

**Minutes of the Meeting of the Academic Council held via Zoom
Thursday, September 23, 2021**

Erika Weinthal (Chair, Academic Council / Nicholas School of the Environment): Welcome everyone to the first meeting of the Academic Council for the 2021-22 academic year. I'm Erika Weinthal, from the Nicholas School of the Environment, and will serve as Chair of the Council for the next two years. Thank you for being here virtually today. We hope to return to meetings in person this semester, perhaps even by our next meeting on October 21st. We will keep you posted on that.

I would like to begin by welcoming all the new members on the Academic Council to your first meeting, and also to all the returning members. I also want to acknowledge our former chair, Kerry Haynie, who served as the chair of the Academic Council for the last two years during these unprecedented times. I really want to thank him for his leadership and demonstrating the importance of Duke's shared governance. I also want to note that at the end of the last Academic Council meeting someone said that Kerry leaves some big shoes to fill. I am only slowly stepping into those shoes.

The Executive Committee of the Academic Council, otherwise known as ECAC, has been meeting weekly since the middle of August. I want to acknowledge the members of ECAC. We have three new

members who are starting the first of their two-year terms:

Keisha Cutright (Fuqua School of Business); **Scott Huetzel** (Psychology & Neuroscience); and **Thea Portier-Young** (Divinity School).

We also have four members who are returning for their second year:

Laura Lieber (Religious Studies, Divinity School, German Studies, and Classical Studies); **Joel Meyer** (Nicholas School of the Environment); **Manoj Mohanan** (Sanford School of Public Policy); and **Anne West** (School of Medicine/Neurobiology).

According to our bylaws, ECAC must select from the Executive Committee a member to serve as vice-chair. **Manoj Mohanan** has kindly agreed to serve as vice-chair for this year.

Lastly, I want to acknowledge two people who keep ECAC and Academic Council running at all times. The first many of you already know, who is invaluable, is Sandra Walton, the Executive Assistant for the Council and ECAC. Then we have a new hire, staff assistant, Mariah Cooke. We welcome her to her first Academic Council meeting.

A few ground rules for Academic Council - attendance is taken at all meetings. For those of you who remember when we met in person we pass around attendance

sheets and you initial it. For these meetings that are still on zoom, attendance is taken through the portal. Our bylaws state that you can be removed from the Council after 3 consecutive unexcused absences. I assume no one wants to be removed, so, please email Sandra if you are unable to attend a meeting. As you ask questions or make comments during our meetings, please say your name and school or department as our meetings are recorded and transcribed.

ECAC and I welcome suggestions for discussion topics for future meetings. If you would like to suggest an item, please send those to me or one of my ECAC colleagues or to the acouncil@duke.edu email account.

And the Council has a tradition of submitting questions to be asked anonymously of the Senior Officers (President, Provost, or Executive Vice President). You can do this either through our website at the “contact us” tab or you can send an email to acouncil@duke.edu.

FACULTY HEARING COMMITTEE: APPROVAL OF NEW MEMBERS

Weinthal: For the first agenda item, you should have received an e-mail this week about the Faculty Hearing Committee. At the September Academic Council meeting, we approve the new members to the Faculty Hearing Committee. A document containing those proposed members along with the list of continuing members was circulated with the email that you received from me in advance of our meeting. We received no objections or questions about the 7 new members proposed and as such these members are considered approved.

I would like to thank all 17 members of the Hearing Committee for their service or future service. And a special thanks to Trina Jones, from the Law School, who has agreed to serve as the Chair. Trina is also a member of the Academic Council, and has served on ECAC in the past. Thank you, Trina, for taking on another role in your service to Academic Council. We hope this will be a quiet year. We also want to thank Sam Buell, from Law, for his service as chair for the past four years.

2020 DUKE COMMENCEMENT AND WILHELMINA RUEBEN-COOKE BUILDING DEDICATION

Weinthal: If you’re like me and you are wandering around campus, you’ve seen a lot of activity, tents, and a lot of noise. It means Commencement for the class of 2020 is happening this weekend. I also want to draw attention to another event that is happening tomorrow at 5:00. The Duke community is invited to attend the public ceremony dedicating the Sociology-Psychology Building for Wilhelmina Rueben Cooke, Class of 1967 – and one of the first Five Black undergraduates at Duke. I encourage everyone to participate in the celebration of her remarkable life and career.

We will now move on to the main item on our agenda and that is to hear from those who are part of Duke’s modeling team as related to the pandemic. But first, President Price would like to say a few words.

Vince Price (President): Thanks Erika. I would like to thank you for your leadership with the Council and thank all of you who are with us here today. I look forward to getting together in person. I also encourage you if you have the

opportunity to join us for the Rueben Cooke building dedication tomorrow afternoon and what I expect to be a lovely commencement. I just want to thank all of our faculty members for extraordinary commitment during the pandemic. We are just so grateful for all the many ways you've gone above and beyond over the course of the past year and a half to ensure that Duke can continue our commitments to teaching and discovery during what I know are very complicated times. I realize this has not been easy. In fact, for many it's been among the most challenging times we've faced. I certainly understand the frustrations of faculty who had to deal with the sudden transition to remote learning in the spring of 2020. Which now seems like it was in a different decade. That, of course, was followed by all the uncertainty and challenges of teaching last academic year and now although we are gathered together on campus again we have the continued operational disruptions and health concerns that have faced us this fall due to the Delta variant. Yet, I know that our students so appreciate the opportunity to be here in our classrooms. I'm aware of how much they need, more than ever, this opportunity to learn from and study with our distinguished faculty. And how much it means to our wider Durham community that our health system and our university, both, have remained fully functional throughout the pandemic, while also working hard and in very close collaboration to support and protect our wider community. As Erika said, we have today assembled a group to brief you on our COVID modeling and our ongoing COVID management plans and protocols. We have with us today a few of the architects of our response. We have Dr. Tom Denny, Professor of Medicine. Along with his colleagues at our Duke

