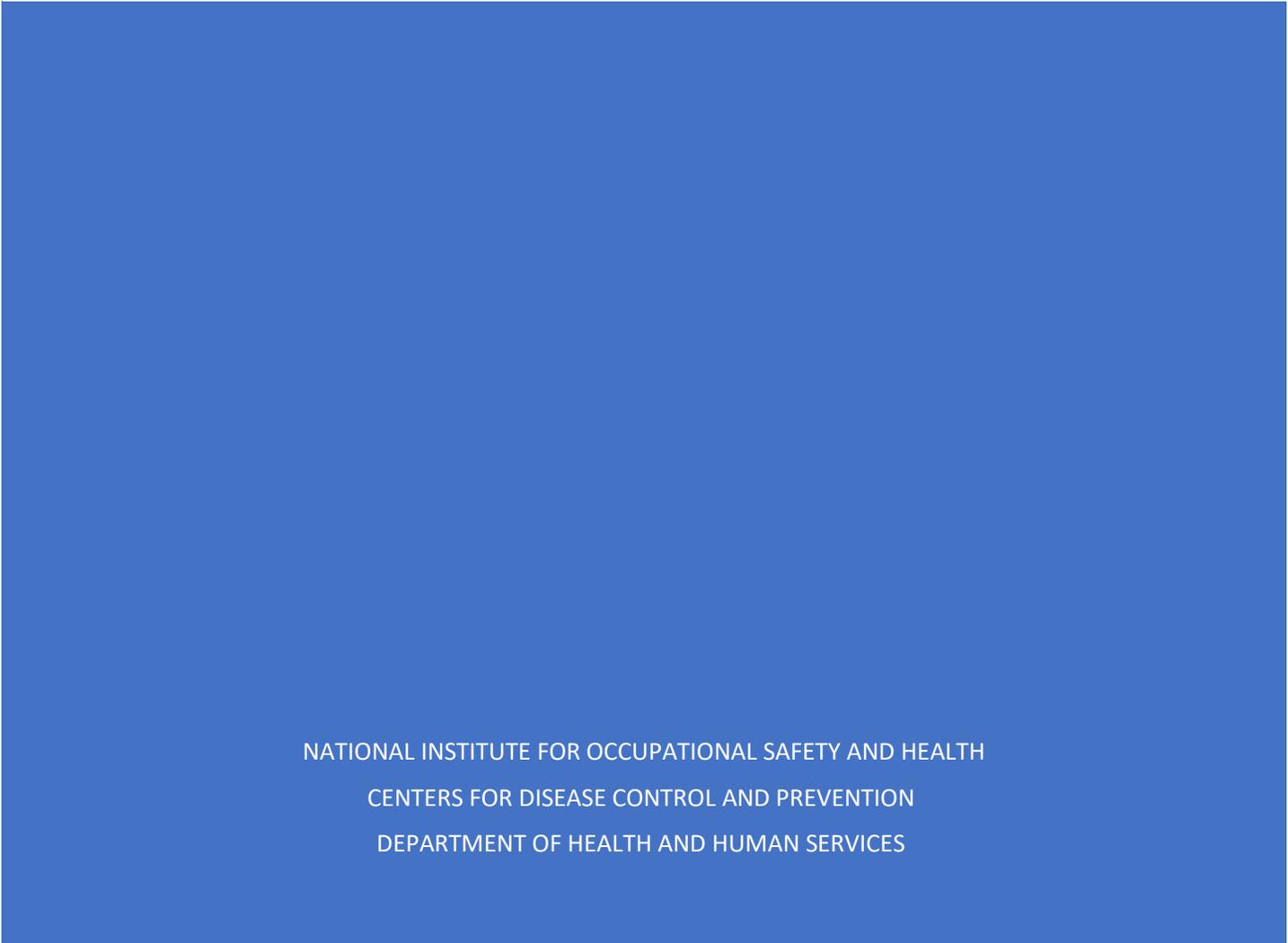# NIOSH EVALUATION CAPACITY BUILDING PLAN 2021-2025

