

NIEHS Worker's Training Program (Sharon Beard, Joseph "Chip" Hughes, Amber Mitchell, Deborah Weinstock, Chris Cain, Salvatore Cali, Eric Persaud, Ashlee Fitch, Kathy Ahlmark, Kevin Reilly, Demia Wright)

Behind The Mask

February 25, 2022

Barr: Good afternoon. Today is February 25, 2022. My name is Gabrielle Barr, and I'm the archivist at the Office of NIH History and Stetten Museum. Today, I have the pleasure of speaking with the staff of the NIEHS [National Institute of Environmental Health Sciences] Worker Training Program (WTP). They will be speaking about all the work they have done throughout the pandemic. Thank you all very much for being with me. To begin, will you please speak about the organization and mission of the NIEHS Worker Training Program and how that connects to NIEHS and NIH?

Beard: Thank you. One of things that I think is important is our ability to really link the mission of the NIEHS, which is to discover how the environment affects people in order to promote healthier lives. I've always thought the NIEHS Worker Training Program was the applied arm—we actually went out and utilized the information that was developed through research, and then translated that material to other workers and those folks who are important. We have really been working hand-in-hand in our strategic message for the institute to make sure that we're able to take this in all the different areas that we have done training in, whether it's hazardous materials, response to diseases, or now what we're doing with Ebola and with COVID-19. We've always looked at having an all-hazard approach because we learn, every time we have a disaster, that we have an instant to expand and move forward and do more with the lessons we've learned from training. We've been able to adapt what we've done because we investigated that approach throughout our training programs.

Hughes: I'm a retired person so I have no role except I try to have a memory of what happens, which is very difficult. But I have very fond memories, and that's kind of why I'm here. I preceded Sharon as the director of the Worker Training Program. It was a great honor to be able to do that—to be able to be part of the government and being able to have the freedom and the opportunity to really make a difference. As Sharon alluded to, part of our strength that we had going into the pandemic was that we had long-term relationships that had been established, particularly within HHS [United States Department of Health and Human Services], within NIH, with Francis Collins, with CDC [Centers for Disease Control and Prevention], and with ASPR [Assistant Secretary for Preparedness and Response]. Those relationships had really grown out of years of work in disaster preparedness and infectious disease response with H5N1 and H1N1 to be able to have a track record and real experience in doing infectious disease disaster preparedness. The words that ring through my mind, like pathogens literacy—the literacy about pathogens—is really something that is very different from what

Environmental and Occupational Health does. Thinking back to the course of humankind, our world was ruled by infections—and deaths caused by infections. Then, later, as we come into the industrial era, new hazards and risks were presented. That's really the birth of environmental health with John Snow's pump or, later, Rachel Carson understanding the relationship between the environment and health and disease. Really, we inherited those things in terms of the disciplines that grew up. What we tried to do was bring together environmental health, infection control, occupational health, and public health so that there is an approach that is an all-pathogens approach, and, as Sharon mentioned, an all-hazards approach. That approach can bring together a lot of different scientific and research knowledge to come up with what we came up with in March of 2020, which was a really practical, evidence-based approach for how workers and healthcare workers could protect themselves. That's kind of what I feel like our mission was beginning in 2020—drawing on our program's past history at the World Trade Center, the Exxon Valdez Disaster during Hurricane Harvey, the World Trade Center attacks, Hurricane Maria, and wildfires—where we knew that the workers who were exposed first were the canaries, and they were the ones we knew we needed to influence because they were the ones who would have the first exposures and probably the worst exposures. That's why our program tried to make sure that we did a risk assessment that was based on who the most exposed are and who are at the highest risk. As you'll hear over the next hour, we sort of built on that approach to be able to present information that was practical and useful for protecting people and workers.

Barr: Did you all start thinking about preparing as soon as you heard that there were cases in China in February—or when did you really get going for your preparations for U.S. individuals?

Hughes: I'll just say my "Spidey sense" came about on New Year's Day. As you know, we got this sense about what was going on in Wuhan and the fact that it had the potential to affect the whole world. That was wonderful because we were able to really start designing a program in January that was able to begin to be operationalized. One of the most important things is we became embedded in the first coronavirus supplemental. Thanks to involvement of Tony Fauci and Francis Collins, we were able to be part of that. In spite of the political situation, we were able to be at the table trying to think about what a long-term public health education program might look like and what the key components of it are. We were really blessed to do that. We had actually been able to activate during the Ebola crisis and build a training program around Ebola for healthcare professionals and others. That was really the blueprint that we used in trying to think about how to respond to coronavirus. Again, having that close connection with NIH, HHS, CDC, and OSHA [Occupational Safety and Health Administration] was really important in being able to mobilize quickly and also develop a longer-term plan.

Beard: My name is Sharon Beard, and I'm the current director of the Worker Training Program. With the strong leadership that we had, [it made sense] to really look at bringing in all of the background and the work that we've done—I'll even go further back—with bloodborne pathogens back in the early 1980s and 1990s. We really started looking at infectious diseases more carefully, and several of our early grantees really helped to push and promote us to have a more focused infectious disease program. We've been doing that training and we've been able to adapt it since then to really look at all the

hazards and pathogens that are out there. With the support of our grantees early on—groups like AFSCME [American Federation of State, County & Municipal Employees], and SEIU [Service Employees International Union] who led that effort to make sure that we're protecting our lab workers and other health care workers—we really just continued that tradition with the work that we're doing under pandemic response now with coronavirus.

