THE US DEPARTMENT OF HEALTH AND HUMAN SERVICES
CENTERS FOR DISEASE CONTROL AND PREVENTION

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH)
BOARD OF SCIENTIFIC COUNSELORS (BSC)

SEVENTY-EIGHTH MEETING
VIRTUAL ON ZOOM, OPEN TO THE PUBLIC
OCTOBER 5, 2021

Contents

Summary Proceedings

The Seventy-Eighth meeting of the National Institute for Occupational Safety and Health (NIOSH) Board of Scientific Counselors (BSC) was convened on Tuesday, October 5, 2021 via Zoom. The BSC met in open session in accordance with the Privacy Act and the Federal Advisory Committee Act (FACA).

Attendees

Kyle Arnone - Member

Lauren Barton, Md - Member

Louis Cox, Phd - Member

Thomas Cunningham, PhD

Cristina Demian, MD - Member

Amaia Downs, DrPH

Mary Doyle – Member

Kenneth Fent, PhD

Michael Foley - Member

Jessica Graham, PhD - Member

John Howard, MD - Director

Grace Lemasters, PhD - Member

Steven Lerman, MD - Member

Patrick Morrison - Member

Emily Novicki - DFO

Kimberly Olszewsky, DNP - Member

Tiina Reponen, PhD – Member

Robert Roy - Member

Marc Schenker, MD - Member

Judith Su, PhD - Member

Welcome and Meeting Logistics

Ms. Novicki called to order the open session of the Seventy-Eighth meeting of the NIOSH BSC at 10:00 am Eastern Time (ET) on Tuesday, October 5, 2021. A roll call of all BSC members confirmed that a quorum was presented. The roll was also called following each break and lunch to ensure that quorum was maintained. Quorum was maintained throughout the day. No conflicts of interest (COIs) were declared. Members of the public were notified that they would remain in listen-only mode until the Public Comment period.

Announcements, Introductions, and Agenda

Announcements

Dr. Reponen welcomed everyone and stated that she would go straight to the Agenda as there were no new members so introductions would not be necessary.

Introductions

None.

Agenda

Dr. Reponen stated that after Dr. Howard's opening remarks there would be three topics being addressed, the first being the Evaluation Capacity Building Plan. She asked the members to keep in mind that from now on during the fall meeting one of the main inputs would be giving a score on the progress of the Plan. The second topic is the new NIOSH Initiative on Mental Health for Health Workers and the final topic is an update on the Firefighter Registry.

Director's Opening Remarks

Dr. John Howard, MD
Director
National Institute for Occupational Safety and Health
Centers for Disease Control and Prevention

Dr. Howard informed the Board that we are in the middle of budget between the House and the Senate. Our 2021 budget was $345.3 million, which represented a $1.5 million increase in *Total Worker Health®* to create a *Total Worker Health* Center for Excellence in Workplace Mental Health. We recently awarded new centers, so we now have ten Centers of Excellence for *Total Worker Health*. The four new ones in California, Maryland, North Carolina, and Utah join the existing six that we have in Colorado, Connecticut, Illinois, Iowa, Massachusetts, and Oregon. This is quite amazing in terms of the growth of this and the support that we are receiving from the appropriators, both in the House and the Senate.

The other $1 million increase that we experienced in 2021 was the $1 million increase in supporting Underground Mine Evacuation Technologies and Human Factors issues. The President submitted the request

for 2022 on April 9th of this year and it has now moved from the House to the Senate. There is a Continued Resolution until December 3rd, so the fiscal year started without a budget on October 1st.

The President's proposed budget allows for a $15 million increase in NIOSH's budget from 2021 to 2022, which is quite remarkable: $2 million increase for ERCs; $2 million for our Ag, Forestry and Fishing Centers; $3 million for Personal Protective Technology issues, which of course we've been very busy with during the pandemic; $4 million for *Total Worker Health*; and then $4 million for our National Occupational Research Agenda, which we're very happy about. So, we'll see what happens in the Senate. So far nothing is scheduled for the Senate Appropriations Committee.

Dr. Howard then provided the following personnel announcements: Dr. Stephen Sawyer was selected as the Director of the Pittsburgh Mining Research Division, PMRD, effective in June. One notable retirement is Chuck Geraci, who really was instrumental in keeping our Nanotechnology Research Center robust. We are trying to induce him back to help us keep the Center in good order and the relationships that we've built across the federal sector with other federal agencies.

Regarding our COVID-19 response, Lisa Delaney, Chad Dowell and everyone in the Emergency Preparedness and Response, has pretty much been working in the response since January of 2020, so we're going on two years now. It has been noted in publications and newspapers that there is a certain fatigue that is associated with such a lengthy response. We are trying to keep up with that and to give people the support they need.

Dr. Howard wanted to draw attention to one study that was actually done. He said that we have recommended a lot of things in terms of mitigation measures, not only masking, distancing, hygiene, but sometimes engineering controls. One measure that people always wonder about is the intervention and effectiveness of those types of barriers that we often see at grocery stores between the cashier and us, the customer. A study that was done by DFSE showed that barriers 36 inches above table height, sitting/standing scenarios, blocked over 68% of particles in the respiratory range. So that gives us some confidence that the recommendation is science-based. We are probably not going to see the end of all those mitigation measures as we go into 2022, so it is going to be very interesting to continue to engage in studies that will demonstrate the efficacy on some of these administrative controls and engineering controls.

Dr. Howard also brought to attention a publication on page 4 of the Director's Remarks, Current Intelligence Bulletin Number 70 on nanosilver, which has a recommended exposure limit. He extended congratulations to the Nanotechnology Center, as well as to all of our risk assessors, for getting that published. It really is a watershed and certainly continues to show that NIOSH is a leader in nanotechnology.

He also made mention of page 6, which contains issues related to masking and some studies that have been done and held with the fit of cloth and medical procedure masks. This again shows intervention effectiveness studies from a lot of the COVID recommendations that we have made.

Dr. Howard also pointed out the ASTM Consensus Standard on barrier face coverings, which NPPTL experts participated in. We are starting to see manufacturers now send their face masks to testing laboratories to be tested against this standard. So, you are now seeing some of them on the market. If you go on Amazon.com and enter "face mask ASTM F3502-21," you will see that there are actually some manufacturers that have

certified face masks. That, again, shows the advancing scientific basis for a lot of mitigation measures that we have engaged in.

Dr. Howard also brought attention to some items associated with our *Total Worker Health* Program, one being our Workplace Supported Recovery. We just released a video to introduce the concept of Workplace Supported Recovery. This is the opposite of your, "You've got a drug problem, I'm going to terminate you." This is the idea that we want to support individuals that are struggling with this problem, keep them in the workplace and give them the support that we need, and they need and teach employers how to do this. He felt that this is going to become a significant video and hoped everyone could take a look at it.

The 3rd International Symposium to Advance *Total Worker Health* is scheduled for October of 2022 and we are hoping that it can be in person instead of virtual.

Dr. Howard then paused for questions or comments.

Dr. Reponen Thanked Dr. Howard and stated that it has obviously still been very busy with COVID-19. She said she wanted to draw attention to one thing in his notes that he didn't mention which has been kind of visible when you look at the guidance for workplace safety and health. It is that OSHA entered the scene this past year, so there is no longer a NIOSH guidance; it seems like they are archived on that topic.

Dr Howard agreed, stating that there are two issues. One is that OSHA has entered the field with their ETS on healthcare workplaces. And it's going to be interesting to see what they decide to do in December because that's the end of six-month ETS. Also, we have been, as others in CDC are, supporting them in the ETS that they are doing now for the general workplace, which arises from the President's Executive Order with regard to mandatory vaccination or submitting to testing every seven days. So that ETS, they're hopeful will come out soon. As you know the word "soon" associated with OSHA rulemaking is always a bit of a flexible term. So, we hope that certainly by November we'll see that ETS. So, they will have two ETS' out there. I think that we in the federal workforce are also under a mandatory vaccination. We do not have the option of testing as the OSHA ETS will do. Ours is a pure mandatory vaccination. All federal employees are required to be fully vaccinated by November 22nd of this year or risk separation from federal service. So as an employer, we're involved with educating our staff about the benefits of vaccination and pointing out that to be fully vaccinated by November 22nd, if they're unvaccinated now, they would have to start with the Moderna vaccine pretty soon - or Pfizer, and a little later for J&J. So, like other employers, we're involved in that too.

Dr. Schenker noted that there is a lot of attention to President Biden's initiative on ambient heat stress interventions and wondered if NIOSH is involved in that whole effort.

Dr. Howard responded that we have done a lot in that area over the years and now OSHA is expressing some interest in that, so we are excited about providing them with the support that they need if they go forward with that. He also said he thinks it has gotten more attention and its importance has been raised, so we are excited about that.

Dr. Reponen followed up by saying that she clicked on some of the links that were in the document and it was quite eye-opening to look at the face coverings. She also commented that if you look at the ASTM

Standard you can see how well it protects the wearer because there are a lot of these face coverings that only filter about 20% of particles so you can really look at what a big difference there is. She said she thinks the standard is great to have and hopefully we will have more of these masks recorded on that standard. She also said that the other thing that has been very visible is that HELD has done a lot of studies on the facial coverings and procedure masks. She stated that this is her area, so she has seen that really great work is coming out from that group and it is very productive. She also mentioned how useful it is to have information that shows how the different scenarios play out. Also, that there is a study on air cleaners and how air cleaners can reduce exposures.

Dr. Howard agreed and said that he certainly has to compliment Don Beezhold, the HELD Director, Bill Lindsley, John Noti and all the folks that have done that work together as a Tiger Team with the CDC response. We have been challenged from January 2020 to now, to adding science to a lot of these recommendations that sounds great. They are sort of intuitive. Put a mask on your face. Well, what kind of a mask? And how thick does it have to be? And how many layers? And how tight does it have to be, etc.? And slowly but surely, we're adding more science to this. Not only is it responsive to the COVID-19 pandemic, but the hope is that it can be carried forward so that we have a body of science that we can build on and continue to build on as we approach, hopefully not anytime soon, but other outbreaks and pandemics that we experience. He also said that Dr. Reponen should point out that the experimental work is not easy to do, and he really wanted to compliment the health folks that have done that work because it took them a couple of months to even set up their laboratory to be able to do the experiment. He also wanted again to compliment Dr. Reponen for pointing out the ASTM International Standard. We've done blogs on it and I think that the occupational safety and health community needs to support that standard more from the practitioner point of view to point out to employers that, "This is the kind of mask that we need to buy our employees to wear, not some that have not been certified."

Dr. Reponen responded that she agreed and that it was already seen last year that the flu cases were also going down, so it's not just for COVID. It helps any respiratory pathogens.

Dr. Howard agreed.

Dr. Reponen also want to know if the $4 million increase for NORA in the House budget that the House has passed was both intramural, extramural, how do we know the division and is it up to NIOSH to decide how that is divided?

Dr. Howard responded yes, that’s a good question. It would be up to us in terms of deciding - because it's sort of like free money in the sense that it's not already earmarked. Congress got rid of earmarks years ago when they were bad. Now, apparently, they're back again. And so, the fact that you have some money that’s in the NORA line means that we have some discretion so that we can augment, for instance, R01 in extramural; we can augment intramural programs. We'll engage in a discussion about it if it actually comes to pass, because it's not something that we've experienced before. He also said that any increase that he has seen since he has been here has been totally earmarked. So, the fact that you have money and that you need to decide how to spend it is really kind of new for us. So, that’s a great question and the answer is that it would be discretionary on our part.

Dr. Graham wanted to know with everything going on, if any thought has been given to the NIOSH Hazardous Drug List and whether that would be coming out soon.

Dr. Howard responded: Yes, excellent question, thank you for asking that. Just last week, I got an email from the folks that are working on that in DSI, Division of Science Integration, Paul Schulte's shop, chiefly Chris Whittaker, that had I think 15 different attachments. There is movement. They have been working steadily throughout this and were at the point of final review, and then publication. I would say within 30 to 60 days. So, the answer to your question is, yes, they've been silent. It hasn't been something we have talked about because I've stopped making predictions about when we're going to publish. I did that last year and it never worked. So, I think we're getting to the end. The folks have done a great job and you should see something pretty soon. Obviously, as you know, it's been complicated by the USP folks and the FDA folks in the sense that it is a complicated complex landscape and we are getting to the end, so thanks for asking.

