Action No. 2001-14300
E-File Name: CVQ22INGRAMR
Appeal No._____

IN THE COURT OF QUEEN'S BENCH OF ALBERTA
JUDICIAL CENTRE OF CALGARY

BETWEEN:

REBECCA MARIE INGRAM, HEIGHTS BAPTIST CHURCH,
NORTHSIDE BAPTIST CHURCH, ERIN BLACKLAWS and TORRY TANNER

Applicants

and

HER MAJESTY THE QUEEN IN RIGHT OF THE PROVINCE OF ALBERTA
and THE CHIEF MEDICAL OFFICER OF HEALTH

Respondents

H E A R I N G
(Excerpt)

Calgary, Alberta
February 11, 2022

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L.B.U. Grey, QC (remote appearance)	Heights Baptist Church, Northside Baptist Church, E. Blacklaws and T. Tanner
N. Parker (remote appearance)	For Her Majesty the Queen in Right of the Province of Alberta and The Chief Medical Officer of Health
B.M. LeClair (remote appearance)	For Her Majesty the Queen in Right of the Province of Alberta and The Chief Medical Officer of Health
N. Trofimuk (remote appearance)	For Her Majesty the Queen in Right of the Province of Alberta and The Chief Medical Officer of Health
M. Palmer	Court Clerk

THE COURT: Good morning. Do we have all counsel online and ready to participate? Mr. Parker, your team is here?

MR. PARKER: We are, Madam Justice Romaine, good morning.

THE COURT: Morning and --

MR. RATH: Mr. Rath, I'm here --

THE COURT: -- I am sorry?

MR. RATH: Mr. Rath, I'm here with Ms. Ingram, we're ready.

THE COURT: Okay. Thank you and Mr. Grey?

MR. GREY: I'm here, good morning, Madam Justice.

Discussion

THE COURT: I want to bring you up to date on a couple of things that occurred that I was not aware of till this morning. Evidently, although all of us are on a Webex channel, given that the number of people that wanted to participate in this hearing the court administration and technical assistance opened a Webinar channel and I understand that about 700 people participated in the proceedings on that Webinar panel yesterday. So I was not sure if you were aware of that, but that seems to be a good way to ensure that this hearing continues in a smooth way.

MR. RATH: Thank you.

THE COURT: The other thing is that I said yesterday, my computer was frozen on that all night given the transition to the new operating system, but my assistant provided me with some new materials that came in this morning from -- I guess from Mr. Rath and then there is responses from Mr. Grey and from Ms. LeClair on the issues of the scope of the hearing. So I would like to hear suggestions on how we are going to deal with that issue.

MR. RATH: Madam Justice, this is Mr. Rath, if I may?

THE COURT: Yes.

MR. RATH: Just to clarify the order of this, we want -- he came into the office this morning to actually find a letter from Ms. LeClair. So the first correspondence was from Ms. LeClair.

THE COURT: Okay.

MR. RATH: Our correspondence was in response to correspondence from Ms. LeClair and obviously it's all about my friend Mr. Parker attempting to limit these proceedings, you know, to matters dating back to July of 2021, which has never been our understanding of these proceedings. So we do need to discuss how we're going to discuss this issue.

MS. LECLAIR: And Madam Justice Romaine, if I -- just me here, Brooklyn LeClair, it's my letter that came in first as Mr. Rath noted. And this was cause -- I understood yesterday that you had some confusion and we all apparently were not (INDISCERNIBLE) of these pleadings, this seems to be a more efficient way to resolve this and hopefully taking up a lot of time today because it appears we're running a bit behind schedule.

MR. RATH: And Madam Justice, again if I may, there's no -- from our perspective there's zero confusion on our part. In our view, this is an attempt by the Crown to unduly limit these proceedings outside of the scope of the procedural order granted by Madam Justice Kirker.

THE COURT: Okay. I read -- I have read what I received this morning and I agree that we do have to deal with this issue. The question is when and how. I know that Mr. Parker is in the middle of his cross-examination of Dr. Bhattacharya and I would like him to be able to finish that today in accordance with our schedule.

I do not know whether -- I have got some -- I have some materials by way of submissions from one of the parties. I do not know whether the other parties want to make some written submissions, as well, before we deal with it. I have -- Mr. Rath, I have got your written submissions. Mr. Parker, Mr. Grey, are you -- do you want the opportunity to put in some written submissions.

MR. PARKER: No -- sorry go ahead Mr. Grey, my apologies.

MR. GREY: Madam Justice, I would be prepared to do so, however, I think that what has been presented by Mr. Rath really presents the joint submission. I do have some -- some supplemental submissions that I could make if the Court needs to hear from me in that regard. I could make those either orally or submit those in writing at your direction.

THE COURT: Okay. Mr. Parker, how about you, do you need to make some written submissions? And I was thinking of written submissions and then followed by a short period of oral submissions.

MR. PARKER: Sure, thank you Madam Justice Romaine. Yes, we do need to get this resolved. Ms. LeClair is going to be responding to this, I will just say a few comments now. She has provided written submissions; I will leave it to her if she feels there is further written submissions required and to make oral submissions. I did -- as I have been trying to piece together and understand the issue is here as I'm going through my cross-examination, I raised with Ms. LeClair that I recall Mr. Rath's office sent a letter, I believe to the case management Justice back on October 5th, that seems to deal with these issues that are now being raised. And I don't recall any response ever coming to that letter, I haven't gone back to look at it recently, I just raised it with Ms. LeClair this morning.

With that said, Justice Romaine, I'm going to pass this to Ms. LeClair to deal with from this point on.

THE COURT: Okay. Thank you. Ms. LeClair?

MS. LECLAIR: At this point, Justice Romaine, I don't believe we need any further written submissions (INDISCERNIBLE) might have, but from the respondent's perspective it's set out in our letter.

THE COURT: Okay, as I said, I just got -- because of the problem with the transitions and the computers, my assistant just gave me a stack of printed submissions. Does that include your submissions, as well? Okay. Well, if we have written submissions from both sides, then all we really need to do is put it aside for some short oral submissions.

I do not --

MR. RATH: Madam -- I just hate to interrupt but if I may, with regard to this matter, we literally arrived this morning to have -- to find Ms. LeClair's letter in our office. We, in haste, prepared -- you know a letter in response. I'm not sure, you know, from my friend Mr. Grey, whether he wishes to add anything additionally and certainly from our position, given that it seems that the Alberta Government is seeking to vary the procedural order of Madam Justice Kirker, that has been in place and has been informing these proceedings. Certainly they should have been the ones making an application to do so and certainly, we need to hear from Alberta as to what their position is, with regard to whether they're now going to be arguing that everything that is before this Court effectively is moot given that the -- you know -- given that the, you know, orders that they say this matter is limited to, we all --

MR. PARKER: I hate to -- (INDISCERNIBLE) --

THE COURT: Mr. Parker, please stop I will call on you next. Mr. Rath?

MR. RATH: So, but I want the Crown and Alberta to put all of their cards on the table so we know what is that we are responding to. Again, all of this has happened in haste this morning in 20 minutes before we were to appear in Court, when I received Ms. LeClair's letter. So -- and I'd like to hear from my friend, Mr. Grey, on this as well. Thank you, My Lady.

THE COURT: Mr. Grey, do you want -- Mr. Grey, I believe Mr. Grey said he supposed your position. He would be glad to make a few supplementary comments and he could do that orally rather than in writing; is that correct, Mr. Grey.

MR. GREY: That is Madam Justice.

THE COURT: Okay and what I have heard is that Ms. LeClair says that there are written submissions from the Crown already in this package of materials that I have not had much time to go through. So, I assume you received the same package of materials, Mr. Rath, did you?

MR. RATH: Our letter from this morning was our attempt to respond to the Crown's submissions in less than 20 minutes before Chambers this morning.

THE COURT: Well, I understand, but did you receive Ms. LeClair's materials?

MR. RATH: Yes, our letter is in response to that.

THE COURT: Okay.

MR. RATH: But from our perspective, this matter should've been brought by the Crown long before these proceedings.

THE COURT: Okay. Well, that is another issue. So, Mr. Parker, do you have anything else to say?

MR. PARKER: Yes, I'm sorry, I know I said Ms. LeClair will respond to this and she will, but I am just picking this up and understanding as we move forward and I think the issue is they're saying it extends beyond the third wave. I'm not sure if we've had an opportunity to look at all the transcripts, I made those submissions to Justice Kirker at least once. I received no -- there was no suggestion from the other side that they were taking issue with this, as I say, I think we should look at this letter from Mr. Rath's office of October 5th.

I'm just very surprised by this and the suggestion that we need to bring an application. The evidence that we filed July 12th was cut-off at the end of June. So if we're going to justify into the fourth wave and the fifth wave -- well we're going to have to put in more evidence or at least consider that. My sincere apologies for interrupting, we've simply not raised mootness and you know, this is the first time it's been raised on this point about impugning orders that we say are very clearly not covered by this hearing, have never been covered by this hearing and so I'm sorry, that is all I want to say and I will let Ms. LeClair take it from here.

Thank you Madam Justice.

THE COURT: Okay. Thank you.

MS. LECLAIR: Just further to Mr. Parker's point there, Justice Romaine, so in our pre-trial factum there were a number of orders that are and been repealed so for Mr. Rath's concern whether the Crown is raising mootness, we have not today and we certainly don't intend to as Mr. Parker indicated. There was a number of the orders that were impugned as part of the proceedings were already -- you know, by the time we filed our pre-trial factum and we did not argue there.

MR. RATH: In any event, My Lady, Madam Justice -- my friend are pretending to be surprised by our submission that these matters go beyond July of 2021, the procedural order granted on August 9th, 2021 clearly states at page 8, under the heading Impugned Chief Medical Officer of Health Orders, that the following CMOH restrictions and then (and for greater clarity and any subsequent manifestations of the restrictions in any future CMOH order not specified below.)

You know, it's clear that all the orders (INDISCERNIBLE) --

THE COURT: Mr. Rath --

MR. RATH: -- are before the Court.

THE COURT: Okay. Mr. Rath --

MR. RATH: Yes --

THE COURT: -- Mr. Rath, Mr. Parker please, I am not prepared to deal with this this morning and I do not want to hear oral submissions on it until I have the necessary background and positions of all the parties. So Mr. Rath you have given me some arguments, Ms. LeClair, you say, you have given me some arguments, I have not really gotten down the file to see those.

What I am going to say is, if anybody wants to write additional, written submissions, they should do so by noon on Monday. Okay. And on Monday -- well by noon on Monday then I have to read it, so on Tuesday morning we will deal with it -- the issue first thing. And in the meantime we will continue with the witness testimony as we started. Okay.

MR. RATH: Thank you, very much, My Lady, that is very suitable. Thank you.

THE COURT: Okay. Then now --

MR. PARKER: My Lady?

THE COURT: Mr. Parker, back to you.

MR. PARKER: Preliminary issues, I know I raised the issue of being short on time. We had planned and I had advised my friends throughout that we had a day and a half for Dr. Bhattacharya. One issue that is -- I want to bring to your attention on timing is Mr. Long's availability. He is scheduled to be up this afternoon after Mr. Redman. I understand the cross of Mr. Redman will be very brief, less than 30 minutes and then there's the issue of Ms. Ingram's objection to Long's qualification and then if he is qualified the qualification if that is not successful and then his cross-examination. He is, we understood, leaving on a holiday on Monday. We have reached out and he can make himself available Monday morning, but he would rather not and so I just wanted to bring that up because I can see us going the full day or close to it with Dr. Bhattacharya, if it doesn't speed up, but his answers were very long. So there's that issue.

That said, we've got Webex, so we may have some more flexibility to move people around or extend things next week.

There are some other preliminary issues. I wanted to just get into the transcripts, you raised daily transcripts and because of what happened yesterday I just want to revisit that if there's any steps taken or whether we should take our own steps on that.

THE COURT: Yes, I have asked my assistant to order daily transcripts.

MR. PARKER: The issue is exhibits, you wanted to return to, perhaps we could do that right after lunch, or when would be appropriate for you?

THE COURT: Sure that would be fine.

MR. PARKER: Thank you.

THE COURT: So can I ask you a question on that, Mr. Parker? I gather that you have paper exhibits that you are putting up for the --

MR. PARKER: Yes.

THE COURT: -- I do not have any of those, is it your plan to get them for me -- to us?

MR. PARKER: Yes, it is and so what I -- and I wanted to discuss that really briefly now before we go and mark them, because in terms of my recollection yesterday, for example, Dr. Bhattacharya was able to identify two of the exhibits, his CV from the website and so that would be marked as a full exhibit. We have an electronic copy; we will share that with you as soon as possible.

We also had his declaration from the *Tandan* case in California, he obviously identified that, same thing, full exhibit, we will provide it to you. We had a couple of cases and I am not sure that those would be provided as exhibits, a Manitoba case, there a Tennessee case *R.K. v. Lee* --

THE COURT: I have the Manitoba case.

MR. PARKER: The Tennessee I will provide, but it wouldn't be an exhibit, or what would be your approach on that?

THE COURT: You know, it would be useful for me to have any of those cases provided. We will not make them exhibits, but if you can just provide them for me.

I can tell you what worked, you know, for the future for all of this trial, what has worked for the last trial that I have been in, is that the parties give the witness and the Judge a binder, a hard copy of all of the exhibits they intend to put to the witness. If some of those exhibits are not put to the witness, then they are just taken out of the binder. But if they are, then that gives me a very good way to follow when I am preparing my judgment, as to -- to follow the cross-examination.

If that can be -- if that can be done here, I would very much appreciate it.

MR. PARKER: Okay and so my apologies, Justice Romaine, we were following the approach that was taken in the last trial in *Gateway* in Manitoba -- we were doing exactly what we were doing and providing the documents after the fact and nobody had any problem with that in that case, recognizing that in a normal case when we're there, once we do this, we'd be providing a copy to the Judge and to opposing counsel as we're providing them to the witness. The suggest was and I agree with it, you don't put documents -- you don't give documents to the witness in advance, that's not how cross-examination is done.

THE COURT: But at the time of cross-examination.

MR. PARKER: Absolutely, absolutely, but of course, when we're here it is not -- I can't just hand them up, so the intent is to get them to you as soon as possible after the fact and that's always been our intent and that's what we'll do. There's also the transcripts from Manitoba. I took Dr. Bhattacharya, I believe, to one of them. Again, I don't -- do you want the whole transcripts? Should we select the portions that we take him to?

THE COURT: Just the section that you take him to.

MR. PARKER: Excellent and that is it for exhibits and those are my preliminary matters, so we are ready to move on.

THE COURT: Okay. Good. Anything else from anybody before Mr. Parker continues?

MR. GREY: Just a point about -- sorry Madam Justice, it is Leighton Grey here.

THE COURT: Yes?

MR. GREY: Just a point about submitting documents that are put to the witness under cross-examination, of course, as you know with an evidentiary documents these documents are hearsay. They are not -- they do not become evidence unless and until they are adopted by the witness. I know that some of the transcripts, for example, the Manitoba case I heard Dr. Bhattacharya to say that he disagree with them, he did not adopt them.

So, I don't think that it would be appropriate to have those submitted as evidence in the hearing, of course, because they are transcripts and they are sworn testimony, Mr. Parker knows very well they can be submitted in another fashion. But I do not think it is appropriate to have those submitted as exhibits in conjunction with or as a result of the cross-examination, unless and until those are adopted by the witness. Of course, Mr. Parker still has Dr. Bhattacharya available if he wants to circle back and do that, I think that would be appropriate.

It wasn't clear to me with respect to all of the documents, certainly some of them that Mr. Parker identified clearly Dr. Bhattacharya acknowledged them and accepted them and those would be appropriate. But I don't think that was true necessarily for the transcript from the Manitoba case.

THE COURT: You see this illustrates I think the benefits of doing it the way that I had suggested, Mr. Parker and Mr. Grey --

MR. GREY: I quite agree with you --

THE COURT: -- because if I had a book and then if you had a book, not the witness, the witness obviously does not get the materials in advance but gets them as he is cross-examined. But if we had those materials we could deal with each one of them in the appropriate way, rather than waiting until later and having to sort out whether they have been admitted by the witness, or not. Mr. Parker?

MR. PARKER: Right and my response -- sure thank you. These are the transcripts from Manitoba and they say what they say. If Dr. Bhattacharya agrees with his evidence in Manitoba that's one thing. If he's saying something different that's another thing. I'm not going to belabour the point given this witness's evidence and try to come back and resolve every point and get him to agree what he said, it will take too long. I am going to take them to him where necessary and his evidence will be on the offence here and you should have the relevant pages as you plan to do, of those transcripts. You can look at his evidence, you can decide, is he giving inconsistent evidence? Is he giving consistent evidence? And I think that's the way it should be done, which is the way it sounds like you had planned to do it.

Beyond that, again my apologies for not providing these documents in advance, I was simply following the Manitoba approach and trying to adjust in this remote world. So I'll know better next time. Thank you.

THE COURT: Okay. Thank you.

MR. GREY: May I just say a couple of things, Madam Justice, before we move on?

THE COURT: Yes.

MR. GREY: Firstly, I rather agree with your approach, I think it's a good example of where we, as counsel, have to adapt ourselves to the new technology and make the best use of it. And so I agree with the process that you have set out.

Secondly, just as a general rule, I think we have to be careful about speaking of this hearing in terms of being under a time clock. This is, as all legal proceedings are, I don't need to tell you this, that this is one of gravity. Mr. Parker had mentioned that in the course of his

questioning of Dr. Bhattacharya and I just don't think that this is a situation where we should be in a hurry or be overly mindful of a clock ticking. Having said that, I do appreciate and it is important to be -- to manage court time carefully, but I just as a general rule, I don't think we should be trying to speed things up or be under, sort of, a game show sort of type of pressure. I just state as general comment. Thank you.

THE COURT: I appreciate that, and I do -- but I do want to warn everyone that I am not available in March. So if we are not finished by the end of February, we are going to have to continue in April. If it looks like we are running close to the -- we are running late, we can certainly discuss sitting longer hours. I am perfectly open to that.

So let's just keep an eye on the schedule and see how it goes. Okay.

MR. PARKER: And then not to the lengthiness, but I have a hard deadline on the end of February, 24th, when I'm hoping to leave the country so I'm not available for a week from the 25th on. We have a lot of witnesses with busy schedules, we've got Dr. Hinshaw, we've scheduled two days for her, that's twice as long as Dr. Rose in Manitoba, Chief Public Health Officer was cross-examined in that proceeding and so those are my comments, Justice Romaine. Thank you for that.

THE COURT: Okay. Let's go with the --

MS. LECLAIR: Madam Justice --

THE COURT: Yes?

MS. LECLAIR: -- I just noticed there are a number of observers here and I was hoping for the benefit of the observers, you could repeat the orders you made yesterday. There seems to be a lot going on in the chat and --

THE COURT: Of course.

MS. LECLAIR: -- my guess is we'll have a lot of attendees.

THE COURT: Yes, of course, I can do that. When I began the hearing yesterday, I noted that even though this was a Webex hearing the same rules of order and courtesy to court staff and all the participants will govern the hearing. I made three orders in order to ensure this. The first order was there is to be no image captured, screenshots or photography taken of me, as a Judge, the court staff and any of the legal counsel or the witnesses.

There is to be no recording of the proceedings other than the court arranged proceeding. This does not mean that the proceedings are not open and if you would like to obtain an official transcript, these are available.

The last ruling I made is that -- and this may not be quite appropriate to the people who are in the Webinar because they do not have access to the chat function, but those of you who are on Webex, some of you may have access to the chat line that is part of the Webex process. This is not meant for any social media chat, it is intended for Court business only, to be used by the lawyers and the courtroom staff.

Thank you. Okay. Mr. Parker?

MR. PARKER: Mr. Bhattacharya is letting us know he's ready to be let in.

THE COURT: Okay.

MR. PARKER: My apologies, Dr. Bhattacharya.

THE COURT: Yes.

THE COURT CLERK: Sorry, just give me one moment to find him.

THE COURT: Sure.

THE COURT CLERK: I've let him in.

THE COURT: Okay. He's not in yet, madam clerk?

THE COURT CLERK: But I called him --

MR. PARKER: We can see him.

THE COURT: He is on, okay, go ahead.

JAYANTA BHATTACHRYA, Previously Sworn, Cross-examined by Mr. Parker

Q Good morning, Dr. Bhattacharya., how are you, sir?
A Good morning.

Q You acknowledge you're still under oath?

A I do.

Q Sir, so I wanted to circle back to what we discussing at the end of the day yesterday on the Savaris study, do you recall what I'm talking about when I say the Savaris study?
A Yes.

Q I'm just going to bring up the document again that I showed you and said was put to you in Manitoba and you told me that that was not the document.
A No, I told you I didn't recall the document.

Q My apologies -- my apologies, I'll have to check the transcript on that. Sorry, hang on a sec. Sorry, I'm just going to get this document brought up, Dr. Bhattacharya. I had misunderstood your evidence, I thought you said this wasn't the document. So, I spoke to Manitoba's counsel and confirmed that I had put the document to you that they put to -- sorry, the same document to you that they had to put to you as document number 39 and I obtained that document from them.

And so, I'm now showing you the document I've obtained from Manitoba's counsel, it says 39 in the top right-hand corner, and I will ask you again, do you recall seeing this document on I believe it was May 4th, 2021, when Manitoba's counsel put it to you in the *Gateway* matter.
A I don't recall seeing this particular document still. I do recall seeing -- at least that point that I raised yesterday about the -- the lag and --

Q Right.
A Yeah.

Q If we go to that point then, could you go down to point number 6 in this document, please, sir? And you'll it's highlighted there, sir, and does that help in any way with your memory as this the document that was shown to you in the Manitoba proceedings?
A I don't recall seeing this particularly document --

Q What about --
A I keep copies --

Q -- number 6, it's highlighted. Does that describe what you're talking about in the lag?
A Yeah, it's exactly what I talked about. In fact, I -- before you showed me the document I mentioned this point, right?

Q M-hm, you sure did, yeah -- yeah. And so, just wanted to establish, can you now confirm that this is the document Manitoba put to you, would you like to take some

time to scroll through it, we can give you control of the document --

A I mean I believe that --

Q (INDISCERNIBLE)

A -- this -- this was put forward to me in Manitoba, but I do not -- still not -- do not recall seeing it in Manitoba. I mean I'm not saying that it's not was -- or was or was or wasn't, you're asking me if I remember now that this is what I saw then, the answer is no to that.

Q Okay, do you recall a document being put to you that you hadn't seen before that was a criticism of the Savaris study, right?

A Again, I don't remember seeing any particular document, I do remember the point. As I said, I described -- I mean I'm not sure exactly what you're trying to get at. I remember the point that was made, and I've seen now this point made in other places since then.

