Chapter 6
Environmental and Occupational Public Health

Bruce Jennings

6.1 Environment and Workplace: Key Venues for Public Health

Environmental health and occupational health and safety have long been established subfields of public health research, policy, and practice (Frumkin 2010). More so perhaps than areas such as infectious disease or health promotion, environmental and occupational health remind us that the health of a society is profoundly affected by its economic system and economic development. Today, the environmental health field is largely concerned with a human-made (anthropogenic) environment brought about by urbanization, the extraction of natural resources, industrial manufacture, the physical separation of home and workplace, and the transportation systems needed to support this mode of economy and pattern of living. Economic development alters the natural environment and sometimes harms ecosystems in terms of the humanly useful services they provide, their diversity, and their resilience. We are coming to understand that all of this has significant consequences for human health.

Environmental health has been understood as a public health issue in relation to air quality, water quality, and exposure to environmental pollutants that are toxic, carcinogenic, or teratogenic or are chemically bioactive in other ways. The rise of fossil fuels as the energy base for economic production and transportation, the industrial-scale advances in mining and metallurgy, and the creation and widespread presence of synthetic chemical substances have contributed to environmental health risks throughout the past two centuries. Indeed, these changes have redefined the meaning of environmental health. For the most part, environmental health involves

B. Jennings, MA (✉)
Center for Biomedical Ethics and Society, Vanderbilt University, Nashville, TN, USA
e-mail: brucejennings@humansandnature.org

the domain of chronic illness and disease, and it investigates factors that increase population risk and susceptibility to patterns of physical and mental illness in various forms. Epidemiological investigation is key to public health response to environmental health hazards.

If the public health of entire populations is affected in the background by modernization and industrialization in the form of environmental hazards, the personal health of a large number of individuals—especially people who work in industrial settings or are otherwise exposed to workplace hazards—is also affected directly in often injurious ways (Bayer 1988). Despite struggles to protect people in the workplace, the literature on occupational health is replete with examples of work-related cancers and pulmonary disease. Moreover, issues of safety and health go hand in hand in the occupational arena. Occupational accidents and injuries are a substantial factor in the overall health profile of society. Some occupational sectors remain particularly dangerous due to inherent features of the work environment, the necessary technology and equipment, or the absence of adequate policies and protections for workers. The recent emphasis in public health research and policy on personal injury and trauma may lead to renewed interest in occupational health as a public health issue.

More effective public health policy in regard to environmental and occupational health is made difficult by the fact that they tend to have distinct regulatory structures. Each is governed by different authorizing statutes and accumulated bodies of administrative rules and is overseen by different agencies of varying government levels (particularly in countries with federal systems). Nonetheless, occupational health and environmental health should be viewed in relation to each other, since both ultimately spring from a common root in the recent history of the impact of science and technology on society. Moreover, the public health responses to these two areas has varied with different understandings of the appropriate role of the state and public authority. This is to be expected, given that health matters overall, though biologically and biochemically connected, raise political, economic, and social issues. Major disparities in environmental and occupational risk, for example, stem from race and socioeconomic status (Shrader-Frechette 2005), and thus raise ethical questions about political and social rights, economic entitlements and welfare safety nets, and the just distribution of risk, wealth, and power.

One additional feature of a contemporary perspective on environmental and occupational public health should be noted: Our paradigm for understanding the interrelationships of health, the natural environment, and the workplace environment is broadening. Lang and Rayner (2012) distinguish among five models for public health, each with its own historical origins and core ideas. These models are (1) the sanitary-environmental model; (2) the biomedical model, both individual and population focused; (3) the social-behavioral model; (4) the techno-economic model; and (5) the ecological model.

The first four models take an essentially human-centered approach. In these models, the term "environment" is understood as a mere backdrop or aggregation of conditions and risks for states of human health and illness. By contrast, model five, the ecological model, understands the natural environment to be comprised of complex *systems*, not as an array of separate factors. The environment is the functional and

relational context in which human health and behavior emerge, not just a set of background conditions. The growing influence of the ecological model of public health is reorienting the study and regulation of both environmental health and occupational health, and this model has the potential to bring them into closer alignment.

