John Hansmann:

Thank you Sarah and welcome everybody to our Health Catalyst Capacity Planning Tool Demonstration and question and answer session this afternoon. Jason could you move the screen to here. Thank you. So myself again, as Sarah said my name's John Hansmann and Jason Jones is also with us. We'll introduce ourselves in a second. But what are goals are for today is we're going to talk through why we got into developing this tool, the capacity planning tool. And spend the majority of the time on the demonstration Q&A component to it. But let me start out here and just introduce myself. My name is John Hansmann again and I have been with Health Catalyst now for about four and a half years. I'm a Senior Vice President of Professional Services.

John Hansmann:

My background, formally, I'm an industrial engineer by formal training. And which means I work in process flow, workflow with staffing and patient flow and get into capacity type components and situations. I support all of our operational tools within Health Catalyst. Jason, you want to introduce yourself and then we'll continue?

Jason Jones:

Sure, John. This is Jason Jones, I thank you all for joining as well. I'm responsible for data science at Health Catalyst. I've been here about 18 months and prior to that had the pleasure of working at Kaiser Permanente and Intermountain Healthcare. Thank you again.

John Hansmann:

And thanks Jason. I forgot to mention I've been joining this in healthcare for about 30 plus odd years. So you have a couple long-term healthcare people on the phone with you today. Our learning objectives for today, we're basically want to help you understand and how to use the capacity planning tool that we put together. Effectively understand what the parameters are, what they mean and how to use them. And then ultimately the output that comes out of the parameter inputs. Being how to understand what the graphs are and interpret and read the graphs and then we'll talk about some uses for the planning tool itself. Can you flip to the next slide, Jason.

John Hansmann:

So why did we build this thing? We got involved with this from the standpoint of we, Health Catalyst, wanted to put together a tool that would take the demand of patients coming into your system and then compare it to a capacity component. How many beds do you have available. And start to determine, identify when and where you will run out of beds if you get overloaded with numbers of patients coming into the system. And we wanted to do this, taking data from a high level, state level, regional, national level components that we're seeing early on in the pandemic. And bring it down to an individual hospital's perspective so you can actually look at what the impact is going to be on your particular hospital and then allow you to start to get into your planning discussions of what do you do now that you are at bed capacity and what you do now start to put your patients that you don't have any additional capacity for.

John Hansmann:

We placed this out into the public domain arena. This fits in with our Health Catalyst mission of trying to improve healthcare and we're all in this situation together. We're going to solve this together. So we wanted to produce a tool that would be available for anybody and everybody to use to help us try to

navigate and understand what the capacity components are going to be. We built this tool based upon the Penn Medicine model that was released a couple of weeks ago. The Penn Med model is really the whole demand side of this. How many patients are coming into the system. And so we're leveraging and utilizing the tool when they've updated their tools, we've updated ours. So we're staying in sync with them right now and Jason's going to talk a little bit more about that when we get to the demonstration itself.

John Hansmann:

But what we wanted to do was build upon a reputable tool so then we can identify and utilize the capacity component or the supply side of the equation, if you will. How many beds do you have available and then get the conclusion of when you're going to run into some potential capacity problems. We wanted to make this as easy as possible, as flexible as possible. Allow it to do what-if analysis. So basically you can do, worst-case scenario, best-case scenario and most typical scenario. And Jason will talk through how we do that too. Can you flip to the next screen Jason? And essentially what we're trying to do for you here is create some time. Give you the ability now to look forward. When will this surge affect you, what day are you anticipating that you will start to run into bed problems.

John Hansmann:

Give you that ability to start those conversations and have those discussions about how do I deal and manage with those patients that are now coming into my system. What do I do with them? Where do I have additional beds that we can go to such as, do you open up PACU beds, do you open up same day surgery. The OR's rather critical care spaces. Other clinic type spaces. Or do you go to community response. I live in the Dallas, Texas area in downtown. Our convention center, we're building beds into there for a short term hospital there and I know a number of other communities in the country are doing the same type of thing. Mobile hospitals, convention centers, hotels, dorms, etc. Where do we have that extra capacity to work from. And then how we use this and we use this for the tool, primarily it's your planners and your COVID taskforce people. Your incidence command centers. And others who are looking at this from a more holistic perspective.

John Hansmann:

Where are you going to build when you start to run out of beds so you can have those conversations and again like I said, build the time or give you the time to now understand, we're going to run out at certain number days. And then what do we and start a planning processes from there. So I'll turn it over to Jason to actually talk through and show the tool itself and then we'll start the answer questions. So please use the question chat activities for the questions and we'll start answering those. Thank you.

Jason Jones:

Thanks John, so Jason here again. And as John mentioned the links are on the screen that they're freely available if you can only remember thehealthcatalyst.com if you can look in the upper left to see the COVID-19 or you can go directly to apps that we're about to look at now. So let me bring that up. And we'll go to the live demo. As John mentioned again, this is big shout out to the predictors healthcare team at Penn Medicine that have really been hard math behind the scenes and come up with the epidemiologic model that we're using. What we've tried to do is try to make it a little easier. If you haven't used it already, don't get overwhelmed initially.