Q Indeed -- indeed, I've seen that too and we're just going through it and see what you have seen. The point, sir, as I just -- we'll sit to try to establish if you could actually confirm this was the document that's referred to. I'm going to bring up the transcript from that proceeding, it's volume 2 and I'm going to ask my colleague to go to page T-119 of that document, please.

Sir, if you could go to line 26 and you'll see the question and then you will read through, and you'll see the quote that I just showed you that was highlighted and then you'll go -- we'll scroll through. Can you give my -- Mr. -- Dr. Bhattacharya a control of the document, Mr. Trofimuk, so he can just scroll through to the next page? Sorry, we're having some difficult giving you a control of it, so have you read to the end of that page, Doctor, we'll go to the next page.

A Yes, I have.

Q Sure, can you flip the page over, Mr. Trofimuk, please. And just continue reading through to the end of the answer at line 7, please. And when you're done, sir, I just want to see, does this in any way help your memory as to whether this was the document that was put to you in Manitoba or are you saying you just don't remember a document being put to you?

A This -- this -- it looks -- I mean you said that was document 39, most likely they did put that to me although again, I don't have recollection of it beyond this which is the -- you know, this memory I was just talking to you with.

Q Yeah, fair enough and I'm glad that was somewhat helpful, sir. The document that was put to you, you will recall and I -- I can't find it immediately in the transcript so I won't waste anymore time on that. You hadn't seen it before, that was response because you

were asked --

A Well, then I didn't see that --

Q -- well what about since --

A -- that document before that, yeah.

Q That's right, you -- the first you had seen that document was in the Manitoba proceeding?

A I mean, I -- I guess so, again I still don't remember seeing it in the Manitoba proceeding but obviously here we talked about this point brought up --

Q Yeah.

A -- we talked about last.

Q Okay, let's go to then -- thank you, Mr. Trofimuk, we can take that transcript down. I just want to quickly go to document, Mr. Trofimuk. And same question -- or -- or the question on this one, sir, it is -- and it appears -- I appreciate you can only see part of the document, are you able to identify this document from what you're seeing, have you seen this before? It is from the same authors as document 39, Gideon Meyerowitz-Katz et al and --

A Yeah, I think I've seen this document before but at the Scientific Report's website.

Q Right, it's another -- it's -- it's a criticism of the Savaris study and that one you think you've seen before. Okay --

A Yeah.

Q -- let's go to document 20, please, Mr. Trofimuk. Same question, sir, have you seen document 20 before? And that is not document 20, so we will take that down and I apologise. My apologies, we're not able to put that document to you right now. Mr. Trofimuk, can you please go to document 32 and if you could just scroll so we could see the footnotes to this document, the references, please.

And Dr. Bhattacharya, you'll see that reference 1 is to the Meyerowitz-Katz article and would you accept -- I -- I know you don't have it in front of you now, the document that I last showed you is the document that is referenced at footnote 1 of this retraction, are you willing to accept it, sir? Do you want to go back to that other document?

A I'm -- I'm actually confused what you're asking me, which -- which document are you referring to?

Q So, there's a reference on this document, sir, to Meyerowitz-Katz, do you see that reference, sir?

A Yes, it's under reference 1.

Q Yeah and that reference is to the document that I last showed you, are you willing to accept that or do you want me to bring up that --
A No -- no --

Q -- document?
A -- I -- I believe it's the same document that it's referring to.

Q It is indeed, yeah and we wanted to go to the document reference 2 but I am not able to immediately find that. Just from that citation to document reference 2, do you see that paralysed difference regressions? Have -- have you -- are you able to tell me if you've seen that article before, sir?
A I have not read that article very carefully.

Q So, you've seen it but just haven't read it carefully?
A Yeah, I have not had the chance to read it carefully.

Q Okay and you will agree with me if you read the retraction from the editors of, I believe it's Science Reports, that the -- that the -- that the concerns leading to the editors no longer having confidence in the conclusions presented in Savaris are the concerns raised in the Meyerowitz-Katz article footnote 1 and the Goetz article in footnote 2, you'd agree with that?
A I mean it's certainly for 1, I agree. I don't know about 2, I'm not sure exactly what -- what 2 -- as I said, I didn't read 2 very carefully.

Q No, fair enough, you'll see that 2 is footnoted in this explanation from the editors as to why they retracted the article. Anyway, it says what it says, fair enough, we can argue that point, Doctor, thank you. And then, Mr. Trofimuk, if you could just quickly bring up document 49, please. And sir, this is -- this is I guess what happens when the extraordinary thing happens and the editors of a prestigious journal retract an article, they give it the old, retracted article stamp. Have you seen this article with that stamp on before?
A No, I haven't but I had seen --

Q Do you know --
A -- I knew that it was retracted 'cause I saw it on -- you know, it was with -- you know, talked about.

Q Right, yeah and that's what I just wanted to explore a little bit more. You -- you saw it was retracted, I know we had a dispute yesterday on who told who it was retracted, and

we'll look at the transcript on that but when did you learn of its retraction, sir?
A I don't remember the date.

Q Okay, it was retracted by the editors according to the retraction I showed you last on December 14th of last year, do you know if you learned of it before Christmas or after Christmas, any way to narrow it down?
A I don't remember the date.

Q Was it in 2022?
A Don't remember the date, I mean it was, you know, over Christmas holiday, could've been after New Years, after -- I -- I could -- I don't remember the date.

Q Okay, you would have had sufficient time though to inform your counsel of this development if you considered it significant in terms of its impact on the opinion that you had given in this matter, right?
A I mean the -- the retraction does not change my opinion of the value of the article, I still think the article is correct and -- and subsequent literature documents the lack of correlation between stay-at-home orders and COVID mortality. So --

Q (INDISCERNIBLE) -- I would. I am sorry, sir, you -- you -- you finish and I -- I apologise for interrupting you. There may be a lag and -- and sometimes I think you're done, and you're not, so please finish your answer.
A Yeah, I mean I think there's a -- there's a -- there's a literature that's -- that's developed since then that -- that verifies the conclusion of this article. The -- I don't believe that the methodological criticism warrants a retraction, I believe it warrants a discussion among the -- the people that are involved in this, the authors.

I think it's -- is a valuable debate to have about what -- what the lag structure is that -- that would be right have between -- the right to look at between imposition of stay-at-home orders and mortality. I think that's a valid scientific discussion and I don't understand why the -- the -- the editors retracted it. As a - as an associate editor of a journal myself I would not issued a retraction, I would issued a -- that would have published a comment and let the debate happen in front of the public.

Q Well, it looked like the debate was happening in front of the public and according to the editors of this Science Reports, the authors of that article lost, sir, you'd agree with that, right?
A I mean I think the authors -- the editors agreed with the -- the -- the criticism but I -- again, I don't -- I don't agree with the criticism as sufficient to warrant a retraction.

Q You had a chance to read the retraction and you -- in spite of that retraction haven't read

it, your -- you're evidence is it doesn't warrant that retraction in your opinion?
A Yes.

Q Thank you. Nevertheless, you agree that that is an extraordinary thing to happen, the retraction of this article?
A The retractions are extraordinary but they're less extraordinary now than they were before the pandemic.

Q And others that have been retracted -- other articles about COVID that have been retracted by prestigious journals, can you give me some?
A Yeah, for instance there was a paper on, I think, hydroxychloroquine retracted by the Lancet and also by the New England Journal because of scientific fraud. The -- there are other examples, but I have to refresh my memory but those -- that -- there -- there have been some extraordinary retractions during this and more frequent retractions than I had seen previously before the -- before the pandemic.

Q You said there have been some extraordinary retractions, in fact I just want to make clear that -- understand that your evidence back in Manitoba was if there was a retraction that would be an extraordinary thing, fair?
A This is an extraordinary thing, I completely agree with you, sir.

Q Thank you very much.
A I just don't agree with the -- I don't agree with the -- the -- the decision to retract in this case, there's no scientific fraud here.

Q I don't see the editors of -- of this report suggesting that, sir, they --
A I agree, that doesn't -- they don't suggest that.

Q Okay but are you suggesting that the -- you're not suggesting that scientific fraud is the only time that an article such as this should be retracted? There might be other basis where it's appropriate to do so, right?
A No, think scientific fraud is the primary reason for retraction. I don't think that if the editors look at the debate and then fall -- now fall down on the one side of the debate versus another when there's still legitimate disagreement among scientists that a retraction is warranted.

Q Understood, thank you, sir. I want to talk a little bit about modelling, Dr. Bhattacharya and I understand your evidence when you're looking at studies that are trying to determine whether non-pharmaceutical interventions, NPIs as we refer to them as, are effective in reducing mortality. You do not like studies that use modelling counterfactuals, you prefer studies that use real world counterfactuals, is that fair, sir?

A Yes.

Q But you were not always of that view, sir?
A No, I've always been of that view that the real world counterfactuals are the better one -- way to go; sometimes you have no choice.

Q Savaris used real world counterfactuals, indeed that's one the reason's you really like that article, that's one the reasons you previously called it perhaps the best peer reviewed article on the subject, fair?
A At the time that I wrote that I think it was the -- was one of the only ones I've seen that actually used real world counterfactuals.

Q Apparently, it didn't use them very well you would agree according to the editors of Science Reports though, right?
A I disagree with that because I think they used it pretty well. I think what their results are still quite interesting. But as I said, it's been verified by other studies that you use different methods, that with -- with real world counterfactuals that reach the same conclusion. Including that Johns Hopkins study you started to discuss yesterday.

Q Well, we didn't discuss it, in fact I think it's pretty clear that it's not relevant to these proceedings given that it's a study that was released a week ago and as we've been very clear, the issues in these proceedings are the constitutionality of order made during the second and third waves. That said, I'm aware there's a great deal of criticism already of that John Hopkins article, I'm sure you've read some of that criticism as well.

I don't want to start getting into irrelevant evidence, but it seems to me that there is a -- there is -- and it's probably more complicated than this but it seems to me there's one side who still likes to use modelling counterfactuals and then there's another group that is saying, no, no, you've got to use real world counterfactuals. Is that a fair kind of overview of the academic debate that's going on?
A I mean, I -- I for a living work on -- on -- on studies that look at causation. I mean we worked -- worked -- we talked about several studies that had published in my career that used real world counterfactuals and looked -- worked very -- worked very carefully to try to stress out the causality 'cause you can't just simply automatically look at a correlation and decide it's causation, you have to be very careful about that.

And -- and there are a set of methods that -- that -- that -- that statisticians, and econometricians, epidemiologists developed over -- over the years to do that. And so, I think that in general the -- the conclusions from that is if you were just -- just simply to do a model and say well this is what would've happened in the world had we not taken some police action in the context of that model and then pretend as if that's actually

what happened that's a mistake --

Q Yeah.
A -- the right thing to do is to look at the counterfactuals of -- based on real world example, so for instance a country or a province that followed a different policy that's similar and then tracked over time their -- their methods like the difference and difference method, you know, regression discontinuity method. The whole slew of methods that have been developed for exactly this kind of question. So, yeah, I think I'm reflecting my professional opinion based on two decades of work on what -- how -- how the best ways to look at these kinds of questions and that involves real world counterfactuals.

Q Fair to say -- well -- well, let me as you this question, sir, do you agree with this statement? Modelled counterfactuals are the most common method used in infectious disease assessments, correct?
A I don t -- I haven't done the assessment of whether a commonality -- I wouldn't be able to answer that.

Q You have no idea if that's correct?
A You're saying the most common, that involves like careful analysis of the literature, looking -- counting articles. Frankly, I wouldn't think it's all that interesting, the question of what's true is more important.

Q Right, so that wasn't my question, the question --
A And I answered your question --

Q -- you're not --
A -- 'cause I don't know the answer to your question. I don't know that (INDISCERNIBLE)

Q Yeah, that's -- that great. Thank you, I appreciate that. If we could go to -- it's from your report, sir, and it's page 579 of 2300 that my friend will bring up and this should take us to your footnote 33 and this is one of your articles I believe. It's got your name on it unless I've got the wrong document, so. And you recognise the name of this document, sir?
A Yeah, I do.

Q And this is, as I said, footnote 34 -- 33, excuse me, to your primary report, do you accept that?
A Yes.

Q And this -- this is -- well what is this, sir, what is this report on?

A So, it's a paper that I published with some folks at Stanford. The -- the -- the -- the goal of this paper was to assess how adopting the -- sorry, I'm having trouble hearing.

Q Yeah, we -- we all again, it's the courtroom microphone, so we lost about, you know, 2 seconds of that answer, sir. If you could do it again, please, my apologies.
A Sure, so this is a -- this is a paper that I published with -- with some -- some colleagues at Stanford. The goal of the paper was to ask when you adopt the -- the possibility that -- that there's many people who are not picked up by -- you know, up by standard by PCR testing who have been infected that didn't -- that were not identified as cases, you know, infected but not cases, how does that change a compartment model -- the predictions of a compartment model, the forecast of a compartment model.

Q Let's go to page 3 of this document, please. I'm sorry, hold that, I'm sorry, let's just stay on the first page and go to the title there and I just wanted to confirm, sir, this was published in -- this is an article in which you're one of the co-authors along with Dr. Bendavid and Dr. John Ionnidis and it was published in a publication -- sorry, it was published in Science Direct, is that right?
A No, I think it was Computer Methods and Applied Mechanics and Engineering.

Q That -- that was my first, that's where I was going, thank you. So, it was published in Computer Methods and Applied Mechanics and Engineering volume 372 and it was published there on December 1 of 2020?
A That's what that says, yeah. Again, if you've asked me before showing me I wouldn't have remembered the date.

Q No, fair enough. So, it's fair to say that as of December 1, 2020, you're one on the coauthors that the views in this article reflect what your views were around December 1, 2020, correct?
A Yes, they -- I mean my -- the -- I believe the articles is reflect my views then and --

Q Sure.
A -- I still think --

Q Let's go to --
A -- the article's quite valuable.

Q Indeed, let's go down -- let's go to page 3 of 44 and if you could go down to the bottom of that page, please? And sorry, just the last paragraph there, it says -- do you see it: (as read)

While there is a pressing need to better understand the prevalence of

> asymptomatic transmission, it is also becoming increasingly clear that it will likely take a long time until we can with full (and if you'll turn the -- you've done so, thank you) -- with full confidence to deliver reliable measurements of this asymptomatic group.

You see that, Dr. Bhattacharya?

A I do.

Q And that's what you and your coauthors wrote in this article that was published on December 1, 2020?

A Well, we wrote those words I think in -- must have been May or June of 2020.

Q And you -- you have already confirmed for me that this -- this article containing your views would have reflected what your views were on or around December 1, 2020, is that still the case or are you saying that this -- that's not the case now?

A No, I mean I -- I think you're -- you're going to ask -- okay, I shouldn't anticipate what you're going to ask me. But yeah, I think it -- it does -- it does reflect what I thought in December of 2020, I still -- I still think exactly what I wrote there, I think what I wrote there is true.

Q Okay, so it will still take a long time until we can with full confidence deliver reliable measurements of this asymptomatic group, is that still your view today, sir?

A No, I think we know quite well, in fact I think by December of 2020 we had started to have a much better -- a better view of the -- of the -- the extent of asymptomatic group.

Q Sure and we'll -- we'll get to some other studies shortly but continuing with this one, the next sentence you continued on -- or you and your coauthors continued on. In the meantime, mathematical modelling can provide valuable insight into the tentative outbreak dynamics and outbreak control of COVID-19 for varying asymptomatic scenarios and that represented your views on December 1, 2020, does that -- is that fair?

A Yeah and it still represents my view.

Q Did --

A Again, I just -- as we talked about yesterday, I believe modelling is a very, very important tool that we have. It's not particularly good at actually predicting and forecasting and certainly shouldn't be used in -- in place of better methods for asking counterfactual questions like comparisons with role of data, with -- you know, with designs that are -- statistical designs that are aimed at picking up causality.

Q But your -- your study and we'll get to it using counterfactuals, to try to tease out the effectiveness of NPIs. You know the -- you know the study I'm talking about, the one

you say is the best?

A I mean it was the best of -- my opinion was it was the best when we published it, I don't know if it's -- I necessarily think it's the best now but yeah we used real world counterfactuals there.

Q And it's been criticized for using real world counterfactuals, fair? You're aware of some of that criticism, right?

A I'm not sure what you're referring to.

Q Well, there's been a series of -- well, there's been criticisms as I understand it of -- of the article we're talking about and there's been an exchange of views has there not between --

A I mean this is science --

Q -- similar to --

A -- so --

Q Sorry?

A Okay, this is what science is, science is discussions between scientists about how they look at data, designs and experiments and there's always exchange of views about this, science is not a monolithic exercise where you have a -- a -- a you know, a -- an assertion or a data analysis made and -- and people automatically accept it without any questions. Science is the process of questioning.

Q I just asked you if you knew about the criticism that -- that has been given in the exchange of views about the article that you called the best study, do you know -- you're familiar with the criticisms, right or -- or --

A I'm -- I'm --

Q -- do I need to take --

A -- I'm not sure -- I'm not sure I understand which criticism you're referring to and I --

MR. GREY: I'd like to make an objection here, Madam Justice. Madam Justice, can you hear me?

THE COURT: Yes, I can.

MR. GREY: Mr. Parker is asserting to the witness that there is -- he's making some vague assertion about criticism. I think in fairness to the witness, if Mr. Parker is aware of a specific source of criticism, if he could put that to the witness. In fairness to the witness, he's asking the witness to conjure up visions of what this criticism

is. I -- I don't think that's -- that's a proper question, I think if the -- if the -- Mr. Parker is aware of criticism he should put that to the witness and see whether the witness is aware of it.

MR. PARKER: Well, you see I want to --

MR. GREY: That's the nature of my objection.

MR. PARKER: -- I -- I would like -- sorry, go ahead.

THE COURT: Go ahead, are you finished Mr. Grey? Are you finished with your --?

MR. GREY: Yes, I am --

THE COURT: Okay.

MR. GREY: -- Madam Justice, thank you.

THE COURT: Okay, Mr. Parker, your response?

MR. PARKER: Yes, I do have some documents on this I'd like to put to him, I want to establish if he is aware of any criticism of the -- and the specific article we're talking about is at footnote 48 of his primary report and it is Assessing mandatory stay-at-home and business Closure effects on the spread of COVID-19, so are -- that's -- that's the question I'm asking him before I get to any documents that I want to put to him.

THE COURT: So, that is a criticism document specifically that you are going to put to him?

MR. PARKER: I might, I'd like to know if he's aware of any criticism documents of the article that we've been discussing.

THE COURT: Okay, I will allow the first sentence and then, you know, get into particulars. So, Doctor --

Q MR. PARKER: Sir, are you --

THE COURT: Yes.

MR. PARKER: Sorry.

A I mean the -- I -- I'm aware that there was a tremendous interest in that -- in our paper, I think you're referring to that mandatory stay-at-home orders paper from the European Journal of Clinical Investigation, that's what you're referring to?

Q MR. PARKER: That's the one, sir, Assessing mandatory stay-at-home and business Closure effects on the spread of COVID-19 --

A Yeah, I've --

Q -- footnote 48 to your primary report, the one you referred in the Manitoba *Gateway* proceeding as in your opinion the best study on the subject at least in May of 2021.

A There was -- I mean, I -- I was aware -- I'm aware that there was tremendous interest in that paper. It -- there's a called thing an altimetric score which is -- it shows how much -- how many people commented on a paper and just -- and it -- tremendous interest in it, I have not had the opportunity to look through all of that, there's just too much to look through.

Q Are you aware of any criticism of that paper particularly by Gideon Meyerowitz-Katz and his coauthors, the same coauthors who wrote the Savaris article that we've just gone through this morning?

A No, I've not seen any criticism from them on that.

Q Let's go to that document then, the study, Assessing mandatory stay-at-home and business Closure effects on the spread of COVID-19. Mr. Trofimuk, 895 to 2300, please. That should bring us to the first page of that document. Actually, I'm sorry folks, I've actually got another version of this, it's probably better I bring up. This was -- well actually just before you do that, at this time Dr. Bhattacharya and Mr. Trofimuk, if you could just scan down to the bottom of this page. This was an accepted article, correct, Doctor, it had -- and it says right at the bottom here I think it's gone through peer review. Just wondering if you could establish -- the document in the first page you're looking at, just what the status of this document was at that time. Was it published?

A I'm not sure what time you're referring to here.

Q Well, this was -- the time would be when this came to us with your January 21, '21 report and so at that time and I think we -- from our discussion yesterday, you thought that this document was published in and around January 5th. It -- it didn't make it into your primary report in Manitoba.

In Manitoba your evidence was that it didn't get in because it was still going through peer review and -- and then it does get in the primary report in Alberta and it's this document here. And so, at that point between January 25th and January 21, what was

the status of this document? It looks like to me from the bottom of it it was accepted for publication and had undergone full peer review?

A Yeah, I don't -- I don't remember the dates of this, I mean this -- I -- I remember seeing this document but I don't remember when.

Q Well, it's -- it's -- it's your document in -- in -- in your report, sir, it's document 48. So, let's bring up another version of that please, Mr. Trofimuk, it should be document 18. And if you could -- this is a version of the same paper you'll -- you'll be able to confirm for me, Doctor? Do you need --

A Yes.

Q -- to see more of it? Okay and sorry, if you could just scan back down again, Mr. Trofimuk, there's some dates just at the top here. Keep going down, please, sir. Right -- right -- no, sorry up. The other down, up, excuse me. And there we go and so just explain to me those three dates, what -- what is happening there? I think I understand it but.

A So, received usually means when the -- when the editors first saw the -- the paper. I mean, I -- so we -- I'm not remember the date we actually mailed the paper in for -- for publication. Then there's peer review, so people give comments -- they send it after reviewers for comments, but we replied to those comments, revised the paper, and then it's accepted for publication I guess on the 24th of December. But I don't -- I didn't -- I didn't -- wasn't aware that it was accepted that day until you just showed it to me. I -- I learned about it I think -- I don't remember exactly when. Shortly after the New Year, might be before.

Q So, the peer review process would've taken place before December 24th, you're confident in that from the dates you've just looked at, sir?

A As far as I know, I mean it must be because that's what it says.

Q Okay, so sir, if your evidence was in the Manitoba proceeding that the reason this was not put in the primary report in Manitoba on January 5th because it was still undergoing peer review, that answer would in fact be incorrect, fair?

A No, that's no incorrect, it's still part of the peer review process until it's fully published. In fact, that --

Q Sorry.

A -- showed me, it had -- there was -- there was, you know, you -- you can corrections, you can do, you know, typos and other things that happen between acceptance and full publication.

Q So --

A Normally, I -- I apologise --

Q I'm sorry.
A Normally -- normally, after acceptance you're not -- you -- the -- the -- a lot of journals, I don't know about this particular journal but usually I just follow it, you -- the journals embargo so that you can't talk about it or talk about it as accepted until it's published. So --

Q When is that?
A I don't know, journals have that -- that -- now that's as I said before there's two sort of processes, the peer review process which has that -- sort of the -- that kind of -- that -- that kind of feature and then other -- others have that -- that second process that open science process that's more -- much more, you know, the debate takes place before the publication in the open.