There are several reasons for this. First, research on the social determinants of health indicates that distinguishing the social from the natural aspects of an environment's health effects is not straightforward. Even in remote wilderness areas, the natural environment is shaped by human activity. Moreover, the social features of everyday life include not only psychological effects (happiness and well-being) but also physiological effects (cardiovascular, hormonal) on the internal biological environment of the human body.

Second, the growing discussion around the health effects of global climate change contributes to this reorientation of environmental health by reminding us that ecosystems are holistic and complex networks of interrelationships and interdependencies. Therefore, hazards to human health take the form of both discrete threats and general factors that undermine the integrity or functioning of ecosystems upon which the health and functioning of all life ultimately depend. For example, a recent literature review on the public health effects of climate change summarizes the situation as follows:

> Impacts of climate change cause widespread harm to human health, with children often suffering the most. Food shortages, polluted air, contaminated or scarce supplies of water, an expanding area of vectors causing infectious diseases, and more intensely allergenic plants are among the harmful impacts. More extreme weather events cause physical and psychological harm. World health experts have concluded with "very high confidence" that climate change already contributes to the global burden of disease and premature death. IPCC [Intergovernmental Panel on Climate Change] projects the following trends, if global warming continues to increase, where only trends assigned very high confidence or high confidence are included: (*1*) increased malnutrition and consequent disorders, including those related to child growth and development, (*2*) increased death, disease and injuries from heat waves, floods, storms, fires and droughts, (*3*) increased cardiorespiratory morbidity and mortality associated with ground-level ozone. While IPCC also projects fewer deaths from cold, this positive effect is far outweighed by the negative ones (Hansen et al. 2013, 8).

Third, the way the built environment is developed can affect not only greenhouse gas emissions but also lifestyle factors that impinge on human health–for example, land use and zoning patterns that lead to suburban housing sprawl and automobile dependency (Frumkin and McMichael 2008).

Environmental health hazards can no longer be thought of simply as discrete entities (e.g., pathogens, toxic chemicals, carcinogenic substances) within an otherwise health-neutral field (Kassel and Stephens 2011). Previously environmental health hazards (even air and water pollution) were viewed on rather narrow local or regional scales and in close proximity to effected human populations. Now we must view the health hazards emerging from systemic disruptions or dysfunctions as operating on far broader scales and far more remotely than previously suspected. Deforestation in tropical areas involves a chain of factors that ultimately affects the quality of life of people with asthma in Central Asia; changes in the salinity and temperature of the oceans will affect heat emergency events in Europe. A contaminated well is a *localized* health risk.

Conversely, environmental changes on the Himalayan plateau that alter the hydrology of a river spanning miles upon which hundreds of millions depend for fresh water, represents a different challenge for public health analysis and response. The problem is *global* and *institutional*, which is to say, fundamentally political and economic. The public health response needs to involve not only specific protections and rules or laws aimed at individual decisions and behaviors, such as toxic dumping in a particular site, or the point source pollution of a river, but also the institutional and systemic governance that alters the structure of power and wealth, and the process by which decisions and policies are made. The perennial debate between an approach aimed at individual behavior and one aimed at structural change is endemic to both environmental health and occupational health and safety.

Because both environmental and occupational public health raise public issues that involve public perception, a couple of the thorniest ethical problems concern the concept of acceptable risk and criteria for risk management and risk reduction. Environmental risks to the public's health can be managed (or prevented) in multiple ways. The same can be said of workplace risks, especially when conditions put workers in contact with dangerous machinery or industrial processes; expose workers to harmful substances; and, in the case of health care professionals and biomedical researchers, expose them to infectious diseases. The debate always concerns how risk management should be done and at what cost.

