

**Amanda Valdivieso:** 0:04

Greetings and welcome to the NASPO Pulse. This is the podcast where we are monitoring issues in states procurement. We've got our finger on the pulse. I'm your host, Amanda Valdivieso.

**Kevin Minor:** 0:15

And I'm Kevin Miner, and today we're talking research.

**Amanda Valdivieso:** 0:18

That's right. We're talking with Dr Rob Hanfield of North Carolina State University.

**Kevin Minor:** 0:22

We're also going to talk with friend of the pod, dr Xiaowei Wu of Oregon State University, who I'm sure you know this, amanda, I interviewed last year season one about the state of supply chain during the pandemic and thankfully we're talking about state's response to the pandemic as opposed to not really knowing what's going on.

**Amanda Valdivieso:** 0:45

Yeah, it's really nice to see this all come full circle for the podcast. Dr Hanfield and Dr Wu, along with several other of our academic partners and the NASPA research team, have just published a new research report assessing PPE shortages that occurred throughout the United States in 2020. This report examines the structural influence of state procurement offices on the ability to respond in an agile and effective manner.

**Kevin Minor:** 1:09

Ooh, shiny new research report? Exactly yeah. And our guests today. They do a great job synthesizing that information as well as explaining their various methodologies that they used.

**Amanda Valdivieso:** 1:21

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**Kevin Minor:** 1:43

Let's take the pulse, dr Wu. Thank you so much for joining us again. Dr Wu and I have actually already had we had an interview last year, and so I'm sure a lot has changed between the time we talked last year and what we talked about now. Mostly we were talking about Supply Chain Council, if you haven't go, listen to that episode, because it's very interesting. But, dr Wu, can you just refresh our memory on some of your background?

**Zhaohui Wu:** 2:08

Sure, I'm at Oregon State University and I'm a professor of supply chain management and I've been working with collaborating with Nespo for four years at least now, and fortunate to be involved in this research with Dr Hanfield on PPE sourcing by the states.

**Kevin Minor:** 2:27

And Dr Hanfield, thank you so much for joining us today. How are you, sir?

**Robert Handfield:** 2:32

I'm good today. How about yourself?

**Kevin Minor:** 2:34

I'm doing well. I'm doing well. We really appreciate you joining us today to discuss this COVID-19 research paper with us. Before we get started, can you tell us just a little bit about your collegiate background?

**Robert Handfield:** 2:49

Sure, I've been a professor of purchasing and supply chain management for about 30 years last 20 years at North Carolina State University, and there we founded the Supply Chain Resource Cooperative, where we work with industry and the public sector on different kinds of purchasing projects. And I've also done some work with some of the federal acquisition agencies, like GSA and VA, and others as well.

**Kevin Minor:** 3:19

So I bet you guys have been extra busy this past year yeah.

**Amanda Valdivieso:** 3:23

I bet you guys have been extra busy this past year yeah.

**Robert Handfield:** 3:25

Yep Supply chain has been sort of on the tip of everyone's tongue, as has been acquisition at a federal and state level. It's been a real challenge, for sure.

**Kevin Minor:** 3:36

You also are an adjunct professor right of supply chain management at Manchester Business School, correct that's?

**Robert Handfield:** 3:44

correct Yep management at Manchester Business School. Correct, that's correct Yep.

**Kevin Minor:** 3:48

I occasionally I go visit my friends over in the UK and we work on research there as well, really, and I bet so, you've kind of seen the whole spectrum in the past year, everything from the academic side to the actual application.

**Robert Handfield:** 4:01

Well, absolutely, and one of the things that was sort of unique about my activity this year is early in March I was brought in to the, the Strategic National Stockpile, and in addition to that, this big study that we did with NASPO gave me a really, really good picture of everything that was going on around the COVID response.

**Kevin Minor:** 4:39

Well, and that's the reason for our discussion today, for our discussion today, we want to get a better understanding of the research paper that was produced by NASPO Assessing State PPE Procurement During COVID-19. And I believe that that's out now. Actually, I know that the analysis is based on a little over 100 hours of interviews with state CPOs, state procurement managers, members of government organizations and private sector organizations that were all involved in the state PPE procurement process. Can you tell us just a little bit about why that's so important? Just give us a general summary of that paper and how it came to be.

