

How Dynamic Academic Medical Centers Improve Communities: The Case of the Rocky Mountain Center for Occupational and Environmental Health

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Abstract

Academic Medical Centers (AMC) are unique healthcare resources that offer services to their local communities. As societal priorities shift, AMCs are identifying approaches to practice community engagement. Although many examples of AMCs exist in the literature, few have targeted resources for specific health topics like occupational health. This case study identifies examples of community engagement from AMCs around the U.S. It also offers a unique perspective of community engagement from the Rocky Mountain Center for Occupational and Environmental Health (RMCOEH), housed within the Department of Family and Preventative Medicine at the University of Utah. This center is one of eighteen National Institutes for Occupational Safety and Health (NIOSH) Education and Research Centers (ERC). We use the Community Engagement Continuum to consider community engagement across various degrees of relationship between the public and AMCs, including outreach, consulting, involvement, collaboration, and shared leadership. Continuing education, course work connecting students with the community, and multiorganization research projects are approaches RMCOEH uses to engage with communities. Although there are many ways for AMCs like RMCOEH to serve the community, there are opportunities for AMCs to improve community engagement efforts through cultural shifts and community participation in projects. We explore such opportunities specifically for RMCOEH.

Keywords: community engagement, academic medical center, occupational health

Introduction

As societal priorities have shifted, academic medical centers (AMC) identify approaches to collaborate with communities to understand better and address multilevel health issues. Within the last decade, academic medical centers have moved away from community outreach to develop strategies to identify and mediate health disparities through community engagement (Wilkins & Alberti, 2019). Community engagement in this context refers to the AMC applying institutional resources to address and solve challenges facing communities through collaboration with community members (Gelmon et al., 2005). Community engagement establishes a mutually beneficial relationship between the community and the AMC. The community gains resources not otherwise available while the AMC obtains support and can apply for funding from external agencies to benefit the community-AMC partnership. This relationship between AMC and stakeholders can unearth new challenges that need addressing and provide organizational and community growth opportunities.

Previous literature describes initiatives taken by AMCs to conduct community engagement through broad activities, specific projects, and collaborations with other universities. A case study at the University of Kansas identified a wide range of activities to promote community engagement, including continuing education, health/wellness screenings, and efforts to reduce disparities among vulnerable populations (Cook et al., 2013). In 2008, a case study at Duke University identified community engagement through patient engagement by providing care management, clinical services, health promotion programs, and disease prevention programs (Michener et al., 2008). A case study of the University of California Los Angeles's School of Medicine identified four domains (research, education, clinical services, health promotion, and wellness) in which they engage with the community. The first domain, research, included a community-based participatory research project called the healthy community neighborhood initiative. The education domain included education for students and tutoring services for low-income students in the community. The third domain was clinical service, and it included mobile clinics and free clinics available for unhoused and low-income individuals. The final domain, health promotion and wellness, included youth fitness programs and mindfulness programs for adolescents (Chung et al., 2016).

Partnerships between AMCs are emerging as well. Northwestern University, the University of Illinois at Chicago, and Northeastern Illinois University are all involved in a community engagement core to minimize cancer disparities through screenings, research symposiums, education, and the creation and distribution of culturally competent health resources (Shalowitz et al., 2009). National collaboration across universities is represented by a project to improve child health equity which includes the following five universities: Northshore University,

University of North Carolina, University of California, Los Angeles, Georgetown University, and John Hopkins University (Giachello et al., 2019).

These cases described here and the partnerships emerging between AMCs provide a foundation for current and future community-engaged efforts on the part of AMCs. Further, the U.S. Department of Health and Human Services (USDHHS) Healthy People 2030 lists "community and workplace" as national priorities needing attention within the broader category of "settings and systems." These goals aim to promote health and safety in a community setting and the workplace (USDHHS, n.d. a; USDHHS, n.d. b). Therefore, in this paper, we delve deeper into how an AMC, The University of Utah, engage with the community to address occupational and environmental health through the Rocky Mountain Center for Occupational and Environmental health (RMCOEH) using the Community Engagement Continuum (Centers for Disease Control and Prevention [CDC], 2011). Through the review of this case, we discuss how community-engaged efforts emerged and areas where the RMCOEH can expand, grow, and develop further as they work directly with the community.

