

**HELEN:** Good morning, good afternoon to everybody that's joined the call. I'd just like to thank everybody that has taken the time out of their day to listen to this important talk about the COVID outbreak and the South African perspective. I'd like to introduce you to two of our esteemed colleagues in South Africa. Prof Adam Mahomed, who's the Head of Gastroenterology at Charlotte Maxeke Hospital, and also, Dr. Zamparini from the same hospital, who's a virologist. I'm going to hand over to them to do their formal introductions. Many thanks and we will come back later for questions.

**ADAM MAHOMED:** Good morning, everyone. Good afternoon, good evening. I'm not sure where everyone is listening from. But thank you so much for joining us. In South Africa we're at the bottom of our hill regarding COVID. And there is so many challenges and issues regarding this disease. And we thought we could share what we're reading, what we're learning to the rest of the country. And it's about sharing our experiences and becoming one in this challenging time.

So I am currently the Professor of Internal Medicine and Charlotte Maxeke, which is currently considered a COVID-1 hospital for South Africa. And with me is a fellow colleague of mine who is from the Infectious Disease Unit, Dr. Jarrod Zamparini. And his task will be, initially, to give us a basic overview of COVID. And the second part of the talk will be a bit more focused to GIT, including GIT disease, a little on endoscopy, and what can we do to help our patients overcome this challenge. And most importantly, is to protect our staff, our colleagues, and health care workers. So I'm going to hand over to Dr. Zamparini now.

**JARROD ZAMPARINI:** Thanks, Prof. Thanks, Helen, for that introduction as well. So just a correction, I'm not a virologist. I'm a general physician. Just want to make that clear to everyone. But we're going to start out, just let me share my screen. You must be able to see my screen now. We're going to just talk a bit about COVID-19, the South African perspective.

So let's see. What's going on? Oh, there we go. Just a disclaimer regarding the talks, information on this slide set is valid as of today. Information's changing all the time with COVID. All my data source are at the bottom of the slides. You can the picture credits at the end. And please just refer to your current local guidelines, as well as the WHO guidelines.

And then something that I've found very useful is Twitter. It's really a great place to get medical information. And a lot of sort of up-to-date things on, there, a lot of experts on there.

So for those of you who aren't from South Africa, that's our hospital over there with Joburg in the background. We're a 1,088-bed hospital, that's tertiary level hospital, providing care to a lot of Johannesburg, a large area of Johannesburg. The medicine department has just over 250 beds. And as Prof said, we are considered a COVID-1 hospital. So we are expecting the tsunami of COVID patients, if and when they come.

So just a bit about SARS-CoV-2, or COVID-19, so remember SARS-CoV-2 is your severe acute respiratory syndrome coronavirus-2, shortened to SARS-CoV-2. Coronavirus disease 2019 is shortened to COVID-19. And SARS-CoV-2 is the causative organism for COVID-19 disease. Easy way to think about it that I explain to people is just as HIV is as the virus that causes AIDS, SARS-CoV-2 is the virus that causes COVID-19.

It's a coronavirus, part of the family coronaviridae. There are about 40 species across five genera. And it causes disease in mammals and birds. In humans it causes respiratory disease. And chances are that you have had a coronavirus before because the regular human coronaviruses account for about 30% of the viruses that cause the common cold. The zoonotic coronaviruses, though, include SARS-CoV, SARS-CoV-2, and MERS-CoV.

Just a bit of the virology, SARS-CoV-2 enters human cells with the Angiotensin-Converting Enzyme 2 Receptor, the ACE2 Receptor. The virus particles actually end up binding to ACE2 and they're then internalized into the cell. And ACE2 has high expression in cardiac tissue and in pulmonary tissue. That explains why it's taken up in the lungs.

So this is something interesting. We're all learning new terms. So this is the term  $R_0$ , the reproductive number of a virus. So what that means is how many people one person with the virus will infect, provided those people are not immune or are not taking any other precautions. So COVID-19 or SARS-CoV-2 has an  $R_0$  of 2.5. So one person may infect 2 and 1/2 people.

Seasonal flu is 1 to 1 and 1/2, and then [INAUDIBLE], the videos on this slide-- I don't know if you can see here-- but that's measles. And that's one to 15.

Now, if you compare flu and SARS-CoV-2, it doesn't sound like a lot. But 2.5, this is 1.5. And this is where I must apologize to my math teachers from high school for not understanding exponential function. But if one person infects 2 and 1/2 people, if you do that to 11 degrees or to 10 degrees-- I infect 2 and 1/2 people, those 2 and 1/2 infect another 2 and 1/2 each-- and you do that 10 times, you end up with 15,900 people infected with the virus in total.

You compare that to something like flu and you do the same, 10 degrees of infection, and you end up with only 170 people infected. So it is quite a large difference, just that 1 and 1/2 extra people infected per person.

You've also heard the term incubation period. So what that is, we have this guy here who's infected. He doesn't practice proper cough etiquette. He infects this guy. And what the incubation period means is that within 14 days of being exposed, he will start developing symptoms.

We know this is probably between 2.2 to and 11 and 1/2 days. And we're starting to learn things now about asymptomatic transmission. It's not that clear yet. But we know that during this incubation period before you start showing symptoms, you might be infectious.

So just a bit of a timeline, just to remind everyone, so on the 31st of December, the WHO in China was alerted to a mysterious pneumonia, started making the news around the 5th of January. At that time there was no evidence of human-to-human transmission. The 13th of January it first appeared outside of China in Thailand. That was the first human-to-human infection.

11th of February it was first named COVID-19. And then 27th of February, for the first time, there were more new cases outside of China than inside. And this is just a map from last night, so just all the territories in the world and countries that are affected by COVID-19. And you can really see that pretty much nowhere in the world that doesn't have at least one case.

In South Africa the first case was reported on the 5th of March. And that's what our curve has done up until then. So we're on 1,380 cases at the moment. An earlier version of this slide, I had a little [INAUDIBLE] circle for each case. But our numbers have skyrocketed. And that's the beautiful exponential curve that we all started to grow familiar with.

So this is the African Union, essentially everywhere has all affected. The countries with no reported cases, some of their own health ministers have said that's probably because they're not testing. But it's everywhere in Africa, as well. I know this talk is going out to a lot of Africa and Middle East.

If you compare this dashboard for other countries, what is good to see, though, is at the moment, the South African curve, this blue line here, is starting to flatten out. And that's been for the last three days. Whether that's true, we're not sure. The health minister himself has said that we're expecting a lot more cases by now. But hopefully, we continue to see this curve flattening.

These are stats as of last night 1,380 cases, 44,292 tests done. That works out to about 777 tests per million people. The reason that's important is that if you don't test, you don't find people. You don't find cases.

South Korea extremely on top of this, on top of things. They've done a lot of testing. They've done 410,000 tests. They have about the same population size as us.

The US has started picking up. Now, they're doing a lot of tests. Italy, the UK at the moment. Sorry, that's that's the US predicted. That's how many they want to test. That's the US at the moment.

But in South Africa what we're doing is the President announced on Sunday night there'll be a rollout of a massive COVID-19 testing program. And so we're expecting-- or the health minister, again, has announced that he's going to start doing about 5,000 tests a day, so that we can catch up on that testing and we can start finding cases.