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH

CENTERS FOR DISEASE CONTROL AND PREVENTION

DEPARTMENT OF HEALTH AND HUMAN SERVICES

Table of Contents

Executive Summary

Over the last 15 years, NIOSH has taken steps to integrate program evaluation into its culture, namely by developing, implementing, and continually refining the process by which it evaluates the relevance and impact of its research programs. Having completed 13 of these reviews, Institute evaluators identified a list of five topical areas, which NIOSH must continue to cultivate to ensure the relevance and impact of its research in the future. This NIOSH Evaluation Capacity Building Plan, developed by staff from across the Institute (Appendix A), is intended to outline specific capacity building needs within those areas and how NIOSH will begin to address them over a five-year implementation period. These areas include:

- Collection and documentation of intermediate outcomes
- Implementation of program review recommendations
- Effective approaches and strategies for communicating impact with target audiences
- Long-term external program review strategy
- Translation research

The format of this document was designed to emulate that of a learning agenda, which every federal department will be required to develop as part of the Foundations of Evidence-Based Policy Making Act. Therefore, the Plan includes a learning sheet for each area, key learning questions, key learning activities, and process steps to address each key question. Key learning questions and activities from all five areas are outlined in the Table 1 below.

Table 1. Key learning questions and activities

Key Learning Questions	Key Learning Activities
How can NIOSH incorporate the collection and documentation of intermediate outcomes (IOs) into its processes?	1. Assess motivations and barriers to collecting IOs. (Year 1) 2. Develop further guidance to encourage collection and documentation of IOs. (Year 2) 3. Raise awareness and educate NIOSH staff about what intermediate outcomes are, why they are important, how to document them. (Year 3)
How can NIOSH improve its program evaluation process to obtain useful, feasible recommendations? How can NIOSH better utilize evaluation findings and recommendations?	1. Understand the reasons review panels might provide recommendations that are beyond the capacity of NIOSH programs to implement. (Year 1) 2. Refine the current process for interactions between NIOSH and review panels to increase utilization of panel findings and recommendations. (Year 5) 3. Identify barriers and motivators at the researcher, program, and NIOSH levels to implementing feasible. review panel recommendations. (Year 1) 4. Increase the inclusion of panel review recommendations in funding opportunities and decision-making at all levels of the Institute. (Year 5)
What are the most effective approaches and strategies for communicating NIOSH impact with target audiences?	1. Complete development and user assessment of impact sheets. (Year 2) 2. Research approaches to effectively assess communication approaches and strategies. (Year 3)

	3. Tap into any on-going or recently completed audience analysis activities. (Year 3)
	4. Develop an internal educational campaign to increase understanding of audience awareness and communication channels and formats. (Year 4)
What is the long-term strategy for conducting external program reviews at NIOSH?	1. Develop a better understanding of program review strategies utilized by other federal agencies and research organizations. (Year 1)
	2. Develop a statement of purpose and objectives that guide external program reviews. (Year 2)
	3. Develop a long-term strategy for conducting external programs of NIOSH programs. (Year 3)
How can NIOSH use translation research to enhance successful adoption, implementation, and sustainment of NIOSH solutions?	1. Develop a shared understanding of translation research across the Institute. (Year 1)
	2. Build a core group of translation research subject matter experts within NIOSH. (Year 4)
	3. Build translation research into projects by adding translation expertise to the effort. (Year 5)

Ultimately, with the successful completion of the steps outlined in this Plan, at the end of the implementation period, NIOSH would like to transition from a capacity building plan to a learning agenda. Formatting the Plan in this way helps the Institute on its path to realizing its next significant evaluation step.

Background

In 2005, National Institute for Occupational Safety and Health (NIOSH) commissioned the National Academies of Science (NAS) to conduct the reviews of eight research programs selected primarily because they represented the majority of NIOSH's budget. The reviews were guided by a framework created by a NAS Framework Committee and a logic model developed with assistance from the RAND Corporation. NIOSH continues to use the logic model and accompanying definitions today as the foundation of its evaluation strategy. This was a tremendous, but worthwhile endeavor to introduce the Institute to program evaluation and receive validation from a prestigious group like the NAS.