Department Background

In starting our review and case study, we begin with some background on the RMCOEH and its establishment. To meet the occupational and environmental health needs in the western United States, RMCOEH was established in 1977. In 1978 RMCOEH was chosen to be 1 of 12 National Institute for Occupational Safety and Health (NIOSH) sponsored Education and Research Centers (ERC). RMCOEH reports to the University of Utah's Senior Vice President for Health Sciences and has a footing in the Department of Mechanical Engineering (College of Engineering), Department of Economics (College of Social and Behavioral Sciences), Departments of Family and Preventive Medicine, Internal Medicine and Physical Medicine and Rehabilitation (School of Medicine), the School of Business, and College of Mines. Due to the center's successes and legislative desires for broader community engagement, these ties have recently expanded via statutory involvement to require co-management of the center by Weber State University. These connections allow for multidisciplinary work and support the mission of RMCOEH, which is to "protect workers and the environment through interdisciplinary education, research, and service." With small and large organizations located in the Salt Lake community, the state of Utah, Health and Human Services (HHS) Region 8, nationally, and internationally, RMCOEH sees the need to provide services that will benefit workers at all levels of the community (University of Utah Health, 2021).

The RMCOEH has four goals:

1. Advance superior occupational health and safety (OSH) academic programs.
2. Conduct meaningful OSH research.
3. Provide exceptional continuing education, service, and outreach.
4. Engineer OSH solutions.

Method and Results

To review and describe the efforts of the RMCOEH over the years since its inception, we apply the Community Engagement Continuum (CDC, 2011). Specifically, the Community Engagement Continuum considers community engagement across five levels of community involvement, including outreach, consulting, involvement, collaboration, and shared leadership. Traditionally AMCs offer services and resources to community members in a unidirectional relationship (CDC, 2011). In the Community Engagement Continuum, this would be represented in the first level, outreach. By discussing the community engagement initiatives at RMCOEH with this model, we identify strengths and opportunities for improvements.

Outreach

The first level of the Community Engagement Continuum is outreach, characterized by a single direction of communication. Community outreach connects services and topic expertise to those who may not otherwise have access to those services (CDC, 2011). The RMCOEH does community engagement at the outreach level in various ways.

First and foremost, the RMCOEH identifies Continuing Education (C.E.) and training needs, then offers these courses to workers and the public. A wide range of courses is offered through RMCOEH, including emergency response courses, self-paced courses, hazard training, Occupational Health and Safety Administration (OSHA) courses, and more. The RMCOEH offers some courses for a small fee, often covered by organizations requiring their employees to take these courses. However, as the COVID-19 pandemic emerged, the RMCOEH saw the need to disseminate current and accurate information related to the virus and established free courses for public education.

Beginning in 2020, participating community members can learn from health and safety experts about ways to better plan for an emergency. Whether in-person or virtual, Neighborhood Emergency Response Planning (NERP) offers RMCOEH faculty members a chance to serve many community members, regardless of their financial situation. With the slogan, "Disasters can be costly, Being Prepared is free," NERP offers six dynamic modules to prepare community

members for a multitude of emergencies. Containing modules including "Earthquakes," "Home and Wildland Fires," "Floods," etc., community members in Region 8 are receiving training for probable emergency events (University of Utah Health, 2020).

The Neighborhood Emergency Response Planning course consists of 4 principles:

1. Emergency preparedness
2. Emergency recovery
3. Coordinated response in communities
4. Disaster response actions

Though NERP's content is based on the Federal Emergency Management Agency (FEMA) guide, "Are you Ready: A Citizen's Guide," participants in NERP are asked to give feedback on the effectiveness of the principles being applied to a real disaster. The faculty and instructors at RMCOEH understand that there is no "one size fits all" for emergency preparedness for different geographical locations. As received feedback makes NERP more effective, community engagement and involvement are attained when people in different states collaborate to help one another (University of Utah Health, 2020). C.E. courses are provided by the RMCOEH to "reduce human and financial costs by providing excellent short-course training in occupational safety and health that is marked by continuous improvement and response to needs, setting the highest standards for both internal and external service" (University of Utah Health, n.d.b).

There are four main areas of the continuing education programs at the RMCOEH:

1. Correspondence Courses
2. Distance Courses
3. NIEHS HAZWOPER Training
4. OSHA Courses

Correspondence Courses are a self-paced online education option. From "Understanding Human Error" to "Understanding and Managing Legal Issues" and much more, Correspondent Courses allow busy community members to receive a quality education at their own pace (University of Utah Health, n.d.b). The topics covered by the Correspondence Courses were selected based on ongoing feedback from Region 8 participants and their safety professional community members.