**Robert Handfield:** 5:19

Absolutely so. You know, as I said, back in April we had an opportunity, based on a conversation with Lyndall Hatton, to launch a study where we would interview every CPO in the country and understand you know, what happened when during COVID interested in understanding, first of all, how they were able to get access to PPE to be able to operate, but also to understand the differences in the ways that each of the state CPOs operated, how they interacted with other actors in the disaster relief operations, actors in the disaster relief operations, the communications that they had and their ability to respond, as well as the challenges that existed along the way. And what we came out with was a really sort of holistic view of how different actors at the state level should react to different kinds of emergencies that occur. And it also gave us some really great lessons learned for the future of how state CPOs should be thinking about interacting with other actors at the state level, but also how they organize

themselves and how they should prepare themselves for future problems that might occur as well.

**Kevin Minor:** 6:47

Wow, and so you made an effort to to interview all 50 states. That's, that's quite an undertaking.

**Amanda Valdivieso:** 6:56

That's a big achievement, yeah, it was.

**Robert Handfield:** 6:59

It was a job it was. We had at least an hour with, with with each CPO. We had at least an hour with each CPO. And then we also spoke with a number of other people as well. In some places we talked with some of their strategic partners, like in Michigan. They worked with GM and we talked to someone at GM. They worked with different emergency response agencies. We spoke with suppliers in some cases. So we got a really great unique set of interviews that I think under any other circumstances we never would have been able to do that.

**Kevin Minor:** 7:37

Given both of your backgrounds in supply chain, I'm sure that sometimes it's hard to surprise you. What is something that surprised both of you while you were going through this study?

**Robert Handfield:** 7:53

Well, I'll speak first. I think for me one of the biggest surprises was the ability of the state CPOs to react to completely unknown situations. You know, for many, many of the state CPOs we spoke with many of them, you know, admitted, we've actually never purchased anything prior to COVID. You know, we established contracts but we negotiated the rates but we didn't actually have to buy anything. When all of a sudden, they're not just buying stuff, they're managing supply chains that are operating warehouses, they're dealing with suppliers in China on PPE, they're working with international bills of lading, they're thrown into this new environment where they really have to learn how to deal with. You know, extreme complexity and unknown situations before. So it was it for many of them it was. It was, you know, trial by fire.

**Amanda Valdivieso:** 8:57

You know they had never they really had to adapt and overcome very quickly. So obviously folks can read the paper on the NASPO website. But what I really want to talk about because you mentioned, rob the lessons learned. So one of the findings during the study was that state procurement offices should move to more of a supply chain management model. Can you, gentlemen, talk a little bit about what that supply chain management model looks like, what it entails for state procurement offices?

**Robert Handfield:** 9:24

supply chain management model looks like what it entails for state procurement offices. Yeah, I'll go first, then I'll ask, maybe, wood to comment. So one of the big changes, I think, was that they were having to buy these masks from people, like I said, in China, from people, like I said, in China, where a lot of them were produced. And not surprisingly, you know, a lot of people didn't know this, but the central place where all of N95 masks are produced is Wuhan, china, which was actually, you know, the ground zero for the COVID virus. Yeah, so a lot of the abilities to get these masks was shut off. But they also discovered that they had to find ways to store this stuff, because virtually every agency in the government required PPE to continue operating and it wasn't a matter of, you know, making a one-time purchase. You couldn't get this stuff. Yeah, and the traditional distributors that they were using, you know the McKessons, the Cardinals.

**Amanda Valdivieso:** 10:38

Yeah.

**Robert Handfield:** 10:38

Didn't have any inventory of it. So all of a sudden they were having to go directly to these in some cases dubious manufacturers or these brokers and negotiate deals with them to buy masks that they had never had to do before. And there were some scam artists out there. There was, there was a lot of scams going on around these masks and on top of that, people were requiring that they pay 50% or in some cases 100%, upfront. Well, for a state procurement officer, that's like a big no-no, you never pay.