Jason Jones:

So the first thing when you're looking at this. That there's a left and a right side panel. The left panel is where we're going to put all of this, the parameters involved in this scenario that we might run. And the right hand side is where we're going to see everything. So if we scroll down a little bit, on the right hand side. Here's where we can look at output, like how many daily admissions should we expect. And you'll see a reoccurring theme, blue will be the total hospital. Orange will be ICU and that's going to be on this tool, a subset of the total hospital. So if you have 500 beds total and 100 of those are critical care, then you would see 100 beds will be representative orange line and then 400 plus, that'll give you your 500 total. But here we're looking at admissions and the other part, the red line, is the number of patients on a ventilator.

Jason Jones:

So we use the admission each day and then we go down a little bit further and just see the total hospital census, so that's just looking at the admissions and then layering on top of that the lengths of stay, for each of the patient types. And then we look at the actual capacity. So this was when we place and you'll see how we do it. The census and then how many beds of each type do you have available and how many beds do you have available. So those are the three main charts that we're going to be looking at. And for each of these charts, there's a little bit of explanatory text underneath. So for instance for the admissions, you'll see it says that the total hospital COVID-19 admissions will peak on June 10th, with 388. And there's again, helpful text is below each of the charts that we're going to look at.

Jason Jones:

On the left-hand side, are a whole bunch of different parameters that help us derive this output. And the first thing that you'll notice at the top is this scenario section. And we'll go through what this means in a bit but for now just know that what we've tried to do is make it as easy as possible to load all of the rest of the parameters that we're going to look at below this scenario section. The next section is the hospital parameters. There's where you want to put your total regional attachment area, whatever that may mean to you. It could be your town, it could be a metro area. It could be a state. So whatever you consider to be your regional population will be important, along with the hospital share of your market.

Jason Jones:

Lastly, in this section, you're going to want to provide the total current COVID-19 hospital census and what date that represents. We know some hospitals are dealing with quite a bit of lag in terms of test results. So you can change these two parameters with whatever information you feel most comfortable about. If you feel good about data there as of yesterday, you could put yesterday. If you're dealing with a three day turnaround time, you can make this back-dated three days. It's up to you. So these are the main hospital parameters. Then this is a section where we start to deviate quite a bit. From the Penn model and that's because we allow you to actually put in what your capacity is. Importantly when we're looking in it here what we're talking about is the capacity you're trying to obtain for your COVID-19 patients.

Jason Jones:

You may have a 500 bed hospital and you're trying to reserve 300 of those beds for COVID patients and to John's point earlier, this may be where you have to bump that up to 400 or look for beds somewhere else to be able to increase it over time. Similarly, we have the ICU beds we're trying to retain for COVID-19 patients and lastly the ventilators you're trying to maintain. In the spread and contact parameters, this is where we're going to start to get into how quickly the disease may be building up and spreading.

And so here you have an option. You can either go in and specify when the first case showed up in your hospital or you can specify the doubling time. As we move forward in time, that I think it will be easier. Easier to use our actual history whereas when the tool first launched most hospitals in the United States didn't actually have any COVID-19 positive patients.

Jason Jones:

So can again, you can put in the doubling time or you can specify when the first patient arrived. This other section, and the other parameter here, the social distancing. Most of us I think are under some kind of order now to stay at home or try to stay at home. And you can try to estimate what the incremental impact of that social distancing may be going forward. So the severity parameters that we're going to look at here. There are the first three all relate to what percentage of infected people will end up needing hospitalization, critical care or a ventilator. So those again are highly local in part because the testing rates are highly local at this point. Below that we have the infectious days, which is how long somebody stays infected which right now is just reading the CDC default of 14 days.

Jason Jones:

And then the length of state parameters. So how long will somebody stay in the hospital if they're only admitted to the hospital and not admitted to critical care. If they're admitted to critical care, then one of the disconnects that many people face is this is the length of time that a critical care patient spends in the hospital and it is assumed that their entire stay will be in critical care. So now they get ventilators. If somebody ends up on a ventilator, the presumption is that they start, are admitted on a ventilator and they're not taken off the ventilator until they're discharged. We realized that those are probably not the assumptions that you typically would live with in real life and we can talk about that in the Q&A section.

Jason Jones:

And the display parameter, this is really just to allow you to control how far out you'd like to look. The default is set at 100 but you can set this to some other value. If you would like to and you'll see why we might want to do that in a moment. And then lastly, and this is another departure for Penn. As people gain more local experience, we thought people would want to be able to look at how their actuals are comparing to what the model might have suggested. So rather than have you type in everything, you can just drag an actual files into this space and the information will be represented on the right hand side. So don't get overwhelmed if this is the first time you've used a tool like this. You're right, it is a lot of stuff to input. Which is why we start at the top by allowing once you've input the information once, you can save this scenario and then just reload it by dragging that scenario file on top.