Q That's very interesting and so you're not aware of when this was -- I think you used the word full publication then, the -- the date of acceptance is not the date of full publication you're telling me?
A No.

Q Okay and -- and you're not sure still I guess right now from anything you've looked at when the date of full publication for this article was?
A No, I don't -- I don't remember. It was sometime in January I remember but I don't remember exactly the date.

Q And -- and sorry, dumb question, how do you figure that out? Where -- where is that written down somewhere on a paper that I can go confirm that or is it not on there?
A I don't -- I mean sometimes the journals will have it on -- if you click that DOI link, the journals --

Q Yeah.
A -- will have it there. I -- I mean, I -- I normally don't -- I mean I have a lot of papers, I don't generally pay attention to the publication dates of the papers.

Q Yeah.

THE COURT: Is this a good time to take the morning break?

MR. PARKER: It's a good of time as any, Justice Romaine, thank you. 15 minutes?

THE COURT: Okay, 15 minutes, yes.

MR. GREY: Thank you.

(ADJOURNMENT)

THE COURT: Okay, thank you.

MR. PARKER: Sorry, Justice Romaine, one concern. We're getting again the chat function used by people watching and Ms. Erickson's (phonetic) not impressed with the time took for the break and would like the government employees to get on with it. Whatever her concerns I'd like to not see these chats if we can avoid it, please.

THE COURT: Yes, okay. What I will do is in the next break I will instruct our technical department to make chat unavailable, that will mean that the lawyers cannot use it or the court staff. So, but I do not know if that will bother you, you probably would not use it anyway much.

MR. PARKER: Sorry, we -- we can communicate in other ways --

THE COURT: Yes.

MR. PARKER: -- Daslow (phonetic) just piped up too. We were discussing some scheduling issues offline but of course we're doing this with everybody else watching, talking about my -- her -- our deadline. Daslow just piped up about I shouldn’t be scheduling my vacations so close to the trial. So, again you know, this is -- this is something that happened at the interim injunction back --

THE COURT: Right.

MR. PARKER: -- before Christmas in '20 and it -- it -- it was very bothersome then because we got the sounds every time people did this. So, in any event, we appreciate anything the courts can do on this --

THE COURT: Okay.

MR. PARKER: -- Justice Romaine, thank you.

THE COURT: Why do I not take 5 minutes now to go and --

MR. PARKER: Thank you.

THE COURT: -- talk to the appropriate people to get the chat line shut down, okay?

MR. PARKER: I appreciate it.

(ADJOURNMENT)

THE COURT: Okay, it will be done fairly quickly I believe. So, if somebody could just let me know when you detect that this has been done.

MR. PARKER: When it's up?

THE COURT: Yes, okay.

MR. PARKER: It -- it seems to -- we haven't got anything since 11:47, hopefully -- I understand this was a breach of an order that you've made --

THE COURT: Yes.

MR. PARKER: -- Justice Romaine?

THE COURT: Yes, it is.

MR. PARKER: Okay --

THE COURT: So --

MR. PARKER: -- good, it -- it --

THE COURT: -- if you would like to -- or perhaps, madam clerk, if we keep a copy of these messages, we will see about tracking the people down, okay? Thanks.

MR. PARKER: And -- and sorry, do people -- I -- I understood people had to fill in an undertaking if they're not lawyers to attend this proceeding. And I'm sorry, is that correct, Justice Romaine --

THE COURT: Well, that --

MR. PARKER: -- do you know?

THE COURT: -- was my understanding. I do not know if it is still the case. Now, that we have the counsel and the court and the witnesses on Webex and the observers on the webinar or most of them on the webinar, I think we will be okay. But I would inquire about whether or not they are still required to fill out a form and if so we will be able --

MR. PARKER: Thank you.

THE COURT: -- to track down these people.

MR. PARKER: Wonderful, thank you.

THE COURT: Okay.

Q MR. PARKER: Welcome back, Dr. Bhattacharya.
A Nice to be back.

Q Could we go to a document, it's page 842 of 2300, this is in your report, sir, and it's from footnote 46 to your report. And do you happen to recognise what I've put in front of you, sir?
A I think so. Okay.

Q If we'd done -- if we'd done this correctly you should have a page that's from the footnote 46 which is the Atkeson, Kopecky, Zha article, Four Stylized Facts about COVID-19, does that help?
A I'm trying to -- it's -- it's a little small but -- on my screen but okay. I -- I do remember the title of that article.

Q So, you -- I'm going to expand that for you, Dr. Bhattacharya --
A Yeah.

Q -- I wanted to go to -- just actually if you could move it up, sorry. I want to end -- I want to see the words right before footnote 3, ending on -- sorry, I want the words right after footnote 3 beginning, Given the observation.
A (as read)

> Given the observation that transmission rates for COVID-19 fell virtually everywhere in the world during this early pandemic period,

we are concerned that these studies may substantially overstate the role of government-mandated NPI's --

Q Very sorry, Dr. Bhattacharya, we'll just get the whole on your screen there and yeah, just this from given through to switch in regime, I think is the section. Basically, I -- does this describe your concerns with modelling in COVID-19, is this kind of encapsulate what your issues are?

A I mean it's a subset of my issues with them, the -- the -- the -- the primary issue I have with them is that the models themselves have been incredibly inaccurate in actually forecasting -- forecasting the -- the path of the disease. The -- and so, using them as counterfactuals is going to end up -- end up overstating the role of NPIs just simply 'cause they often have over -- overestimated the -- the -- that path of the disease over. And the -- and there's incredible uncertainty about the parameters that populate the -- the models, the -- a lot -- a lot of discussion about many of the parameters. So, it -- I think this -- this part that you're referring to --

MR. PARKER: Is anybody saying anything, it's gone quiet. Sorry.

A Yeah, no, I'm -- I'm just reading, we -- I'm just making -- reading it to make sure I understand that what I -- what -- what I wrote here --

Q MR. PARKER: Sure.

A -- so, I mean what -- what -- what I'm trying to say here is that --

Q Sorry --

A -- you shouldn't use --

Q -- sorry, you -- you -- I didn't think -- sorry to interrupt you, I don't think you wrote this did you? This isn't from one of your articles is it?

A I don't -- I don't think I wrote this, I don't remember but I do agree with this, I think it's true --

Q Right, that that's -- that's --

A -- we shouldn't use the first early part. I thought you were asking me about what I -- my problems with using modelling was. That's what I was trying to assess.

Q I was, it was just you said you were trying to figure out what you meant when you wrote this and so that made me say wait a minute, you didn't write this and so --

A No, I didn't -- I don't remember writing this --

Q -- (INDISCERNIBLE) said (INDISCERNIBLE)
A -- but I -- I -- I do remember -- I mean I do agree with this. Actually, you -- you cited this -- what is this page 843? Is this from the -- you said it's from my report.

Q It's footnote -- it's footnote 46 to your primary report, it's a page from that report. Footnote 46 is Atkeson, Kopecky, Zha, Four Stylized Facts about COVID-19 --
A I see, now -- now I understand. Okay, so now I have more context. I thought you were asking about my -- my -- my -- my problems, like as I said my major problems with it is is that the forecasting has been -- has been incredibly inaccurate and so to use it as way to generate counterfactuals is going to generate overestimates.

This -- this criticism I completely agree with as well, you should be using the early part to -- to -- to -- to forecast the -- what will happen in the -- in -- in the later part necessarily because of omitted variable bias, you have to be very careful about that. You can use it, it's informative potentially but you have to be careful about -- about -- about the inferences you draw about -- I mean, it's true.

Q I would think it's the case --

MR. GREY: Mr. Parker, I -- I don't have an objection, I just -- you -- you mentioned that this is a footnote number 46. I'm not clear on what this is a footnote to. I mistakenly went to Dr. Bhattacharya's CV and found number 46, which is a paper that he wrote --

MR. PARKER: Yeah, it's not his CV, it's a footnote --

MR. GREY: Yeah.

MR. PARKER: -- to his primary report, Mr. Grey --

MR. GREY: Okay.

MR. PARKER: -- as I said, thank you.

MR: GREY: Thank you, yeah I didn't hear the -- I didn't hear that. Thanks.

THE COURT: Okay.

MR. PARKER: My apologies.

Q MR. PARKER: Okay, thank you. Let's move on to document 16, please, Mr. Trofimuk. Actually, just before I discuss with document with you, sir, the -- when you filed your primary report and you were criticizing the studies that had performed modelling, those studies were performing modelling in the COVID-19 context in the first wave I take it?
A I mean there's lot of modelling, I don't --

Q Right but when you filed your primary report, sir, what period were those studies considering? Your primary report was filed January 21st during the second wave -- it's the tail end of the second wave, so what period were those studies considering that you were criticizing?
A I cited a lot of studies, Mr. Parker, I'm not sure exactly that -- it would be difficult for me to go back and characterise exactly the time points of every single study which vary. So, I'm not sure what you're getting at.

Q Well, if you filed the report on January 21st, it was very similar to one you filed on January 5th, which was still during the second wave. Do you not agree that it's most likely that the studies you were criticizing must have been studies forecasting out of the first wave of COVID since you were in the second wave when you filed the report?
A I mean I -- I was looking at the time at second wave forecasts, I was looking -- I mean this is just like -- like all through 2020 I was looking at forecasts basically everyday in lots of different places, including the first and second wave. I don't remember exactly the -- the context of the -- the -- the question that you have in -- have in mind.

Q Have you read the affidavit of Deborah Gordon that's been filed by the respondents in this matter?
A No.

Q She is a vice-president with Alberta Health Services and among other things she speaks to, forecasting issues during the first wave, you haven't seen any of that evidence then?
A No --

Q Okay.
A -- I -- I cited the literature on -- on forecasting errors, including some -- some very well-known paper -- well, what -- sort of well-done papers that document the difficulties of forecasting all through the waves. I mean there's -- we still have very inaccurate forecasting now despite, you know, 2 years of experience with it.

Q Do you know anything specifically about the forecasting that's been undertaking in Alberta?
A I have not looked recently at Alberta's forecasting, no.

Q What do you recall from looking at it less recently?
A I -- I -- what I recall that it was -- it was -- it had the same problem that many other forecasts have had in -- throughout the world which is that it tended to overstate the -- the estimates relative to what had ended up happening.

Q Certainly, in Alberta that was true during the first wave. I'd like to actually go to Ms. Gordon's affidavit and my friend will bring that up and we'll go to paragraph 27. Actually, just back to the bottom of the next page, please, Mr. Trofimuk, paragraph 27, there we go.

And you'll -- so this is -- this Deborah Gordon's evidence on what the -- what was forecast during the first wave, and you would appreciate, sir, you will agree with me that there was a great deal of uncertainty about this -- about COVID and SARS-CoV-2 during the first wave as to how transmissible it was, as to how -- as to how serious it was, a lot of unknowns at that time, correct?
A Yes.

Q And if we look at paragraph -- turn to the next page or you can see it there, 27(a). This is the first wave forecasting I understand of AHS, and you'll see that paragraph (a) says: (as read)

> Non-ICU hospitalisations were based on predictions of 14 percent of all COVID-19 cases would require non-ICU hospitalisation.

And you'll see in (b) "ICU forecast was at 6 percent", do you see that, sir?
A Yes.

Q And -- and you'll see at paragraph 28: (as read)

> As a result of these projections and to ensure capacity for COVID-19 patients, AHS took various steps to proactively create acute tier capacity and to plan for further capacity expansion.

And then you'll see in the next paragraph Ms. Gordon speaks about delaying all non-urgent scheduled surgical activity as a result of this forecasting. You see that evidence, sir?
A Yes.

Q And if we go to paragraph 38 now, please. Yes.

THE COURT: Okay.

Q MR. PARKER: And sir, it's the second last sentence of -- of this paragraph that I just wanted to take you to: (as read)

> During wave 1, Alberta's hospitalisation rates were 4.2 percent and ICU admission rates .8 percent compared to 15 percent and 5 percent with the original modelling used from China's experience.

The 15 and 5 here is slightly different from the -- I think it was 14 and 6 percent that I just showed you, but you can see during this first wave, you'll agree with me that according to this evidence, AHS was forecasting for 14 to 15 percent of cases would go into and hospital and 5 to 6 percent would go into ICU. You accept that that was what the forecast was for the first wave?

A Yes, I accept that that's what this -- this affidavit says.

Q Right, would -- do you have any contrary information to what I just read to you on this subject, sir?

A No, I think that's -- I mean I'd -- I'd have to go back and check my memory on this but like I said, I was looking in -- looking at the -- at lots of different forecasts. I'd -- I'd have to go check to -- to make sure but yeah, I accept that this is what Dr. Gordon says.

Q Yeah, she's not a doctor but in any event and you -- you understand then also you accept that during wave 1 Alberta's hospitalisation rates were 4.2 percent in ICU -- sorry, where hospitalisation rate was 4.2 and ICU admission rates were .8 percent, you had no contrary information to that, sir?

A No, I don't.

Q Okay and -- and do you know, is this kind of divergence between forecast and actuals in terms of hospital capacity during the first wave, is this something that was common to many jurisdictions?

A Yes.

Q Because of the uncertainty in -- in regard to COVID?

A No, I mean in large part because of forecasting errors. The forecast that -- that were adopted in many, many jurisdictions overestimated the -- the -- the -- the lethality of COVID, underestimated the age gradient and mortality and -- and I think didn't have any clear picture of how the disease actually spread.

Q Right and that was pretty common from jurisdiction to jurisdiction, right?

A Yeah.

Q Everybody was in the same situation basically?
A Well, not necessarily, I mean there were -- there were -- there attempts that I was aware of that didn't get very much prominence to try to address that. I mean like that -- that paper that you put up that I published was an attempt to address at least one source of uncertainty in the forecasting, which had to do with the extent of asymptomatic infection and how --

Q That was your own --
A Yeah, that was -- I mean like there were lots of attempts to try to address some of the -- some of uncertainty but the -- the -- many, many of forecasts of used by public health agencies had this same problem that you just outlined here.

Q Right and you attempted to address these many, many problems with these modelling forecasts by using your own modelling study, right?
A No, I mean, I -- that was an attempt to address one source of uncertainty, what we viewed as an important one. I mean I think it's -- it's beyond the scope of that paper and frankly I think it's beyond the scope of humankind to really have an accurate forecast, it's too complicated a problem.

Q Would you agree with me, sir, if I suggest to you that Ms. Gordon talks about how this forecasting in the first wave led to -- I just read you the evidence, led to cancellation of non-urgent surgeries. I suggest to you that that was the only time -- in other words, during the second and third wave these surgeries were not cancelled because of forecasting errors, these -- any cancellation of health procedures was a result of the people that were going into the hospital and filling up the hospital during those waves. Do you have any contrary information to that, sir?
A I'm sorry, I didn't understand your assertion.

Q I'm suggesting I read to you from Ms. Gordon's affidavit that as a result of the forecasting -- the over forecasting of admissions to hospital and ICU during the first work -- wave, that had an impact on delaying all non-urgent scheduled surgical activity and other medical procedures. And my suggestion to you was that is the only time during this pandemic that that has happened.

Any impact in delaying surgery and other procedures after that was not based on a forecast that was wrong and taking steps to open up the hospital for COVID patients that didn't come. It was in fact caused by COVID patients that did come, the hospitals were overcrowded. Do you agree with, sir, do you understand the question?
A Now, I understand the question, I -- I don't know that that's a fact -- I --

Q You don't have any contrary information though, right?
A I -- I mean in think in many jurisdictions that what you just said is not true, that in -- in fact during -- during later periods, the -- the hospitals stay -- they're empty in part because of lockdown orders.

Q All right but you don't know that that's the case in Alberta, you -- you don't have evidence that -- on that at all, right?
A On specific to Alberta, I don't think I included any evidence in my declarations on that specific point.

Q Well, I don't you think you included evidence on any jurisdiction in your declaration on this specific point. If you mean declaration, your two reports, it's not in there, sir, if it is, please take me to it.
A No, it's not --

Q Thank you.
A -- not specific to Alberta, no.

Q No, not specific to anywhere, sir, there's nothing in there about any jurisdiction on this issue, if there is please take it to me -- take -- take me to it.
A I'd have to refresh my memory; I can take a look. Do you want me to take the time to do that?

Q I think, sir, we don't have that time. So, if you can take us there great, if not, no, I don't want you flipping through because I'm going to tell you it's not there but if you can take us there, please do so.
A Okay, if you -- I mean I'm not -- I'm not clear what you want me to do.

Q I want you to tell me if you're aware of any evidence on this subject that we've been discussing in your reports and I think what you're saying is you don't remember any but you -- you think if you flipped through it it would help -- help refresh your memory and you could answer the question, right?
A That's correct.

Q You know what, I'm not going to ask you to do that, I am comfortable what's in there, I'm comfortable with your answer and we can just argue the rest, thank you. Okay, Mr. Trofimuk, can we go back to document 16, please? Dr. Bhattacharya, this document, have you seen it before?
A No.

Q It -- the title Assessment of stay-at-home orders, it's one of the criticisms of your article

that we were talking about earlier that's at footnote 48 of your primary report. Does that help you or are you still saying no, you've never seen this before?

A I've never seen this before, no.

Q The -- the authors here, Lonni Besancon, Gideon Meyerowitz-Katz, and Antoine Flahault, do you recognise those names, sir?

A I -- I recognise Meyerowitz-Katz, I don't know the other two or I --

Q And indeed aren't -- and -- and do you recall Meyerowitz-Katz from the criticism of the Savaris article that we went through this morning?

A Yes.

Q In fact, it was this group of authors that were at footnote 1 of that retraction wasn't it?

A There were four authors in the other one, three in this one, so --

Q There was -- there was, indeed, Mr. Wimmer W-I-M-M-E-R, I believe the modeller actually you're right. He did join them -- with them after that, thank you for that correction. Let's go to the next document, please, it's 56, yes. No, I'm sorry, it's 9, excuse me.

THE COURT: Mr. --

Q MR. PARKER: Have you seen --

THE COURT: Mr. Parker?

MR. PARKER: I'm sorry.

THE COURT: Am I on mute?

MR. PARKER: No, we can hear you.

THE COURT: Okay, what document is this?

MR. PARKER: This is -- my apologies, Justice Romaine, this is -- this is document 9, these are my own document numbers, just got -- listed them for convenience and these are the ones we'll be sending down to you if they're marked as exhibit or if you otherwise want us to send them to you even if the witness is not able to identify them --

THE COURT: Okay.

Q MR. PARKER: -- and this -- and this document is -- it's a footnote to the last article I showed which is a criticism of your paper, number 48. This document -- sorry -- I'm sorry if you -- I -- I didn't hear if you answered this or if I even got the question in. Do you know if you've seen this research article summary before?
A No, I have not seen it.

Q Okay, just before we move on I'd like to go to page -- no, page -- page -- yeah, 3 of 8, please and it's table 1 right there. I just wanted to get into this issue of defining NPIs a little bit more, I appreciate you never seen this document before. Sometimes when I go through these various studies about NPIs or -- or lockdowns as some choose to call them, it's frustrating that there's no definition of what lockdowns are.

I think your definition was it's a suite of measures and in any event this is a study on that subject of NPIs and their effectiveness. And this table includes a description of various NPIs, and I just wanted to go through these with you and get an idea which you thought were the most severe and which of these would be less severe NPIs. Can you just look at these and there's 1, 2, 3, 4, 5, 6, 7, 8, different categories listed of NPIs, you'll agree with me?
A 1, 2, 3, 4, 5, 6, 7, 8, yeah, that's what it says here.

Q And are you able to tell me by looking at these gatherings -- sorry, these NPIs and their descriptions, are you able to say well these would be considered more severe, and these would fall in the less severe category?
A I'm -- I'm not sure exactly what you mean by severe.

Q Right, well do you have a way of determining whether a -- a certain set of NPIs are more severe than another set of NPIs?
A Again, I'm not sure what you mean by severe.

Q Well, you -- your -- let's talk about your -- your study at footnote 48. That was a comparison between certain countries that you say used severe NPIs and two countries, South Korea and Sweden, that I understand you say used less severe NPIs, am I correct on that?
A I mean we were referring to something very specific which is the adoption of mandatory stay-at-home orders and business closures. So --

Q And -- and --
A -- neither -- neither Sweden nor South Korea in their first wave used those -- those strategies.

Q So, a stay-at-home order as defined in this article, it's the bottom of the eight categories, is that the stay-at-home order that you referred -- that -- that's what you're referring to when you're talking about stay-at-home orders in your article, right?
A I'd have to read the -- I mean it's a little small but I -- but I have to read the definition.

Q We'll -- we'll -- we'll make it -- can we make that bigger? We'll try to boost that up for you, sir. There you go, how's that?
A That's better. Yeah, that's consistent with my thinking of what -- of what would -- would consist of stay -- stay-at -- mandatory stay-at-home order. I mean the -- the -- there's some slippage in there about who the exemptions are granted to and so on but --

Q M-hm.
A -- yeah.

Q And so, your -- I'm just going to call it your assessment study at footnote 48, you'll know what I'm talking about?
A The European Journal of Clinical Investigation study?

Q And I'll know what you're talking about when you respond like that. Yeah, that's the one I'm referring to, sir.
A Okay.

Q The -- Sweden and South Korea did not have these types of stay-at-home orders?
A They didn't in the first wave have those mandatory stay-at-home orders, no.

Q And -- and they were -- Sweden and South Korea were compared to what? Ten other countries or?
A This -- I don't remember the number but yeah some of (INDISCERNIBLE) countries, what we could get complete data on -- on -- on -- the key thing there was we needed to be able to get data not just on the country level but also on the -- on the -- the -- the province level if you will, so that we could have more observations within each country.

Q Right, you dug down into the detail, I remember that now, on a sub -- subnational basis I think is the language used, right?
A Yeah.

Q Now, whatever number of countries you compared South Korea and Sweden to, ten or whatever it was, did they all of these equivalent stay-at-home orders at some point during the first wave then?
A Some of them did, all -- all of them did at some point I think.

Q You think, okay, you're not certain?
A Mind you it was -- the details are in the paper, I had to refresh my memory.

Q Sure, okay. No, fair enough, the details are in there, they're in there. You're aware that Alberta did not have a mandatory stay-at-home order such as this, sir, during the pandemic?
A Yes, I'm aware.

Q (INDISCERNIBLE)
A (INDISCERNIBLE) -- it has business closures which are also included in the paper.

Q And -- and what do you know about the business closures in Alberta, sir? Do you know any details about them, when they occurred, anything at all?
A (INDISCERNIBLE) relatively early on in the pandemic, there were some exceptions but there were places like I think grocery stores were allowed to stay open, but many other businesses were -- were forced to stay closed.

Q It's fair to say at this point you don't recall many details if we were --
A I'd have to refresh my memory.

