's Telemedicine Health Information Exchange, remote patient monitoring, knowledge sharing, education and training, research, public health, disaster preparedness and response, this whole idea of the Internet of medical things, and artificial intelligence, and developing countries are leapfrogging forward using these new information communication technology systems. And the talks that we just heard before mine are perfect examples of how we can share that knowledge and expertise globally.

In developing national international health systems, we do this through collaboration. And I just outline eight important steps,

Build upon relationships, existing programs, and system of care that exists in an individual country with which we're working. **Team building** with all the important stakeholders, with that comes a **needs assessment and understanding cultural** perspectives around health care, and then **planning for implementation** and as we're doing that **sharing knowledge, cultural exchange, both internal within a country and external between countries**. And then we need systems of **data collection, analysis and evaluation**. And importantly, **sustainability business planning**, so that these programs can continue. And then when we have those things in place, as we're doing all that, really preparing for **implementation and getting started**.

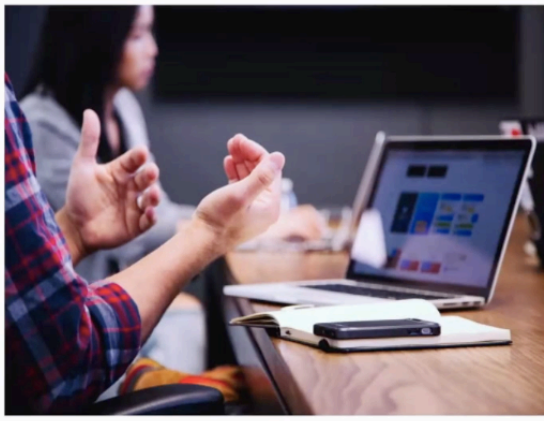
The Telehealth Checklist

- WHY?
- WHAT?
- HOW?
- WHEN?

what I like online simply as a telehealth checklist may be obvious to many of you already involved in telehealth. It's the why, what how and when. Why, what are the reasons we're doing telehealth?

WHY? Reasons for Telehealth:

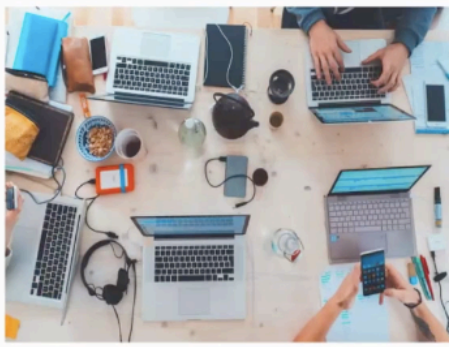
- Define Needs, Goals, and Objectives that are addressed in using Telehealth
- Enhanced Access to Services/Avoiding Unnecessary Travel, as well as Exposure to Other Diseases (COVID-19)
- Improving Continuity of Care
- Enhancing Chronic Disease Prevention and Management
- Sharing Knowledge



We have to define the needs the goals objectives that are addressed when we're using telehealth. These can include enhanced access to services, avoiding unnecessary travel, as well as now, exposure to other diseases such as COVID-19. Improving the continuity of care is another reason to do it, enhancing chronic disease prevention and management and sharing knowledge.

WHAT?

- Develop a Multi-disciplinary Planning Team
- Determine "Originating" (Patient and PCP) and "Distant" (Consultant) sites participating in the Program
- Determine most appropriate Technologies
- Determine Adequacy of Connectivity



So what is involved developing a multidisciplinary planning team determining the originating sites with a patient and primary care providers are and the distinct consulting sites that will participate in the program determine the most appropriate technologies to apply for that particular application of telehealth, as well as determine the adequacy of connectivity, a challenge in many developing countries.

How do we do this? We have to look at our workforce delineation determine the staff and providers that are needed at both a consulting or distant site and referring originating site. Many programs can't work well. And as we know, we have reasonably trained people at all the sites involved and then workflow determination. How do we schedule document? Do we use synchronous or asynchronous applications and then we must follow national and international regulations and address legal ramifications along with applying reasonable standards of care when we're using telehealth.

WHEN?

- Readiness Preparation and Developed Timeline
- Business Plan/Financial Support Defined
- Documentation of Utilization and Define Metrics that Demonstrate Benefits
- Plan Ongoing Evaluation and Continued Quality Improvement (CQI)

Finally, when it involves readiness preparation, and develop a develop timeline, so we can Institute appropriately and effectively along with that business plan, and a financial support being defined, and documentation of utilization and defining the metrics that demonstrate the benefits of the program. And then finally, plan ongoing evaluation and continued quality improvement, what we call CQI.

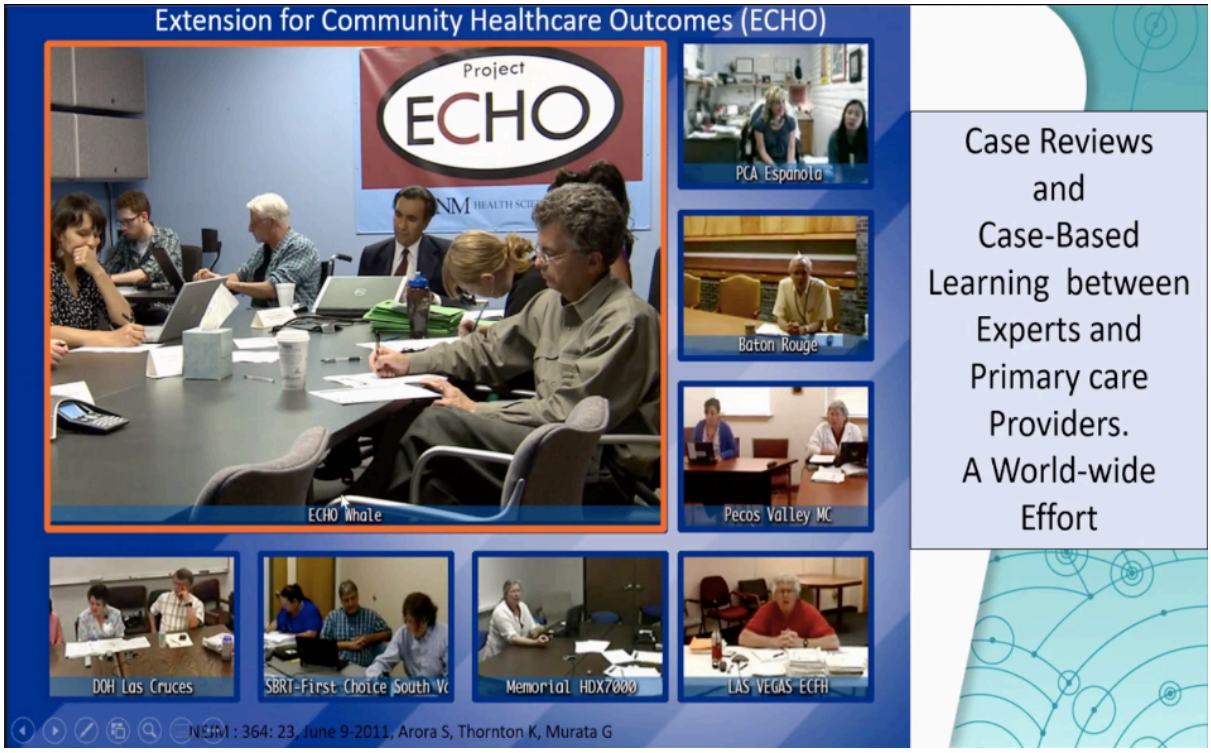
A *Continuum* of Telehealth Approaches Primary and Specialty Care

- Provider Education and Case Reviews (e.g. ECHO Model)
- Specialty Consultation: Specialist Provider to Primary Care Provider
- Direct Patient Care Evaluation and Management
- Real Time Video/audio, or Asynchronous - Store and Forward
- Remote Patient Monitoring
- Direct to Consumer Services

It's a continuum of telehealth approaches for both primary and specialty care, provider education and case reviews. The example many of you may be familiar with the ECHO model, a specialty consultation or specialist provider consults with a primary care provider. Direct patient care, evaluation and management with a patient is seen by the physician or other provider, be a primary care or specialist. And this can involve real time, audio, video, or asynchronous store and forward applications. We also are now doing more and more remote patient monitoring, and what's called direct to consumer services many health systems are providing.

