



National Occupational Research Agenda (NORA)

Review of the 2019 National Occupational Research Agenda for Respiratory Health by Non-NIOSH Members of the Respiratory Health Cross-Sector Council

June 2022

Prepared by:

Paul K. Henneberger, MPH, ScD

Co-Chair, NORA Respiratory Health Cross-sector Council

Senior Science Advisor, NIOSH Respiratory Health Division

Disclaimer

This is a product of the National Occupational Research Agenda (NORA). It does not necessarily represent the official position of the National Institute for Occupational Safety and Health (NIOSH), Centers for Disease Control and Prevention. Mention of any company or product does not constitute endorsement by NIOSH. In addition, citations to websites external to NIOSH do not constitute NIOSH endorsement of the sponsoring organizations or their programs or products. Furthermore, NIOSH is not responsible for the content of these websites. All web addresses referenced in this document were accessible as of the publication date.

Additional Information

For more information about the National Occupational Research Agenda (NORA), visit the web site www.cdc.gov/nora. For a monthly NORA update, subscribe to NIOSH eNews by visiting www.cdc.gov/niosh/eNews.

Suggested Citation

NORA Respiratory Health Cross-Sector Council [2022]. Review of the 2019 National Occupational Research Agenda for Respiratory Health by Non-NIOSH Members of the Respiratory Health Cross-Sector Council. By Henneberger, Paul. Morgantown, WV: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health.

June 2022

Table of Contents

Summary	1
Background	1
Results	3
Characteristics of those who responded.....	3
Priorities and justifications.....	3
All objectives are important.....	4
Summary of justifications for priorities that addressed COVID-19 and climate change.....	5
Summary of justifications for priorities specific to each of the ten objectives.....	6
Conclusions	10
Appendix: Tables 1 - 10.....	11

Summary

In February 2022 the 18 non-NIOSH members of the Respiratory Health Cross-sector Council (RHCC) of the National Occupational Research Agenda (NORA) program were requested by RHCC leadership to indicate their top two priorities for occupational respiratory health. Their responses covered all 10 major objectives in the 2019 National Occupational Research Agenda for Respiratory Health (NORA-RH). Respondents referred to the COVID-19 pandemic in justifications for nine of the 41 priorities indicated, and justifications for five priorities addressed climate change. The other priorities related to a variety of work-related exposures and respiratory diseases, and fundamental activities. This illustrates that many issues in occupational respiratory health still need attention, both in terms of research and interventions, and the objectives presented in the 2019 NORA-RH are relevant and important in 2022.

Background

The National Occupational Research Agenda ([NORA](#)) is a partnership program to stimulate innovative research and improved workplace practices. Unveiled in 1996, NORA has become a research framework for the nation. NORA is sponsored by the National Institute for Occupational Safety and Health (NIOSH), the institute responsible for occupational safety and health research in the U.S. Centers for Disease Control and Prevention (CDC). Stakeholders from a variety of organizations are engaged in ten sector NORA councils that are based on major areas of the U.S. economy, and seven cross-sectors councils that address the major health and safety issues that impact U.S. workers. Each council develops and maintains agendas for its own sector or cross-sector. Taken together, these agendas form the national agenda for improvements in occupational safety and health.

With the start of the third decade of NORA in 2016, individuals from academia, industry, government (including NIOSH), and patient organizations with an interest in occupational respiratory health were invited to become members of the NORA Respiratory Health Cross-sector Council (RHCC). One of the first tasks for RHCC members was to develop the National Occupational Research Agenda for Respiratory Health (NORA-RH), which was published online in January 2019. Consistent with the goal of

maintaining the NORA-RH, RHCC Co-Chair Paul Henneberger asked non-NIOSH council members in February 2022 to identify the two most important occupational respiratory health objectives for 2022. This was motivated by the fact that 2022 was approximately the middle of the third decade of NORA, and that the experience of the previous two years of the COVID-19 pandemic may have influenced the priorities of members who took part in crafting the NORA-RH. Also, it was an opportunity for members who joined after the NORA-RH was developed to express their priorities for occupational respiratory health. Members were given the [NORA-RH](#) as a reference but were also told that their responses did not have to be limited to the ten major objectives and multiple sub-objectives in that document. Those major objectives are listed below, organized into three groups based on subject area.