The Institute spent several years after the NAS reviews implementing committees' recommendations, and in 2016, began to consider conducting additional reviews. Institute evaluators saw an opportunity to build upon the foundation that had been created with the NAS review and utilize advances in the evaluation field in assessing program impact outside of randomized control trials. After considering several models in the literature, evaluators chose to employ the contribution analysis (CA) framework to guide the next series of program reviews. Through the application of this framework, a program assembles evidence to demonstrate a plausible association between its activities and the observed impacts. In other words, it seeks to show contribution to an outcome rather than causal attribution. To present a strong contribution case, it's critical that a program be able to demonstrate and substantiate intermediate outcomes (actions taken by stakeholders in response to NIOSH products or efforts). To ensure programs selected for review met this and other criteria (mature enough for an impact review, had not been recently reviewed, etc.), NIOSH evaluators performed a standardized evaluability assessment of all programs within its program portfolio. Through that process, Institute evaluators identified five programs that met the criteria for immediate review.

During 2017-2019, NIOSH conducted [five external program reviews](#) (Healthcare and Social Assistance, Exposure Assessment, Construction, Emergency Preparedness and Response, and Mining) using CA, refining the process each year [Downes et al 2019]. Each program under review developed an evidence package describing the program, its activities, outputs, intermediate outcomes and actual or potential improved worker safety and health outcomes. Evidence packages were submitted to an external review panel consisting of a panel chair selected by NIOSH and a team of four to five panel members selected by the panel chair. NIOSH provided instructions for the panel review and background information about NIOSH and the program under review. After reviewing the evidence package and meeting with program representatives for a one-day face-to-face session, the panel independently deliberated and then provided findings in an oral presentation and a written report. This report includes scores for relevance and impact and a set of specific recommendations for NIOSH's consideration.

NIOSH has identified areas of strength and areas in need of further refinement or development within the program review process. Moreover, upon examining all five review panel reports, NIOSH evaluators have identified areas where further investment in evaluation capacity building by NIOSH is clearly warranted. The five topical areas include:

- Collection and documentation of intermediate outcomes
- Implementation of program review recommendations
- Effective approaches and strategies for communicating impact with target audiences

- Long-term external program review strategy
- Translation research

This NIOSH Evaluation Capacity Building Plan, developed by staff from across the Institute (Appendix A), is intended to outline specific capacity building needs within those areas and how NIOSH will begin to address them over a five-year implementation period. The format of this document was designed to emulate the format of a learning agenda, which every federal department will be required to develop as part of the Foundations of Evidence-Based Policy Making Act. In short, a learning agenda is a set of questions related to an agency's work that, when answered, improve an agency's effectiveness and efficiency through informed decision making. Ultimately, with the successful completion of this Plan, NIOSH would like to transition from a capacity building plan (a process for improving NIOSH's ability to conduct and utilize evaluation) to a learning agenda (identifying priority occupational safety and health questions best answered with evaluation studies to inform decision making). Formatting the Plan in this way helps the Institute on its path to realizing its next significant evaluation step.

Topic Area: Collection and documentation of intermediate outcomes

NIOSH sees value in continuing to use the contribution analysis approach for its external program reviews. However, to successfully and efficiently implement CA moving forward, NIOSH must make a substantial culture change in identifying, collecting, and documenting intermediate outcomes (IOs). The Institute defines IOs as actions taken by stakeholders in response to NIOSH products or efforts. For example, a manufacturer commercializing a NIOSH technology prototype or an employer adopting a NIOSH recommendation into their workplace. IOs are critical to making a claim that a NIOSH program's contributions have had an impact on health and safety outcomes. It demonstrates that evidence-based products and findings/recommendations are adopted by intermediaries and end users and therefore, it is more likely that they will positively impact the health and/or safety of the users. Like others in the federal government, NIOSH has not historically collected this type of information. While the Institute has documented reach metrics such as webpage views and downloads and scholarly metrics such as peer reviewed journal citations, it received feedback from all five expert review panels that it needs to move beyond these types of metrics and begin to document use/adoption.

Therefore, this particular learning question focuses on building the collection and documentation of intermediate outcomes into NIOSH processes (e.g. making collection and documentation of IOs a regular part of NIOSH culture). Adding another "step" to any process requires an understanding of the motivators and barriers from the perspectives of key implementation groups. Focus groups will be conducted with NIOSH researchers, division/laboratory/office (DLO) management, and program management to gain their perspective about what will, and will not, work. In addition, before any implementation begins, it will be crucial to identify NIOSH staff to serve as evaluation resources within each DLO to join those working directly on this evaluation capacity building effort. This will allow these DLO staff to more directly engage in the capacity building effort, encourage the collection and documentation of IOs within their DLO, and empower them with an improved understanding of how IOs fit within the Institute's evaluation process.