Well, this all involves distributed medical intelligence, just as we're doing right now, sharing our knowledge and experience just in time on demand that evidence based best practices, but put into a realistic context based on available resources within a country, addressing mutual needs and interest in applying the most appropriate technology for that environment.

We're all using more and more cloud based video conferencing like zoom, and there are others. This is an example of how we actually brought in a Pediatric cardiologist, from Virginia, in the United States, to a conference on Telemedicine in Tehran, in Iran, at Tehran University of Medical Sciences, and we're able to come in in real time, and share our knowledge and expertise.



I mentioned the ECHO program. That's the extension for community health care outcomes that was developed by Dr. Sanjeev Arora, as you can see in this picture. And this really involves case reviews and case based learning among all the participants, who are generally primary care providers, where they can share their knowledge and actually determine the best way to manage a patient with a complex chronic disease. And that's a program that's very active also in India, in other countries around the world.

Tele-mentoring/Tele-supervision

This kind of goes back to what Dr. Eisert had been talking about. This is a picture I took when I was in Kiev, in the Ukraine, where we can do telemonitoring and tele supervision. And this is actually a live open heart surgery on an infant, where a surgeon at the conference was able to see in high resolution, the surgical area and be able to advise the more junior surgeon on how to proceed with that delicate operation as if he was there, virtually looking over their shoulder in the operating room. So this idea of Telemonitoring, Tele supervision and helping someone who's maybe been training procedure, and now actually being there in real time and helping them becomes important.

They're also asynchronous international web based solutions. I mentioned the Swinfen Charitable Trust out of the United Kingdom, and Doctors Without Borders. This is where local providers can send a description of a problem, patient's history and other relevant material, such as x rays clinical photos, using a secure web based messaging system. This allows referring practitioners access to a worldwide panel of hundreds of specialists in a wide range of disciplines. As you can see in that picture, that's a new-born infant in Iraq with a congenital skin disease, and the doctors there were able to get very rapid consultation from specialists around the world.

They're examples of meaning the challenges of communication networks. This is an Ecuador in the Amazonian region, where the military the Ecuadorian Air Force provided access to their satellite network that connected to a rural hospital on the Rio Napo where they get a consultation and education using telehealth.

In Nepal, they have developed a microwave network, the gentleman here Mahabir, Poon, put transmitters and receivers on the highest areas he could find, for line of sight, so they could get to the mountain passes in Nepal, and in fact, even connect up to a base camp at Mount Everest. So we're seeing creative approaches to developing networks that can support telehealth technology, and even the most remote rural areas.

Then we're also understanding the importance of integration of traditional medicine. This is a picture I took in Rajkot in India, where Saurashtra University is studying therapeutic plants have been used for centuries, trying to understand what is in those plants that provide the therapeutic benefit. And so we can share that knowledge among all countries of what we learned, whether it's in India, or the jungles of the Amazon.

This is another example of the integration of traditional healers, and conventional doctors and nurses like clinic alternative and Otavalo, Ecuador, where doctors and nurses work side by side with traditional healers. And this becomes one of the most popular areas where people can get health care where there's a respect for all these different approaches to health care that can help their citizens.

Also, I want to mention the exchange of students and faculty we've been involving our students and students from other countries. In projects together, where we learn together as students and faculty, and understand the issues in individual countries, countries.

As an example, some of our students have done research right in the jungle, the Amazon, working with community leaders, understanding what the health issues are, and how to deal with them, and share knowledge.

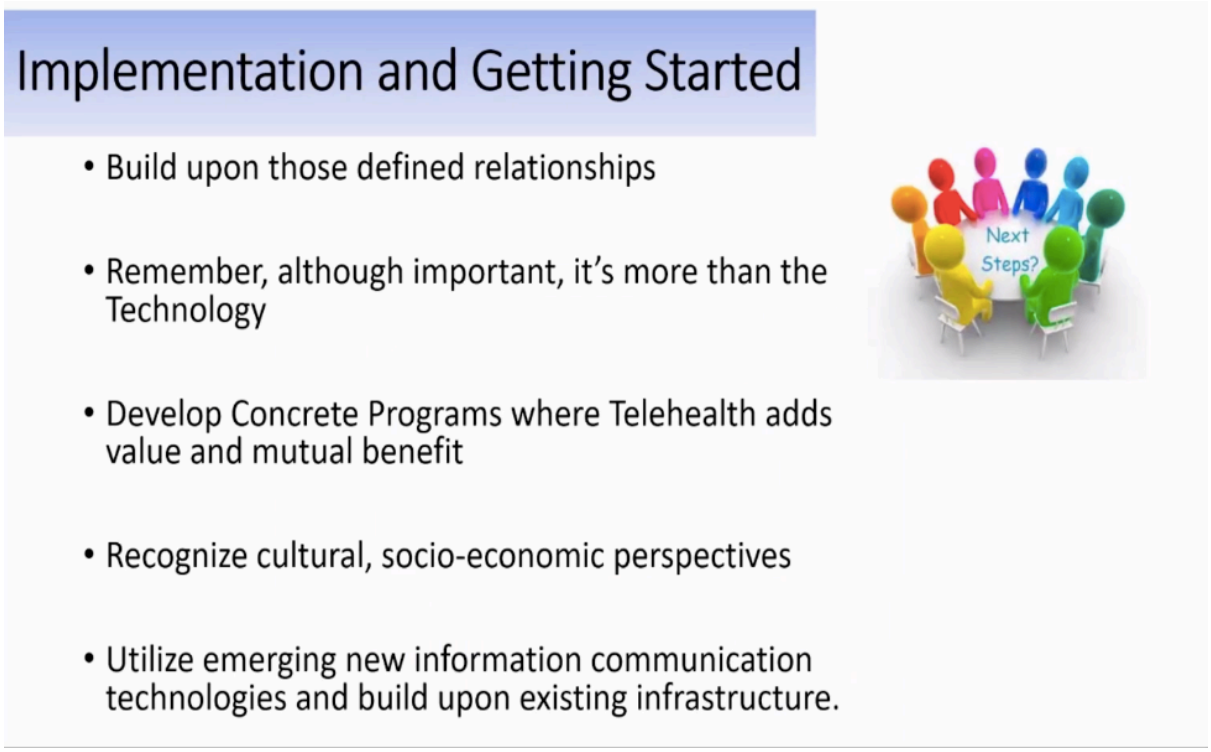
Global Health and Telemedicine Research Opportunities

- Collaborative Research and Exchange
- Addressing UN/WHO: Sustainable Development Goals (https://sdgsinaction.com/)

And finally, global health and Telemedicine research opportunities, through collaborative research and exchange. We can do that with this technology. And we can also be addressing the United Nations, World Health Organization, sustainable development goals, many of which can be supported through the use of digital health and Telemedicine.

Health Information Exchange and Telemedicine : Complimentary Pieces of the Puzzle

And finally, health information exchange and Telemedicine health information becomes important in how we manage a patient understand their health history and document. So that's an important piece of the puzzle in developing digital health.

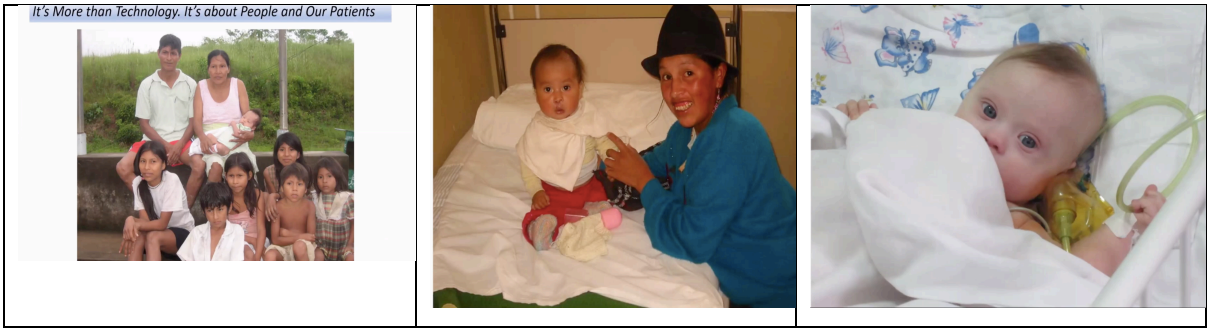


we need to look at how we then finally implement all these elements and get started build upon those defined relationships. Remember, although important, it's more than the technology, developed concrete programs where telehealth adds value and mutual benefit that we can demonstrate recognize the cultural, social economic perspectives, utilizing emergency new information, communication technologies, and building upon existing infrastructure.