- Work-related respiratory diseases: Objectives 1-4
 1. Prevent and reduce work-related lower and upper airways diseases
 2. Prevent and reduce work-related interstitial / dust-induced lung diseases
 3. Prevent and reduce work-related respiratory infectious diseases
 4. Prevent and reduce work-related respiratory malignancies
- Occupational respiratory exposures: Objectives 5-7
 5. Advance the understanding of how acute and lifetime mixed occupational exposures and mixed occupational and non-occupational exposures impact respiratory health
 6. Advance the understanding of the impact of occupational chronic low-level toxicant exposure on respiratory health, notably chronic low-level irritant exposure
 7. Advance protection of the respiratory health of workers who respond to or are impacted by natural and unnatural disasters, including epidemics and pandemics
- Fundamental activities: Objectives 8-10
 8. Advance surveillance for occupational respiratory diseases and relevant exposures
 9. Advance the assessment of occupational exposures for the study of respiratory health
 10. Advance information dissemination, education, and positive changes in behavior for workers, patients, employers, policy makers, and health care providers about how to address the occupational contribution to respiratory health, including issues of impairment and disability

This report is not intended to replace the 2019 NORA-RH and does not provide consensus opinions of the 18 members who responded. Instead, it indicates how many members prioritized the different objectives and summarizes justifications they offered for their choices. The report includes 10 tables, one for each of the major objectives in the research agenda. The anonymity of those who submitted priorities is protected by referring to them as Member 1 through Member 18 based on randomly assigned numbers. Comments submitted by members were edited for clarity and to maintain anonymity.

Results

Characteristics of those who responded

The members who participated in this exercise work for or represent different types of organizations. The distribution across those organizations include: 10 university, 2 health and safety director in a company, 2 patient organization, 2 US state government agency, 1 US federal government agency, and 1 national health agency in another country.

Priorities and justifications

Thirteen members indicated two priorities and five indicated three priorities, for a total of 41. The number of times major objectives were chosen in descending order from most to least frequent are:

- Objective 5 and 9, n=6 each
- Objective 6 and 7, n=5 each
- Objective 1 and 3, n=4 each
- Objective 2, 8, and 10, n=3 each
- Objective 4, n=2

Full-text justifications submitted by RHCC members are presented in Tables 1 – 10 that appear in the appendix, with the table number corresponding to the objective number.

All objectives are important

Several members expressed concern that all 10 major objectives and numerous sub-objectives are still important, and that selecting only two objectives fell short of paying attention to all the needs for researching and preventing occupational respiratory diseases. These concerns are presented in the following comments from 6 members, presented in the order in which they were received.

Member 10

This is a difficult (but important) exercise because:

- They are all pressing issues, perhaps arguably variably so depending on the time scale considered.
- They are somewhat overlapping (as another member has pointed out)
- I don't quite understand how prioritizing/ranking will lead to practically. You alluded to this but I would be interested in learning more about the process because this seems to have potentially very important implications.

Member 8

It's hard to pick just two objectives, but here are my thoughts.

Member 17

Arguably, all the objectives listed have merit.

Member 2

Thank you very much for this opportunity. I would like to echo my colleagues' words. I believe that all these objectives are extremely important.

Member 16

I have the benefit of many previous thoughtful and very well-articulated responses. If I have to write something different from everybody else, I will write that I do not believe that the pandemic changed any of my views or altered the fairly well-crafted research agenda. All objectives are important, and there are more than enough people to investigate them: we just

need more funding! We are not chasing an ambulance (or a fleet of ambulances...) here just because of COVID-19. We knew (and the respiratory and public health community should have known much better) that occupational infections and pandemics were a recurring and probably increasingly worsening menace and should have been better prepared for it. We already belabored that point in the review article that several members of this council co-wrote. So, that's my stand: all objectives are equally important and pressing.

Member 16 follow-up comments: The original document was pretty good. I am so happy that we included respiratory infections.

Member 3

Two separate comments:

- I think it is hard to pick the two highest priority objectives. I think they are all still very relevant.
- The rest of the objectives and sub-objectives I think are all still extremely important. I hate to only mention 2!

Summary of justifications for priorities that addressed COVID-19 and climate change

The issues of the COVID-19 pandemic and climate change were not explicitly named in the 2019 NORA-RH but were addressed in several justifications for priorities indicated by members in 2022.