The issue is the way to make the diagnosis, you need to do paired nasopharyngeal and oropharyngeal swabs in ambulatory patient. The problem is with these swabs, they are special swabs. They're called flocked swabs. They have to be sent off in viral transport medium. And they must be sent at between 2 and 8 degrees, or would have to be frozen at minus 70 if it's more than five days to the lab, which might be the case for a lot of rural areas.

What's preferred though is lower respiratory tract samples, that sputum, tracheal aspirate, or bronchoalveolar lavage. That can be sent in your normal sputum bottle or leak-proof container, and, again, must be transported at between 2 and 8 degrees, or minus 70 if it's going to take up to two days to get to the lab.

The NICD has a case definition. This has changed a lot. The most recent case definition, the first line is this that hospitalized patients with severe acute respiratory illness, which is fever and one of the defined symptoms of respiratory disease, and the absence of an alternative diagnosis that fully explains the clinical presentation.

They've also retained the old definition, which was before we had local transmission. And that someone with an acute respiratory illness with sudden onset of at least one of a cough, sore throat, dyspnoea, fever, history of fever. And then in the 14 days prior, you either have close contact with confirmed or probable cases of SARS-CoV-2, you've worked in or attended a hospital where these patients are, or you have a history of travel to areas with local transmission of SARS-CoV-2.

The question everyone asks, though, is how severe is it. So this is from one of the initial studies out of Wuhan, which was 44,500 people infected with-- confirmed with SARS-CoV-2. 81% of patients are mild. That means that they either have no or only a mild pneumonia, not requiring oxygen.

14% are severe. So they require admission with oxygenation. Or on radiology, they have more than 50% lung involvement. That's on chest X-ray or CT scan. And then 5% are critical. So they require some sort of intervention, be it ventilation or inotropic support for shock, or renal replacement therapy for acute renal failure.

The problem is in South Africa if you look at those numbers, I mean, 5% doesn't sound like a lot. But this is the prediction that was done early on in our outbreak. They said best case scenario is that we'd have 600 cases by the 10th of April.

So we are here at the moment. We've definitely got more than that. We have 1,380 cases. Worst case scenario is that by the tenth of April, they expected 12 million cases.

Obviously, that hasn't happened and unlikely to happen in the next eight days that we jump to that number. But the issue is, and the reason that this is important is because you look at those numbers, 81%, 14%, 5%. 88% of people with mild disease is 10 million people. Fine, they can be managed at home for the most part.

Severe disease, so these are patients that require hospitalization. That's 1.79 million people, nearly 1.8 million people. But more concerning is the critical patient. On that number of 12 million, that would equate to 640,000 patients.

The problem with that is that in South Africa, we only have 6,000 ventilators, 4,000 in the private sector, about 2,000 in the public sector. That number has come from the health minister and from a lot of news reports, around there. As far as I know, that's that's the correct number.

The next question though is mortality. So we saw in Wuhan, out of that initial study, looking at about 2.3% mortality. On the Diamond Princess, which is interesting because they tested everyone, whether you were symptomatic or not, and of the 6,000 or so people on the ship, 680 tested positive for SARS-CoV-2. And of those people, 48% were asymptomatic. And of all those people that tested positive, only 1% have died to date.

Global at the moment, the mortality rate is 5%. This is crude because it's just taking your fatalities over the people tested. You're missing all those asymptomatic patients that aren't tested. We think we're probably going to end up around this number at the end of all of this. And that's what the CDC has said. That's what Anthony Fauci said from the NIH in the States.

At the moment-- this is as of 8:15 GMT-- we're sitting at just over 900,000 cases worldwide and 47,000 deaths. This is everywhere in the world, though. The US has ramped up testing. So they're sitting on more than 200,000. Italy is on 110,000. The issue with Italy is they've had 13,000 deaths. That works out to more than 10% case fatality rate, about 13%, 12%, 13%.

Somewhere like South Korea doesn't even appear on this table anymore because they've just dropped down. But you can see different countries, countries like Switzerland that have strict social distancing that have really tried to shut things down, they have much lower case fatality, compared to places like Italy. And obviously, Italy has its own problems because of the average age of their society is much older than the rest of Europe, at least.

And this is Italy, what we've seen. This is from a *Sky News* report. Wards just full up. I mean, for the South Africans, if you did your time at Bara, even some bad days at the General Helen Joseph. This is what a ward looks like in General. But the Italians aren't used to this. This is chaos. And people just running around, nurses just falling asleep on shift because they're so tired.

Now, I think everyone saw this. I mean, this resonates a lot, with a lot of us. These are army trucks transporting diseased patients to another city's crematorium because the city they were in, the crematorium had ran out of space.

So the thing is that a lot of people are throwing this number around. I assume it to be true that Italy has the second best health system in the world. What we do know is the European Union as a whole has one doctor for every 279 people, one nurse every 117. The Middle East and North Africa has one doctor for every 794 people, one nurse for 433 people. Sub-Saharan Africa has one doctor for every 4,500 people, one nurse for every 972.

So if Europe is struggling to handle this-- you're looking at Italy and Spain specifically-- how are the Middle East and North Africa and sub-Saharan Africa going to cope? Italy specifically, those are their numbers. That's the Spanish numbers. These are our numbers, one doctor for every 1,100 people, one nurse for every 284 people.

And we've seen what's happening in Italy and Spain. So we need to be cognizant of it. And that's why we need to try and [INAUDIBLE] is flatten the curve because we need to make sure that our health care system can cope with the influx of people, based on the number of doctors and nurses we have, and facilities as well.

So just how contagious and deadly is it? Well, as we've said, it falls into this box here. The  $R_0$  is about 2 and  $1/2$  with a mortality rate of about 1%. These are great slides from a website called *Information Is Beautiful*. They've got a lot more than just this one if you want to go to and have a look at it.

You compare that to something like seasonal flu, which sits around there, chicken pox, which isn't going to kill you, but you're going to spread it a lot. Then you compare it to, in Africa, our old friend TB. We know that TB untreated has a mortality rate around 12%, 13%. South African data would put the  $R_0$  a bit closer to 10. That's also based on our HIV prevalence.

And then speaking of that old friend HIV over here, HIV has an  $R_0$  between 4 and  $1/2$  and 6, obviously spread in a slightly different way to all of these respiratory viruses. But untreated, HIV has a mortality rate of about 90%. So sure, COVID-19 not so bad compared to the diseases that we know that we treat every day.

This is quite a nice quote that I found. Said more people die from car accidents than bear attacks. We can say the same. More people die from HIV than COVID-19 or TB then COVID-19. But if you saw a sleuth of bears-- and really, that's the name-- running at you, you wouldn't say to the bear that cars kill more people. You'd take that time to attempt some social distancing maneuvers really fast. I think that's important when you think about why we're doing this, why we're doing all this social distancing.

Also, don't just think of yourself. I'm in that age group. There, given my age, I have 0.2% mortality if I get this. My grandmother's in that age group. If I bring it home and give it to her, she has a much higher chance of dying from COVID-19. Similarly, people with cardiovascular disease, diabetes, et cetera, much higher chance of dying.

And that's what we're seeing with this in places like Italy, with a much older age group, and then also in patients with higher prevalence of patients with cardiac disease and diabetes dying. So, again, it comes to not thinking of yourself, the social distancing important not to protect yourself-- I assume we're all mostly in this age group-- but to protect those that are older than us that have a higher chance of dying.

