And we are live now, Vikram.

Vikram Patel: Welcome to the first public webinar on the Lancet Citizens' Commission on Reimagining India's Public Health System.

Thank you for joining us today. My name is Vikram Patel and I serve as one of the 4 co-chairs of the commission. The commission is an ambitious cross-section endeavour that aims to roll out a citizens roadmap for achieving universal health coverage for the people of India and we aim to do this through the active involvement of diverse stakeholders - both the actors in the health sector and the community. Please visit our website, the address of which you can find in the chat box - www.citizens health.in. For more information but also to get involved.

The Commissioner's webinar series is intended to serve as a platform for public health discourse in India and to engage a wide community of academics, practitioners and the public on substantive and timely issues regarding health. The webinars would be held on the second Tuesday of every month going forward and you can sign up to receive alerts about our events and webinars on our website. Today's webinar - The Covid Crisis in India, what is the way forward - is the first of this web series and of course it is a critically important and timely discussion on what we consider are the priority actions for India to deal with the devastating pandemic surge and the humanitarian crisis it has spawned. We want to focus on the immediate actions that are needed to save lives and to stop the spread of the pandemic.

We are hosting this webinar in collaboration with the India Task Force of the Lancet Covid-19 Commission. This is another Lancet Commission, an interdisciplinary initiative across the health sciences, business, finance and public policy and the India task force is the only country specific task force set up in recognition of the unique challenges that India faces in dealing with Covid-19. There will be a short survey which you will be able to find in the chat box as a link, after the initial remarks of the panelists.

I encourage you all to fill it out, to share your views and suggestions - both about the topic that we are discussing today but also the topics of future webinars that you would like to see. In order to address and manage the rampant misinformation about Covid-19 patients, most of whom can be kept away from hospitals from appropriate evidence based treatments, I want to take this opportunity to announce to you a new initiative that will be announced in the days ahead.

A team of practicing clinicians from community based and private organizations in India have joined hands with clinicians from several US Universities to form a community science alliance committed to advancing scientifically sound evidence based strategies for caring for our most vulnerable people. Now I would like to introduce Sara Jacob who will moderate our discussion today. Sara Jacob is a journalist of repute and a senior editor at NDTV 24/7. She is an anchor of "We The People " one of NDTV's flagships primetime shows and previously shs served as the US correspondent for the NDTV covering both the 2008 and 2012 elections.

Sara Jacob: Thank you very much for accepting our invitation to moderate today's webinar. Over to you now.

Thank you so much. Thank you Vikram. Thank you everyone. You know India is in a big crisis in the current Covid situation. We are reporting 4 lakh cases, 400 deaths daily, hospitals and morgues are overflowing. Medical staff are exhausted. We have a shortage of oxygen, we have a shortage of drugs. We need to fix accountability but we also need to first find a way out of this quagmire so here this evening, to look at the way forward. To focus on the short and long term actions that are needed, the lessons that need to be learned and the next steps that need to be taken. So thank you, the Lancet Commission and the Mittal Institute have put together leading experts from the medical and scientific and public policy community. I am going to try and introduce them. Given their many accomplishments and the time limit that we have for this session, I am sure I am not going to be doing it much justice but let me give it a shot. Pull this up here.

So of course we have here Gagandeep Kang, one of India's most distinguished scientists. Fellow of the Royal Society of London. The first Indian woman to be in the FRS. One of the co-chairs of the Lancet citizen's commission. Professor of microbiology at the Department of Gastrointestinal Sciences at CMC in Vellore. Her work has been crucial to the development of India's road to the vaccine - a vaccine that would be both indigenous and affordable. She is a member of several advisory committees for the WHO, mainly related to research in the use of vaccines. She has been since 2020, an ex-officio member of the working group on Covid - 19 vaccines, established by the strategic advisory group of experts at the WHO and of course most recently as part of the 12 member task force to find ways of tackling India's medical oxygen problem so truly in the hot seat right now.

We have also Dr. K. Srinath Reddy who in addition to of course being a very distinguished cardiologist is possibly India's best known public health expert. A pioneering institution builder in this area. President of the Public Health Foundation of India, a commissioner in the Lancet Citizens Commission, a member of the India taskforce of the Lancet Covid-19 commission. He is formerly head of the department of cardiology at AIIMS. He holds several advisory positions, several national and international bodies. He serves as an adjunct Professor of epidemiology at Harvard. He has been appointed as an advisor on Health to Government of Odisha, rank of cabinet Minister and same to the government of Andhra pradesh also with the rank of Cabinet Minister.

Peter Piot joins us from London, England, I think. Peter is the Director of the London School of Hygiene, A Handa Professor of Global Health. He is a special advisor to the President of the European Commission on research and innovation for Covid-19. Of course one of the world's highly regarded virologists, he is known, best known for having co-discovered the ebola virus in Zaire. Professor Piot is part of the team that isolated the Ebola virus in Zaire in 1976. He has lead pioneering research in HIV AIDS, women’s health and infectious diseases mainly in Africa.

He has been founding and executive director of UNAID and undersecretary general of the United Nations and of course he has been the victim of a moderate to a severe case of Covid and he has used his own experience with the illness and the health system in conjunction with his academic expertise to lead discussions on this subject so we would love to hear from him on the experience in the UK and how we could compare that with India.

We have K. Sujatha Rao, former Union Secretary of the Ministry of Health and Family Welfare, Government of India, Commissioner of the Lancet Citizen's Commission. She has been involved in the first ever National program for non-communicable diseases, a process for a National policy for the use of antibiotics for the use of vaccines in public health. She is currently a co-chair of the high level Commission on health that we have formed in Andhra Pradesh, member of the National Health system resource center. She has worked in various national and international organizations, including being on the advisory panel of the Bill and Melinda Gates Foundation and also of course founding member of the public health Commission of India.

And we have Gautam Menon, Professor of Physics and Biology at the Ashoka university prior to which he was Professor of theoretical physics and computational biology at the Institution of Mathematical Sciences, Chennai. I told you the accomplishments are numerous - they just go on and on. He was founding Dean of the Computational Biology Group. He is currently adjunct Professor at the Tata Institute of Fundamental Research at Mumbai. He works on a number of biophysical problems in the field of mechanobiology and the modelling of infectious diseases and the implications for public policy have been a long standing interest of his.

That said, I am going to start by requesting all our speakers to present their views on the immediate strategies needed to save lives for India for how we can minimize the epidemic's impact on the vulnerable India, especially if you can all speak for 5 minutes each, that would be great. Dr. Kang perhaps you could start because I happen to be speaking to an economist and a policy planner about my moderating this event earlier and he described you as being fearless in expressing your views of having no political leanings. So if you could set the stage Dr Kang, what are the lessons that India needs to learn? What should our next steps be?