Jason Jones:

One of the concerns that people have is that others might be able to see their scenarios or their actuals. So none of these data are stored on this server. And you'll see in a moment we can download them locally and you can maintain your scenarios and your actuals locally. They're only represented visually when you drag them on here and then they just disappear. Okay. So let's start with a bit of an exercise here. So, let's look at our daily admissions. And what you'll see is that the peak of total hospital admissions will be 388. And it's supposed to occur on June 10th. So one way for us to change that is to come down and say, well you know what? I think the doubling time has now slowed and it's not doubling every four days, it's doubling every six days. So I'll just come in and type the number six here and I'll hit enter in a second. Once I do, just try to remember we have a peak of 388 on June 10th.

Jason Jones:

So if I hit enter now, it will recalculate for me. And we'll see we have the peak being 192. And not until June 13th, and this is the classic flattening of the curve that we're all trying to achieve. So I'll put that back to four, and you'll see again we go back to 388 and June 10th. And all of that information was carried on through all of the different values that we're representing here again, the hospital census which takes into account. Length of stay and as well with the capacity that we have. So the next thing that I wanted to show you rather than going through and entering every single one of these individually, is what it looks like to load a scenario file. So I'm going to bring up on my desktop here, now it's going to be very small on your screen, I apologize but maybe you can see what I have, a scenario, called pessimistic and I'm simply going to take it and drag it on top. And it's going to go through and update all of the charts and all of the data for me.

Jason Jones:

So you'll see now we have very different information in terms of the admissions. We have different information on census. And we have different information on the capacities that we have here. And once again, once I've loaded that file, I've given it an author's name and a scenario name. I've changed the parameters, like the regional population and how many hospitals were in this area, sorry, how many COVID-19 patients were in the hospital as of this certain date. And this is assuming that I had data available, up until April 3rd, last Friday, and that there were 35 patients at that point in time. I've indicated how many beds we'd reserve for these patients and all of this information is now saved in that simple scenario file and is very good for uploading. You can manage many scenarios.

Jason Jones:

Examples of types of scenarios, as John mentioned, you've got a pessimistic, an optimistic, and realistic version. But you could also have scenarios, what if I look at one hospital, all the hospitals in my system. Or all the hospitals in the geography whether they're mine or not. What happens if a hotel down the street gets turned into a hospital. So you can save as many scenarios as you would like and again, they're as easy to reuse. It's simply dragging and dropping in this space. The other thing I mentioned, is that we could load actuals. So let me show you want an actuals file looks like. And there's a section on the website that helps you get started. But this is an example of an actuals file and what we'll put in is just the dates that are relevant. The total number of admissions, ICU admissions and incubated patients. As well as the census total, ICU and ventilated patients.

Jason Jones:

Then if you have it, the accumulative regional infections. You don't have to have all of these columns. You can just populate the ones that you do have. But whatever information you have, and you'll see this is now going through April 7. In order to use it, all I have to do is... I'm going to scroll up so you can see where it shows up here. On the total census. I'm going to just drag this file over on top of this section and it will upload it for me, again temporarily, it's not stored. And now whereas before we just had these lines, showing what hospital census would look like. We now have dots or circles on a line that are representing the actuals. And you may be able to detect if your eyes are really, really good that there's a little bit of white space showing up between the actuals and the predicted. So one way you can zoom in a little bit to see how your actuals are comparing to predictives, I can change the number of days to project and say 100 to 30.

Jason Jones:

And when I do that, it's reduced the X axis by quite a bit and now I can get a little bit of a better view of how it is that my actuals are starting to depart from what would've been predicted. And at this point I can come in and say, well, you know what? I now have data that are more current than what was available when I first saved my pessimistic model. So let's go ahead and update that. What I know now is through the 7th, I have 30 patients in the hospital. And I'll enter that information. It'll update everything in the charts so I'm now updating the actual epidemiologic model. And you can see, not surprisingly, because I generated the data from the projection but now, not just perfectly. So once I have that, I can now give this a new name if I'd like to. You can call it COVID-19 updated. Come down to the bottom and save this scenario. It will ask me where I want to save it. And I'll go to my download section. And I can save my model and I won't save it.

Jason Jones:

I won't override it, but that's how easy it is to save it on your local desktop and again, then you can manage it however you'd like. Let's just go in and see how it's actually changed the answer and I'm going to zoom back out to looking at 100 days. So remember before, my capacity, if I reload my pessimistic model. Let's see if this will work. Hope it'll work. I'll do the pessimistic. Down here, I'm going to refresh this again. There's a bug by the way that I'll point out in the underlying software that we use. Where it doesn't always refresh your file if it has the same name. So I'll go in and drag the file on top again. And reload my pessimistic scenario. Okay. So in my pessimistic scenario before we updated it, we were going to run out of all of our hospital beds on May 1st, our critical care beds for all COVID-19 patients on April 18th and then on the ventilators on the April 22nd.

Jason Jones:

If I load my updated model, which we just created together. We'll see how now we've gone from May 1st to May 7th. And we now have until April 21st for our critical care beds and so on. So again, the hope was that we've made it easy for you to see how the COVID admissions, COVID-19 admissions and lengths of stay and your available capacity are all related to each other. And to allow you to have multiple scenarios that you can easily run and update and compare to your actuals. And I will pause there. John, do you have comments?