And, in conclusion, together, we have opportunities to integrate telehealth in a manner that can provide platforms for greater continuity and collaborative efforts within and between countries for clinical service and consultation, public health, disaster preparedness and response, education and training and research. So we think globally, but we act locally.

And it's a team effort, working together in interdisciplinary collaboration, sharing expertise and experience, providing mutual support, sharing vision and goals.

It takes a village, it takes all of us, it's more than a technology. It's about people and our patients, and how we support them.



Like this family, in the Amazonian region of Ecuador, like this mother, and child in a small rural hospital, getting the support they need, or this individual child with complex medical problems, we can work together.

So I finished with just saying, we can promote the adoption of global health and overcome barriers by belief in the value of digital health, demonstrate that value. And that all takes dedication, and persistence. Together, we can all make a difference in this conference, I think is an excellent example of how we share that knowledge and can work together in the future. Thank you very much.

Dr. Ratta: Could I ask Mr. Bedi to give his comments for this evening session, we've had wonderful talks from all. So if you could say something about the augmented reality in the Indian scenario

Dr. Bedi: This has been a very enlightening session. First of all, how the technology itself is advancing. And then, you know, joining hands internationally, to share knowledge, further knowledge, so that it reaches a large number of people all around the world, and benefits at all stages of their life. Superb presentations I must say Dr. Alverson, another Frank you know, education. Without that we cannot advance further. So those are the things that we keep in mind right in the beginning, you know, some beautiful experiences have been shared. And they give teachers a lesson as to how the going together can really make a great difference. Thank you.

Dr. Ratta: I believe Dr. Meenu Singh is here who has a lot of experience on ECHO project. Could you elaborate a little bit about the ECHO program which they just mentioned.

Dr. Meenu Singh: Yeah, extension of community health outcomes. Professor Dale, we have been using in India in collaboration with the ICMR. Actually we did, we actually doing a project for teaching evidence based health care to north-eastern states. And, in fact, recently, we have been, you know, started using it for COVID cases as well, because there is this COVID, now emerging in our state, north-eastern states, and we discuss cases and related to those cases, we give them evidence based information for management of those patients. And we also using real evidence based information based on systematic reviews, Cochrane Reviews, which is used for teaching the, doctors over there. And prior to this in Chandigarh, we, we were also using it for Hepatitis C treatment in the state of Punjab. And some of these experiments have really proven to be very good. Similarly, it's also been used for tuberculosis treatment. And in fact, ECHO is being utilized for teaching the doctors about how to treat tuberculosis. So it's really a technology which has helped us, we have evaluated it as well, and it's actually showing positive results.

Dr. Pradhan: These talks were excellent in overall, I think that Dell Alverson saying that the dedication and persistence is very important, whatever you do, and that needs to be translated to the people actually, unless it translates to the people directly. So this cannot be accepted. But of course, this takes long years, this doesn't come within a year or two. So you need to very specific forecast and specify what really were at least in a very small field also, like you saw the example of Peter, I think the technology what it demonstrators this is these are very focused kind of work. So which inspired us, I think this kind of things would pervert and the education part is definitely you can need so over emphasis. I think Frank has already emphasized about the education part, especially in digital health, actually, digital education is the need of the hour.

Dr. Ganapati: Yeah, just to reiterate what we have been saying for the last 20 years that today, distance is meaningless. And my favorite phrase that geography has become history. So there is no geography at all. And I think the last from this morning, you have been proving that. And I am just recollecting how it all started 20 years ago, and I think the advances in this year has been just spectacular. And I think the Coronavirus has turned out to be a global CTO, Chief

transformation officer. And I think a strand of RNA has done what 1000s and 1000s of people all over the world we're not able to do.

Dr. Shroff: I know since we have such an extended passionate panel, so I want to throw some thoughts. And one of the challenges which I think has been, you know, cross border consultations Teleconsultations with COVID happening with such a, you know, exponential kind of Teleconsultations happening and the cost factor being so important. Today, you know, there has been a lot of cross border consultations. The problem is the accreditation. The problem is the medico legal aspects. I know perhaps, you know the sciences address or the societal thinking the regulations as to advance. So I want an opinion from the International, you know, kind of faculty, especially Frank and Peter and their thoughts on this. And after that. I also want to ask Dr. Pramod the same question about cross border insurance coverage. What's the status of that?

Dr. Alverson: Well, I'll just start with Shroff, that when I've talked about and I think that we all know that when working between countries, It's very hard. Important we work with people from the countries with which we want to provide service, or from where we're receiving service. So it requires having stakeholders from those countries. For instance, if we were going to provide services in India, we would have to work with you and others in India, like Dr. Ganapati, to understand the legal requirements and ramifications. And at the same time, make sure we're following reasonable standards of care and finding that help. And vice versa, you may have expertise that we could take advantage of in the United States. And in that case, you need to understand our legal ramifications, you would work with people here in the United States, like Pramod and myself and others, to understand that. So, to me, that's how we're going to deal with it because every country has its unique issues. Generally speaking, we'll work with ministries of health and the government to make sure that they are aware of this, that we've addressed any their concerns, but that's some of the approaches that we take. And actually, that's worked out fairly well. We have some excellent programs, in many countries, were provided support and consultative services, and many countries turn out that they can provide much of the support ,themselves. They don't necessarily always have to have an outside consultant.

Dr. Ratta: I have a question for all of you, any one of you may answer in regard to the cross border consultation. Now let's say we have a patient from United States calling a robotic surgeon in India, if he could help with the surgery. This could well be fetal medicine, or

whether it is dermatology, whether it's neurosurgery ,urology, Question is about the modality of payment, would you consider our wallet, which has bitcoins or a cryptocurrency as a token of exchange for the services provided?

Dr. Pramod: I just want to mention, in general, the payment paradigm will change. And in my talk, I cover the partnership with the payer and the provider. So if the model monies is controlled by the provider, let's say a hospital system, and they feel that they can achieve certain consultation in your example, robotic surgeon, outside of the country, then need not to go to the insurance company to bill an itemized as covered by the provider. And this will empower the funding to the provider and they use it best fit for the their workflow and outcome for the patient. And that will be a very dramatic change versus a silo. Here's the payer, they need transparency, they're worried about fraud and abuse, versus the provider who has the best interest for the outcome for the patient. This is where I think it will model will work not only in the US, but other countries where government funded health care is done where you can have the transparency and use the resources, edge best needed, determined by the provider, not the another bureaucracy or payment system.

Dr. Alverson: That's where I think we have to work together with the health systems and countries with which we work. People can get creative, will the health system, let's say call Paulo in India, said we really could benefit from Dr. Icers program and his surgeons for doing cochlear implants. And we think it's going to add value and we're willing to pay for that. So that would be one model. But that's why and I mentioned the checklist. That's why you need to develop a business plan and determine how it will be supported financially. Many people are doing this as volunteers hard to sustain that on a long term basis without some kind of a financial plan and business plan. So it's a great question. And I think it'll be individualized returning on the country and system with which you work.

Dr. Ratta: There's another question leading to that. What about the professional indemnity cross borders? Now we have to take a professional indemnity when we work in one country. What happens if we are consulting a patient from another country, maybe a neighbouring Country. What about the professional indemnity for that? Dr. Pramod, Would you have some thoughts on that?

Dr. Pramod: Yeah. So again, when the consultation between a provider to provider indemnity is really covered, so if the healthcare provider is accessing resource, so you in reality you are not. I mean, you are.The remote person is not directly seeing the patient and responsible, you are providing professional service to the provider in this case and say, let's say, in India or wherever, so the indemnity rules change, because it's now in consultation as determined by the healthcare provider.

Dr. Ratta: My question was, if it was directly with the patient, if you were doing a tele consultation with a patient, what happens to the cross border?

Dr. Pramod: Yeah, in that case, you need to look at, there are liability insurance that will provide you that and you, people usually have a release from the patient, but that the lawyers still go ahead and take action. But typically, people have a patient sign release saying that, that they know, this is being provided remotely, and so forth. But they're still, I think, it depends on the situation where they may need to secure additional liability insurance, which is available for capital medicine or digital health.