Barr: What were some of the ways your program went about educating workers and their employers on how to deal with the new pathogen and all the changing circumstances and guidelines, which happens quite a bit? How did your efforts evolve over the course of the pandemic?

Mitchell: My name is Amber Mitchell, and I serve as a science advisor to the Worker Training Program, as a contractor specifically, because I have a background in occupational infection prevention. I'd say we worked very quickly and collaboratively. I remember Chip actually called me on a Saturday to ask if I wanted to come to serve—and yes, of course I did. I'd do anything for Chip and for the WTP. We developed resources that workers and employers could access online and remotely, including several awareness-building and worker training slide decks on coronavirus and COVID exposure prevention. Over time, we actually organized and launched many webinars that were open to the public. These webinars reached hundreds of people. Some of the webinars had hundreds just on a singular webinar. Our audiences included frontline workers, employers, trainers, researchers, and safety advocates. Our topics ranged even early on from building an infection prevention and control plan to ventilation and airflow to vaccinations. We did a webinar on safety in schools and safe reopening of schools, and we also developed a series of technical briefs and fact sheets as the pandemic evolved. This really helped people navigate the risks associated with variants, with vaccine hesitancy, and confusion about mask wearing and respiratory protection—and the differences between the two. We helped our trainers, including grantees, to adjust their online training and, later, to safely open the in-person training. We stayed on top of—sometimes ahead of—guidance that was coming out from CDC and even from NIH. For example, we did a superstar webinar panel on safely reopening schools right as they were reopening, and we did briefs on variants and vaccines very early on as well. I'm extremely proud of the work that we did and the team that was pulled together. The Worker Training Program and its grantees have some of the most highly qualified and experienced occupational health and safety professionals I've honestly ever worked with. We'll continue, as we move on, to stay abreast of the needs of workers and their employers as well as the communities they serve and create materials that assist in ongoing efforts. This would mean not just for COVID but thinking ahead towards emerging infectious diseases or continuing to have occupational infection prevention for any pathogenic organism moving forward. It really has changed the nature of how we think about people interacting in their workplace and viruses and bacteria. It's just been a wonderful experience and we hope to continue to serve the public that way.

Barr: How long did it take you to put some of those materials together, and what was involved with that? What was the planning like putting together these webinars and workshops, in a different format than you usually do, on such relatively short notice?

Beard: We've always had a collaborative approach on building tools and resources. We look at the expertise that Amber brings dealing with infection control and our grantees who've been doing this and working with their own communities and workers and bring all these folks together. Of course, we have some stellar staff at our National Clearinghouse who work at health and safety training. That approach has really pulled together a lot of these resources and fact sheets and booklets and what we call our "Protecting Yourself" worksheets and training curricula that really has the bulk of the information in there. From there, we build on that and develop visuals and resources in a collaborative way and really rely on our grantees. We are the funding agency—we provide cooperative agreements to our grantees so that they're able to develop these tools and resources within their organizations, partnering with workers and employers to make sure that these tools and resources get to the right places and get into the right hands. By doing that and helping to establish this history over the years of this program since 1986, we've been able to adapt really quickly to be able to pull this material together.

Weinstock: I'm Deborah Weinstock with the National Clearinghouse. Our very first workshop on COVID-19 was actually held the week after the pandemic was declared. Actually, we had been planning for it to be held in Atlanta on March 17 and 18, so we had to quickly shift and make it into a virtual meeting. It was originally going to be on a similar topic—workforce protections for biosafety and bio-preparedness. We obviously reoriented it on protecting infectious disease responders during the COVID-19 outbreak. Broadly, that workshop explored what training and protective measures worked best during previous infectious disease outbreaks to best inform protection of workers during the COVID-19 pandemic. Then we just moved forward with developing all the materials that Amber had spoken about and pulling together the webinars that would be useful for folks. One of the things that is really important to understand is that the bulk of the training that had been done by the grantees prior to the pandemic had all been in person, and so this shift to training virtually was complicated. Part of what we did when we were holding webinars was to have technology tips for virtual meetings and interactive online sessions. We ran some "train-the-trainers". We also did a three-part series of webinars on training best practices in the time of COVID that dealt with setting up online training, practices and platforms, and tools for creative engagement on virtual platforms.

Barr: How were they received by others—by the trainers, by your grantees?