human vaccine institute who have been absolutely central to developing and implementing our extensive testing programs. Dr. Cameron Wolfe, Associate Professor of Medicine, who has lent generously of his time and expertise in infectious diseases to help us develop our protocols. Dr. Steve Haase, Professor of Biology and also on the Faculty of Medicine, who has been central in our key ongoing modeling efforts. And Vice President for Administration, Kyle Cavanaugh, who has seemingly been everywhere, all the time, in leading our COVID management activities. I am incredibly grateful to all of them, as I am to the dozens, indeed hundreds of other faculty and staff across campus who have been instrumental in keeping us safe while we teach, learn, discover, and serve. Thanks to these impressive team efforts, our COVID protocols, as disruptive as they have certainly been at times, they've allowed us to keep moving forward. And despite the renewed challenges of the Delta variant we are in a significantly better position this fall compared to last year. Duke is fully vaccinated with very limited exceptions, which enables our university community to remain active, engaged, and to be here together in person. The life of our university goes on and is still vibrant. Importantly, our policies are also intended to prevent viral transmission. Thus, a safe guard to the wider community in which we are living. Over the past several weeks North Carolina and the Durham region have been dealing with hospitalizations that are close to the highest they've seen since the onset of the pandemic. The good news is that cases may be cresting, but we can't afford to compound any ongoing public health challenges. Now fortunately, because our faculty, students, and staff are vaccinated, the great majority of those

in our community who have been infected are asymptomatic. None have been seriously ill. However, while infected they can and do transmit the virus to others. Thanks in large part to the testing and quarantine protocols we have, we have brought our student case loads down from over 350 in the first week of September to fewer than 20 last week. That's out of more than 21,000 tests conducted in the last 7 days. These protocols do work. We understand well that mental health is also a vital part of our public health commitments. We do what we can to support the wellbeing of our students, faculty, and staff during all these disruptions. To that end we are carefully studying whether isolation periods for infected but vaccinated individuals might be reduced while safely limiting viral transmissions. The evidence suggests that our policies are working, but we are not out of the woods. We continue to work on a daily basis, and in many cases an hourly basis, with our public health experts, senior leadership across the university, and with our faculty and staff to design interventions that will keep us safe and on a trajectory toward normal operations.

I want to ensure that we have plenty of time for questions. Let me just say again thank you very much for everything you've done. I'm just so grateful for everything that you're doing for Duke. I'm proud to call you my colleagues on Academic Council and Erika, with that I will hand it back to you.

Weinthal: Thank you Vince, for also providing a perspective on the start of the semester. I know many of us were expecting a different start to the semester and have had to learn to be quite adaptive. Especially in a situation where

there has been lots of uncertainty. It's because of that we really wanted to hear from the modeling team today to understand the data and how decisions are made that shape how we are in the classroom, how we are on campus, and back within university life. So, I'm going to turn it over to Kyle to guide this discussion today and then we will come back for Q&A. Again, if you have questions raise your hand and we will put you in the queue to have them answered afterward.

FALL SEMESTER UPDATE AS RELATED TO THE PANDEMIC

Kyle Cavanaugh (Vice President for Administration): Good afternoon, I hope everyone is doing well. The way we've structured this is, I will start with laying some ground work of the planning that went on through the end of last academic year, the summer, and then the start of the semester. Then share some data with you, a variety of experiences that we've had, and then turn it to Steve. He's going to go a little bit deeper into some of the analytics and the structure of the modeling approach that has been used over the last year. Steve is also going to say a word or two about some of the sequencing experiences we've had. Then we will turn to Tom who will go a little bit deeper into what I would label some of the unique aspects of our testing program here compared to many of the schools around the nation. Then we will wrap up with Cameron, who we have asked to talk a little bit about transmission. Also, I am sure everyone is paying very close attention to what is going on with both the FDA and the CDC as it relates to boosters and also beyond for children. I'd also like to extend my appreciation to faculty colleagues who have been absolutely invaluable, certainly to me

personally. I've labeled it as the Duke Difference - The reliance on some of the people that we have here today, but there are dozens of people that have been actively involved who have been incredibly helpful.

(Refers to slide)

It really starts with just laying out a framework of what has continued to be a growing reliance on, not only people in expertise but a lot of data. In addition to our own modeling team we've continued to expand the individuals that we rely on from Mark McClellan, Dennis Clements, to colleagues over at DKU and certainly on a daily basis our close working relationship with the health system. We also, which we shouldn't take for granted since it is not the case everywhere across the country, have strong working daily relationships with Durham Public Health Rod Jenkins, and Zack Moore who is the State Epidemiologist. We are incredibly fortunate, we've both been invited to and have had ongoing conversations with the CDC. We have standing meetings with both public and private universities, not only here in the state, but we have weekly standing meetings with all of our peers. We are comparing all of that data. And at Duke we have some unique opportunities to have access to professional sports leagues like the NBA. We've talked to them about protocols and approaches. Dr. Wolfe has unique access to not only the NCAA, but he's chair of the ACC medical advisory committee. Finally, we are looking at all types of data. Not only our own, but Hopkins, the CDC, the state, and many others.