Dr. Alverson: I just want to mention, one of the things just like was mentioned from the Internet Society. The American Telemedicine Association is reforming. To my delight, the International special interest group, where we're going to bring people from all around the world to discuss the challenges and possible solutions. So whether it's financial, medical, legal, and so on, then we'd work together on how we might do that. And that's probably going to bring in our friends from the legal community. And that becomes an important issue. Because the worst thing that could happen is to see the patient suffer because of bad advice, and treatment, but also for the providers to find themselves in trouble. So, so I'm hopeful that we can work with the international society, along with the American Telemedicine Association, in addressing these kinds of issues, because they're important ones and need to be addressed together.

Dr. Shroff: I think, Dale, what you brought up is so important, because we do know that consumers are doing direct consultations from many countries with Indian doctors. And that's the reason why I brought up this topic. Consumers are leading the way, they're not worried they know what we're doing. And consumers say, okay, the doctor in India is already charging me $5 or $3. And he's waiting time is zero. So I've come to India. So the consumers are always

reading this, you know, and that's the reason why it's so important for us in our field to sort out, you know, some kind of methodology procedure to put a framework so that this ecosystem doesn't get stressed, and something doesn't happen, which can actually derail the whole thing, whole process, you know, that should not be issues related to somebody dying and so on in healthcare system. So we need to make those guidelines and it is time day that we do that ASAP. You know, the time has come the COVID has really made things very urgent. And this dialogue, this narration, we need to do more constantly and come up with a framework soon. Because you know, this is important.

Dr. Ratta: Telemedicine Practice Guidelines for this matter is open about the cross border consultation, and especially as Dr. Meenu mentioned about the SAARC and the PAN African network. You know, we have lots of consultations happening. So I think we're on the right track, getting the message across. And also during this COVID time, you would have noticed that majority of the medical colleges in India were shut. And I'm sure most of them overseas were also shut and a lot of Indian doctors who had gone abroad for training ,have all done a lot of online classes. That was the theory. But the beauty of it was they also had mock hospitals, and simulation labs, which helped them to get the clinical acumen, which unfortunately, in India, our medical colleges lacked. So what Frank like to throw some light on the this aspect of the medical education, international experience in other countries.

Dr. Frank: Yeah, thanks . Can you do one part of your question I didn't get properly Can you just repeat it? See, in India,

Dr. Ratta: Most of the medical colleges due to COVID pandemic, were not allowing the medical students to do the clinical rotation. And all they were able to do was clinical online classes, the theoretical part of the curriculum, it then missed out on the clinical interaction with patients of taking history from a patient, examining certain patient, or eliciting signs to their teachers and seeing whether it was the right way of learning or not. Now, this aspect got totally neglected in these last nine months. And it was only on the 1st of December this year, that the National Medical Commission made it mandatory for all the colleges to reopen. However, internationally, a lot of Indian students who are studying abroad, have had the occasion of learning through simulation, through mock hospitals. So what is your experience internationally of having come across such education?

Dr. Frank: Personally, I don't have a direct experience, except that we heard about this and what's going on, because people are trying to find solutions, as they are forced into it. Now, a lot of things have developed, the question is, what has proven itself or the efficiency of it yet? Again, time is a is one of the elements, you know, you have to let, you have to let time do its own work. And it's a miracle that, for example, vaccines have now been developed, and almost ready, within one year, which was never heard before. And, okay, the money was made available, because it reached out to 7 billion people. So the politics, you know, and the structure, the existing structures, were agreeing to go for it. on education, there's still a lot to be done. But what I do believe that these possibilities that you just mentioned, certainly, when it comes to the more the clinical teaching, which so far was done basically within the environment of an all our so now, people are going for solutions, and because of the technology of Visio, etc, is evolving so well and so fast as well, I'm optimistic that also there, there will be further developments that will prove themselves and be totally acceptable. Again, we are in the midst of it and it has gone. So many things have gone so far. I'm always somewhat afraid when things go too fast. And but I'm positive towards it. And I know that and this is also what we're trying to do to make an inventory you know, a benchmark of all those institutions, but there are so many, you know, that if done and have not even been communicating what they were able to do and this is going to be part of the work that we will try to achieve through the consortium. Identification of who is who and doing what.

Dr. Ganapati: I have a question that I would like to be addressed by the international faculty. See, the thing is, as everybody's been talking about cross border consultations in telehealth practice and we in India have recently got the freedom to practice telehealth because of the issuance of the guidelines by the Government of India and the notification of the same by the government in May itself. So, and of course, as I mentioned that it is not there is no mandate as far as the restriction of borders is concerned as far as the Telemedicine practice guidelines. So, what is happening is, of course, it was happening earlier also without guidelines. We were having, you know, teleconsultations, from India to other countries, especially so in the African and the, and the UAE and the Arab, the other Middle East countries, and of course, even in the first world countries, for that matter, because the cost of medical treatment is grossly less than what is the what is there in first world countries. For example, in the USA. Now, what is happening is that with the floodgates opening COVID, of course, has given it a massive push. And of course, the floodgates opening anybody and everybody is jumping onto the bandwagon of telehealth. Now, that gives rise to a massive, massive issue of quality in health care, how to

ensure quality and health care. So would this I would like to ask this enlightened panel, beginning with the Dale, would you would you like to comment on how to ensure quality and what we need to do as a way forward to ensure quality, especially in a country like India, where this technology has recently is making headways?

Dr. Alverson: Well, I'll start out by just mentioning that what's going to be really important that we come to agreement on reasonable international standards of care. So different groups, the International Society, for Telemedicine e health, the American Telemedicine Association, and I'm sure it's happening in India as well are developing what we might call guidelines to use telehealth appropriately, so that people have some basis or format to consider when they're providing those kind of services. Whether it's within a country or across borders, we have to really look at that that's a concern we have even the United States is in a rush to use the this these technologies of digital health, that we don't always follow reasonable standards of care for patient evaluation, the physical exam, and so on. So we have to make sure that we're covering those things appropriately. I might, I might add that, I think on the education standpoint, just to follow up on that. I think in the meantime, and we've done this before, we're probably going to have to fall back a lot on simulation, where students work with, with simulators or with mannequins, that as much as possible can simulate the physical exam. So they can learn how to do that and get feedback actually. As well as monitoring them. And taking history. We've done that with the technology even before COVID where we did virtual interactions with students, and they were observed, just and we do standardized patients. These are actors and observed so that we can help train them as well. But I think it's another example. In in I think, Frank, as you said, we're open to creative ideas, people, this is where we work together, say, this is how we're approaching it in India, or this is how we're approaching it in Africa or whatever, and share those kind of those kind of experiences. But, Dr. Gaur, I think that what it's really going to come down to is we need to have agreed upon perhaps almost international standards of care that are applied appropriately, when we use digital health as well

Dr. Shroff: I also want to ask you one question to the international panel with a COVID with outpatient kind of consultation growing up. Have you seen any, you know, lowering of cost of care in your countries? I know Covid is cost of course, management of Covid is huge cost, but the general cost of care with more outpatient consultations with more teleconsultations is are you seeing any shift in the cost of care?

Dr. Pramod: I can just start the two things. One, In the beginning, the reimbursement is same whether it's in person or to Telemedicine. But having said that, the insurance companies have publicly reported they have a huge profit because not everybody is getting the care they need, because the focus is on COVID. And B, people are scared to go to these facilities for anything other than that. So, the cost is lower, but not because the per patient is lower, it's just that the number of patient service as the lower.

Dr. Shroff: But Dr. Pramod, there's a behaviour change with COVID and acceptance of telehealth as a consultation model may help the cost of care be kind of tied down a little bit in your countries, I suspect ?

Dr. Pramod: Britain projects that over time, it will reduce the costs overall costs, because the virtual consultation is of shorter duration and also it will be lower payment for that because you are taking less resources. That is the projection. But so far, the reduction is because of lack of the volume.

Dr. Frank: Actually what we have seen, well, the cost is what it is, but all of a sudden, countries are found billions, sorry, trillions, you know that they want to invest money that they don't have, by the way, but as the rate of interest is 0% countries can borrow for 50 or 100 years. So it's not as you were going to pay for it. It's our children, grandchildren, great grandchildren, and let it if you have 100 years to cover it. So what at zero. And now they have found all of a sudden, the reason and the obligation to put health again, on top of the priorities. I know, before when we went to conferences in the honourable ministers of health, how much else is important how much education is important, but they were always Okay, I speak for my own country. But I know it's the same more or less everywhere in the world. They were the first budgets to be cut, you know, and now all of a sudden, no politician can defend its position anymore by ignoring the importance and the priority of health. And that is thanks to COVID. So yes, let it be the customer the customers be and in the proper way. But the there is going to be more money available, that's for sure. And let's hope that also it will be handled properly. Because the trust the problem is when there is a lot of money, it also attract shoes.