Cain: My name is Chris Cain, and I'm with CPWR [Center for Construction Research and Training, formerly Center to Protect Workers Rights]. We're one of the NIEHS Worker Training Program grantees. We actually participated as grantees in many of the activities that have been discussed. At CPWR we work with the building trades unions. Thinking about construction workers and all the training that happens in the construction workforce, both on the job and in the unions' training centers, is something that is kind of central to us. A lot of our training at the beginning of the pandemic did shift to online training, so we were learning as we were doing, and sharing what we were learning and the best tips and practices we could as far as distance synchronous learning goes. In the construction industry—

many, if not most, construction workers worked right through the pandemic, including the training centers that some of them operate. So, we, with NIEHS funds, stood up guidance for training centers who were doing in-person training during the pandemic, with guidelines to keep the trainees and the employees of those training centers safe. We got a lot of traction through webinars that we participated in with NIEHS or that we as an organization put on with NIEHS funds, but also in partnership with NIOSH [National Institute for Occupational Safety and Health]. Our first CPWR-held webinar was in April, and we had Dr. Howard, the head of NIOSH as our guest speaker. We worked very closely with NIOSH and NIEHS, but that was the first of 22 webinars we did over the course of the pandemic that were related to COVID. We've reached at least 20,000 people through those webinars—all aimed at the construction industry. What we knew and what we were learning—we put out guidance for the industry very early on, from CPWR and our parent organization NABTU [North America's Building Trades Unions], on how to work safely in construction. But also, just as things changed—there were always changes coming along in the pandemic—we felt the need to do these webinars frequently. One I wanted to highlight was one we held with NIEHS just to really highlight to our construction audiences the tools that NIEHS has available through the Clearinghouse and through the staff at NIEHS around COVID-19. We did that, starring Sharon Beard, in November 2020. Another one that was really pertinent to this conversation was one we did with one of our evaluation professionals. We looked at the effectiveness of online training in two courses—one that was given only in-person before the pandemic and one that was shifted to online—and looked at the differences and the similarities in how well people learned in both modes. That one was sponsored directly through our NIEHS funding.

Barr: What were your findings? How did people learn better?

Cain: One of the things we found in that study was that the instructors were a lot less comfortable shifting to online synchronous training than they would have liked. They rated the experience lower than did the participants. The participants generally were very satisfied with what happened, and when we looked at comparisons of evaluations, there was a lot of similarities. We also have another study coming out really soon on longer courses, where we compare the differences between online synchronous training and the in-person training that occurred using the same evaluation form, so that's coming very soon. We'll be doing another webinar on that very shortly.

Barr: While we're on the topic of online training, with your online training tools and COVID-19 training courses, which the NIH Workers Training Program did a lot of over the pandemic, how did you select what you were going to cover? How did you collate the information in such a timely manner—all those manuals that you all created that were online? How did you choose what languages you would offer your different resources about the pandemic in?

Cali: My name is Salvatore Cali with the OAI, Inc. When this all came down, I was watching the situation like Chip was early on. When we knew that we could not do live courses anymore, I panicked. After the panic, we thought of how we could reach the most people. So, we thought we could do train-the-

trainers. I spoke with Sharon Beard and other people at NIEHS. I was really pleased to work with them because of the situation—they turned out to be very flexible. We could not use the cadre of instructors we already had who had experience with infectious diseases because they mostly worked in hospitals and they were very, very busy. They told us right up front they couldn't help us. I was fortunate in that I did have a background in infectious diseases, and I did have some materials already worked up from a different setting, so we were able to pull that together and turn that into a train-the-trainer. It did help a great deal to have the NIEHS meetings and seminars as we were going along, so that we could feel confident that what we were presenting was timely, pertinent, and basically was factual—because we all tend to forget that at the beginning of all this, we didn't know what was going on. We didn't really know the specifics about the SARS virus and things like that. We developed the material. We started working with some of our best partners, such as the Latino Worker Safety Center (LWSC). I talked to our program director at HWWTP [Hazardous Waste Worker Training Program]—it was Alex Princess at the time—and I talked with Dan Ramir at LWSC. Then we spoke with BPSOS [Boat People SOS], the Vietnamese group. They all joined in—they all became trainers under our program. We specifically targeted them to be able to train using the curriculum that NIEHS developed—the sets of training that we focused on—and they worked really well together. Ultimately, we felt pretty good about the product that was coming out. In regard to the languages, since we were working with LWSC, they had a lot of experience with translation in other languages, so they had people who could teach in Spanish, Polish, and Arabic. Because we were working with the BPSOS, they could translate to Vietnamese. One of our best instructors—one of our contract instructors named Wendy Chan—has a Chinese ethnicity so she was able to get it translated into Chinese. It all came down surprisingly quickly and surprisingly painlessly.

Barr: Do you have any idea how the different resources you created were utilized by different worker audiences or different professional entities?

Persaud: Eric Persaud here. I am a program contracting evaluator with the Worker's Training Program. WTP recognized that was an important outcome for the response, and they organized an evaluation of the COVID-19 training program. When WTP received congressional funding to respond to COVID-19 and the pandemic through training and technical assistance, the program director at the time, let's say, "voluntold" me to look at some immediate outcomes. My doctor advisor at the time sent an email in the middle of the night and brought in other various stakeholders to formulate an evaluation plan—that for many years WTP has been building through their history of responses. When I started as a contractor, we set that in motion—to evaluate the program for its utilization and its impact. We reviewed existing training courses that were delivered, annual progress reports from the grantees, and we went a step further and conducted a mixed methods evaluation using focus groups and surveys with the grantee, principal investigators, and other representatives. From the participants, we found that they found the curriculum, the webinars, and the national calls have been helpful—that we helped to foster partnerships and training and outreach to vulnerable populations, and that the NIEHS has supported them and helped them build capacity for future infectious events and other emergencies. Participants also mentioned how the training materials were being integrated into broader trainings and how the instructor and train-the-trainer approach helped to widely disseminate the training. The evaluation is