6.2   Population Benefits, Individual Rights, and Ethically Acceptable Risk

The four intriguing cases in this chapter provide examples of policy, decision making, and public health practice under specific circumstances. Looming in the background of each case are fundamental questions about power, equality, and social justice. The cases indicate the need for a more systemic understanding of environmental and occupational health factors, from the small-scale ecosystem of potentially contagious organisms within the human body to the large-scale natural ecosystem's reaction to the effects of mining technology and operations.

Here are the main themes and issues that the cases in this chapter pose for environmental and occupational health, especially from the perspective of an ecological model of public health ethics:

- How should a society democratically set priorities and manage its economic sectors to ensure productivity in the global economy and at the same time protect its limited natural resources, its core values, and cultural diversity of regional and ethnic ways of life? Snyder and colleagues address this theme in their case on mining and health equity.
- How should vulnerable populations, such as hospitalized patients, be protected from serious infection, and to what extent should those measures impinge on individual rights and careers of health professionals who are subject to screening and possible exclusion from clinical practice? This theme is addressed by Rump

and colleagues in their case involving the exclusion of physicians who test positive for Methicillin-resistant *Staphylococcus aureus* (MRSA) from performing patient related interventions.

- How should nongovernmental organizations (NGOs) working on development projects in resource poor and underserved areas allocate limited resources effectively and equitably? What responsibility does the NGO have when its programs inadvertently pose health risks to the community that also may threaten its future capacity to provide services? This theme is addressed in Hayward's case about well construction in areas without access to safe drinking water. Hayward compares the health risks and benefits to the cost of different construction methods.
- What are the ethical responsibilities of organizations whose staff and volunteers do public health work in areas lacking public safety and security resources? What balance should be struck between outreach to those who need services and the personal health and safety of the organization's employees? This case, also by Hayward, describes how Peace Corps volunteers use motorcycles to reach otherwise inaccessible areas, which increases their risk of traffic accidents.

As mentioned previously, the forces of economic, scientific, and technological development brought environmental health and occupational health and safety issues to the forefront of contemporary public health. Indeed, public health as we know it today is an outgrowth of the industrial revolution, which has brought about both great advances and significant disparities of wealth and power. Worldwide, public health operates amid highly urbanized social systems stratified by class, race, and ethnicity. In its quest for optimal health outcomes on a population basis, public health is ethically constrained by individual rights and liberties that may conflict with that goal, just as it is politically constrained by powerful vested interests. Nonetheless, social inequality is an obstacle against which public health pushes. For the most part, certainly in the post-World War II era, the direction of public health has been toward greater access to the resources and conditions necessary for widespread health and well-being, greater social and economic equality, and fairness for the most vulnerable and marginalized.

Operating within that trend, decision making about environmental and occupational health draws primarily on two ethical concepts of public health: One is a utilitarian ethic of population well-being, and the other is an ethic of human rights, dignity, and justice.

Utilitarianism defines the ethical rightness of human acts toward maximizing aggregate net social benefit (happiness, utility, preference satisfaction). Not surprisingly, utilitarianism is a significant aspect of public health ethics. Its orientation toward aggregative outcomes befits its concern for populations rather than individual health—weighing and balancing options rather than delimiting intrinsic value or ethical absolutes.

Rights- and justice-based ethics focus on intrinsic rightness or wrongness of specific acts and general actions—*not* on the consequences of those acts. Actions embody fundamental values such as respect, dignity, equality, autonomy, and inclusiveness and therefore have intrinsic rightness. This ethical orientation appeals to cultures with a heritage of humanitarian concern and to political and legal systems that are simultaneously democratically egalitarian and protective of individual liberty.

Utilitarian ethics and rights-based ethics may conflict when situations pit aggregate net population benefits (i.e., health and welfare) against equity and fairness perspectives that reject discrimination and are unwilling to violate the rights of one, or a few, to achieve well-being among many. Such dilemmas and trade-offs often arise in public health practice.