Dr. Ratta: So just as I was saying , PWC had just recently concluded that India could save 5.5 billion USD over the next five years, if only 25 to 30%, of face to face consultation moved to tele consultation. How about that? That's a big saving for the country.

Dr. Mishra: Actually. I'm bringing up some issues. I enjoyed Dale your lecture a couple of years ago, I heard a lecture from you. In one of the ATA meetings regarding the FCC. FCC made a policy for funding few of you the resource centres to promote Telemedicine for the rural areas. And you are one of the critics in that. I appreciate that. So now what is happened after that phase two of funding, because issue is now who is going to fund Telemedicine, that issue that is there for US same issues there in Cambodia and also in India. So that is one issue. When you are addressing rural Telemedicine, we talk of rural and rural, we never think about the internet blackout. So don't assume that very important for regulatory bodies regarding the telecommunication.

Dr. Dale: if I could just quickly answer Dr. Mishra, the Health Resources and Services Administration United States (HRSA) is continuing support. These regional telehealth Resource Centres tell people in their region and we just like the different states in India, to help those that are interested in developing health, how they can do it effectively. All the steps that I mentioned in my talk, to provide that experience and expertise to help others who see the value of telehealth, particularly in rural areas. So in our area in New Mexico, we are part of the Southwest Health Resource Centre. And that's been very helpful in people looking at how they realistically can move forward and how they can get to support. So right now, the federal government supports (HRSA) programs and these resource centres. And I think every country, such as India, hopefully can develop similar types of approaches. They can up all regions of the country appropriately and effectively and realistically, develop their telehealth applications. Thank you, Dr. Mishra, for your question. Thank you.

Inauguration

Dr. Goel: We have our chief guest for the inaugural function. Dr. V. K Paul here. May I request the president TSI Majo rGenerak Ashok Kumar Singh to welcome Professor Paul, he has graced this occasion third time and running which I must say must be a record and no reason for honour. As far as the TSI is concerned 2018 in Vijayawada, 2019 in Delhi in a physical conference, and now he will be addressing us virtually again. Now, actually the linchpin of the conference in Chennai gentlemen V K Paul Sir.

Major. Ashok Kumar Singh: I would like to welcome Dr. V. K. Paul NITI Aayog member. Welcome, sir. Thank you very much and being the president of TSI. I've been very lucky because this I'm the 13th president of TSI. And everything happened during this period is in a very, very entertaining time where the NITI Aayog started off with the TPG and we started running around healthcare centres. Then we started off with your guidance through Dr. Guru Iqbal Singh was saying we started this wonderful thing on orientation courses that we had. And so we have trained around 15,000 doctors come out very well. And Telemedicine is taking off in a very, very big manner. I welcome you and you are the limelight you are the person who has really thrown us into this beautiful thing. We started off enquiring from people as to how they find and we've taken out a really small booklet between me and my daughter and now so is the TPG is out so what will follow what will follow is Telemedicine, regulatory body Telemedicine. It will be a doctor mentation is going to be very important. So, all these things which are there will be forwarded to you to the TSI for your interaction. I thank you very much welcome to our inaugural session.

Dr. Goel: Gentlemen, welcoming the professor who has been actually at the helm of affairs as far as the telehealth is concerned in India. He needs no introduction actually. But even then, it is my pleasure to introduce Professor Vinod Kumar Paul, member NITI Aayog government of India. He has been a member of the faculty as the administrator of Medical Sciences, New Delhi for over three decades, and head of the Department of Paediatrics for several years, being an eminent neonatologist Dr. Paul is also a member of the steering committee of global, every new-born action plan. Professor Paul has been closely associated with India's health policy and

programs in various roles over three decades. India's Maternal and Child Health Program imprint of his research and expertise as a globally recognized academic and public health exponent, Dr. Paul chaired the technical advisory group on women and children health for WHO Southeast Asia region. He has been a co-chair of the board of the Partnership for Maternal Newborn and child health, the PM and CH the Government of India appointed Dr. Paul as a member of the national institution for transforming India and NITI Aayog in August 2017. When he leaves the health and nutrition verticals, he has played a pivotal role in for formulating the portion or beyond and Ayushman Bharat initiative, which is a humongous program and one of the largest, in fact the largest healthcare assurance program in the entire world. Professor Paul till very recently was the chairman of the Board of Governors of the Medical Council of India. He has been a co-chair of the board of the Global Partnership for maternal, newborn and child health, and a member of the UN Millennium project taskforce on Child Health and maternal health. He's also a fellow of all the three science Academies of the world of the country, which by itself is a record and recipient of the Dr. B.R. Ambedkar Centenary Award for Excellence in biomedical research by ICMR and the public health champion award by WHO. He was conferred the prestigious Ihsan Dogramaci Family Health Foundation Prize by WHO a 2018 World Health Assembly. He is similarly responsible for giving the much needed impetus to the telehealth initiative in India, as the Telemedicine practice guidelines were drafted and issued under the helmsman ship of Professor Paul. Sir, I'm personally indebted to you for an immensely learning experience while helping to draft the Telemedicine practice guidelines under your mentorship. May I now request Dr. Paul for his address?

Dr. V. K. Paul: Thank you so much. Well, good evening, distinguished leadership of the Telemedicine Society of India, in particular, General A K Singh Ji, Colonel Ashwini, Goel, LPP. Ashok Kumar Sangal, Dr. Murthy, Rama G. Sunil Shroff, and if my friend Dr. Gary Paul Jr. is on this conference my special hug to him, and distinguished colleagues from India, distinguished faculty from other countries who are, I believe, on this call and on this program, I am delighted to be here. And as you said that we had encounters of a different kind last two years, but I didn't want to miss this opportunity, even though virtually, because of the momentous things that this year has brought, in general in the space of health, but specifically also in the space of Telemedicine.

So, I wanted to really be in conversation with you on how the developments have taken place and how to really move forward now to the next level of harnessing this technology for the welfare of people and health care of people of India, in particular. I am sure this has been may have already been stated how important this year has been. One Of course, clearly, because of the pandemic, the new normal that we are looking at. Things have changed so much in our personal lives in our professional life. lives in our workplace lives in every which way each one of us is experience an unusual and a different situation and we still aren't sure, still not sure how this will pan out in months to come. But in that backdrop, two distinct and very important milestones were achieved in the context of Telemedicine.

The first has been the development of the Telemedicine guidelines, and I'll talk about it a little bit more. And a second has been the, the launch of the national digital health mission. Both are interconnected, both are critical developments of this year. And let me first touch upon the second, then I'll come to the first one which has areas of work to be done by all of us. The National digital Health Commission has three critical pillars. One is registry of facilities registry of the second one, the registry of doctors, and third and the most important individual level records. My record as a citizen, a health ID or Health Aadhar so to speak. Then building on this are the electronic health records building on this or other applications. But also building on this is the application of Telemedicine. So Telemedicine is a priority application and approximate application and aspiration of the national digital health mission. So in a way, Telemedicine has been elevated to a very, very prime horizon. So to say, I think that's truly game changing because what we did with the other development was a building a distinct block. But what the national digital Health Commission does is takes us to application takes it to scale, in a never before way and in a sustained way forever, forever escalating visibility of national of the Telemedicine paradigm isn't insured through the National digital health mission. So I think that's a huge development. It has many other pillars has many other aspects. But once and for all, Telemedicine is now a way of life, a way of life way of policy way of endeavour of the public sector and the private sector and way of life for citizens and providers alike. So I would salute this development, I'd like to congratulate and thank the Prime Minister for giving this gift, which has profound implications for better healthcare, more affordable health care, more human health care in our in our country, using the elements of technology and of course, other very critical aspects of the national digital health mission. I'd like to now come back to the neck the Telemedicine guidelines product.

