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Rural health and rural industries: Opportunities for partnership and action

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A recent article in *Morbidity and Mortality Weekly Report*¹ describes the Fatalities in Oil and Gas Extraction (FOG) database—an industry-specific database created to help researchers understand patterns of deaths among US oil and gas extraction (OGE) workers. Among other strengths, the database includes detailed geographic data on fatal incidents—a feature lacking in other systems that track workplace fatalities. It is clear that the majority of OGE worker fatalities occurred in rural micropolitan and noncore counties (Figure 1). This finding may not be surprising to people in the industry. However, it does raise questions about relationships between work, health, and rurality that are rarely explored explicitly or systematically.

The uneven allocation of social and structural determinants of health (SDOH) across geographic space accounts for disparities in health outcomes among people living in urban and rural areas.³ Employment is an SDOH that can impact health through working conditions, access to income, health insurance, a sense of meaning, and quality housing.⁴⁻⁹

In the 2023 Consolidated Appropriations Act, Congress provided funding for the Centers for Disease Control and Prevention (CDC) to establish an Office of Rural Health. The Office will coordinate across CDC programs, develop CDC's rural strategic plan, and provide leadership in rural public health. The National Institute for Occupational Safety

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CONFLICT OF INTEREST STATEMENT

The authors report no conflict of interest.

and Health (NIOSH) has had a significant impact on rural health through its efforts to reduce risks in specific rural industries, including agriculture, commercial fishing, mining, and OGE (referred to herein as examples of “rural industries”). NIOSH has created systems to prioritize the needs of these rural industries through its strategic plan,¹⁰ National Occupational Research Agenda Sector Councils,¹¹ industry-specific research agendas,¹² and extramural Centers.¹³ These processes, though, have not typically focused on the rural contexts in which these particular industries operate. Likewise, with the exception of farming, rural health researchers and practitioners may not adequately account for work’s influence on the health of the individuals and communities they serve. As findings from the FOG data suggest, a systematic focus on the nature of rural work is needed to account for cross-cutting safety and health issues common to rural businesses.

Rural worker health would benefit from increased collaboration between our 2 communities of practice specializing in OSH and rural health, respectively. Safety and health professionals have focused on OSH issues in rural industries for decades, demonstrating that rural working conditions can be improved with dedicated action.¹⁴⁻¹⁶ We acknowledge, however, that our communities of practice have rarely recognized important contributions made by the other. Occupational hazards in rural industries are well-documented, but rural health care providers and their patients may lack practical information about workplace health issues and prevention strategies. Knowledge gaps may exist when available training materials are not utilized by all rural practitioners, as is the case with agricultural medicine,¹⁷ and when specialized training and guidance are lacking, as is the case in OGE.¹⁸ Conversely, aspects of rural health care and rural communities that create opportunities or challenges for rural workers and that are well-known to rural health specialists may be unfamiliar to OSH specialists who have historically defined their scope of practice in terms of biological, chemical, and physical stressors rather than social ones.^{19,20}

RURAL INDUSTRIES, RURAL PLACES

Rural places are socioeconomically and demographically diverse. Many, though not all, rural communities depend on local natural resources. Communities reliant on the price of a single commodity or the success of a single company are vulnerable to changes in economic conditions. Without economic diversity, rural communities cannot as easily recover. For example, prior to the COVID-19 pandemic, rural employment rates had not yet fully recovered from the Great Recession, whereas urban rates had.^{21,22} The pandemic only worsened rural employment trends.²¹⁻²³ Moreover, troubling patterns in “deaths of despair,” including deaths by drug and alcohol poisoning, suicide, and chronic liver diseases and cirrhosis, among rural men in particular, are related to economic trends.²⁴⁻²⁶

People in rural places value health because it helps them work and maintain independence.²⁷ Incentives to work in rural industries are strong despite their high-risk environments.²⁸ Addressing hazards in rural industries has been a focus of NIOSH and its partners over the past 5 decades, resulting in measurable improvements in worker health.¹⁴⁻¹⁶ Additionally, rural industries often involve outdoor work, increasing exposure to extreme weather, sun exposure,^{14-16,29} vector-borne diseases,³⁰ and animal interactions.³¹⁻³³ Land-based OGE

workers can be exposed to similar environmental conditions as agricultural workers, among whom heat is a well-recognized hazard.³⁴⁻³⁶

Rural places are often defined by low population density or proximity to a population center,³⁷ and traveling long distances is a fact of rural life.³⁸ Driving long distances increases exposures to motor vehicle crash (MVC) risk, including fatigue, resulting in high MVC death rates.^{37,39,40} MVCs are a leading cause of occupational fatality across rural industries.³⁹⁻⁴¹ Rural industries also are more likely to use vehicles other than cars and trucks.³³ Tractors remain a leading cause of death in the agriculture industry.^{42,43} Rural roads may also differ by lighting and design,⁴⁴ crash type,⁴⁵ and roadway hazards (eg, farm machinery and wildlife).^{46,47}

Rural businesses and workers rely on local health care infrastructure which, like roads, is shaped by public and private investments.⁴⁸ A recent publication using FOG data described fatal cardiac events among OGE workers in remote locations,⁴⁹ suggesting that limited access to emergency care may have contributed to workers' deaths. Another study found workers in commercial fishing were nearly 40 times more likely to survive a ship sinking within 3 miles of shore, compared to further out at sea.⁵⁰ And OSH researchers have found high uninsured rates in rural occupations.⁵¹ Rural health researchers have explored deep and abiding challenges with health care access in rural areas, including delayed emergency care,^{52,53} health professional shortages,⁵⁴⁻⁵⁶ and hospital closures.⁵⁷⁻⁵⁹ Rural businesses have critical roles to play in improving rural health care access, including through health insurance benefits, emergency action plans,⁶⁰ and other mechanisms.