NIOSH Evaluation Capacity-Building Plan Update

Presentation

Dr. Reponen stated that the next topic is the Evaluation Capacity-Building Plan. She reminded everyone to keep in mind that there will be a question-and-answer session and they will spend some time in scoring the progress.

Dr. Downes began by saying that it was really exciting to see what was able to be accomplished in the first year because of some of the emergencies with COVID, and things like the incidents at the border, and just with the number of people being deployed to help. However, we have been able to meet everything that we said we would. She said that because some of the members were not on the Board the last time this was presented, she would give a brief background into how and why we got here with this Plan. For those of you who don't know, we previously did eight program reviews through the National Academies. And we took some time to try to implement some of those recommendations. We did another five program reviews using a new framework - or new-to-NIOSH framework, anyway - called Contribution Analysis, and through those five reviews, we received some critical feedback. While we got recommendations that were program-specific, we also saw some themes that cut across all programs and thought that since we had heard some of these things before, here was an opportunity to address them. As we were preparing to be reviewed, we also did sort of a quasi-evaluability assessment and looked at which programs were ready to even go through this type of review using this framework. We found that there was a lack of evaluable programs, and not programs that couldn't be evaluated in some way, but just this type of evaluation. And we even ran into logistical issues because, the way that we are set up in a matrix organization, if you send a construction program through and then you want to send, for example, the musculoskeletal program through, there is going to be an overlap in terms of the research that's included. So that was sort of an issue. And then just the burden of going through this type of review, whether it's on the researcher, the program manager/division

director - since those two are one and the same, that's a lot of work. And then finally, the Foundations for Evidence-Based Policymaking Act, which is really looked upon favorably in the federal government. It is a new Act around evaluation and data sharing across governments that we really need to start looking at governmentwide. We need to make sure that those decisions are supported by evidence and the first title in the Act has to do with evaluation.

The Office of Management and Budget (OMB), released a circular at the end of June which probably has the most detailed expectations and guidance that they have ever put out. And not only are they asking those cabinet-level agencies - such as HHS and DOL- to follow the things in this Act, but their expectations are also that operating divisions, bureaus, divisions, and other agencies try to follow this Act. That means developing an evaluation plan, or a learning agenda as evaluators know them. These are some of the reasons why we needed to start thinking about evaluation capacity building and it led us to start to develop a capacity-building plan. So, when we looked across those cross-cutting themes from those five reviews, there are really five topic areas that we needed to concentrate on to prepare our programs for going through evaluation. One was collecting and documenting intermediate outcomes. We kind of scrambled for those during the reviews because it wasn't something we systematically collect. It was kind of when we went through the review everyone was going through their file folders, their emails, calling people in retirement trying to find these things. So, we don't want to be in that sort of frantic situation when we want to review a program.

Then there is also the implementation of program review recommendations. Part of going through a review is not only the process of presenting your information, but once you get the recommendations and the findings back, you want to be able to use them. It's more of a utilization-focused review, so you want to be able to use what you get on the back end or you are not getting the whole benefit of the evaluation. Then there is communication of those intermediate outcomes and evaluation findings. So, we want to be able to use what we get out of these recommendations. We do great work, so we want to be able to spread the word that we do that great work. We want to have a long-term strategy. We don't want to in one year say, "Okay, mining program, you're going to go through a review next year," or "Construction program, you're going to go through a review next year." There is a reason why we do strategic planning and plan for these things hopefully years in advance. We are working towards something, so we need to have this long-term strategy. Regarding translation research, we found that we were getting a lot of critical feedback about that in these reviews. And so, there is a need to build more of that foundation and do more of this type of research going forward.

Dr. Downes then proceeded to talk about the Year 1 progress. She said that out of the five topic areas in Year 1, there were only four topics areas that really had activities that required a report as part of the plan. There was nothing in Year 1 in the communication of intermediate outcomes and evaluation findings to report on. She stated that she wanted to address some of the language regarding the first topic area so that everyone would be on the same page when she started talking about these topics. She informed everyone that when we think about a logic model, she wanted to be clear on two definitions. First, the outputs - these are really the products of our research or our service activity. It could be anything from peer-reviewed publications, to

website or social media content, to patents, to technology, to databases. They are really those tangible products that come out of the research. And then we talk about intermediate outcomes. When we think about Contribution Analysis and the framework that we use for evaluation, that framework all hinges on intermediate outcomes - being able to demonstrate those. We are really talking about what people outside of NIOSH do with those outputs or those products. So, it can be anything from, as Dr. Howard was just talking about, adoption of a new standard or regulation and ASTM using some of our science and our recommendations to adopt a new standard or regulation; commercialization of a new technology or even revising a technology based on some of our science or our recommendations; external researchers building upon NIOSH research. That is what we are talking about in terms of intermediate outcomes.

The first key learning activity that we really wanted to do when we were thinking about this topic area is: what are the motivators and the barriers to collecting intermediate outcomes? That is kind of the very first step, so we need to learn more about that. We wanted to conduct focus groups from people representing various perspectives: from researchers, to division, lab, and office—or DLO director—to branch managers—which are really our branch chiefs, our team leads, maybe our deputy branch chiefs, which you might see referred to in this presentation as our middle managers—and then our program leaders.

We then conducted interviews with some of our DLO directors. This activity was carried out by an internal workgroup led by Dr. Christy Forrester. And while the workgroup did all the background work in terms of developing the questions, doing the analysis, and writing the report, they did hire an outside contractor to come in and conduct the focus groups and the interviews. However, that person used our questions because we just wanted the expertise of somebody to come in and conduct the actual focus groups and the interviews.

So, the four focus groups that had about six to eight people, were conducted with what we saw as early researchers, those that were here seven years or less; and what we call advanced researchers, which were here more than seven years. We had portfolio members, those are anyone who leads one of our program portfolios, and we also had our middle managers group. And then the four interviews were with our Division, Labs, and Office Directors. What we really wanted to get from these focus groups and these interviews was simply, what do you know about intermediate outcomes? Do you even know what they are or know what some examples of them are? “What do you see as the value for collecting them?” “What is your process for collecting them?” “What are the barriers and motivators to collecting them?” and “What support could you use as far as collecting them?” We had a lot of findings and this report was rather interesting to all of us. I think some of us made the assumption that we knew what some of the findings would be, but we were actually surprised when we started looking at the individual groups.

The level of understanding of intermediate outcomes is really kind of varied. When we looked at the division directors, the definition was really understood by that group and they were able to give very specific examples of what intermediate outcomes were. When we talked to the advanced scientists or the advanced researchers—who, again, had greater than seven years of research experience at NIOSH—they understood what the definition was, but they had a little trouble articulating specific examples, especially examples that really represented the breadth and depth of all the different types of intermediate outcomes that were out

there. Then there were the early-career scientists and the middle-management folks - your branch chiefs, your team leads. They had trouble articulating both the definition and the examples, often confusing the examples with goals and outputs. So that was fairly interesting for us to hear. The DLO directors and the middle management really could express the importance of demonstrating those intermediate outcomes. They thought that that was the most important and feasible way to demonstrate NIOSH's impact. Whereas the researchers, both advanced and early, didn't see as much value in the intermediate outcomes; they didn't see them really being used. They see them more as a project-planning exercise that NIOSH does. So that was an interesting finding as well. We also found that there was no formal development process for potential intermediate outcomes.

During the project-planning process, when somebody is developing their new project, they're required in our project-planning system to put down their expected intermediate outcomes. But we found out that there was no standard practice or general practice of how to do things if they wanted a project to reach a particular audience and wanted this audience to do X as a result, so what type of output would need to be produced.

Then the last sample finding that we had is, there were varying opinions on who should be collecting these things and how they should be collected. For example, researchers didn't feel like they should be the ones that were spending the time collecting these intermediate outcomes. And there was also a feeling among some researchers that we shouldn't be burdening our partners and our stakeholders by reaching out to ask, "What have you done with our products or our outputs?" They saw that as an unnecessary burden on our stakeholders. So, both of those were interesting things.

There were five recommendations that came out of this workgroup: That NIOSH really develop an official definition for intermediate outcomes. We have one that's sort of unofficial, I'd say, but I think it might need to be a little bit more friendly for researchers to understand, so we're working on that. Guidance and resources to aid in this whole process and evaluation training, just some simple evaluation concepts that might be useful to people whose background is not in evaluation. An education campaign and now that we know that there are different groups with different understandings about intermediate outcomes, maybe it's not an institute-wide campaign, maybe it's targeted so we have to do some thinking about that. And the resource website - so if we come up with some of these guidance or resource documents, having them all in one place that people can go to. The next step is to really develop some of this guidance so people can begin collecting these intermediate outcomes and documenting them. That will be the next step in the coming year.

Then as far as the second topic area, there were really two key learning questions. We actually worked on the first key learning activity under each question. One was understanding why review panels might provide recommendations beyond NIOSH's capacity. Because we got a lot of recommendations during these reviews that were very broad, that covered a broad range within, for example, a program of a specific population. So, how are we going to realize these things? So, it was hard to figure out how to even begin to implement those things. And then identify barriers and motivators at the various different levels, feasibility implementing the recommendations. So, the process steps really lay out what do we specifically need to do to accomplish these activities?

So, reviewing the materials that we currently use for program reviews and looking at the process that we currently use, interviewing portfolio managers and research staff that have been or could be involved in future reviews, and interviewing leaders of programs and Institute leaders who are responsible for implementation responses and decisions. So, we actually formed two workgroups because, again, there is a little bit of a difference. So how do you get recommendations that are more focused and feasible? And then if you were to get those types of recommendations, how are you actually going to implement those? So, there were, again, two questions going on, so we had two different workgroups. The charge was given to those workgroups, the current review process was explained, the review materials that we currently used were disseminated, and both workgroups came up with questions that they wanted to ask those that would be part of the focus groups and the interviews.

Dr. Downes then indicated that she would go to the fourth topic area and would explain the reason why. She said that the key learning activity for the long-term program review strategy was to really find out a little bit more about how other federal agencies are doing their review processes. So, what that really meant was looking at the literature, doing an environmental scan to see what other review processes were out there, and then interviewing program leaders that have experience that have gone through our previous external reviews to see what their experience was having gone through those reviews; what they learned, what they would change and what they would do differently. So, again, we formed another workgroup. A charge was given, the current review process was explained, the review materials were disseminated, and this group came up with questions for the focus groups and interviews were developed. Also, our office—the Office of Policy, Planning, and Evaluation—did an environmental scan to search other agencies' web pages related to evaluation to sort of see what these other agencies were doing in regard to evaluation, especially given that that new Foundations for Evidence-Based Policymaking Act was out there. And we also did a follow-up interview with the National Center for Injury Prevention and Control because we knew somebody who had participated in their process and really liked the process, so we wanted to learn a little bit more about it.

I mentioned that there were two workgroups for the second topic area, which was the implementation of program review recommendations, and another workgroup for long-term program review strategy. We found that the questions that these three workgroups came up with were very, very similar. So, what we did was to actually combine the questions. And the other piece, as many of you have stated and as Dr. Howard had stated, we were in sort of a situation where we had so many people being deployed, we couldn't go back to multiple people and ask, "Could you participate in this focus group or could we interview you?" And we also had that other activity related to intermediate outcomes where they were doing focus groups and interviews as well. So, we had to be very careful of asking people for more time. So, what we did was we came up with questions that would be responsive to all three workgroups' needs and we did four focus groups and 12 interviews to address the needs of all three workgroups, because their questions were so similar, and we wanted to be respectful of other people's time because we were in this response to a worldwide pandemic.

So, we hired Westat to come in and actually conduct the focus groups and the interviews, although the workgroups came up with the questions. So, the four focus groups were division and lab directors, researchers, program portfolio leaders, and we also had our middle management group. As far as the 12

interviews, we had DOL directors, we had researchers, and we also got four former review panel members because we wanted to hear from those review panel members. So, our study questions ranged from looking at the value of those program reviews, to looking at how our process could be improved, to ensuring we had the right panelists on these review committees, and really using the recommendations when we got to the end of the process. So, some of the things we found from this were looking at the value of the program reviews. Overall, everyone we spoke with really found that there was value in doing these program reviews. There was some concern particularly among researchers, around building sort of an evaluation culture because they felt like that would somehow threaten their ability or their time to do some of their research activities, which is how they get promoted, and that is understandable. There was a general sense across the board with all of those that we interviewed that more resources needed to be dedicated to implementation and also more time committed for this whole process to be successful.