This is really the start of us coming out of the spring and going into the summer. We had very strong advocacy and we will

show you some numbers here about what is going on with vaccination. Looking at using these models and going into about the middle of the summer, which was a very challenging time, if you remember, we kept our testing program going through the summer. We were doing about 4,000-5,000 per week to support our research initiatives. But we were seeing very low numbers. I think there was a risk there internally for us to get lulled into a sense of compliancy. Thank goodness for the work that was going on, the modeling, taking a look at what was happening in India, Israel, and the UK and looking at some early emergence of some of the variants. That's really what drove us to then have a very robust testing program for the start of the semester. I will tell you compared to our peers that was a lonely position for us to be at during the summer. We did start with entry testing, and we'll keep in place our surveillance. We'll talk a little bit about our sequencing piece. We did plan to have approximately 150 isolation beds at the ready, but we also had a plan B...C...and D. Which was what would happen if we saw some really quick spikes, which we did in week 3. Obviously, supporting our in-person instruction, knowing that we are going to have a large number of humans here both undergraduate and graduate students. Insuring that we can keep the research enterprise moving along and supporting in-person football and other types of athletic events.

This time last year, that we started the planning and working with our health system partners about the roll out of the vaccine -- this is something I think each one of us should be incredibly proud of (refers to slide). This is data from this morning. So, as of this morning, both in the health system and the university

there were over 43,000 faculty and staff who are fully vaccinated. Our entire student population is fully compliant. We are north of 16,000 students who are fully vaccinated. So, we have close to 60,000 people who are in our community who are fully vaccinated. In fact, just look at the university itself, we are north of 22,000 of our faculty and staff. So, we are over 95% who are fully vaccinated and 98.5% who are fully compliant. This is really a spectacular accomplishment. Now into the data of what we have seen over the first couple of weeks. This is our positivity numbers that we've seen starting the week of August 2nd. That first week is a little bit of a misnomer because we really had a small population. This was the return of our School of Medicine, Fuqua, and others. If you see the blue are student numbers, the orange are faculty and staff. The faculty and staff numbers have stayed fairly stable through this entire period of time. You see we are a little bit higher than we had hoped for in weeks 2 and 3. That gave us a lot of concern and triggered a lot of the things we are looking at.

Looking at all kinds of variables here, not just the number of cases but the severity of that, and looking at the viral loads of each individual case; we are in contact both internally and externally about that. And going up on that ramp it really spawned five different things that we did. One was to dramatically increase the amount of isolation space that we had available. Second as we were thinking about week five, dramatically increasing the frequency and the targeting of the surveillance testing. As you know we did some modifications to the externally wearing of masks. Some modifications of dining and then the curtailment of some of the large events that we had. These are

really difficult to show cause and effect. But, I think we were comforted that all of the things that were put in place there, and a lot of credit to our undergraduate and graduate students who complied so incredibly well here, that we saw a quick reduction in cases in week five. If we go out to week six and seven, you'll see that those trends have continued. We are expecting that we are probably going to see a little bit of a bump here and there as we continue to go on. The couple things that I would say is, virtually this entire population, nearly 100% are fully vaccinated, the majority of these cases are either asymptomatic or have very mild symptoms. It's been a good experience so far.

I mentioned earlier, since the beginning of the year, we've been working with the NGS lab and we have been taking every single positive and going through sequencing. Steve's going to dive into this in a little bit. I wanted to point out a couple of things, (*references slide*) the slide is color coded based on the type of variant that we are seeing. And if you see going back into the beginning of this, this is all what is referred to as the Alpha variant. If we get into the yellowish, that was the first outbreak that we had back in March 2020, and this was all the California variant. As we go through the summer, and you get into that orange that is now all the Delta variant. We have seen 100% of Delta. We'll see some subvariants that Steve will talk about here in a minute. I'll just wrap up with one or two here Steve. Isolation status – we were at a point in time where we had 259 students on campus and in isolation. As of this morning that is down to 1. We have 19 students currently in quarantine. The capacity there has worked very well. We are monitoring very closely everything

that is happening at our peer institutions. They are talking to us. Our academic year is slightly ahead of some of our peer institutions. So especially at places like Cornell and Emory, they are about two weeks behind us and had very close to the same experiences then tried to adapt some of the same, especially on our modifications on testing.

Going forward, for the immediate future, we will continue the frequency of our testing. Cam is going to talk about preparation and expansion. We are ready for this based on what the CDC will say about moving forward with a third dose. Then as you know we have moved forward with the flu vaccination for our students. We will be rolling that out for our faculty and staff next week.