For example, one conflict involving individual rights arises in the case from Rump and colleagues. In this case, a precautionary policy of exclusion provides safety for hospitalized patients who have contact with a medical student who is a carrier of MRSA. But at the same time, the exclusion policy burdens the medical student who faces personal and professional risk to her livelihood. An individual's rights may be violated when health status becomes the basis for discriminatory treatment or for the loss of liberty or opportunity. A physician or other health care professional with a condition that poses undue risk to patients illustrates the conflict between individual rights or freedom and protection of patients health collectively, or indeed, protection of patient health individually. To resolve such conflict, one must strike a balance among competing values, informed by factual (biomedical) knowledge. No individual has the right to intentionally harm an innocent person, and no physician has a right to deliberately harm a patient. These conflicts typically arise when facts are uncertain and knowledge is imperfect or probabilistic. Thus, the question turns not on *absolute* right and wrong, but on *reasonably acceptable* risk. Is a policy that provides a blanket exclusion of health workers who are MRSA positive appropriate? Or is this policy overly inclusive and cautious? Moreover, how do we ethically factor in the costs or harms done by exclusion of risk? Perhaps a gifted physician who poses a low risk of infecting patients may greatly benefit them. If so, then considerations of nondiscrimination for the individual (physician) and aggregate net benefit for the population (patients) could coincide.

Hayward presents a mirror image in her case on threats to personal safety. This case involves transportation safety in the developing world, a significant public health problem to everyone living and working there. Under discussion is a policy that prohibits staff and volunteers from using dangerous forms of travel, such as motorcycles, even when alternative means of accessing remote areas do not exist. This would affect many field staff and volunteer health workers who strive to maximize client services by minimizing transportation time, even at the risk of a traffic accident. The rights-based question in this case has to do with individual freedom of choice versus paternalistic protection by institutional authorities, again within the context of ethically acceptable risk. The utilitarian question may be framed as a cost–benefit comparison of population harm done by the death or injury of health workers (to themselves, their families, and their clients) and the harm done by suboptimal service delivery (slower, but safer modes of transportation). A far-reaching consequence may be the loss of public health and economic development programs that benefit the community.

Risk and harm appear in yet another guise in Hayward's case on safe water standards and well construction in rural Africa. An ethical dilemma arises because a less expensive drilling technique (shallow rather than deep-drilled wells) can produce more water for more people; however, the risk of contamination and harm to users will increase. How can decision makers resolve the trade-off between water quantity and quality to benefit the aggregate net population's health and welfare? In this

instance, an organizational and programmatic risk is also involved. The dilemma decision makers face has broad implications for future public health initiatives in the region. If too few wells with a high per unit cost are produced, the community might perceive that the needs of many are not being considered. Similarly, they might perceive their health and safety are being neglected if the wells are inexpensive. Decision makers should strive to preserve community trust if they are to gain cooperation in future public health initiatives.

These three cases illustrate how almost every conceivable approach to risk management can pose one or more ethical problems. Risk management interventions may protect some while shifting the exposure and burden of risk to others, raising serious questions of distributional equity or fairness. Or, interventions to mitigate risk and protection efforts may supplant or inhibit other programs or public health activities since intervention is expensive and may lay claim to scarce resources.

Moreover, the concept of risk is seemingly impossible to define in value-neutral terms and is inherently controversial. Even more ethically charged are the questions of what level or degree of risk is socially acceptable, who should decide, and how exposure to risk should be distributed across the affected population. Routine public health practice in environmental and occupational risk management involves interventions and policies designed to prevent harm to individuals and to lower health risks within the population. Interventions include various forms of public health surveillance—screening and testing—of different groups, with the attendant untoward effect of discrimination or social stigma. Policies may involve regulations with substantial financial consequences in the form of job loss in regulated industries and hence higher unemployment rates in the overall economy or higher production costs and hence higher prices for consumers.