Dr. Gagandeep Kang: I think when we think about the rest of the world and how we view India and how we view ourselves, we don't have a sense of scale. Perhaps, you know, maybe Miss Rao and Srinath Reddy have some understanding of this but I always find that I am discovering constantly all the parts that are missing in India's healthcare system and that is why being part of this Commission is very important to me. There are so many neglected people who are neglected sections of the population that we never hear about and while I might have understood migrant labour because I work with communities, I don’t think I understood the scale of it and I have only had 40 years in the healthcare system in the country so far. That was what was brought home to me more and more clearly through last year, so I think having a good sense of what we want to measure in whom and where is very important and then building the platforms to be able

to provide access to care is important. I don't think we need, and it is becoming clearer and clearer, we do not need names in every State or names in every district which is something that Government has been very focussed on but if we can build our strengths from the ground up, it will stand us in good stead in peace time as well as war. What has happened in this particular situation is an over centralization, a lack of recognition of the skills that are available on the ground and that early command and control has now persisted for well over a year and it is still to a large extent hampering our efforts to be able to deliver care to people who need it. I think the example of oxygen is one among the failures we have had in that direction. There is a lot to do but if we don't learn from this pandemic, we are never going to learn. I am going to stop there.

Sara Jacobs: So need for decentralization...Dr. Reddy as India is struggling with this second wave, we have these fresh variants, double mutant strains, classified as this new variant in India, a new triple variant, we are hearing all this, thisnsi creating fresh panic right now so it seems like it never ends. So what do we need to do to ovecome this right now?

K. Srinath Reddy: Well let me start off by echoing what Dr. Kang has so very crisply stated that what we really require is data driven, decentralized decision making. We do need a coordinated countrywide containment strategy in order to bring down the transmission rates as swiftly as possible, even as we are accelerating our vaccination programs. But since you've asked me about the variants, let me start with the variants. Obviously the variants are emerging because of multiple reasons. Whether they have entered India from abroad or they have arisen here, the only way they can actually make an entry into the human body is through the nose, the mouth and the eys. So if we can get people to mask properly outdoors and particularly indoors where (inaudible) formation can be fairly common and wear double masking if required but most importantly prevent sizable gatherings of people. Particularly in static crowds and super spread variants ought to be roevented as strongly as possible. Now the question of the immediate task whether there is going to be a countrywide lockdown or a combination of lockdown and near lockdown ins some States, that is a decision that has to be taken, of course after an assessment of the condition of each of these places and sometimes this has to be differentiated even with States and even within districts and that is why I am pleading for decentralized decision making with a common template of action for decentralization and we recognize that despite all the anxieties displayed by our international observers, many of whom wish us well like Dr. Saucci who says that all of India must go into a complete lockdown.

Well you can't wrap all of India into one blanket. It is a huge sub-content with a lot of variations across the country and we do need to take firm steps but they need to be

somewhat differentiated based on the ground realities. Then of course we are really talking about early detection of cases and that requires a good household surveillance with primary healthcare are available as well as any citizen volunteers, based not just on testing which is important but also symptoms, history of contact and travel and then preferences for early testing of both the people who have suspected as well as people who have caught it. Those are important endeavours and there I believe a lot of citizen engagement is required at the frontlines and then of course isolation and quarantine is required but we must also recognize that for hospital referral treatments or evenisloation at home, diagnostic testing while it is extremely important and it is important for a variety of reasons including the fact that you still want to find out what the genomic testing will reveal about the variants and so on as a follow up of the initial diagnostic testing but we must drive home the message that we will still have a number of false negative cases and therefore to depend only on the diagnostic test either for the home isolation or for hospital admission which has been the bane of our hospitalization policy turn almost yesterday. I think we must remove that aberration from our policy. Then in terms of home care we need a lot of old people to be provided with adequate support, from primary healthcare teams as well as citizens primary healthcare support groups and then they must be provided the assurance that they will have a emergency transport to a hospital where they are likely to get admitted with again a high level assurance of getting admittance without having to wander from pillar to post. These are systems that should be put in place locally through a lot of local partnerships and citizen partnerships which has been the missing element of our pandemic response so far has to be brought in, evry, very strongly.

We need people to partner with public health. And then we need to of course improve our hospital facilities, including temporary admission. The oxygen crisis has to be solved, we have to provide oxygen security,w e have to ensure that the drugs are appropriately prescribed and not have a mad rush for drugs which are not really required at the time like redesivir is not even on the drug use list, (inaudible) is misused in a number of people. So this is where we need clarity and scientific messaging and standardised protocols are also going to be required.

As far as vaccines are concerned, I think it is especially essential that every citizen who wants it and needs it has access to it without having to face the barrier of financial hardship. It is a fundamental right and that needs to be respected. How the Centre and the State will actually go about this and share the expenses is something that they can decide but the availability of vaccines should not be left to the vagaries of a person's affordability or without escalating a bidding war between the various States and the

Private Hospitals. And of course we do need to ensure that the support systems are adequately setup at every level but I also believe that it is absolutely important that science prevail at every level. Unfortunately we have not been sufficiently respectful of science and many of our decisions have not been driven by science.

Of course we have not been as bad as Mr. Trump's America but we have still fallen short and we must pay respect and heed science as we move on. So I do believe that if we take all of this into account we can emerge from this agony and anguish of this pandemic and we can create a new health system that is more comprehensive and compassionate. But before I end, I would just like to say that it is not just these few conditions that are addressing this issue. I would strongly recommend that the viewers of this program visit the advisories issued by the National Human. Rights on the 4th of May and again a few days later. While all may have forgotten that the humans Rights Commision has existed for some time, these two advisories are remarkable in their clarity and direction and in detail of first one deals with what governments must do in order to ensure the rights with respect to Covid in variety of ways and the second one even talks about the right of the dead. So these are remarkable documents I believe people can visit and gain from. Thank you.

Sara Jacobs: So one size fits all doesn’t work for a country the size of India and our nature is what you were just saying. Peter, Peter Piot, what are the lessons India can learn from the UK given that the UK has just emerged from a harrowing second wave, What can India learn to emerge from this too?

Peter Piot: Thank you Sara and hello everybody. Well first of all I think we can all learn from each other. In this pandemic I don't know of a single country that really knows at all in terms of a sustainable way, even countries like New Zealand and so on, they are isolating themselves but now they are stuck so how long can they stay and we all have to learn from each other and only Indians and India can solve the problem in India. That is if only also because of, as you know as it was said, the country is so vast. It is certainly one of the things I have learnt but I would say a few points. I look at it also what can the world learn from India? First of all it tells us something about the epidemic and the pandemic. It is far from over.