Justifications that addressed COVID-19

The COVID-19 pandemic exposed weaknesses in public health and healthcare systems in the United States and other countries. Nine members provided justifications for selecting Objectives 3, 5, 7, and 10 that identified needs for improving these systems. Full-text justifications appear in Tables 3, 5, 7, and 10, respectively, in the appendix and are identified with “**(COVID-19 related)**” at the end of relevant entries. A summary of the needs for improvements related to COVID-19 (and the objective and number of members who wrote or agreed with a justification) are listed below.

- Improve the prevention of work-related respiratory infectious diseases in workplaces (Objective 3, 3 members).

- Improve the understanding of how non-occupational sociodemographic factors and non-occupational exposures may work with occupational respiratory exposures to increase the likelihood of disease, severe illness, and death (Objective 5, 3 members).
- Improve the healthcare industry’s understanding of basic respiratory protection (Objective 7, 1 member).
- Improve the low level of health literacy and limited ability to interact with healthcare systems demonstrated by many people during the pandemic (Objective 10, 1 member).
- Improve public health communications, including the use of novel opportunities for information dissemination/updates such as social media (Objective 10, 1 member).

A final observation about the COVID-19 pandemic was not associated with a specific objective and made the point that the United States has experience with infectious disease outbreaks but was unprepared for a pandemic.

Justifications that addressed climate change

Several justifications provided by members who selected Objectives 5 and 7 pointed out that climate change is impacting the respiratory health of workers. For Objective 5, one member noted that climate change makes occupational respiratory exposures more complex. For Objective 7, four members suggested giving more attention to climate change because it has likely worsened conditions that could impact the health of workers. The exposures worsened by climate change include smoke from wildfires, bioaerosols associated with flooding, and temperature extremes. Full-text justifications that mention climate change appear in Tables 5 and 7 in the appendix and are identified with “**(Climate change related)**” at the end of relevant entries.

Summary of justifications for priorities specific to each of the ten objectives

The following summarizes justifications that members provided for their choices of individual objectives and is organized in three groups: Objectives 1-4: work-related respiratory diseases; Objectives 5-7: occupational respiratory exposures; and Objectives 8-10: fundamental activities. Full-text justifications submitted by RHCC members are presented in tables located in the appendix.

Work-related respiratory diseases, Objectives 1-4

The first four objectives address the prevention and reduction of different work-related respiratory diseases:

1. lower and upper airways diseases
2. interstitial / dust-induced lung diseases
3. infectious diseases
4. malignancies

OBJECTIVE 1

Council members selected Objective 1 more times (n=4) than the other three objectives in this group. Justifications for Objective 1 included that work-related lower and upper airways diseases are still very common, the need to improve surveillance for chronic obstructive pulmonary disease (COPD), and the need to develop new methods for assessing clinical outcomes.

OBJECTIVE 2

Those who picked Objective 2 on interstitial / dust-induced lung diseases expressed several concerns. These included the observation that workers continue to develop and even die from silicosis, indicating the need for additional efforts to prevent work-related dust-induced diseases. Also, the scientific community has not made significant progress on this topic, too many cases labeled as idiopathic pulmonary fibrosis (IPF) have an occupational cause, and workplace exposure assessments are needed before concluding a diagnosis of IPF. Finally, a member described dust as the greatest threat to the respiratory health of workers in a variety of industries, and further work is needed to identify the exposures that impact large numbers of workers and then generate the data to inform awareness and preventive actions.

OBJECTIVE 3

For work-related respiratory infectious diseases, one member expressed interest in focusing on occupational exposures that increase susceptibility for infections, and another proposed expanding this objective to include communicating science-based guidance to legislative bodies seeking to regulate airborne infectious diseases. A third member stated that the spread of COVID-19 among essential

workers who could not work from home and were unable to easily use respiratory protection suggests a need for novel mitigation measures that could be used during future outbreaks of respiratory infectious diseases. Finally, a member identified Objective 3 as having the most relevance post-COVID-19, specifically to document the lessons learned about preventing transmission and incorporating these lessons into new baselines for the state of the science.