Dr. Steve Haase (Professor of Biology):

Thanks Kyle. So, there is a lot of opinions on what we ought to be doing in a COVID space. I think that really comes from different experiences we all have and different perspectives. So, before I get started I want to be really up front with my perspective. Currently, I will be teaching two courses this semester. One is a graduate course with about 15 students. The other an undergraduate course of 20. I am teaching in BIO154 which is just a little larger than a big school bus. So I think a lot about how I deliver a great course and keep everyone safe at the same time. The second perspective I have is, my wife and I dropped off our kid at Rutgers. She's a new freshman. I also think a lot about the student experience and how do we optimize the experience of our students while keeping everyone safe. So, when I think about what we ought to be doing in a COVID space I come mainly from those two perspectives. I want to tell a little

story today about planning. There's been some questions about how we make decisions and where that data comes from. We started planning for the fall about a week after commencement in May last year. As part of that we engaged a modeling study in response to guidelines from the CDC for colleges and universities that came out on June 4th. Those guidelines suggested that for vaccinated populations of students they shouldn't be required to mask, social distance, or participate in surveillance testing. We really wanted to think deeply about this as, Kyle said, we were watching what was happening globally. So, we engaged a model that we had created awhile ago and asked a straightforward question – What's the impact of surveillance testing? And we also looked at how quarantining affected limiting infections in student populations that are 100% vaccinated.

I'll move quickly through this. (*Refers to slide*) All of it is published on the archive right now. I'm happy to share that information with folks who are interested in the details. One of the big questions we had was about vaccine effectiveness and particularly its effectiveness at preventing infections. At the time Pfizer and Moderna were reported to be 90% effective against infection. J&J about 66%. And I should say each of these vaccines still remain highly effective at preventing severe disease. So what we did was we started off asking of our model; and this is an agent based SEIR model, kind of a standard epidemia logical model, what is the impact of surveillance if we have a 100% vaccinated student population? And that the vaccines are 90% effective. On the left (*Refers to slide*) we are looking at all the assumptions we started with. Again, I don't want to get too deep into the weeds.

It's all published and I'm happy to discuss with those who are more technically oriented. But, what we see here on the right, in a couple of graphs, is that in red we are looking at student cases without testing, and we actually started with an initial condition of 5 out of 5000 students being infected and then asked what happens if we test in blue versus if we don't test in red. And these bands are 95% confidence intervals and what you see is you really can't distinguish between red and blue in this condition. Then the other thing we varied was the outside prevalence. So, the prevalence in the Durham community. (*Refers to slide*) .1%, 1% down here, and again largely no difference between testing and not testing. For us, this is what herd immunity looks like. We've heard a lot about herd immunity. Our big question though is what about variants? At that time, we had just started seeing Delta and we were mostly Alpha in the United States. I pulled a slide off of a presentation that had been given at the CDC and studies in other countries had suggested that various vaccines were less effective against some of the variants we were seeing, Alpha and Beta. Then J&J against P2 from Brazil and Beta. All the way down to 52% effectiveness. So, we took that model and said okay what happens if we lower the vaccine efficiency to 75% and 50% here? And what we found right away at 75% that not having surveillance testing made a substantial difference in the number of cases we were looking at. The Y axis here varies, so pay attention to that. Then as we go up to 1%, which we are very close to that right now. We can start to see something that almost looks exponential. When you get down to 50% efficiency we start to see exponential growth on campus. The only reason the cases go down here in the model is all the infected

students become immune. So essentially the disease has kind of burned through the population. This made us very worried about what might happen for variants like Delta if the vaccine effectiveness got lower than 90%. We also studied quarantine and asked whether quarantine, so segregating our exposed but not infected students for 10 -14 days, was any better at reducing the number of infections we saw than simply testing them at a higher cadence. What we found, surprisingly, in the last two rows of this table is that quarantine wasn't any more effective than testing at a higher cadence. So, this was one of the other things we investigated a little further in terms of policy.

So, I'm not going to go through this ridiculous complex slide. It's all in this paper, but there is model architecture. These are the parameters estimates. Some of them came from publications. We fit some of the parameters in the model directly to infection data from Duke. So, there was some Duke specificity to what we had found here. Again, this is all published and available. I'll also point people interested in modeling, all the data models code can be found on a get lab shown here. We are making that all available.

In conclusion, if vaccine effectiveness stays at 90% than surveillance and the other mitigations have a marginal impact on the number of infections in a fully vaccinated population. But if vaccine effectiveness drops below 75% we can start to see substantial impact on the number of cases we see. Then testing and mitigations become more important. Finally, increased testing for exposures works just as well for quarantine in our model. What are the limitations? It's a

model. All models are wrong. Some models are useful. I think this has been a useful model. There are things that we didn't explicitly model, including symptomatic testing, which is something that is really important. We didn't model anything about vaccines effect on severity of illness or hospitalization. It's very clear that vaccines are still very good at preventing severe disease and hospitalizations. One of the things that folks are debating is as the impact on illness and hospitalizations drops maybe we should have an increased tolerance for infection. Again, that's something that is up for discussion. I think the caveat for me is that unvaccinated populations in our local community as well as immune compromised members of our Duke community are something that we are really concerned about when we think about having too much tolerance for having infections on campus. Much of what we found in this modeling exercise drove some of the policies and strategies that we developed for the fall, way back in June. As Kyle said, we were the only university that I knew of at that time that really committed to continue to test our vaccinated student populations. It was a very small group. Now many of our sister universities and institutions are following suit. Real quickly, as Vince pointed out, we are seeing pretty substantial rates of infection off campus. Our state-wide weekly incidents about .5%, Durham county about .3%, Wake County about .2%. *(Refers to slide)* This is Duke's weekly incidents on campus; substantially lower. These numbers were computed from the New York Times COVID dashboard. The amount of testing we are doing at Duke is so much higher than what is happening state wide or in these other counties. *(Refers to slide)* These numbers are pretty severe under estimates of the cases we