The question of ethically justifiable public health paternalism versus individual autonomy arises when individuals want to continue engaging in activities that put themselves, third parties, or the general public at risk. Among the difficult issues raised about situational ethics are (*1*) identifying the genuine interests and agendas of public health authorities who follow seemingly paternalistic programs to reduce risks and harms; (*2*) identifying when individuals knowingly (and willingly) expose themselves to environmental or occupational risks, given the context of inequalities of power and wealth involved and the lack of employment or residential options available to these individuals and their families; (*3*) determining a reasonable level of acceptable risk in the face of scientific uncertainty; and (*4*) gauging how a policy to reduce public health risk will affect public perception and trust.

6.3 Systems and Power: The Ethical Importance of Ecological and Social Context

We generally know that human health is undermined when the diversity, services, and functioning of ecosystems are compromised. We also know that various economic activities that extract raw materials, manufacture commodities, and provide jobs often secure these benefits at the expense of the environment. On a local or

regional scale, the health burdens are often felt by people in the immediate area, whereas the benefits and wealth often accrue to people far removed from the local environmental disturbances and health risks. When viewed as a manifestation of economic systems, environmental health and occupational health are inseparable from questions of global health justice, and these are very difficult theoretical and practical questions indeed. Moreover, these dimensions of the ethics of environmental public health are evolving. Today, given what is known about climate change, we can reasonably say that economic activity virtually anywhere can be environmentally damaging—from oil drilling in the Artic to land clearing in tropical rain forests—and that such damage affects the health and well-being of people everywhere, not just of those in the local or regional areas where the environmental damage takes place.

If environmental public health cannot be divorced from economics, neither can it be understood apart from conditions of governance at international, national, and local levels. International policies and interventions, including the Millennium Development Goals and climate change response defined by international protocols beginning with the Kyoto treaty, are forms of global governance in which environmental public health and public health ethics play indispensable roles.

Questions are no less complex for public health and for ethics at the national level. In the developing world, particularly countries still experiencing widespread poverty and lacking fundamental infrastructure and services, economic growth remains a priority and benefit. Nonetheless, there is a trade-off between short-term economic gains and long-term national (and global) interest in health, economic sustainability, and environmental conservation. For example, ecosystems like rainforests perform a vital function in absorbing atmospheric CO_2. This global function can be undermined by economically driven decisions about land use and other commercial activities that lead to deforestation. Climate change is only one, albeit dramatic, illustration. The collective carbon footprint of developing countries is growing, often placing the preservation of their ecosystems, biodiversity, and fresh water at risk. Putting the economic growth of developing nations on a more sustainable path is not only critical to global control of greenhouse gas emissions, it is also key to each nation's economic future and to global public health.

Economic development is no longer simply an issue for each national government to acknowledge in its internal affairs and domestic policy. In our global market, external forces impinge on options and resources of individual countries, even wealthy and powerful ones. Yet in the absence of international governance, it is the government of each country that remains ethically responsible for the health and welfare of its citizens and should legislate and regulate its social and economic affairs accordingly. In a democracy, public participation, debate, and consensus in viewpoint and among plural groups are valued and essential components of governance.

The case from Snyder and colleagues provides an opportunity to examine the global and systemic dimensions of environmental public health ethics and governance. In Mongolia's economy, which is heavily dependent on the mining industry and mining operations, the trade-off between economic growth and environmental protection is acute. The country clearly needs investment and job opportunities to combat poverty. But issues of social justice, including health equity, are made complex by the stratification of wealth and income and by the uneven development of different regions and

sectors of the society. Mining operations can threaten a complex and fragile ecosystem and adversely affect health (e.g., toxic waste, air and water pollution). Mining operations can also create social dislocations (work migration) and change patterns in land use, especially in areas with a long cultural and economic tradition of pastoralism.