Again, currently we say, "okay, next year, mining" – if that's the program- "you are going to be evaluated." So, they pretty much stop a lot of what they are doing, and this is what they work on for that year. And they spend a lot of time on finding what they need, getting this package together, that sort of thing. So, we'd like to maybe 10 years out say, you're going to be evaluated on X and so 10 years from now they know at the start what they are going to be evaluated on and so they are constantly working towards that so it's not just, drop all your stuff and let's work on this for a year, sort of thing. So that is something that they were thinking. And as far as implementation, more resources are being put towards that so they could make implementation happen.

The panelists really liked the evidence packages that we put together but wanted more interaction with the programs. They only had a one-day interaction with the programs. And the panelists also felt like while they liked the evidence packages, they felt like what we put in there was more of the good stuff about the programs and they thought that if we put in more weaknesses, maybe gave a fuller picture of the program including some of the weaknesses, they might be able to help more as far as recommendations. So, the next step for this particular activity would be to develop the purpose statement and objectives that will guide whatever our long-term strategy is going to be as far as program reviews.

Then the fifth is translation research. Again, one of the things that we learned was that people weren't really sure exactly what translation research was. And there was some misunderstanding or confusion around how it was different or the same as R2P. So, we wanted to really make sure that there was a shared understanding about what this was across the Institute going forward. And so, conducted a literature search and an environmental scan about what was going on in the larger dissemination and implementation sciences community and how did NIOSH fit into that? And then looking at our current definition or conceptualization of translation research and refining it and reconceptualizing it if we needed to or just tweaking it a little bit as to how we're going to apply it at NIOSH going forward. So, I am happy to report that the literature review is complete and has been submitted for publication, and the environmental scan is also complete. We are currently working with one of the world's best SMEs in the dissemination and implementation area and Dr. Borsika Rabin on the refinement of translation research. We have a small workgroup that is going to be working on this refinement process and we hope to have a draft by the end of the year. In addition, we went above and beyond what was in the ECB plan and conducted 23 interviews with intramural and extramural

researchers to find out a little bit more about how they saw translation research. How, in their mind, based on what they thought it was, how they conducted it, and also where it intersected or how it might have intersected with R2P. We also drafted a glossary of terms around translation research that we could consider applying or using at NIOSH as well.

And then, finally something that wasn't specifically spelled out in the ECB plan, but was definitely a part of our intentions with the ECB, was to really start working with one of the extramural centers. And that was something we did with the Agricultural Safety and Health Centers. And just sort of a refresher, those are funded through extramural cooperative agreements. We currently have 11 funded and they range in their activities from research, to outreach, to training, to developing educational materials, and developing relationships with government and nongovernment organizations. And while they're typically looking at things at a local and regional level, they also contribute to things at a national level. So, what we wanted to do is, since we consider them when we do our program reviews, we present things we have extramurally as part of our evidence packages. So, we really want them to be on the same page with us in terms of how we define intermediate outcomes, outputs, what we're doing as far as logic modeling, and kind of presenting one real, whole program with intramural and extramural.

Because the Ag Centers were really interested in this and they have evaluation and communication specialists that were more than willing to work with us, we asked them if there were about three to five topics that, out of all the Ag Centers, they could at least contribute to one logic model. They came up with three topics that all the Ag Centers could contribute at least to one of them. And those were heat-related illness, rollover protective structures, and hazardous exposures in livestock. We hope by the end of the year that we can finalize those logic models. They are actually working on the evidence tables to support what they put in the intermediate outcome column. But it has really helped because now we are sort of on the same page on how we define things. They have also seen that they can use these for future planning.

So, we have done X, Y, and Z. What's the next logical step? Is it to further disseminate this intervention? Or here's an opportunity where this center has developed this intervention, it's now evidence-based, so is it appropriate or could it be appropriate for Center A to take Center B's intervention and try to now use it in their region so we're not totally reinventing the wheel if it's something that could be useful? So, there are opportunities like that. We also saw that there were some gaps in translation research and there was a desire to learn more about that topic. So, we brought in somebody to begin to talk about it, so that's something that we can pursue more of in the future.

The other really, really, exciting thing that just happened is that the Office of Extramural Programs is getting ready to release its Funding Opportunity Announcement for the Ag Centers for their every-five-years renewal and they have actually integrated or injected some more evaluative and translation research concepts into that. I think that's really going to be helpful in bringing those centers even more in line with what NIOSH is doing in allowing us to collaborate and hopefully making more impact in the future. We are really excited about that brand new, off-the-press news.

Dr. Downes concluded that she wanted to thank all the staff members who contributed in some way to this effort considering what we faced with COVID and people were being deployed. She said that when this plan

was developed COVID hadn't really taken over the world yet, so going into Year 2, we are going to have to adjust the plan a little. Like many others, I think we thought that when the vaccine came things would maybe calm down a little, but that really hasn't happened. So, I'm not sure that we can go at the pace that we had originally planned given deployments and other things. We might have to readjust our timeline. However, I am really happy that we have been able to at least meet all of our Year 1 obligations.

Discussion

Dr. Lerman commented that he thought that great progress was made especially in a very challenging time. There were two findings that I would like to try to encourage you to focus on. One, frankly a disappointing finding that you had which is that your researchers don't see the value of intermediate outcomes and, in your plan forward, there was nothing explicit about communicating why this is critically important, which I think it is. Perhaps that's embedded in your education campaign. If it is, I would make that prominent in your education campaign. And if it isn't in the education campaign, I would certainly include that. The other very encouraging thing is that in your focus groups there was recommendation to put a focus on identifying weaknesses, sort of a natural tendency to want to have the evaluation show how terrific a program is and what great progress has been made, but where you get the real value is in identifying weaknesses so that you can address those. So those are the two things I hope get a lot of emphasis in the plans forward.

Dr. LeMasters said that it seemed to her that before programs can identify intermediate outcomes, they need to know what their ultimate outcomes or their primary outcomes will be. And then if I know what my final outcomes, what I'm shooting for, I could then pace back and determine, well, in order to get to B, I need to get A's activities accomplished. So, did you balance that? I mean, to know what your intermediate outcomes are, you have to know what your final outcomes are, or at least you have to have a vision for that, right?

Dr. Downes wanted to clarify the question: When you say "primary" or "ultimate," do you mean like to reduce exposure to—you name it—like fumes or chemicals? Is that sort of what you're talking about?

Dr. LeMasters responded: Yes, that, or it could be like in your Ag Center to develop safety standards for tractors, for example, that would be a final outcome. But before I could get to that final outcome, there are intermediate outcomes like understanding the differences in tractors or understanding how many farmers out there are not protected with roll bars, for example. What is the extent of the problem would be an intermediate outcome before you would define your final outcome of making a difference in improving farm worker work standards? Do you see what I'm saying? And it would be hard for me to come up with an intermediate outcome if I didn't know what my goals were. And that's the final outcome, what are my goals at the end?

Dr. Downes: Yes, I think you're getting at a good point about the difference between program-level goals and a project level of goals. For a project, we're kind of looking at what are you trying to do with this project? If I'm trying to develop an intervention to reduce violence in cabdrivers, I want them to adopt whatever intervention that I come out with. So, the actual intervention would be the outputs and the intermediate outcome would be the cabdrivers to adopt it.

Dr. LeMasters: Or the intermediate outcome might be to understand, what is the extent of the problem? How many cabdrivers are affected with violence—or nurses, or whomever are affected with violence, and then understanding the extent of the problem would be the intermediate outcome, and the final outcome would be to design or promulgate things that could be done to prevent aggression in the workplace or whatever it is. But it seems like to know to get to the endpoint, which is the goal, to make a change, right? Translational into change.

Dr. Lemasters: Okay, so do you see what I'm saying? So, if I don't know what my primary outcome where I'm going, what is the goal at the end of this period of time, how am I going to come up with intermediate outcomes?

Dr. Downes: I think you make a good point. I think one of two things: one, to determine whether an intervention—for example, going back to the cab driver's example, to determine whether an intervention was even needed, you'd probably do another type of study to determine like more formative research to determine whether it was even needed.

Dr. LeMasters: Okay, is it even a problem.

Dr. Downes: Yes, before you would even start a project that developed an intervention—or, yes, to develop an intervention. So that would be probably a whole different study before you would get to that point. And some of our studies are looking at—and we've found this with some of our reviews is some of it is we get to the end and it's an output and the finding is that this doesn't work, it's not needed. And then we don't produce an intermediate outcome because the finding is there's not a problem, it's not needed—

Dr. LeMasters: Well, that is the intermediate outcome, though, you see? Finding out whether or not an intervention is needed is an intermediate outcome. That intermediate outcome then may say, well, we don't need the goal, the final outcome, which was recommending change, recommending ways to deal with aggression. The intermediate goal would be is there a problem and how do we determine that? And then the final goal would be if there is a problem, if the intermediate goal says, yes, there is a problem, then determining how we make a change with that problem to improve the situation. Do you see what I'm saying?

Dr. Lerman: Could I jump in? Because I think frankly, you're talking past each other. And correct me if I'm wrong, but I think the NIOSH working definition of an intermediate goal is getting the information out into the public, getting a recommendation to be adopted, getting a paper to be cited, that sort of thing. And I think what you're referring to is actually further upstream than what NIOSH is referring to as an intermediate goal. Or an intermediate outcome.

Dr. Reponen reminded Dr. Downes that she had a slide that shows the intermediate outcomes and requested that she put the slide up.

Dr. LeMasters continued, okay, and then the end outcomes. So, there are intermediate outcomes and then there are the end outcomes. So, when I see that you develop interview questions, I mean to determine what the intermediate outcome—without knowing the final, the end outcome, personally for me it would be hard to develop what the intermediate ones were.

Dr. Downes explained that we defined end outcomes as our reductions in some health or safety outcome. So a reduction in exposure to some sort of chemicals, a reduction in musculoskeletal diseases in agriculture workers, whatever it is. So, we do have those. I mean to be able to do a project, when people put in proposals for the NORA competition, they're required to show how it addresses strategic goal(s). Strategic Goal 2 is a reduction in hearing loss, for example. And then they go down and the intermediate goal could be something to the effect of manufacturers will adopt something because they could be addressing technologies. So, their project could be looking at trying to revise or tweak an existing technology or develop a new technology relating to hearing loss.

Dr. Reponen asked if the end outcome relates to the like reduced exposure, reduced injury/illness?

Dr. Downes replied yes.

Dr. Reponen responded that it's project specific. So, I guess that probably was implied, but that was not defined. But you had one of the recommendations was that the intermediate outcomes need to be better defined?

Dr. Downes explained that Yes. We have a working definition, but I think that for project officers it needs to be a little bit more lay language for a non-evaluator because they have trouble connecting to more a more evaluation, technical language sort of thing. So, we have a workgroup working on that now because they're trying to change some things in the project planning guidance and it's to make it more usable for project officers.

Dr. Reponen: responded and said she remembered one of the outcomes from the focus groups was on how is it collected and who is collecting? I guess that's a big question because that can take a lot of resources.

Dr. Downes agreed.

Dr. Reponen said that it was much more difficult than counting the publications or counting clicks on the website to look at these.

Dr. Downes responded, exactly.

Dr. LeMasters wondered, looking at this intermediate outcomes and translation, where do you see translation coming, translation after you've got the primary outcome, end outcomes, and translation is part of that end outcome, is it not?

Dr. Downes responded that we have translational research, and we have the transfer/translation. And so, we really look at that as you have your output and then transfer happens. So, what do we do to get it in the hands of somebody that can actually use it?

Dr. LeMasters: Right. So where does that appear—what do we do to get it in the hands of people that would use it? Where is that on this description of surveillance and evaluation? Would that be another one?

Dr. Downes: No, if you look up at the model, it's between outputs and intermediate outcome. So, for example, we might have outputs and we're using social media to get something out into the world. Well, that

would be our method of transfer and somebody picks it up and they further disseminate it and that would be the intermediate outcome.

Dr. LeMasters: So, the translational part, as you're describing it, is an outcome also, correct?

Dr. Downes: No, are you talking about translational research?

Dr. LeMasters: No, I was talking about your definition of translational—I assume you meant translational into the public, right, translational information? Or you tell me what you meant, I guess.