The RMCOEH also partners with external groups to provide accurate and reliable training for community members. A partnership with the University of Texas School of Public Health's Southwest Center for Occupational and Environmental Health created the Prevention, Preparedness, and Response Academy for Hazardous Waste Worker Training (P2R). This collaboration provided effective Hazardous Waste Operations and Emergency Response (HAZWOPER) training to workers who perform waste cleanup and emergency response.

RMCOEH also works with OSHA to provide training through the Mountain West OSHA Education Center (MWOEC). This center offers training to all states in Region 8. Topics included in these trainings are targeted towards construction, oil & gas, maritime, public sector, and general industry (University of Utah Health, n.d.c).

As part of Distance Courses, the RMCOEH offers "Business Safety and Success during the COVID-19 pandemic." The goal of the course is to educate students on science-based best practices for promoting worker safety and health during the COVID-19 pandemic. This course discusses ideas for restructuring business operations to mitigate challenges due to the COVID-19 pandemic. Along those same lines, RMCOEH offers another course called "Novel Corona Virus COVID-19." This course is free and educates students on up-to-date information about COVID-19. RMCOEH offers courses like these to provide community members with expert opinions from multiple qualified sources.

Second, the RMCOEH works with external agencies to provide opportunities for local communities. Engagement with national organizations aids in establishing credibility with community partners. As the world shifted after the emergence of COVID-19, a national priority to protect frontline workers came to light. Hearing the call, RMCOEH quickly mobilized resources with the help of the Centers for Disease Control and Prevention (CDC) to collect and report data on COVID-19 cases among local frontline workers. To evaluate this crucial group of community members, the CDC selected the RMCOEH to recruit 720 healthcare, first responders, and frontline workers in Utah; this study is known as Researching COVID to Enhance Recovery (RECOVER). RECOVER's purpose is to perform "research on the epidemiology of COVID-19 in essential response personnel" (University of Utah Health, n.d.a). The study began enrollment in October 2020, and the anticipated end date is March 2022.

The research questions driving this study surround the need to understand various aspects of COVID-19 in the frontline worker population within the state of Utah. The research questions intend to uncover how many people get sick with COVID-19, what symptoms are common if they have COVID-19, how long does it take to recover from COVID-19, how many people become infected with COVID-19 but do not become sick, how well people are protected from getting COVID-19 again after having it once, and how effective are the vaccines and how well do they protect people from infection.

As the world entered the second year of the COVID-19 pandemic, a collaboration between RMCOEH and the CDC grew into more of an established partnership as the RECOVER project got extended and an additional project reflecting priorities surrounding youth and COVID-19 emerged. Current national priorities have shifted to understanding COVID-19 responses in those under 18-years-old. To meet this national need, RMCOEH has continued its partnership with the CDC to study the effect of COVID-19 on the youth. The purpose of Pediatric Research

Observing Trends and Exposures in COVID-19 Timelines (PROTECT) is to increase understanding of COVID-19 infection rates and vaccine efficacy among our youth population and share findings with the country to protect our youth better.

Third, the RMCOEH provides funding to research projects through the Pilot & Small Projects Grant Program, which aims to assess and improve community health. Supported by NIOSH and RMCOEH, this program is a way for university students to work with community members to study and enhance occupational safety and health to receive funding. This award offers \$5,000 - \$10,000 for one year (University of Utah Health, n.d.b). An example of this funding helping the community is a current study aimed at the ergonomic risk for ski instructors. Without special equipment, ski instructors experience strain while holding positions not meant for the gear used. This project aims to assess the risk of the instructors and report back to the community studied.

Fourth, the RMCOEH participates in local, national, and international outreach by sharing research with academic and industry communities through attendance at various conferences. Work produced by faculty and students has been presented at various occupational health conferences, including American Occupational Health Conference (AOHC), Society for Industrial and Organizational Psychology (SIOP), American Psychological Association's Work, Stress, and Health Conference (WSH), Interdisciplinary Network for Group Research (INGRoup), American Industrial Hygiene Conference (AIHC), etc.