John Hansmann:

Yeah, let me add a couple things to the graph that you have right in the middle of the page. So as Jason said, remember the blue line is all, are total beds, are total patients are in the... That we have available to us to put any patient into them. And we're specifically looking at the COVID patients here. The orange line is ICU. And the red line are ventilated cases. As you can see, as you start to follow the trend down, today's date is the vertical gray line that's on April 8th. And for those of us who are working from home who don't know what date it is, like me, that is the date. You can see that on May 7th, our blue line is now crossing the zero dash line. So, for May 7th forward, until we get back out into sometime in late June, that whole dip of the blue line, the dip of the orange line and the dip of the red line, that's where you are now at capacity and actually over capacity.

John Hansmann:

You have more patients in the system than what you have available beds for. And this is where your planning scenarios will now have to come into play of how will you take care of those patients. How will you manage them. Where will you take care of them at. And as Jason showed, that just by changing a couple of parameters, you can start to play what-if games with this. And in the scenario he showed, we

moved out from putting real data into the tool, now moved out from May 3rd to May 7th. Which if this is your hospital, you just gained four more days to figure out your plans of how you're going to address that deficit situation and when you're out of beds.

Jason Jones:

Yeah. And let's say, you know John in one reference you had mentioned is perhaps taking from the OR, your traditional step down units or something else and creating ICU beds. For instance we could come in and say, wow, maybe we can get another 30. So out of a total of 60 ICU beds that we can put into service and then we can see how it is that that then moves you out so May 3rd. Because you have a capacity somehow. So that's the hope of how this, that we can help you figure out where your capacity needs to be and then how to modify them. John, anything else that you'd like to look at in here before we go back to the slides?

John Hansmann:

No, but we have a lot of questions that are on the questions list so why don't we start addressing them. You may want to stay here Jason in case if we need to look at some models. So the first one is, will this predictive model work for Ontario and Canada?

Jason Jones:

It should. It's funny. So it's one of those, so often I find myself presenting on wonderful predictive models from Canada and this is maybe one time where the US gets to give back. Although in Pennsylvania in this case. So yes. The underlying theory behind the model should work equally well anywhere in the world, truthfully. And if you're interested in that or perhaps you've heard on the news or somewhere else, this mystical SIR model. That is that chart on the date and all the explanations for it are represented here. I didn't cover it but it SIR's stands for susceptible, infected and recovered. And it really is a population epidemic spreading general model that can apply anywhere in the world. What you'll want to be changing are things like the population and how it is that patients or the population was shared amongst the hospitals.

Jason Jones:

If you're having better luck in Ontario at achieving social distancing in the like then you may well want to change the impact of that social distancing or other parameters that alter how the epidemic is spreading. But absolutely, this should work anywhere in the world if you change the parameters to meet your local circumstances.

Sarah Stokes:

John, would you mind if I hope in and do our closing poll question in case people need to jump at the end of the 30 minute window?

John Hansmann:

No, please do. It's perfect timing.

Sarah Stokes:

All right. Okay. Again, we want to thank you all for joining us today and we know some of you are going to have to drop here at the end of our 30 minutes. So pre-empting that we would just like to ask you if

you would like to see some additional live demos, sharing other COVID best practices for solutions. So I'm just going to leave that open for a few moments. We do have a great list of questions that have come in. We do want to encourage you to still submit questions. That's the whole purpose of today's session. We want to answer anything that we can to help you best use this tool in your own environment. So be sure to get those submitted and John and Jason are planning to stay on extra-long to address those. So give you just a few more moments here.

Sarah Stokes:

It looks like it's starting to slow down a little bit. Thank you for taking the time to vote. And I'm just going to go ahead and close that poll. And then I'm going to turn it back to you, John.

John Hansmann:

All right, thank you Sarah. And for those of you who have to leave, we have the development team on the left hand side, like I said, it's taken a team effort to where we are today. And we have contact information. A web address, or excuse me, an email address up on top, at covidcapacity@healthcatalyst.com, to send us any questions or comments. The capacity planning tool link and then also the website. And these will be distributed for those of you who attended the session after it's all done. But for those of you who can stay on, we have probably 10 or 12 questions in the list that we're going to continue to answer. So if you want to go back to the model, Jason, I think that's probably going to be the best place for us to stand.

Jason Jones:

Absolutely. I will go back … whether. Yeah.

John Hansmann:

I'm sorry. Go ahead.

Jason Jones:

I just wanted to check. The other thing we're going to do is ask people for their input on how we should prioritize subsequent improvements. And I wonder what order should we should go, I'm happy to go in either order, either answering questions for asking people for their input on the prior development priorities for the next week or so.

John Hansmann:

Why do we do a couple more questions and then come back to that.

Jason Jones:

Okay.

John Hansmann:

I think we still have a good number of people that are staying on. So next question on the list is how does this model compare to the IHME or the University of Washington model?

Jason Jones:

So I love that question. I love when people, University of Washington, IHME. They have developed a fundamentally different model. And I look every morning to see how it is that things are converging. Now the IHME model, for those of you who aren't aware, if you Google IHME, University of Washington COVID-19, I should pop it up for you. Terrific group up there. The only, on there about their model, is that it is at this. It's now international but within United States it's at approximately the level of a state. So for those of us who live in places like John in Texas, or like I do in California or some of you might be in New York or Michigan. I mean state level data is not quite what you need. So it's a wonderful model, very different methodology in every publication on it but it's well worth reading.