OBJECTIVE 4

Two members expressed the viewpoint that work-related respiratory malignancies have been overlooked for too long. One expressed a need for more studies to identify dangers associated with new chemicals, and the other called for action based on findings from new methods that more quickly identify unsafe levels of occupational exposures.

Occupational respiratory exposures, Objectives 5-7

These three objectives address different aspects of occupational respiratory exposures:

5. mixed occupational exposures and mixed occupational and non-occupational exposures
6. chronic low-level exposures, notably irritant exposures
7. protecting the respiratory health of first responders, including during epidemics and pandemics

OBJECTIVE 5

Objectives in this group were selected as priorities by members more often than objectives in the other two groups. For Objective 5, three members stated that the pandemic emphasized how non-occupational factors such as obesity, smoking, and household environmental exposures may heighten susceptibility for infection and severe illness among individuals exposed to SARS-CoV-2 (the virus that causes COVID-19) at work. Two members emphasized the impact of the combination of infectious and non-infectious exposures on respiratory health. Another member noted the need to differentiate the contributions of occupational and non-occupational factors to respiratory disease.

OBJECTIVE 6

Several members selected the need to achieve a better understanding of how occupational chronic low-level exposures, especially to irritant chemicals, contribute to respiratory diseases. Two of them did not specify a particular respiratory disease as the outcome of interest, but for another two it was asthma and for one it was COPD.

OBJECTIVE 7

Objective 7 relates to improving respiratory protection for workers who respond to or are impacted by natural and unnatural diseases, including epidemics and pandemics. One member said they felt the pandemic revealed that the healthcare industry lacked an understanding of basic respiratory protection and raised concern about the ongoing challenge of the healthcare infrastructure to sustain the impact of a pandemic. Three members agreed with the suggestion to bring more attention to how climate change has likely worsened conditions that could impact the health of workers. These exposures include smoke from wildfires, bioaerosols associated with flooding, and temperature extremes.

Fundamental activities, Objectives 8-10

The final three objectives relate to fundamental activities that support the prevention of work-related exposures and respiratory diseases:

8. surveillance for exposures and diseases
9. assessment of occupational exposures
10. information dissemination, education, and positive changes in behavior

OBJECTIVE 8

Several members emphasized improving surveillance for occupational respiratory diseases and related exposures. One of them discussed the importance of developing a surveillance algorithm for occupational COPD, and another proposed developing a method to conduct surveillance concomitantly for both occupational exposures and respiratory diseases. A third member stated that surveillance for occupational exposures and respiratory diseases was indeed fundamental and influenced many other objectives.

OBJECTIVE 9

Several reasons were provided for advancing the assessment of occupational exposures. These included developing assessment tools linked to respiratory health outcomes, such as wearable and portable devices, and epidemiologic research tools such as job-exposure matrices (JEMs). Another comment focused on providing information to workers they can use to lower their risk of disease.

OBJECTIVE 10

Several members prioritized advancing effective communication described in Objective 10. The reasons included learning from the challenges of effective health communication during the COVID-19 pandemic, using novel approaches like social media to reach the intended audience, and using information to empower those at risk.

Conclusions

The current exercise is consistent with the responsibility of each NORA Council to not only develop but also maintain an agenda for occupational safety and health. The findings support the conclusion that the 2019 RH-NORA is relevant and important in 2022. This confirmation of the 2019 document encompasses all subject areas: work-related respiratory diseases, Objectives 1-4; occupational respiratory exposures, Objectives 5-7; and fundamental activities, Objectives 8-10. The RH-NORA is an agenda for the entire nation for improvements in occupational respiratory health. The RHCC will continue to promote the objectives of the 2019 agenda by activities that include “information exchange, collaboration, and enhanced dissemination and implementation of solutions that work,” as described in the [Statement of Purpose for NORA Councils](#).