are seeing [Durham community] and this is a very accurate number [Duke community]. So, Duke weekly incidents is well below what we are seeing off campus and we are very proud of that. As Kyle pointed out we have been sequencing and this is part of a state-wide sequencing effort. Tom has been able to secure a grant from the state and we are participating as a part of a collaborative for various universities and institutions who are sequencing positives as many as we can get. Then sharing that data with the state and CDC. What we saw here is Alpha, in red, take over fairly rapidly and then an extreme rapid take over by Delta. Then on the bottom here we continue to track about 100% Delta here on campus, but we are also tracking some of the sub lineages of Delta to make sure we are not seeing any of them substantially expand over time. With that I am going to turn it over to Tom.

Dr. Tom Denny (Professor of Medicine): Thanks Steve, and thank you all for the opportunity to present today. I want to take you back to the early summer of 2020 when the program was sort of being conceptualized and we were thinking about what the guiding principles had to be. What I am going to talk about is asymptomatic testing and asymptomatic surveillance system compared to what is done in a clinical system for symptomatics. My career started early in the HIV days and we had many of the same challenges then as we do now. We did not have the resources we needed for testing and treatment. We had to be innovative and come up with some new approaches to meet all of those challenges. For an asymptomatic testing system - some of the principles we set out on is we didn't want to compromise a clinical system. We wanted to have a

scalable system. We didn't know where we were going; were we going to need 1,000 test per day or 5,000 tests per day? Which we got to 5,000 tests per day pretty quickly. We wanted to have a system that was independent of supply chain challenges. It would not have helped us to develop a system that we started and then 6 weeks into found out we couldn't guarantee supply chain and would be out of business. Then, the last part of it was, we wanted to have a rapid turn around time. If you are doing asymptomatic surveillance testing you have to be quick. If you're turning results around in 3 days or 4 days you have already had individuals walking around who are infected that are transmitting. At that point it's like why do it? You have to be able to do this in a rapid turn around time. So those were some of the guiding principles that we set out to develop in our testing system. I don't have time to go into details of it, but I will point out a few important parts of what we do. But if you go to the CDC's MNWR, the CDC did contact us last year and they had heard about our program. We were featured in an MNWR article with all the details. Later in 2020 I participated in a national science workshop and that ended up with this article providing advice to other universities on testing programs. One of the hallmarks of our system is what some of you that have labs call a home brew. This is a laboratory developed testing system that we set up. We did this early on in the pandemic because if you make an analogy to HIV knowing viral copy matters, my team and I thought, that being able to estimate the viral copy was going to be something clinically important. And we've done a number of studies with the ICU team and others to show there is some validity to viral load. We developed this system, and you can

see that we can have almost 100% dictation down to 31 copies. That is a very sensitive asset for picking up something that we are doing. We built validation panels, and we ran through them. We were confident that we had a platform that was scalable for us, that we could deploy for this need. For those of you that know PCR, this is old fashion PCR, two step PCR. The secret wide scalable, no one wants slow reagents today that take 10 or 12 hours. They all want the rapid PCR. When we were developing this, we were absolutely certain that we could have a supply chain that would guarantee our ability to meet the demands we were thinking we would need.

The other part of it is pooling. If you wanted to test 15,000 samples in one day it would be very hard and very expensive. So, one of the work arounds to do that is to do what's called pool testing. Pool testing is very simple. You build a pool of a couple samples. You test. *(Refers to slide)* That is one sample lighting up in that pool. What you then do is you go split that pool into the individual samples. We've had them sitting in a refrigerator since they've come in from the sample acquisition part. Then we test them individually to show which member of that pool is positive. When you build pools you have to make sure you have sensitivity. When we were conceptualizing this project last year, we were thinking about what number we'd have to test on a daily basis. We said, well maybe it's this number. We settled out on a couple different pool sizes. Pools of 5, 10, and 20. What we wanted to make sure of, is if we had to go up to high pool numbers, pools of 20, is that we had sensitivity. On the right side you will see what the sensitivity looks like for our in house system. You'll see that we can go up

to a pool of 20. We started out with pools of 5 last summer. We migrated in the early spring of this year to pools of 8. That was basically to accommodate a higher volume of testing on a per day basis. On the left side, you are seeing data for an avid M2000. That's a clinical platform that we use. That's used in a lot of laboratories. You will see there that that system has a sensitivity of 100% up to a pool of 10. The bottom line is our in-house system that we use for the first screen of testing is highly sensitive.

This just shows you, it's a little bit out of date, the overall numbers. I think we are up to about 650,000 tests we've done since the conception of the program. It shows you how at different points in time we had a little bit of a plateau in testing needs. Campus was quiet, things were good. Then we had to rapidly start escalating again.

This slide is also a little bit out of date, but this is just a cumulative number of positives. It just shows you the trend. You all know it, you've been living it. When campus was calm and quiet and then we had the surges. You can see where the numbers come on.