Jason Jones:

But it unfortunately is not going to do much further below the level of the spread at this point. And part of that is because it relies heavily and appropriately on actual data and as the model was developed we just didn't have that much data.

John Hansmann:

Thank you on that.

Jason Jones:

Hopefully that helped.

John Hansmann:

So next question. Does a tool assume a certain percent of ICU beds are for COVID?

Jason Jones:

No, it does not. You can specify that in two ways. In fact, you have to specify it in two ways. One it is, and we're actually seeing geographically there are really different proportions of people in different geographies that are needing to be hospitalized at all of your locations to be put in critical care. So one is of those who got infected, what chunk will end up in the hospital versus, in the hospital overall versus in critical care. And the other place is, sorry. When you specify the amount of space that you have in your hospital. Typically, critical care is a small chunk of the total hospital beds, which you're in a location where you need a lot of critical care beds, you may have actively repurposed a lot of your typical med-surge or other beds to be critical care ones.

Jason Jones:

On the supply side you can also manipulate that independently.

John Hansmann:

All right, thank you. I'm just trying to scan through. See what kind of questions that we have here. Let's look at this one. It appears that we're modeling on a daily bucket of time perspective rather than an interval of time. Are you assuming that all discharges for a given day occur before the admission occurs?

Jason Jones:

Yeah. Gosh, this is really be great to be able to have a little bit of the conversation. We are. The underlying model is bucketed on the daily, like an image or daily basis. So no, it's not possible to think how, in this case how you're discharging patients at 10:00 AM and then admitting new patients at 2:00

PM or something like that. So that maybe is a partial answer where you realize that often people would like to have more granular information if that's where the question is going. And one of the questions we would've had for you, because as soon as we go below whole days, we start to break with the Penn Med model. And there's a tradeoff there. Because it's nice to be tied to a reputable organization model.

Jason Jones:

But as it starts to breakdown our actual experiences... When we deviate from how we think about the world. We've done that already in a way. Because these lines, if you go to the Penn Med model. If you wanted to get your total hospital, we've labeled it differently. On their site we'll see hospital instead of total here. And so you would actually have to add up how many patients are on a ventilator. How many patients are in critical care and how many patients are in the quote/unquote hospital, to get your total hospital and we didn't find anyone who thought about the world that way. So that was an immediate departure. Where total hospital here really does mean total hospital. All the patients you have. Critical care is a subset of those totals. And then ventilators are neither beds nor people there. They're things and they're managed separately so we have deviated from Penn in the past but we've tried to stay in lockstep with respect to how the model operates.

Jason Jones:

To get back to the original question…

John Hansmann:

So let's do, Jason, let's do one more question and then go our responses that we're looking for some feedback on where we are going. Because this one will... Doesn't impact or is related to that. And it's from an organization who they're already on the curve and they're studying to near their apex. So their next concern is what happens next? In the post-acute world, the capacity and … on healthcare … etc. Can this be modified to now incorporate post-acute care activity?

Jason Jones:

Wow. That was a great question. We haven't modeled it and John, curious to your thoughts but we're actually at least where I am, struggling that this skilled nursing facilities and the like because they're having outbreaks there. Those spread very quickly and we actually lose the facilities very quickly. It's also a challenge with the staff there because it's one thing to lose, it's a terrible thing but it's one thing to lose 10 nurses at a hospital who become COVID positive but if you lose a couple nurses at a skilled facility that may be everybody. So it's a really good question. The model does help us understand when of those that we should expect patients to be able to be discharge from the hospital.

Jason Jones:

We have not yet worked on dispositioning them, nor did we have it on the priority list. So John, I'm curious your perspective. How we should think about that because we end up with a horrible circumstance where people technically could be discharged from the hospital but there's nowhere for them to go.

John Hansmann:

Yep. So as Jason said, our team, we haven't formally started talking about this but it's been something I've been thinking about for probably the last week or so. As some sites in the country are starting to move into that part of the curve, what happens next. The scenario that I keep running through my mind

is somebody who's sitting in a hospital because they're still sick enough that they need hospital care but now they've recovered but they're still contagious so we can't let them back out to the community. What do we do with that type of person. Where do we send them? And it's going to become an issue just like on the mortality side where now other, you know New York is starting to deal with this right now, with where do you put the bodies. We don't have the morgue capacities in most hospitals and they're bringing in refrigeration trucks and things like that.

John Hansmann:

So we've been starting to think about or at least I've been thinking about this, where we go next and how do we take this. But we don't have any plans in place right now to do anything with it. But the concept could and should follow through very similarly. Now just how we model it and the ability to play what-if games with that data I think becomes very important.

Jason Jones:

I agree.

John Hansmann:

So Jason, you want to ask the couple questions that are related to that that we want to get information from folks on?