What we also don't know is what it does with HIV. We have the highest HIV prevalence in the world, 13%. It's about 8 million people. And of those, only 55% are virally suppressed. We know that patients with HIV have worse outcomes with other respiratory viruses. So we're not too sure what will happen with HIV. But at the moment, we're assuming it's probably not going to be good.

Another issue is what about PPE. We've seen people all over the world running out of PPE. We've seen American doctors be warned by the health institutions for speaking out about this. So I was going to cover this. A surgical mask is designed to prevent droplet spread from the wearer to the general public. And it prevents wearers from being splashed in the mouth by body fluids.

I assume most people on here are gastroenterologists. You all know why you need to wear a surgical mask and what fluids you're exposed to. But what they don't do is prevent the wearer from inhaling particles the size of a virus. And this is the issue with people wandering around the streets wearing masks that they provide a false sense of security in terms of protection. New data is coming out. The WHO will revise their advice on masks in the coming days. But for now, we know this to be true.

An N95 mask, for those that have worn it, you know it's not the most comfortable thing. But what it does is prevent inhalation of particles larger than 0.3 microns with 95% efficacy. That's the name. It should be used by health care providers doing procedures which cause aerosol formation, so, again, during gastroscopies, colonoscopies. It's an important bit of equipment for you guys to be wearing.

So this is the WHO guide. And for the moment, if you're providing direct care, surgical mask, gown, gloves, eye protection, these guys here. If you're doing aerosol-generating procedures, such as intubation, chest physiotherapy, sputum induction, bronchoscopies, and then gastroscopies, colonoscopies, you're going to wear this equipment here.

So just a brief note on management. This is from the NICD's guideline classifying mild disease and what's classified as mild disease and who's able to safely self-isolate. What we do know is that the single most effective supportive measure is oxygen. You want to target a sat of more than 90% in non-pregnant adults. You're going for sats of 92% to 95% in pregnant patients.

What you must do, though, is consider the risk of aerosolization of high-flow oxygen and NIV. And you saw those pictures from Italy with the guys in their space bubble. And that's what that's doing, protecting aerosolization.

Our current guidelines from the NICD, they keep changing. But they don't recommend any current specific treatment because of the lack of randomized control trials. What we do know is about a couple of drugs, chloroquine has a long-term safety profile. It works by blocking viral infection by increasing endosomal pH. It interferes with glycosylation of cellular receptors for SARS-CoV. And it also has immune-modulating activity, which may enhance antiviral effects. And recently, it's been FDA-approved for emergency use of COVID-19. So there is precedence for using it.

It is widely distributed. Importantly, it goes to the lungs after oral ingestion. And it seems hydroxychloroquine seems be more potent than chloroquine in vitro studies. We've only got chloroquine in South Africa. It's your plasmoquine. And there are 23 clinical trials currently ongoing for chloroquine.

Little bit about Lopinavir/Ritonavir, we all have experience with that. It's a protease inhibitor. It has a firm track record in the management of HIV. Has in vitro activity against SARS-CoV, so that's SARS-CoV-1, and has some activity against MERS-CoV in animal studies.

But this trial came out about two or three weeks ago in the *NEJM*. And what they took was 199 patients. They all had [INAUDIBLE] sats of less than 94% or a P/F ratio of less than 300. They divided them into two groups, lopinavir plus standard care or standard care.

And standard care involved oxygenation, ventilation as needed, renal replacement therapy, inotropics, or whatever else was needed. And then they looked at the primary outcome, which was time to clinical improvement, which was 16 days in both groups. So there wasn't any benefits of Aluvia, lopinavir and that group.

In secondary outcomes, though, what they did show was a decreased length of stay in the lopinavir group. Mortality was less in the lopinavir group. But there were more GI side effects. And we know from our HIV patients that a lot of them don't tolerate Aluvia because of the diarrhea and the vomiting. These secondary outcomes have to be taken with a pinch of salt, though, because of the small numbers. For now, we have to just keep seeing what Aluvia does.

Tocilizumab, a lot of good data coming out about this. It's an anti-IL-6 monoclonal antibody. The biggest trial we have at the moment is 21 patients who all met criteria for severe or critical COVID-19. And all of them had relief of fever within one day.

And anecdotal reports from South Africa report the exact same thing, relief of fever almost immediately after giving the first dose. A CT scan showed reduction in lung opacity for most of the patients, or nearly all the patients. There was a reduction in symptoms within a few days of therapy. And there was a significant reduction in CRP, which returned to normal within five days for 84% of the patients.

Again, if we're thinking about South Africa, a 400 milligram vial of Actemera or Tocilizumab costs 7,000 rand. So it's something that we're going to have to look at. But the affordability is in question. Other things that I'm not going go into, but zinc and vitamin D, Azithromycin, and IVIG also being looked at.

There's a lot of talk about ibuprofen. French officials warned that it could worsen the effects of the virus. The reason is that ACE2 receptors are up-regulated by ibuprofen. The WHO currently doesn't recommend against its use. But the NICD in South Africa recommends that it may be prudent to avoid this class of agents where possible, unless prescribed for another chronic condition. So for fever, use paracetamol. And only keep on your ibuprofen if it's already prescribed for something else.

Certainly, for ACE inhibitors we know that ACE2 levels are increased with ACE inhibitors or angiotensin receptor blocker therapy. So theoretically, there's an increase in viral transmission with up-regulated ACE2. And there's an increased cardiac expression of ACE2 on ACE inhibitors, which might explain the increased risk of cardiac events, the increased risk of death in cardiac patients on these drugs. The ESC and the NICD don't currently recommend stopping ACE inhibitors or ARBs. So you're going to have to just watch this space to see what happens with these drugs.

In terms of corticosteroids, they aren't currently recommended for use by either the WHO or the NICD unless other indications exist. And that's because there's short and long-term harm in steroids use in SARS with no survival benefit. And there's evidence of that. There's also increased mortality in influenza and MERS with the use of steroids. So what you do know that the prevention is better than the cure.

Vaccination, while there's 10 clinical trials in progress of this vaccine, couple of phase 1 trials in progress, at the earliest, though, we're looking at 12 to 18 months. So for now, social distancing is important. But for African testing-- that's Atticus township-- we have 10% of our patients, or people in our country living in informal settlements, 5 and 1/2 million people. And social distancing is impossible for these people. And we need to understand that. And we need to think of the South African context. When we just keep punting social distancing, what does that mean for a large majority of our population?

Similarly, we keep saying hand hygiene, so it's a bit weird because we don't shake hands anymore. These are some greetings to go with. I personally like the live long and prosper. I feel like it's a good thing to say during a global pandemic. But anything else, as long as you're not making contact.

And then wash your hands. The reason for that, soap is like a nuclear weapon to this thing. The outside of the virus has a lipid bi-layer. And the best way to think about it is if you have a greasy pan, you add Sunlight liquid to it or dish-washing liquid, the grease just dissipates. And if the same thing for the virus. You add soap to it, that lipid bi-layer falls apart. And it falls apart and goes straight to virus hell. So that's the end of that.

Again, though, in our country, 26% of people don't have access to water in their houses or on their property. And that's even less in the rural areas. 60% of all Africans don't have access to water in their houses in rural areas. So expecting someone to go and wash their hands every time at the communal tap if it's working, and again, it's something that we need to think about in the South African situation.

The question is, though, I mean, does this work? Does hand hygiene work? Does social distancing work? Well, we have historical information about this. This is the 1918 flu pandemic.