**Amanda Valdivieso:** 11:19

You don't do that.

**Robert Handfield:** 11:21

So they had to get special dispensation from their you know, from their governor in some cases to be able to do this. And literally, if you didn't move quickly, if you didn't make that deal and send them the money by the time you return, those masks were gone. Somebody else had bought them.

**Amanda Valdivieso:** 11:40

Yeah.

**Robert Handfield:** 11:42

I don't know if you want to add to that.

**Zhaohui Wu:** 11:44

Yes. So at Torch Rob is saying one thing we observe is the entrepreneurship of the buyers and the state producing agent, and so it's like they work right away with the private sector. And one interesting thing is the state procurement knows what is in shortage, way ahead of anybody else in the world, because they buy so much. It's a consolidation point and so early on I think one state was saying we know there will be a shortage of electronics and that was not even in the mind of many anywhere and they work with private sector right away and calling on the agencies to say well, there could be a shortage in five months and you need to act on it before the budget season cycle is over. So that collaboration between private and the state, I think, inform us that there's a really quick coalescence of the supply chain that the individual buyers within all the states are able to connect with and build off the public supply chain and link it with the private ones. So that's quite amazing how fast that happened. Yeah.

**Kevin Minor:** 12:59

Well, yeah, and just that. I mean, I assume that it's something that you guys don't see a lot either. Is that partnership between these public and private agencies?

**Robert Handfield:** 13:10

That's correct. Yeah, you know, generally, you know there isn't a lot of interaction between the state and private sector, right, but in many cases we saw that they were actually talking to companies in the private sector and relying on them. A great example, like I said, was Michigan. You know they reached out to the automotive companies and the automotive companies had people on the ground in China that could actually contact suppliers there and get access to PPE. In another case, one of the states had access to the Chinese embassy in New York City and were able to contact them and get access to people over there as well. So so, being able to to, you know, build that network and use that network of people to to get access to, to, this was, was important.

**Robert Handfield:** 14:13

The other point I want to make is, you know, during this time period, as we all know, you know, the, the, the Trump administration essentially made a mandate that the states were sort of on their own when it came to finding PPE. So every state was sort of trying to get PPE and, in some cases, competing with other states for it. Yeah, that's true. One of the things that NASPO did is NASPO was able to, you know, have these weekly calls, and that really helped

people to come together and share information between one another, and a lot of people said that that was a really important role to be able to have those discussions with other CPOs and in some cases, you know, get access to information on where they were getting their stuff yeah, yeah I know a guy?

**Kevin Minor:** 15:08

yeah, I know a guy, let me call him. Here's his number.

**Amanda Valdivieso:** 15:11

Yeah, I know, and they're still discussing that stuff to this day.

**Robert Handfield:** 15:14

Yeah, absolutely, absolutely yeah, so that naspo played a great role in that regard well, hey, we'll take.

**Kevin Minor:** 15:20

We will take. Uh shout outs shamelessly whenever we can get them.

**Amanda Valdivieso:** 15:26

Yes, that's right, absolutely so. I want to go back to a point I think, rob, you mentioned earlier about the ideas that there was issues of warehousing logistics with state procurement offices, something that they haven't really gone into but now all of a sudden they have to. They had gotten away from owning warehouses but with COVID hitting, they had to face these issues of stockpiling supplies. So can you talk to us, both of you? Can you talk to us a little bit about the different ways the states responded to this part of the disaster?

**Robert Handfield:** 15:57

Well, what happened is, during COVID-19, states were suddenly confronted with the need to manage, as I said, supply chains and, and as there were shortages of PPE, suddenly, you know, these stockpiles were disappearing and in many, most states. You know, some of them did have warehouses in the past but had eliminated them over the years. But they suddenly felt that they needed to initiate sourcing with these overseas suppliers and then they had to have a place to store them. Well, many of them had never established a warehouse and distribution capability to store emergency supplies Overnight. They had to coordinate logistic shipments, deal with tariffs and then sign warehouse leases to enable storage of inbound materials, and then sign warehouse leases to enable storage of inbound materials. And what was funny was, you know, people were saying well, at first we started, you know, using the conference room. Right, they were using the conference room to store masks and stuff. And pretty soon they figured out that that wasn't really what it worked.