Q Fair enough. I -- I appreciate you haven't seen this article before, sir, I'm going to tell you it's showing a date of February 2021, it looks like 19th to me. Can I just get you -- I -- I want to go to the first page I believe, page 1 of 1 and I just -- results -- there we go, if we could get results in and what's below it there. Right-hand column, there we go. And I'm just going to read from where, sir, you'll see it says: (as read)

> While exact intervention effectiveness estimates varied with modeling assumptions, broader trends in the results were highly consistent across experimental conditions. To describe these trends, we categorized intervention effect sizes as small, moderate, or large, corresponding to posterior median reductions in the reproduction number R -- (I'm going to skip the numbers and continue)
>
> Across all experimental conditions, all interventions could robustly be placed in one or two of these categories. Closing both schools and universities was consistently highly effective at reducing transmission at the advent of the pandemic. Banning gatherings was effective, with a large effect size for limiting gatherings to 10 people or less, a moderate-to-large effect for 100 people or less, and a small-to-moderate effect for 1000 people or less. Targeted closures of face-to-

face businesses with a high risk of infection, such as restaurants, bars, and nightclubs, had a small-to-moderate effect.

Sir, I appreciate you haven't seen this study before but you will agree with me that there were articles on the subject of the effectiveness of NPIs that come out in February of 2021 that took -- or came to a different conclusion than you had come to in your study in the footnote 8 -- footnote 48, your primary report, the one published in the European Journal of Clinical Medicine, fair?

A There is an incredibly large literature looking at this exact point, in fact -- I mean as we've talked about that Hopkins study it's -- in an attempt to evaluate what that literature is saying. It's a complicated literature with lots of details involved, it's very difficult to -- to summarise very -- very easily and methodological issues are quite important I think when you're evaluating papers like -- for instance this paper you've showed me, I haven't been able to see what the methods are. So, before I decide whether I like the conclusions or not I have to see what -- what they actually did.

Q Yeah, I mean we could take you to that, sir, I -- I'm not going to suggest that that's a useful -- a good use of our time, springing a paper on you and getting you to say whether you like it or not. I just wanted to establish as a fact that there is, certainly in the academic literature, a different conclusion reached than you've reached in your own studies on this subject, right?

A I mean I think the -- as I said, what's guided me in my -- in my evaluation of the papers in this subject is, are they looking at real world comparison, are they using methods that carefully try to assess causation rather than just simply correlation. Are they -- are they -- or are they relying on modelling data to -- or -- to -- to develop the counterfactuals? A whole host of other things I would look at to see if the paper is -- is reaching -- using methods that are reasonable or -- or -- or reliable for the -- to reach any conclusions that they have.

Q Do you remember my question, sir?

A I mean what you're -- what you're asking me is -- I thought what you're asking me is what -- how am I assessing the -- the -- the papers like this?

Q No, I'm asking you just as a fact that the time your paper came out in December '20/January '21 and after that you came to conclusion in that paper that NPIs were not hugely effective at reducing mortality. You would agree with me as a fact that there were plenty of academic papers at that time coming to a different conclusion, that's fair, right? I think you've agreed to that already.

A I mean I -- I think we referred to that when you had that discussion n about the Hopkins paper. Right, the -- that -- I told you there was a very large number of studies that that Hopkins paper assessed, there was a very robust discussion and I think I've answered

that, the base --

Q Well, I just -- well, is it -- sorry, is the answer yes? I think it's a simple -- it's a yes, right?

A Yeah, there's a big debate going on in the academic community over this.

Q Thank you -- thank you, very much. Well, yeah, okay. Let's --

MR. GREY: Mr. Parker -- Mr. Parker?

MR. PARKER: M-hm.

MR. GREY: Before we leave this, could we just confirm that you will not be attempting to adduce this paper as an exhibit as part of your case?

MR. PARKER: Well, he didn't --

MR. GREY: The witness very clearly has not adopted --

MR. PARKER: -- he -- he didn't --

MR. GREY: -- it --

MR. PARKER: Yeah, exactly --

MR. GREY: -- and it doesn't meet --

MR. PARKER: -- exactly --

MR. GREY: -- the evidentiary standard. Okay, I was just --

MR. PARKER: Yeah, he hasn't --

MR. GREY: -- trying to understand why you showed it to him? Thank you.

MR. PARKER: For that -- for that reason, to see if he had seen it that right before, he hadn't seen it before then, so to establish --

MR. GREY: Yeah.

MR. PARKER: -- the fact as he confirmed that there is, as a fact, a difference in opinion at that time, right?

MR. GREY: Very -- very well, I think we knew that --

THE COURT: Okay.

MR. GREY: -- 10 minutes ago but I don't want to interrupt your cross-examination, thanks.

THE COURT: Okay, however --

MR. PARKER: Okay.

THE COURT: -- I am going to interrupt it now. It is 12:30, it is time for the lunch break. We will take an hour break for lunch, okay?

MR. PARKER: Thank you.

THE COURT: Okay, thank you. We will resume at 1:30, thank you.

PROCEEDINGS ADJOURNED UNTIL 1:30 PM

Certificate of Record

I, Michelle Palmer, certify that the recording herein is the record of oral evidence of proceedings held in the Court of Queen's Bench, held in courtroom 1702, at Calgary, Alberta on the 11th day of February, 2022 and I was the court official in charge of the sound recording machine during these proceedings.

Certificate of Transcript

I, Ethan Zaherie, certify that

(a) I transcribed the record, which was recorded by a sound recording machine, to the best of my skill and ability and the foregoing pages are a complete and accurate transcript of the contents of the record, and

(b) the Certificate of Record for these proceedings was included orally on the record and is transcribed in this transcript.

TEZZ TRANSCRIPTION, Transcriber
Order Number: TDS-1000831
Dated: February 14th, 2022

Proceedings taken in the Court of Queen's Bench of Alberta, Courthouse, Calgary, Alberta

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February 11, 2022	Afternoon Session
The Honourable Justice Romaine (remote appearance)	Court of Queen's Bench of Alberta
J.R.W. Rath (remote appearance)	For R. Ingram
L.B.U. Grey, QC (remote appearance)	Heights Baptist Church, Northside Baptist Church, E. Blacklaws and T. Tanner
N. Parker (remote appearance)	For Her Majesty the Queen in Right of the Province of Alberta and The Chief Medical Officer of Health
B.M. LeClair (remote appearance)	For Her Majesty the Queen in Right of the Province of Alberta and The Chief Medical Officer of Health
N. Trofimuk (remote appearance)	For Her Majesty the Queen in Right of the Province of Alberta and The Chief Medical Officer of Health
M. Palmer	Court Clerk

THE COURT: Okay. Thank you. Okay we are back with continuation of Mr. Parker, cross-examining Dr. Bhattacharya.

Mr. Parker.

JAYANTA BHATTACHRYA, Previously Sworn, Cross-examination by Mr. Parker

Q Dr. Bhattacharya, good afternoon.

MR. PARKER: My apologies Justice Romaine, my camera was off there.

THE COURT: Okay.

Q MR. PARKER: Doctor, we were talking about your document at footnote 48, your article on assessing effectiveness of NPIs.

A Yes.

Q I just want to talk about some of the criticism that I understand that has been made of that study, see if you've heard this criticism. One of the criticisms is that the small sample size and the samples composition have not been justified and introduced a lack of representativeness and I understand the sample size being referred to here is 10 and I understand that's the number that the two countries, Sweden and South Korea were compared to. Have you heard that criticism of your study before, sir?
A I have, but it's incorrect.

Q The other -- next criticism I've heard is that the control group composition is arbitrary. That is the control group is composed of only two countries with less restrictive measures, Sweden and South Korea, sorry -- "less restrictive measures" should be in quotes, however, while those countries did not close businesses or use stay-at-home orders, both countries have implemented several other measures that could be considered as "more restrictive". Have you seen that criticism before, sir, of this study?
A I have, it misconstrues what the study is about. The study is about assessing mandatory stay-at-home orders and business closures, the effect of those, not of the other measures.

Q Right, but you categories ten countries as using more restrictive NPIs and two countries as using less restrictive, right?
A No, we took two countries that didn't impose those two specific sets of measures, mandatory stay-at-home orders and force business closures and compared them against countries and periods where they did and we used sub-national samples, not simply just ten countries as you keep saying.

Q Right.
A So we had more observations than you're -- than you're letting on.

Q My apologies, I'm just ignorant, I'm not trying to mislead. The sample size was ten at the sub-national level not nations then, that's fair right?
A No.

Q No?
A The sample size was much more than ten at the sub-national level.

Q Okay. I'm just reading from the criticism; I will show that -- well I've showed you the criticism earlier and you said you didn't see it. Do you remember responding to the criticisms in this article by way of your own letter to the editor of the European Journal for Clinical Investigation?
A Yes.

Q And, in fact, is it fair to say that these first two criticisms were two of the criticisms that you responded to in that letter?
A Yes.

Q Now, that letter, sir, was it written by you or Mr. (INDISCERNIBLE) --
A All of us worked together and contributed to that letter.

Q Okay and so there's a number of footnotes to that letter, do you know if you would've looked at these studies that are footnoted to that letter?
A I looked at a subset of those footnotes, but not every single one.

Q Okay. I take it some of your colleagues would have looked at the ones you would've looked at then, is that what you're saying?
A Yeah, it's a joint effort.

Q Do you understand that both Sweden and South Korea used, to some degree, school closures during the first wave of the pandemic?
A Yes.

Q You had determined though, as I understand how you -- how you performed the study that more restrictive NPIs were stay-at-home and business closures rather than school closures. In other words, countries that had or sub-national level data from jurisdictions that had school closures were not considered to be more restrictive and so you'd made the determination that school closures were therefore less restrictive NPIs than the other two, the stay-at-homeland the business closures; is that fair?
A No, it's not. The reason why we focussed on mandatory stay-at-home orders and on forced business closures is because we had a control group. We had a set of countries, two countries, in particular, at sub-national regions that did not impose those and we could compare them in terms of a real world comparison with countries that did. That's why we focussed on those, because we wanted to focus on places were we could generally estimate that could plausibly be seen as actually casual as opposed to just, you know, modelling efforts and inferences based on those.

So, the reason we didn't do school closures is exactly why you said. In the early days of pandemic, at least for brief time, Sweden closed some schools and same thing with South Korea, so therefore we didn't have any variation among the set of counsels we had available to us with sub-national data on that point. So we didn't address it because we couldn't plausibly address it. There wasn't any variation to address it.

MR. RATH: I'm sorry -- as much as we like Mr. Parker muted -- sorry My Lady, I just will advise the Court that Mr. Parker couldn't be heard.

MR. PARKER: Thank you Mr. Rath.

THE COURT: Right.

MR. PARKER: My apologies.

Q MR. PARKER: Sorry, this is a criticism of the report, schools closures are -- a part of the criticism -- school closures are often described as the most restrictive problematic interventions. The phrase, last to close and first to open is commonly used. In assessing NPIs would you say that school closures are often described as the most restrictive problematic of MPI interventions?

A I do believe that school closure are quite a problematic intervention. I mean it's an empirical question whether its more or less severe. I don't have a -- I mean I personally think they're probably more severe.

Q Sure and do you know the period of time that Sweden closed schools during the time period -- well actually what time period did the study look at? What period was the data from, sir?

A I'd have to look at the paper to give you precise dates.

Q Sure. During 2020, so during the first wave of the pandemic, possibly into the second wave, do you know what time period Sweden closed its schools and what schools were closed, if any?

A I think they primarily closed over schools -- for secondary schools, so high school students for some time, I think they kept primary schools, daycares open for the entire epidemic, if I'm not mistaken.

Q Sorry --

A Yeah I mean I think that that's -- but I don't know the precise dates.

Q If I suggested to you that starting in March 2020, secondary schools worked mainly with distance learning based on the Public Health Agency's recommendation, would you agree with that, sir?

A Yeah, that just what I just said, right.

Q Well, you weren't sure, so now I'm looking to certain it up a little bit, does that help you?

A I said that it closed, I just wasn't certain of the date.

Q Sure and does that help, March 2020?

A I'd have to go -- I'd have to go and check, but I take your word for it.

Q It's -- and do you know when they reopened -- and sorry -- do you know if universities went online at that time?
A Yeah, in Sweden they did for a short time.

Q And do you know when they reopened, both high schools and universities?
A No, I would have to go back and look at the dates.

Q If I tell you it was for the fall -- fall school season in September, would you agree that that was the case?
A For universities or for secondary schools?

Q I understand that's for both, sir?
A I mean I'm pretty sure they did for universities, I don't know about secondary schools, I'd have to go back and look at the dates.

Q Do you know anything about South Korea's restrictive digital legislation that was used at this time in regard to the pandemic in that country?
A Yes.

Q What do you know about that, sir?
A They put a passport in place, a digital app in place, so they could track -- do contract tracing, so they could see where people had been and if they'd been in contact with people that later turned out to be positive, including entering into businesses and things like that.

Q And that employed elements such as video surveillance, mobile phone location data and credit card monitoring, is that your understanding?
A I don't -- I didn't know about video surveillance but I knew about the phone apps.

Q That sounds pretty invasive, would you agree?
A I mean it's a contact -- it's a vigorous contact tracing program, absolutely.

Q Are you aware of any North American jurisdiction that used such an approach to contract tracing during the pandemic?
A I think every North American -- or sorry I'm sure about Mexico, I'd have to go look, but basically everywhere in the United States and in Canada used contract tracing of some sort.

Q No, no, this kind of contract tracing, this kind of what I've described as invasive, digital

legislation, contact tracing including video surveillance, mobile phone location data and credit card monitoring?

A I'm not aware of any North American jurisdiction following the South Korean contact tracing model, no.

Q If we could go -- I appreciate you can only see the title here, have you seen this before, sir, can you tell from what I'm showing you?

A No, I can't -- is this my article? I can't tell what this is.

Q No, it isn't -- sorry can we -- no this is -- this is an assessment of your article by Johns Hopkins, sorry I think it's their official COVID-19 group, I forget the actual name, but it was - I understand from what I see here, it was published in the European General Clinical Investigation, we'll scroll through it, are you able to tell me if you've seen this before?

A I don't -- I don't know who the authors are and I don't know of any official group at Hopkins that speaks for Hopkins at-large. There are authors there.

Q And if we go down to the bottom the review was posted on March 12th, 2021, you see that? Again I appreciate we're just scrolling through here, but your recollection as -- you've not seen this before?

A No, I don't remember seeing this in this form, can you give me the authors?

Q I don't have them readily at hand, sir, so but we will certainly send this to you as soon as possible, I just -- as I say, I understand it is from Johns Hopkins as you can see from the address line at the bottom of page, I think. I just wanted to go to --

A I can't really -- it's too small for me to see. That's just a website, who are the authors?

Q So these folks have some criticisms, the first is: (as read)

> The timing of MPI implementation across countries was not randomly allocated. Countries enacted policies in response to characteristics of the epidemic that were highly likely to have affected subsequent confirmed case counts. This endogeneity could have severely bias effect estimates and undermines confidence in the study results.

You've seen the criticism before, sir, right?

A Yes.

Q And then the next criticism, sir, is that: (as read)

> Additionally the sample sized countries was small, ten, and did not

include many countries for which sub-national MPI and case count data are available.

Again, not my word, countries in this case, I'm just reading the criticism, but obviously you've seen that criticism before, right?

A Yeah, this is false, it's not true. I should say about the endogeneity problem that is a problem that is standard that occurs whenever you're comparing real world results, it's a much better problem to cope with than the problem of assessing model accuracy for counter factuals. That --

Q I understand -- sorry --

A -- yeah that's fraught with -- I mean there's no way to assess whether the assumptions are right, whereas with endogeneity you can have a discussion, look at the empirical results and assess the quality arguments. And that's -- I think it's a -- the appropriate direction of the literature should go in that direction, assessing those kinds of questions, standard kind of questions that occur whenever you're talking about questions of causality in empirical literatures.

Q And correct me if I'm wrong, I thought I'd -- you'd dealt -- you -- am I right that you discuss this endogeneity problem in the study?

A We did and we also I think -- if I'm remembering right, in the response letter, as well.

Q We'll get there and I think what you said is basically, well, this is the same for everybody else, so you identified it but (INDISCERNIBLE) --

A No, I'm just saying that their assessment is not definitive, it's a question of, you know, you have to look at the arguments and the data and see what the -- you can actually assess the accuracy -- I'm sorry the -- you know, sort of the -- you can assess the arguments based on looking at data and decide whether it's true or false. The assumptions underlying the causality inference are really what they're asking about. But that is the kind of conversation you can have when you compare real world outcomes, you can't even have that conversation when you're comparing against modelling counterfactuals. Modelling counterfactuals involves a whole host of untestable assumptions that you're going to try to infer based on -- based on that -- what the effect size was.

Q There so -- another criticism of your study, sir, is the language used to describe the result is incorrectly causal; you've seen that criticism before, right sir?

A I have, but again it relates to this question -- the question of endogeneity, my opinion and of course it's my opinion because I wrote the article, is that we did a good job with that. There are people who disagree and we can have a conversation about whether alternate assumptions would be more plausible or less plausible. I mean I think that's

the -- that's how science works, as I was saying.

Q Right and, in fact, the criticism that I'm looking at -- acknowledges that you openly acknowledged this issue in the discussion case.

A Absolutely and it's as a I said a standard thing you must do whenever you're considering whether a set of comparison across -- across groups is actually a causal -- you can actually make a causal statement or not with it. That's nothing -- that's nothing new, the question is not in the criticism, the question is in the details of the discussion about, you know, about whether its plausible or not, that these are -- these were adopted in response to or -- or in response to, you know, the facts on the ground or in response to facts elsewhere.

So, for instance, the counterargument I make to this argument, is that these countries, many countries adopted these measures almost simultaneously regardless of the facts of the total spread of COVID in each country or each province or each sub-national region. In particular, sub-national regions, some regions had low spread, some regions had high spread and they all adopted more or less uniformly, all these countries together.

And so, I don't agree with this criticism that says that there's endogeneity at the implementation. What that means endogeneity at implementation is that sub-national regions adopted the policies in response to exactly what they saw on the ground there and not anywhere else, not outside of the sub-national regions even within their own country. I think that's false.

I can't hear you, Mr. Parker.

Q Sorry, your answers are very long sometimes, Dr. Bhattacharya, so I lose track. So on this causality issue, the criticism, one of them is: (as read)

> The case data came from study countries -- sorry -- case data from the study countries is likely inadequate to generate causal conclusion nonetheless the paper sometimes relies on statements implying a causal impact or lack thereof from interventions. For example, the phrase, effects of is used in the paper refer to the case numbers after interventions are implemented. It is merely the association between case counts after the intervention came into effect that is measured, not the effect.

You've seen that criticism before, sir?

A Yes, but again I think that that's not accurate, I believe that we did a good job with the

causality. I think the problem you're having with this, is that the words, effect of, doesn't necessarily imply causality. The criticism itself is wrong, although though I do think, as I say, I think we did a pretty good job of the causality, certainly better than the estimates that rely on modelling estimates for the counterfactuals.

Q (as read)

> Testing capacity was limited during the first wave in all considered countries, and as this authors acknowledge, this inherent flaw suggest that no causal conclusions can be drawn from this study.

That's fair, right?

A Not -- I don't think that that's fair. I think what you can say is that testing was limited, that is fair and that means that we are going to have noise in our estimates of the total number of cases measured. But that's a problem with even the modelling studies and the estimates of you know, lives -- of cases averted even from modelling studies, because they also rely on cases estimates. That's a standard problem with the whole literature.

Q Have you -- has this study been changed at all after receiving some of the criticism and comments to better reflect the study's inherent limitations; has that occurred?

A I mean we replied to -- we replied to the criticisms in the journal.

Q So that's a no?

A I don't know what you mean by changed.

Q Have you revised the study in any way as a result of any of these criticisms, it's not a complicated question?

A In response to the criticism we did some additional, you know, additional statistical estimations and reported them in that response letter.

Q Is there anything --

A Once it's been published, it's published, I mean you can't go back and revise it.

Q Unless it gets retracted.

A If it gets retracted it's still there, it doesn’t -- doesn't go down the memory hole.

Q No, it's just gets a big stamp retract article on the front so people can see that they shouldn’t be relying on the study is what I've seen, in Savaris, at least, right?

A I mean I think it reverts back to a working paper.

Q Sir, back to this criticism that we've been discussing, it's entirely possible that the lack of benefits highlighted when comparing countries to Sweden, for example, could be due to the fact that Sweden had incredibly restricted testing during the assessed time, that's fair, right?
A I'm sorry, one more time I missed that.

Q Sure. It's entirely possible that the lack of benefits highlighted when comparing countries to Sweden, for example, is due to the fact that Sweden had incredibly restrictive testing during the assessed time?
A I mean a lot of countries had incredibly restricted testing at this time. The issue is not that. The issue is in Sweden and South Korea, they followed a very different policy with regard to two different things. The mandatory stay-at-home orders and the business closures, whereas the other countries had those. You could actually make a comparison of that kind of -- if you want to ask what the effect of restrictive --

Q Sorry, I just want to ask and get an answer to this question, I appreciate that evidence you've given already. But I just want to go back to this question, sir, because it's not open mic night here and I'd like to try to get through this. And what the criticism is, it's entirely possible the lack of benefits highlighted when comparing countries to Sweden, for example, is due to the fact that Sweden had incredibly restricted testing during the assessed time? Is that a fair criticism or not?
A I don't think so, because Sweden -- the number of cases, as it changed over time was compared essentially to itself and to other regions within Sweden. And so the availability or lack of availability testing or differences in the lack of availability testing across countries should have no effect or very little effect whatsoever on the conclusion. Again, the sub-national regions did a lot for us. Those kinds of country specific matters shouldn't have an enormous effect on the results.

MR. RATH: My Lady, I'd like to enter an objection at this time and I'd just like to point out for the record that my friend's insulting comments like "open mic night" et cetera don't really advance matters. These are very complex matters and Dr. Bhattacharya is doing his best to answer him in a forthright manner and I don't find that my friend's insulting comments really advance things very well.

THE COURT: Mr. Parker?

MR. PARKER: I got the phrase from the very eloquent Chief Justice Joyal in Manitoba who used it several times during that proceeding when it appeared to me he felt witnesses were unnecessarily elaborating or not answering questions and my apologies, I'm not intending to be rude and I apologise to you Dr. Bhattacharya. It was in that context I made that comment.

THE COURT: Thank you Mr. Parker.

MR. RATH: Perhaps if my friend --

THE COURT: Mr. Rath that should do it. Mr. Parker has apologised.

MR. RATH: Thank you.

Q MR. PARKER: And so we're going to this document now, sir, and this is -- this is the document that ultimately -- is one of the documents that you and your coauthors responded to. Have you seen this document before, sir?
A I think so, but you'd have to show me the author for me to really respond.

Q Right. Let's do that.
A Yeah, okay, I've seen this.