This is a summery slide. Basically, put it all together; what we do on a day to day basis. We rely on a lot of information coming into the modeling team. Testing is a barometer of what is going on in your behavior. Your campus environment or whatever you are testing. It's important to not just pick out a few people to test, but to have some sort of a modeling system or metrics to pick out who is going to be tested on any one day. That's what Steve's team and others work very hard to do on a day to day basis. Then there is a whole team, operational team, who has to

schedule this. They send the student a notice. They get it on their phone, they know they have to present and have a sample provided. Then it comes over to our laboratory and we build the pools. We use robots to make these pools for us. We can go through several thousand pools, making pools, building them, in about a 3-4-hour period. Then they go on to the testing platforms. We run the lab 3 shifts a day so we can work with rapid turn around times. That was a challenge for a lab such as ours; research and discovery team. We had to bring on a night crew like a clinical lab. We are fortunate, we are also a clinical and TAP accredited laboratory. So, we have a number of clinical platforms in our laboratory. What we do after we have a positive pool is we deconvolute it and bring it over to one of our clinical platforms. Then we start testing to see who is positive. At the end we are at about an 18 to 24-hour turnaround time from the time we get the sample. We have sent the result, an electronic record, into student health or employee health, where they then have a medically actionable result. They can institute contact tracing, they can institute any other things that they need to do with a typical medical actionable accreditation result. So, that is sort of a summery of how we do it. I'd be happy to talk with you offline if people have more questions about it or you can refer to the MNWR for more details on the system.

Dr. Cameron Wolfe (Associate Professor of Medicine): Thanks Tom, and I really appreciate the chance to discuss this with everyone too. Before I get into the few bullet points I'm going to talk about, I did want to emphasize one of the things that we really tried to do that Tom and Steve both hit on in their diagrams -- which was to try and actively

learn as we saw positive cases coming through; and as we saw symptomatic kids coming through in real time, where to modify direct testing in ways where cases were occurring and to learn frankly from that. In terms of actionable items to offer different mitigation techniques too, much of that was in real time. I think Steve and many other folks in contact tracing and student health deserve the heavy credit for that. It really did give us a visibility on how to apply this testing in a way that was unique to all of our student groups. Because, the risk has been different. We've seen different risk on campus and off campus.

One of the things we have reassuringly not seen, still to this day, is a classroom risk. Through both the sequencing methods of tracing that Steve highlighted and then the laborious man hours of picking up the phone and speaking to all these kids who have had a good and well colored menu now of how people are transmitted to each other. To this day we don't have instituted cases where we have seen that occur within the classroom. Now that's been in a pretty mitigated situation. You guys have all gone through scenarios in the last calendar year when it wasn't in person, but that's held true as we've moved into the classroom last semester and this semester. What has also been true is that we can take that same data to my role in athletics. For example, we didn't see on field transmissions. The parallels to me have been sort of helpful to visualize that it's not the daily activity of what our students have been doing. It might have been what they then went and did after hours -- what's been happening in the downtown, in the bar, or in their apartment complex or perhaps in our meal halls -- and we've had to make adjustments. But those sorts

of things have been very helpful to us to then come back and blend both the phylogenetics and the contact tracing to get a clear picture of that. I think we probably have a clearer view than most.

I wanted to highlight that the other parallel that we've been able to watch is what happens in the health care system. We've had a privilege to watch how my colleagues in infection control in the hospital have handled their risk. Which has been unique for other reasons. We took a very early decision compared to other colleagues to sort of instigate indoor mask requirements. *(Refers to slide)* This graph now extends well beyond, but this is a section of the middle of last year. The red line being employees that were becoming sick, where we can clearly document their exposure was at work; either from patients or peers. The yellow and green line, either clearly documents out of work exposure or ones where we couldn't quite pin it down. What you can see in the final line is our community rates, where our staff was then leaving and taking the mask off, in fact mirror the community transmission rates. But when you are in close knit intense exposure situations at work the mask made a profound difference in terms of reducing exposures of our own staff. I think this has been exactly the parallel that has occurred on the campus. We've tried hard to use this data to anchor decisions on masking where we could. You'll see that is one of the last things we pull back on as things slowly ease away. I can certainly get into other mitigation activities if folks want.

Kyle asked me to talk a little bit here about projecting forward and what this means. We are nearly 100% vaccinated which I agree is extraordinary effort. That

isn't a static number though, that's moving. And even as we speak I was waiting for tweets from the CDC panel to look at how they interpret boosters that will be relevant for many of us on this call. What we know so far is if you are immune suppressed yourself, and many of our faculty and some of our students are, you are already cleared for a third dose. We know that that is helpful in those groups. I do think our expectation is we will be coming back to both students and older adults who live here and work here to suggest very soon that boosters are relevant for people over the age of 65, and relevant for folks who are on the front line of health care. Then potentially relevant for students and teachers. While I think interpretation of how the FDA thinks about institutions is what we will be guided on here.

Steve mentioned he just dropped one of his kids off at college. My two kids are at the polar opposite end of the spectrum. They are both in elementary school. So, I sort of view this from quite a different spectrum, but I also view the FDA decision making on vaccine for kids and I'm sure many of you are in the same boat. We have had better visibility on childhood vaccination expectations as of this week with some really reassuring information from Pfizer that looks very effective and safe in our 5-11-year-old age bracket. As you know it's already approved for 12 and above. People often ask when do we expect that will be released? I think knowing the pathway of FDA submission, FDA approval, and CDC approval, current projections would sort of be towards the later half of October or early November at the earliest. That's quicker than we might have projected if you had asked the question 3 or 4 months ago. I think for those of us who have

elementary or middle school age family members that will also be a real weight off our shoulders to get our kids protected as well.