Jason Jones:

Sure. You're not going to see all these choices because we can't on this platform but what we were going to ask you is if, and please, only if you actually have interest in using this tool. Can you help steer our development priorities a little bit. And you'll see five options on your screen and it'll ask you three times, so you get three votes and if one of these is just so important you won't use it without, then you can vote three times for the same thing. But this is our current thought on priority of what should we add to the tool. One, was the ability to model demand for PPE or personal protection equipment. The other is do we need to add, for you, as we have with the ability to provide how many beds you have. Do we need to provide that capacity and ability for you to add your supply or resupply for PPE. To make it useful.

Jason Jones:

Number three on the list would be staffing impact, related to COVID-19. So nurses and pharmacists and physicians, and like. Then number four is what we started to talk about a little bit. At what point if any, do we shift from the Penn Med model to one that is more empirically based and perhaps more precise once we start to gather more data or should we stick with the Penn Med model. Because again, it's a highly reputable and terrific source. Number five, which are the last thing we see in this session would be, should we look at emergency department demand. We'll see there is an option by the way if there's something else, like we're willing to think about post-acute, please email us and we will add that to the list. That one we'll add anyway but the more people that ask, the more likely we prioritize it.

Jason Jones:

Sarah, if you don't mind can you give that opportunity for people to help us prioritize where we... Where we put our development efforts?

Sarah Stokes:

Yep. Okay. So just as Jason said we're going to do three quick questions for you all. And we want to know of these features which Jason just went through one-by-one, which item would you prioritize first in this first question. And again, your options were number one, demand for personal protection equipment. Number two, future resupply to estimate capacity constraints for that PPE. Your third option is staffing impact based on COVID-19 patient demand. Fourth option is shift from Penn Med model to an empirically based data modeling. And your last option is emergency department demand caused by the COVID-19. So I'll give you just a few more seconds on this one, and again we're going to have two more polls right after this for your second and third choice. Okay. Oh, there was a quick surge there. Okay. All right everyone, thank you. We're going to go ahead and close that poll and move on to your second choice here. Just give me one second here to pull that up.

Sarah Stokes:

Okay. So again, same options here. But we would like to know your second choice for priority of these listed features. So we'll give you again, just a few moments to submit your votes there. By the end of this you're going to be very familiar with all these answer options. And again, we do have a really great list of questions but if there's still anything top-of-mind for you, please do submit that and we'll see if we can get it addressed today. And if not, we'll make sure to follow up with you after the fact. Okay. That one's slowing down, we're going to go ahead and close that.

Sarah Stokes:

And then let me switch over to our third priority here. Okay. So again, same answer options but what is your third priority among these listed features. And just like before, we'll give you a few moments. You should be pretty familiar with this by now so I think the clicking... The speed has definitely increased at this point. Okay. I'm going to give you a final countdown here. Three, two, one. We're going to go ahead and close that poll. All right, back to you guys.

John Hansmann:

All right Jason, you want to go back to … in case. Oh, I'm sorry.

Jason Jones:

I just wanted to make sure you saw the address here, because I realize again that post acute wasn't covered. So here's an email address that you can use and we're monitoring that to take your input or answer any of your questions. Okay. Here we go.

John Hansmann:

So we still have a number of questions left for those of you that can hang out. We're going to go through the list and finish them all off before we hang up today. A comment from Dale Sanders from Health Catalyst. Is talking about organizations are struggling with quantifying and he puts it in quotes, the effectiveness of the social distancing in their catchment area. He's been suggesting that, that they use a Google community and mobility data from their area to inform effectiveness of social distancing. And we have a couple other websites that we've identified that had some pretty decent data for the social distancing also in it too that we'll pass along with the documents so you can have a better than a guess if you will. But a good number to be putting in to the social distancing parameter that's on the page that's a little bit higher than where Jason is right now. Let's see.

Jason Jones:

And this is where that social distancing parameter is... And it does have a meaningful impact. So before I'd gone in double dark, our ICU beds. So that upstate got back to 30 again. So we see where we are and then I'll go in and change this theory, to let's say it's 40% and just literally go from May 7th to May 24th. And we're not … also quite a bit. We never dip that far below zero. And I was speaking with one state that Dale know as well where they thought they might be able to get to a 70% improvement with social distancing. At which point you never go zero. So these parameters do matter quite a bit and again, they're very local and they're also changing over time. So it is... Dale, thanks for this suggestion on where to look to help people estimate that.

John Hansmann:

So a similar question Jason, how can good parameters be adjusted to account for possible hot spots, again in quotes, for the dense, at-risk populations like nursing homes, retirement communities, etc. like we've talked before.

Jason Jones:

Yeah. So if you wanted to get hyper-local, one thing you could do is treat your regional population on a much, much more granular level which I won't do because it's going to make everything else look completely wacky. But you could say, where we have 10,000 people who might ever go to the skilled nursing facility and they have 50 or 100% of the market share. For instance, you could absolutely model your world that way. And the tool will absolutely work. The numbers of course will all be much smaller. We want to adapt your beds quite a bit but you can get as local or global as you would like to with this tool. And it should work pretty well for you. Hope that helps.

John Hansmann:

So similar question, same vain in a way. Could the model identify hospitals where we can silo hospitals where elective surgeries can continue and certain hospitals could become COVID-19 specific hospitals? Any thoughts on that?