**Robert Handfield:** 17:04

Yeah, and, and then they said, well, how are we going to, how are we going to find these? You know, what are we going to do? So many of them were able to work with different agencies. I know in California they contracted with UPS to, you know, get a third party warehouse space. In other cases they had, you know, maybe some old warehouse space available that they had used previously and they were able to renew those leases. And in many cases they had purchasing people assigned to work in the warehouse along with the emergency response teams in the state and we're actively, you know, located in these warehouses managing them. We spoke with a couple of folks that were doing Zoom calls from a warehouse.

**Robert Handfield:** 17:55

Yeah, and they just responded they did whatever we need to do. I've never leased a warehouse before, but there's always a first time, and so they learned and adapted quickly to the requirements.

**Zhaohui Wu:** 18:12

One. Another state was getting a lease from a private sector and not a federal company on the East Coast, so they

were able to use a private sector warehouse and the private sector in many cases also helped to set up the system, the logistics system within the warehouse. Oh nice, Okay, With the help of the National Guard as an able body to move things.

**Amanda Valdivieso:** 18:38

That's a good combination of different resources coming together.

**Kevin Minor:** 18:42

Yeah, yeah, absolutely yeah. So there's a quote in this study that I'd like to read and I want to see if it resonates with you guys. It says so we found a vendor that could get us a lot of masks all at one time and they had gotten a shipment in from somewhere and then the actual boat was coming around the port. I had somebody drive down and hand them a check for 25% before the ship arrives at the port. The only way I can explain it is that it's like Tony Soprano walked up the dock, handed them the cash and took it. That happened to me. They took it. How does that? I mean that's like one of the first quotes right on the top page, like page two of the study. How does that resonate with you guys? Yeah?

**Robert Handfield:** 19:33

I mean, that was, that was, uh, that was a great quote and and, uh, you know the individual and you know was was really incredulous when they were describing this to us. Yeah, uh, it really was unheard of, like I said that, that any state procurement officer or any representative of the state would pay cash, literally cash up front, to somebody you did not know, an unqualified vendor, and that was just the state of it was. The demand for PPE was so intense and people were just getting desperate and doing whatever they had to do. Tense, and people were just getting desperate and doing whatever they had to do. And, like I said, if you didn't pay the cash, if you said, well, we don't do that at our state, well, you didn't get, you were out of luck because somebody else would be willing to do it.

**Robert Handfield:** 20:28

So what had to happen is many of them had to have special dispensations, so they had to have very close relationships with the chief financial officer of the state and get a special request and approval. And in some cases, people were doing this by texting over their cell phones with one another to get this done, and timing was really was of the essence get this done and timing really was of the essence. One of the things that also happened, I think that we heard about, was there were some scans out there, as I mentioned, and in some cases and part of the problem was the federal government also came out with a list of approved PPE suppliers and then later came back and changed that list. So some states went ahead, contracted with these providers, then discovered they were no longer approved and had to claw back funds that they had already provided to them. So it was a real mess to say the least.

**Kevin Minor:** 21:27

Yeah, that sounds like an understatement.

**Amanda Valdivieso:** 21:30

Yes it does, and I imagine all these state procurement officers also are. Most of them are doing this from home because they've all been, you know, relegated to their homes due to the pandemic, yeah, so on top of maintaining their I mean other stuff still had to run Right.

**Kevin Minor:** 21:46

So on top of yes. Contracts you normally you have to maintain.

**Amanda Valdivieso:** 21:51

Exactly.