We have all hoped probably somewhere, that, you know, there are vaccines, there are scientific breakthroughs and one fine day we will go back to normal. I think we should forget that term and even ban it. If we go to something, it will be going forward to the new normal, not going back to the old normal and, so it is, that is the first point, not over.

Secondly. I think that one of the big lessons is that this is kind of, English is my third language, my second language is French and they say (french phrase) - it's an announced disaster. It was predicted. You know, we have seen it also in Europe and all over before in the u.K. and so and soif you take the U.K here. About a year ago we were in really bad shape. There was lack of leadership. When we locked down in the country it was far too late, when it was announced and that you can commit how many deaths that - the health system was not prepared and that ironically there was a long, countries were ranked in terms on preparedness for a pandemic. This was a theoretical ranking in the global preparedness commission or something like that and who came first - U.S. and then U.K.

U.S. going upto 1 million deaths and we have probably around 200,000. The least one can say is that our predictors of whether you are prepared or not are not very good. We were not really good and so I was hospitalized in very, in March, in the very early days and that is why I have a high appreciation for oxygen and I still feel very (inaudible), I feel it in my guts when I see that lack of oxygen which is so simple in theory in what a difference it can make but what happened then is that there was a decline in infections all over Europe, of deaths and all that but then in a sense we became very complacent and Europe was driven by the desire to go on holidays in the summer. And that there is also, very hard, for democratically elected governments to control and we came with Christmas and here again we were you know relaxing the measures, the non-pharmaceutical interventions that were described by Dr. Kang already - were really very relaxed and we had big parties all over, you know, for Christmas, everybody - big parties, getting drunk and so on and this was kind of a real hotbed for transmission and then in addition there was a variant.

Now no virologist has been surprised that these variants pop up, that is what viruses do. Some are far more extreme like HIV than others. For politicians it is very convenient, the variants because they can blame their own failures on variants. But we need to know that the effect of the variants is a combination of this, you know, early relaxation and premature declaring victory and then making it the perfect storm with more transmissible viruses. So that is what happened here. Now fortunately, I will say on the positive side in the U.K. that the vaccination rollout has been very good. Although in the meantime the U.S. has far more people that have been fully vaccinated. The U.K. has gone for one shot and we will see who gets the next one. I got my first injection on the 9th of january. Like 1 year exactly after the sequence was announced but there was nothing to do with it, no causal relationship. But then it took like 12 weeks before I got the second one but

that is going quite well. The rollout in the rest of Europe is slower but it is now picking up. I could say a few words about the EU because some of it is comparable to India. On the one hand of course the 27 members of the EU are sovereign countries.

It is not like a State which are not fully sovereign but the policies we were having the same problem that Srinath ahs said because people living in country A work in Country B, they have a partner somewhere, if you close the shops in Netherlands or the bars, the people go to Belgium, etc. etc. so that the fact that we didn;t have a kind of coherent policy was a problem but in terms of vaccine procurement and I think this was important and the reason I am saying is that the option that everybody for themselves and the result would have been that the bigger countries like France and Germany would have the vaccines but smaller countries they could have waited. This is where vaccine equity and making sure everybody has access is really important. Now the, so that is what the scale is. No, I think that for India the way I see it is that I agree with everything that was said before. It has to be science based, definite and informed and using the formidable power of Indian manufacturing and so on which is there and but what I think international community can do, which always makes me a bit cynical you know when plane is sending a 100 canisters of oxygen to Indian - fine, I mean but that is not going to make the difference but what could make a difference is lifting export bans on ingredients needed for making vaccines and the commodities and so on that is really the kind of structural intervention that would work and there are no silver bullets here and i think that is really a lesson.

You need this combination of what we heard all together. But I would also say, in the middle of a crisis we always need to think of what, you know, never misses a crisis in terms of strengthening the systems. Because it is not over - the world of all the pandemics - and this one is not over so, I would say that we are all very, very worried that this could be a kind of a window on what could happen elsewhere also. Be it In Africa, or the Middle East or Latin America. Brazil frankly is going along the same path with similar ingredients in terms of leadership, in terms of denial, relaxation etc. So this of course in the first place a problem and a tragedy for Indians but it is something that will affect the whole world partly also and because we depend on Indian manufacturing of vaccines for the rest of the world and I understand that you know, that the vaccines are needed in India but that is something that in terms of thinking of the epidemics was something I had underestimated you know the importance of, yeah you can call it vaccine nationalism but I understand that the democratically elected leader wants to take care of their citizens in the first place and what does that mean for the world and one of the lessons is that we also need national and regional security in terms of manufacturing

and no I think India can provide lots of support for manufacturing in africa for example or in other parts of the world. The top priority now is to stop this transmission and make sure that lots of people don't die. I think there is a lot of sympathy but again no silver bullet and it has to be solved from within India, from the various parts of India and thanks for inviting me. Thank you.

Sara Jacobs: So we need to stop the transmission. I think, we, everybody will agree with that. Sujatha Rao the second wave may peak soon, it may, start, there is no guarantee though that there may be a third wave as Peter points out and as we saw in the Spanish flu, as we have seen in America and Europe. What would you expect? What do you think our government needs to do on a priority basis right now to get us through this?

Sujatha Rao: I would just like to say as an opening sentence that you know whenever we write about health like Dr. Drinath Reddy will agree with me, we always start with a sentence that India's health system is in the ICU. India's health system is broken. India's health system is battered. Largely because of the last seven decades we have never spent more than 1% of our GDP and so today when we see so much tragedy, that is you know getting more and more visible, it is no one's fault. It is just that the system was never geared up ever to take care of what is happening.

That said, I think the test too has been unforgiving in it's, velocity and fierceness because even if we, I assume, had a reasonably good health system, we still would not have been able to cope with what is happening today. What I am most worries and what I think the government should do tomorrow morning is to take care of the Northern States. Waves too came in a big way in Bombay which engaged all our attention and as we see Maharashtra has the capability and the institutional capacity to really be able to contain no matter how huge the problem be and bring it down. Now today the positive rate has come down to less than 10% and I see here 6% and it is a remarkable feat. The epidemic has now, the virus has now gone to Karnataka, it is now going to the Southern States, Kerala and so on but I am not still so worried about it because these are States which have huge number of doctors, infrastructure and they can cope with it. What is worrying me is the silent spread of this virus in Bihar rural areas and the rural areas of U.P., Uttarakhand. Uttarakhand has not had more than 8 people die, the last figure was a180 people dying in a day and then you have Chattisgarh where 94% have been affected and you know, I mean you can go on, Goa has 50% - every second person is infected in Goa. These are not areas we saw affected under wave 1 and we nearly never, I mean, this is another missed opportunity that we never really took advanced

steps to see that these emerging areas which are not so badly affected in wave 1, would be the prime areas where the virus would find its home now and that is what is happening. In the rural areas of U.P. and Bihar, thye reports that I've been getting through my own contacts for the last 2 weeks has been that just in Eastren U.P. there are no testing kits.