Jason Jones:

Definitely. Probably the way that we've seen people address that most is counter to what I've just said. Leave this section the same. But then and perhaps give it a name like COVID-19, treating a whole hospital as the COVID hospital. And then down here, we would put in the bed availability within that COVID-retained hospital. So let's just pretend that you have a 500 bed hospital that had been a general, acute hospital before. And now there's a 100 bed hospital somewhere else that had also been general. And now you take that 100 bed hospital and we use it only for certain types of procedures or anything non-COVID related. I think John's heard this too many times from me, we know there's some places that are moving labor & delivery to outside of the hospital for instance.

Jason Jones:

And then you could take all 500 of those beds and say well, in this area, all 500 are going to be used for COVID-19 patients and then you actually have just quote/unquote solved your problem with running out of hospital beds, almost. In the scenario that we're running. That's exactly the type of scenario that John had mentioned, might be possible and here I would suggest you just change your bed capacity to essentially treat the entire general hospital as a COVID facility and leave out the ones that you intend not to use for COVID at all.

John Hansmann:

So along the similar lines... Along the similar lines for that Jason, what's the best way to use the tool to answer what needs... Sorry my question just disappeared. Oh, there it is. This question tool is not the most useful in the world. What needs to happen to not exceed capacity?

Jason Jones:

Yes. So we sort of just did that. If they didn't want to exceed capacity, let's just pretend that we're not going to change the virulence or spread of the disease or the lengths of stay of course. That will also have an impact. So if you can figure out how to reduce your length of stay or something or increase social distancing. Let's leave those parameters alone. So now if we look at the capacity chart, we can see that we're short about 200 beds at peak. Then we have 300 beds. As I did before, we can go in and put in that we have 500 beds and now we don't have really much of a problem with total capacity that we see that our next biggest problem was with critical care.

Jason Jones:

And that we're short about 130 critical care beds. To go from 30 to 130 seems like a stretch but just to display it. I can then say, well we'll go to 130 beds. I predict our critical care beds actually have to go a little bit further than that. But you can play with your capacity to figure out how you can meet the depends and we could do the same for ventilators. The other thing which isn't so likely is you could say, well you know what, there's nothing we can do to bump up... Let me reset these. To bump up our total hospital beds. I mean you could go the double occupancy rooms or something. But maybe what we can do is bump up the chunk of them that are critical care.

Jason Jones:

And so then you could go and say well we can make 100 of them critical care and perhaps then be able to take care of the sickest of the sick patients but still struggle a bit with the people who are going to be hospitalized. As it relates to altering your capacity, all of that would happen in here and just suggest playing with it, within the capacity chart. You can see the tables by the way, if you want to get precise numbers. So, when you click on that checkbox it will give you precise numbers and if you want to show it every day instead of every week, you can look at it every day and see exactly where the estimates are.

John Hansmann:

So we have two bed… Thanks Jason. So we have two bed-related questions. And I'll take a stab at these first and then if you want to comment on anything from there Jason. So one is, can the data be broken down into specific units. So you can understand what's happening at a unit level and where a unit is nearing capacity. And the second, associated with it, can you identify dedicated surge beds and understand what those beds are at capacity? And basically the model is structured where we can understand the total number of beds in the house right now and the critical care beds or ICU beds. To get any further breakdown into an individual or specific unit, we don't do that at this point in time.

John Hansmann:

But like what Jason just showed, the ability to download the data into Excel and get the tabular data, you can then take this into Excel, everything that runs off the model and then sub-divide it up into your individual units and address individual specific capacity from that perspective. And you could do that or you can go with the surge beds too.

Jason Jones:

And John, you brought up a good feature that I didn't cover. I showed how you can display when numeric data in the tabular fashion rather than visually. But also underneath each of the plots, there's an ability to download a file. And near the very bottom, there's the download the full table. And a reason why you might want to do this is, let me go to scenarios. And you download those. The reason why you might want to do it is because not only do you have all of the data that we just looked at but you also have all of the assumptions that you used. I know this is probably a little bit small to read so let me zoom in a little bit. But you'll see a bunch of replicated numbers and the reason for those, because we said, 2.5% of the patients were going to need to be COVID patients who tested positive for COVID-19 were going to be hospitalized.

Jason Jones:

So all of the assumptions are in this file. And then if we look at the date, when all of the dates, and all of the other things. How many admissions you have. How many beds you're going to have left over. These are the capacity charts that we were looking at. As well as in your whole population how many are still susceptible, how many are infected, how many have recovered, and so and so forth. It is possible for you to download on either individual components, like how many admissions or where does the capacity look like. Or you can download in one scoop everything on this page in one place, if you prefer that. Thanks for the reminder, John.

John Hansmann:

Yeah, thanks. So next question. At any unique point in the graph, are patients only counted once or does for an example, a ventilator patient also count as a hospital bed and/or a ICU bed?

Jason Jones:

Okay. So between days people get counted only once so on April 26th people, and 27th, people are going to be counted in April 26th and April 27th. For census and for capacity. But not for admissions. People can only get admitted once. And then as it relates to the lines, people are counted in critical care and in the hospital total. And the critical care is a subset. So right now on this date, we have 14 people in critical care. And that is a subset of the total 63 people in the hospital. So if you have 63 in total, 14 of them are in critical care. And if I hover, nine of them are on the ventilator. So you do not want to be summing up these lines for any reason. And that again is a difference between Penn Med website, where if you go there you actually do need to sum up all three lines to figure out what your total hospital capacity is. Or total hospital use is. Hopefully that answered it.