**Robert Handfield:** 21:51

Well then and you bring up another point, which is, you know, working from home. Many of these state agencies had people that had always come into work, you know, and some of them were told literally overnight. Well, guess what? We're all working from home. And people were packing up their computers. Some of them didn't have laptops, they had desktops and were throwing them in the trunk of their car and driving home saying how do I do this? And so states had to also really rapidly adapt, and a number of states had just implemented e-procurement systems which allowed them to be able to do things virtually. But in other cases they were having to adapt to these kinds of situations. In some cases they were able to deploy laptops to their staff quickly and be able to get them functioning from home. Some of them didn't have good Internet connections from home. Some of them didn't have good internet connections from home, so there was a real disruption in terms of the workflow.

**Zhaohui Wu:** 22:56

That also occurred I'm sure many, many states are telling us the same that in the first three months no one took a vacation or work at home. And what is a day of work? And this PPE is in Asia, so everybody work until the sun, until the other side of the house. Now we have a delivery or have a price. And I remember one state many on the Southeast were dealing with hurricanes and you had to find a evacuation hotel for people, and so they work until 2 am, and well, that's a hotel. And on the West they work until 2 am, and well, that's a hotel. On the other west coast, those 2 am hotels.

**Kevin Minor:** 23:36

Dr Wu, you bring up a really good point in that, the fact that some of the states deal with natural disasters much more frequently than others. What can states in the hurricane belt teach the rest of us about emergency response and procurement?

**Zhaohui Wu:** 23:53

I was getting up late to prepare for this last night, but really I was reading the interview on one of the states and there's so many small things that's happening during a hurricane and they've been through so many, and the one thing that jumped up in mind is that it was lesson learned. And so there's so many little lessons we would not think about, and so I think one of the learnings is well, what do we learn from this? And how we practice, how we get better next time, and every disaster is different. So there's a lot of little things. For example, we bought the generator but we had the fuel supplier as a separate supplier and the fuel does not match the generator. So this thing we will not think about.

**Zhaohui Wu:** 24:36

And we have the driver who deliver the ice, and then whether the driver should stay or not, and there's money, the cost associated with it. So all these little things and I think the more disaster you have, ironically it seems the states are dealing with it better. They just have more experience. It's a so different type of disaster. So the lesson learned here is practice and talk with each other among the states and figure out what are the best practices in envisioning the scenario and what are the best purchasing practices with the sudden needs of something?

**Robert Handfield:** 25:16

Yeah, I can add to that. I think one of the things from the states in the hurricane belt is they were well-practiced in emergency response. I mean, they had very mature response systems. Granted, a hurricane is a one-time event. You know, COVID kind of just went on and on and on. Yeah.

**Amanda Valdivieso:** 25:36

I was going to say I think Dr Wu brought up a great point that what all these state procurement offices can learn is just to talk to each other and learn these best practices from each other. I think that is so important to moving forward, regardless of whether or not you know, once we're out of the pandemic and everything is back to normal, just keep that communication going.

**Zhaohui Wu:** 25:54

Right and also in Rob's example. There, I think, how the state procurement work with the EOC and the work with different agencies of finance and the structure. It's not just necessarily a described structure of centralization, it's how the collaboration happens and that's really important and they figured out how they suffer through it and they know how to get things done in real time.

**Robert Handfield:** 26:18

One of the differentiating features of these states that are because we developed sort of a maturity model that helped identify sort of best practices of states that were able to handle the response you know more effectively is you really need to have a playbook so you need to understand when there's emergency, who does what. What is the role of procurement, what's the role of emergency response? And the point that we're seeing is you really need to have procurement in a central role in this, because no one knows more about where to get stuff, how to find it, how to build a contract, how to respond, and so procurement needs to work closely with other agencies, especially emergency response and that playbook. Every state should have their playbook developed of what happens in an emergency, not just something like COVID, but any kind of emergency that you know to be able to deal with. That, yeah.

**Amanda Valdivieso:** 27:22

I know NASPO has done a number of studies and papers on the need of the procurement office, the central procurement office, having more of a forward-thinking role in government and I think this pandemic just illustrated that so perfectly, the need for the procurement offices to be a part of it.