Appendix: Tables 1 - 10

Table 1: Justifications from members who prioritized Objective 1: Prevent and reduce work-related lower and upper airways diseases

Member	Justification
14	Objective 1, specifically: 1.2 Prevent and reduce work-related COPD, and Objective 8: Advance surveillance for occupational respiratory diseases and relevant exposures. I've spent the past year working with two pulmonologists. We've improved our surveillance algorithm for occupational COPD and tested it with a small cohort of workers' compensation cases. I'm not sure how to do this, but perhaps the algorithm could be used to debate a wider-accepted definition/consensus for occupational COPD. This would be useful in the surveillance setting but also perhaps in the clinical setting.
9	A worthy goal that would require development of new tools or methods for assessing clinical outcomes.
4	To me, being forced to select two items, Objective 1 and Objective 4 would be the most pressing, I think especially Objective 4 is overdue, because recent information about safe and unsafe levels of exposure now should speed up the process of reducing exposure limits, e.g., for chromium and respirable crystalline silica, leading to a further focus to reduce occupational exposures to carcinogens by inhalation.
7	These are still very common work-related disorders, including those caused and those exacerbated by work, and ranging from rhinitis to laryngeal disorders, to COPD, asthma, and bronchiolitis.

Table 2: Justifications from the members who prioritized Objective 2: Prevent and reduce work-related interstitial / dust-induced lung diseases

Member	Justification
6	<p>This objective, in my opinion, represents the greatest threat to respiratory health in various industries. The silica standard alone was long overdue, but its passage was only the beginning hallmark in the ongoing work necessary to educate and safeguard workers in silica-related industries. We have a long way to go to solidify an understanding that occupational dusts are intertwined with controls and respiratory protection. We can consider ourselves successful when employers and workers adopt and implement controls in much the same way that they intuitively fasten their seatbelts before starting their cars. The process of hazard recognition and adoption of controls must reach that level of marriage between those two processes. The challenge is to identify the exposures that impact large populations and work to produce the data to support thorough awareness and action.</p>
15	<p>This is based on my experience managing a state-based occupational respiratory disease surveillance program. Since I just identified yet another death attributable to silicosis in a young worker fabricating engineered stone countertops, the impact of dust-induced diseases is fresh in my mind. And it is clear we are only seeing a very small proportion of those affected for a wide variety of reasons. So much additional work needs to be done to prevent dust-induced diseases.</p>
3	<p>I do not think the scientific community has made significant progress on Objective 2, and specifically on: 2.1 Increase the role of exposure assessment in the evaluation of patients diagnosed with idiopathic pulmonary fibrosis to improve identification of possible workplace contribution. I think so much of what we call “idiopathic” is in no way, idiopathic.</p>

Table 3: Justifications from members who prioritized Objective 3: Prevent and reduce work-related respiratory infectious diseases*

Member	Justification
18	<p>The spread of the COVID-19 pandemic at essential workplaces where workers cannot telecommute or easily use respiratory protection requires novel mitigation measures. These measures included technology-dependent newer screening and diagnostic tests, preventive behavioral practices, and vaccination. The lessons learned from the pandemic would be very useful for future respiratory infectious diseases. (COVID-19 related)</p>
12	<p>Could we look at expanding Objective 3 (sub objective 3.2 Evaluate optimal methods to prevent influenza transmission in healthcare workers, including the role of protection against transmission by aerosols) to develop or provide science-based guidance to legislative bodies seeking to regulate airborne infectious diseases? My thoughts are – OSHA has periodically talked about an infectious disease standard, Cal OSHA implemented Aerosol Transmissible Diseases (ATD) standards, and others have discussed legislation. Are there requirements that we can agree upon that should be included in any attempt to regulate ATDs? We all saw the “PPE” discussion around gaiters to medical masks to KN95s (for COVID-19), some of us are still embroiled in isolation room discussions, and right or wrong the OSHA Healthcare Emergency Temporary Standard protecting workers from COVID-19 in settings where they provide healthcare or healthcare support services. (COVID-19 related)</p>
1	<p>Occupational risk factors for respiratory infections, i.e., exposures increasing the susceptibility for infections.</p>

Member	Justification
3	<p>The objective that has the most relevance post-COVID is Objective 3, including the sub-objectives 3.1 and 3.2.</p> <ul style="list-style-type: none"> - 3.1 Improve the technology of respiratory protection to prevent infectious diseases and improve the way the protection is used at the workplace. - 3.2 Evaluate optimal methods to prevent influenza transmission in healthcare workers, including the role of protection against transmission by aerosols. <p>In particular, there are many, many lessons we have learned in this area over the last two years that need to be documented, incorporated into new hypotheses and creating new baselines for what we should consider the state of the science now. This also would have implications for Objective 7: Advance protection of the respiratory health of workers who respond to or are impacted by natural and unnatural disasters, including epidemics and pandemics. (COVID-19 related)</p>