In Philadelphia they had sailors arrive home in port with flu symptoms. They infected their entire barracks. But they needed money for the war effort. So they had a parade. 200,000 people attended. 72 hours later, every single bed in the city's 31 hospitals was full. And two weeks later, 4,500 people were dead.

In St. Louis, similar thing happened. Sailors arrived home with flu symptoms. But the health commissioner was ahead of his time. He issued an emergency order. Shut down all schools, playgrounds, pubs, and churches. Sounds exactly like what's going on in most countries at the moment. He also restricted attendance at funerals.

And this is what happened. St. Louis had this-- the parade was on the 28th of September. Sudden spike, by three weeks later, their death rate was 250 per 100,000. Unfortunately, then, everyone was dead. So their death rate dropped. And it flattened out.

St. Louis did the opposite. They closed everything down. And they had the lowest death rate in America during the 1918 flu pandemic, a small spike here in mid-winter. But what this is, is this term of flattening the curve. I'm sure you've all seen that picture. I've taken it out of my slides. But the health care system, the limit is here.



So if you go above that limit, as happened in Philadelphia, you overwhelm the health care system. And you just can't cope with the number of patients, whereas if you social distance, wash your hands, all of that, you prolong your outbreak, sure. But you never overwhelm the health care system. So doctors and nurses can cope. And just the sheer number, the bed number can cope with it as well.

And this is a modern example. This is South Korea. South Korea is really interesting. They didn't have an enforced lockdown. They just said to everyone, look. This is what's happening. If you social distance, you're going to stop this. And people stop going out. They stopped going to restaurants, stopped going to movies. And the restaurants and cinemas started closing down because they said, well, no one's coming. We might as well help out with this.

That happened towards the end of February. And as you can see, just their case number has dropped. And their curve is nice and flat now. And South Korea is almost back to normal.

So that's my part in this. Want to say we're all in this together. We need to stick together. That's a picture from the Solidarity Fund. So just stay safe. And I'm going to hand you over to Prof. Mahomed, now.

**ADAM**  
**MAHOMED:** Thank you, Jarrod. That was a really nice presentation. I think we'll take questions at the end of the talk, both talks.

**JARROD**  
**ZAMPARINI:** Perfect. Over to you, Prof.

**ADAM**  
**MAHOMED:** Thank you so much. So we have a few slides that are very overlapping. And I think it's important for us to highlight the issues. And this is a disease that's putting a burden on an entire world. It's affecting economies and that. So why is it of importance to the gastroenterologist?

We're far from the respiratory tract. The pulmonologists are at the front line. Because it's going to affect and has affected our practice day-to-day. Do we as gastroenterologists need to know what are the symptoms of respiratory? What are the high-risk features? Yes, because it's going to affect our practice when patients are inpatients and when patients are outpatients.

In South Africa Dr. Zamparini has highlighted our rates already. But what needs to be highlighted is we've already lost two health care workers, two doctors. One was a professor in HIV, and we've lost that.

If you look at the Italians, they've lost 60 doctors. And it hasn't [INAUDIBLE] to take into account the other workers, the nurses. So we need to be vigilant and come up with a reasonable approach that works for patients, as well as our staff members.

There are these progression to multi-organ failure, the most common cause of death. That is more likely in patients who are elderly, as mentioned previously. And we need to know about the co-morbidities that patients are presenting to us, especially chronic renal failure, diabetes, COPD. And also, what's the history of malignancy in the past? There's lots of issues regarding IBD, as well as immunosuppression. So we need to look at all of those high-risk features in our patients.

It's most commonly recognized mode of transmission is via the respiratory droplets spread. However, the virus has been proven to be found in other bodily fluids, including feces. And very interesting, a recent article has found SARS positive in patients with GI symptoms in the absence of respiratory symptoms. So we should pause and remember. You can have GI and positive COVID in the absence of respiratory symptoms.

What about this interesting study by Luo? SARS-CoV-2 enters ACE2-expressing cells that are found in the lung, but as well as multiple areas of the gut. This may explain the enteric symptoms associated with COVID-19 infection. In the study one can easily see nausea, vomiting, abdominal pain, a significant presentation in patients. And this has to be taken in account in patients presenting to you.

This may not be simple dyspepsia. This might be COVID too. And we need to be understanding that these symptoms may precede respiratory symptoms. And this has significant implications for endoscopy service, both urgent and non-urgent.

What about testing? Should we be happy with our testing that we currently have? Remember, a single negative nasopharyngeal swab may not exclude infection because of the rate of these false negative PCRs, especially early in the disease. Viral RNA may degrade if the sample isn't stored and tested [INAUDIBLE] And Jarrod has highlighted the standard that we need to do.

Remember, depending on the timing of when the virus is in you, you may have a negative nasal swab and a positive pharyngeal swab as the virus moves down towards the lung. This may be improved by repeating nasal swabs 24, 48 hours apart and taking samples from different sites to improve test yield. The gold standard for respiratory sample is bronchoalveolar lavage. But this may not be feasible. So considering non-respiratory samples may be of value.

PCR on stools is positive in a third of patients. And in some patients where respiratory samples have had false negative, in two patients with stool samples that were PCR positive, live viral cultures were also positive, confirming the presence of live viable virus presence in the feces. Some patients who were recovering still had persistent stool PCR positive. These patients may have a potential for recurrence and ongoing transmission from ongoing viral shedding in the feces. At this point in the pandemic, where presently high new transmission rates, exploring GI manifestations of COVID-19 infection is limited by the perils and risks of endoscopy in these patients.

And a recent case report would highlight our challenges in our profession, in endoscopy and as well as the COVID-affecting impression of hemorrhagic colitis. As our clinical experience with this disease expands, so we are learning more about the different GI manifestations from patients who are already infected and are presenting with GI complications. For example, this case report awaiting publication, a 71-year-old returning to the US from a 10-day trip to Egypt presented with exclusively GI symptoms of acute diarrhea, which developed into dysentery with abdominal pain, nausea, and vomiting for over a week without respiratory symptoms, no fever.

Respiratory symptoms developed nine days after onset of GI symptoms. Nasal swab and stool positive for PCR for CoV-2 and 19 infection. Endoscopic features findings that seen on the picture, there were areas of mucosal erythema histology in keeping with previous SARS that was described in 2003 with GI infection histology normal, but virus identified on biopsies by electron microscopy.

The patient was treated with chloroquine, and the GI symptoms improved. Follow up imaging, colitis resolved. Respiratory recovery lagged behind the patient, but made full recovery and did well. This is the first report of colitis where other etiology is excluded. Is this SARS-CoV-2 a normal presentation? I think we need to be vigilant about strange manifestations of CoV-2 and we need to document this and share this with our colleagues.

Why is endoscopy staff at such a high risk for COVID-19 transmission? Endoscopy requires close proximity to patients. The highest risk of getting the infection is when you have aerosolization of respiratory droplets. And this is what endoscopy does.

In a very interesting study from 2019, the face exposure-- and we look at the exposure of gut bacteria to a face mask of the patient of the endoscopy and colonoscopy-- up to 45% had bacteria that were related to the colon. And this tells us in the presence of COVID, which has a much more high infectivity rate, we as endoscopists need to be really vigilant and really think hard about whether we need to do that colonoscopy or even gastroscopy at the current moment.