Dr. Downes responded**,** Well, there's transfer/translation and that's where you try to take your output and transfer it to somebody who can actually do something with it, which would be somebody outside of NIOSH. And sometimes there is some translation in that in terms of making it useful to them or in some sort of form that they can actually use and adopt it. So sometimes, for example, in translation you might have a NIOSH recommendation, or we send somebody to an ASTM standard setting committee and instead of just we might hand over the report, but then we also have the experts sitting there and they can translate some of what was in that report or give some more information. And then ASTM ends up incorporating some of that additional expertise into their standard, so that becomes an intermediate outcome. There's also translational research, which is a little bit different because that's really a type of research. So, for example, we have an evidence-based intervention, and we want to further disseminate it. So, we know it's effective, we've tested it for efficacy and effectiveness in Group X. But we think, hey, maybe it can work in Group Y. We have to figure out through a research study how do we get it to Group Y and is it effective in Group Y? And that's translational research.

Dr. Reponen asked, I just wanted to understand, you had four topics and it looks like you're reporting you completed three out of them and fifth will be completed by the end of 2021. Was that initial plan to get it completed by this time? I'm not exactly sure what is your Year 1? Is it from last September to this September?

Dr. Downes responded, Yes, so we wrote this in calendar years initially and part of our going back and reassessing based on some of the COVID activity that's continued to happen, we'll be readjusting by fiscal year so we can make sure that we align better with the BSC calendar. But for Year 1, it is by calendar year. So, we do have all the meetings set up for the translation workgroup, the refinement workgroup for the rest of the year to get that last activity completed by the end of the year.

Dr. Reponen: And then if I understood correctly, the agriculture, when you connected with them that was like an extra thing.

Dr. Downes agreed.

Dr. Reponen: Was that in your plan for on, or was it just implemented? Was not in your initial plan?

Dr. Downes: It wasn't in our initial plan other than we wanted to do it. We included somebody from the Office of Extramural Programs because from the beginning it was our intent to somehow bring extramural programs more into what we were doing intramurally. But we didn't expressly put it any specific activities in

the plan. So, we've worked with them as we've gone on. So, the intent to work with them was there, but specifically how we were going to do that or what we were going to do wasn't spelled out in the plan.

Dr. Graham wanted to know if there are efforts to sort of showcase the new NIOSH outputs in order to encourage their adoption in maybe standards that are being revised or regulations that are being revisited to sort of enhance the opportunity for these different NIOSH programs to have an impact.

Dr. Downes: I'm glad you asked that question. It's a really, really good question. To be honest, one of the things that we talked about in terms of the communication piece is that we've often been reactionary and not proactive. And one of the pieces that we wanted to put together was these things that we're calling impact sheets. And we've been doing some interviews. We couldn't interview Congressional staffers, so the next-best thing was to interview some folks from CDC Washington and some other policy people in some of our other CDC centers. They took a look at the draft impact sheets that we had to try to figure out: Is this something that's going to be useful? Is it in a format that they could really understand? Is it too jargony, that sort of thing, that conveys some of the impact that we're having and some of the outputs in the research that we're doing? And when would it be useful? How could we get it to them? And some of the discussion was around, well, some of this might be helpful if you target it towards specific senators or specific congressmen or women when there's specific legislation coming out. So that's one of the things that we talked about using those for as opposed to just an all-out send these out blitz and doing some targeted information based on what's going on in that person's state or specifically around legislation or specific hot topics that might be going on. But we did get some feedback on how we might need to reformat them and change some of the language to make it a little easier to understand for non-OSH community. So that's a really good question and that's something that I think we're going to try to pursue.

Dr. Graham said that was really good to hear because there is a lot of talk about ASTM and there is always ongoing revisitations in ASTM as well. So, if you were able to sort of have some partnerships where you could be aware of what is being revisited and maybe reach out to whoever is leading the group, that could help with intermediate outcomes.

Dr. Downes said that that was helpful.

Dr. Barton was interested in the panelist responses. When you said that they were interested in including weaknesses in evidence packets. I assumed that you already have weaknesses included in there, right?

Dr. Downes responded, we really tried to pick things that we knew that we had a lot of work going on around to present, so we had intermediate outcomes because that's what Contribution Analysis the framework hinges on, being able to demonstrate these intermediate outcomes. So, a lot of our work that wasn't as far along or we might not be able to demonstrate those intermediate outcomes, we didn't present because we needed to be able to present these things that had intermediate outcomes. So, I don't know that we intentionally left them out, but because we were so focused on intermediate outcomes, that's what got presented.

Dr. Reponen said, I also wonder in your focus groups when you had the participants of the program directors you had, I'm assuming you had some that had gone through evaluation. Did they indicate if there was any

change in what kind of changes were made based on the evaluator? So basically, this continuous improvement loop, was that happening or was it like they get the recommendations from the evaluators and, okay, that's in a document and everything continues? I'm just wondering how that works.

Dr. Downes: Yes, that's one of the areas that we need to improve in that we heard from them and we heard from others. We especially asked some of the researchers, "Are you aware of the recommendations that we got back from these reviews?" Some of them were not aware of the recommendations that we got back. People seemed to be really focused on the scores that we received back and less focused on the recommendations that we got back. So, one of the things that we are thinking about - and, again, this is very early in the process - but we're thinking about possibly eliminating scores and really focusing on the review recommendations because what's going to be most helpful to NIOSH are those review recommendations and not a numerical score, which is sort of arbitrary. So, that is something that we can do moving forward. But also looking at the recommendations, many of them were fairly unwieldy. One of the five programs that were reviewed received about 20 recommendations and they covered a vast population of subgroups within their particular sector and a vast spectrum of types of research and different areas that needed to be looked at. And there is just no way that that group could handle that either. So, I think we also need to be asking more targeted questions on the front end for reviewers to respond to as opposed to just giving them a general charge of, judge us on impact and relevance, and leaving it so open-ended. Also, are there specific evaluation questions that we can ask to get them to focus more on? Those are all things we are thinking about.

Dr. Lerman wanted to know if you get 20 recommendations, for instance, is there a process downstream of that to whittle it down to prioritize which of these recommendations should we be focusing on and which may or may not be good ideas, but they just don't make the cut?

Dr. Downes responded, we don't have a firm process on doing that. Often we leave it to the program to kind of say, "Yes, we think we can do this," "No, we can't." And often it's put into the strategic plan, some of these recommendations, but then, since we do it through a competition, there's no way for sure to know whether that recommendation is going to be addressed or not, or if somebody is going to write a proposal to address it or not. So that's another thing that we have to consider. And some of the recommendations we get are sort of even outside the scope of what NIOSH is congressionally mandated to do. So those are also some of the issues that we deal with. We don't have a specific set-in-stone way to deal with those things, no. We typically leave it up to the program based on what they think they can do.

Dr. Lerman followed up by saying, not every recommendation is a good recommendation. I am giving you some input right now and you might decide thanks, but no thanks.

Dr. Downes responded: Yes. It is also hard to say no to recommendations because they are good recommendations. So, we have started saying, "At this time, maybe we don't have the expertise, maybe we don't have the resources." So, this is the first time we've actually been able to sort of say those things. But also keeping open the door that maybe in the future, should circumstances change, we will revisit it. But thanks for that feedback. That's really nice to hear.

Dr. Reponen indicated that since there were no other questions the scoring exercise would be next.

Scoring Progress on the NIOSH Evaluation Capacity Building Plan

Regarding scoring, **Dr. Reponen** explained that there is a five-point scale and scoring can be done using half points, decimal points or also using increment numbers. And it's supposed to be a consensus, so everyone's score would be compiled, and one overall score would be given. She indicated that she would use the same process that she uses with her students when they had a Ph.D. defense. She would let the committee give their comments about which one they liked and then go ahead with the floor recommendations on what score should be given.

Dr. Cox noted that there was an issue about value weights. There are criteria and one that was touched on earlier, is how seriously do stakeholders take this exercise, implement it and then learn from it, which he thought would ultimately be the goal of the program. He went on to say that so far there's room for improvement there. On the other hand, he thought that all first-year goals were met, but not that important, long-term one. So, where we end up on this 1-to-5 scale depends very much on the relevant weights given to those components, which he thought were subjective. He asked if there was an overall guidance on how much weight to give to the different criteria?

Dr Reponen responded that it is basically asking how well they implemented and if they met their targets and it looks like the targets were met but she wanted to know how to define the implementation.

Dr. Lerman said he didn't think the goal was to succeed in changing the hearts and minds of NIOSH staff yet. You have identified strengths and gaps and developed a plan, which I think was basically what you hoped to do in Year 1. I think I heard, I if heard correctly, that Number 3 didn't progress because of COVID, which is understandable. But if basically you achieved your Year 1 objectives on 1, 2, 4, and 5, in a COVID year that seems like a solid 4 rating, maybe even a 4+, if I'm understanding correctly.

Ms. Novicki responded that there was never a plan to get to that this year. Just in thinking of a five-year plan, it didn't make sense to get to that piece.

Dr. Reponen wondered if that was not even in the initial plan to be done and wanted Dr. Downes to comment on when that would start.

Dr. Downes responded that it was actually scheduled to start in Year 2.

Dr. Reponen followed up: Year 2, okay, so next year. So that was not for Year 1 anyway. Out of the five topics, only the four topics had some activities and, again, they will continue. But there were certain activities that were planned to be done in Year 1 and it looks like they are all completed except that the translation research will be completed by the end of this year. Everything is already scheduled that could be completed.

Dr. Lerman said that sounded like a 5 to him.

Dr. Reponen inquired if anyone had an opposing argument.

Dr. Cox said that he would favor a 4 because to him a 5 says there's no room for improvement. However, he wondered if that was really true because it seems to him as if the has done a great job under difficult conditions, so he wanted to know if we were to say 4 versus 5, does that affect people's paychecks? He said the useful feedback is that at the end of the day it is real-world change that is the value of an evaluation program. So there needs to be progress towards that. That being said, I think the staff has done a great job, under challenging conditions. He went on to say it is a little ambiguous about how the numbers will be used and understood it should be between 4 and 5.

Ms. Novicki explained what the numbers would be used for. She said that this is a GPRA measure which stands for Government Performance and Results Act. We have a suite of about 10 or 11 GPRA measures that we report to Congress every year as part of the budget package. We have our budget request and then there's a performance section where we report on GPRA measures and so it will be a part of that package. There's not a direct impact on our paychecks or anything like that. It is just one piece of information about our performance that goes to Congress.

Dr. Cox responded that if that was the purpose then he would be glad to give it a 5 since he thought the performance was good. In other words, if it may affect budgeting and that overall evaluation, from that standpoint he thinks it's a 5.

Dr. Reponen agreed that she would tend to also look at it favorably also since it has been a challenging year. And even though the fifth one is not done yet, from all indication it looks like it will be completed.

Dr. Barton agreed that it is a 5.

Dr. Olszewski supported a 5 as well.

Dr Schenker said that it is interesting that 5 says "very good progress." It's not "perfect." I think "very good" is a standard that I could support as well is a 5.

Dr. Reponen then declared a consensus of a 5.

Ms. Novicki said that each member had to verbally give their vote on the consensus score. The

response would be yes or no regarding the final score of 5 so that the majority vote would be recorded. The vote was unanimously “yes.”

Dr. Reponen thanked **Dr. Downes** for her great work during these difficult times and said she assumed

that next year the scoring will continue using the same exercise again.

Public Comment

There were no public comments.

Mental Health Initiative for Health Workers

Presentation

Dr. Reponen reminded the members that the next topic would be the NIOSH new Mental Health Initiative for Health Workers and that Dr. Tom Cunningham had posted two questions for the Committee to discuss after the presentation. The first one is: What does success look like in this program? And the second is: What might be missing?

Dr. Cunningham thanked everyone for the opportunity to address them and introduced himself. He said that he is a Senior Scientist in the Division of Science Integration and has been with NIOSH for about 13 years and has recently come on board as the Scientific Lead of the new Mental Health Initiative for Health Workers that about which he would be sharing information.

Dr. Cunningham stated that as part of the American Rescue Plan of 2021, NIOSH received funding from Congress specifically to develop a national awareness and education campaign to safeguard and improve the mental health of health workers. He explained that when we say "health workers" we include not only frontline healthcare workers such as nurses and physicians, but also EMS first responders, mental health workers, public health workers, and the many support roles that may not be as high of a risk for an infection but certainly are subject to challenging working conditions. He said some might ask why has NIOSH received this funding? Well, one of the main points of emphasis in the American Rescue Plan is to address the mental health needs of health workers, and workplace health and safety issues are obviously right in our wheelhouse. But what might be a little less well-known is that NIOSH has been conducting and supporting workplace mental health research for more than 30 years.