When the Institute begins modifying its processes to include collection and documentation of IOs, it's critical that researchers, DLO management, and program leaders clearly understand: 1) what an IO is, 2) why it's important to collect and document them, and 3) ways to identify IOs. Based upon what is learned during the focus groups, awareness and educational campaign activities will be developed and implemented over time to include the nuances and intricacies of various IOs. For example, the definition of an IO can be situationally dependent, and not all IOs are created equal. Some are stronger, or more influential than others. Further guidance is needed as NIOSH begins to systematically collect this information.

Status	
Inputs	• Contribution analysis (CA) program reviews
Key Learning Question	How can NIOSH incorporate the collection and documentation of intermediate outcomes (IOs) into its processes?
Key Learning Activities (KLA)	1. Assess motivations and barriers to collecting IOs. (Year 1) 2. Develop further guidance to encourage collection and documentation of IOs. (Year 2) 3. Raise awareness and educate NIOSH staff about what intermediate outcomes are, why they are important, how to document them. (Year 3)
Start of Process	To date, the contribution analysis framework has served as a meaningful way to assess the relevance and impact NIOSH's research programs. However, because this framework is dependent on the Institute's ability to demonstrate intermediate outcomes (e.g. the adoption of NIOSH products and efforts by stakeholders), in order to sustain implementation of this framework, the Institute must begin to build in more systematic efforts to collect and document those intermediate outcomes.
Steps in Process	KLA-1 • Conduct focus groups with researchers, division/laboratory/office (DLO) branch management, and program leaders • Conduct interviews with DLO Directors KLA-2 • Develop further guidance around defining and documenting IOs KLA-3 • Identify NIOSH staff to serve as evaluation resources within each DLO • Develop and implement an awareness raising and educational campaign around IOs • Support effort to develop and/or expand upon current methods to collect IOs
Next Steps	

Topic Area: Implementation of program review recommendations

As a result of the external program reviews from 2017 through 2019, NIOSH received [60 overarching recommendations](#) (Healthcare and Social Assistance (20), Exposure Assessment (11), Construction (11), Emergency Preparedness and Response (5), and Mining Programs (13)) with some recommendations having multiple sub-recommendations. While some panel recommendations were clearly stated and easily interpreted; others were somewhat obtuse. At times the recommendations suggested NIOSH take actions outside its statutory role as a federal research agency. The volume and scope of recommendations in the first round of reviews was so large that NIOSH began to suggest that panels limit the number of recommendations to no more than 10, with mixed results.

At the conclusion of each review, NIOSH and its partners tend to place great importance on the resulting scores and comparatively little on the recommendations. Both the external review panel report and the NIOSH response are posted to the NIOSH [program evaluation webpage](#). The program response is sometimes treated as more of an aspirational plan than a call to action. Improving the use of the recommendations is an important step to moving evaluation from a validation of past work to a mechanism for improving NIOSH research programs.

NIOSH leadership recognizes the value of utilizing program review findings and recommendations and moving forward, would like to place an emphasis on 1) understanding how NIOSH can better provide the external review panels information that encourages them to focus recommendations and makes them more feasible to ultimately implement and 2) increasing consideration of review findings and recommendations in funding opportunities and decision-making at all levels of the Institute.

As part of the review process improvement activity, NIOSH plans to build on experience gained through incremental changes to the process in the second and third rounds of reviews. Further improvements to evidence packages developed by programs under review and guidance to external review panels are needed. The challenge is to help external review panels focus their recommendations without compromising the independence of their review.

NIOSH will develop a recommendation improvement workgroup to review recent external program review material and identify process improvements. Materials to be reviewed include review panel criteria, guidance provided to review panels, interactions between NIOSH and review panels, panel recommendations, and NIOSH responses to recent expert review panel reports. Additionally, the workgroup will use a combination of interviews with DLO management and focus groups of program portfolio leaders who have either been through an external program review or who anticipate going through a review in the future. The workgroup will produce a report outlining one or more enhancements to the current process for interactions between NIOSH and external review panels that will increase utilization of panel findings and recommendations, while maintaining the integrity of the external program review process.

Furthermore, to better implement recommendations, the Institute can benefit by taking internal steps to enhance the likelihood that NIOSH programs take advantage of the feedback received from external program review panels. NIOSH will form an implementation workgroup to look at what happens after NIOSH writes its response to expert review panel findings. The workgroup will interview program portfolio and Institute leadership who are responsible for implementation responses and decisions.