Any person in an endoscopy room was shown to have up to 1.8 meters was at risk of being exposed to bacteria in that study. Remember, non-respiratory transmission, fecal-oral transmission, and it's been already proven in biopsy specimens. And remember, you can still be infected whether you are asymptomatic or mildly asymptomatic. And this may have an effect on our out-patients and how we triage patients.

And the endoscopy unit urgently needs to establish temporary standards of practice during this period of uncertainty with COVID-19. How do we do that? I think we have to document things and have SOPs and checklists put into place. Infection prevention guidelines need to be written up for every endoscopy unit or wherever it's done, even it's done in theater.

We need to minimize the risk of infection of endoscopy staff, patients, and their families. Limit unrecognized and preventable spread of COVID-19. A screening modality before patients get to you are important. Protocols may need to be adjusted as new evidence and clinical experience evolves.

As a practical example, we used in our department the BSG guidelines last week. This week, those BSG guidelines have changed. So we have to be keeping up-to-date on a daily basis, as evidence becomes available.

Scheduled endoscopic procedures should be re-evaluated. All elective or non-urgent procedures should be deferred. Semi-urgent or high-priority procedures should be evaluated on a case-by-case basis. Urgent cases that cannot be deferred should continue with recommended PPE. We need to use common sense. Oncology is a difficult area to deal with. But we need to individualize cases. We always need to put it at the back of our head risk-benefit ratio.

So what should we be doing? Patients attending the endoscopy unit, pre-screen for high-risk exposure or symptoms. I can't emphasize that as well. We need to also maybe consider doing temperature monitoring as patients enter your unit to make sure that we are not missing asymptomatic disease.

What is their history of fever, cough, sore throat, dyspnoea. Also, remember, out-patients are coming to us with GIT symptoms. Is it COVID-related GIT symptoms, or is it the normal GI symptoms? Our index of suspicion must be very high.

Remember to look for contacts with family members, high-risk travel history. And also, when doing temperature, remember, non-contact monitoring. Avoid patient density within the unit. Minimize family escorts. Keep patients a minimum of 1 to 2 meters apart. You probably have to reschedule patients and do a booking system. So instead of having 20 patients in the morning, you have to spread it across, 10 and 10 in the morning and afternoon.

When performing endoscopy, remember, high-risk procedure aerosolization. We need to risk-modify our behavior so that we are at least reducing our time of aerosolization and exposure. The patient, when coming into room, should be intermittent. And high-risk patients should wear surgical masks. This mask should be removed just before the procedure and replaced as soon as possible, without undermining the patient's recovery. Look at the patient sedation and oxygen saturation and then once saturation improves to over 90% on room air, consider putting the face mask on.

Endoscopy personnel, standard high-end washing protocols. As doctor Zamparini highlighted, the nuclear bomb is really soap. Before and after all patients, I can't emphasize soap washing, hand washing. Remember, the room needs to be decontaminated. Contact with all potentially contaminated surface has to be cleaned prior to you bringing the next patient in.

Before putting on after the removal of PPE, including gloves, remember, standard hand-washing protocols. All staff are to be trained on correct procedure of wearing and removal of PPE. This needs to be documented. And remember, education and re-education, training and retraining so that the standard of PPE is held to its maximum level.

This slide, I'm sure, we've probably seen. And it's everywhere. I'm not going to go through all the details of this. But I just want to highlight one aspect of this. In all of these steps, hand-washing, hand-washing, hand-washing. And I would like that to be a take-home point for any of our endoscopy units is hand-washing is most important to prevent the spread of this infection, especially in avoiding us taking these deadly organisms to our families.

What about the endoscopy? What about the scopes? So scope reprocessing, scopes are reusable accessories. Should we reprocess. According to current standardized reprocessing guidelines, viral transmission through endoscopy has been limited to a very few cases of hepatitis B and C. Failure to adhere to reprocessing and disinfection protocols are implicated.

And remember, with the ECP scopes, this is a high-risk endoscopy procedure. And with best of cleaning modalities reprocessing, we still found infections. So in particular when it comes to ERCs, do you have to do the scope now? Can it wait? Remember the asymptomatic patient. It is, again, recommended to reinforce training and personal meetings on a strictly following reprocessing guidelines. This needs to be documented and a checklist needs to be done.

The endoscopy room may remain stable and may be exposed with feces for at least 24 hours. For all intermediate to high-risk COVID-19 patients, we have to decontaminate all environmental surfaces. Endoscopy furniture, floors should be disinfected after each procedure.

Remember, wherever your hands have been, remember the potential spread of droplets and hanging around droplets. So you may want to delay and increase your time between procedures. Ideally, negative pressure rooms with a delay of 30 minutes before next patient may help us minimize the risk to our patients and our fellow colleagues. A standard room where endoscopy do not have negative pressure facilities, delay one hour before next patient. Allow for the micro-droplets to settle. And then start cleaning and disinfecting.

We've done the endoscopy. Remember, asymptomatic high-risk patients still infective. All these patients we recommend a telephonic follow-up, up to seven days to 14 days for screening for interval symptoms and fever. What happens if they do become positive? You then have to do contact tracing and alert all those that have been exposed. And you would like to also do temperature monitoring for all staff twice a day so that you are picking up any early disease so you can self-isolate and reduce the risk of infection in your colleagues.

Record keeping of patients who have been canceled or deferred for rescheduling at a later date it is imperative. We cannot increase our loss of patients because we've forgotten about them. As soon as this crazy period of COVID settles, we need to get back to helping our chronic patients.

Contributors to person-to-person spread of SARS-CoV-2, those that are asymptomatic or mildly symptomatic individuals, may have been neglected or underestimated for investigation. Remember, testing is not 100% accurate. These patients were also largely responsible for the high-rate of new transmissions in many countries.

Non-respiratory routes of transmission, there is more and more literature coming out that fecal-oral in particular may help to explain the rapid spread of COVID-19. Recovering patients may continue to send viable viral particles beyond the symptomatic period. And it is important for us to have proper hand and stool hygiene.

That is my last slide. And these are the references. My recommendation is that we keep up to date. There is a webinar by the American Association on the same topic again tonight. And remember that all of these reports are changing on a daily basis.

We have to be vigilant and put important mechanisms to make sure endoscope processing, endoscope patient processing are adhered to. And we should have social distancing, even in our units. Thank you so much. And I think we could have some questions, now.

**HELEN:**

Thank you Prof Mahomed and also, Dr. Zamparini. I just think that was a fantastic presentation, bringing the audience up to speed about potential burdens of COVID-19 in a low to middle income country, and also, strategies to manage in an endoscopic setting. What I found really prudent was that you touched on the strange manifestations that have been highlighted, but very minimal reports in terms of the endoscopic treatment of patients, and also, why endoscopic staff are at risk.

So what I think I will do is if anybody has got any questions, please could you type it in the Q&A task bar at the bottom of the page, and I will ask the questions to the two faculty. And then they can decide on who's best to answer it. In the first instance, I just wanted to ask one question that's been asked already. So who do you think is making the decisions? Or who is making the decisions on the patients that can be rescheduled or not and how best to manage these?

**ADAM**

So Jarrod, I'm going to answer that. I think--

**MAHOMED:**

**JARROD** OK.

**ZAMPARINI:**

**ADAM** --the most senior person in an endoscopy department should be doing this. The wealth of experience and  
**MAHOMED:** knowledge needs to risk-stratify these patients. And I would want the most senior person documenting yes or no and when. And link to this is a contact number for that patient so when we get back to some sort of service delivery, we must be able to contact the patient.