NIOSH has experience in examining mental health impacts of work conditions such as nonstandard work arrangements, work hours and fatigue, occupational stress and, sadly, we know these conditions permeate many industries. But, specifically for health workers, our *Total Worker Health* Program, the Healthy Work Design and Well-Being Program, Healthcare and Social Assistance Program, and the Work Stress Prevention Program at NIOSH represent the historical underpinnings and expertise we bring to the table as we launch this new Mental Health Initiative for Health Workers.

The NIOSH approach to any worker issue is to minimize the hazardous elements of any job. So, for example, it's not possible to overcome 10-12 hours of difficult work in a day, or poorly designed work, day in and day out, with a referral to the Employee Assistance Program or an add-on wellness program. We know that's not going to be an effective approach. So, we know this is going to be especially critical to build a sustainable solution for health workers going forward.

Dr. Cunningham said that as we move forward with this initiative, he also wanted to highlight where our focus is. It is really at the level of the employer, because that is where the authority rests, to set workplace demands and change critical policies like schedules, how much flexibility is provided, how supportive the supervision is, and how many controls and resources are given to address workplace demands. So, we want

to empower employers with useful messages and effective tools, as well as workers, so that they can get them into the hands of health workers in their work environments, where we know they are already stretched to their breaking point already.

Dr. Cunningham indicated that before going into some of the specifics about what we are doing currently in the initiative, he wanted to touch on some of the current health worker burden data that he has been compiling and learning more about recently. So obviously, in the face of the COVID-19 pandemic, we have all seen lots of reports of the mental health impact that the pandemic is having, particularly on healthcare workers. We know that there are more than 20 million healthcare workers in the United States, and if we include mental health workers, community health workers and public health workers, that's several hundred thousand more workers additionally, that we are trying to do something for here.

We know during the course of the pandemic that virtually everybody working in the health profession has been stressed by their work, and we have seen some indications of severe mental health challenges being reported as well, and being elevated, in particular among different groups. But overall, if we look at things like pooled prevalence of depression and moderate PTSD, that's nearly a quarter of folks working in these professions that are reporting these symptoms, and this is certainly an alarming trend. But we also recognize that these challenges are not new to healthcare. We view many of these challenges as longstanding issues that we know were around before the pandemic started, so that's why we want to build sustainable solutions.

Now, we've certainly heard of those sort of headline types of mental health issues that lead to things like suicide among physicians for example. That has certainly caught lots of news attention. What may not have received nearly the same level of attention is the number of people potentially leaving the profession in the light of the pandemic. For example, if we just look at nurses, there's data showing that nearly a quarter of nurses have been considering leaving their positions over the course of the pandemic, and they reason they are considering leaving are many things that we would consider work organization issues. So, thinking about things like insufficient staffing or the intensity of their workload or not feeling like they're listened to or supported on the job, those are things that we think can be addressed at the employer level. Thinking specifically about physicians, nearly 80% reported burnout prior to the pandemic. Seventy percent or nearly 70% have reported some type of depression symptoms, and roughly 13% have reported having thoughts of suicide. So again, burnout, stressors, and workplace stress are falling on this continuum of mental health challenges, so we are not just focused specifically on suicide but many of these other challenges that lead up to those points. We are seeing all of these things increasing in the course of the pandemic. And as we think about developing messages going forward, I think it's important to note that the vast majority of folks working in health professions are women, and if we look at physicians who report feeling burned out, the majority there are women physicians, 64% reporting being burned out.

Thinking about much of our own CDC workforce and the public health workforce in general, we want to include public health workers here too because we know that this group, based on the MMWR report that came out over the summer, this group is reporting significant levels of mental health challenges as well. Looking at reporting symptoms of depression, anxiety, PTSD and/or suicidal ideation, more than half of a

pretty robust sample of public health workers have reported significant mental health symptoms in the past two weeks when the survey was collected. We don't really have good baseline data on levels of mental health challenges in the public health workforce but again, we know that this is a workforce that is being stretched to their breaking point as well.

Dr. Cunningham then wanted to shift attention to what we are trying to do with the initiative. He said that the overall objective for this initiative is to improve the mental health and well-being of the nation's health workers through prevention, awareness, and intervention. He illustrated the 5 main objectives that would be used starting at the upper right which spotlights the personal, social, and economic burden of poor mental health outcomes among health workers. Second, we want to develop a repository of best practices, resources, and interventions. Third, we want to inspire, amplify, and support partnership efforts. We have a wealth of partners that have already been in place for both NIOSH and the CDC Injury Prevention Center who are working alongside of us in this effort, and we want to take advantage of those partnerships but also develop new ones. Fourth, we want to improve data, screening tools, trainings, resources, and policies for sustainable change. And finally, we want to generate awareness around mental health challenges among health workers, and that is really the headliner from the American Rescue Plan - to do this national social marketing campaign to bring the message to all these different audiences that we want to be able to reach.

Some of the more specific activities that correspond to each of these objectives, we've already begun work on delving into the more national health worker mental health datasets and, additionally, bringing on external experts to help us out with that through some contract mechanisms. Around our objective to assimilate the evidence around effective interventions, organizational best practices, current resources, this is where much of our effort is currently. So here, we have an external support team of approximately eight external academic folks working through either contract mechanisms or Intergovernmental Personnel Act agreements, or IPAs as we call them, where we are able to get academic folks onboard. We are really excited to have Dr. Kent Anger managing this group of external experts that are working to, again, assimilate what are the evidence-based interventions around mental health for health workers, and around mental health in the workplace in general, to do some of that sort of systematic review work to better understand what the quality of evidence is for those interventions, to help us grade some of those and suggest ones that might be most effective to promote more broadly.

We also recognize that there are lots of good things going on that might not be represented in the peer-reviewed literature. So, part of what that external team's task includes is an environmental scan of what's being done currently by different health systems, doing some key informant interviews of decision-makers and leaders in different health organizations, to identify what they think are the best practices, or where they could use some help.

Moving around the wheel now to the bottom around partnering for impact, here we are relying on several existing federal partnerships. We are also leaning heavily on our *Total Worker Health* Centers of Excellence that you heard Dr. Howard mention, that we've recently been able to fund several additional ones there. And of course, several of those more health industry-specific partnerships that we are able to take advantage of through our Healthcare and Social Assistance Program that keeps us well-connected.

Our fourth objective is to identify or to adapt new tools and we have already had significant progress in terms of getting some extramural grants funded. We also have an intramural competition that we are conducting right now. And we have also funded some work around expanding or promoting use of the WellBQ questionnaire that NIOSH has developed that organizations could use, and we are thinking about how we might develop a data clearing house for organizations to do some benchmarking or comparisons.

We have also invested in our Quality of Worklife survey to add some new items specifically around mental health outcomes, and also try to sample more broadly among health workers so that we can look at not only some of those workplace stressors, job demands, resources that are available, but also tie or connect those directly to outcomes related to depression and other mental health variables. And then the fifth objective around generating awareness. As previously mentioned, a lot of our resources from this are driving towards conducting that national social marketing campaign that we hope to get off the ground very soon.

And just to tell you a bit about the NIOSH Action Hub in the middle there, so this is made up of not only an operations team that includes me and several other senior leaders at NIOSH who meet on a weekly basis to monitor our progress and coordinate with both intramural and extramural partners. We also have what we call a Scientific Working Group of about 18 or so internal NIOSH experts that meet every couple of weeks to assure scientific integrity, to help provide and coordinate our knowledge base with those folks that are working with us externally on the assimilation task as well, and to help us evaluate and report on success. There are folks working inside that Action Hub in the middle of all this activity, that we are really fortunate to be able to take advantage of.

Dr. Cunningham also mentioned some of the progress and next steps around each of the objectives that were laid out. First, around understanding health worker burden, some of the things that have already been completed, in addition to giving some contractor support, some of our researchers in DFSE have been doing some analyses of the most recently available Behavioral Risk Factors Surveillance System survey data -that's the BRFSS data. There is data from approximately 32 states, with industry and occupation coding there. The goal is to be able to create some data visualization products using those data, some pooled analyses from Quality of Worklife data and other data sources, to paint a clear picture of health worker burden as it relates to mental health outcomes. Around the assimilation of evidence, this is where the greatest volume of work is being done right now with our external support team.

Dr. Cunningham then spoke about the Request for Information that was just recently published. During the break he attached a link to the RFI in the chat. He explained that the goal is to receive comments from the public about effective interventions that they should be aware of like who's operating in this workplace mental health space, specifically among health workers, that we might not be aware of and that we should be connected to that would help to identify potential partners. Also helping us to think about how to evaluate our efforts. There are ways that organizations are gauging the effectiveness of what they are already doing around mental health interventions in their workplaces. He said that the RFI is open for comment through late November, and everyone is encouraged to take a look at it and share their comments or perhaps more importantly, help to disseminate it as widely as possible. It has already been shared with a number of our external partners, requesting that they disseminate it widely, along with a promotion toolkit

that includes social media elements and a newsletter flyer that people can use. We have already heard positive responses from our partners that they plan to promote that widely for us. The comments that we receive will be an additional set of input that we can include in the assimilation report that we are expecting to have roughly around January or February of 2022.

It is very important for us to work with our new partners as well as with our longstanding partners. We've been making the rounds with a number of different groups including HRSA, who also received a significant amount of American Rescue Plan funding. They are nearing the end of their call for proposals for up to $120 million in funding, specifically around developing resilience training for frontline healthcare staff. We have already had some conversations around giving our awardees an all-awardee workshop or opportunity for connection, so that some of the people who have been funded through the *Total Worker Health* Centers of Excellence and the specific research grants that were funded by NIOSH through this initiative might have the chance to connect with those who are being funded by HRSA.

Dr. Cunningham also mentioned that the Action Alliance group [National Action Alliance for Suicide Prevention], who they were able to connect with through the CDC's Injury Prevention Center, has been a phenomenal resource. Connecting with a wide network of partners. They have been operating in the suicide prevention space for about a decade already and have made a number of key connections. They are also a really good resource around messaging, specifically around suicide prevention and mental health. So, we have been really fortunate to work alongside of them.

Another resource is the American Federation of Teachers. Some might be wondering why the AFT is noted here. They're actually the second largest organized labor group representing healthcare workers in the U.S., which I didn't realize until we got into this initiative, but they have proven to already be a really important partner for us, not only in terms of reaching a significant portion of our healthcare audience, but also with sharing some data. They are routinely surveying their members. So, we are looking forward to hearing from them, as well as The Joint Commission, very soon about some surveys they are doing around moral injury or burnout among health workers. Around the objective for identifying or adapting new tools, here some of the progress we've made includes getting that funding out the door for many of the *Total Worker Health* Centers of Excellence research projects. So, we were able to select specific projects within those Center applications that are relevant to this, and we were happy to see about a dozen or so that were directly relevant to this initiative.

We have also funded a cooperative agreement with the American Hospital Association recently - we just kicked that off. They are going to be doing some work around identifying suicide risk and assessment best practices that they are able to glean from their members. So, they cover, hundreds if not thousands of hospitals across the U.S. We are looking forward to them sharing some of those findings with us. Again, we'll be able to fold that into our assimilation report, but then also work with the AHA as a key dissemination partner, given their reach across hospitals. The next steps include conducting our own intramural funding competition. We have already announced that internally at NIOSH. We have a group of interested researchers that have already submitted their Notices of Intent and are moving forward with developing

project proposals for two-year projects. We will be exploring new grant and cooperative agreement opportunities to supplement ongoing efforts here.

Finally, around generating awareness - some of the work that we have completed already, so we have been reviewing recent campaigns. We realize we're not the first people to come along and realize that the mental health of health workers is important and needs to be addressed in a large-scale way. So, we are reviewing some of those existing campaigns right now. We have secured a contractor to start doing a trademark review for us and developing some of that brand identity that we are going to need for this initiative. One of the next steps we are looking forward to is actually having a campaign name and a logo that we will be able to share widely. And we will also be looking for a social marketing contract to be awarded early in fiscal year 2022 as well. So, we have got that Performance Work Stat. prepared and it is being reviewed and sent through the proper chain. We will be looking for a significant contract to be awarded very soon. And the flow of work is that we want to assimilate all of the evidence and the best practice information that we can, pulling everything we can from the Request for Information, and have a report that we can hand off to a contractor and say: look, here's all the tools and interventions and resources that we think need to be promoted. Help us figure out how to get that out now.