These interviews will be used to identify barriers and motivators at the researcher, program, and NIOSH levels to implementing feasible review panel recommendations. Interviews will also solicit ideas on how evaluate and prioritize panel review recommendations and how to leverage Institute funding opportunities and decision-making to incorporate high priority recommendations into program activities and initiatives. Finally, the workgroup will develop a list of strategies for: 1) including review recommendations into funding opportunities and decision-making at multiple levels within the NIOSH, and 2) communicating review panel recommendations to intramural and extramural researchers, DLO leaders, and NIOSH stakeholders.

Status	
Inputs	• Contribution analysis program reviews
Key Learning Questions	Question 1: How can NIOSH improve its program evaluation process to obtain useful, feasible recommendations? Question 2: How can NIOSH better utilize evaluation findings and recommendations?
Key Learning Activities (KLA)	Question 1: 1. Understand the reasons review panels might provide recommendations that are beyond the capacity of NIOSH programs to implement. (Year 1) 2. Refine the current process for interactions between NIOSH and review panels to increase utilization of panel findings and recommendations. (Year 5) Question 2: 3. Identify barriers and motivators at the researcher, program, and NIOSH levels to implementing feasible review panel recommendations. (Year 1) 4. Increase the inclusion of panel review recommendations in funding opportunities and decision-making at all levels of the Institute. (Year 5)
Start of Process	While the Institute continues to refine its current framework for externally reviewing its programs, NIOSH has also recognized a need to place more emphasis on utilizing program review findings and recommendations in decision-making as opposed to using reviews simply as a mechanism to ensure its programs are programmatically relevant and impactful. First, the Institute must take steps to improve its review process to encourage reviewers to offer more focused, feasible recommendations, while being careful not to infringe on the independence of reviewers. Secondly, NIOSH must improve the incorporation of review findings and recommendations in funding opportunities and decision-making. Ideally, this would increase the cost/benefit of such reviews, improve overall programmatic relevance and impact, and allow the Institute to evaluate implementation since the last program review.

Steps in Process	KLA-1
	• Review current external program review materials
	• Interview program portfolio managers and research staff that have been or could be involved in program reviews in the future
	KLA-2
	• Make recommendations, as appropriate, to improve the utility of the external impact review process
	• NIOSH internal review of recommendations
	• Finalize recommendations
	KLA-3
	• Interview program and Institute leaders who are responsible for implementation responses and decisions
	KLA-4
	• Identify a list of strategies for including review recommendations into funding opportunities and decision-making at multiple levels within the NIOSH
	• NIOSH internal review of strategies
	• Finalize strategies
Next Steps	

Topic Area: Effective approaches and strategies for communicating impact with target audiences

In the late 2000s, at the conclusion of the eight NAS reviews, NIOSH missed the opportunity to further communicate the impacts captured as part of those reviews. When NIOSH utilized the contribution analysis approach for its five most recent reviews, program evidence packages contained substantially more intermediate outcomes than previous packages. Not only does NIOSH have another opportunity to communicate this information to stakeholders, this also represents an opportunity to use intermediate outcomes to influence further adoption. To achieve this, the Institute needs to not only identify effective mechanisms to communicate this information, but also how it can be tailored to specific audiences.

NIOSH leadership, communicators, and evaluators recognize the value in identifying and applying the most effective approaches and strategies for communicating NIOSH impact with target audiences. The need for this work is further evidenced by input from NIOSH communication leadership groups, feedback from NIOSH Federal Advisory Committees, budget and policy summaries, and through formal and informal feedback from stakeholders and customers. This learning question focuses on identifying the most effective approaches and strategies for communicating NIOSH impact with target audiences.

The Institute plans to continue its work drafting impact sheets, which is a short, one-page document that outlines approximately three specific ways in which NIOSH research has had an impact, as detailed in program review evidence packages. These documents are designed for a policymaker audience and therefore, NIOSH evaluators and communicators would like to seek feedback from current and former staffers about the format and content of the new sheets. Institute staff would then use this feedback to revise the sheets and accordingly and develop additional impact sheets in the future as opportunities arise.