And another point is you have to give patients contact details if the situation changes. If someone now comes to you with dyspepsia and you thought it was COVID and then presents a week later with hematemesis, that patient must be able to come to your endoscopy suite after being triaged, managed for assessment. Thank you.

**HELEN:** Thank you. The next question comes around limited resources. Should surgical masks be used during G scopes and C scopes?

**ADAM** So Jarrod, I'm going to answer this again. Surgical masks prevent droplets spread. These procedures are high-risk  
**MAHOMED:** procedures. Aerosolization, you're at increased risk of getting not just COVID, other infections as well. So I would tell you a minimum is an N95 mask with a visor. And the important thing is visor and a hairnet.

And right now, it's full PPE, a gown, which is impermeable to water, as well as an apron. In our current context, imagine you're going into a nuclear disaster with radiation. That's the degree of risk that these procedures have. And I would emphasize full PPE, N95, visor, gloves, proper donning and doffing of PPE, and also discarding all of that in a correct way as well. Jarrod, would you like to add anything?

**JARROD** No, no. I think you covered it, covered it all. N95, wear [INAUDIBLE] these procedures, yeah.

**ZAMPARINI:**

**HELEN:** OK, my next question will be, how will you manage the different priorities coming into the endoscopy unit once the crisis has subsided?

**ADAM** So I think what's going to happen when the crisis subsides, there are some articles coming out from China on how  
**MAHOMED:** we're going to deal with this issue post-COVID. Remember, you're still not going to be 100% COVID-free. You still have to have an SOP regarding how patients come. I think this disease is going to change our practice forever in the future.

We have to monitor and continue with screening. Remember the asymptomatic carrier. It doesn't take away-- if we reach the peak, it doesn't mean the disease is gone. So I would, again, want a triage system, proper history-taking, proper screening. And this can be done telephonically, so you don't bring the high-risk patient back into the unit. And you get them tested at the right place.

If you are asymptomatic, COVID-negative, you've got the numbers down, you have to come up with a strategy to catch up with what we've done. It's not fair on humanity and all other patients that their diseases are put on hold. I think for me, what I would do would probably engage with management on how do we do catch up. We have to catch up in the afternoons, in the evenings, on the weekends to get back to where the patients need to be. Colonoscopy screening need to be caught up. We need to get back to normality, but in a responsible way, and not delay the whole system.

**HELEN:** Thank you. The next question is regarding shoes. There's some data from Singapore suggesting that shoes may be an important vector in the health care setting.

**ADAM**  
**MAHOMED:** So Jarrod, do you want to answer first before I answer?

**JARROD**  
**ZAMPARINI:** Yeah, sure. But I don't mind. Look, obviously, shoes, we know that your droplets are falling to the ground. They're landing on the ground. The thing is it depends on how long it lasts on the ground, its viability. And then even what we're seeing is that even though we've seen all these reports that virus is lasting five to nine days on surfaces, is that viable virus? Does it have the ability to reproduce?

What I'd recommend at the moment, none of the WHO, NICD, CDC, anyone recommends shoe covers. It might be different in terms of endoscopy because of sort of all the fluid that's going around, as much as virus shed onto the ground. But what you should do in any case is if you're getting home-- and this is what we're doing in our hospital now-- we're all wearing scrubs to work. So we're coming to work, changing into scrubs, changing into other shoes, and then changing out of our scrubs and into other clothes when we go home. And as you get home, you put those scrubs from the plastic bag or another bag and your shoes into the wash and wash them.

So I haven't seen that data from Singapore. I'd be interested to see it. But I think it sort of runs in that we don't know enough about this. As Prof says, the hair covers are important as well. And the shoe covers might be important for the same reason that it's spreading in virus places that we're not thinking of.

**ADAM**  
**MAHOMED:** So I think from a GIT point of view, I would suggest you have to wear shoe covers because we know from this study where they did it with the face mask and colonoscopies that feces soiling was of the entire room, 1.8 meters. Masks that were kept away from the entire procedure was contaminated.

And it's a lot of soiling. I think, Jarrod, from a practical point, we have a lot of stuff that are leaking out on us. And I would recommend for gastroenterologists to be using absolutely full PPE, including shoes. But I accept what you're saying and I think I never used to wear scrubs. COVID-19 is now making me wear scrubs. And I don't take it into my house because the family's a bit cranky about that.

**HELEN:** Thank you I'm going to stick-- we've got quite a number of questions to go through. So I'm going to stick to the PPE questions initially. And then we've got some questions, particularly related to patient conditions in the EOS, in ERCPs and other endoscopic management of patients. So let me stick to the PPE questions, first of all. We have a question to say that, must a doctor change the PPE for each patient being scoped?

**ADAM**  
**MAHOMED:** Jarrod.

**JARROD**  
**ZAMPARINI:** Yes. That's it. I mean, look, you are scoping patients. One might have COVID-19, one might not. And you risk spreading it from your PPE to the patient, and that's it.

**ADAM**  
**MAHOMED:** I must tell you, and a different take in a resource-limited country and we are doing five or six procedures that are emergency. And N95 masks are scarce resource. Visors are scarce resource. So it comes back to my point. Do we really need to do that scope?

And if we are, do we have full PPE for every single patient? It becomes so challenging. But from a practical thing, if at all possible, change and have your PPE change. But if not, the resource limited, keep you N95 mask on for the entire day or session so you don't increase your risk to the health care worker.

**HELEN:** The next question is around wearing masks for all patient interactions. A lot of patients are asymptomatic.

**JARROD ZAMPARINI:** Yeah, it's a tricky one. Patients that are asymptomatic are unlikely to be shedding virus in high numbers. So the patient's not coughing and spluttering and getting it everywhere. It comes down to resources, again.

If you can, do wear a normal surgical mask in between patients. There's going to be some benefit to that. But most important is that you're wearing it when you're having interaction with confirmed or suspected patients and wearing your N95 masks or your FFP2 mask when you're doing aerosol-producing procedure.

**ADAM MAHOMED:** So if you're going to do an ENT examination, if you're going to be doing fundoscopy, you're going to be putting a tongue depressor down the mouth, I think a surgical mask is lower risk benefit. And I would suggest an N95 mask. And the question is, do you need to do the ENT examination?

Can you go on clinical examination? And there's literature coming out to say rather use logic, common sense, and say, can I defer this examination? Can I give you an antibiotic? You've got some clinical lymph nodes. Do I need to put my head down your throat and look?

These are very challenging questions about a surgical mask and should we be using it all the time. Increase your distance. Put the chair and your chair between the patient a larger distance to prevent the droplet spread. There's lots of evidence that you're getting micro-particles sitting around a patient. Talk softly. Talking loudly, your particles go further and they're hanging around.

So we have to change our behavior to try to minimize risk. And from a practical point of view, when do you change a surgical mask? Resource limited, we don't have these things. So, again, it comes to social distancing with logic and common sense.

**HELEN:** Thank you. I'm going to move on to some of the patient-related questions. So how long should one delay an ERCP in a patient with obstructive jaundice [INAUDIBLE] of pancreas cancer? This pandemic could go on for many weeks. Jaundice may complicate with colongitis renal dysfunction.