I'd like to share with you that the need for having a framework, ethically appropriate framework, hopefully legally aligned, and legally secure framework, to an extent was triggered in Vijayawada conference, I for the first time learned that you do need a law. And you do need some kind of a framework through which to proceed ethical, safe interaction between the doctor and the patient. And then when we were looking at the options, the option to invoke that then Medical Council of India act which is now repealed. And within that, to invoke the ethics, ethics regulations was considered to be a very gentle and a safe way to move forward. Because ethics regulations provide the transaction between the patient and the doctor. And they provide the ethical shield around this interaction, both to the doctor as well as to the society as well as to the subjects. It's a two way responsibility. And then it is handled in a in a professional way, in a systematic way under that act, and his processes are respected. These processes also have judicial oversight and judicial intervention. In a in a systematic way. So it provides a way for the legal as well as ethical protection within the Constitution of India. Of course, all provisions are valid because NMC assumes all those provisions to be valid, by way of extension of the successor act of the provision of a successor act. Having said that, what we try to do and I want to want us to know this, what we tried to do was, provide a simple, gentle, faith driven, trust driven model of interaction between a patient and the provider, the doctor, I am weighing each one of these words, because I've spoken these words. And I've written these words in the Telemedicine guidelines repeatedly, it's about a trusted relationship between the doctor and the patient. It builds on how we interact with patients in a face to face situation tries to replicate that it tries to, to build on the values that drive that interaction. And the understanding was that interaction takes place. It is not foreign our consultation processes that we as patients are familiar with. And we as doctors, those of us who are doctors are familiar with, we do it on a daily basis. Therefore, the paradigm used is a relationship of trust. And that's the basis the first and foremost pillar off of the Telemedicine guideline with the Board of Governors, after repeated discussion enunciated. It is meant to be built on that it is meant to be aligned with that, it is not meant to be a replacement of that it is not meant to change the paradigm of trust to a commercial transaction, for example, there is a commercial transaction when you take a consultation, but then the trust is not taken away. ethical principles of that interaction are not taken away, I want us to always remember this, that that is the thinking that led to the model that exists today. It is not perfect it is it will change. It'll evolve. It's a living document. And we have made sure that changes within this are possible in a dynamic way, in an easy way, without having to go to the parliament, for instance. So those flexibilities were kept, because it was built on a relationship between the doctor and the patient. I want you to remember that because

then the other new implications of Telemedicine will come. And when these guidelines will be invoked one way or the other. I want us to remember that this the thinking behind this, first and foremost is that cement that glue as patient and doctor, because there will be now other uses of for this modality, it will go in a couple of directions. We can talk I will come to them in a moment. But I want us to understand that that is what drove us.

It is like saying when we wrote our Constitution, what was the debate on that week about a particular section? What drove that thinking why such a decision was taken? Why Directive Principles were kept distinct from fundamental rights, for example, and why did we have constitutional entities like an election commission, or a CAG for that matter, and so on. So I want us to understand it is trust. It is a model of doctor patient that the quintessential model of doctor patient relationship in which technology is used for the benefit of the patient, and for upholding the scientific and the ethical and human tenets of the medical profession. And I'm passionate about what I'm saying. Now, having said that, I it became very handy. And that's something that we should please us immensely. We were all your you know that we were working together on this. We looked at different models. And we were working for almost six months in a systematic way. And then we found our thread as to how to go forward. And then we followed it and it was the work of at least five to six months if not longer. But what is God's will and that is a is a blessing that almost when it was ready by the day comes the pandemic and the need for a lockdown We have a final workshop ready middle of March or early March. And lockdown decision comes and lockdown when it stared at us, it was clear that now tele consultations will have to be undertaken. Thank God, we had a framework which aided this. And I can tell you today that day after day before a day after day off the lockdown decision, which we actually decided that it should go public and we didn't have time to go through the gazette road. And in keeping in consultative processes the honourable Prime Minister's office, we took the route of promulgating it as a as a central government depart so to say, and followed by, of course, a former regulation which required a few more days of work, in terms of formalities, but the content is the same, exactly the same. So we found a way to do it. And within a couple of days of the lockdown, this modality of care and outreach became possible at a different level of ethical and legal framework system. And that's something which I think was a which torturous and God's will. Needless to say, how if the pandemic during lockdown, post lockdown, all the phases of unlock has been so phenomenally useful. such a blessing that it happened. And we didn't have to invoke any other law or any other ordinance. The framework was there. It was for the situation, it was perhaps less ambitious. Because we were not

anticipating this, we were pulling in away step wise. But then it served the purpose to a very large extent, millions of consultations have taken place, millions and millions of consultations have taken people rose to the occasion, doctors rose to the occasion, hospitals rose to the occasion, private public, individual practitioners rose to the occasion. And thank God it was there, I will just say thank God, this happened. If there had to be a situation of this nature, which is so devastating, thank God, we had a way forward, which was, in some ways thought out, in some ways, legal and in some ways valid on the ethical ground. So truly, truly grateful to God that it apart was shown to us to a solid, I'm truly grateful to you, a for having triggered this already advocacy, which put us on the spot. And somehow we were able to respond the Board of Governors, I thank them for their support, because there were many discussions, I assure you, it was on the agenda for 7 to 10 meetings. And we were going page by page, I thank them. I also thank you for conducting those trainings, because ultimately this is a tool to be used first and foremost by the medical profession. But it is also a tool which has to be understood by the patients and public at large. So on educating the doctors, although we made it mandatory after a certain period of time, we will also make it as a part of the curriculum, etc. But there was no time but you rose to the occasion to take first major step in the direction of educating doctors in a systematic way, which was also an endorsement that you made for this effort. Also, you also spotted infirmities or inadequacies, as you would expect in a document of this nature, particularly in the context which was really not foreseen by anybody. It was a context which was totally new, and it continues to be moved. So thank you so much for triggering for nurturing for being the midwife in a way and also for spreading the good word. Having said that, we also now in a larger paradigm of national digital health mission, as well as Telemedicine revolution.

We have a few other things to do and there are many more that I may not be able to say but you may remember, but to answer the question, what will follow? Let me answer that question in one word, Telemedicine revolution. What will follow is a true, lasting, sustained ever escalating Telemedicine revolution. It is imminent. It has happened already. And people have seen how useful it is how you can actually say visits by people even in normal times. So what is going to follow is only a revolution and I want TSI to be ready for it. Because you're okay, like, we all have been part of, you know, advocacy groups and societies and so on, I have spent much of my life doing advocacy for Child Health, newborn health, maternal health, you know, and so on. So I know it's, we thrive on advocacy. But now that we have certain products, which enable our mission to be achieved, my request to all of you is now to think somewhat in a

different way to look at how to use this opportunity, particularly of the national digital health mission, over and above this gentle small work are a product of Telemedicine guidelines, which is only a small, you know, cog in the system, to help the people. So first request to you is, how are we making a difference? in a big way, using the technology. In these two systems are one big system in which there is an enabler available? How can we help? How can we have the purpose for which we were all doing this advocacy, which is service of the people promoting positive health promoting affordable health, you said, You told me that this will reduce costs. Now we have to make sure that with the same cost. We serve more people, you all said that it is something which is, you know, good for geriatric patients, because they don't have to come up? Are we doing something about it? So I'm just asking these questions together to all of us, but just to I'm using the prerogative of being the speaker at this moment. So how do we take it to its utility, to the extent that the resources, existing resources allow, and how we see the next level of leadership in this regard globally, in some ways, we may be ahead of most countries, and with a little bit of more effort by the leadership and some nudge from the policy side, we could be ahead of everybody, we could be, we could be breaching barriers, which have not been breached by anybody because that that is the potential of our nation and of our people.

So that's my first take as to how you think it should be used. Your advice on that your guidance on that have increased the reach? Or shall we increase the reach in the post COVID-19 times? If so, how it is how should this be done in primary care setting in private sector setting, large hospital setting? and so on and so forth? What are the tools that are required? Now to implement that? Can we build those tools? Can we help the doctor as well as the patient to use it?