**Kevin Minor:** 27:39

Well, that, and, Dr Handfield, to your point, just being able to acquire or procure goods responsibly and up to state codes and to the law, right I mean, you know, I'm sure that there's a lot of administrators and leadership that need things, but, like you said, I have no idea where to get them, but also no idea how to acquire them lawfully, while still being a steward of taxpayer money.

**Robert Handfield:** 28:06

Right, that's right and and you know there are state regulations that have to be, that have to be followed. And you know, ideally you do want to get, you do want to deal with approved suppliers that are, that are approved by the state. You want to get fair competition. In some cases, you know you need to get the right number of bids and so forth, need to get you know the right number of bids and so forth. But during an emergency response, you know you have to kind of weigh that off against. You know what can we do to really, you know, help people that are in need at the moment. And so having that right balance of an approach that follows the state guidelines you know, yet is able to respond quickly, becomes important.

**Kevin Minor:** 28:53

Yeah, and what a decision to make. What a decision to have to make. Yeah, I mean, people were dying and you know.

**Robert Handfield:** 28:59

You know that if you don't get material in that people need, there's going to be ventilators and you know all these kinds of things became really critical in those early days.

**Kevin Minor:** 29:12

Dr Handfield, you mentioned the maturity model and I know that that is something that you guys went through throughout this paper. Can you synthesize that a little bit for us?

**Robert Handfield:** 29:21



Sure, we came up with just a general maturity model that identifies a few dimensions of sort of the level of emergency response maturity, and it has to do. The dimensions in this case refer to, you know, the governance of the emergency team, as I said, who's in charge, how well the states had managed their strategic stockpile, how well they had planned ahead for different risks, how they dealt with human resources and communicate with their team, as well as the level of IT infrastructure planning during this event. So I think what we're starting to see is, you know, organizations that have a more mature approach to this generally have a chief procurement officer that is more centralized, you know that reports to the secretary, who reports to the governor, and we start to see procurement is more responsible at a higher level for the response and isn't sort of a standalone function that is just sort of a contracting function. So I think we see procurement playing a bigger role in emergency response in states that are a little more mature in their approach.

**Zhaohui Wu:** 30:52

I agree. I mean you said, well, you said pretty much everything there. So in a way, there's a configuration and looking back at all the data and we're kind of building off a profile of which state is where in that model. And so if I'm a user of the model as a state agency or a governor's office, it's like, well, how well is our state handling able to handle the disasters, and how well is our government, how efficient, how resilient is the government? Yeah, so it's quite interesting to see from a state management standpoint that how well we compare with other states. So, yeah, so that's that's part of the work we're doing at this point.

**Amanda Valdivieso:** 31:40

So now that we're seeing a light at the end of the tunnel, to all, this has been over a year. I mean think Mark, yeah, marked over a year since this pandemic has started. I mean think marked, yeah, marked over a year since this pandemic has started. Do you both see any lasting effects from this disaster in state procurement, good or bad? Do you see any lasting effects that will occur?

**Robert Handfield:** 32:00

I do. I think we're starting to see that people are really coming back and saying what are the lessons learned, what should we have done differently or what could we have done differently? And, for instance, some of them are saying now this gives us additional ammunition to invest in a procurement system, perhaps, or to upgrade a procurement system, or to be able to look at how we work from home. I think work from home was a big aha moment during this whole event and people are looking at that may be something that happens a lot more going forward. I think it's going to forever change the way we work. I also think that there will be discussions around governance and playbooks, and we hope that the report will also generate those kinds of discussions within state agencies to make some changes.

**Zhaohui Wu:** 32:59

Yeah, two more things on that. Adding to that is that you know this is a pandemic happening at the same time, other things are happening and unfolding right. So, like the shortages now and the boat is stuck in Panama, or, as it is now, not Panama this time, and the shortage is still happening, and I'm sure some of the things that are contained are something the states are buying, and also the data security issue, it's happening in parallel, so all these things are a part of the priorities of the states and so, as we come out of a pandemic and the states really are thinking the purchasing is part of supply chain and how we deal with this internationally and how we look beyond the vendor or the distributors. So, going back to the first question you asked, that's another way we see how state procurement becomes supply chain management. It deals with all the things the private sector is dealing with in the global supply chain environment.