available online now, but one example is how it's utilized for organizational change. I was really struck by one of the grantees mentioning how they observed, six months after they'd done the training, something so simple as having hand-washing stations and hand sanitizers. They weren't there before, but after the training, were on site. Grantees also shared the value of the program and how they felt supported and helped. I have this one quote that best sums it up: "Sharing the information that NIEHS provided, the Zoom classes, and the sharing of the challenges from the NIEHS community was huge, and NIEHS helped to do that by sharing the webinars and getting out first with the materials and putting it out there and soliciting feedback. It helped some of us with no expertise gain that expertise."

Barr: That's wonderful. That's really great feedback. Do you know, though, what types of audiences used it more or less? Do you have any of that kind of metrics at this point? Did certain demographics, professions, or groups use your resources more?

Persaud: The program was meant to target all kinds of industries and occupations. I know at first the attention was towards first responders and healthcare workers, and over time the program has expanded to be adaptable across industries and occupations. What makes the resources that WTP puts out so helpful for so many is that it's not one plate, but rather a diverse set of groups.

Barr: Do you have any feedback as to if some of those workplaces will keep things like washing stations and things like that in place for the future?

Persaud: That would be a good thing. I really hope so. It sounds like these methods to be resilient and to think about disaster response and future impacts of these events are being integrated into training not just today, but for the future going forward.

Beard: You asked about the occupations that we trained. We had a plethora—everyone from airlines, airport workers, construction workers, disaster and healthcare first responder workers, teachers, students, food service workers—all those essential workers who were really integral in making sure that the front line got the information they needed. Everybody from agricultural workers to laboratory workers—we handled everybody. We were able to reach all those groups because of the collaborations that've had and the outreach and training that was developed. We had training such as infectious disease awareness and other types of things. It was a broad group of folks that we trained.

Barr: This goes into our next question. How did you address the needs of different worker populations for health and safety training, including those at high risk? Did you do any targeted training for certain groups—for example, airline workers—to make sure they got certain information?

Fitch: My name is Ashlee Fitch. I'm with the United Steelworkers Tony Mazzocchi Center, one of the grantees of the Worker Training Program. I'm going to try to navigate some of that question. Just for background purposes, as we're talking about different occupations and different workers: a lot of the grantees, just as Sharon said, have industrial workers, construction workers, day laborers—a whole different variety of occupations. At the beginning, that's where we started to see this conversation about essential workers. In some cases, they were forced to go to work, not able to take different precautions that maybe you or I had during that time. Whenever we look at that higher risk from an occupational standpoint, we had to look at those certain control measures or mitigation measures that we could apply in those different workplaces. Specifically, we talked a lot about healthcare. Amber was very involved in helping everyone understand some of the traditional infection control measures that are common in a healthcare setting—and how we can take things like understanding ventilation and how ventilation is used in that setting and help protect other workers and other high-risk occupations. That ability to adapt what we have from previous infectious disease outbreaks really helped that translate to where workers can understand. Especially whenever we're dealing with PPE shortages and having conversations about using personal protective equipment that may not be traditionally used in certain occupations. [Our goal was] Really understanding the kind of challenges that came along with each occupation through a hazard assessment or control assessment. Actually, part of one of the first webinars that WTP put on was really helpful in making sure we targeted those gaps in occupations. We're able to work with workers, communities, and companies to get training and understand the best measures.

Now the other high risk was really looking at health from a health equity standpoint. A large portion of our grantees and a large portion of the workers that we train are minority groups across the country that face barriers such as access to health care, education, and language barriers. That's something that really is integrated as part of the Worker Training Program. We are established community partners to provide trusted advice in some of the communities most hard to reach and hard hit during the pandemic. Our program has worked in the past with another grantee, the Atlantic Center for Occupational Health and Safety, with the promoters' community, health promoters. It's part of our environmental career worker training program. They have worked for years with community members to make sure they have access to and understand healthcare and they have educational materials. That is just one example of how, when all these resources came out, it could quickly be deployed by trusted sources in communities. In both cases, whether in your community or in your workplace, as many people said, there's different mediums—virtual training or in-person leafleting—all that had to be evaluated in that initial assessment. Doing virtual training to a lot of healthcare workers who have to be there may not have always been the right tool or the right medium to get the language there. But it was just an ongoing assessment of needs and using the resources that we had to make sure that workers and communities got trusted, up-to-date information whenever they need it.

Barr: That's wonderful. You provide great advice from the national level, but as we all know, there are a lot of different barriers throughout the pandemic—for instance, in the supply chain. It was hard for people to always get PPE, which was best practice. There are other social issues and different advice coming from the national level and then some state level advice with sometimes different situations or



thought processes. How did you navigate those sorts of situations, and did you address any of the practical concerns that some people may have had?