Second point comes, is the following. How do we define the Telemedicine guidelines per se, you have pointed out some things about lists this list that list, the whole idea behind the list was to keep you know, the law and the safety of the patient. Valid. We didn't want to go beyond a certain situation, but maybe with time we will do so. please remember it was post COVID sorry, pre COVID 19. In usual normal time, so we said you can promote as much positive Health and Counselling as you want. But make sure that the emergency is not missed. Then if you haven't seen the patient for a long time, please don't prescribe it. You know, Rituximab for example, on the first interaction on the Telemedicine and then once you have seen a patient you can push the frontier further, these are the simple principles that we and if you said if I helped lay health work or a paramedic is looking at consultation, this will be the understanding. So we use very common sensible principle to have a core which is valid and intrinsic and

acceptable. Now, there may be a need right away to modify those things. And list modification is actually one executive decision of the TM of the of the NMC we have captured that it doesn't have to become a regulation and so on. So kindly let's talk about how to refine that model. version two, whether this year or next year or next year or 2025 should be based on the experience and new aspirations and the new normal and the new faith in trying to work together. So that's something which we which we should be, should be working on to make it really more and more perfect. I also like to keep in mind how in the public health sector, You can help now for us to build a strong, you know, an end in a full architecture of Telemedicine. That's my second point is distinct from the first one, which is defining the model. Fair enough. But now I'm requesting how you can partner with the government to make sure that there is a formal system of Telemedicine all through one of the offshoots has been e-Sanjeevani. As you know, from the government, tell us if that's serving any good purpose, how can we improve this? How can we build on that that's one model. The other one is health and wellness centres, where by definition, we have said that there will be a provision for Telemedicine even before everything else happened. And then from there consultation with the Medical College consultation with specialists in urban health, we are visualizing now a system where specialist consultations will be a norm. Can you help build this steel frame so to say of the healthcare system, in which Telemedicine is a part and you help us do that, by way of ease by way of building a system by way of facilitation by way of training, you work with the state governments you work with Hyderabad municipal authority or Delhi and DMC or whatever, South Delhi hospital. So that would require not just the interfacing policy people but also with the people who are out there. And my last point is a bit of a concern. And that concern comes from the commercial angle that the Telemedicine excites, it worries me. It truly worries me because as I said from the beginning, it is based on a model in which a doctor and patient interact. There is a transaction in a certain setting through, you know, in a private consultation, private doctor consultation, private hospital consultation, and there is accountability in a public sector interaction, there is an accountability, you know, like there's somebody responsible, but we must keep in mind that Telemedicine should not endure opportunity created by Telemedicine or Telemedicine guideline should not commercialize healthcare beyond a point. Yes, it's an industry. Yes, there is a payment you make for a consultation or a surgery. Yes, indeed. But I'm very concerned that there would be distortions that would lead to a very different kind of conflicts of interests, opacities and so on. So when I am consulting on a Telemedicine platform, who is not behind this, what is a face? What is at the back end? Is it knowledge? Is it experience is it ethics am visualizing as a patient, a doctor on the on the screen,

or on the telephone call? I just leave this discussion here. Well, we must take it up in offline, forcing individuals to follow a certain commercial path to force them to make choices with regard to purchase of certain medicines. These are unethical dimensions. So I'm worried about the unethical part at one level and worried about the, you know, opacity that may come up that we have to be mindful in some other forum, we would like to discuss this more in depth, but I want us to remember that this to me would be breach of the very principles for which the BUG put their mind together the faith based on which we did this. And the last point I wish to make is just there are more complex issues which we now need to grapple beyond this, which means about privacy, which means strong You know, the data issues. This is a journey with the National digital Health Commission is taking laws are being refined guidelines are being done, policies are being announced to watch that space and see how it is applicable to the Telemedicine dimension of the digital healthcare. Because there are many other dimensions to the digital health mission and the policy of this nature. But there are surely several facets which apply to this doctor patient relationship through a medium, the tele technology medium and there whatever those principles get enunciated frameworks get created. We need to align them to our mission of providing affordable quality health care, humane health care, based on trust. So be mindful of what other correctives which would have been in a in a broader sense, in the space of digital health, several of them are aware, applicable to our dimension. And we want to be custodians, for, for individually for human rights custodians for ethical practice, and custodians for the general and the overall good of people of India, I leave these thoughts for you, and please pardon me, if I you know, spoke from the heart, straight from the heart, there is no written text. And but I'm so happy that we as a community have been able to start in small way a potentially very, very critical path breaking Telemedicine revolution to which we have added a little effort, this period of time and so grateful for you, to you for the faith that you reposed in me the ideas that you shared, and the friendship and affection that you showed. Thank you very much, Jai Hind !

Dr. Goel: Thank you, sir, for those wonderful words of wisdom that you imparted to us, it has always been a pleasure and a treat, it is always been an intellectual treat listening to us, I assure you from the Telemedicine society of India, you see you have your address certain concerns, which are so very valid. And in fact, your prime concern that you vocalized is that with the advent of the telehealth technology, which is globally pervasive now, in view of the ongoing COVID pandemic, and the issuance and promulgation of the notification because of notification in India. So, it has become a no holds barred floodgates have opened rightly so,

anybody and everybody will be jumping onto the bandwagon. That is what you refer to as commercialization of services is what we have to guard against, as you rightly said, and I and having known you, sir. Your sensitivities, I know it for a fact are always with the keeping the patient at the centre, and that is what all our efforts need to be keep. Most all our activities need to be patient centric. So, possibly, you given us a vision for the way ahead, sir. Definitely. And I as the president elect of the Telemedicine society of India, the President is also here and all the luminaries of the stalwarts of TSI are here. I'm sure I speak for them that we will not be found wanting sir. Let me let me apprise you of the fact that some of us from TSI are already on the draw disability, you know very well and myself, we are engaged in an activity with the Bureau of Indian standards for defining the telehealth standards in India. That is one because we strongly feel and I'm sure you would you would agree with us and support us understandable that when we provide any kind of health care or in the delivery of health care, when we want to ensure quality, I think the quality has to be based the effort so based on certain standards, and then only can we ensure quality. And so these standards are going to be defined. Also, everybody is when pointing out the issue of training. TSI at the moment is engaged in a lot of activities as well as at your behest. You gave us the mandate of training doctors on the usage of Telemedicine practice guidelines, that has been taken up very actively with the by TSI under the helmsman ship of the president and our training team in charge Dr. Shroff is also the organizing secretary of this conference and I have tried to give whatever cooperation I could do. Another thing that we are engaged at the TSI is we are trying to find synergy and cooperation amongst the regional countries as well, that effort is going on. So we are in the process of fracking together a coalition of regional countries like minded people from the regional countries. So this dream of yours and which has been given the by the addition of our honourable Prime Minister Shri Narendra Modi Ji, the tele health has got such a great In India, and that is what we want to percolate amongst the other friendly countries in our region.

Without any more time, Sir, I want to thank you for taking your precious time. I know you're very busy. You have you were in the meeting earlier and back to back, you come here on behalf of TSI, and all our members, and all those delegates who have are a part of this conference. We thank you from the bottom of our heart. And I assure you that we will continue this dialogue and we will continue working for the patients, especially in the public health area, as far as TSI is concerned, Thank you so much.

TSI Report

Dr. Murthy Remilla: Good evening all ,at the outset. Once again, welcome all the delegates, dignitaries on the Dias and our chief guest Professor Vinod Paul, honourable member NITI Aayog government of India, who graced us at the inaugural function of Telemedicon 2020.

On this occasion, it gives me great pleasure today to present a report of TSI activities during the past one year. Telemedicine practice guidelines issued by the Ministry of Health is the biggest landmark of the year with a concerted efforts of many TSI members on persistent efforts for more than a decade. The guidelines have turned many fence sitters, who are aware of Telemedicine and its benefits, but were apprehensive about the legality of Telemedicine and today they have become real practitioners of Telemedicine. Here we especially recognize the efforts of our chief guest Dr. Vinod Paul, whose participation as he mentioned in Telemedicon 2018 at Amaravati. Give new pace and direction for the efforts of TSI to get Telemedicine recognized by government of India. And also this is a hattrick kind of participation from him in Telemedicon 2018, 2019 are now into those in 2020 which only show his conviction and commitment to Telemedicine Under its expansion in India. Thank you, sir.