RURAL POPULATIONS

Rural industries are woven into the fabric of rural communities, reliant on the health of rural residents, and influencing their health, in turn. Health disparities observed between workers in rural industries and other industries likely relate to rural/urban disparities generally, including high rates of suicide,^{26,61} smokeless tobacco use,^{62,63} seatbelt nonuse,^{62,64} overweight or obesity,^{49,65} and drug overdoses.^{26,66,67} Occupational health disparities have impacted rural workers in certain population subgroups for many years (eg, immigrants),²⁰ because OSH interventions are often inadvertently tailored to the experience of the normative group.⁶⁸ Disparities may persist or worsen without attention to the characteristics and values of rural populations. Advertisers have long-used themes of self-reliance and ruggedness to increase tobacco use among blue-collar workers.⁶⁹ The same values provide a fundamental basis for prohealth messaging to rural workers.^{27,70}

RURAL OPPORTUNITIES

We envision a future in which our 2 largely separate communities grow together to improve health in rural America. Rural health practitioners and researchers may benefit from familiarity with OSH topics, including hazards and health conditions, workers compensation, and workplace interventions. They may also benefit from exploring how employment and job characteristics, such as compensation, job security, and scheduling, impact rural population health. NIOSH extramural Centers are valuable resources that

conduct research and offer continuing education programs, pilot grant opportunities, and subject matter experts in topics relevant to rural health.¹³ Conversely, many universities are home to academic centers focusing explicitly on rural health.⁷¹⁻⁷³ Collaborations between these academic institutions are encouraged to help characterize how rurality circumscribes work-related benefits, risks, and outcomes and identify promising interventions. The field of implementation science, which is the systematic investigation of the use of strategies to enhance adoption, integration, and sustainment of evidence-based health interventions in clinical and community settings, could be especially useful in this collaborative effort.⁷⁴ Interventions that have not been evaluated in rural contexts may not effectively improve rural outcomes, requiring dedicated adaptation or, preferably, rural perspectives from the early stages of intervention design.

The health and safety of workers in rural industries would benefit from dedicated investments to improve rural communication technologies, health information systems, and public health infrastructure. Common public health data sources may not include variables which account for work or rurality.^{75,76} Additionally, small sample sizes for rural places and industries require aggregation across larger areas or timeframes—a problem technology and dedicated attention to rural industries may help solve.⁷⁷⁻⁸⁴ To this end, NIOSH has recommended all public health data systems should collect work information.⁸⁵

Recent calls have been made for greater rural representation in decisions that impact rural health.^{48,86} NIOSH has an infrastructure for incorporating rural priorities into its research agenda and funding priorities. We are eager to learn how we can better partner with people in rural areas, including residents, workers, clinicians, business owners, researchers, and policymakers, so that we may better serve rural America together.

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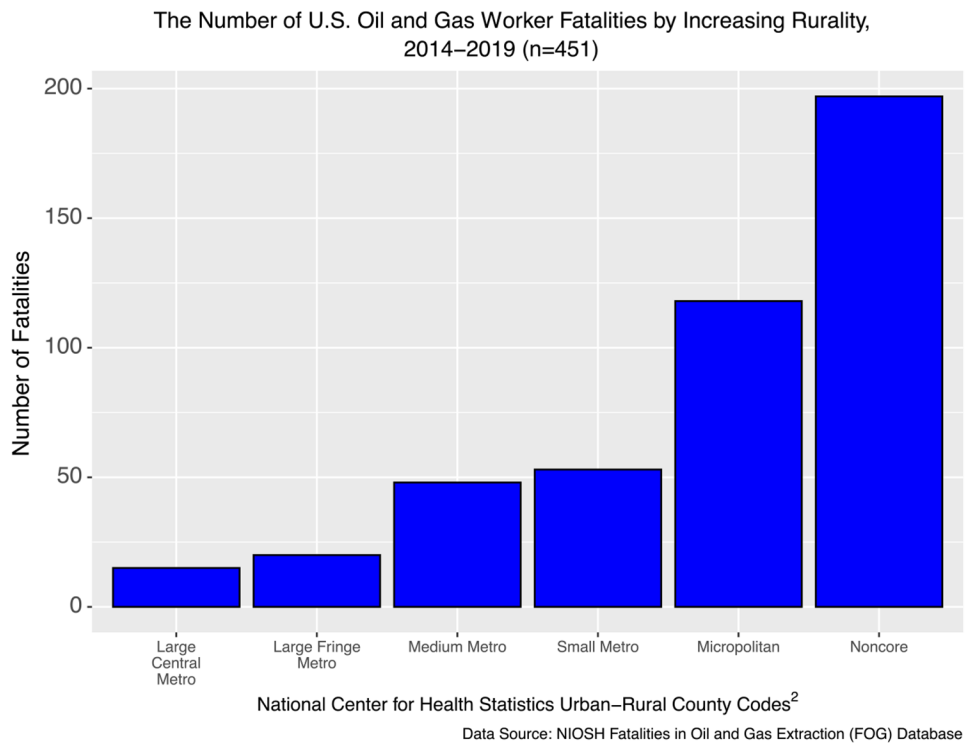


FIGURE 1.

The number of US oil and gas worker fatalities by increasing rurality, 2014-2019 (n=451). The Fatalities in Oil and Gas (FOG) database includes detailed geographic information about the location of each fatal incident. Fatal incidents were assigned to the counties where they occurred and counties NCHS Urban-Rural Classification Scheme codes² categorized incident levels of rurality. The number of deaths increased with increasing rurality.