Fitch: We were able to pivot, based on those initial ongoing assessments, to meet the needs of workers. Regardless of some of the challenges we had, overall, it has been able to be overcome—all of the grantees, with great direction of WTP, have been able to help address those.

Ahlmark: There were several challenges that we faced. WTP staff already had full workloads. The past responses to other man-made and natural disasters allowed us to quickly pivot priorities and allowed us to prepare and execute a new contract mechanism to allow for the focus to be on COVID-19 activities. We had to make sure we had the most current and accurate information available to develop our COVID-19 response activities. We wanted to continue to facilitate worker safety and health training, provided by the grantee community, that was different from the standard in-person training they were used to.

Barr: How did you guys balance the COVID work with your other job—some of the other training that you do? Some of those issues remain a problem continually. How did you balance your pandemic work with your regular work?

Beard: We're still struggling with that right now. It seems like we thought it was going to be over much earlier, but we've had to have sustained efforts in that. It was just prioritization. Each time there was a pivot or there was a change, there was new guidance and new information out, we just had to stop and focus our efforts to understand the literature—to do searches, to talk to different professionals, and figure out what we needed to do to attack that problem at hand. That's why, having such great expertise from our grantee community and from our federal and state partners, we were ever ready to just tackle any new task and new effort that came out. It was very difficult, as all of us know, because we were working a lot of extra hours pulling together this information. We were doing a lot of research, but all of our grantees—and I'm so proud of the work they've done, along with our contractors and staff—they stepped up to the challenge. They worked long and hard hours. We had a lot of meetings where people were getting on early in the morning because of west coast and east coast schedules, but that was just a testament because we knew this was important. We saw the urgency, we saw the death, and we saw the sickness. We wanted to make sure that our tools and resources stayed available, and we were able to adapt and put it together in various different languages and do these webinars because it was so important that it was done. This is just one of those things where we knew we had the expertise we needed to bring the people together. We just had to make it happen.

Reilly: I can say a few things from another grantee perspective as well. My name is Kevin Reilly with a program at UCLA [University of California] in Los Angeles, and I'm the PI [principal investigator] for the Western Region Universities Consortium [WRUC]. We're another one of the grantees under the training

program, and our consortium is comprised of four university-based programs here on the west coast. In addition to University of California Los Angeles, we have partners at University of California Berkeley, Arizona State, and University of Washington. We cover a whole territory on the west coast. Our program is very much relying on partnerships with local organizations across our region—worker and community organizations. We work a lot with labor union locals, with worker centers, and community-based groups. When the pandemic first struck, we were getting really inundated with questions from a lot of our partners about what COVID is, the implication on health, working, and workplace safety, and best practices for essential workers who are continuing to go to their jobs. The resources that the Worker Training Program staff were making available through those webinars and educational tools were really invaluable for us in terms of being able to just have some resources at hand to respond to people, and then in turn to start developing our own materials and training approaches that we could be using to really engage with those folks. Across our program, we ended up rolling out a lot of different training initiatives to reach different kinds of audiences. We arranged everything from webinars we were doing with nursing locals in California around protections for frontline nurses and hospitals, acute care facilities, and nursing homes. We were doing awareness level training with folks in garment manufacturing warehouses and restaurants, grocery stores, home care—you name it. A lot of that training was being done in Spanish to reach Spanish-speaking audiences. We also have partners in our consortium that were doing a lot of work with tribal communities, both in the Southwest and the Pacific Northwest and Alaska—just to give you a sense of the kind of breadth of different groups that we were reaching.

One of the big challenges we faced early on, and continue to face, is just the quickly and continually evolving nature of this pandemic. Knowledge about COVID keeps changing. The nature of the variants and the ways in which these different surges have rolled out keeps changing. The workforces that are impacted keep changing, the rules keep changing—both at a federal level and certainly in places like California. We have had a lot of changes in rules and standards at the state level or the local level. It's been a lot to navigate for us in those regards as well. Having both the resources of NIEHS and also having this kind of grantee community to be falling back on and sharing best practices and information as we go, has been invaluable for us to be as nimble as we can to reach all these different audiences. I'll just say two other things in terms of some challenges. One that we've been really aware of, given the breadth of audiences we reach, is the different levels of technology literacy among different groups. For some groups that we reach it's very easy to just put together a Zoom webinar—you get people in the room and folks are really happy to jump on. For other groups, the level of technology literacy is not there. Access to reliable internet services is sometimes not there. People might not have the technology at hand to connect up. We've had to really pivot quite a bit to make sure that we're able to reach different audiences in the best methods possible. We certainly have had instructors who are not happy to start doing online training. We have to kind of “hand hold” a lot of them to teach them what it means to do a virtual class. We can do this in a way that's consistent with our high-quality training, even if it's not in person.

The last thing I want to throw in here, which has been striking to all of us in the work that we're doing, is that the needs of vulnerable workforces run so deep. Yes, we're training providers around health and

safety and how to carry out and take proper measures in a workplace. But when you get people into a space to talk about those issues, you cannot really avoid, a lot of times, talking about all the other ways in which these folks are finding themselves vulnerable in the context of this pandemic—food insecurity, housing insecurity, lack of health care access, or lack of transportation—and just the trauma that so many communities have gone through the last two years. The death, the widespread sickness, the suffering that some people have gone through—people do not leave that at the so-called classroom door.