Next, it is important to recognize that there is already a foundation for capturing this information within the Institute, but the field of communication is constantly evolving, and an effort should be made to use current knowledge and approaches. To that end, a workgroup consisting of NIOSH staff with expertise in communication and research translation will be convened to conduct a review and develop recommendations for effectively assessing communication approaches and strategies. This work will include conducting a literature review and environmental scan to assess approaches for evaluating current communication effectiveness and developing a report that highlights potential approaches for NIOSH to consider moving forward.

Additionally, this workgroup will also look across the Institute, CDC, and other federal agencies to determine if there are on-going or recently completed audience analysis activities such as NIOSH's Customer Service Survey and the development of Personalyst. The workgroup will also seek available audience datasets that may help NIOSH communication and research staff better communicate with their target audiences. The findings from these first two steps will feed into internal resources for NIOSH staff to better access audience information and build evaluation into their communication activities.

These activities will help to lay the foundation for raising awareness within NIOSH about the importance of identifying your target audience and understanding factors that may influence what and how

information is communicated with them. The workgroup, working with internal groups such as the Communication Lead Team and Science Lead Team, will develop an internal educational campaign to increase understanding of audience awareness and communication channels and formats that can facilitate the work of reaching these audiences. Specifically, thinking about who initial target audiences are, what industry/occupational sector are they in, where they are in the awareness and decision-making process (for example Stages of Change framework), understanding the audience's needs and goals, and the purpose of your communication with them. This may include identifying and bringing in training resources for audience analysis, clear communication, data visualization training, and promoting internal staff resources.

These efforts to address this learning question will help to expand understanding of and capacity for communicating impact of NIOSH's work and furthering the reach of important occupational safety and health information.

Status	
Inputs	- National Academies of Sciences program reviews - Contribution analysis program reviews - NIOSH communication staff and Communication Lead Team - Feedback from federal advisory committees - Previous NIOSH efforts to conduct formative research and communicate impact - Information gathered from programs efforts to improve communicating impact
Key Learning Question	What are the most effective approaches and strategies for communicating NIOSH impact with target audiences?
Key Learning Activities (KLA)	1. Complete development and user assessment of impact sheets. (Year 2) 2. Research approaches to effectively assess communication approaches and strategies. (Year 3) 3. Tap into any on-going or recently completed audience analysis activities. (Year 3) 4. Develop an internal educational campaign to increase understanding of audience awareness and communication channels and formats. (Year 4)
Start of Process	Although in 2016 NIOSH adopted a theoretical program review framework designed to place more emphasis on demonstrating impact, to date, NIOSH has not capitalized on its opportunity to communicate it's impacts proactively with stakeholders. Furthermore, it has potentially missed a chance to further the adoption of NIOSH research outputs and efforts by not utilizing intermediate outcomes as an influence mechanism to encourage others to act. NIOSH leadership, communicators, and evaluators recognize the increased demand on federal agencies to demonstrate their impact, but also see an opportunity to use communications about intermediate outcomes as a means to influence further adoption. Therefore, it is critically important that the Institute not only identify effective mechanisms to communicate this information, but tailor it to specific target audiences. This information can also be used by researchers at the project level to support the increased likelihood of intermediate outcomes in the future, as well.
Steps in Process	KLA-1 - Complete draft impact sheets - Complete NIOSH clearance process - Conduct user assessment - Draft summary findings from assessment and revise draft impact sheets - Complete NIOSH clearance process - Publish KLA-2 - Conduct a literature review and environmental scan to assess approaches for evaluating current communication effectiveness

	KLA-3
	• Research current audience analysis activities for key findings and resources • Identify available audience datasets KLA-4 • Facilitate bringing audience awareness training to research and communication staff • Develop and implement an internal awareness campaign around existing NIOSH communication product format options and how they relate to target audience needs
Next Steps	

Topic Area: Long-term external program review strategy

While the Institute has made incredible progress in the area of program evaluation, the evaluation process lacks any long-term strategy. For example, NIOSH waits to assess program readiness for evaluation and selects programs for review until it is about to start conducting reviews. The next logical step in NIOSH's progression is cementing program evaluations into its culture. Leveraging what NIOSH has learned from its evaluation experiences, and the enthusiasm surrounding the Foundations of Evidence-Based Policy Making Act, the Institute will develop a long-term external program review strategy that supports program efficiency, relevance, and effectiveness while also striving for a balance between the investment made in program reviews and the benefit gained.