So, regarding some of our timeline and our initial milestones, you can see some of the key things that have already been happening, or have happened, in fiscal year 2021. I will highlight just a few things that are happening in fiscal year 2022 early on. So, as I already mentioned the Request for Information. That was a key piece for us to get out, and we are already seeing several folks mention it and share it widely. I checked just before we got on, and two people have already commented on it in just the few days that it has been available. The other thing I will point to, down near the bottom - we have it labeled as a kickoff webinar, but it is more of a call-to-action webinar, with the Office of the Surgeon General and key leaders within CDC and NIOSH as well, to highlight this issue, to announce this initiative to the world more broadly, and to really focus attention here so that folks can be more aware of the mental health challenges that are being faced by the health workforce.

Dr. Cunningham also wanted to mention that as we just came out of September, which was Suicide Prevention Awareness Month, we published a NIOSH Science Blog with NIOSH authors co-authoring this piece along with partners from the Action Alliance as well as from CDC's Injury Center. So, we were really excited to see that come together so quickly with this diverse group of partners that we have been working with, and we look forward to posting additional Science Blog pieces going forward, not only with our internal scientists but with folks from groups such as the American Nurses Association for example.

We presented three questions in advance. The first one is, "What does success look like for this initiative overall, and for that communication campaign more specifically?" So, we have to think of that campaign as sort of the centerpiece of this broader initiative. You can see that we've done a lot more here than just start putting together a communication campaign. And the second question is: "Given the comprehensive approach NIOSH is trying to take to address health worker mental health and well-being, what are we missing here?" As you can see, we are trying to cover as many bases as we can think of to make sure that we have received good evidence-based information, that we're able to reach the right audiences, that we understand

those audiences as best we can, and lots of associated activity. But given everything that we've laid out to you, what do you see that might be missing? And then before we jump into answering some of those questions, I just wanted to acknowledge some of those other folks that are on that operations team alongside me, including Lore Jackson Lee, Casey Chosewood, Paul Schulte, Christy Spring, Summer Slaughter, and Syd Webb. So, thanks for that, and I think we can move to our discussion now.

Discussion

Dr. Roy said he personally couldn't think of anything more important right now. It has been an important issue but sadly, with the pandemic and everything, this has been brought really to the forefront, and I think a lot of help is actually needed. And again, I have a bias in this. I have a family member who is an integrative health and wellness coach, and a resident physician in the family. So, this is very near and dear to my heart. A couple of things. Speaking of that, have you reached out to the National Academy of Sciences, the Institute of Medicine? They have a clinician well-being program that I know they're very heavily into. And just one other thing. I am from Minnesota and when you mentioned that with partnerships and academic institutions, there are a lot of them with world-class training on well-being and things like that, and one of them is the University of Minnesota's Center for Spirituality and Healing. I think they've been a leader for over 20 years in health and wellness. Have you, you know, made inroads to any of those academic programs and, even important, residency programs for residency physicians, I think get at the prevention early on because you know, they're already under stress. They're brand-new physicians. They're working a lot of hours, and those academic and other programs that host those I think would be very, very well-served by bringing this to the forefront to them. I'm sure they realize that, but maybe they don't realize that they have all the - there are people out there to help them to put these programs together. I know that was a lot but again, thank you, thank you very much for this initiative. I think it is critical.

Dr. Cunningham responded that he jotted down three questions. The first question was if there was any connection with the clinical well-being group at NAS. The answer to that is yes. Within the broader group of NIOSH experts that serve on our Scientific Working Group, we have a couple of folks there that have been serving with that group. So, we are connected there.

The second question was about how we are connected to some academic centers. **Dr. Cunningham** said that the first thing he will do is point back to those *Total Worker Health* Centers of Excellence. We are connected to ten leading research centers that are addressing some element of mental health in the workplace in some way, shape or form. In fact, one of those Centers at Johns Hopkins is specifically devoted to workplace mental health. More broadly than that, I think our Request for Information will be one way for us to become aware of some of the groups that are doing more specific work that we wouldn't be aware of if they're not applying for NIOSH funding. That is part of our challenge. We are also going to be learning quite a bit about other academic institutions that are players in this space through our collaboration with HRSA. They are potentially expecting about a hundred or several hundred applications for their funding opportunity, which is a much bigger group to look at than what we're used to seeing.

The third question was about connections with residency programs. **Dr. Cunningham** said that the point is well-made that we need to be able to address some of these issues on the front end in terms of workforce

training. One of our partners, the American Federation of Teachers, actually has very good connections to many of those Tier 1 academic institutions that have medical residency programs there as well. We have already had conversations about whether there are elements that could be incorporated into training that they could help support. They have a keen interest in that as well, so there is a nice alignment there.

Dr. Olszewski said that she is a practicing nurse practitioner in occupational medicine, as well as Director of Graduate Nursing Programs at one of the state universities in Pennsylvania and everything that he talked about is what is going on in the healthcare field right now. She said one thing that just kind of came to mind is, "What are your thoughts on the vaccine hesitancy and vaccine mandating among healthcare workers and how this might impact mental health?" Because I know that's a big topic right now here locally. My other question kind of piggybacks onto what Mr. Roy just said as far as looking at nurses before they enter the field, or nurse practitioners that are already nurses and training to be advanced practice nurses. There was a lot of anxiety going through the pandemic, and I think that's an opportunity to look at that group, advanced practice nurses as well. I am aware of the HRSA funding. I know there are some people, my colleagues, that are very interested in doing that because they see the need as well. And one other thing I might mention, you mentioned a couple of times about *Total Worker Health*. Our association that I'm president of is AAOHN, the American Association of Occupational Health Nurses, and we represent about 4,000 occupational health nurses across the United States, I think, and having partnerships and affiliations with organizations just like you mentioned, like we do, *Total Worker Health* is key for rolling this out, and we'd be very interested to talk to you more about how we can support the initiative. So those are my thoughts, thank you.

Dr. Cunningham responded: I think your first question was how vaccine hesitancy and vaccine mandates are kind of folding into this whole mental health challenge that we've already been facing - if I caught that correctly. I really see it as potential. So, the workforce issue is one thing, but then there is also just the broader social context where everybody is doing their work, right? I think the challenge that we are seeing right now, and we've seen reports of this already among healthcare workers treating people who have been vaccine-resistant, and the additional layer of stress or moral injury that may be causing right now is significant, and we are having a hard time getting past that right now. So, I think that we have to continue to recognize the additional stressors that are being brought into the work environment, not only by the patients that are coming in, but also by the demands that are being placed on the workforce. One thing that we are also seeing is just the shortage of physicians, nurses, health workers in general. That is only getting worse right now. That is sort of compounding all of these challenges, because the people who are still there and showing up for work, they have fewer supports around them. They are having even more intense workloads. So, I think it is just sort of this compounding or magnifying effect that we're seeing.

Regarding the question about training for nurses and advanced practice nurses, **Dr. Cunningham** said that he again thinks that it goes back to that same point that Robert was making about the importance of getting these issues out in the open early on. We have this sort of gigantic barrier, systemic barrier, that has to do with licensing and stigma around speaking up around mental health challenges. And so, if we want to change something like stigma, that is sort of an end outcome in this kind of a game, to being able to make those kinds of changes. So, we can address those issues in the training environment and as people are approaching the profession, I think the better off we will be.

Dr. Lerman added, I tried to look at your question regarding what success looks like. It is sort of tying it into this morning's discussion. I think you have a lot of partnerships and you're well-positioned to do this, but an intermediate outcome that I think is critically important is through those partnerships or other routes. Do you get tools that you have developed or identified or adapted, implemented by these partners or others? That's an important intermediate outcome. And then working with those partners who actually do implement the tools - assuming that you're successful in getting them to do that - is assessing whether those changed end results, whether it's stigma, whether it's depression, burnout rates, whatever those might be. But looking at the actual tools that you pushed out, and then measuring did those tools make a difference. So, the first part of that is, I think, comparatively easy; the second part I think is probably quite difficult, but I think that would be a great way of measuring success.

Dr. Cunningham responded that he thought the comments very much on the same page with how we are thinking about this. So, I think you actually described one of the specific intermediate outcomes in our logic model that Amia helped us put together. So, good to see our thinking is aligning here. In addition to seeing if partners are implementing things that we're recommending, we want to see if employers are implementing things as recommended or if they have intentions to do so. Those are things we can measure, and so we want to do that, and we plan to do that. We also want to know if workers are able to actually take advantage of the resources that are being provided. So, that will tell us a few things: one, if they are seen as effective; but two, if they are being given opportunities to use them. I think that is a big part of what we are trying to communicate is for employers to find ways to give employees the time and opportunity that they need to take care of their mental health.

And to your last point, you know, to be able to actually see changes in levels of depression or anxiety, or suicidal ideation, any of those kind of mental health outcomes that we're interested in, you're right. That is going to be a serious challenge. Of course, we will continue to try to build surveillance around those issues as best we can, but I don't think it is going to be a direct connection to success of the campaign, so thanks for that.

Dr Lerman said, to be clear, that last part, what I was thinking of wasn't globally measuring levels of depression, but measuring levels of depression, burnout or whatever in the target population of the toolset that you push out.

Dr. Schenker wanted to extend congratulations on the comprehensiveness and importance of this effort. In terms of the questions, and number two, what I heard missing was the word "immigrant". As you know, immigrants make up a large proportion of the healthcare workforce, both in doctors and nurses to community health workers, home health aides, and others. And the burden of being an immigrant compounds the stressors that you've been addressing, and I just wonder how the effort is going to address this, whether you have a special initiative in that regard. My recommendation is that it be included in your efforts because it is intrinsic to this workforce.

Dr. Cunningham said that he couldn't agree more that this is certainly an important issue for us to incorporate throughout the entire initiative, and specifically within our communication efforts, to have tailored communication, tailored messages for specific groups of workers. So, one of the ways we are trying

to address that right now is in our characterization of burden work that we are doing right now. So just as an example, within that BRFSS dataset that we are working with, right now we are trying to pull out demographic information so - you know, what does that look like in terms of the different occupations. And to your point, certain occupations are certainly populated more by immigrant workers than others. So that is certainly something that we want to take into account there. Additionally, in our interactions with our partner organizations, so for example the American Nurses Association, they are keenly aware of the varying demographics within their organization as well, and we have had conversations around, again, how do you tailor messages for specific groups, make them more relevant, those kinds of things. So, thank you for that.

Ms. Doyle said that she was thinking along the lines that Dr. Olszewski was, to approach AAOHN for partnerships as well as AOHP, the Alliance of Occupational Health Professionals in Healthcare. I think they would be a key group to work with as well. I noticed that you mentioned the *Total Worker Health* Centers and partnering with them, and I would suggest the ERCs as well, because as a CE director, I am getting a lot of calls from health professionals looking for resources, how to help their workers deal with mental health stressors, and I think it is something that the ERCs would be happy to partner with you on, say during a conference or presentations for their groups.

Dr. Cunningham responded that those were great suggestions.

Dr. Reponen commented that she is one of the ERC directors and she agreed with Mary. We are training occupational health nurses and occupational medicine doctors so I think this could be implemented in our training materials.

Dr. Su said for question one regarding what success would look like, I was thinking early treatment and correct diagnosis of mental health problems, follow up progress and in-time interventions such as suicide prevention. And then for question two, I was thinking extra pay for overworked healthcare workers through the CARES Act could reduce the economic stress of healthcare workers, and if someone is more vulnerable, perhaps people could be more careful about increasing their workload.

Mr. Morrison noted the incredible amount of work that was being done and that it is so comprehensive. He said he didn't think he had seen something this comprehensive, but that the real point is always the evaluation of the program, and that's what you're really looking at; and what does success look like. I come from the emergency responder group, the paramedics and the firefighters, and you know, success is the campaign – it is one thing having a campaign but are they using the source materials within their organizations? Have they been able to do that? And I am glad you are using the organizations, because they usually are the spokespersons for those members, that they trust. And if they trust it, then bringing it into the work setting is a little bit better there too, having that trust and having that relationship.