I'm happy to pause there as we want to give people time to ask questions. Again, thanks for the opportunity.

Weinthal: Thank you Kyle, Steve, Tom, and Cam. We really appreciate you giving us a deep dive into what has gone into the planning for the semester with modeling, testing, mitigation measures, and the importance of masking for all of us. We have a few minutes that we can have questions and for those who can stay a bit longer we are happy to keep going if there are a number of questions but we also recognize that many of you may need to jump off. So, if you have any questions use the raise hand function and that will make it easy for me to call on you.

Harvey Cohen (School of Medicine):

Just a quick question. How do you anticipate handling Cameron Indoor Stadium crowds in the fall for basketball? I'm thinking it sounds hard to distance.

Wolfe: That question has been at the forefront of many peoples minds I can guarantee. You think of Cameron and you think of what makes that a great stadium. What is it? It's densely packed, it's everyone yelling, and it's a small events stadium. That's what makes it great. But that is also not ideal in this situation. So, I know we have already been going back and reevaluating the ventilation system and making sure we can do what we can there. It's not finalized yet, but many athletic departments across the country are evaluating basketball within the context of masking, vaccination, and testing. Without spilling too many beans, I

think we will be reviewing those three mitigation techniques for games. At the end of the day it's a close packed stadium and what worked for the players last year up until March Madness is the fact that they were masked and spaced. They didn't have a chance to be vaccinated where as now there is a great opportunity here for letting people in who are vaccinated.

Jocelyn Olcott (History): First of all, I just wanted to thank you for the presentation and also for all of this work. I have to say over the past few weeks, I teach two classes in person and they are both quite full. I felt my blood pressure dropping week over week as we've seen the numbers come down and how quickly the administration responded when they went up. From a teaching perspective, I just wanted to thank you all for how much this year has been better than we thought it might be.

Two questions that maybe are sort of first world problems. One, is about whether there are any plans for closing the exceptions for exemptions to getting the vaccine. In some of the smaller departments and smaller spaces having unvaccinated, particularly, staff since they are there all the time, has just sort of limited the extent of which we can fully come back and I know there is ethical and legal questions there, but I am just wondering if that is on the table. And then, this is kind of a crystal ball question, but for those of us who are thinking about large in person events potentially in the spring, is there a timeline by which we should be making decisions around those kinds of things?

Wolfe: I can answer the first part, only the large function question some what

later. We've grappled with that exemption question for a decade now with flu vaccines across the hospital. We've had a medical task force. In fact, we've need many because of this program to review medical exemptions and they've been fairly straight forward with COVID to be honest. Religious exemptions have always been a more difficult one to navigate. Because there is EOC guidance on the fact that it is anticipated that institutions will allow flexibility. I'm not going to get the wording correctly. But, strongly held beliefs and then it goes on. Sincerely strongly held beliefs, I think is the exact phrase. It leaves open the legal interpretation of the word sincere and it leaves open to the recognition that it doesn't have to be an organized religion if that's your strongly held belief. That has some legal precedent even though people have debated the exact context. So that has always left us in a position where we felt the right answer was to give people the breadth of what they felt was important to them as their sincerely held belief. You are raising a point, which is a bit grieving to me for many years, which is that that allows flexibility that is I'm sure not ideal medically and probably not the original intent of the crafters of said language.

Haase: I might be able to hop in on the second question. Certainly, large gatherings present an increased risk. There are ways to mitigate that risk. Masking, being outdoors, these are all things that we have learned and relearned over time. In terms of prediction, you said crystal ball. It's probably there. There's a very large group of people trying to model transmissions and positives nationwide. There is actually a site on the CDC where you can see all the modeling predications and

oddly enough they look like the predications for where a hurricane is going to hit when it's just off the coast of Africa. They are all over the place. Oddly enough, the best predictor is the average of all of the models. Now that predication is still only good a few weeks out. This has been a great frustration for all of us which is we don't have a good way of predicting what's going to happen more than two or three weeks out. So that makes it very difficult to plan for events and other things. I don't have a great answer, but as we know right now flexibility is key under these conditions.

Weinthal: Thank you. So, I am going to follow the example of pooling, like the testing. I am going to pool three hands up and just have them ask their questions and then let whoever wants to respond. I see Edna, Mine, and Trina. I would just also have you introduce yourselves and ask your questions.

Edna Andrews (Slavic Languages): I've been teaching in the classroom 5 days a week since the fall of 2020. I'm actually not going to ask you a question. I'm going to say thank you. Because last year, while I felt reasonably comfortable in the fall, by the spring, waiting to get vaccinated, it become a little tensor for me personally in my head. I have been blessed. Your protocols are wonderful. While I am a living example, and my students and the focus program with 500 students plus in the classroom. I want to thank you for everything you've done and this wonderful presentation. I think on behalf of so many of us, who are not here today, just wanted to let you know thank you and please keep sharing the information.