**ADAM MAHOMED:** I think you have to-- there's guidelines that are addressing this specifically. And I think you have to make an individual opinion. I think on the basis of colongitis, acute sepsis infection, you have to do an ERCP. You have an option of doing a noninvasive test for assessing this pancreas. Do you need to do an EUS versus a CT scan?

And I think if your delay is going to change the outcome from an oncological point of view, I would have an MDT and have a discussion about whether we need to do it. I think in these cases, an MDT will be of value to decide should we have an endoscopy done or not. And that might help us in making decision processes and become more ethical in our response to these challenges.

**HELEN:** Thank you. We have a question regarding post-transplant in immunosuppressed patients. The physiological stress by the virus seems to drive an unregulated pro-inflammatory states and multi-organ failure. Is there any evidence for a lower disease burden in post-transplant or immunosuppressed patients?



**ADAM** Jarrod, you want to go first?

**MAHOMED:**

**JARROD** Yeah, I can. So what-- I mean, imagine this is also talking to our HIV patients, our patients with HIV who aren't virally suppressed. We saw in one of my slides patients with cancer have an increased risk of mortality. I haven't seen any reports of patients post-transplant on immunosuppression. I haven't seen anything else about immunosuppressed patients. I've been trying to find information about patients with HIV and COVID.

**ZAMPARINI:** So the answer is I'm not sure, probably not. The thing is that we do know that Tocilizumab works by dampening the immune response, by damping your IL-6 response. So there might be some benefit. And that's why we say we don't know what's going to happen in the HIV pandemic. But we do know that patients with HIV are at high risk for complications from influenza and other respiratory viruses. So I think probably not to lower disease burden, but we're going to have to wait and see. And I think just from the physiology, we're going to have to wait and see.

**ADAM** So if I--

**MAHOMED:**

**JARROD** Yep.

**ZAMPARINI:**

**ADAM** --could respond from the transplant literature and also inflammatory bowel disease biological literature, it's not evidence-based guidelines. It's expert consensus guidelines. And it's saying consider deferring significant immunosuppression. Try to maintain them on immunosuppression that they're on. Try not to add more immunosuppression and be vigilant about infection control and temperature monitoring.

**MAHOMED:** There has been one case report of a renal transplant patient infected with COVID. And he did reasonably well. It's to be vigilant. But there's no specific guidelines, including the use of chloroquine as a prophylaxis in these patients. I think there's still studies that are going to be developed regarding these issues.

**HELEN:** Thank you. In the era post-COVID, will it be necessary to take PCR for COVID before scheduling an endoscopic case?

**ADAM** So if we look at one of the studies or editorials or letters to the editor or one of the American journals where the Chinese authors have actually drawn up a protocol and algorithm answering exactly that question, and from what they are describing, the answer is that we should be doing this, even in asymptomatic patients because we don't know who has or doesn't have the virus. And it may affect the risks of other patients coming into that room for doing endoscopy. I think this is a field that will evolve as we get out of the pandemic in Europe and Africa. And probably China will lead this way in giving us guidelines.

**HELEN:** Thank you. And we've got a question specific to Dr. Zamparini. Could you comment on the relatively low number of cases in Hong Kong where masks have been used extensively in public.

**JARROD** Sure. So I think this is what we're all talking about. Should we not all be wearing masks in public? It's what's being done in Asian countries, and their numbers have all dropped. Obviously, mask-wearing is a cultural thing in a lot of the East. And the thing is, though, we think Hong Kong's done well. But just last week Saturday, so they had a lockdown. Similar lockdown, everyone went home, stayed home, and their case number dropped.

**ZAMPARINI:**

Then they released everyone. Well, that sounds awful. But they stopped their lockdown and people went out. And they had a surge in cases again this weekend. On Saturday they had 48 new cases. And it's gone up again. And they've just reinforced a new lockdown.

So I think the mask thing is an issue. The WHO, I saw this morning, is going to have a look at it again and see if masks should be recommended for the general public. What we have seen, though, is in somewhere like Wuhan and China where they had the initial outbreak, wearing masks there is also cultural. And everyone wears masks. But they still had a huge outbreak.

It just comes down to that thing of you wear a mask, it might put you at more risk because it's irritating your face. You're touching it. You're moving it around. And it might not protect you alone from it. So I think, again, it's hand-washing, social distancing to try and prevent the spread. Prof, I don't know if you have anything to--

**ADAM**  
**MAHOMED:** I just think there's such a scarce resource in the entire world, N95 surgical masks. And if we're going to suggest or implement a standard or guideline, you have to have the resources before you put it. I know the Americans are actually thinking of this as isolation plus mask, so you're actually decreasing that droplet spread, trying to break that infectivity rate, whether you're symptomatic or asymptomatic. But from a practical point of view, I don't think the world has enough resources to implement an SOP of standard usage of masks all the time.

**HELEN:** Thank you. I've got two, well, three additional questions. But I can link them in. So which patient should be reviewed as an outpatient in the GIT clinic? And then it moves on to adhering to guidelines around PPE and also management of our private hospitals.

**ADAM**  
**MAHOMED:** So Your first question was who should be getting endoscopy and what type of endoscopy?

**HELEN:** So which patients should be reviewed as an outpatient in the GIT clinic, yeah.

**ADAM**  
**MAHOMED:** Which patient should be reviewed. I think every single patient has to be reviewed, has to be reviewed from a potential being in contact. If we start at that level, then you can decide whether the patient needs to come to you or not. This should be done ideally telephonically. Then you should actually look at what procedure needs to be done.

And, again, my personal advice is it needs to be deferred, based on would it impact the patient immediately or can it wait. Can it be deferred? And it's very hard to give an answer in black and white. It has to be the senior person making that decision. Your second part of that question was, Helen?

**HELEN:** How can we ensure that the endoscopy units are adhering to guidelines recommended? And also, somebody else also touches on the doctors doing scopes in the room. So it's about how do we adhere to guidelines available in the public domain, but also, how do we manage this?

**ADAM**  
**MAHOMED:** So I think you have to have a checklist, documentation. And before you enter the room, before you do the procedure, is it safe for me? Is it safe for my patient? Is it safe for my colleagues? How many people need to be in the room? Let's limit the amount of staff in the room if you have to do a procedure. Again, checklist, checklist, checklist.

And I have a bias of saying no PPE, no endoscopy. No full PPE, no endoscopy. Do not take shortcuts because you're putting yourself, your colleagues, and the patient at risk. Stop. Do not do procedures if you do not have full PPE. Jarrod.