Consult

The consult level of the Community Engagement Continuum offers a little more trust and communication between the community and the AMC. Typically, a partnership is formed between the community organization and the AMC in this instance. The community organization will have a need, and the AMC will work to provide information, identify problems, solve problems, and/or produce recommendations (CDC, 2011).

Engagement with local communities is essential for academic entities. It can foster trust and mutual growth and help improve both the community and the academic institution. Communication with local leaders and organizations aid in the understanding of what is needed within the community and where academic institutions can collaboratively help. Engagement between these parties is important for making connections and job sustainability that the university will produce professionals that may work within these communities.

First, the RMCOEH offers and requires all its students to enroll and engage with the community through a course titled "Occupational Health and Safety Solutions." Required of all master's and Ph.D. program students, this course offers students an invaluable opportunity for community engagement and involvement by allowing the students to take on the role of consultants. This

interdisciplinary course incorporates ergonomics, industrial hygiene, occupational medicine, occupational injury prevention, and safety. This course allows students to bring what they have learned and put it into practice to benefit the Utah community. Local and state organizations identify problems, and then interdisciplinary teams of RMCOEH students, under faculty guidance, work to produce practical solutions for the organization. Students work collaboratively with the local and state organization partners to provide solutions by performing sampling and testing in facilities, completing quality data analyses, and then delivering a final report to the company. This course is a sustainable way to keep RMCOEH an active community-engaged partner. Products of this course are often presented at National Occupational Research Agenda (NORA) Young/New Investigators Symposium. Presenting this research allows for connections to be made with other research institutions and demonstrates practical research to community members.

From this course, a multitude of consulting and research projects have been done to benefit community partners. In 2020 students were able to conduct a hazard analysis of a copper mine and found vibration, noise, and lead exposure hazards. This student group was able to identify cost-effective, short and long-term solutions to these hazards through engineering and administrative controls. In 2019, students were able to assess the ergonomic risk for health care employees at a pharmacy warehouse and sterile compounding facility. The student team visited multiple facilities and captured data on which tasks put the workers in the most harm. From their findings, the team was able to recommend sustainable changes, including altering the safety climate of the organization to put more emphasis on ergonomic training and safety as well as engineering controls aimed at lighting the physical load for the employees.

Second, the RMCOEH faculty help conduct needs assessments for communities. An example of this includes a needs and exposure assessment of communities exposed to toxic chemicals that had been released. According to the Environmental Protection Agency (EPA) data, 273 million pounds of toxic chemicals were released in Utah in 2016, ranking the 3rd highest among U.S. states. With many toxic chemicals in the air, RMCOEH sought to assess community members' exposure in the area affected by this disaster. Research conducted by faculty members of RMCOEH performed in 2012 educated many community members about unknown toxic chemical exposures. This information helped community members by providing evidence and justification for action.

Third, RMCOEH engages with the community through consulting with the Center for Meeting Effectiveness (CME). This group works to improve worker well-being and safety through improving meetings. Meeting satisfaction has been linked to job satisfaction. As the most common type of communication in the office, it is essential that employees have positive meeting experiences. This team provides information on effective meetings to local, national, and international community partners. CME can provide an assessment of meetings, identify

areas of improvement, and recommend best practices to community partners (University of Utah Health, n.d.e). This group provides coaching for community partners on how to conduct a good meeting. Currently, CME is working to assess safety meetings among construction workers as well as fire departments. This group is also working with an international organization to measure and compare meeting behaviors between two different virtual meeting software.

Involvement

Involvement presumes a little more trust between community partners and AMCs. This level of the Community Engagement Continuum identifies a clear partnership between the AMC and the community partner. Communication and participation circulate between the partners and cooperation is present (CDC, 2011).

The RMCOEH demonstrates this level of engagement through its work and research with truck drivers. Working with small and large private trucking companies and state and national trucking associations, the RMCOEH integrates research and injury prevention through multiple avenues. Not only was research done with local truck drivers, but findings and empirical evidence are also shared as written publications in monthly newsletters sent out to all members of the trucking association. The RMCOEH also works with private trucking companies and the state trucking association to provide informational presentations to members and truck drivers. Walkthroughs, coordinated by trucking agencies, provide a space for RMCOEH to assess challenges and discuss safety measures with these agencies. As the COVID-19 pandemic progressed, the RMCOEH produced PowerPoints and resources for trucking companies to provide drivers. The ongoing partnership with these local and national trucking companies and associations strengthens the trust between RMCOEH and these agencies, allowing for productive communication and further opportunities for involvement.