Barr: How do you deal with that?

Reilly: For us, it's meant partially being open as facilitators to allowing some of those issues to come up and being nimble on our part to figure out how to facilitate that, but then also really trusting in our partners. Our partner organizations that we work with are embedded in those communities. They know what those issues are. They have resources at hand that we are maybe not familiar with. For us, it's just been an enormous lesson that the knowledge, skills, trust, and respect that all those partner organizations bring are just invaluable to us being able to do our work and in supporting those communities in the way they need to be supported. Not only can we bring a certain amount of expertise to the table, but we in turn provide trainers other ways of kind of "farming" the folks in these organizations with the knowledge that we have—but then giving them the kind of space to take it and adapt it in ways that need to be adapted in order to make it most useful to the groups that they're working with.

Hughes: I just wanted to pick up on what Kevin said. One of the things we did that I feel was a really important innovation is we tried to institute the "week in review". Friday afternoon we would come together virtually. Part of that—looking at where we are, where we were, and where we're going—was about the mental health of our community and the way we dealt with trauma. One of the things that I had instituted was that we had a group meditation on Friday afternoon, which I know some people think might have been a little weird. The effort of what we are trying to do was address the spiritual, psychological, and emotional needs of our community. A lot of that had grown out of what we have all experienced in past disasters, which is how we take care of the actual emotional needs of the people who are the responders and how we keep a focus on keeping up people's spirits, dealing with their emotional issues, and being resilient. Of course, for us, resilience is really what it's all about in terms of sustaining a response over the long term—which we are still in the middle of maintaining. I just wanted to add that to what Kevin really opened up, which is how we addressed human health in a holistic way that addressed all of the needs of everyone.

Barr: Thank you for adding that. Were there other lessons learned or applications from the COVID experience for you that you would apply to other situations?

Beard: We've had this conversation a lot amongst our grantee communities. We have the expertise and background because we've done health and safety training. We understand personal protective equipment (PPE), we know how to develop exposure control plans. So, what was important for us to do is to take that knowledge and say that the groups we work with, and the exposure control plans that we develop might want to move to a higher level of personal protective equipment. We work to establish those protocols. A lot of people were not wearing N95s early on because they couldn't get access to them, but we were able to utilize some of the tools and resources that we already had because we had a stockpile of those materials we used for our training. We really wanted to adapt. OAI, Inc. actually provided some of their tools, resources, and PPE to some local organizations who needed to have it—to healthcare workers and people—because we were not actually doing training in the field. Everything was about adapting and utilizing the tools that we had. We still, to this day, are trying to focus on making sure that whatever the setting is—especially during the omicron variant—we really focused on making sure people wore a higher level of protection because we knew it was important to do. That's why we have to keep looking at this as an ongoing pandemic. We have to focus on making sure that we're protecting everybody—our trainers or the people who come into our recovery centers that we funded under this program—and to adapt as necessary. That's something that we've been able to do very well.

Hughes: I just want to pick up on that. It's sort of ironic—if you've read the news brief that came out today. The National Academy of Sciences study that was just released today or yesterday—which of course Bruce Lippy, Ph.D. [Director of Safety Research at CPWR] was part of—looked at this question about how we take personal protective equipment and protective actions that people need to take that might be focused on workers and try to expand that out to the general public. That really is an issue that we've struggled with in terms of how we think about all the guidance we want for the most exposed and the highest risk people, how we interpret that for everybody who might have some exposure during a pandemic, and how you message that. That's going to be an ongoing challenge that we all as a society are still struggling with.

Barr: Your program has such a long history of dealing with different types of pathogens and work hazard situations. Can you speak a little bit more in-depth about your previous work and how that's informed your response to the pandemic?

Wright: Sure. I'm Demia Wright. I'm a public health educator with the Worker Training Program. Chip spoke to some of this at the beginning. We're an all-hazards training program—so [our goal is] getting the workers the skills they need for any hazard, including unknown hazards and infectious diseases. We really have been at this with the bloodborne pathogens work under the OSHA regulations. The program responded to the anthrax attacks—doing training around that and H1N1 and avian influenza. Then more recently with Ebola, Zika, and COVID. We also consider the world of pathogens and biosafety around mold remediation following major hurricanes and floods, and really helping communities and workers avoid those exposures. We have a paper coming out soon about the program's history and infectious diseases. With the Ebola program, Worker Training received 10 million dollars in funding through HHS