*There was one additional comment related to infectious disease that did not directly address a specific objective: “I think it is important to emphasize that we did not learn much new with the COVID-19 pandemic. In the United States, we learned how awfully unprepared we were (and remain?).” (Member 16)

Table 4: Justifications from members who prioritized Objective 4: Prevent and reduce work-related respiratory malignancies

Member	Justification
4	<p>I think especially Objective 4 is overdue, because recent information about safe and unsafe levels of exposure now should speed up the process of reducing exposure limits, e.g., for chromium and respirable crystalline silica, leading to a further focus to reduce occupational exposures to carcinogens by inhalation.</p>
1	<p>This topic has been overlooked for many years. The risk pattern in workplaces has changed with less or no asbestos, less tobacco smoking, and exposure to new chemicals. There is a need for new studies.</p>

Table 5: Justifications from the who prioritized Objective 5: Advance the understanding of how acute and lifetime mixed occupational exposures and mixed occupational and non-occupational exposures impact respiratory health

Member	Justification
16 & 18	The spread of the pandemic raised concerns about the role of demographic factors such as sex, race/ethnicity, obesity, and smoking, and non-occupational exposures such as public transportation, multigenerational housing with limited access to running water, and exposure to outdoor and household air pollution on the incidence and mortality from COVID-19 respiratory infections. In addition, the role of genetics and epigenetics is still not understood. Nevertheless, the lessons learned from the pandemic have highlighted the importance of non-occupational factors that impact respiratory infections. (COVID-19 related)
5 & 13	Caveat is the inclusion of both infectious and non-infectious exposures. In looking back at the agenda document, infectious exposures were not really emphasized in Objective 5.
17	Objective 5 stands out to me as being one that looks at both occupational and non-occupational exposures which could advance our understanding as to how causes of these diseases are related to the work environment as opposed to non-work causes (smoking, genetics, etc.).
2	When I look at the public health discipline’s experience during COVID-19, I believe that Objectives 5 and 10 are critical. Objective 5: With climate changes, population dynamics, poverty, and increasing global disparity levels, these variables make occupational respiratory exposures more complex. (COVID-19 related) (Climate change related)

Table 6: Justifications from the members who prioritized Objective 6: Advance the understanding of the impact of occupational chronic low-level toxicant exposure on respiratory health, notably chronic low-level irritant exposure*

Member	Justification
10	For the reason Member 7 nicely articulated. This issue remains, irritatingly, one that compensation boards, physicians, and even patients seem chronically confused about.
15	A very significant proportion of work-related asthma cases are associated with low level, chronic irritant exposures. This area also could have a huge impact on prevention.
1	There is a considerable lack of knowledge regarding occupational exposure to gas, dust and fumes and risk of exacerbations of COPD. I think that is the most important challenge for us, just now. If I were younger, I would initiate an ATS/ERS joint consensus statement on this topic.
7	This partly overlaps with Objective 1 but remains a poorly understood relationship with respiratory diseases.

* A fifth member selected Objective 6 as a priority but did not provide a justification.

Table 7: Justifications from the members who prioritized Objective 7: Advance protection of the respiratory health of workers who respond to or are impacted by natural and unnatural disasters, including epidemics and pandemics

Member	Justification
10	Because of the reasons Member 8 articulated so nicely, especially climate change, which was by many previously and perhaps still seen as more ‘environmental’ than ‘occupational’ but clearly has profound impacts on workers. (Climate change related)
8 & 12	In addition to the major and present issues with occupational risks from the pandemic, this objective seems broad enough to include other relevant disasters such as those linked to climate change – wildfire smoke (firefighters), flooding (mold/bioaerosol exposure linked to mitigation), increase in airborne allergens (agricultural work), extremes of temperature (outdoor workers), etc. And I like the focus on applied research to identify ways to ‘advance protection’ of worker respiratory health. (Climate change related)
6	COVID-19 exposed the vulnerability of workers in healthcare and first responder industries. Respiratory protection concepts that are common within the construction and petrochemical industries appeared to be entirely absent in healthcare organizations. I have engaged many workers in healthcare and assisted living that are completely unaware of basic fundamentals of respiratory protection. Other than the education component, the management of the Strategic National Stockpile should be considered to shield its operation from political influence or hesitance. If this approach is a bridge too far then providing material and guidance to larger organizations to develop their own stockpile would be beneficial in ensuring that healthcare workers and first responders have the controls and supplies necessary to ensure their health and those of others. A large concern was the ability of our healthcare infrastructure to sustain the impact of the pandemic and I believe this remains a vulnerability to this current contagion and potentially others not yet seen. (COVID-19 related)
11	Agree with addition of climate issues (Climate change related)