Mr. Morrison continued, What's missing? We're going to have a lot on paper, if you go to a lot of organizations, and they say yes, this is what we have. But really, if you talk to the end user, are you using it? Do you trust it? Is it, you know, the Employees' Assistance Programs that came about really, I think, in a lot of ways to save money, are they being used? And do the employees trust them? And I think that's an evaluation that employers have to make, because I think if you really want an honest approach, what is working and

what is not working, then you have that in there. The other thing might be peers. Peers is, you know, a big program that a lot of people are using within their own organizations - nurses, doctors, having those that are willing to be a peer, to talk to others about accessing mental health services, and sometimes that breaks it a little bit better. You are talking about the stigma. There is a huge stigma in the fire service and EMS, and we are sort of rounding the corner on that. We have been able to do a lot. So, I would like to see something with that evaluation of those third-party systems that are being used, maybe peers, and then the telehealth. Telehealth is really, if there's anything that COVID-19 did, it really spotlighted telehealth. Was it going to be used? Was it going to be accessed? And really taking a look at telehealth and really evaluating that for services. I think, given our members, we saw an uptick in the willingness to talk to somebody on the phone or to talk to somebody through Zoom, and that was really incredible. But that was brought about because of COVID-19. So again, congratulations for the program - your team has a lot of work to do but I really do think you're going down the right avenues.

Mr. Folely just wanted to make a suggestion on question one, for a measure that might be able to capture, with appropriate controls of course, for some of the downstream effects on turnover, and that would be take advantage of the unemployment insurance database that can allow you to compare partners to non-partners in terms of separations. You can identify the particular employers that are your partners and then amongst them, you can calculate their turnover rates. They are not broken out, unfortunately, by occupation but if you have enough of a sample size, you might be able to use it to detect differences in separation rates between partners and non-partners.

Dr. Reponen noted that on the chat, **Dr. Judith Su** wanted to mention childcare and elderly care support for healthcare workers when applicable, to reduce stress and prevent burnout.

Dr. Cristina Demian wrote that in healthcare settings, we have annual health updates, which typically include TB screening, respiratory medical clearance, and fitness - and almost never mental health screening. We also have, in select settings, and for highly strained healthcare workforce well-being surveys. Do you think your initiative can look at probably a small number of settings to see if they have integrated annual health updates that includes a mental health assessment for the entire healthcare workforce? And what, if any, benefits may there be?

Dr. Cunningham replied that it was a great suggestion. I don’t know just yet because I am anxious to see what our assimilation report will cover, and if there are any existing sort of interventions that look at this specifically, of incorporating it into an annual health exam. But the other way that we can go with that is to include some questions about this in our key informant interviews with leaders across the different levels. So, thanks for that suggestion.

Dr. LeMasters commented that in terms of number two, what is missing, getting buy-in by groups regarding mental health disorders can be challenging, particularly when you are talking about people having suicide and depression. And what I have observed in healthcare workers over this last year or so is what I would have labeled PTSD - that they are really suffering from post-traumatic stress disorder. And I was just wondering if it is possible to think of the whole syndrome, or at least part of it, as that they are coming out of a war almost with this pandemic, and they are suffering PTSD.

Dr. Cunningham responded that he thought she was absolutely right. I think we are just seeing that now, but we are going to continue to see symptoms of PTSD among health workers. If there is a day when they say COVID, the pandemic is over, there are still going to be symptoms of PTSD lingering after that. We know that, based on how the disorder works. So, to your point, I think continuing to look at our surveillance data, so we can characterize that, is going to continue to be very important, not only now but in the coming years, so that we can see that and assess it and respond to it.

Mr. Arnone thought this was a fantastic project. He added, I'm just wondering if, in your analysis of like work organization, are you taking into consideration things that I would think more of like employment practices? So, like the on-demand nature of a lot of health work, or the fact that there is mandatory overtime, which is common practice in healthcare settings and not really in other sectors of the economy. So, things that fall in sort of the employment zone. Are you taking those factors into account?

Dr. Cunningham responded, Yes, that is a good question. I think we're doing our best to take those things into account, and you point out some elements that are sort of different about health professions as opposed to other sectors of the economy. So, I think as we are able to sort of outline what the barriers are, those will be things we keep coming back to - I think you called them employment practices. And really, I think those are sort of systems issues, right? I think it is challenging for one employer to make significant changes to how they are organizing work if the industry isn't supporting it in some way. Demanding it would be another way of describing it. So, I think we are going to have to have some creative solutions here, without a doubt, and really what we are driving towards here isn't a one-year communication campaign. Our end goal here is really a culture shift for the industry. So that is going to take a sustained effort for sure.

Dr. Reponen reminded everyone that **Dr. Cunningham** had put the link to the Federal Register, which has the Request for Information, into the chat. She hoped they all could spread the word about that. It is open until November 26th so there is still time to respond to that.

National Firefighter Registry Update

Presentation

Dr. LeMasters gave an update on the NFRS meeting. She said that NIOSH is considering methods for registration, and access to the web portal. The whole Subcommittee meeting was really focused on that issue, and we explored two possible forms of registration. One was full registration, and that means if you do full registration, that the individual can come back and retrieve all previously submitted data in their user profile, including the sensitive data. But the one problem was that it requires identity proofing, and that was the main issue. If we have full registration, where the firefighter can look over their data, change their data, add to it, then we must have identity proofing so that for a safeguard against anyone else having access to that data. Mike Loudermilk presented about identity proofing, and so what will be required in this identity proofing is not only submitting your Social Security number, but you have to require digital validation that you are who you are. And "digital validation" refers to a driver's license. So essentially, you would be

presenting your driver's license as proof when you want to go back and access your data, and also at your initial registration. So that process is called full registration.

The second option was a light registration, and with that, you cannot access sensitive data. But when you go back you can still access your name, address, email address, phone number, work status but not any details about your work. And you have no ability to retrieve sensitive data or change that data. You will be creating an account at that web portal but not have to present identity proofing like a driver's license.

After these two options were presented to the Subcommittee, there was a third which was called "no registration." That was essentially treating it like a web-based survey where you entered the data and there is no going back in order to add information later. That "no registration" was discounted, and we really focused on number one, "full registration", and number two, "light registration." Then we had a pretty lively conversation about identity proofing, and Pat sort of led that session.

Mr. Morrison agreed, Yes, we did, we did have a lively conversation, and just to let everybody know, the individuals on that conversation really represented, I think, a pretty good slice of what the fire service, what the emergency medical services, are on. So, it was a really broad base, consisting of career firefighters, part-time firefighters, and volunteers. We had a lot of people there - and non-firefighters were on this call too. Lots and lots of conversation, but really what it came down to is that the most important thing that we can do when we open this portal up is to really register firefighters in that, and what would be the barrier for firefighters coming in, or emergency responders and EMS workers coming in and registering for this system?

Overwhelmingly, I think every organization that was represented basically came down to option number two, going with the light registration. They really felt that with the full registration, you were going to turn off so many individuals just trying to get their information in. There is a lot to that, and I know that this has been a struggle for Dr. Fent and his team, trying to get this registration done, trying to get through the regulations, trying to get through the breach of a lot of this sensitive information across the globe. So, we really kind of left it out there - Grace and I left it out there - for this conversation to start by itself, tell us exactly how you felt. So, to move forward, we are suggesting - I know we don't make the ultimate decision, but the Subcommittee was recommending going ahead with light registration, to get this registration portal open and functional so we can move forward.

Dr. LeMasters clarified that this was a suggestion and not a formal recommendation, so it did not have to be voted on.

Mr. Morrison agreed.

Mr. Fent said he would give a brief update on where we are with the Firefighter Registry, and then talk a little bit more about the options that were presented back in August, and then we can open it up for discussion.

So just to refresh the BSC, the National Firefighter Registry or the NFR came about through an act of legislation, the Firefighter Cancer Registry Act of 2018, and this Act mandated that CDC/NIOSH develop and maintain a voluntary registry of firefighters, to collect relevant health and occupational information, for the

purposes of determining cancer incidence. So, clearly, the goal of the NFR is to track cancer and risk factors over time, to better understand the link between workplace exposures and cancer.

Since we last reported to the BSC, we've established our mission and vision statements, and so our mission is to generate detailed knowledge about cancer in the fire service through a voluntary registry that reflects our nation's diverse fire service. And our vision is to equip the fire service and public health communities with the knowledge that they need to reduce cancer in firefighters. So, our vision is really focused on getting the data and findings into the hands of the fire service and others, to help them reduce cancer risk among firefighters.

Lastly, our protocol, which was developed with input and guidance from the NFR Subcommittee, provided our overarching objectives. And our objectives including collecting self-reported information on workplace and personal characteristics through an online web portal, obtaining records from fire departments or agencies to track trends and patterns of exposure, and then linking with health information databases including state cancer registries and the National Death Index.

I also want to just draw everyone's attention to the NFR logo, which was recently approved, and you will notice that it has a lavender ribbon, and that color ribbon represents all forms of cancer. So, it is really important to note, again, that all firefighters will be strongly encouraged to join the NFR, not just those with cancer. The NFR is really more of an exposure registry than a cancer registry, and this is essential for understanding the differences between firefighters who do or do not develop cancer. Firefighters' participation in the NFR is completely voluntary, but we do hope to enroll 200,000 or more firefighters over the next several years, and we will have a recruitment emphasis on women, minorities, and volunteers, as called out specifically in the Act, but we are also interested in various subspecialities of the fire service, including instructors and wildland firefighters, and fire investigators.

So, there will be two enrollment routes as part of the NFR. The open cohort is a non-probability sample in which any firefighters - active, former, or retired - would be eligible to participate. This enrollment method is beneficial for recruiting a large and diverse sample, but it may not be generalizable. The targeted cohort will be a prospective cohort of active structural firefighters recruited from rosters of selected fire departments or state agencies, and the targeted enrollment method allows us to select firefighters throughout the country from geographically diverse departments of various sizes and would be less susceptible to selection bias than the open cohort. And then this design also allows us to focus enrollment on women and minorities and volunteers, as well as access incident records for more information on exposures.

So, the way in which firefighters will enroll is still under development. This is taking the longest time because data security is such a big priority, and you know, there are several new federal data security requirements that we have to comply with. We just feel like it is absolutely critical we get it right the first time. But even though this is still being developed, we do plan for enrollments to involve informed consent, collection of information about individuals to establish a user profile, and then an enrollment questionnaire which will include questions on demographics and work history, and workplace practices, etc. We do expect enrollment to take between 30 and 45 minutes, where newer firefighters will be on the low end, and more experienced firefighters will be on the high end, simply because more veteran firefighters will have more exposures and work history to report. We also want to make sure that firefighters can log out and back in,

and pick up where they left off, because we know that firefighters could get a call or have other competing activities that would take them away from the registration. We are also interested in capturing data from other sources to better understand firefighters' exposures, including fire department records or incident records, and exposure tracking application data. We know that if firefighters are going to the trouble of tracking their own exposures, it stands to reason that they would want to possibly share that information with the NFR, so we want to make that possible if that is something that they want to do.

During the NFR Subcommittee meeting in August, we heard from our IT Director Mike Loudermilk about three options for the initial login process for the NFR web portal. And again, these three options are the full registration option where there would be no limits on data retrieval or updating; light registration, where sensitive health information cannot be retrieved or edited; and then a third option which we didn't discuss too much in detail because we really wanted to focus on those first two options. I do want to note that the same type of data can be collected with either Option 1 or 2, and the differences really lie in what data can be retrieved and edited by the participants when they log back in. And again, that first option, the full registration option, would require identity proofing, and identity proofing would require a full Social Security number and a photograph of someone's driver's license or state-issued ID, front and back.

So, the NFR Subcommittee had a very robust discussion about these options, and we even heard from several members of the general public. We had three oral comments and seven written comments that were submitted as part of that meeting. And overall, the Subcommittee expressed concerns about identity proofing hurting participation rates and producing selection bias and suggested that Option 2 was a good balance of collecting the information that is needed, while making some data retrievable, without creating substantial obstacles for participation. Again, the full transcripts and meeting notes are available on the NFRS webpage. We are considering all the comments we received from the NFR Subcommittee, in terms of the design of the NFR web portal.