In order to begin developing such a strategy, it is prudent to look toward other federal organizations to learn from their program evaluation experiences. NIOSH will reach out to colleagues at other federal organizations to learn more about their evaluation processes and examine the literature for ideas. Additionally, it will be valuable to speak to the leaders of the five NIOSH programs that recently underwent review to gain their perspective on important considerations for developing a long-term strategy.

Since the external program reviews will continue to be the most resource intensive type of evaluation that NIOSH conducts, drafting a purpose statement and objectives for this type of review should be completed next as it will likely influence decisions regarding timing and program selection elsewhere in the strategy. Based upon the findings from the previous information gathering step, and the Institute's vision for this type of program review moving forward, the NIOSH Evaluation Forum will draft a purpose statement and objectives, outlining the overall and specific aims of the review such as its scope. These will subsequently be reviewed by NIOSH program leaders, the NIOSH Leadership Team, and the NIOSH Office of Policy, Planning and Evaluation (OPPE). Once those items have been finalized, NIOSH will create a small workgroup for the express purpose of developing a long-term strategy for external program reviews. Consideration will be given to factors such as the investments/benefits of such reviews, the characteristics of which programs would undergo external impact reviews, the cycle for conducting the reviews, and the preparation required for the reviews. Ideally, the strategy would provide programs with clear expectations for reviews and plenty of time to prepare over a much longer period of time (to improve the connection between planning and evaluation), and avoid the evaluation of the same research multiple times. Once drafted, this strategy will be reviewed by the Evaluation Forum, program leaders, the NIOSH Leadership Team, OPPE, and the NIOSH Board of Scientific Counselors.

Status	
Inputs	• National Academies of Sciences program reviews • Contribution analysis program reviews • Foundations of Evidence-Based Policy Making Act
Key Learning Question	What is the long-term strategy for conducting external program reviews at NIOSH?
Key Learning Activities (KLA)	1. Develop a better understanding of program review strategies utilized by other federal agencies and research organizations. (Year 1) 2. Develop a statement of purpose and objectives that guide external program reviews. (Year 2) 3. Develop a long-term strategy for conducting external programs of NIOSH programs. (Year 3)
Start of Process	After conducting the first five program reviews using the contribution analysis framework, NIOSH evaluators and program representatives recognized a demonstrated need to develop a long-term external program review strategy for: 1) which NIOSH programs should be reviewed, 2) when, 3) how, and 4) what needs to be done in preparation for the reviews.
Steps in Process	KLA-1 • Search the literature and environmental scan for alternate program review processes • Interview program leaders that have been through the last series of external impact reviews KLA-2 • Draft purpose statement and objectives for external program reviews • Internal NIOSH review of draft purpose statement and objectives • Finalize purpose statement and objectives KLA-3 • Draft long-term external program review strategy • Internal NIOSH review of long-term external program review strategy • Revise long-term external program review strategy • NIOSH Board of Scientific Counselors review of long-term external program review strategy • Finalize long-term external program review strategy
Next Steps	

Topic Area: Translation research

Translation research (TR) is the application of scientific investigative approaches to study how the products of research can be effectively translated into everyday practice. This type of research has received increased attention in the occupational safety and health (OSH) field, and has become increasingly important for NIOSH, as stakeholders call for greater evidence of the positive and sustained impact of OSH research. TR approaches are uniquely suited to moving research outputs (such as evidence-based interventions) into use by employers and workers. TR strategies are also useful for capturing and characterizing the intermediate outcomes of OSH interventions, as well as the key factors that influence whether an intervention is adopted and institutionalized. Efforts to increase and enhance the use of TR approaches at NIOSH have been underway since 2016, but there continues to be a lack of shared understanding of the concept within the Institute, and very few projects and programs have explicitly incorporated TR methodologies.

NIOSH began discussing TR in OSH in 2010 following critical reviews by the NAS as well as calls within the OSH community to increase efforts to investigate factors that enhance and limit the development, transfer, and use of occupational safety and health information and technology. Initial thinking was captured in the NIOSH Research Roadmap (2016), built on the widely cited National Institutes of Health (NIH) 4-phase, bench to bedside model, along with other clinical and public health models. The roadmap called for the formation of the NIOSH TR Core and Specialty Program as well as promotion of the concept more widely, and differentiated TR as being distinct from research to practice (r2p), in that TR is the study of r2p processes (with the aim of improving these processes to enhance adoption and sustainment of effective OSH interventions). A key journal article published in 2017 [Schulte et al 2017] offered a definition and framework for TR for OSH, and subsequent journal articles aim to disentangle overlapping terminology and concepts which are used in the multiple disciplines involved in dissemination and implementation (D&I) science, TR for OSH, and research to practice.