Table 8: Justifications from the members who prioritized Objective 8: Advance surveillance for occupational respiratory diseases and relevant exposures

Member	Justification
14	Objectives 1 and Objective 8: I've spent the past year working with two pulmonologists. We've improved our surveillance algorithm for occupational COPD and tested it with a small cohort of workers' comp cases. I'm not sure how to do this, but perhaps the algorithm could be used to debate a wider-accepted definition/consensus for occupational COPD? This would be useful in the surveillance setting but also perhaps in the clinical setting.
9	This appears to be an unmet need that could enable development of models or new approaches to concomitantly assess exposure and disease.
15	I would argue that as one of the primary 'fundamental' objectives, it has the capacity to drive and influence many of the other objectives. Without surveillance, our ability to track, characterize, and evaluate progress on well-established occupational respiratory diseases and exposures, as well as new previously unrecognized exposures and diseases, is limited. Over the years I have seen the extremely modest investment NIOSH has made in state-based occupational respiratory exposure and disease surveillance identify many previously unknown hazards and document the impact on human health of those hazards. I've also seen it document decreases in hazards that have been reduced through changes in policy, standards, and prevention. To me, this objective is essential

Table 9: Justifications from the members who prioritized Objective 9: Advance the assessment of occupational exposures for the study of respiratory health

Member	Justification
8 & 16	There is still much work to be done to develop occupational exposure assessment tools that are linked to respiratory health outcomes, e.g., source apportionment analysis, real time measures of dust exposures (including with wearable and portable devices such as silicone wristbands), mineralogic characteristics of retained lung dust, valid JEM and other epidemiologic tools, meaningful biomarkers of exposure (e.g., for allergens and antigens linked to occupational asthma and hypersensitivity pneumonitis).
5 & 13	Caveat is the inclusion of both infectious and non-infectious exposures. In looking back at the agenda document, infectious exposures were not really emphasized in Objective 9.
17	Both Objective 9 and 10 are quite important from a patient view. One cannot develop a plan of attack without further quantifying the disease and measuring the intensity. At that point, Objective 10 comes into play as relating to not only the research community but the workers at risk as well. Knowledge is power as the saying goes. Informing those at risk as to what behavioral changes could help can only lower their risk of disease.
11	I agree with much of what Member 8 writes. I would also add that part of advancing the assessment of occupational exposures overlaps with Objective 10 as researchers in other fields are often unaware of the range of tools/statistical approaches to assess explore disease relationships.

Table 10: Justifications from the members who prioritized Objective 10: Advance information dissemination, education, and positive changes in behavior for workers, patients, employers, policy makers, and health care providers about how to address the occupational contribution to respiratory health, including issues of impairment and disability

Member	Justification
17	Both Objective 9 and 10 are quite important from a patient view. One cannot develop a plan of attack without further quantifying the disease and measuring the intensity. At that point, Objective 10 comes into play as relating to not only the research community but the workers at risk as well. Knowledge is power as the saying goes. Informing those at risk as to what behavioral changes could help can only lower their risk of disease.
2	When I look at the public health discipline’s experience during COVID-19, I believe that Objectives 5 and 10 are critical. Objective 10: Especially during the pandemic we learned that despite the fact that scientists consistently proclaim that science should lead the public discourse concerning scientific challenges, one of the main issues is the low level of health literacy, the ability to understand, apply medical information, interact with the health system, and policy. (COVID-19 related)
11	<ul style="list-style-type: none"> - Agree with identifying novel opportunities for information dissemination/updates (e.g., social media, etc.) and broad outreach at the local and national level. - Identify specific organizations/groups within these stakeholder groups to prioritize for outreach. - With the pandemic, there are lessons to be learned about what worked and what did not work. (COVID-19 related)