and was able to develop a new infectious disease response training program. It was a three-year program with eight grantees. It was really interesting because a few of those grantees were in the final months of a no-cost extension when COVID hit. If you look at the training numbers of those last couple months, they sort of shoot through the roof of what they were able to do under the infectious disease program. That program, overall, built tremendous capacity of curriculum and trainer expertise for infectious disease training programs in our network. Those specific eight grantees, as well as NIEHS and our whole community of organizations and trainers, really helped us pivot again and immediately adapt the curricula that was out there or develop new curricula and training on COVID. We've had basic awareness classes. There's been higher level operations classes. The training courses under COVID have included vaccines. Chris could talk about a course that's specific for when you're working around construction and healthcare facilities. The mental health piece is something that's been a part of our program for several years now—we have a resilience for community responders course. That mental health piece has always been a part of disaster [response] since we developed that course, and to have that be part of the COVID response at this time has been really critical for a lot of our grantees. We received a separate set of 10 million dollars for COVID response that we got in early March of 2020. With the funding, we've trained more than 45,000 workers at this point. If you look at our regular funding that we get from our Superfund-related activities and funding that comes from the interior and environment appropriations, that's an additional 46,000 workers that have been trained around the concept of COVID. So, we're over 90,000 workers trained at this point on COVID and all the ways COVID affects workers' lives and jobs.

Barr: That's quite an accomplishment. How do you think COVID will affect your program in the future—or what are some things that it has brought up that you would like to continue to do, do more of, or do better?

Wright: I'd be interested to hear what the grantees say about this because one thing that's changed, probably permanently, in our program is this introduction of virtual training or hybrid training. Traditionally we've been a hands-on, skills-based training program. That's just what hazardous waste worker training was—having our worker trainers out there doing in-person classes. Everybody had to pivot, but there's actually been a lot of benefits of including virtual in our toolbox now. I don't know if any of the grantees want to say anything.

Cain: I will. We've always been one of the grantees who are in-person, in-person, in-person! Construction workers learn hands-on. They learn skills that way. They go through apprenticeship programs. They don't learn from a book. What we have demonstrated through some of these evaluations we've been doing since the pandemic [began] is that there are some courses we can do as distance synchronous training programs. While the satisfaction rates are not as high as the in-person classes, some of these more technical, educational type programs can be done over distance and synchronously. Even the testing scores we've looked at for the different modes of training are similar but there are some differences depending on the course. We'll be releasing some of that information soon. Some of this distance learning is here to stay—it's just economical for certain courses. You can get

a lot more people trained for the same amount of money when you reduce travel costs. We're going back to in-person training as much as we can right now. It's definitely going to be a mix from here on out.

Barr: That makes sense.

Fitch: This is Ashlee with the United Steelworkers Tony Mazzocchi Center. I would echo Chris about having a blended approach or looking at the teaching or delivery methodologies that we're using for training. One thing I've learned or understood more about because of the pivot in our transition was the equities in some of these larger socioeconomic challenges that are confronting our training populations, workers, and communities. Also, especially under the "Justice40 Initiative", how we can utilize all of our resources and work collaboratively and collectively to ensure that we're doing our best to address what we can of those issues and make sure that training is accessible to everyone who needs it and in the language that they need it—maybe sometimes not the ideal delivery that they could have, but that this is accessible. Those rose to the forefront, and you really saw the strength of this program pull together. Everyone worked together to make sure that people had the resources that they need.

Reilly: The only other thing I may add is the other side of the coin, which is also kind of an equity issue—that by providing training in these virtual formats, we've been able to reach a lot more people in more remote areas of our region than we would have otherwise. There's the upside, too, of being able to provide at least some of our course offerings to audiences that we wouldn't necessarily have had access to before. They may not themselves have had access to resources like us prior to this, so that's been kind of positive through this transition.

Barr: That's great. It's been wonderful getting to speak with you all for the past hour and learning all about everything you've been doing throughout the pandemic. Do you all have anything else you would like to share about your work, about the pandemic, or about your personal experiences these past few years?

Cain: Before we get to the closing statements, I wanted to respond to a question you had asked, and I had to look up. You had asked about lasting changes and work practices that were implemented during the pandemic. We did a survey that was fielded at the end of 2020, asking contractors in the construction industry that very question. We do periodic management surveys with partners who have access to a panel. The contractors in this panel said 61% of them plan to continue to use some of the practices that were implemented during COVID. The most frequent one is increased hand washing stations. To me, that's incredible news because construction workers are plagued by contact dermatitis from the materials they work with, and hand washing is one of the solutions to that problem. Even though we know that this particular virus is not spread that much by contact, this is a good outcome for our industry based on the pandemic. There's a couple of other practices, but that was really the one that

stood out for me. Maybe one more—more tolerant and flexible policies for absenteeism due to illness. Twenty percent of contractors responded they would be adopting that after the pandemic. In construction, we don't get sick leave—if you don't go to work, you don't get paid. So, the concept of the industry being more open to sick leave—which is hugely important to workers' well-being—is huge. They are incremental steps in the right direction if you want to look on the bright side of something.

Beard: I'd also like to say that from a standpoint of industrial hygiene, we've talked about ventilation more than we have in our entire lives through this COVID pandemic. When you have respiratory hazards, you really have to look at ventilation. We saw at a lot of facilities—especially in meatpacking and those type of close, aggregate settings where people work together—that if you don't look at the spread of disease, especially with the respiratory hazard—and look at how effective your ventilation controls are, make sure you have appropriate HEPA filters, make sure you look at spacing and understand how the flow of air occurs, you're not going to be able to protect people. We know that this COVID-19 is not going to go away. It's something that we're going to have to live with. You have to try to figure out how to adapt and how to utilize this. A lot of discussions will talk about what you do in the workplaces and in your schools, and we've seen some great changes. I've seen many schools have increased their protection in reference to ventilation. They're doing more assessments; they're looking at how a lot of the older equipment needs to be replaced. They're looking at airflow. That's something that's good! That's something that you really have to make sure we look at across the board, especially with the aging infrastructure that we have here in the United States. You have to be able to have good ventilation. If you don't, you're going to have the problems that continue to persist, not just with COVID but with mold and other types of biologicals that have continued to plague us over the years.