Q There we go and there's the names there, sir, it's Bessancon and Meyerowitz-Katz, Chini, Fuchs, Flahault, you've seen these names before?
A Yeah I've seen this document before.

Q You've seen this document before, okay. And then -- and this sir is your response, you and your colleagues response to some of the criticisms that I've been reviewing with you, is that fair?
A Yes.

Q And actually let's go -- and what role did you take in this document, sir, do you recall?
A I helped -- I helped devise the strategy for answering some of these -- some of the criticisms. I helped with editing the draft or the document after it was written, the first draft was written. I consulted closely with Eran Bendavid and John Ioannidis, I think Christopher Oh was more a -- he worked more closely with Eran Bendavid. We worked -- we worked together on this document.

Q And there's a number of references in this document, 1 through 17, Sir, you see that?
A Yes.

Q And I asked you earlier if you had looked at these references and I think you said, some of them was your responsibility, I take that to mean some of these were other of your coauthors responsibility, is that fair?
A I mean yeah, this was a joint document, I don't remember who quoted every single

reference.

Q Okay. Do you remember any of these references that you would have looked at, for example, number 2?
A Isn't that the document you just showed you?

Q It was the document I showed you before lunch you said you hadn't seen before, so that's why I wanted to come -- sorry to be fair -- the document I showed you before lunch was not published in the European Journal of Clinical Investigation, it's got the same title, same authors.
A You didn't show me the authors, sir.

Q Yes, it was the one Besancon, Gideon Meyerowitz-Katz, Antoine Flahault and you pointed out --
A You showed me a document with no authors before lunch.

Q No that's -- well sir, the transcript is going to reflect this, you pointed out that there was actually another author on the criticism of Savaris --
A You're right, you're right -- wait -- no you showed me a document with three -- yeah three authors, yes.

Q Right --
A I was conflating --

Q -- and it's the same three authors and it's the same documents.
A I apologize, I was conflating an earlier document you showed me without authors.

Q I'm doing that a lot, sir, there's a lot of paper here, I will admit it so no apologies necessary. Thank you. So does this change your earlier answer though in terms of whether you had seen that document I showed you before and just to be fair, the document I showed you before, I understand is the same only it was not yet published in the European Journal of Clinical Investigation?
A I didn't see the working paper version; I don't know it -- I'd have to look carefully at that document and see if there's any different -- I mean I've seen the published version.

Q Yeah, no fair enough. Let's go down to 16, Brauner, that was another document I showed you before lunch and you said you hadn't seen before, we went and looked at the table of NPIs in that document. I take it that you weren't responsible for this reference in preparing this response?
A I don't remember seeing that -- I don't remember seeing that paper.

Q Fair enough. Sir, is this the last word on this debate at this moment, sorry, I'm not saying you can predict whether there will be anymore responses, but in fact I expect --
A Mr. Parker, I expect we'll be debating this for a good long time.

Q Indeed. Indeed. Is this the last word so far from you folks?
A Are you asking if I'm working more on this? I hope -- I mean the -- yes, the answer is yes, I'm going to work more on this topic going forward.

Q No, I meant when I go out and look for correspondence between you and your critics of this article, will I find anything newer from you that you're aware of, other than since this letter was accepted on March 17th, 2021?
A No, at least I haven't worked on anything, I mean it's possible John or Eran or Christopher have.

Q I understand the document -- the study at footnote 48, your study, the Assessing Mandatory Stay-at-homeland Business Closure Effects, that was a re-analysation of a study call the Effect of Large Scale Anti-contagion Policies on the COVID-19 Pandemic by -- I'm going to pronounce it Singh (phonetic) H-S-I-A-N-G et al; is that correct?
A Yes.

Q And you've re-analysed Hsiang because they use modelling counterfactuals and you don't like that approach, is that fair?
A Yes.

Q What -- what conclusion did Hsiang come to on the effects of large scale anti-contagion policies on the COVID-19 pandemic, that is, what conclusion did they come to on the effects of NPIs?
A They had a very complicated set of conclusions. They look at -- because they're using modelling, they didn't have to worry so much about the problems of causality, they just assumed that they knew it. And they looked at a whole bunch of interventions and had some assessments for each and every one of them. It's impossible without my going back and looking to characterize, as a whole, what they found. Some they found were more effective, some less effective.

Q Fair enough, the Hsiang Study is footnote 17 to your surrebuttal report, just to make it clear that it was part of your evidence filed in this proceeding, right, sir?
A Yeah, I've read it.

Q And is that your main problem with the Hsiang Study that it didn't -- it used modelling counterfactuals?

A In fact, yeah, I mean that's the best or the major problem with it, it assumed a counterfactual that -- that didn't make any sense, at least to me.

Q It does to some others though?
A I mean they published it.

Q Indeed. Sorry, was another criticism of that study of yours we've been talking about that it also does not have a lag between MPI introduction and what you're measuring?
A I don't remember if that was specifically addressed or not in the set of criticism, I do remember talking about it --

Q Was that -- sorry --
A -- I don't remember, I'd have to look back at the comments.

Q Sure, I'm sorry for talking over you, sir, it is hard, I'm trying not to do that, just when I think you're done and you're not done and so my apologies.

THE COURT: We are on mute; we cannot hear you.

MR. PARKER: I am just telling my colleague which document to bring up so I intended to be on mute --

THE COURT: Okay. Okay.

MR. PARKER: -- so you didn't hear me say something bad.

Q MR. PARKER: I think you have seen this document before, sir, do you recall?
A Who is the author? Let me see, Liat, I don't specifically remember, but I have vague memory of it, I have to refresh my memory.

Q It was published October 27th -- well sorry -- I should be careful with these dates, I've got October 27th, '20 written down on it, what do we see there? Oh yeah, published online October 22nd, 2020. I know it was put to your in the Manitoba proceeding, I don't know if that helps at all.
A I don't have any memory -- specific memory of this paper, I mean I have a vague memory of it, but I don't have a specific memory of it.

Q You will gather from the title that it's a modelling study across 131 countries?
A Yeah.

Q If you go down to the third paragraph in the summary, sir, you -- would you agree that at least this study interprets individual NPIs including school closures?
A I'm sorry, I'm not sure where you're asking me to look.

Q Interpretation, individual NPIs.
A Okay, yeah.

Q And they -- they put a delay in of one to three weeks, sir, do you that?
A I do, I see that.

Q And that's important here in measuring the efficacy of NPIs, is that fair?
A It was in this study; I mean I am not sure what -- I'd have to look at the details of the study to give you more of an assessment of the lag structure and the importance of it.

Q What is the purpose of putting that lag in, sir? Why is that important?
A It's important because the -- there's delay between people getting sick and then dying. But here -- the question of laps is -- is -- it's we're not looking at death, we're looking at, you know, sort of showing up to the hospital or being identified as a case. The lag structure, you know, you put it -- you put an implement -- you put a NPI in place and it may have an immediate effect because people stop going out, or it may have a delayed effect because it just -- it takes some time for the cases that are already in place to play themselves out. So the question of lag structure is important, but it's not -- it depends on the particulars of the NPI and the particulars of the situation in which those NPIs are implement.

Q And an NPI may have very little effect at some point in time if it's layered onto NPIs that are already in place, a stay-at-home may have very little effect after other lesser intrusive NPIs have been used, that's fair, right?
A It's possible yeah.

Q We're just bringing up the next document -- oh I'm sorry we haven't got it. My apologies. My apologies about the delay there, have you seen this document before, sir, I understand it was put to you in the Manitoba proceeding?
A I don't have any recollection of it.

Q You've never seen this before to your knowledge then?
A I'm not saying that, I'm saying I just don't have any recollection of it.

Q Okay. Sir, do you know if you've seen this document, sir?
A Can I see who the author is?

Q Sure. There's an awful lot of them --
A We started this conversation -- there's hundreds of thousands of papers, I mean it's a lot.

Q Indeed.
A This is the one you asked me about earlier.

Q Yeah, we're experiencing some technical issues, sir. Sorry, we're having some freezing here, so my apologies again. Apologies, it looks like this one is -- kind of pushing -- here we go we'll try this one instead. The authors are on this one, so I don't know if that helps. Have you seen this one before, sir?
A I don't remember seeing this one, no.

Q Okay. Let's just go down a bit, Mr. Trofimuk to the methods and results, please. And sir, this one used global data on a non-parametric machine learning model to estimate the effects of NPI in relation to how long they have been in place. They applied a random force model and used accumulated effect plots to derive estimates of the effect in the single NPIs in relation to their implementation date in addition we used bootstrap samples to investigate the variability in these ALE plots. Now, do you have concerns with those methods from the description there, sir?
A I do. Generally speaking the problems of endogeneity that you identified earlier are worse in these kind of -- these kinds of methods. These are essentially large scale correlations. So it's difficult to address the kinds of endogeneity questions that you brought up earlier.

Q I show this one on the last page, we don't need to go there, but it was accepted -- received November 3rd, 2020, accepted July 21, 2121, published online July 28th, '21, as you'll see there. Go back to the first page Mr. Trofimuk please? I just want to look at the conclusions -- sorry results. And these folks using this method came to the conclusion that closure and regulation of schools was the most important NPI associated with pronounced effect about ten days after implementation. Restriction of mass gatherings and restrictions and regulation of business were found to have more gradual effect and social distancing was associated with the delayed effect, starting about 18 days after implementation.

Now, I know you haven't seen this and you have some problems with the methods, but you will agree that at least about July 28, '21 there was academic material being published that was coming to conclusions that are different than the conclusions you have come to on the effect of NPIs?
A No, I don't think so. I think this is -- this is talking about -- is it talking about business closures?

Q No, it isn't and I'm not intending to compare your study directly to this study, I'm saying that I understand from your evidence, the totality of your evidence, the review of the academic literature, you're saying NPIs are not effective in delaying -- decreasing mortality, is that fair?
A Well, I'm saying that -- I'm trying to remember in terms of what I wrote as of that date, what I said was that it was an open question, if I remember right.

Q Okay. That's fair.
A The literature has moved -- I mean I think moved in that direction toward that it wasn't particularly effective.

Q Okay. So it was an open question July of '21 is what you're saying?
A Yeah and I reflected both modelling literature and the real world data, the real world literature as it existed then if I remember right, you know, as I understood it then. I think it's moved on, the literature moved on toward -- away from these modelling studies and toward just studies that are actually doing real world comparisons.

Q Sure. My colleague is just going to find one of your documents, it's at footnote 4 of your primary report and my apologies, you've got 2300 pages in there and we have done our best to figure out which each page the documents are at, but unfortunately they were not numbered consecutively and so sometimes we don't have those numbers immediately at hand. So I'm just looking for -- it's a -- Seroprevalence of antibodies to SARS-CoV-2 in 10 sites and it's a document that was put as a forward to your primary report, do you recall that?
A Can I see the document, is that the CDC study?

Q By Havers, that's right, yeah.
A Yeah, I remember that study.

Q And we're just bringing that up. And that study, you were aware, sir, when we find it, it does footnote both your Santa Clara study and your LA County seroprevalence study, is that -- if you have that recollection, we will accept that that's the case; or do you want me to show you that?
A I believe you; I didn't look at the footnotes or the references.

Q Thank you very much. And here you'll see the conclusion of these authors, this shows a date of December 2020 in volume 180 of the JAMA Internal Medicine publication and in any event, these conclusions state that: (as read)

> The seroprevalence estimate we report suggested that at the time of specimen collection from March to early May 2020, at large majority

> of persons in 10 diverse geographic sites in the US had no been infected with SARS-CoV-2. The estimated number of infections, however, was much greater than the number of reported cases in all sites. This finding may reflect persons who had mild or no illness or did not seek medical care or undergo testing but who still may have contributed to ongoing virus transmission in the population. Because persons often do not know if they are infected with SARS-CoV-2, the public should continue to take steps to help prevent the spread of COVID-19, such as wearing cloth face coverings when outside the home, remaining 6 feet apart from other people, washing hands frequently, and staying home when sick.

And, sir, that was the advice of these authors when this article was published in December 2020, did you agree with that advice at that time, sir?

A Did I agree with -- so I agreed with the first sentence you read entirely. In fact, it reflects exactly what we found in the Santa Clara and LA County studies that there were many, many times infections than cases and that -- and that, you know, in the US. In fact, I think one of the sites in this study was the Bay -- the San Francisco Bay area and they basically replicated our finding. So I --

Q It was -- if I said the answer sorry -- that I wasn't trying to ask you about the earlier, it was the advice at the end, that in December 2020, was it your opinion that the public should continue to take steps to help prevent the spread of COVID-19 such as wearing cloth face coverings when outside the home, remaining 6 feet apart from people, washing hands frequently and staying home when sick?

A Okay. So okay so I've changed my opinion about some of these things over time, so I'm trying to understand what --

Q Absolutely, do you recall back in December 2020, would that have been consistent with your …?

A Yes, I was still in favour of hand washing frequently and staying home when sick, I think that's very, very important.

Q Face coverings, cloth face coverings when outside the home?

A I was less certain about that, whether that was good or not. The evidence on that, I mean we can talk extensively about that, but I was less certain of whether that was good or not at the time, so I hadn't fully made up my mind on that.

Q Fair.

A Six feet apart, I thought was probably wise, I no longer think it's all that wise or all that necessary.

Q Okay. That's very fair and you know, I've got some mask papers that I can put to you and we can talk about this and -- but I think maybe we could short circuit that, you would agree that there's papers that say masking is effective and there's papers that say masking is not effective and we could explore it all different ways, but would you agree with that first statement, sir?
A Yes.

Q And would you agree that that's not only the case presently, but it was the case back to the first wave of the pandemic is that a fair statement too?
A Well, since -- I've learned since that the date you asked me about this -- that it was actually a very large, randomized literature of the effectiveness of masking on -- on the spread of respiratory viruses like the influence, for instance. In fact, a very -- dozens of randomized studies that preceded the pandemic, they found mostly no effect whatsoever. So the bar for how a -- what a high quality study is in the mask literature in my mind is higher than it is in this literature about -- about the effectiveness of NPIs. What's -- a high quality study in the mask literature is a randomized controlled study, a randomized evaluation. Not simply just a correlational study or modelling study. This comment that --

Q Sorry, can I just stop you on that point? The randomized investigation in a mask context, do you not need one group of people wearing masks and another group of people to go maskless to perform that type of randomized study, sir?
A Yes.

Q Right, okay, so that raises some -- that may be difficult to obtain, it may raise some ethical considerations, for example, doesn't it?
A I don't think so, I mean we've had two randomized mask evaluations during COVID and dozens before. I mean if it was unethical then someone would've cried foul before. I don't think it's unethical, I think it's an open question whether masks as used in the community actually have any effect whatsoever and so if there's equipoise then it's not unethical to run a randomized evaluation.

This comment by the way at the end of this paper is an editorial comment, not a conclusion from the actual estimate that's provided in the paper. The estimates provided in the paper have to do with the first part of this conclusion.

Q Right, I was interested in the recommendations being made at the time to protect people from COVID-19 and your thoughts on that, sir. Just on the Santa Clara study, I know we discussed -- I'm not going to get into a detail, we went through the issue with your university and not being able to release the letter. Just -- it was -- when it came out it

was a -- it was a very highly criticized study, I guess. There was a great -- there was a lot of publicity about it, a lot of concern, people were -- a lot of people were upset about it, it created a lot of controversy; is that fair?

A I mean I got a lot of praise, as well, I mean if you want to fair.

Q Yeah, no that's -- absolutely. One of the criticisms, sir, is -- if you recall, is that the IFR population-wide in Santa Clara the study overestimated population-wide seroprevalence and under estimates IFR.

A I mean people thought that, I don't -- you have to give me something more specific about the methods. You're just saying you don't like the conclusion.

Q What does IFR stand for, sir?

A Infection fatality rate.

Q And how do you calculate that?

A Lots of different ways potentially, but the way we calculated that is by estimating the total number of people in the population in Santa Clara County and then also in the LA County, similarly, based on a population sample of -- of antibody presence in the blood of people in those populations. And then you can compare that against the death rate from, you know, like one, two, three weeks later to see what --

Q Right --

A -- the -- and then the numerator will be the deaths --

Q -- the denominator -- sorry -- I'm going to talk now; the denominator is taken from the seroprevalence study and that's your estimate of those that have been infected with the virus?

A Correct, yes.

Q Got it, thank you very much.

A They have antibody evidence of having been infected with the virus.

Q The Santa Clara study did it use a -- the estimate -- did it use a 2 percent infection rate among randomized participants?

A We didn't use, that was the result of the study was that when we did the reweighting to make the sample we had representative of the age, race and sex distribution of people in Santa Clara County, we found that there was a prevalence of 2.8 percent, I think, if I remember the number right, of antibodies in the population on April 4th and 5th, 2020.

Q And sorry -- there was criticism about the way that the folks who took part in the Santa Clara study were selected to take part in that study, is that fair?

A Yes. So we used a sampling scheme based on Facebook recruitment which is not particularly usual in these kinds of -- these kinds of studies. The reason we did that is because it was -- we were under a mandatory stay-at-home order, it's very difficult to do population sampling without some -- some rapid way, some scheme like that.

And so we got criticized that the sample that we had was not representative of the population of Santa Clara County, at-large. That's why we re-weighted the sample to be representative of the age, race and sex distribution of the County, in order to have -- to make our sample more representative of the actual population in Santa Clara County.

In the LA County study we used a method that was different for sampling. We actually hired a professional firm that had an existing representative sample of LA County and sampled from that population. And using that, we found very, very similar answers. In fact, we found a higher prevalence rate in LA County at roughly the same time period about 4 percent as we found in Santa Clara County at 2.8 percent.

Q So, a lot of people, you're finding a lot of people who have this virus in them at the time then?

A I mean it depends what you mean by a lot, but what I agreed with Havers et al said, that 2.8 percent and 4 percent means that a lot of the population had not been exposed. But it was many, many more times -- more people that had been exposed than people knew about at the time. The location for instance of the Santa Clara study was that there were 40 or 50,000 -- I'd have to look the number up -- but people who were infected at the time when only about 1000 people had been found as cases.

Q I want to turn to the first part of your report, Topic A, your primary report. If we could bring that up please, Mr. Trofimuk? And this -- the title of this section is, Does COVID-19 Pose a Real or Imminent Serious Threat to the Health of the Population, sir? And I think your point here is that -- that it does not unless you are elderly or you have comorbidities; is that fair?

A I mean I think that the largest risk is posed to the people who are -- by far the largest risk is people who are older but then -- and certain comorbidities also correlate, but there's a -- but as far as like a risk radiant, it's rare to find in epidemiology such a large risk gradient as is found with age and the risk of mortality and hospitalizations for COVID-19.

Q And, sir, have you -- I think you said you did or perhaps I'm wrong on that, did you have an opportunity to review Dr. Hinshaw's affidavit filed back in July in this matter?

A I did not.

Q Okay. So, you don't know offhand how Alberta's numbers for patients admitted with COVID-19 compared to patients admitted with seasonal influenza, you have no knowledge of those numbers, right?
A I mean its hard for the flu because it's tracked very differently in Alberta and everywhere else, it's very difficult to make a direct comparison.

Q Have you read the affidavit on that point that we filed from -- excuse me -- have you read the affidavit on that point that we filed of Patricia Wood, the Stats Canada individual?
A No I have not.

Q Okay. We'll go there, now, sir.
A At least I don't have a recollection of it.

Q It's pretty brief, sir, she just addresses this point that it's in -- in this section of your report and this section of your report, sir, as I understand it you take issue -- what you say is, this is at page 5 and 6 of your report, I'm just going to read it to you, because I want to go with Ms. Woodward's (sic) affidavit: (as read)

> According to Statistics Canada when a pre-existing condition is suspected of putting a person to ….

Well, you know, rather than I read it, I think I'll just summarize what I understand you're saying is, you're saying that influenza deaths and COVID-19 deaths are counted differently by Stats Canada, is that what your point is, in this part of your report, sir?
A Is this from my report or from the Woods report.

Q No this is from the -- yeah we've got your report up now, sir. So it's that's last paragraph on 5 and then you go into page 6 on this point, so if you want to read through that and tell me what you're saying there.
A I'm sorry -- okay can you go down a little bit? Yeah, it's what I just said to you earlier, it's very difficult to make a comparison of counting COVID influenza deaths because they are -- the statistics of how you count them is different.

Q How are they different, sir? What do you know about that, did you talk to Stats Canada on that to confirm that was correct?
A No, I just read the -- read the document that I referenced there.

Q Okay. So this is the affidavit of the Patricia Wood, sorry I was saying Woodward, my apologies, it's Patricia Wood, she is the Senior Mortality -- or at least at the time she swore this affidavit, was the Senior Mortality Classification Specialist at Statistics

Canada and you'll see in paragraph 3 she says and this is after having look at this part of your report: (as read)

> The assertion that Statistic Canada counts COVID-19 deaths and influenza deaths differently resulting in "artificially elevated" death statistics due to COVID-19 is not accurate. COVID-19 and influenza deaths are coded using the same World Health Organization international coding rules and guidelines for selecting underlying cause of death for statistical tabulation.

Do you see that, sir?

A I do, although I don't remember -- remember the words, "artificially elevated", maybe it possible I wrote it, I don't remember. I'll say this --

Q Sorry, just to confirm that, it's in the part of your report we just looked at, the last sentence of that part we looked at --

A Oh I see, yeah, you're right.

Q -- respiratory and this is difficult and results in artificially elevated death statistics due to COVID-19. And according to Ms. Wood, who again is the senior statistician with Statistics Canada, that is false; do you accept her evidence, sir?

A She didn't disagree with that part --

Q Sorry --

A -- discrepancy and (INDISCERNIBLE) and informs and makes comparisons between the two difficult. Let me just say, that the key thing here is we're talking about early in the pandemic, the codes for COVID-19 were not established. So there was a procedure where people would have -- make a distinction between confirmed COVID-19, probable and suspected COVID-19. And so there was different, so I guess I don't agree with her in that sense, I mean it's -- during the -- at points in time during the pandemic, especially early on, they were very, very differently coded.

So, for instance, where it says, World Health Organization international coding rules, those were developed during the early days of the pandemic and evolved over time. In fact, there was an ICD-10 code put in place, sort of a -- I forget it was like April or May, later -- not at the start of the pandemic cause it didn't exist at the start of the pandemic. So the coding rules evolved, you know, over time.

Q Sorry, let -- so just to be clear, when a senior statistician with Statistics Canada reads the portion of your report that I've just put to you and says, swears that -- that assertion that Stats Can counts COVID-19 deaths and influenza deaths differently resulting in

artificially elevated death statistics due to COVID-19 is not accurate and so you put that in your report from January 21, '21, Ms. Woods affidavit was sworn July 12th, 2021, and you're saying that she is wrong when she swears that report?