So people have been, I mean today we have seen so many deaths coming out. It is largely because those with symptoms go to the centre and the centre says here take paracetamol and don't come back to us because we don't have the testing kits and they don't have transportation to take them to the district hospital so either they just die or they treat themselves. So what is the situation today is that we just need to open up and allow civil society and NGO organizations in taking charge and setting up isolation centres at these villages where the people, I mean the with the rapid RAT they can test out who are positive, get them isolated from their families, take care of them, if they get fever or whatever the home protocol is to provide that, use the oximeter everyday they are trained function in several of these NGOs that I know and allow them to work. If they get more serious then they can be sent to the district hospital by having tie ups. You know some NGOs and Civil Society organizations very quietly are doing very good work but they need to be strengthened and they need to be encouraged and they need to be allowed to participate. I am afraid policy here has to be much more stronger in inviting NGOs back because this government has not been very supportive to NGOs though we have heard the Prime Minister twice made this statement saying please come forward and help.

So there has to be massive decentralization to the local level and that has to be done of course advisedly because it is not like the Centre can abdicate its entire responsibility to States and the local bodies. It has a role to play and it has a function to discharge and responsibilities to discharge and what do I mean by that is to really mount a Nationwide campaign on promoting the use of masks. I don’t think distancing or I don't think washing hands is a recommendation that many, majority of our people can really implement but the government can certainly come down heavily at any crowd gathering and aggregating centres and simply not allow crowding and also promote the use of masks. I think that is a huge campaign that we have launched before for family planning, we have launched before for polio and immunization. We have launched before in a conservative society like ours for the use of condoms for stopping the HIV getting transmitted.

It was very difficult to give dignity to MSM's, you know in a highly conservative society like ours, it is not easy to promote you know men having sex with men. All these

capabilities, this history, this knowledge is very much with us and this needs to be tapped and used in doing a massive information campaign and linked to that is the complete lack of rational treatment and accessible protocols.

I mean all we do in T.V. shows is random lot of doctors where one is talking about remdesivir while another is talking about C.T. scan should be done, somebody says you shouldn't do it. Why should there be this confusion and people,then do whatever suits them or start demanding from the doctors that kind of treatment to be given. I think very strong treatment protocols need to be drafted very quickly by tomorrow afternoon for home care, for hospital treatment for mild and medium cases and for severe cases and widely publicized and with retired doctors doing on telemedicine treatment (inaudible) PHC and the different levels so that they know exactly what to do instead of running around and buying this very expensive drugs and getting themselves impoverished.

I have personally faced that in my own family, that as Dr. Reddy said remdesivir is useless, I told them that but they still spent over 2 lakhs and bought those shots, you know. Then finally I have the most important thing that needs to be done again very quickly is that a vaccination policy. Something that has been engaging my attention. I think we have messed it up and we need to straighten it out. Because it is not really anymore about the advisability of having differential pricing or the advisability of narrowing the eligibility criteria. That is there but what is most important is improving the supply of the vaccine and that is not getting the attention that it should.

We are depending on these companies which are producing today as I talk to you 61 million doses a month to take care of our demand of 1.3 billion doses to be done as quickly as possible to get that herd immunity that is so critical for you know controlling the pandemic. So that this is not going to happen with these 2 companies. There are solutions. The States and Central Government has adequate powers. It is empowered to take very positive and solid decisions to resolve this problem and I do hope they do it very quickly and sort it out.

Another key important issue that often doesn’t get media or attention in public discourse is what is happening to the children who have not been going to school in over 1 year. They have lost the whole academic year, I mean, they are children who learn every single minute and here are children who are just cooped up at home and not going to school. What about the children whose both the parents have been taken to the hospital, who takes care of them. So you know I am a member of NHRC Delhi and I was asking them, and member means there is some committee there and they have said they have

identified about 1200 children in Delhi and they are trying to make child homes so they can stay there till the parents come back from the hospital, of course hopefully alive. So you know this is a huge social problem that is emerging again and I don't think are really engaging with that kind of situation where it requires daily immediate attention. Then the nutritional support and of course the Prime Minister has sanctioned some food grains and so on but the mid-day meals have stopped and the IDCF nutritional programs of the little infants have stopped and in some places they are giving dry rations and some places they are not being given. I have been a bureaucrat for 36 years Sara and I have still, you can criticize it and you can critique it till the cows come to, you know birds come to roost but there is still a capacity and capability for them to devise policies to address some and sort out some of these issues, provided they are allowed to and there is some sort of political support.

And finally of course it is an opportunity to bring in institutional innovations. The Ministry of Health as it is designed today is not being able to help us to overcome the future pandemics at all and there are going to be many more. If we see the history of this virus starting with SARS in 2003 and we never listened to the signals it was sending. There was SARS, there was Ebola, there was H1N1, there was swine flu and it went on and on and on and it is finally broken up in this very dramatic and traumatic manner and I don't think we are seeing the end of it. So after we are quietened down and you know the fire has been ut it, what we are going to see is a wreckage among all sections of our society these battered lives would have to be result again systematically and I would say that we should probably gun for the council of sorts with the Prime Minister chairing it, with the Chief Ministers to slice out which are the populations segments which require special interventions to get them back to the old normal that we knew before the pandemic - lost income, lost educational opportunities, lost you know parent's gone, lost families so on and so forth so I think that is something we need to do and finally of course systematically rebuild our health system.

Even as I said, let me come back to my loop - Bihar has, I mean average for 1 doctor for Indian population is 1500. Bhar it is something like 1:37000. How do you expect anyone to do anything so there had to be massive attention to U.P. and Bihar in terms of not just the hospitals and oxygen plants but the distribution of human resources. And even as i am talking today it is very important for them to take innovative actions such as getting 5th year MBBS students to work whereas 5th year MBBS students, Ayush practitioners in U.P so some of them are very good and some of these Ayush practitioners are very experienced. After all giving someone a shot and giving someone a paracetamol doesn require you to be a greatshot specialist and therefor when we see

the oxygen falling below 88 and take the to the hospital so these kind of nurses and so on you have to ramp up and provide more doctors and human resources personnel and support for both these States to cope with what is coming now.

It is a grim and a serious situation and I think they are doing their best in Delhi. I can't think of saying that nobody is scared or nobody is doing their work but the point here is that a multifaceted approach has to be taken and very quick decision making on some of the 2-3 issues that will make a difference. Because why I am saying vaccines again, whatever decision you take today, it will take 4 months for you to get whatever is the required vaccine and I am saying that in 61 million, we have to build a capacity to get 300 million a month. Instead of vaccinating 4 million a day we have to reach upto 10 million persons and if you are saying is this a realistic target? I am saying, I am putting my entire 36 years experience on a wager to say that we can do it but provided there are lots of caveats in it and all those policies are taken care of. So let us hope we come out of this very quickly. It has been a very traumatic experience. Many of us have lost friends, many of us have lost family members. I still have good friends battling for their life so it is very difficult to talk about wave 2 without getting emotional. Let us hope that we just get out of this fast.