Mine Cetinkaya-Ruadel (Statistical Science): This has been a wonderful

presentation. I've been to flavors of this presentation over the last couple of weeks. When the first email from Sally came, and we were reading that there was no classroom transmission, as a statistician the question I asked is "How do we know?" So, it's really nice to hear the how. My question is how are we communicating this, the scientific part of it, to our students? They are also curious. It's possible I'm dealing with a group of students who are studying statistics, so they are additionally curious, but what I hear from the undergraduate body is they are thankful that they don't have to be on zoom 24/7 but they are curious. To my knowledge they haven't had the privilege of being in these meetings. I guess, what's the plan for communicating the sum of this inward into the university at the level that our undergraduates would be able to appreciate it as well?

Sally Kornbluth (Provost): A couple things - One, we are going to do a brief interview with Steve, probably not as data intensive that would satisfy a statistician. We will cover at least in lay terms some of this. Erika, I guess I would ask you, we taped this part of it, we talked about making it available to all faculty, and we can talk to Kyle and the others after, but we can certainly make the scientific part of the talk more broadly available and also send the link around to Steve's paper. I think we can work this somehow into the student messaging as well. We will definitely talk with Mary Pat [McMahon], and Gary [Bennett] on how to do that.

Weinthal: I realize I just skipped over Trina. I'll let Trina ask her question and then have anyone who'd like to respond.

Wolfe: If I can just add one thing to what Sally said. We have probably 3 or 4 very public MNWR's discussing exactly what's

happened in a way that is visible to everyone. Sort of half written, or well under way. Both within Duke and Duke's collaboration with other folks. That should be absolutely presented to the students because it is their data. They absolutely deserve to hear this. I'm so glad that question came up.

Trina Jones (Law School): I think this is probably a non-issue but it would be wonderful to receive confirmation that it is a non-issue. I teach 50 students in the Law School and one of my students sent me an email last night basically saying he had tested positive. We proceeded to talk about how he would access the material. But other than the email being sent to me, I would not have known that the student had tested positive. We were all in the classroom for 90 minutes yesterday. Socially distancing, and with masks. And we were back there today, minus the student. I wasn't overly concerned because I've been told repeatedly that the risk of classroom transmission is very small. But if I were immune suppressed or if I had a child who were unvaccinated and I was coming home to that person I think I'd want to know that someone was positive in a close setting that I had spent a significant amount of time. Could you tell us whether our protocols are adequate, keeping in mind privacy concerns, to make sure that people who might be a high risk or who might have a family member who is at a higher risk would know that they have been within a close space with someone who has tested positive? Even if the risk of transmission is low.

Wolfe: I think this is a great question and it exactly comes to why our colleagues in student health, and the contact tracing folk need a lot of the credit here. We've

tried to strike a balance here. Because exactly of the other comment you made about health privacy against the public health need to trace individuals. There is a very fine line in public health that allows you to have...in fact we've been lucky to have a dual relationship with not only student health contact tracing, but all contact tracing with the health department. Then we sort of blend those together in a sort of complimentary way. To say look what sort of exposures here might have reached the threshold where we need to contact people. And to do it in a way that helps us minimize transmission but also keeps privacy. I think it's been successful so far, because we are seeing the numbers come back down. And we haven't seen inadvertent transmissions that we have not anticipated or expected. Is it going to leave everyone aware of all the cases that are occurring in their classroom? Actually, it won't by intention. I'm glad that student had the wherewithal to come and say "Hey, I'm not going to be in the class." That's important for other reasons clearly. But you can imagine that's a pretty delicate balance between student health calling that individual, talking through what they've done, where they've been, what did the class look like, was it an indoor or outdoor class, were they in the marine lab living in each other's back pocket, we've had all sorts of mutations of that. And then to expect that the county health department will probably do the same thing and ask them all sorts of questions. And our students have had different answers to both as questions have been posed in different ways, or they felt more or less comfortable to answer questions. I think they've worked pretty complementarily to help reassure me. At the end of the day, I go back to the data that we have in our health care

system that says that masks work. I'm not told, for example, in the hospital when my colleague tests sick because that's his or her information. I'm told if I have an exposure that is significant. But I appreciate your question because that's when it's reassuring for me that my kids will be vaccinated. That's when it will be reassuring to me when we've all had the chance for a booster. We've all gone through these phases where we also know myself and everyone around me is also protected in case those things are not picked up. But for the most part they've been very accurate.

Kornbluth: You know Cam, if I can just add one thing. I think that has helped some people in terms of reassurance is to reemphasize that anyone can enter the regular surveillance testing program. For folks teaching, there are so many sites on campus and around to just incorporate it into their routine. I'm not saying that everyone has to do that, it's just reassuring to a lot of folks to be able to do that.

Weinthal: I know we are almost 10 minutes over. I don't see anymore hands, but I again want to thank everyone; Kyle, Steve, Tom, Cam for sharing your experience and also being willing to answer questions whenever we have questions that we send to you. I want to encourage members of the Council when there are concerns that come up to reach out. We've been in conversation and trying to get responses conveyed in different ways with messaging that comes out of Sally's office or having presentations at Academic Council. Again, I welcome suggestions. If there are questions the email is acouncil@duke.edu.

Our next meeting is on October 21. We hope to meet in person in our usual location of 0012 Westbrook Building in the Divinity School. We will be masked if that happens. Otherwise, I hope everyone has a good evening and I hope to see some of you tomorrow at the Reuben-Cooke dedication ceremony.