John Hansmann:

I think it did. Couple different questions in this arena and it gets back the poll questions that we asked. Are we considering to add PPE and/or other disposable items, equipment, supplies, into the tool?

Jason Jones:

Yes. In fact, we're hoping that we can go live with that tomorrow, fingers crossed. We've been working really hard today so that hopefully is the next thing that comes up on the list. John do you want to describe what will be in there for people?

John Hansmann:

So on the PPE side, we're looking at gloves, masks, gowns, shields and differentiating in between N95 masks and general surgical masks. And then in other category for you to track other things that you may be using. But those five articles primarily and then we're going to be identifying a use rate per day that you can modify or change with the parameters, like you've seen on the left-hand side. Then based upon the demand requirements with patients coming in, the map will be calculated and then various graphs will show the pictures to it. And then depending upon your poll results, we're looking at trying to decide where we put our efforts for the next few days.

John Hansmann:

Do we put in a real inventory count to then allow you to have what you have on hand versus what your demand is going to be. Or are we going to work on something else. Because we're not sure if we're going to do that second piece yet. We want to see how valuable that was, that's why we ask the question, the poll questions. But for sure we're going to have the demand side of the supplies again, for masks. The two types of masks. Shields, gloves and gowns.

Jason Jones:

Great.

John Hansmann:

We probably have time for one more or two more questions and those that we don't get done in the hour we'll follow up with everybody on. I'm trying to find a good representative question. Last question that we'll address here. Does the model feel an impact on loss of revenue due to loss of elective cases and/or cashflow related activities?

Jason Jones:

So no, the short answer. We have thought about that, Health Catalyst has. Outside of this tool, send us a note if you'd like some more information. We have been working with people to try to... Of course, what is everyone done, everyone's moved those elective procedures out. Can we estimate to the question that was asked, what the financial impact of that will be. But also things like how can we manage the reschedule of those which is also a dynamic because none of us really knows exactly when COVID-19 will allow us to return to normal. The models give us an indication but that's dependent upon people's behaviors and everything else.

Jason Jones:

So we do have solutions, they are specifically focused on helping you address cashflow but haven't figured out to do that easily in this tool. I'm not really sure we could without having to add about 30 or 40 other items on the left-hand side.

John Hansmann:

Yeah, we were joking yesterday about having eight feet of parameters and having to scroll up and down. That would get very untenable to use. We do have one more question, I would like to get to Jason before sign off. I realize we're at the top of the hour. We're way over our time but this one was very interesting and I think we can address shortly. Or in a short time period. Has any verification been done on this meaning looking back six to 12 days later. Have we hit the nail, are we far off? What is been our experience so far?

Jason Jones:

The predictive accuracy that was why we have the ability to load your actual data. And the truth is that this model as opposed to the empirically-based prediction model, relies very heavily on your assumptions. And so the utility of the model depends on the accuracy of your assumptions so we've tried to make that as easy as possible to assess. So that you can adjust your assumptions. And that was also why we asked the question, those are kind of point in time and how hard should we work on trying to help you with that process of adjusting assumptions.

Jason Jones:

One thing that Penn did really quickly which we were grateful is it used to be the case that you had to put in the doubling time, which almost nobody knew but we didn't have any cases to estimate anything off of. And then they added the functionality of being able to say when you have your first hospital case. Which then allowed them with knowing the current census to be able to estimate a double in time for us. So that was nice. But that's only using two data points. We think we can do much better if people actually are willing to provide something like two weeks or more of actual data. So that's allowed or provided that facility for the upload of data.

John Hansmann:

So Sarah I think we probably need to wrap up here because we were only planning to go over to the top of the hour. Can you put that last screen back up Jason while were... The last-

Jason Jones:

Yes.

John Hansmann:

Yes. Thank you. While we summarize and give me 30 seconds Sarah, and Sarah jump in. So thank you everybody for your time and your attendance today. Hopefully this was very helpful to you. And as we tried to do and put this out on a public space, this is a tool that's available for you to use right now. And to help you start that and it'll save you time and start that conversation of when are you going to run out of beds and what are you going to do about it when you're done. The group on the left-hand side, they've spent a lot of time putting this together. So thank them for the tool. We have the contact information on the right-hand side. The tool itself on the website if you haven't downloaded the tool yet.

John Hansmann:

And again, thanks for your time today. Jason, any last comments you want to add in?

Jason Jones:

No, thanks again for your time and for those of you who have provided care, thank you so much for doing so.

John Hansmann:

Yeah, and thanks for your questions. Great questions, we did not get to all of them so we'll follow up with those of you, that for the questions that we didn't get answered. You're going to get copies of this and then the documentation from Dale's comments on the social distancing and others. We'll supply all

that going forward. But we think we have a really good tool here for you to use but if you don't use ours, use somebody's because we're all in this together and we're going to solve this problem together. So take care, be safe and thank you for your time today.