A I mean I'd have to talk with her, but I don't think I agree with the way you're asserting it, I don't think I agree with that assertion, I think I -- I'd say what I wrote is correct, and (INDISCERNIBLE) -- some misunderstanding between us two about what exactly she thought I meant and what she means. So it's possible that we agree and we don't know -- I mean it would take some conversation to figure out she means -- she thought what I meant and what I actually meant.

Q Well, we filed, her affidavit, sir, you haven't apparently been showed that affidavit and so I -- just put the part to you that I thought was important and you're not agreeing with that part, you disagree with the senior statistician from Statistics Canada who says they do not count COVID-19 and flu deaths differently and you say that's wrong?

A Well, I mean she's wrong about that as a blanket statement for sure during some parts of the pandemic before, for instance, the ICD-10 codes were introduced for COVID-19 they were counted differently.

Q Sir, let's talk about the death rate. Deaths from COVID-19, are they primarily over 65?

A So, about somewhere between, depending on the countries, being 70 to 80 percent of deaths are over 65.

Q Sorry, 70 to 80 percent?

A Yeah, something on that order, a very large fraction of the deaths of people are over 65.

Q It's a very serious disease for elderly people then, you accept that?

A Yes, I do.

Q And you acknowledge also people under 65 die of the disease?

A Yes.

Q There's pediatric deaths?

A There are.

Q Deaths right through the age spectrum?

A Yeah, but the vast majority of deaths happen above the age of 65 in the older populations. Roughly even seven years of age doubles your risk of infection fatality rate.

Q I remember hearing you say that before, sir, Yeah, every seven years of age, doubles your risk of fatality?

A Yeah.

Q Double the risk fatality rate and it was 70 to --
A Fatality infection rate.

Q Sorry?
A The infection fatality rate.

Q Right, IFR, yeah. So every seven years of age doubles your IFR risk, is that, do I have it right now?
A Yes.

Q Got it. Thank you. COVID-19 has a greater impact on the poor?
A Depends on if lockdowns are in place or not.

Q It has a greater impact on those who have underlying health problems?
A Just so we're clear, what I meant by the poor, so I can clarify the answer. In places that had severe lockdowns or strict lockdowns or more strict NPIs, there's been more inequality in COVID-19 deaths than in places that have not had them. And yeah, so poverty does matter, but it matters in combination with the presence or not lack of presence of lockdowns.

Q And you acknowledge that COVID has had a greater impact on those living in crowded conditions?
A Yes.

Q So while the death rate as a percentage of cases is low, that number is not evenly spread across the population, right?
A That's correct.

Q There are a greater number of deaths among the poor?
A Again it depends on places where lockdowns have happened or not happened. In places that have lockdowns there's greater concentration of deaths among the poor than in places that have not had lockdowns or that had less severe -- less severe restrictions.

Q And where is your -- where's that discussed in your report? This would be around the article we've just been looking at, number 48 footnote and all the cases you refer to there would be what you're saying supports the statement you're just making, right?
A I'm sorry, I'd have to look at my report to say exactly where I --

Q Sure, why don't you look at there and tell me, sir, where you're supporting that statement

in your report then, other than where I've just pointed you to?
A I thought I was just answering your question you were asking me, but I didn't realize to say directly in the report, but if you want, I will look in the report.

Q Yeah, why don't you do that, sir, where is that statement supported? I assume it's those footnotes and those around it that I've just been referring to, footnote 48.
A What I had in my mind when I was talking to you, was looking at data I'd seen in the United States comparing places that had a less strict NPI regimes versus more strict. So for instance in LA County --

Q Okay. So you're looking -- I think then you're referring to in your report where you look at Florida versus California, then?
A Possible, I don't remember the -- I'd have to look at the report, hold on let me see if I can find it.

Q You know, we don't -- we don't have time for that, sir, so we'll just leave that. The report says what it says. Do know, sir, I know you said you don't memorize numbers, but do you have an idea what Alberta's death rate is from COVID per 100,000?
A I don't -- I don't memorize numbers.

Q And so you don't know what California's is?
A No.

Q Florida's?
A Well, I mean I think -- one of the things that's very important when you're comparing any --

Q Sorry, do you know Florida's death rate per 100,000 was the question, sir?
A No, I do not off the top of my head know it.

Q Thank you. Do you know if the United States, the vast, vast majority of those states, other than Hawaii and Vermont perhaps, have death rates per 100,000 significantly higher than Alberta does?
A I think Canada, all its provinces, have had lower death rates per 100,000 than the states of the United States but one of the things --

Q (INDISCERNIBLE) --
A -- sorry may I finish?

Q Yes, please, sorry.
A One of the things that are important when making these kinds of comparisons that you

must age adjust because of the high concentration of deaths among older people, that is the older people have the higher -- the worst outcomes if they're infection.

Q Understood.

A Younger places will automatically just by nature of having younger populations have lower death rates per capita. So it's statistically misleading to compare places that have young populations with old populations without doing that age adjustment (INDISCERNIBLE) --

Q I understand, sorry, go on.

A So you get a very different outcome if you -- if you age adjust in terms of how countries and provinces and states do, than if you don't do the adjustment. If you don't do the adjustment, you're going to be misled into thinking that a province or a location did well, simply by the fact it has a younger population not anything to do with what policies are followed. So for instance, Africa has a very low infection fatality rate, a low number of deaths, mainly because it's only about 3 percent of its population, you know, continent-wide is older.

Q Thank you, sir. Yeah I understood that you've made that point before and it's a valid point that one factor you have to adjust for is the age of the population when comparing death rates and one common death rate that I see is deaths per 100,000, that's a common death rate that's used to compare jurisdictions, deaths per 100,000, right?

A Yeah, but as I said, it's statistically misleading. If you have a risk factor for age --

Q We got that point, sir, you need to adjust it for age, you prefer -- it's misleading if you just compare one to another without adjusting for age, that's your evidence, right?

A Yes.

Q What about other adjustments though? I mean so Florida, you say is old, so you have got to make that adjustment and then it improves somewhat vis-à-vis California that you like to compare it to. Do you not have to though take into account that in Florida, for example, is wealthier than California, is that not something you might have to adjust for too?

A Wealth is much less of a factor than age by far. Age is the single most important factor. In terms of health factors to adjust for, I think risk factors like diabetes, like obesity both have some gradient in terms of the infection fatality rate and so it would be better if you adjust for that. But if you had to pick a single factor for to make it somewhere in the ballpark right, it would be age because it's such a steep gradient in risk by age.

Q Right, has anybody tried to adjust for taking into account people with comorbidities in one jurisdiction versus another, is that possible or is that just not really possible?

A It's possible, I mean I've seen some estimates, I have not done them myself, but I've seen estimates where they -- where people adjust for both age and obesity simultaneously for instance in the United States, say to look at deaths per capita adjusted for both age and obesity.

Q And sorry, I just wanted to return to this issue of Canadian provinces relative to United States states; do you know if Hawaii ranks among the very lowest of US states in deaths per 100,000?
A Yeah, it does.

Q And I'm going to assume because it's pretty isolated, that's a big part, you would agree, as to why it's managed to achieve that?
A I mean I think a lot of island nations and islands have done much better than any other places.

Q What about Vermont, do you know if Vermont has fared well compared well to other United States on this deaths per 100,000?
A I think on the death per 100,000's yes, I think also in age adjusted, but I'm not sure exactly where it falls for -- it still falls within the top one-third or might even be in the top one-quarter in the age adjusted number, I'd have to go look.

Q Sorry, I'm not sure I'm picking up your evidence. We're talking about Vermont and you're saying the age adjusted deaths per 100,000 in Vermont rank in the top quarter of the States?
A Yeah, I mean they did really well.

Q Oh really well, okay, yeah I -- I usually see those ones up close to number one as they're worse on the list -- so that's why we're getting --
A Vermont and Hawaii, Maine, I think, did really well, as well.

Q Do you have any knowledge as to whether Alberta's death rates, would be a half or one third or one quarter of some of the death rates in states in the United States, any -- any idea about that?
A I think all of the provinces of Canada did better than the vast majority of states in the United States.

Q Did they do better by that kind of multiple when we're looking at this particular figure?
A I again would have to look at the number, I don't memorize number.

Q Okay. I know you don't memorize numbers, but you actually are not able to answer this question then, you do not know deaths per 100,000 whether Canadian provinces or at

least this province, when compared to US states, can be shown to have had one-half, one-third or one-quarter of the (INDISCERNIBLE) --

A Are you asking like a specific magnitude, I wouldn't be able to tell you a specific magnitude. It wouldn't surprise me if they did much -- did better, in fact, I know they did better, the provinces of Canada did better in terms of that statistic. I have not seen statistics from Canada that have done the age adjustment, but you know, I think that's important as I've said.

Q Right.

A It wouldn't surprise me if the Canadian provinces did better just generally than -- that the United States states.

Q There are different -- there are factors in play that are different possibly between the provinces and the states that may impact the efficacy of NPIs, is that fair?

A So the -- right I think it's if you want to understand the effect of NPIs you have to -- it will be very different in Montana than in LA. Yeah, absolutely, I think you're going to have a very different experience of NPIs and the possibility of effectiveness of them will differ from place to place. This is why we use the sub-national regions data rather than the country-wide data; I think it tends to produce -- you have a better chance of actually picking up what the causal effect is of NPIs.

Q One factor that will influence the efficacy of NPIs would be willingness of the population to comply with mandatory or recommended measures, is that fair?

A Yes.

Q Sorry, I should clarify this; NPIs are always mandatory and never recommendations; is that correct?

A Not necessarily, I mean you can have NPIs that are recommendations, for instance, I think Sweden had NPIs that involved recommendations for staying at home when sick, recommended capacity gatherings, things like that.

Q Well, I mean you recommend staying home when sick in the Great Barrington, right?

A Yeah, I mean I'm not against NPIs generally, I think the key thing is whether they're worth doing relative to the harms that they impose on the populations and different NPIs can have a different pattern of benefits and harms. The question is for each one, whether -- whether it produces more benefits than harms.

Q If you can target the NPIs to a specific group rather than province or population wide, that would generally be preferable?

A Yeah, I'm very strongly in favour of focussed protection because the older population is very, very high risk, resources and recommendations that focus on protecting older

populations from COVID exposure, especially before the vaccines and since the vaccines prioritizing them for vaccination and boosters, I think are -- is quite important.

Q In fact, that's a good point, sir, I think you have to make a distinction on NPIs when you're discussing them as to whether you're discussing them in the pre or post vaccine scenario; is that fair?
A I mean I think the -- I'm sure I -- if I take the gist of your question, I think I agree with it. I mean I think that the sense that the effect of NPIs will differ based on whether the vaccines are available or a whole host of factors.

Q And that's a significant factor that Alberta had to take into account during the second wave, the vaccine status of the population, right?
A I mean I think the vaccine status of the population is quite important.

Q Do you know when the Province of Alberta began vaccination?
A I think it was January 2021, but I could be wrong.

Q Do you know whether Alberta prioritized vulnerable people first, such as the elderly?
A It did, I know it did.

Q And you would support that's good public health practice?
A Yes.

Q It's consistent with your view to focus protection?
A Yes.

Q Do you know anything about -- have you studied the impact of COVID-19 on Alberta's Indigenous population?
A I've seen some statistics of it, I haven't studied it in depth.

Q Are you able to provide any evidence on the Indigenous death rate from COVID in Alberta?
A It's higher than the rest of the population, but I don't know the numbers off the top of my head.

Q On -- so just staying with this idea of mandatory and recommended NPIs, Sir, and I have looked at the GBD and we'll probably get there later, but do I take it then that the GBD it deals with recommended NPIs, such as if your sick, stay at home, right? You've said that an NPI and the GPD says to do that, that's just good -- that's just common sense, right?
A I mean I think it's good public health.

Q Indeed, but it's recommended you do that and is that -- is that one difference between the Great Barrington Declaration and NPIs that you don't like, is it the GBD never goes beyond recommending things, it never mandates?
A I mean I don't think the mandates are particularly effective in protecting populations. I think it breeds distrust eventually in public health and resentment of public health. I think in the long run, they tend to be very counter productive. I think a public health that has the trust of the population can get -- make good recommendations consistent with what the science is saying, like whose most at risk and tailor it to the populations living conditions and so on and you'll have much more effective -- good outcomes than if you employ mandatory restrictions in low risk populations, for instance.

Q And so when I read the GBD, and I read that there are things that are -- that you agree with, such as staying home when sick, do I read that to say that that is always a recommendation, but you would never support a mandated requirement that those who are sick with COVID should stay home?
A I think a recommendation that someone stays home when sick, most of the population will follow it, if you say for COVID because people take COVID seriously. So I don't think it's necessary to do a mandatory stay home if you're sick. For instance, I would very much strongly oppose a Chinese policy of barring, the locking, you know, doors or nailing doors closed of people who have COVID. I think that would be (INDISCERNIBLE) --

Q That would be Draconian.
A Yeah.

Q Yeah, but just so I understand if there's any common ground here and where the divergence is, when we look at the GBD and the recommendations in there, those are -- or the wording in the GBD, I just want to understand is part of the distinction that the authors of the GBD say you never proceed past recommendations, you never mandate, even if it's something such as staying home when you're sick with COVID, is that correct?
A I mean in the context of -- I could imagine there would be diseases where you might to do something different, but in the context of COVID, I think mandating people to stay home when sick would have the same -- similar kinds of problems that mandating almost anything does. If you're asking me to compare mandating someone to stay home when they're sick versus closing an elementary school, I would rather the mandating -- I'd rather take the mandating when sick. I think the best approach is telling the population, telling people that if you're sick it's really wise to stay home and I think most people would follow that.

Q And what about -- and is that you -- I take it that was your approach when you wrote the Great Barrington Declaration, I think it was maybe October of '20 and so we know that would've been your approach that Alberta, you say, should have taken during the second wave in the fall of 2020, as well?
A I mean I think it should've taken it during the first wave, I think it should've taken it during the second wave, the third wave, the fourth wave and every wave from now until forever.

Q So, no distinction between the fact that we had nobody vaccinated compared to whatever our vaccination rates are now, in your view, and the view of the Great Barrington Declaration something as sensible, a public health advice as staying home when sick, should never be mandated, even in the context where you've got a vulnerable population who has not received vaccination yet and the vaccination is on the horizon?
A I think the key thing for the vulnerable population is to protect them from -- by using all kinds of measures and resources. So, for instance, you should next expose -- send COVID infected patients from hospitals into a nursing home, right? That resulted in many deaths in Canada and the United States that should not have happened. If the idea of focus protection is adopted, that would never have happened. The reason that happens is --

Q Sorry, would that be recommended or mandated? You would mandate that, wouldn't you, or would that just be a recommendation?
A I have no power to mandate, I'm just giving a --

Q Right, it's your recommendation of what governments should do, they should follow the approach in the Great Barrington Declaration. I'm just trying to understand, compared to the approach that's being taken, which we refer to as a suppression strategy, does the Great Barrington Declaration, in various context, such as the ones I'm giving to you, does it ever move past recommendations to mandating, passing law, so that these things must happen, such as the nursing home situation you're describing?
A I mean I think if you -- the problem that we're trying to address in the Great Barrington Declaration, was a problem of strategy for how to protect the vulnerable. The strategy that Alberta followed and much of -- many other countries followed, is a strategy of suppression, disease suppression, generally, in the population at-large, with an idea that it would protect vulnerable, older populations. Instead what we argued in the Great Barrington Declaration is the strategy that ought to be followed is direct protection of older populations without relying on control of spread of the disease. I believe that the control of the spread of the disease is a very difficult, costly and potentially maybe even impossible thing to do with huge collateral harms to the people that -- in terms of their health and psychological wellbeing.

I believe that it's possible, even before the vaccines to devise better measures for protecting vulnerable populations than were adopted by governments, including by the Alberta Government. Some of -- you're asking me if I'm in favour of mandating, generally I think I'm not against -- I'm against mandating, as a matter of -- it tends to reduce trust in public health, so that it could -- it won't -- an initially successful mandate will result in counterproductive results later on as population at-large starts to distrust and resent those mandates -- trust the public health less and resent the mandates. I think we've seen that play out in Canada right now.

I think instead a better approach generally is for public health to develop trust by the population at-large and make sensible recommendations for the population to protect vulnerable -- the vulnerable populations and devote resources to that.

Q So the question was, sir, in the context of the nursing home situation you were describing from the first wave, does the GBD ever rise about recommending things and move to mandating such as in that context, when we have a vulnerable population and there is no vaccination yet, or is it only recommended, we never move to mandating?

A I mean I don't think a mandate would be necessary there. If you tell hospital that it's not a good idea to send patients back to nursing homes that have been infected, the hospitals won't do that because they don't want to kill patients in those nursing homes. If you tell hospitals to clear out the hospital beds so that they're empty so that you have room for COVID patients then they'll do that. It's not -- the recommendation is more important than whether it's mandate or not mandate.

Q Well, I mean isn't what's important if we're looking at something like people staying home when they're sick particularly when you've got a vulnerable older population and there is no widespread availability to vaccines yet, isn't one of the important factors whether people are going to follow the recommendation and are more likely to follow what's being asked of them if it's mandated; isn't that an important consideration?

A So the first part is yes, I agree, it's important that people follow recommendations for it to be effective. The second part I disagree with you. I think it's only in the short run that you have that a mandate will be very effective. In the longer run, as I've told you over and over, you undermine -- you create resentment in the population that's been mandated. You undermine the trust that the public has in public health and you end up with worse results. So in general, I don't think that mandates are better, both in terms of their effectiveness, I also don't think it's necessary. As you said earlier and this is one of the great things about Canada, you actually have a very public spirited people and so if you give them advice, grounded in science, and use resources to back up that advice, you would have excellent results. I mean I think that's one of things I admire most about Canada.

Q And you agree, sir, sorry to interrupt, but you agree that that's one of the distinctions and one of the reasons our -- on the metric death by 100,000 that Canadian provinces have fared significantly better than US states, the reason you just talked about?
A I think so and I mean this is not a -- this is now I'm talking outside of the medical literature (INDISCERNIBLE) -- it wouldn't surprise me if that turned out to be completely true.

Q We shouldn't take you outside your area of expertise, that would be bad of me. But, returning to this point of mandated versus recommendation, you're agreeing that in the short term, in the short term, that it may be appropriate to mandate if you've got a significant, significant problem that you need to deal with, such as you've got a significant threat of hospital overcrowding, ICU overcrowding, you've got no widespread vaccination of the population, you -- you got to, you feel, deal with the overcrowding problem and it's going to be short term, you would support, in that situation, mandated measures such as stay home when you're sick; is that fair?
A Even then I don't think it's necessarily appropriate to do that. I think -- just so we're clear, you're using stay at home when sick I hope just as a stand-in, I support wider ranging measures than just stay at home, when sick, right?

Q It's just a simple example, yeah, it was one -- sorry the reason I took it was I know it was in the GBD and it stood out to me when I read it and I thought, well there's some common ground but is Dr. Bhattacharya and his colleagues just saying, we never move past this as a recommendation? It's a good sensible public health recommendation obviously, but we just don't move beyond recommendation because that's the line that's drawn in the GBD, is that fair?
A As I said, as a general matter, the recommendations even are going to end up with better results in the long run. The question of whether in the short run, whether locking people in their house if they're sick, would result in fewer people going out, the answer is yes, it would result in fewer people going out, if you lock people in their house (INDISCERNIBLE) --

Q You're talking China and -- sorry you're talking now the locking people in your house and I'm sorry to interrupt, but you're talking China and draconian measures when you talk about locking people in their houses.
A When I hear you say mandate people stay home when you're sick, that's what I have in my head, I mean I'm not sure exactly what you're -- how would you do it?

Q You think you'd pass a law that says if you have tested positive, for example, you must stay home for a certain period of time from your positive test or from when your symptoms subside. That's the type of thing that I'm talking about when I say, stay at home when you're sick and I assume you're talking about the same thing in the GBD

when you say stay home when you're sick, if you've got symptoms or if you test positive, stay home it's a recommendation, that's what I'm talking about.

A So can I get some more clarification, do you mean, what would be the fine if you left or found out on the street, which COVID positive?

Q You want me to work a fine, you know what I haven't come up with a fine --

A You know, I think this kind of conversation would involve the specifics about exactly what kind of a mandate would mean and so on. I think as a general matter, this is why I keep coming back to this, those kinds of mandated mandates are less effective in large part because they undermine the trust of the population eventually in public health. They come to see public health as this draconian thing, I mean obviously China is the extreme, rather than something that's working together with the public for the benefit of the public.

Q Yeah, no I understand that, sir, but I was just wanting to focus in on the short term and I know you want me to give more -- more context to the scenario, but I was just trying to really keep it simple and keep it at this level of the same thing is supported, stay home when you're sick. But what if you have a problem, a real big problem to address and you believe that you can get better results, significantly better results from a brief mandated requirement to do so than simply a public health recommendation a request that people please do this? And in that context, would you suggest mandated, for a short period until you're able to avoid the concern that you are passing these laws for, in particular hospital overcrowding?

A I'm going to tell you my philosophy of public health is that one should not be dogmatic, and I can't -- I'm hesitating to answer your question, in part, because you're asking to make essentially like an answer that's against my nature. I can imagine there might be a situation where a mandate might be useful just to get you over the hump of some short term thing and it's worth the long term undermining of trust. But that imagination would be -- I mean it would take a lot to make me agree to that. I mean I think generally speaking and in fact almost universally speaking, it's much better for public health to work with the people and gain the trust of the people and those kinds of mandates, I view as tending to undermine that trust.

Q No, and I picked that up, but I also understood you to be saying that if you -- if you short term, is that not less likely to undermine trust? In other words, I thought that your concern was, in particular, it's the long term imposition of mandated requirements that will erode public trust -- or trust in the public health system?

A I mean if you lock me in my house for 2 seconds, I'm not going to have any trust in you. I mean I just -- it would really depend on the nature of the imposition and the kind of -- like you know, even short term thigs can undermine trust. It just -- it's hard to do this as a hypothetical, Mr. Parker.

Q December 2020 you're in Alberta, there's no widespread available vaccine, you're positive with COVID and you must -- it's required that you isolate in your house, that's a requirement, it's the law; do you support that type of law at that time if you are dealing with a significant public health crisis of expected overcrowding of hospitals and ICUs?

A I guess I don't, because I think if you'd asked the Canadian people -- the Albertan people to stay home if they're sick, they would have done so at almost exactly the same rate that they did.

Q Do you have any evidence of that, sir, have you done any surveys or studies?

A I do not have surveys of that, I do think that that is not -- I don't -- I haven't seen evidence to the contrary either. I mean I haven't seen public health undertaking all kinds of mandates without any kinds of production of evidence what I would agree is -- what I would think was adequate for those kinds of -- and sometimes, you know, severe restrictions.

Q You're not aware of whether Alberta felt it had compliance issues with recommendations versus mandatory measures, you don't have any knowledge of that, sir?

A Not in particular, no.