While much of the initial presentation of TR at NIOSH has focused on the 4-stage framework included in the NIOSH roadmap, which parallels the full continuum of research from problem identification to application of intervention and eradication or reduction of the problem, we recognize that there is a need for focused attention on research that addresses the latter stages of the r2p process – that is, D&I science approaches. The concepts of TR and D&I are overlapping, with many scientific disciplines using differing terminology for the same or similar concepts. Therefore, NIOSH will first focus on refining and aligning our definition of TR for OSH with how other institutions (such as the National Institutes of Health and the Veterans Health Administration) are operating in this sphere, by conducting literature reviews and environmental scans. It will be critical to develop a shared understanding of the concept across NIOSH, with an emphasis on stage 3 of the TR framework, which is the main area of overlap with D&I science.

Once the Institute has refined its definition of TR, the focus will then be directed toward building TR understanding and expertise across the Institute. Currently, the institutional knowledge of TR and D&I are largely limited to a core group within one NIOSH research division. Incorporation of TR learning activities within the Evaluation Capacity Building Plan has introduced TR concepts to a small group of additional NIOSH staff in other DLOs, but there is a need to begin to build TR capacity among more NIOSH staff to assist with incorporating TR approaches into ongoing projects and programs Institute-

wide. Current NIOSH TR experts will work to identify researchers and program leaders to engage with TR Program staff to explore possibilities for incorporating TR approaches into their research and outreach efforts. NIOSH will also plan workshop activities with external experts in the field of D&I science to enhance understanding and increase engagement with specific project officers and program leaders.

The final activity to address this learning question will consist of conducting one to two pilot projects to demonstrate feasibility of implementation science strategies. This will require one to two new projects to be developed, with joint leadership by representatives of both candidate program staff and the TR Program. These projects will serve to not only move a particular area of OSH research forward along the r2p continuum, but also to serve as examples of how TR approaches can enhance the potential downstream impact of NIOSH research. We anticipate these demonstrations may also lead to adding staff with TR expertise within other DLOs as the value of adding TR approaches is realized.

Status	
Inputs	- National Academies of Sciences program reviews - Contribution analysis program reviews - Translation Research Roadmap - Translation Research Core and Specialty Program - NIOSH stakeholders - State of translation science within other agencies
Key Learning Question	How can NIOSH use translation research to enhance successful adoption, implementation, and sustainment of NIOSH solutions?
Key Learning Activities (KLA)	1. Develop a shared understanding of translation research across the Institute. (Year 1) 2. Build a core group of translation research subject matter experts within NIOSH. (Year 4) 3. Build translation research into projects by adding translation expertise to the effort. (Year 5)
Start of Process	NIOSH began its efforts in translation research (TR) about 10 years ago. The Institute has made great strides during that time such as the publication of the NIOSH Translation Research Roadmap in 2016 and examination of how TR concepts and language overlap across disciplines. However, just after the eight National Academies of Sciences reviews, the five most recent program review panels again expressed a need for the Institute to continue to expand and evolve in this area. Additionally, given the Institute's renewed emphasis on translating its research into impact, particularly through the demonstration of methods to more readily achieve intermediate outcomes, this type of research will be increasingly important. Therefore, NIOSH must continue to conduct formative research to learn from others in this area, but must also commit itself to more clearly articulating how it will apply TR concepts at NIOSH and use that to educate those across the Institute about TR to increase familiarity, understanding, and eventually, use. Finally, since TR is relatively new, particularly to the occupational safety and health community, NIOSH should also work toward demonstrating the feasibility and importance of such work through pilot projects to increase "buy-in" within the Institute.
Steps in Process	KLA-1 - Search the literature and environmental scan relevant to TR - Refine a definition and conceptualization of TR application at NIOSH KLA-2 - Identify researchers and program leaders for inclusion in TR education and outreach efforts - Conduct workshop(s) on TR approaches in OSH KLA-3 - Conduct one to two pilot projects to demonstrate feasibility of TR
Next Steps	

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