Barr: Hopefully it'll keep up and after COVID is over, people don't go back to their old ways of ignoring things. Do people have any closing comments or ideas they would like to share?

Beard: There are two things I would like to share as far as closing comments. [The first is] that we will continue to develop these tools and resources because we don't know what's going to happen tomorrow. A lot of people are not thinking about this from a strategic standpoint. We still have new confirmed cases at around 30-something thousand people a day, and still have people who are dying every day. We've got to look at those high-risk individuals and make sure that controls are going to be put in place as necessary to protect them and to protect their families. We have to continue to focus on our emergency responders and our health care providers because they're always going to be that front line. We're going to see issues impact them whenever a different variant comes out. We're still seeing surges in states across the United States as far as the number of cases. We have to look at this as a rolling case. We have to keep looking at positivity rates and we have to adapt. That's one of the things that's important for us to look at. We have to make sure that we're continuously assessing the situation based on other hazards that might happen and the variants that are going on. We've got to continue to protect all our workers, individuals, and our families, so that we can be safe just living our lives.

Reilly: The thing that I really want to emphasize is that, as a grantee in these last couple years, we've really felt tremendously lucky to be supported by the NIEHS program and to be a part of this community. The resources we get from the NIEHS staff, the Clearinghouse, and from other grantees, has just been invaluable to us being able to respond to the needs we're seeing on the ground. We've been tremendously appreciative of the understanding and the flexibility we've been given to kind of adapt and pivot as we go. [That] really allows us, in a way, to trust the needs of our partners that we're working with on the ground and continue to provide them the support they need as they're doing the same thing—making their way through and trying to figure this out. I just want to make a big shout out to the tremendous resource that this program is and has been in the last couple of years and will continue to be as we move forward.

Hughes: One of the things I worry about most is the future of public health. What we've seen, of course, has been almost a vilification of public health—by so many people who don't understand what it means to try to have a science and evidence-based approach to protecting people, the laws that we've had in place, etc. I guess I just worry for future generations that there won't be the “public” part of public health, which is having people actually appreciate the necessity for things we have to do to protect society as a whole—not just us as individuals. I have hopes—even having this recording that future generations can listen to. You people out there in the future, don't forget public health!

Cain: Can I actually jump on that? One thing that's really unique about this program is that it's intended to get to the people who are not in public health, who are not scientists, who are not physicians or the like. These are just regular Americans who go to work. I don't think there's a lot of other avenues that are intended to educate a non-academic in matters that are scientific based, which is what we do in our training programs. For that reason alone, it signals that this is a very important program, and it is serving a purpose to improve the scientific understanding of average working Americans. Hopefully, maybe, it could be part of the solution to the problem that we have.

Mitchell: I wanted to add one more thing too. In the broader sense of the public health community, occupational health and safety is typically a small subset of broader public health. Just like Chip and Chris said, I'm hoping that the pandemic brings to light occupational health and safety and gives keeping safety at work a bigger importance in the broader public health community. If you think about it, the largest numbers of people work—and that increases year after year when people are aging, and they're still working or never retire. So, from a population point of view, we have an opportunity to serve probably the largest proportion of people working. That, in and of itself, is a great way to rise up our profession within the public health community. I've been really grateful for more and more attention on the work that we do.

Beard: The diversity of the individuals we have in our training programs, the subject matter experts—whether they're working with the union or a community-based organization pulling all those resources together—has been one of the biggest strengths of this program. It's really made us more focused on



understanding the needs of a diverse population, because we work in so many different environments and our partners are so diverse and so broad. In situations like this, when we know that everybody was affected by COVID, we've been able to broaden and reach out and touch so many different lives. One of the things that I know I've said across the board is that we share this with workers, but we also have probably been the voice of health and safety protection for our families, our friends, and our communities across the board. I don't know how many conversations I've had with family members and friends and people in my community when they have a question about coronavirus or have a question about some personal protective equipment. We have been kind of envoys to our different communities. It's been something that is our role as public health workers and people—to make sure that we're talking about this and having individual conversations. That's how we are able to work to change the outcome and keep people focused on making sure that we stay safe. We've got to do that from this point forward.

Barr: I'm sure you all are asked many questions—given your expertise—by a number of people. Thank you all for participating and for all your work. It's such an interesting topic. As Amber is saying, it's interesting that COVID is the first time in a long time where disease and work was so much at the forefront of the conversation. I'm relatively young, but it seems like with a lot of other diseases lately it just never even crosses people's minds. Hopefully that will be an outcome. I wish you all the best—and continued success. Thank you so much for talking with me.