Once we launch and start registering firefighters, the next step will be to conduct the health outcome linkages. We understand and appreciate that if a firefighter is diagnosed with cancer, the last thing on their mind will be to report their cancer to NIOSH. So instead, cancer information will be determined by periodically linking their information collected, you know, from the NFR, to state cancer registries to determine cancer incidence, and the National Death Index to determine cancer mortality. The North American Association of Central Cancer Registries' new Virtual Pooled Registry will also be a useful asset for those linkages.

The last time we reported to the BSC, we discussed the importance of collecting Social Security Number for these linkages. So, we are currently in the process of obtaining approval to collect and store SSNs. Based on the comments we received from the Office of Management and Budget or OMB on our enrollment questionnaire, as well as feedback we got from various fire service and scientific stakeholders, our plan as of now is to ask for the last four digits of the SSN. All the questions will be optional, and by asking for the last four digits of the SSN rather than full SSN, we believe we will have better compliance. Partial SSNs with other identifiers, including name, date of birth and residential address, will hopefully allow us to confidently match to state cancer registries.

This figure shows the data sources we will be capturing. The web portal is really the common denominator among all the NFR participants, regardless if they are open enrollment or the targeted cohort. All that individual data will be funneled into a secure exposure database that is later linked to health outcome databases. Again, those are mainly the state cancer registries and the National Death Index.

The Firefighter Cancer Registry Act states that we should ensure information in the NFR is publicly available as appropriate, while also protecting the personal privacy of participants. So, because of that, we are in the process of obtaining an Assurance of Confidentiality, which is the highest level of protection allowed by the federal government, and will assure participants, fire departments and other institutions like state cancer registries, that NIOSH will protect the confidentiality of the NFR data. We are also pursuing secure mechanisms for making deidentified data available to external researchers via the use of research datacenters, which are federal data warehouses responsible for protecting the confidentiality of the participants while provided access to restricted use data for external researchers to do different statistics on. There are also some potential limitations that should be considered in designing the NFR.

So, the generalizability of the NFR may be impacted by participation bias, especially if participants are more likely to have had cancer or associated risk factors. Participation bias is an important consideration in the design of the enrollment system, as the steps required for registering could affect participation rates across the fire service and may impact certain groups of firefighters more than others. So, this bias could be significant in both the open and targeted cohorts, and that's why making the user authentication and login process as simple as possible is so important. Small sample sizes could also affect our ability to investigate rare forms of cancer, or specific firefighting subgroups. Other limitations listed here relate to the analyses of the NFR data, so exposure/response analyses will be affected by record availability for example. Self-reported exposures and behaviors may be subject to information or recall bias. There are also healthy worker biases that need to be considered. And so, regardless of these challenges, we do hope to develop a platform that allows the fire service and scientific communities alike to better understand the burden of cancer among firefighters and informs methods for reducing cancer in the fire service.

We have made a lot of progress over the last year. We are especially thankful to the NFR Subcommittee for their careful review of our draft protocol and consent form and enrollment questionnaire, all of which have been updated and posted to the web. We also submitted the enrollment questionnaire for Office of Management and Budget review, OMB review, and actually just this past month, we received approval from OMB for that questionnaire. We also drafted an Assurance of Confidentiality and submitted that for CDC review. As I mentioned, we are applying for approval to collect and store SSNs.

And lastly, we began planning the development of the NFR enrollment system or web portal, and we do think, with the NFR Subcommittee and NIOSH BSC's guidance on our enrollment system, that we are cautiously optimistic that we can have a system in place that is tested and ready to register firefighters some time in 2022. And when enrollment opens, we will work closely with all the fire service stakeholders to notify firefighters throughout the country about this opportunity. The planning, building, testing and deploying of the NFR web portal, of course, is complex and will take some time. So here, we provide an estimate of the timeline as provided by the NIOSH IT department. Right now, we are gathering all the requirements for the

NFR enrollment system, which is why the NFR Subcommittee meeting regarding the web portal design and user authentication was so important.

So here are the three enrollment registration options again. You know, these options pertain primarily to the process of setting up an account, and the ability to retrieve and edit data. So again, the same type of questions or information and data can be collected in all three options, and the NFR Subcommittee, during that meeting back in August, provided the pros and cons for Options 1 and 2.

So here are the pros and cons that we heard from the NFR Subcommittee for those two options. And again, the biggest con was related to the potential impact on participation rates and selection bias if ID proofing was required. Many on the Subcommittee suggested that this con should be considered above all others and could prevent the NFR from being successful.

Dr. Fent concluded that the NFR program would like to hear if the NIOSH BSC has any additional pros or cons, or other considerations for the NFR enrollment system and user authentication process not listed here. I do want to thank everybody on my team, and of course the Subcommittee and the NIOSH BSC for all your guidance over the last few years.

Discussion

Dr. Reponen suggested that everyone should look at the pros and cons. We can also do other questions and comments if you have other comments, but this is one of the tasks that we need to look at and discuss. I guess, I'm looking at the first pros in Option 1 - that you can provide longitudinal information. She asked if there are possibilities for Option 2 then to do some intermittent surveys where you could get that same information If there are changes in their employment or exposure?

Dr. Fent replied yes. That's a good question. Option 1 makes it a little easier to do longitudinal updating of certain information, but we can still do that with Option 2. It just requires additional surveys of participants periodically. Let's say every year or so we would want to ask questions about, for example, has your job title changed, or has certain health status changed over time. Whereas with Option 1, they could see their answers and just update them as they go. With Option 2, we would have to do follow-up questions, it's a little bit more onerous on the participant, but we can still get that information.

Dr. Reponen asked if in Option 2 can they change their address or not? if their address changes or phone changes, can they change them, or can you not do any do any updates?

Dr. Fent responded that **t**hey can certainly update it. They just wouldn't be able to see certain protected health information, but when it comes to name and phone number and email address, they would be able to see that information because it is not considered sensitive information. And that was part of the presentation that we had to do with the Subcommittee. It kind of listed out the different variables and what is considered protected or sensitive information, and what isn't. The bottom line is that even under Option 2, they can still update that information. It's just that there is some information they would not be able to see when they log back in.

Dr. Reponen asked if Social Security is still being collected in both Option 1 and 2?

Dr. Fent responded that that is correct.

Dr. Reponen said because otherwise, you cannot connect it with the state and federal registries.

Dr. LeMasters asked if the entire social security was required for Option 2 or just the last four digits?

Dr. Fent responded, Just the last four digits. He said that with both Option 1 and Option 2, we would only collect and store the last four digits. But under Option 1, as part of the identity proofing process, they would have to ask for full Social Security number. Just because we are asking for it as part of identity proofing doesn't mean that we have the approval to collect and store that information.

Dr. Reponen noted that one of the cons for Option 2 would be that if you wanted to have longitudinal information, that requires the investigators adding additional surveys, and the participants also then, basically everybody would have to participate in that, even if they don't have any changes.

Dr. Fent replied that that is correct.

Dr. Reponen said that the Subcommittee did very thorough work, so it seems like there is not much to add since they probably spent several hours on it while the BSC are given a few minutes to look at it.

Dr. LeMasters said the Subcommittee spent all day on it.

Dr. Reponen wanted to know if they had to do Option 1 type of procedure when they were recruited to the Board of Scientific Counselors? She remembers it being pretty onerous to get these things into the system when they were recruited or came onboard.

Ms. Novicki scrolled back to the slides that showed the identity proofing process.

Dr. Reponen wanted to know if the slide was for Option 1?

Ms. Novicki responded, yes, these are the slides. She indicated the state-issued ID that Kenny talked about and said that you have to have two devices, because you're doing this on your computer and then you have to use your phone to take a photo of your license. This is a multi-step process to do identity proofing.

Dr. Reponen followed up that if somebody wants to go back and change information, do they have to do the same ID proofing every time when they access?

Dr. Fent replied that our understanding is identity proofing would happen - would have to happen - during the initial registration, or the initial setting-up of an account. Once their identity has been authorized, or authenticated I guess is the word, they wouldn't have to do it again unless they wanted to change their username and password, in which case they would have to go through it again, is my understanding.

Dr. Reponen said: Yes, I looked at this before the meeting, and yes, I do agree that it is a lot of steps, and then you really have to have two different devices, take a photograph, submit that. So, I think that could be a big restriction for people to wanting to sign into the system. Well, it sounds like you have captured very well all the pros and cons, and the Committee doesn't have anything to add. Or only maybe that one additional Con for the Option 2.

Summary and Wrap-Up, Future Agenda Items, Meeting Dates, Closing Remarks

Dr. Reponen said, in summary, we successfully scored the Evaluation Program and there were a lot of comments to the Mental Health Initiative and less comments to the Firefighter Registry because the Subcommittee already had elaborated so thoroughly on that content, so it looks like everybody just pretty much agree with what the Subcommittee came up with. So now there is an option for suggesting future agenda items from the Committee. Are there any longstanding agenda items that we have to do in the Spring meeting already on your list, Emily, maybe?

Ms. Novicki responded, Yes. We always have some ideas, but if there's anything in particular that you all would like to hear about, you know, it's always good input for us to have.

Dr. Reponen said, since there are no items in mind now, I don't think Emily would mind if you send an email and suggest things while we are going through the Fall, and hopefully we'll be able to meet face-to-face. That was the plan, but we will see it later I think, if it's going to be a face-to-face meeting. Usually, we meet in April.

Ms. Novicki responded: Or May, yes. It depends. This year, we met in May, but it could be in April as well. It just kind of depends on how schedules work out. The idea going forward is we would meet in person in the April/May meeting, and then have an October meeting on Zoom, but I really don't have a good answer whether that will be possible right now.

Dr. Reponen said**,** I want to thank Emily particularly, for putting this meeting together, and all the presenters and all the Board members. We have a few outgoing members.

Ms. Novicki said Yes.

Dr. Reponen said, So I want to thank them, and we will have new members in the Spring.

Ms. Novicki responded that we have four members rotating off, that's Kyle Arnone, Mary Doyle, Steve Lerman and Marc Schenker. We really appreciate your service, and so we have a recognition certificate that we will be sending out, that if you want to put up on your wall, you can do that. So, I just want to say thank you so much and, if you want to say some parting words, you are welcome to. In the Spring we will have four new members to introduce. We have been lucky because the past couple of years, our membership has been pretty stable, but it will be a bigger change next year. But yes, thank you for your service, for your preparation, and thoughtful comments during these meetings. We really appreciate it.

Ms. Doyle said: Thanks for the opportunity. It's been great to serve.

Mr. Arnone responded: Thank you very much. I've learned a lot from you all.

Dr. Lerman said: It's been a wonderful experience, thank you.

Glossary

Abbreviation	Definition
AAOHN	American Association of Occupational Health Nurses
AFT	American Federation of Teachers
AHA	American Hospital Association
AOHP	Association of Occupational Health Professionals in Healthcare
BRFSS	Behavioral Risk Factors Surveillance System
BSC	Board of Scientific Counselors
CDC	United States Centers for Disease Control and Prevention
DFSE	Division of Field Studies and Engineering
DLO	NIOSH Division, Laboratory or Office
DOL	US Department of Labor
DSI	Division of Science Integration
ECB	Emergency Capacity-Building
EMS	Emergency Medical Services
ERC	Education and Research Center
ETS	Emergency Temporary Standard
FACA	Federal Advisory Committee Act
FDA	Food and Drug Administration
HELD	NIOSH Health Effects Laboratory Division
HHS	US Department of Health and Human Services
HRSA	Health Resources and Services Administration
MMWR	Morbidity and Mortality Weekly Report
NFR	National Firefighter Registry
NFRS	National Firefighter Registry Subcommittee of the NIOSH BSC
NIOSH	National Institute for Occupational Safety and Health
NPPTL	National Personal Protective Technology Laboratory
OMB	Office of Management and Budget
OSG	Office of the Surgeon General
OSHA	Occupational Safety and Health Administration
PMRD	Pittsburgh Mining Research Division
PTSD	Post-Traumatic Stress Disorder
R2P	Research to Practice
RFI	Request for Information
USP	US Pharmacopeia

Certification Statement

I hereby certify that, to the best of my knowledge and ability, the foregoing minutes of the Qctober 5, 2021, meeting of the NIOSH Board of Scientific Counselors, CDC are accurate and complete.

Tiina Reponen

Digitally signed by Tiina Reponen
Date: 2021.12.06 16:29:34 -05'00'

Tiina Reponen, PhD

Chair, NIOSH Board of Scientific Counselors