MR. PARKER: Justice Romaine, I'm not sure when we started up, my apologies, did you want to take an afternoon break or shall we go right through?

THE COURT: Yes, no let's -- we started at 1:30 so it has been an hour and a half, a little over, so let's take the afternoon break for 15 minutes.

MR. PARKER: Thank you very much.

(WITNESS STANDS DOWN)

(ADJOURNMENT)

THE COURT: Thank you.

(WITNESS RE-TAKES THE STAND)

Q MR. PARKER: Dr. Bhattacharya, I am going to turn to Part B of your report, your primary report, which dealt with a symptomatic transmission, sir.

MR. RATH: If I may, must a quick housekeeping matter.

Would my friend Mr. Parker mind advising whether he's going to be done today or not because we have Mr. Redman standing by and we can let him go for the day if he's not needed.

MR. PARKER: Yeah, it doesn't -- well, sorry, maybe let's have that discussion before we start. The concern is I'm not close to being done but given the -- given the scenario unfolding and these folks saying they want 4 days with Dr. Hinshaw rather than the schedule 2, I'm quite content to wrap up today and say am I done, even though I haven't got through everything I wanted to.

I think we've done all we can do within the time we've had and I think that's fair, we've agreed to the schedule. And so if we're not going to extend the schedule, then we will wrap up today and say we're done. I know there may be some re-direct and hopefully we can get that done either today or tomorrow or next week.

THE COURT: Okay.

MR. PARKER: On the other hand, if we're going to look at rescheduling and extending the time period that we've agreed to, then we do have more questions of this witness on a number of issues. But as I say, my preference is to wrap up and keep the schedule that we're on and stick to it. Those are my thoughts.

MR. RATH: Madam Justice, I only raise that for Mr. Redman. I in no way intend to --

THE COURT: Yes.

MR. RATH: -- curtail any time that my friend needs to do what he needs to do.

THE COURT: I think it is quite fair to say that we should let the next witness go for the day. You know, we are obviously not going to get to him. Okay. With respect -- but I would like to talk a little bit about this, extending the time for the hearing. As I have made it clear, I am not available after February 25th. Not available any time in March. If we are going to be needing more time, then we should discuss whether or not to agree to sit longer days or we should perhaps recognize the reality of continuing this in April. Now, maybe counsel can think about this and we will talk about it on Monday. Tonight, Mr. Parker, I do not think you -- I think if you are not finished by 4:30 or quarter to 5, I cannot stay much past that. Madam clerk, I do not know about you but --

THE COURT CLERK: Not tonight, My Lady.

THE COURT: Not tonight. So, if you have -- if you need to continue on Monday, that is what you should do is what I am saying. Okay.

MR. PARKER: Okay, I appreciate that. I think it's really in the context of a decision on the overall issue because I heard my friend say this morning that 2 days isn't going to be enough for Dr. Hinshaw. They are estimating 4. We've already got this agreed to witness schedule and, as I say, my preference is to say we've done what we can, we'll stick to it rather than extending it. But if, ultimately, we're going to be looking at extending this hearing, then, you know, that would change potentially my approach because I will ask this gentleman some more questions in some more areas. But, you know, my preferred approach is we get what we can get done within the scheduled time and on that basis, I'll wrap up today with this gentleman. So --

THE COURT: Well, okay, but -- and this is something we have to decide today. So --

MR. PARKER: Yeah.

THE COURT: -- do we have time to have 4 days of Hinshaw in the schedule?

MR. PARKER: No, we don't. We have an extra day at the end as it currently stands. We will argue on the last 2 days and we have an extra day at the end. I mean, I -- you know, Dr. Hinshaw is an extremely busy lady as you can imagine, and I'm obliged that 2 days is an awful lot of time to take out of her schedule for this hearing. I appreciate she's a witness and she will be here for the 2 days, but now we've heard that 4 days is required and that is a significant concern. And so -- but the answer is right now we do not have 4 days in the schedule for Dr. Hinshaw and I would expect that I would have objected to that time period if it had been proposed.

THE COURT: Okay. I am not going to -- I am not going to make the parties stick to the time period. If extra time is required for any witness, we are going to give it to that witness. Having said that, if there is any repetitious cross-examination or any issues with respect to the cross-examination that indicate that the time is not being used in a useful way, there are ways for the Court to address that. So, we should probably start on Monday with an earlier time to start and an hour for lunch and a half-hour at the end of the day. So, I am thinking, you know, we start at 9:30, have lunch for an hour, finish at 5:00. See if we can make up some time. Does that suit everyone?

MR. PARKER: That certainly works for us, Justice Romaine,

thank you.

THE COURT: Okay.

MR. GREY: Madam Justice --

MR. PARKER: Sorry, one question for my friends --

MR. GREY: Oh, sorry.

MR. PARKER: No problem, Mr. Grey. Do you envision you have re-direct at this point, gentlemen?

MR. RATH: Yes.

MR. GREY: I do, yes.

THE COURT: Okay.

MR. PARKER: So, there we go. So, we're heading into next week anyway.

MR. GREY: Madam Justice, I would request -- I could be in court as early as you would like on Monday and stay as late as you would like on Monday. However, I do have a childcare issue today and, therefore, I would request that we adjourn today no later than 4:30, please.

THE COURT: Okay. Okay, I think we can do that. We are obviously going to go -- we are obviously going to continue with the doctor on Monday one way or another so -- okay. But after --

MR. PARKER: And, Madam Justice --

THE COURT: -- after Monday --

MR. PARKER: Oh, sorry.

THE COURT: -- sorry, after Monday will you have continuing -- Mr. Grey, will you have any continuing limitations on the hours of 9:30 to 5?

MR. GREY: No, I'm going to sequester myself, as I said,

throughout the rest of his hearing. I'll be able to come in as early as you like and stay as late as you like. I will take your direction.

THE COURT: Okay.

MR. GREY: Just today, unfortunately, I have to -- I have to be somewhere with my son. I have to pick him up from school by 5:00.

THE COURT: I completely understand. Okay, Mr. --

MR. GREY: Thank you very much.

THE COURT: -- Mr. Rath? Mr. Rath?

MR. RATH: Just quickly, I don't --

THE COURT: I am sorry?

MR. RATH: Just quickly, Madam Justice. I don't have the schedule in front of me but Thursday, the 24th, is marked open if needed.

THE COURT: Yes.

MR. RATH: And then you'd indicated earlier that you were available until the end of the month. That would give us Friday the 25th and Monday the 28th if required as well.

THE COURT: Yes, I can do -- I can do the 25th but I cannot do the Monday, sorry.

MR. RATH: Oh, perfect. Okay. Well, at least we have that (INDISCERNIBLE).

MR. PARKER: And I had mentioned earlier that I am out of the country on the 25th. I know Mr. Rath is keen to see me reschedule my -- what I had planned, but I'm not available past the 24th.

THE COURT: Okay.

MR. PARKER: And that was scheduled -- that was scheduled before these trial dates were set so …

THE COURT: Right. And so is my schedule. So, I am sorry, Mr. Rath, I guess we are going to have to be finished on the 24th and if we have to continue in April, we will talk about that. I have some time available in April and certainly this takes some priority over my regular scheduling.

MR. RATH: Thank you, My Lady. And just to be clear, I understood Mr. Parker saying that he was available the 28th. I didn't understand it was the 25th so --

THE COURT: Okay.

MR. RATH: So, him suggesting that I'm trying to (INDISCERNIBLE) spike his holiday is not where we're at, thank you.

THE COURT: No. Right, okay. So, we will start on Monday at 8:30 and I am sorry that -- well, we should ask Dr. Bhattacharya -- I'm sorry, I keep murdering your name, sir -- Dr. Bhattacharya if you are available on Monday.

A Yes, I am.

THE COURT: Okay, thank you. Okay. Okay, let us continue with the cross-examination.

MR. PARKER: Thank you.

Q MR. PARKER: I wanted to turn part B of your primary report, sir, and this deals with the asymptomatic transmission. Do you remember writing this section of your report, sir?

A Yes.

Q And I've got in front of me page 10 and you -- this paragraph in the middle here says: (as read)

> The scientific evidence now strongly suggests that COVID-19 infected individuals who are asymptomatic are more than in order of magnitude less likely to spread the disease to even close contacts than symptomatic COVID-19 patients.

And that was your opinion when you wrote your report in around January 21, '21, right, sir?

A Yes.

Q Is that still your opinion today?
A I think Omicron has changed that. I think the (INDISCERNIBLE) with Omicron.

Q I'm sorry, we're getting the feedback again I think from the courtroom. Could you repeat that, please, sir?
A Yes, I think Omicron has changed that. I think it's very likely that asymptomatic spread is more important with Omicron than it was with the previous (INDISCERNIBLE).

Q But what about -- had this opinion changed prior to Omicron? So in the Delta wave, in the fourth wave --
A No, I think -- I'm sorry.

Q No, that's okay. Sorry, just let me finish that -- Delta in the fourth wave, Alpha in the third wave, you would stick to this opinion for those, right?
A Yes.

Q Got it, okay. And then you speak about the meta-analysis of 54 studies from around the world and that is what I am going to refer to as the Madewell study, you'll understand what I'm talking about?
A Yes.

Q Okay. So we'll come back to the Madewell study. I just want to look at a few other studies before we get there. The first one we'll bring up is I'll call it the Cevik (phonetic) study, it is 623 of 2300 to your report. And, sir, do you remember anything about the -- what I'm calling the Cevik study that's in front of you? It was again -- it was footnote 34 to your primary report?
A I do remember reading the study but I don't remember too many of the details. I'd have to remind myself.

Q Sure. If you just go down to the bottom of this page, Mr. Trofimuk, you'll see that it was published online November 19th, 2020. Do you see that, sir?
A Yes.

Q And you had obviously read the Cevik study as you footnoted it to your primary report?
A Yeah, I remember the study, okay. If you fax me details, I can go over to refresh my memory. But, yeah, I remember the study.

Q You read Dr. Jason Kindrachuk's rebuttal report that was filed in this matter, right?
A Yes.

Q And Dr. Kindrachuk discusses the Cevik report. He says that: (as read)

> The review provided temporal evidence for viral accumulation and clearance in asymptomatic patients. These observations are in good agreement with prior contact case and studies where the highest risk of transmission fell from a few days prior to symptom onset to 5 days post onset.

And, sir, is that something that helps your memory with what the Cevik report said?

A Can you repeat that one more time?

Q Right. Dr. Kindrachuk said -- excuse me, Dr. Kindrachuk in discussing the Cevik report, which he said is a systematic review by Cevik et al the authors, they identify 12 reports that provide a temporal viral load data for individuals with asymptomatic infections: (as read)

> Viral loads in the reports were found to be similar to four reports or lower in two reports those from symptomatic patients. However, viral clearance appeared faster in asymptomatic patients based on observations from six reports. [And then he says] this revie provided temporal evidence for viral accumulation and clearance in asymptomatic patients. The observations are in good agreement with prior contact tracing studies where the highest risk of transmission fell from a few days prior to system onset to 5 days post onset.

Do you recall reading that in Dr. Kindrachuk's report and does that help you recollect what the Cevik report found?

A I don't remember that specifically from Kindrachuk's report but I do remember now that you mentioned it the finding of -- finding in the Cevik study.

Q The finding -- sorry, we're talking about the highest risk of --

A (INDISCERNIBLE). So that you have viral load in your nose, (INDISCERNIBLE) symptomatic, and it declines over time.

Q And did you understand from the Cevik report that it was saying that the highest risk of transmission fell from a few days prior to symptom onset to 5 days post onset? Does that sound correct to you?

A So what it was saying was that the viral load is highest. That doesn't necessarily correspond with the risk of transmission. For that you actually do want to look at the contact tracing data.

Q So you are disagreeing that Dr. Kindrachuk's assessment of the Cevik report where he says at page 10 of his report -- and sorry, when I'm using these page numbers, there's a consecutive page number on Dr. Kindrachuk's report from 1 to I think it's 1236. To right-hand corner page 10 and, again, it's that report that -- sorry, that page of his report that I've been reading from. And again, the important point that I'm indicating to you from his report is that Cevik shows it's consistent with contact tracing that the highest risk of transmission fell from a few days prior to symptom onset to 5 days post onset. And that's what I'm asking about. Do you have that understanding from the Cevik report?

A I mean, my understanding from the Cevik report, I'd have to refresh my memory, but it has to do with viral load, not with transmission. What Kindrachuk wrote and what you just read to me is reasonable but I don't know if it's -- you know, I don't know if it's true. I mean, I think it's likely true but I don't know for certain it's true that --

Q You agree -- sorry, go ahead, Doctor. Again, my apology.

A Yeah, it's likely true that transmission is highest when -- in early on. There are contact tracing studies that find that that's true, actually, but the fact that viral load declines doesn't necessarily imply that it is true, if you understand me.

Q Yeah, I got what you're saying. You -- we looked at one of your reports earlier actually, excuse me while I grab it. And, sorry, I didn't have this teed up and I wasn't intending to go back to it. Maybe we'll have to. But this is the one we looked at earlier today, *Computer Methods in Applied Mechanics and Engineering.* Do you remember that report, sir?

A I do.

Q And that's the one where you had said there was a pressing need to better understand the prevalence of asymptomatic transmission: (as read)

> It is also becoming increasingly clear that it will take a long time until we can with full confidence deliver reliable measurements of the asymptomatic group. In the meantime, mathematical modelling can provide valuable insight into the tentative outbreak dynamics and the outbreak control of COVID-19 for varying asymptomatic scenarios.

A Yeah, we read the (INDISCERNIBLE).

Q Indeed we did and that reflected the views --

A (INDISCERNIBLE).

Q -- at the time as to asymptomatic transmission and the state of knowledge and your knowledge about it, sir?
A I mean, I wrote those -- those words, I forget exactly when we -- when we submitted. I think it was like in May or June of 2020.

Q M-hm.
A By the time it was published in December, we knew a lot more than in May or June of 2020 about asymptomatic spread.

Q So when that happened, sir, are you saying that this was published December 1, 2020, and you no longer agreed with what was being published in something that you were one of the authors of?
A No, no, I'm not saying I disagree with it. I think it's true that -- I mean, but by December 1, 2020, we had already learned a lot more.

Q Right. But I'm asking you did you think this was true at December 1, 2020, what I just read to you?
A Did I think that modeling was going to be -- was most important and we had to learn a lot more. I think by December 1, 2020, we had learned quite a bit more.

Q Well, okay. So December 1, 2020, then did you believe that there was a pressing need at that point to better understand the prevalence of asymptomatic transmission and that it was also becoming increasingly clear at that time that it will take a long time until you can with full confidence deliver reliable measurements of this asymptomatic group?
A I mean, I've been looking at the literature on contact tracing and asymptomatic spread and it was increasingly clear that asymptomatic people, people who had had no symptoms but had the virus in them, spread the disease less -- are less likely to spread the disease to people that they're in contact with than symptomatically infected people. So I wasn't surprised when later that I saw that Madewell study.

Q Right. And the Madewell study, well let's go to -- actually, let's go to the Madewell study then, please, Mr. Trofimuk. Sorry, I just wanted to go back to your report again and introduce the Madewell study. And so again, the same paragraph we were reading, sir, beginning, A meta-analysis of 54 studies. This is talking about the Madewell study right here, isn't it?
A Yes.

Q Okay. And so you're saying at Madewell: (as read)

A meta-analysis of 54 studies from around the world found that within

households, where none of the safeguards at restaurants were required to apply, are typically applied, symptomatic patients passed on the disease to household members in 18 percent of instances. Asymptomatic patients passed on the disease to household members in .7 percent of instances.

And that was your understanding of what Madewell said when you wrote this report, right, sir?

A Yes.

Q And is that your understanding of the Madewell study today? That's accurate, what you've written there, sir?

A It's accurate for what Madewell said. Since then there have been more reports about distinguishing two kinds of asymptomatic spread; one early on during, as you said -- as you talked about in the subject study -- early on versus later on. And the finding is that what's called the pre-symptomatic period -- so the finding is that in the pre-symptomatic period that the rate is higher than later on, usually the 1 or 2 days when -- after you first get infected.

Q Thank you for actually bringing that up, sir. And we should probably define a couple of things for the Court. A symptomatic, pre-symptomatic, and could you also explain what secondary attack rates are, sir, as succinctly as possible?

A Sure. Secondary attack rates are the rate at which someone who is infected infects other people.

Q And are you able to give me the numerator and denominator for how you calculate SAR or should we just skip that bit?

A You can skip that bit but it's complicated because it's different for -- like the nice thing about the analysis for households is you know exactly who is exposed so you can calculate the denominators much easily than if you -- than if you just do general contact tracing studies.

Q I've read that it's very difficult, I hate to say impossible but I can imagine it's very difficult to delineate pre-symptomatic and asymptomatic transmission within the household setting. Do you agree with that, sir?

A I mean, it's hard just generally because asymptomatic -- someone who is asymptomatic never gets any symptoms at all through the whole course of the disease. Some is pre-symptomatic initially has no symptoms and then later develops symptoms. So distinguishing during the pre-symptomatic period whether someone is going to be asymptomatic the whole time or eventually developing symptoms. You can't tell in advance necessarily with any technique that I'm aware of whether someone is going to

-- if they have virus in them going to develop symptoms or not.

Q Thank you. And thank you for actually completing those other two definitions I asked you to do, so that was great. And I understand what you're saying. I think particularly though, it's true that in household settings it's very difficult to tease out symptomatic from pre-symptomatic more so than in other settings, is that fair?

A But you can also tease out secondary attack rate much easier in household setting because you have the denominator. You know exactly who is exposed --

Q Right.

A -- because you're living in the same house with them, you're going to expose them.

Q And that's knowing who is exposed is helpful to the analysis then?

A Yeah, because then you can get the denominator much more easily.

Q And the data that you're looking at, the quality of the data, is that important to this issue that we're talking about, teasing out the symptomatic from pre-symptomatic?

A I mean, I think when you do a meta-analysis you absolutely have to do the assessment of the quality and I actually thought Madewell et al did a pretty well -- pretty good job of trying to understand the quality of the data in the selection of articles. None of these studies are perfect.

Q The 54 studies that you refer to in this paragraph, do you know how many individuals were in those studies?

A I'd have to go look at the numbers.

Q If I say to you that the 54 studies in the meta-analysis, it was over 77,000, would you accept that?

A Sure, if you say so. I'd have to go look them over, yeah.

Q Well, I mean, fair enough. We won't make you do that right now. I think it was actually 77,758 but don't quote me on that. But it was over 77,000, and it's late in the day, Dr. Bhattacharya. But in any event, the 54 studies, the meta-analysis, this was an important part I take it, you've put it in your report. Fair?

A Sure.

Q Sorry, just to be clear, is it important that there were 54 studies? I mean, you make that point a meta-analysis of 54 studies, is that important to your conclusions on this point or is that not important.

A The total number of studies is less important than the quality of studies, as is the total number of people. I mean, I think I'd rather have a clean study with fewer people where

I understand the definitions and the causality and all that much more than a very large study that doesn't make that so clear. But --

Q And --
A -- I was putting 54 there as a descriptive -- description of what Madewell was doing rather than trying to say this good just because it's 54. I mean, I --

Q No, I understand that. Thank you, sir. And sorry, did you clean or clear, the other part that's important?
A I forget what I -- I think I -- I think it's really important -- I think I meant clean. So a clean --

Q I think --
A -- (INDISCERNIBLE) I can draw valid inferences from the set of studies.

Q Right. And so I take it then when you looked at the 54 studies it was clean and you have 54 studies and so that makes it --
A (INDISCERNIBLE). I apologize.

Q Sorry.
A I thought it was finished.

Q No, sorry. You had something to say, go ahead, sir?
A Yeah. So I mean -- so I didn't read every one of the 54 studies. I read the Madewell study. The purpose of a meta-analysis is to do an assessment of the quality of the studies that they're putting together and then make an assessment of what the studies as a group are telling you. So Madewell and his colleagues did the assessment of those 54 studies and I read their assessment of the 54 studies that they -- their assessment of those 54 studies combined in the context of that meta-analysis.

Q Okay. And you accept that those 54 studies had over 77,000 individuals in them?
A Was it 77,758 you said?

Q But I said not to quote me. So, yeah, that's what I said. Okay. And you -- again, this is -- I just -- we'll hold onto Madewell for a second. I just -- this issue of the symptomatic and pre-symptomatic transition, very (INDISCERNIBLE) in the scientific community, fair?
A Yeah.

Q There are many peer reviewed articles on this subject if we go search for them, fair?
A Yes.

Q Probably not many peer reviewed articles as well, fair?
A Yes.

Q In fact, I think you said in your second report there's vast literature on the symptomatic spread, do you accept that you said that, sir, in your second report?
A Don't remember writing it but it's true.

Q This issues symptomatic/pre-symptomatic transition, very important part of your report, sir. Much in the public health policies are premised on the fact that the disease spreads easily, is that fair?
A Yes.

Q And your major thesis is that people will spread the disease when they have symptoms and that the spread without symptoms is very, very rare, fair?
A Well, I wrote down how rare, .7 percent in this Madewell study for people living in the same house.

Q And, of course, we have your evidence from Manitoba on this and I think it's fair to say - correct me if I'm wrong - that your evidence in Manitoba would have been that the spread of the disease when people are without symptoms is very, very rare. Is that a fair assessment of your evidence from that proceeding, sir?
A Point 7 percent in household settings.

Q And I think I understood you to say -- and you're saying household settings is the best because -- the best to get this assessment from as I understand it because people are not using in your view the same protections they might in other places, restaurants, the public, et cetera, right?
A Yeah. I mean, I think the household settings you're more likely to spread the disease to people in your own household than you are to spread it to someone you have casual contact with briefly.

Q And from your evidence, sir, I think I understand that you're saying that .7 percent, that's all pre-symptomatic because the symptomatic is zero?
A Well, I don't know if it's zero but it's -- you know, it's lower.

Q Okay.
A I don't know -- I mean, I don't know if anyone knows that number, if it's zero exactly, but it's less than the pre-symptomatic period.

Q I had thought your evidence earlier -- and I'm not intending to take you right now to a

particular spot in it but to be fair, I had thought that you had said asymptomatic spread is very, very rare and that this .7 percent is made up of pre-symptomatic making asymptomatic zero essentially.

A And -- and -- well, I mean, you're extrapolating the zero. I think asymptomatic that's not pre-symptomatic is lower than just pre-symptomatic as asymptomatic.

Q And pre-symptomatic to you is .7 percent so very rare, 7 in a thousand.

A I'm sorry, so Madewell did not make a distinction between pre-symptomatic and people who were asymptomatic all the way through.

Q Right.

A So -- so this .7 percent is a combination of both the people who are the first 2 days of their disease and people who were later in their disease.

Q I understand that. In fact, Madewell says, as you will recall, if you want to see where they were able to delineate the symptomatic from pre-symptomatic, we go to the Qiu, Q-I-U, and we'll go to that in a bit. Do you recall Madewell saying that?