Sara Jacobs: Thank you Sujatha for giving us a really comprehensive look at what the problem is. Let us hope we get out of this. Will we get out of this Gautam Menone, modelling infectious diseases is something you have been interested in for a long time. Any good news at all in this front? When do you see this wave peaking and is the third wave inevitable and what can we do to prevent one?

Gautam Menon: Let me just start with a sort of broader issue before we can even discuss a problem like this and that is the question of data and its absence. How do you make a transition between the anecdotes that you hear to real evidence you can based on sort of policy. And the question you have raised about what happens in the future is of course important because there is the difference between a purely reactive policy versus something that is proactive, that tries to anticipate what happens in the future though you can not see it perfectly. That is why you need models but right now as Sujatha Rao pointed out, models have to deal with a lot of very corrupted data at the bottom and right now the data that is coming out of States such as U.P., Bihar, Jharkhand etc. is not clear to what level one can trust these numbers anymore because there is a huge variance we see between numbers on deaths and cases that you see on the ground and numbers that are reported officially. So alongwith that is all of these new entities that have entered the discussion - the new B161 variant and its various sub-

variants, some of which may be more important than the others. So the models we have we do need to retool and re-adjust to account for a whole lot of more complication than the original model that we used. So I just wanted to talk about what goes into these models - the nature of this data and where to get the information that feeds into these models in the first place.

Muc of modelling really now continues to use numbers derived from U.S. typically U.S. U.K. data and China data. There is relatively little by way of models based on Indian data because we do not understand or have those numbers in a comprehensive enough sense. So one thing that we do know is that towards as we get to the older populations in India, 65+ it is a little less as compared to the analogous numbers for the Western population so that is certainly one sort of number, one sort of evidence that we know we can peg any sort of analysis on but much of the rest we really don't know. For example, anecdotally we have heard in the first wave that there were a very large number of asymptomatics. But is that number 50% or is it 80% or is it 90%? You hear a huge range of numbers and you don't hear anything that really enables us to pin a specific modelling parameter on that. What about symptomology in different waves? Are people showing different symptoms in different waves? Again not very clear. We just have anecdotes and no real information. But the real interesting point that I want to make is just the answer to these questions. By the 15th of January let us say or the 15th of February let us say when the 2nd wave took off, how many people in India were infected? It seems like the most straightforward question to answer. In some sense it seems like the most basic question. You had a peak that went up, a peak that went upto 15th of September. It came down very gradually. The little blip during the festival season in India but by and large it came down to little above 10,000 by the middle of January or the end of January. But the question of how many people were infected, you get answers ranging all the way from 20% at the lowest level to something like 60-70% at the highest level. The only large scale information we have comes from the ICMR sero survey that really gives you numbers that are really on the lower end of the most conservative estimates that you have because they tell you it is quite around 20-22% pan India but the number in actuality is much larger. If you look at the sero surveys in the big cities, you get much larger numbers, you get numbers like 50% and 60% and so there is some gradient between rural India and urban India and it is important to account for this in the calculations. It is interesting that there is no theoretical calculation really that gets you a number that is that low. This has a very important implication for the number of people who are susceptible to the second wave. How many people are left at the end of the first wave who could catch the disease if you assume that reinfections are not important.

That brings me to the second point of importance about numbers. What is the significance of reinfections? How many people are being reinfected? People who were infected the first time and who catch this infection again. Does having it in the past, does it protect you in anyway? Are we talking about 5% of the people who caught it the last time catching it a second time? Are we talking about 20% or 30% of the people who caught it the last time are catching it again this time? This is a number we do not know.

The other thing is vaccine breakthroughs. Of course anecdotally all of us know people who have had one dose of vaccine or two doses of vaccines etc and then caught Covid-19. As far as we know it's very protective, any vaccination is very protective against serious illness except there are people with some level of mild symptoms are those who test positive and the question is, there has been some level of breakthrough there. Can we estimate the fraction of people with let us say mild symptoms or possibly even severe symptoms among those who have been vaccinated? We have no information.

So where is this information coming? How does one lay one's hand on it? First of all let us say go to a specific hospital or some specific small state and try to get this information. This information is actually all there. The Indian Council of medical Research, the ICMR collects information on every test that has possibly been done for Covid-19 in India. Every test. Okay? So with that information and given that it is linked to Aadhaar numbers, to various IDs, to telephone numbers etc you can ask. If someone tested positive for March or April last year, did they test positive again in October of last year. Of the people who tested positive in October, many are etsing positive in March or April at the end of the second wave. That is important information. Do you know what tests they took? Do you know the efficacy of those tests - can you glean it from this data? Can you link databases together? There is an agency that looks for example at vaccines. Can you link records of people who have been vaccinated and can you link data of people who have tested positive and combine that particular piece of information together. Can you look at aarogya setu which monitors how people travel once you download that app and ask, did this expansion of people's movements, did that have any correlation with how the disease spread? You can look at data by the (inaudible) Corp, you know which is genomic sequencing setup by the government and then you can ask where are these variants coming from? Was there any early warning signal in those variants in the data in terms of sudden rise of the positivity of the cases at the district and sub-district level. The point I want to make is that this data is all there. It just has to be released and made available appropriately to people who can then study it. Right now that database is just increasing in size if you look at the number of tests it is a

horrendous number of tests that we have actually done but the analysis that has got to go in to extract every little piece of information that is of incredible importance for the analysis of Covid going forward, for me that analysis is not being done. So I think for me it is a priority that when I talk of data or when I talk of models to ensure the sense that we have sensible data and sensible information that feeds into those models in the first place. let me just finish, every person who spoke before me said all the right things about masking and improving the health system etc.

Let me just make two points. This pandemic came from a spillover event. It came from bats into human beings and possibly through some intermediate animal. The whole field of disease ecology is a field that tries to look at all these relationships between veterinary health, animal health, forest, deforestation, human encroachment etc. This is an important field from a scientific point of view in terms of thinking about what would happen in the future.

The second important point I want to talk about is ventilation. We have had a lot of important discussion in this country about masking and so on but we have not had any discussion in this country on ventilation. We know now that ventilation is absolutely crucial to how this disease is transmitted between people. We need to have discussions around how to retool or how to ventilate classrooms, public places, areas. We need to encourage people to go out. As we keep pointing out our messaging has been consistently negative - we say don't do this, don't go out but the one positive we know that we are approximately 100 times less likely to catch Covid if you are outside and are well masked in a not too crowded situation. Let us in our messaging try and emphasize these things- emphasize the role of masking and think about the role of ventilation and that is where the science and technology and engineering and all of this information that we have gathered about this disease and how this spreads and that is how we can feed into sensible decisions. Okay. Thank you.