**Kevin Minor:** 34:05

So, before we go, thank you guys so much for talking with us today. Before we go, one thing that we like to ask all of our guests is just if they have any advice for our listeners and this can be professional advice or so on just something that you've learned in the past year or just something that you like to tell people.

**Robert Handfield:** 34:20

Dr Hanfield, you know I think my advice would be that you know this was an unprecedented event was an unprecedented event, but don't don't rest back on your laurels and say well, you know, now we're going to be able to go back to normal. I don't think that's likely going to be the case. I think it's more likely that there's going to be some profound changes, like I said, in the way we work, in the role of state procurement, in the resilience of how states operate and in federal and state government. And I think we can learn from this and I would encourage everyone to kind of do a postmortem and bring their team together and say what do we learn from this and what do we think we should change or what should we do differently going forward. There will be other emergencies, hopefully not as dramatic as this one, but we need to be prepared for other unexpected events, dr Wu For me.

**Zhaohui Wu:** 35:24

Yeah, so one thing is that disaster always brings the best of us, and when we're spending so many hours interviewing the buyers, I don't feel that, and you know, this is the work of just some people who are introvert and came out as the biggest helper for the states, and so I think there's a social capital.

**Zhaohui Wu:** 35:47

Excuse me, there's social capital built by the buyers and the state purchasing agency and among other peers in the states. So the state procurement should leverage the social capital and further professionalize the procurement and make this really important. As we know, this is going to be more disastrous. This will be more important than supply management. So this is an opportunity for individuals as professional growth and also as an opportunity to bring up, to make the supply chain as a function, the procurement as a function at the state.

**Kevin Minor:** 36:30

Dr Wu, in our last interview, one thing that you said and I'll never forget, I really liked it. You said that this entire thing's kind of been like jazz music, Just very improvisational and you never really know what's coming next.

**Zhaohui Wu:** 36:44

So are we at least?

**Kevin Minor:** 36:46

coming to the end of this jazz song, I hope so. I think we all did Well, gentlemen. Thank you guys so much for joining us today. We really appreciate your time and we really appreciate your participation and work on this research paper, I think it's going to help.

**Amanda Valdivieso:** 37:06

Thank you, guys so much.

**Robert Handfield:** 37:07

Thank you, it's been a pleasure.

**Kevin Minor:** 37:10

So, Amanda, what did you think of that interview?

**Amanda Valdivieso:** 37:13

I thought it was very insightful. You know we've heard a lot about this before over the past year and I still think it's extremely relevant and unfortunately, that it's still a thing today. But overall, I'm glad that we are getting this information out there.

**Kevin Minor:** 37:28

Yeah, yeah, it is unfortunate. I mean we have heard all this before, but I think it's important to reiterate and hear

more of the academic analysis side, paired with firsthand accounts.

**Amanda Valdivieso:** 37:42

Yes, and while also hearing about the model they use, the lessons learned, I think will be very important for a lot of people who are reading the report.

**Kevin Minor:** 37:51

Agreed and we will put the link in the description where you can download the report Assessing State PPE Procurement During COVID-19, a Research Report. And Amanda, tell our listeners where they can find it.

**Amanda Valdivieso:** 38:07

Yes, Kevin, of course. So you can access the research report by going to naspo.org and heading over to the research and innovation tab, and when you click on that, you can click on all the publications, and this will be the first one that pops up for you.

**Kevin Minor:** 38:21

Yep and shout out to the NASPO research and innovation team for all the time and energy that they put into writing this report as well.

**Amanda Valdivieso:** 38:29

That's right. They are our friends over there at the Research Innovation.

**Kevin Minor:** 38:33

Team, absolutely For both of us.

**Amanda Valdivieso:** 38:35

Hello R&I, hey guys. So yes, thank you so much for listening today.

**Kevin Minor:** 38:40

Until next time, thank you.