A Yes. So this was in a comment I think later after I wrote the (INDISCERNIBLE) Madewell made that comment.

Q And have you seen the affidavit that's been filed by the respondents of Dr. Natalie Dean in this matter?

A I have some memory seeing it but I'd have to refresh my memory to see if I saw it.

Q Okay. Do you know who Dr. Natalie Dean is?

A I've heard of her, yes.

Q She's one of the co-authors of the Madewell study.

A Yeah.

Q So you may have read that affidavit but you don't recall right now?

A Yeah.

Q And as I understand your thesis, because the spread of the disease without symptoms is rare -- again, I had understood you to say very, very rare but let's say .7 percent is your evidence so 7 in a thousand, that sounds rare. Would you say that's very rare, sir, or how would you -- how would you describe .7 percent?

A I'd say it's unlikely if you're simply asymptomatic, either pre-symptomatic or asymptomatic, that you will spread the disease to someone in your own household even though you're in close contact with them.

Q And that's --
A (INDISCERNIBLE) --

Q -- based --
A -- percent.

Q That's based on Madewell, okay. And so, again, your point in your report is that, therefore, based on this, less -- sorry, less intrusive lockdown policies could be replaced with less -- sorry, intrusive lockdown policies could be replaced with less intrusive symptom checking. You wrote that at page 7 of your second report, sir. Does that sound like something you wrote at that time?
A Yes.

Q And your major theme is you can do symptom checking. That is the symptoms would be what, what would you be checking for? Headaches?
A So the classis symptoms of COVID. So in includes headaches, fevers, loss of sense of smell and taste, you know, cough, so on.

Q So headaches, fever, loss of sense of smell and taste. Is that it?
A I mean, there's a complete list of the World Health Organization symptoms you could potentially check for and that require to have a subset of them.

Q There are a lot of symptoms for COVID aren't there? Vomiting is a symptom, although I think it's described more as a secondary symptom. But you will agree that there are lot of symptoms of COVID which I suggest to you makes it not easy to rely on symptom checks because of the variety of symptoms, fair?
A I mean, I think for the vast majority of cases that actually end up with symptoms, we're talking about a pretty well-defined discreet set of symptoms that are, you know … The most unique ones are loss of sense of smell and taste but also includes, you know, fever, coughing, headaches, various other symptoms. There's like I said, there's a complete list that the World Health Organization put together for the -- that defines the -- that clinically defines the condition. I'd say -- I guess, Mr. Parker, I'd say that if you're going to do symptom checking, you don't have to be quite so formal. I mean, you can advise the public what the most common symptoms are and then advise them to stay home if they're sick.

Q Right, yeah. You can certainly do that, ask them to do that. As long as they can identify that they've got symptoms and are willing to comply. You were talking about unique and discreet symptoms and then you moved back to the whole WHO list of symptoms. Just wanted to understand this unique, discreet symptoms. Was that something that you thought was of particular use in this context and, if so, what are those unique, discreet

symptoms? I think we have fever, headaches, cough, and loss of smell and taste, is that right? Any more?

A I would -- I mean, there are -- yeah, I mean, I think like there's diarrhea was one symptom, but that's relatively rare compared to other symptoms. It tends to be a respiratory disease. So, yes, you're right. There are some other symptoms but they're much less common than the respiratory symptoms.

Q I'm just trying to -- sorry, Doctor, I'm just trying to -- when you said unique and discreet symptoms, I'm just trying to understand what those --

A Oh, I apologize --

Q -- (INDISCERNIBLE).

A So, look, a unique system, what I mean by that is a symptom like loss of sense of smell and taste, those symptoms tend not to be found in other respiratory conditions in the same way that they're found in COVID.

Q Yeah.

A That's not -- it's not so specific that you would make a diagnosis of COVID just from that. That doesn't -- that's not right either because there are other respiratory diseases that can produce that. It's just that those are much less common in the population in the last 2 years when COVID has been.

Q Well, if somebody loses their smell, you know, right now it's probably a good chance that it's COVID is what I'm --

A Yeah, the possibility is high for it being COVID.

Q Yeah.

A But, I mean, but if it was 2018 there's no chance of it being COVID even though you lost your sense of smell. So it's a matter of what's prevalent now. Look --

Q If it was -- if it was 2018, we wouldn't be here, Doctor.

A Yeah, I think the key thing is that the public knows what those symptoms are, the most common ones, because they've been told over and over again.

Q But, of course, there's this whole list of other symptoms as you're saying the WHO has a whole list of them. So they know the common symptoms but there's a whole bunch of other ones as well, right?

A There's a few other ones. It's actually not as long a list as you might think, Mr. Parker. I'd have to go look and check because I'm sure I'll skip one if you ask me to memorize -- or to regurgitate the list.

Q Sure. Let's go to the -- we're going to bring up the Madewell study, it's 527 of 2300. And this, sir, is the Madewell study. And, sir, you -- the meta-analysis of 54 studies, you made that point, it's written in your first report, and you put that in your surrebuttal report as well. That was when you were talking about Madewell. Let me just -- let me just find what you said about Madewell there. It should be on the screen there, Doctor. That is your second report. And you say at the bottom there, sir, again, it was 54 studies that were analyzed by Madewell in coming to this conclusion that asymptomatic and pre-symptomatic spread was .7 percent, right, sir?

A Yeah, I was citing Madewell.

Q And then counsel for the applicants also made that point in their pre-trial factums that Madewell was a meta-analysis of 54 studies and so that seems to be an important point because it's appeared twice in your evidence and it's appeared in their opening -- their pre-trial factum for this matter. Do you remember giving evidence on this point in the Manitoba proceeding?

A Yeah, I know I was asked about this.

Q And you were asked specifically about the 54 studies?

A I'm not sure what you mean by specifically but I wasn't asked to go through all the 54 studies. I mean, that's what Madewell did.

Q I just want to bring up your transcript from the Manitoba proceeding, sir. Sir, I can give you -- I'll give you a chance to read more of this but I just want to focus in on line 38 here where you had said, I had forgotten there was 151. Do you see that, sir? Do you have any idea what you're talking about there when you forgot the --?

A I have no idea what the context of this is.

Q Sure. Can you scroll up just a bit more, Mr. Trofimuk, right to the top of the page here. And -- there we go. And you see at the top there Ms. Leonoff, Manitoba's counsel, says: (as read)

> Q Do you agree that when you only have 151 people in a study maybe you should do some further exploration?

And then you see your answer there, sir. Do you -- does this help you recollect where this 151 comes from?

A No.

Q Okay. The issue, sir, is that the Madewell study, the meta-analysis in the 54 studies and the 77,000 whatever number of people was an analysis of symptomatic spread. There was a sub-analysis by Madewell and that was of pre-symptomatic and asymptomatic

and that had four studies with 151 individuals. Does that help your memory now, sir?

A Yes.

Q Okay. And, in fact, if we -- and you'll see here your answer you say, well -- hold on, Mr. Trofimuk. Might we just go back to where we were there, please, sir. And you're answering counsel who is asking about 151 people and you say: (as read)

> A I think if you have 10 million people in a study you need further exploration.

And then you'll see if we go down the Court interjects and says: (as read)

> I have just one question for you, Doctor, but just so I am clear, the 150 people that have been identified here, do you agree though that that is at the lower end of the spectrum in terms of reliable individuals upon whom you would base a study of this sort?

And you can see the rest of the question. And then if we could scroll down so we could see the answer that talked about (INDISCERNIBLE), sir. And then you responding to Chief Justice Joyal here, and as I say, you'll see us get back down to line 38 where you indicate you'd forgotten there was 151 individuals in the four studies that were considered in the asymptomatic and pre-symptomatic sub-analysis that Madewell did.

So, in any event, you recall this now and do you recall that in fact the analysis of pre-symptomatic and asymptomatic done by Madewell was not an analysis of 54 studies, a meta-analysis, it was a sub-analysis with four studies with 151 individuals. You accept that as correct, sir?

A So you're -- I'm sorry, I missed the question. Do I accept that the asymptomatic component that they're talking about had 151 in four studies? Yes, I do.

Q Yeah. So just to be clear, you've said in both your reports and the counsel for the applicants have said in their pre-trial factum that the Madewell analysis is a meta-analysis of 54 studies and came to this conclusion, symptomatic 18 percent, pre-symptomatic/asymptomatic .7 percent. And I'm telling you, sir, that's wrong. And that is wrong, isn’t it, sir?

A I don't think so. What you just said is true.

Q They were not -- no, there were not 54 studies with over 77,000 individuals in that analysis. There were four studies with 151 individuals, and I'll take you to the data if you want to see it, sir.

A I'm sorry, but, sir, like I don't think you -- what I wrote was that the Madewell study

covered 54 studies with 77,000 whatever individuals. That is (INDISCERNIBLE).

Q It did. It did. But not the part that had anything to do with pre-symptomatic and asymptomatic, sir. That was four studies with 151 individuals.
A I didn't say that those parts in anywhere I wrote or anything you read to me that those -- that there were 54 studies of asymptomatic. I said there were 54 studies covered by the Madewell study. I said that there was 18 percent were symptomatic and .7 percent were asymptomatic. And then here --

Q Right --
A -- the discussion about the details of the study, and what you said is true, that for the asymptomatic --

Q But, sorry --
A -- component there's four studies and 151. How is that inconsistent? I don't understand.

Q Because the .7 percent, sir, is derived from the four studies of 151 individuals. It's not derived from the 54 studies with over 77,000 individuals. It's misleading. What you wrote is misleading, sir.
A I don't agree with that. I quoted directly from the study. The question is how cleanly chosen are the studies and how cleanly chosen is the context. Four studies of --

Q And in these --
A -- four good studies of the asymptomatic spread with a clean context like household settings is going to provide you better information - this is what I told Judge Joyal, too - than 10 million people in a less controlled study.

Q Right. You had forgotten there were only 151 until you were reminded and shown that by Manitoba's counsel. Until then you were insisting it was 54 studies with the 77,000 individuals. In fact, it's four studies, 151 individuals. That's where the -- hold on, sir, that's where the .7 percent comes from and we'll go to the data next and I'll show you that if you're not going to admit it, sir. This is misleading.
A Mr. Parker, it's not (INDISCERNIBLE) --

Q And indeed -- hold on, I'm not finished yet. And indeed, you admitted to the judge when he asked you about this that you had forgotten that it was 151 individuals but, yet, in your surrebuttal report filed after you said this in May - filed in July - you returned to 54 studies in the meta-analysis and that is wrong and that is misleading, isn't it, sir?
A No, it is not misleading and it is not wrong. There were 54 studies in the Madewell study. I don't understand how you can possibly think that that's misleading, Mr. Parker. That's just not right. What I said --

Q Because the -- the implications, sir --

THE COURT: Mr. Parker -- Mr. Parker, please let the Doctor answer.

Q MR. PARKER: Go ahead, sir.
A I said there were 54 studies in Madewell. There are 54 studies in Madewell. I didn't say there were 54 studies of asymptomatic spread in Madewell. I said there were 54 studies in Madewell, which is true. And I said --

Q Your -- it is. Mr. Madewell --

THE COURT: Mr. -- Mr. Parker.

Q MR. PARKER: -- is a metal-analysis of --
A Just so we're clear --

THE COURT: Mr. Parker, Mr. Parker, wait until the Doctor finishes his answer.

MR. PARKER: I thought he was done, my apologies.

A It's also not -- I mean, I never anywhere said how many studies were asymptomatic or pre-symptomatic. The question to me is not so many --

Q MR. PARKER: Why did you --
A I'm sorry, the question to me is not so much whether the number of studies, the question to me is whether they're, as I said, high quality in terms of how clean the studies are in terms of control. Here you have a setting, household setting, where you have automatically control. You automatically know the denominator much more efficiently -- or more accurately than if you -- than if you look at other studies that aren't looking at a household setting. And so those four studies are, I mean, in my view, quite informative. Now, I don't -- I don't remember writing anywhere that there was 50 studies for one group and four studies for another because that's not nearly as important. This is -- I accurately reported the results of the study. It's not misleading in the least.

Q So I'm going to take you to -- this is the affidavit of Dr. Natalie Dean, sworn or affirmed August 27th, 2021. And saying the first page, and again, I think you've said you had some recollection of seeing this before or putting in front of you? Do you --
A I have some recollection of this, yeah.

Q And you'll see paragraph 2 Ms. Dean, Dr. Dean rather, has a PhD and an MA in biostatistics from Harvard University, currently employed by Emory University. It's a good school, sir, Emory University, you agree with that?
A Yes.

Q Could you scroll down please, Mr. Trofimuk. And she attaches her curriculum vitae. She says -- let's go to paragraph 3 at page 1 to 5 of her CV, she lists the referee journal articles of which she is a co-author. Number 36 on that list is the Madewell study, sir. You see that?
A Yes.

Q That's the study we've been talking about, right?
A Yes.

Q Dr. Dean is a co-author of that study, right?
A Yes.

Q And you'll see that she says counsel for the respondents contacted her and provided her with a copy of the supplementary expert report of you and noted that the Madewell study is footnote 14 on that report. And she's reviewed the portion of your report on pages 6 and 7 under the heading Asymptomatic and Pre-symptomatic Individuals?
A Yes.

Q That contains your discussion of the Madewell study?
A Yes.

Q She says that counsel for the respondents also provided her with a copy of the following evidence filed in this matter: A portion of page 10 of your expert report, your primary expert report. That's where Madewell study if footnote 30. We took you to that earlier.
A Yeah.

Q And then portions from pages 10 and 11 of the report of Jason Kindrachuk. And then she describes in paragraph 6 her understanding of the information that I've provided to her. Please read that. If you can scroll down, please. And, sorry, scroll down further so we can see 7 at the top, please. And then counsel for the respondents asked Dr. Dean to provide an affidavit to be filed in this matter to help inform the Court, providing her knowledge of what the Madewell study says about asymptomatic and pre-symptomatic transmission and providing any other comments on the evidence of Dr. Bhattacharya and Dr. Kindrachuk. And she says she has previously provided a short explanation of what the Madewell study did find on asymptomatic/pre-symptomatic transmission in a

social media link reference in Dr. Kindrachuk's report. Do you remember seeing that social media link before?

A No.

Q Do you remember seeing the comment by Madewell?

A Yes.

Q And do you remember the substance of that comment by Madewell?

A The substance of that comment by Madewell was a distinction between pre-symptomatic and asymptomatic and, in particular, it referenced the Qiu article, that's Q-I-U article as providing better evidence on that distinction than the Madewell itself.

Q And that was better evidence because they said basically if you want to see a study where they've delineated pre-symptomatic from asymptomatic, that's Qiu. We weren't able to do it in Madewell in the four studies that we're looking at.

A Yeah, I actually disagree with Madewell about that. I think that the problem with Qiu is that it's not controlled. It doesn't --

Q You're saying it's not household settings?

A Yes.

Q And we'll go back to Qiu and look at the settings that they were looking at in a minute if we have time. So then she said she's previously provided this explanation. Sorry, do you remember the Madewell study coming out in December -- mid-December 2020 was when it was published, December 14th, I believe?

A I remember when I saw it but it was, you know, around then.

Q It was -- it made the news because I think for the same reasons you've indicated, is, wow, if there's no significant risk of asymptomatic/pre-symptomatic transmission, then that's a game changer, right? That was how it was being presented by some commentators when it was released, some commentators in the news? Do you know if that's true?

A I don't remember the news reports around it.

Q Okay. So you don't know if that had anything to do with Dr. Dean and the social media post, whether she was reacting to those news reports and saying folks are taking this and -- for something that it shouldn't be taken for? You don't recall that?

A I don't remember any of that, no.

Q And so paragraph 8 is Dr. Dean explaining succinctly, as she says, what she previous did in the social media link, and then she breaks it down, it's a summary: (as read)

> The Madewell study conducted a meta-analysis of 54 studies to assess secondary attack rates using household studies.

You agree with that, sir?

A Yes.

Q (as read)

> B. The Madewell study page 5 to 17 also conducted a sub-analysis to study the transmissibility of asymptomatic SARS-Co-V to index cases.

No disagreement there, sir?

A No.

Q And then 'C', do you agree with what 'C' says: (as read)

> The sub-analysis broke-out index cases designated as symptomatic from those designated as either asymptomatic or pre-symptomatic.

A Yes.

Q And then let's go to 'D'. Dr. Dean affirms that: (as read)

> The sub-analysis contained much less data than the main meta-analysis. As Dr. Kindrachuk noted in Exhibit C and is shown on E figure 8 in the supplemental online content to the Madewell study [a copy of which is attached and marked as Exhibit D to her affidavit], the sub-analysis summarized 27 studies reporting secondary attack rates from symptomatic and four studies from asymptomatic or pre-symptomatic index cases.

You see that and you don't disagree with that, sir?

A No, I don't disagree with that.

Q Shouldn't you then have maybe indicated that somewhere in one of your reports that -- that the important part of the Madewell study for the purposes of which you were presenting it for, which was that the secondary attack rates from asymptomatic and pre-symptomatic were very low, .7 percent. Wasn't it important to then indicate that

this was derived from must four studies, much less data than was in the 54 studies in the meta-analysis? Isn't that an important limitation to have noted somewhere in your evidence, sir?

A I don't think it's a limitation. The question is the quality of the studies. As I said, the controlled environment is really important here. I reported what I thought was a legitimate result. I still think it's a legitimate result.

Q Why -- why is the 54 study even relevant to this issue, sir? Why do you say that --?

A I'm meta-analysis -- I've just -- literally, I was just quoting the first line just so it was clear that -- which study I was referring to.

Q But since the sub-analysis does not use 54 studies, and since it uses only four and since it's only 151 individuals in there compared to over 77,000 in the 54 studies that you said in both of your reports and counsel has put in their pre-trial factum, should you not have indicated somewhere in there so that the folks reading it would say, oh, okay, I get this. This is not 54 studies that come to this conclusion, it's a sub-analysis that comes to this conclusion. Shouldn't that have been pointing out somewhere --

MR. GREY: Madam Justice -- Madam Justice, I'm going to raise an objection.

THE COURT: Go ahead.

MR. GREY: We've heard this question restated at least five, if not six, times. It's been asked and answered repeatedly. I know Mr. Parker does not like the answer, but Dr. Bhattacharya has answered it several times and we're getting into the area in my respectful view of badgering and harassing the witness. Dr. Bhattacharya has answered this question repeatedly and repeatedly.

MR. PARKER: I disagree. This is a very critical point --

MR. GREY: My objection is for the Justice, Mr. Parker

THE COURT: Yes, yes.

MR. GREY: I was not interrupting you.

THE COURT: Yes, yes, okay. Mr. Grey, I am going to ask for Mr. Parker's response --

MR. PARKER: Parker.

THE COURT: to the objection.

MR. PARKER: Thank you, Justice Romaine. Thank you, Mr. Grey. My response is this is a critical point and I've put to the Doctor that he has misled the Court and he's done it on two occasions. And I have not got in my submission a straight answer as to why he did not put in any indication in either of his reports, nor did counsel in their pre-trial factum, that the .7 percent has nothing to do with the 54 studies with 77,000 plus individuals. Four studies, 151 individuals. Isn't that important to know, and I haven't got a response.

MR. GREY: May I respond, Madam Justice?

THE COURT: Hold on, hold on, please.

MR. GREY: Okay.

THE COURT: I agree that it is an important point. I think you have gotten the point across, Mr. Parker, and you have received several answers. I have to agree --

MR. GREY: Thank you.

THE COURT: -- that anything more would be harassment.

MR. PARKER: Sure.

Q MR. PARKER: Let's go to Exhibit D of Dr. Dean's report --

THE COURT: No.

MR. PARKER: I just want to --

THE COURT: Okay. One more question, Mr. Parker. We know that Mr. Grey has a problem going beyond 4:30 so …

MR. PARKER: Right. I'm sorry.

Q MR. PARKER: This is right at the bottom here, sir. If you go to the bottom, those are the four studies, do you see? Can we blow that up, please, at the bottom, asymptomatic or pre-symptomatic? So there you see, sir, asymptomatic or pre-

symptomatic and under that we've got Shaw (phonetic), Lee (phonetic), Lewis (phonetic), Park (phonetic). Those are the four studies, right?

A Right.

Q And you go to that far right column, 111, 23, 2, and 15. You add those up, 151 individuals, right?

A Normally in a meta-analysis you wouldn't be adding up like that but, yes.

Q It's a sub-analysis, sir, is how the co-author describes it. And my point is if you add up those numbers in that last column - 111 and the ones under - that's 151 individuals that derived the .7 percent. You agree with that, sir?

A No, that's not exactly right. So my point is that you wouldn't normally just add those up. There's a statistical technique on combining studies that involves something more sophisticated than just adding the denominators in the studies up and having numerators up and then dividing. I didn't put this chart in my -- I mean, I reference a very large number of studies. I put in the summaries --

THE COURT: I am sorry, Doctor.

A -- what I thought was most important.

THE COURT: Doctor, I am sorry. I had stopped the question that Mr. Parker put on the basis of the objection so rather than go back to that question, the question before you now is basically is that where you get the .7 percent from? What is shown --

A Oh, yes, that's where the (INDISCERNIBLE). Thank you, Your Honour.

Q MR. PARKER: Yeah, there's the -- sorry, we're done, Justice Romaine, for today?

THE COURT: I think we are done for the day. Okay.

MR. PARKER: Thank you, Justice Germaine.

THE COURT: Okay. Thank you all. We are adjourned for the day, and we will be back at 9:30 on Monday morning.

MR. PARKER: Now, you said 8:30 earlier and I thought that was Monday --

THE COURT: Oh, did I?

MR. PARKER: So, it's 9:30.

THE COURT: Oh, no, no, no. Sorry, 9:30. We all have things to do --

MR. PARKER: Thank you.

THE COURT: -- before court. We are not just sitting in court. I just want to say this for the purposes of people who are sitting in. The in-court time is very important but so is the out of court time to prepare for the in-court time. So that is the reason for the usual timing of court proceedings. Okay, 9:30 on Monday morning.

MR. PARKER: And thank you for those comments, Justice Romaine. I appreciate that. Have a great weekend.

THE COURT: Thank you.

PROCEEDINGS ADJOURNED UNTIL 9:30 AM, FEBRUARY 14, 2022

Certificate of Record

I, Michelle Palmer, certify that the recording herein is the record of oral evidence of proceedings held in the Court of Queen's Bench, held in courtroom 1702, at Calgary, Alberta on the 11th day of February, 2022 and I was the court official in charge of the sound recording machine during these proceedings.

Certificate of Transcript

I, Charlene Zaharia, certify that

(a) I transcribed the record, which was recorded by a sound recording machine, to the best of my skill and ability and the foregoing pages are a complete and accurate transcript of the contents of the record and

(b) the Certificate of Record for these proceedings was not included orally on the record.

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