- JARROD**  
**ZAMPARINI:** Sorry, yeah, I agree. Exactly what you said, Prof. The thing is, if you are looking for these guidelines, the Department of Health released guidelines at the end of March. So if you do want to take it to your private hospital management and show them that guideline, that's where it's available. Otherwise, the WHO or the NICD guidelines for PPE for different procedures. And you can use that as your basis to discuss with management.
- ADAM**  
**MAHOMED:** If you're engaging with your hospital management and they want evidence as to why you want A, B, or C, the American guidelines, the European guidelines, the BSG guidelines, there's no need for us to reinvent guidelines in Africa, inside Africa, or wherever. There's enough guidelines out there from good centers, good expert opinion. We don't have to reinvent the wheel. Go to your management and tell them if you want me to do this, I need this equipment. You don't send someone to war without the resources.
- HELEN:** Thank you. We've got a question around the extension of the lockdown period in South Africa, in particular. Would you propose, based on the current trends, an extension of this?
- JARROD**  
**ZAMPARINI:** Sure. I don't think we're in the position to answer that. I think we expected more numbers by now. But, yeah, I think we'd have to wait to what the health epidemiologists say what our numbers do. We thought that only 10 days into the lockdown we'd start seeing a drop in numbers. It's going to depend now with the upscaling of testing and what happens from there.
- ADAM**  
**MAHOMED:** If you look at the Italians, they went up and they had a slight plateau for a week or two, and then they spiked again. You look at the UK data, we had 22% infections, slight up, and then they jumped up to 27%. I think we are at the bottom of the hill in South Africa, and we should still prepare for everything that's coming.
- There's no country that has deviated from this program, except for South Korea. But they also went through that initial curve and flattened the curve towards the top. But the initial uptake was quite intense. And I don't think we must drop our guard or relax with whatever we're doing. Expect the worst.
- HELEN:** Thank you. Do you think the infection prevention and sterility protocols in endoscopy procedures will become more of the conversation after this pandemic?
- ADAM**  
**MAHOMED:** I think we've got data looking at hepatitis B, HIV, hepatitis C, and other viruses. And it's quite regional common guidelines on how we reprocess and what we've been doing. And with the CRE and ERCP scopes and those issues of infection, we've even tightened it up really more. I actually don't think that COVID-19 is going to actually enhance our degree of what we're currently doing. We might think of adding other chemicals to our armor.
- But we need to monitor this. There's no answer to this. And I think once we start doing a lot of endoscopy and we monitor patients, like what we should be doing currently anyway to see if we're giving patients infections, is then we'll get better information. But if we look at hepatitis B and C, the rate of transmission of this with our current guidelines is minimal. And these are highly-infectious organisms.
- HELEN:** Thank you. We've just had another two questions. So then one hospital is recommending surgical masks as opposed to N95 respirators for urgent endoscopy in patients not suspected of COVID-19. Is this adequate protection?

**ADAM** So you don't know if the patient has COVID-19 because there's a 10% to 30% false negative rate. Symptoms

**MAHOMED:** sometimes are not aligned. And in our current context, I can say to you, and I'm confident, do not wear surgical mask and do endoscopy. It is not acceptable PPE at all. The barest minimum when doing endoscopy is full PPE, . non-negotiable Jarrod?

**JARROD** Agreed, yeah, full PPE. You don't know who has it. You've seen on Prof's slides that some patients don't have

**ZAMPARINI:** respiratory symptoms. They have GI symptoms, so full PPE is not negotiable. There's local transmission. You don't know who has it.

**HELEN:** Is there a recommendation to take hydroxychloroquine as a prophylaxis for the health care provider?

**JARROD** So it's controversial at the moment. What we do know is that chloroquine has about a 21-day half-life. So in our

**ZAMPARINI:** hospital guidelines--

[AUDIO OUT]

**HELEN:** Dr. Zamparini, we've lost your sound. If you could just repeat that.

**JARROD** OK.

**ZAMPARINI:**

**ADAM** OK, we've lost sound. So our hospital guidelines have put it there. But the South African guidelines, the NICD, and

**MAHOMED:** from the health authorities, it has to be done in a clinical trial. They are probably-- is many trials looking at the specific question whether they can be as prophylaxis. In the States, they are currently doing a study looking at 10,000 recruitments of health care workers and see if it works.

However, this is an experimental drug. It's not standard of care. And if you are using it, you need to get special permission from the government to use it. Again, common sense and logic may apply. But speaking as a health care professional under the Health Professional Council of South Africa, it is not authorized to be used.

**JARROD** Yep. Have you got me back there, Helen?

**ZAMPARINI:**

**ADAM** Yeah.

**MAHOMED:**

**JARROD** Yeah, so exactly what Prof said. So there's consensus that it might work. But it's not approved for that use. And

**ZAMPARINI:** SAPRAA has sent out an email saying that you shouldn't-- it's not recommended, in any case, and you'd be preserving our stocks for patients that do have it.

**HELEN:** Thank you. Questions just coming to say should anosmia be asked a screening question.

**JARROD** Yeah, so the British ENT society sent out an alert a few weeks ago, as well, saying that a lot of patients are

**ZAMPARINI:** presenting with anosmia. A patient that we saw, the first patient at our hospital reported that she had anosmia. I think it's a good screening question. But you've got to then look at the other symptoms, as well, and the other contact and that sort of thing as well.

**ADAM** I think it's a good test to do because it adds to us treating patients and putting them away from high-risk

**MAHOMED:** patients. Maybe we're wrong. But if giving us something to prevent us from doing endoscopy and putting health care workers and other patients at risk, I would put it as our screening modality. I do think smell is part--

[AUDIO OUT]

**JARROD** We've lost you, Prof.

**ZAMPARINI:**

**HELEN:** We've lost Prof completely. We'll just give a few--

**JARROD** Yep.

**ZAMPARINI:**

**HELEN:** --minutes to come back. Just while we're waiting to Prof to come back on board, there's one question, which is around the pandemic on exercise in populations, so sports team, so slightly different direction, and Dr. Zamparini.

**JARROD** Yeah.

**ZAMPARINI:**

**HELEN:** But just about the COVID in the sportsman and also COVID in the sports in public and risk mitigation for the sports medical team. If you can just give any insights that you have on this.

**JARROD** Sure. So-- I see Prof's back. Prof, the question is just about the question's about COVID in the sportsman,

**ZAMPARINI:** managing mild and severe disease and returning to sport and sports in the public. So the thing is with COVID in the sportsman, we don't know yet. Again, they're having a couple of sports teams under the Australian. 17 tested positive for SARS-CoV-2.

What we do know is about sports and influenza, increased risk of myocarditis and myocardial event if you're exercising with active influenza. So that's one thing. In terms of going back to public participation in sports, obviously, a problem, packing 60,000 people into the stadium. One person has SARS-CoV-2, you see how it spreads, really quickly. You can have that whole stadium infected in an afternoon.

So we're only going to be able to know about that once the pandemic dies down. But, in terms of the sportsman, yeah, sort of for now, follow the guidelines of influenza. We'll have to wait and see what comes from it.

**HELEN:** Thank you. I think that's all the questions for now that we've received. And I just like to extend my thanks once again to Prof Mahomed and also, Dr. Zamparini. It's been a fantastic presentation. And I would just like to say I think any further questions will probably be channeled through the Sages Society in South Africa for the South African community on this call. But thank you once again. And I will be closing this call now. And just a few final words from both of you.

**ADAM** Thank you so much for listening. It's a challenging time. Data is changing. There's new emerging evidence

**MAHOMED:** coming every day. I think try your best to remain sane. Have time out. And be vigilant. And protect your family and colleagues. And we will survive this. Thank you, guys.

**JARROD** Thanks. Thank you for inviting me to this call. Prof, just as you said, it's a difficult time. We need to stick together.

**ZAMPARINI:** You know, there's no longer surgeons, physicians, gastroenterologist, EMTs. We're are all just doctors. And the enemy is COVID. So we need to stick together in this. And if you have any questions, just ask your local infectious diseases or critical care specialist, as well, if you have any more questions. They're more than willing to help you out, I'm sure.

**HELEN:** Thank you, everybody. Good afternoon.