Sara Jacobs: Simple steps, I think both you and Sujatha Rao, simple steps that can have great outcomes. Masking and ventilation but you touched upon the importance of data. You have a minefield of data out there but it needs to be studied and it has to be understood to be used to work to our advantage. Dr. Kang do you (inaudible) a higher understanding of this scope of India's outbreak is crucial to controlling it. Is that why we are seeing mutations and variants and if we are going to continue seeing these mutations and variants are we then just playing a cat and mouse game with vaccines?

Gagandeep Kang: I think one thing that is really important to understand about this virus is that among RNA viruses it evolves relatively slowly. But because there is so much around and there is so much, it is replicating in so many different people, it is almost inevitable that if we allow it to continue to replicate like this, we are going to continue to going to see variants coming at us very fast. Remember that we didn't have a lot of variants early on? That us because the virus was in a population it had not encountered before and now it has had time to multiply and now it is starting to encounter people that are protected it is starting to get into people who are immuno-deficient and it has opportunities to change and the only way we can prevent variants or slow variants down is by slowing replication of the virus. Now in India where we are we obviously are underestimating the scale of the infection. But these serological surveys told us that and the data that is in the news everyday is telling us more of that. Just emphasizes that when we need control and we haven't found a way there yet and in this particular, in you know the last 3 or 4 days, the numbers have been a little bit less but it's also been the background of testing numbers changing a fair bit. So we can't consider that we are done yet and as far as I can see this is something that has affected the West and North andis spreading East and South so there is much more to come.

What I don't get is that we understand the principles of control and we have been very reluctant to apply them. Whether that is by all the methods that everybody else talked about and thinking about how you slowly contain spreads through lockdowns or though limited lockdowns as are happening now. Why can't we have a concerted effort to do this? I think it it back to what I mentioned previously. There is not an understanding of who is accountable for what. And as long as you don;t have both accountability and as well as responsibility, it becomes very difficult to deliver on the interventions that are required. So if we are to achieve any level of control, to suppress virus replication, we need to do all of the non-pharmaceutical interventions and roll out vaccines at exactly the scale that Sujatha mentioned. 10 million a day is achievable but we have to be working together to do this and we are not.

Sara Jacobs: Talking about vaccines Sujatha Rao, you have emphasised the vaccines. Everybody has talked about decentralizing in a sense perhaps some would say, the Centre has decentralized a bit in the manner that they have asked States to directly negotiate with vaccine producers in India and abroad. Is that a solution according to you? Is vaccine pricing something that States can do? You have been the health secretary and at this stage if you ask the State to go to an Indian vaccine producer or go abroad, wouldn't most people already have committed to orders placed to other countries earlier? Other countries which had the foresight to place orders earlier?

Sujatha Rao: The way we are going about it is very bizarre. To begin with we have had a very well set working (inaudible) program. Where the Central Government, it is a shared responsibility - effective disease control in the concurrent list of the Constitution so when Central Government says we have done this, they are not doing any Satte a favour, it is their job and obligation to do that. So in this shared responsibility of infectious diseases across State borders, the Central Government has always been responsible for procuring the vaccines only because it has a big market and therefore its negotiating power is much more and two it will also be able to get some kind of a uniformity in the type of the vaccine that will be provided for use throughout the country. For this reason, we have not only got the capability of issuing global tenders if required, negotiating and also most important the quality assurance mechanisms of well honed in Central Government. Now suddenly the Central Government switches this whole policy and says to the States, you go and go to the market and buy your own vaccines. So are we going to have Jharkhand having a Chinese vaccine and Bihar having a Sputnik and you know different, I mean Maharashtra having a Pfizer, I mean everyone is going abroad, I mean how does it happen? Because any vaccine that comes from outside has to be approved by the drug controlled who comes under the administrative discipline of the Central Government and so therefore now they have waived (inaudible), I don;tknow what Dr. Kang feels but do we allow any vaccine to come into the country and do we use anywhere without any understanding of what it's implications could be for the people of India. You know, there are so many issues involved that you can't have this mad situation where 20 vaccine companies and each one is giving in part or full to different States. That is not the way we implement this program. What we need to do to achieve the 300 million dollars, 300 million doses is to use our power of compulsory licensing - that is a power given to us on the TIPS agreement and precisely to face the kind of situation we are finding ourselves in. Precisely for this. Never has India been in a situation where we needed to think about compulsory licensing and this is the very first time. This is a national public health emergency. What does this mean? This means that biotech, for example the co-vaccine, is completely indigenously produced. We don't need anyone's permission to issue the compulsory licensing that should have been done way back in December or jJanuary 3rd when authorization to sell was given. You have the power thereby to fix a rate and you have about at least 10 companies, 4 in the public in the sector and another 3 -r 4 more who have the capability to manufacture this vaccine in this country. And therefore as you ramp up Biotech and Bharat Biotech and Serum to produce what they have - about 200 million doses they can easily go up to and another 100 or 150 million through these other companies that are given the technology and why I said the immediacy of decision making is important today is today it is important for the government to take a decision on this. It will take a good two months for

the technology to be given to different companies. They need to revamp their production lines, some assistance might need to be given to reach that production by July or August and we have 300 million doses and we do micro planning at the district level in Binno and as as I said if we could vaccinate 26 million kids on top of the bus, inside the villages, across the river, sitting in the fields, in railway stations and so on we can easily 10 million vaccinations in a day - it is not at all difficult and then we can think of achieving of her immunity.

Sara Jacobs: Short term and long term solutions. Short term: masking, ventilation focus on that and long term: build-up the infrastructure to have more vaccines 2 months or 3 months down the line. Dr. Reddy you know I am looking at my news feed and the breaking news right now is that the gap between 2 doses of Covishield has been widened to 3-4 months. Based on a recommendation of a Covid working group. Of course questions are being raised because there is a shortage of vaccine production, I think my wrong (inaudible) on this panel but is there scientific evidence to support this and if so is it going to be made public?

K. Srinath Reddy: I am not ton he panel so let me clarify the straight way. Hello. Can you see me?

Sara Jacobs: Yeah we do. Go ahead.