Collaboration

Collaboration is characterized by bidirectional communication where both partners are involved at each step of the process. This level of community engagement strengthens partnerships and trust between communities and the AMC (CDC, 2011).

The RMCOEH has a close relationship with the Utah bar and court system. When the concern of depression emerged as a priority for Utah lawyers, RMCOEH began work to address this industry-identified concern. RMCOEH built a collaborative relationship with the state bar and court system through research with Utah lawyers. The RMCOEH works with these entities to conduct research, provide and discuss results, and plan interventions that firms can implement. What initially began as a task force evolved into a standing committee on lawyer well-being. This committee includes state bar representation, a state supreme court justice, mental health

experts, small law firms, large law firms, diversity, equity, and inclusion representation, and RMCOEH representation. This interdisciplinary team works together to develop education seminars to share at national conferences. This team also works to improve policy surrounding lawyers to promote healthy behaviors, such as incentivizing certain aspects of well-being for continuing education credits.

This relationship steps into shared leadership as RMCOEH works with local firms, helping educate and empower the firms to improve their safety and well-being by providing data, resources, and support.

Shared Leadership

The final level of the Community Engagement Continuum is shared leadership. This is characterized by a strong bidirectional relationship between the community partner and the AMC. This level includes community-based participatory research (CBPR), which puts value on the lived experience of community members to provide insight and make decisions. Shared leadership offers the strongest level of trust between partnering organizations and can contribute to sustainable positive health outcomes (CDC, 2011).

The RMCOEH itself is an example of shared leadership with the community. The advisory board guides decision-making for the center and is made up of community members and leaders. Although this is shared leadership, what is needed is more shared leadership in the community-based participatory research domain. Engaging in CBPR will encourage and empower communities to improve safety and well-being by engaging in research as an equal partner. Faculty are working on submitting project proposals for funding that will propel RMCOEH into the shared leadership space.

Discussion

RMCOEH is a unique example of a center that attempts to build community-engaged efforts to better occupational health outcomes at multiple levels. By sorting projects and initiatives into the Community Engagement Continuum, we can identify areas of strength and opportunity for RMCOEH. By utilizing this framework, AMCs like RMCOEH can better recognize what is done well and what needs improvement. Much of the community engagement initiatives are within the outreach, consult, and involve levels of the Community Engagement Continuum. This means RMCOEH offers many services to various communities to improve worker health. Areas for opportunities lie at the other end of the continuum within the collaboration and shared leadership levels.

First, the more dynamic AMC is with its NIOSH Education and Research Center, the more likely it is to reach every level of the community. Although many of the initiatives mentioned provide critical services to communities and are improving communities at these various levels, most are not quite a community engagement in the sense that the community and RMCOEH are collaboratively working through projects together, i.e., community-based participatory research (CBPR). This is a major opportunity on which AMCs may capitalize. We recommend changing language (e.g., vision, mission, goals) in the department to help alter the culture and emphasize the importance of community engagement. A study on community engagement within U.S. and Canadian medical schools showed that most language in the vision and mission statements did not reflect a desire to improve community engagement (Goldstein & Bearman, 2011). If community engagement is a priority, it needs to be reflected in the organization's culture, starting with the language.

Second, another opportunity that AMCs could utilize with ERCs would be to conduct needs assessments at local, state, or regional levels. A needs assessment can help identify occupational and environmental challenges as well as community partners at the various levels. Utilizing techniques, such as the Delphi method, can help ensure the community leaders are at the table and the issues discussed are relevant to the communities. These challenges can then be matched with researchers at the AMCs for collaboration on research and finding solutions.

Conclusion

AMCs are a useful tool for universities to serve various communities and improve health. AMCs with ERCs allow for the focus on health and well-being to be on workers and occupational health, providing a unique opportunity that only 18 universities in the U.S. could have. The Community Engagement Continuum is a practical framework to arrange initiatives to see opportunities better. More importantly, there are opportunities for AMCs with ERCs to improve community engagement efforts through culture shifts and community participation in projects. It will be important to involve community partners as AMCs with ERCs grow and continue to increase their research efforts. Though the relationship between AMCs and communities can sometimes be strained, community engagement is possible, as the RMCOEH has demonstrated through years of dynamic research. We hope that partnerships between AMCs and communities continue to grow with community engagement at the forefront.

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