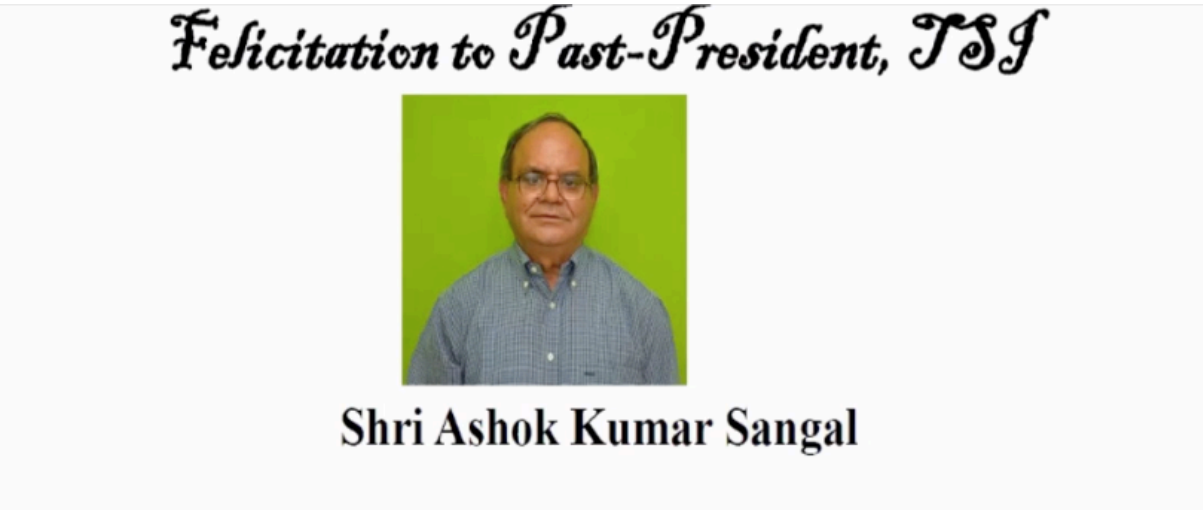
Though COVID-19 is one flip side in our lives this year, in order to meet that challenge, TSI is on a path of expansion in terms of state chapters on the activities on the kind of engagement with other associations and the efforts. The current team of TSI office bearers took over in December 2019. In the reporting period, three new state chapters are inaugurated. And one more chapter in Gujrat is in the pipeline. I'm happy to hear to announce that Kerala chapter was inaugurated on 19th January Telangana chapter was formed in January 2020 and Uttar Pradesh chapter was inaugurated on 22nd February 2020. As of today with 11 state chapters in operation and hoping to extend to many more in the following one year in tune with the times and following the issue of Telemedicine practice guidelines. record number of five online EC meetings took place this year, in addition to one meter EC meeting conducted on September 15 2020. This was to finalize the modalities about conducting the Telemedicon 2020 in the virtue of or in the fall out of the COVID-19 in an online mode. This Telemedicon 2020, which you are witnessing today is a culmination of the process and the efforts of TSI, TSI executive committee and specifically TSI Tamil Nadu chapter. Our appreciation and applauds in Telemedicon 2020. TSI partnered with other technical associations and provided training on

introduction to Telemedicine that delegates in practice guidelines on the do's and don'ts of Telemedicine and about 15,000 numbers were retrained and the efforts are continuing to match the match required multiplication in the training and probably certification activity with the approval of government of India subsequently as required by the Telemedicine practice guidelines.

This year also, Telemedicine society has continued Association and a close working relationship with international agencies like is ISfTeh and the American Telemedicine Association ATA. We will continue our efforts in this direction. We are happy to share part of the number should be received with the state chapters to support them in conducting increased the number of Telemedicine and CME activities. When we look at the state chapter activities to state chapters Rajasthan and Kerala standout among others the group which actively conducted Telemedicine and CME activities in this year, Rajasthan chapter along with Medical College and the MG College of Health Informatics held the first International Conference on digital health informatics on 12th and 13th February 2020. The conference was attended by senior TSI members and international delegates from USA, Bangladesh and Denmark. Kerala State chapter conducted an online event on September 24, on Telemedicine practice guidelines what the physicians need to know this was conducted in association by Kerala chapter. We in association with IMA Kannur under digital health India and is that has spread the valuable word and message about the Telemedicine practice guidelines and the essence. We look forward to more dynamic 2021 by the state chapters and other chapters joining this dynamic activities.

Delhi NCR state chapter conducted the Telemedicon 19 in December 19, where this current team took over a total of 321 delegates participated in this conference with 89 faculty members, 44 student members, 161 TSI members, and most importantly to note 126 non TSI members participating in this event. Attendance from senior officials Ministry of Health and Family Welfare, Commerce, Judiciary, the highest ever for any Telemedicon and stands on as a speciality of this event, not only among them our Dr. Vinod Paul member NITI Aayog our honourable chief guest today. Commerce Secretary of minister of Commerce and Industry honourable Justice Pratibha Singh, Delhi High Court, Dr. D. S. Gangwar, Health and Family Welfare, Mr. Lau Agarwal, joint Secretary Minister of Health, Mr. Kirti Uppal president Bar Council Delhi High Court, Miss Geeta Kathpaila, Director General at Government and many more officials. The TSI places on record our appreciation to the Telemedicon 2019 team of

NCR for the success event. When we look at the new members enrolled since 2019 December till date, the figures are encouraging, though not satisfying 216 life numbers, three corporate members, two paramedical members, six institutional members, one overseas member and four fellow members are added in this year. So with that we stand today at 702 life members, 9 corporate numbers, 6 start-up company corporate members, 4 paramedical members, 50 institutional members, 5 overseas members as a student members 25 fellow members, and 2 honorary members, requests all the TSI members to bring more new members to TSA and also more importantly bring more TSA members into the conferences. This year. Also, the participation from the TSI members is not that much encouraging, requesting each member of TSI who is participating next year to bring 5 more members with the active support and environment of all the members and guidance of the executive committee, senior members, members of industry research institutions and well wishes. TSI looks forward for a more active and dynamic year ahead and hope to present much more impressive report next year telemedical 2021 will be held at SGPGI Lucknow in a hybrid mode during November 12th to 14th, 2021. The event will be preceded by tutorials and Live workshop on digital health technology and application to be held during 10th and 11th November 2021. Thank you all for the opportunity and as honorary Secretary on behalf of the society TSI, I extend a happy and healthy year ahead to all of you and look forward to seeing you all during the next conference at Lucknow. Signing off from this report your sincerely Dr. Murthy, honorary Secretary Telemedicine Society of India, Jai Hind !



The felicitation to pass president Shri Ashok Kumar Sangal.

It gives me great pleasure today to recognize the contribution of a technical professional who worked hard in promoting the growth of Telemedicine in the country, right from its infancy. Born in 1949. In Dehradun, Uttarakhand. Mr. Sangal, we are glad to know you graduated in science at young age of less than 17 years, and got your master's degree MTech from University of Calcutta in 1970. In first class,

You had a rich experience of 37 years in Israel in various capacities of satellite system engineering, operations management system simulation broadcasting and in the use of technology for societal obligations from where you retired as group director. You are deeply involved in propagation of Telemedicine using satellites, right from pilot networks to state level networks of several states and Telemedicine mobile van services in the country. Your notable contribution during Tsunami, very egovernance. Network Setup in 6 islands was configured to provide Telemedicine support in remote islands is much appreciate it.

You were also involved in evaluation of Telemedicine platforms have multiple Telemedicine vendors in the country for induction in ISRO networks. You were chairman of Telemedicine user group meet conducted by ISRO in 2000 and in 2007 which gave anonymous feedback on network utilization. You were also responsible for configuring the first school education broadcast network for mass medical education for FOGSI using receive only terminals. You were a member of the National Task Force on Telemedicine standards and guidelines. You presented several papers nationally and internationally and were a member of UNOSSA panel on Telemedicine implementation approach for Africa at ISfTeH, Cape Town. ISfTeH 2006 at Cape Town and ITU, Isarel, INMARSAT London etc. You are a member of several societies associations, and also proud to note, your recipient of UN fellowship for a year at European Space Agency.

You are associated with the TSI since its inception and worked in various capacities from EC members to President. You were the president of TSI during the year 2017 to 2018 and extended your best to services to the society. You contributed towards improving the TSI headquarters functioning, guiding on audit related matters, helping several amendments to constitution, former national Member Sates number of state chapters forming committees for administration, financial system and inter organization association with IMA and other agencies.

Currently, you are serving as a fellow member of the TSI, your sincerity, devotion to work and form determination established for you today as a professional of high repute.

From the fraternity of TSI, we thank you Mr. Sangal, for all your efforts, and on the occasion of Telemedicon 2020. This is a token of appreciation for all your contribution to the society.

Wishing you a happy and healthy year ahead, and continued service to TSI

honorary secretary, Dr. Murthy Remilla and the president Maj. Gen. Dr. A. K. Singh, from the Telemedicine Society of India, and on behalf of the whole fraternity of Telemedicine Society of India. Thank you.

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