K Srinath Reddy: Okay. I am not on the panel. Let me state what I understand is the state of science here. The astrazeneca trial conducted mainly in the UK and some other countries had two strands which were accidentally created of basically having, two full doses of the vaccine given, 4 weeks apart as per protocol and an additional smaller strand which had half dose initially and the full dose second time and some of these were spaced at 3 months in what was called a contractor's era. Nevertheless they found that the dse that was given 3 months later of that particular strain which was basic had better immunity in terms of efficacy when the trials were completed and the British regulator accepted that position and so did the WHO and which said okay because it is showing greater efficacy in the given 8-12 weeks which is what the WHO said. And then later a U.S. trial with 32,00 patients which was the larger trial had 2 whole doses at 4 weeks intervals and that showed 76% efficacy. So you can choose what you want from the various trial groups of astrazeneca which has been a bit messy, to say the least but nevertheless there is an option available upto 12 weeks beyond 12 weeks we don’t have ac elar cut proof. The WHO accepted 8-12 weeks. Spain is the only country that has gone upto 16 weeks. Now some, based on the immunogenicity studies, some

differences are being offered that if you do greater spacing, you are likely to get a better immune effect but if you only go by the efficacy trial then I don't think you should cross the 12 week boundary. Now why have we gone upto 16 weeks in India, is it to follow the Spanish example or is to give a greater availability of doses to people from the first dose to be spread out to more people? Those are all possibilities but the science is what the trials frustrated.

Sara Jacobs: Gautam this brings me to the issue of transparency and the trust factor - you have touched upon this. Trust in public institutions - effective, honest communication really at this point of time. Transparency when it comes to reporting cases, mortality numbers and hospitalization and as all of you have pointed out all of this needs to be lead by scientific evidence, using data. If you could just you know, what needs to change going forward?

Gautam Menon: I think it is a question of attitude more than anything else. That government agencies should be comfortable with providing material to the public that anyway the public pays for it right? The public pays taxes, provided that your properly anonymize, make sure that all security regarding the divulging personal details are left of it. It is very important data and it is important to be transparent and it is important to put in place processes that check for transparency. The default should be transparency. You should have to make a special exception if you want to conceal something. Health as a number of people have pointed out, you should not have to file an RTI to get some information that is of this nature. It is crucial to our public health effort and it is crucuai;l to understand where cases of death etc are going in this country. Not just for Covid-19 but for everything so let us move to a situation where the default is access and to cancel we have to make a special argument for.

Sara Jacobs: Specially since the solution to this pandemic could lie in this data. Alright , so we, now it is 6:40 so I want to start taking some questions. Peter I wanted, someone has a question here, what I wanted to ask you because there is as you said, that I was reading somewhere that like Covid-19, the virus disappears but its consequences linger for weeks as Sujatha Rao also pointed out. So we have a question here for someone who has logged in. What are the repercussions for the divide between the developed world and low income countries with respect to Covid-19. How can this be addressed? Because perhaps depending on who gets the vaccine, we can see the world now divided on new lines between the haves and the have nots?

Peter Piot: Yes a very important questions and I think one of the biggest geopolitical issues in addition to the issue for Covid itself and the truth is that, this problem the pandemic will not be over until it is over everywhere and so there is indeed a divide and there is a moral issue as you know there is when you have here in Europe and the U.S. we talk about vaccine, passports so certificates so that people can attend events and can travel and all that and those where the vaccines are not available will not be able to benefit from this new type of freedom so that is one issue in terms of fairness but secondly what is really very important also to go back to Gagandeep said about variants and so on, the, it's in the interest actually of every country, even in the wealthiest country, every single country in the world has full access to vaccines because as long as there are certainly millions of people living with this virus, mutants will arise and variants will emerge and these variants then at some point become really ugly. At the moment it looks reasonably okay, for a vaccine to prevent serious illness and death with the current vaccines but nobody will be safe and no country, if the virus is circulating widely. This is where a really rational, very strong argument for let us used that old fashioned road to solidarity but for massive, massive vaccinae roll-outs and that is where we were all very hopefully for India because let us not forget that Indian companies produce over half of all vaccines in the world, let us say in normal times and so it is going to be a key that the rest of the world epidemic brought on the control of India that will be of course in the first place benefit Indians but it is going to benefit the whole world.

Sara Jacobs: (inaudible) critical for pandemic control itself.

Peter Piot: Yeah, yeah, yeah. That is why this international collaboration is so important. But as you said about us, as we heard about India, even here in the U.K. Scotalnd and Northern Ireland and Wales and England have different policies. Different policies for entering the country and we are only what 65 million people and that does not make us even a very big State. So it's not that you have a unique problem. What you are unique in of course is the size and the vastness and that you know, of course, you have a perfect storm of everything that was you know said. But we need a global solution for it to get and there has been global failure and when I was in you know working with AIDS we had HIV disgust at the you know global, at the UN Security Council and at the Heads of State level. I came many times to India and Sujatha Rao was involved in it for example as well as Srinath Reddy, a special assembly of the UN - we haven't had any of that and yet this is like the biggest crises in spacetime that the world confronts. So there has been a real lack of national leadership and that siw hy the leaders of every country connect and particularly make sure that there are no barriers erected against each other and that is also because, it is a lose-lose at the end of the day.

Sara Jacobs: Absolutely. From the global, we have a question taking it down to the local. Sujatha Rao perhaps you can take this. What measures can we take to prevent the spread of Covid-19 in villages. How might these strategies differ from those in urban areas?

Sujatha Rao: Well the strategy will differ in the sense that you know, you have to understand the fact that in many of the rural areas and particularly as I said in the Northern states they don't have access to health facilities, doctors and nurses. So much of it has to be within the community itself. So we just have to use the community resources. For example Bihar has a very vibrant self help group movement . So they are a very big youth social societal resource that needs to be utilized amd then we have the Ashas who are in every village so a lot more time and energy has to be spent to get informed people at the village level and then help them to organize and isolate those who are infected and can protect themselves from getting and spreading infections in their communities and that kind if effort has to be made which also means that providng that kind of money. And stop elections. I know even as I am talking now they are getting ready for the Panchayat election. Jesus Christ. With all that is going on how can they be thinking of holding elections in the rural areas right now. There has to be some understanding at the political level to say that let communities take charge. I want to give one example here. When Ebola struck, Sierra Leone and Liberia and so on, U.S. announced..

Sara Jacobs: Sorry we seem to be losing the line there with Sujatha. Cam the rest of you hear me? Okay. So let me try and get another question that I am also very interested in...

Sujatha Rao: So that is the critical point. We have not appreciated the importance of communities and civil societies and local panchayats. Kerala's whole success is largely because of that as you know. They have gram panchayats which are so empowered they have been able to address the issues there itself.

Sara Jacobs: So both local and decentralized. Another question that another concern that everyone has right now, Dr. kang perhaps you can address this - these reports that children are likely to be affected more in the third phase because as you have said over here, new mutations continue because the virus will reproduce whenever where it will non-immune, unvaccinated body and they will jump onto the next vulnerable person and children are unvaccinated and we don't have a vaccine certainly in India for kids and is this a concern and what do we need to do to protect our kids?

Gagandeep Kang: I have heard this third wave and children are going to be more affected story and I don't understand it. Children have been affected in the first and second wave as well. yes, we are going to vaccinate everyone down to the age of 18 which also I think is way too hurried a strategy. We don;t know enough about the variants and whether this is really required to move this fast for the lower age groups. I would much rather focus on the covering the older ge groups first and then do an age descending strategy.

Sara Jacobs: So a shortage of vaccines.

Gagandeep Kang: I think the age descending strategy makes sense if you want to reduce mortality. I think if you want to take doses away from the over 60 year olds and give them to people who might be more economically productive at 25 is not the way we should be going. Because the risk is lower for the 25 year olds. Which children as well. They will get infected but their risk of severe diseases is low but it is not like it is absent. There are certain inflammatory syndromes that I have seen in children but it is for sure something that we really need to think about very carefully. The third wave I think there will be third and fourth and fifth waves because we are not going to vaccinate everybody and there will be enough susceptible people in this country to continue to see smaller waves and outbreaks and it will become maybe more localized. Seasonality plays a role and then we will have a better understanding of what that is nce we have had the virus circulating for a couple of years. I think we have a lot to learn but as for the children in the third wave, there is no science as far as I understand.

Sara Jacobs: I am so glad, I am so glad to hear you say that Dr. Kang. Thank you. I want to just something that Dr. Mitchell Weiss from the faculty of Global and Social Health from the Harvard Medical School has talked about. We haven't touched upon this enough. We did so in the beginning of the first wave, certainly in the media but the impact of this pandemic upon mental health - he spoke about this video coverage of cremations, non-specific reports of global shortages but overall mental health is something that could be the next you know, major pandemic for India? Anyone would like to take that?

Someone: Vikram is still around..

Sara Jacobs: Dr. Reddy?

K. Srinath Reddy: I can certainly take it up but when you have Vkram Patel on the panel so I feel it would be a little inappropriate on my part to try and

Sara Jacobs: It is an issue we seriously need to, we haven't given it much thought.

K. Srinath Reddy: I entirely agree. No, no I entirely agree. There are many issues now. It is not just after the pandemic but what is happening to the person who is suffering? What is happening to the person who has long covid and brain fog? You are also seeing the impact on family members and you are also seeing the impact of people who are unrelated looking at the visuals and the whole experience of anxiety, fear and alienation - all of this is a tremendous drag on the mental health, quality and stability and I do think you need particularly when you were isolating people, I mean in the early stages of the pandemic we were dragging away people to isolation rooms and quarantine without even maybe explain what is the kind of family contact they are going to have, os in a sense we even have actually put up notices on people's houses - that kind of stigma also we have created. So I think mental health has been violated in very many ways, wittingly and unwittingly and we ought to pay attention to that and then we do need to create compassionate support and give this whole issue of community engagement. It is the people who in the community are closest to you and it is those people who are most likely to provide support in these kinds of cases and of course professional health is also required. Whether it is a family physician or a primary healthcare doctor or the anganwadi worker or the Asha who is tending to you most of the times in terms of primary care or the self-help group that Sujatha talked about, all of these are going to be important but we do need to create conditions and we have spoken of children and more than immediately of the virus, it is the impact of mental health challenges that are created because of parental illness or seeing elders die in the family or being shut off from their peers, all of, I mean wondering about their education and employment future, these are things we must take care of now, even when planning for the future.

Sara Jacobs: Thank you all. We have completely run out of time so much more to talk about but clearly and in fact I will just try to wrap up - no single response to defeat the Covid-19 pandemic, decentralize, transparency in vaccine development and transparency in data and of course most importantly we need to start investing in our health. Range of actions needed for an effective response. We hope that you know, this conversation can provide some guidance to policy makers for the centre and the state, to overcome this current wave and the future waves that as you all are saying are definitely coming. But thank you all. I would quickly just like to pass on - hand over to

Tarun Khanna and Kiran Mazumdar-Shaw both of whom are co-chairs of the Lancet Citizen's Commission and if you could give us the closing remarks right now.

Tarun Khanna: Kiran you want to go first?

Kiran Mazumdar-Shaw: Sure. I think that I must thank the panellists for a very, very thoughtful discussions. I think we have deliberated on a number of very, very key points in terms of how do we deal with hsi second wave in India and I really believe that some of the very important and pertinent points that came out were about the dependence on reliable data, the fact that we have valuable data that we need to use for modelling better and the fact that we should look at how we want to vaccinate and how we want to decentralize and more than anything else, the fact that Peter also talked about is that India needs to find ways of solving its problems because India is a very vast and diverse country and you know it is about you know working out its own model. Because it is not about one size fits all. Learnings are there. We cans share learnings and I think there were important points made about how this particular pandemic has exposed the frailty of our healthcare system.

Sujatha Rao very, you know, well, sort of, put it that, you know, we need to make sure in invest and continue to invest in strengthening our healthcare system because that is what this pandemic has exposed - that we just are underinvested in healthcare and I think we ought to use this pandemic to finally convince ourselves that investing in healthcare is the right thing to do because it is of compelling self interest. We have to be prepared for another wave even if and I am hoping it will never happen but I think one thing that this particular second wave has shown us is that we aware not prepared and I think the compacne that we alls emed to have played - whether it is the U.K. over Christmas or whether it is India over recent months of elections and other religious festivals, we have got ourselves into serious trouble.

But I think, I for one, remain optimistic that we do have the way forward. We are the vaccine producers of the world and let us vaccinate our way out of this. I know the Gagandeep ahs talked about going through an age tiered vaccination process but I do believe that this time around we are seeing far too many young people dying and that is what worries me because the mortality rates that we are seeing, this time around are far greater among the younger people than it was in the first wave. Maybe it is because of this tsunami that has hit us but having said that we do need to workout and build models like Guatam Menon talked about. We have this very rich reservoir of data. Let us use it intelligently and apply it for the greater good. So thank you everyone. This has been an

excellent webinar and we will have more of these because it is very important to get citizen's to really listen and exchange ideas and ask questions. That is what this commission is all about. Thank you.

Tarun Khanna: Thank you Kiran. As usual Kiran is far more eloquent than I could be and has essentially said everything that I was going to say so I won't belabour it. So let me just thank all the panellists and Sara for kindly moderating this and a number of people here are super busy, in particular in dealing with the pandemic so we really deeply appreciate it. On behalf of my co-chairs at the Lancet Citizens Commission and the Mittal Institute at Harvard, thank you all for joining us. There is a survey link in the chat function. We would be most grateful if you could fill that out so we could serve you better. All the best.

Sara Jacobs: Thank you. Thank you everyone.