The case by Hayward questions whether to drill expensive deep wells or less expensive shallow water wells in sub-Saharan Africa. Part of the health risk posed by the shallow wells requires a change in cultural behavior by preventing livestock from contaminating the wells and by controlling surface run-off. Thus, any successful public health effort cannot be assessed apart from the capacity of the local society to manage and behave toward both its natural and constructed environment in prudent and sustainable ways. Similarly, but on a larger scale, Mongolia's regulation of economic growth and its mining industry raise questions of cultural rights and cultural capacity as well as questions of social equity and institutional capacity to govern in an effective and socially legitimate fashion.

In summary, environmental and occupational health policy and practice is an ethical minefield. Overly cautious approaches when predicted outcomes fail to materialize may reduce the general public's attentiveness and compliance with public health warnings, recommendations, and directives in the future. Insufficient, cautious responses leading to health consequences that could have been avoided can carry a heavy political price for officials involved.

As you read and examine the cases in this chapter, pay particular attention to how public opinion is formed, ethical decisions are justified, and inclusive and participatory deliberation and consensus are achieved. We need effective and meaningful approaches for engaging the public in health decisions. In particular, we need to find ways to make a participatory and deliberative form of democracy practical and effective, especially in the context of environmental and occupational health. Civic education about environmental health and ethical literacy will prepare not only stakeholders but all citizens to make wise decisions about economic interests and the use of technology. What would motivate genuine deliberation and not simply special interest advocacy? And civic deliberation is not free-standing; it requires special organizational forums and needs to move from spontaneity to institutionalized practice if it is to make a lasting difference. Proper access to information and the cooperation of experts with specialized technical knowledge are examples of the organizational side of effective grassroots participation and discussion of key environmental and occupational health issues. How can public health professionals facilitate and contribute to the formation of civic practice and democratic public judgment in this sense?

References

Bayer, R. (ed.). 1988. *The health and safety of workers: Case studies in the politics of professional responsibility*. New York: Oxford University Press.

Frumkin, H. (ed.). 2010. *Environmental health: From global to local*, 2nd ed. San Francisco: Jossey-Bass.

Frumkin, H., and A.J. McMichael. 2008. Climate change and public health: Thinking, communicating, acting. *American Journal of Preventive Medicine* 35(5): 403–410. doi:10.1016/j.amepre.2008.08.019.

Hansen, J., P. Kharecha, M. Sato, et al. 2013. Assessing "dangerous climate change": Required reduction of carbon emissions to protect young people, future generations and nature. *PLoS ONE* 8(12): e81648. doi:10.1371/journal.pone.0081648.

Kessel, A., and C. Stephens. 2011. Environment, ethics, and public health. In *Public health ethics: Key concepts and issues in policy and practice*, ed. A. Dawson, 154–173. Cambridge: Cambridge University Press.

Lang, T., and G. Rayner. 2012. Ecological public health: The 21st century's big idea? *British Medical Journal* 345: e5466. doi:10.1136/bmj.e5466.

Shrader-Frechette, K. 2005. *Environmental justice: Creating equality, reclaiming democracy*. New York: Oxford University Press.

6.4 Case 1: Assessing Mining's Impact on Health Equity in Mongolia

Jeremy Snyder
Faculty of Health Sciences
Simon Fraser University
Burnaby, BC, Canada
e-mail: jcs12@sfu.ca

Craig Janes
School of Public Health and Health Systems
University of Waterloo
Waterloo, ON, Canada

Colleen Davison
Clinical Research Centre and Department of Emergency Medicine
Kingston General Hospital
Kingston, ON, Canada

Department of Public Health Sciences
Queen's University
Kingston, ON, Canada

Oyunaa Lkhagvasuren
Leading Researchers
Ulaanbaatar, Mongolia

Lory Laing
School of Public Health
University of Alberta
Edmonton, AB, Canada

Meghan Wagler
Faculty of Health Sciences
Simon Fraser University
Burnaby, BC, Canada

This case is presented for instructional purposes only. The ideas and opinions expressed are the authors' own. The case is not meant to reflect the official position, views, or policies of the editors, the editors' host institutions, or the authors' host institutions.

6.4.1 Background

Mongolia is a landlocked country bordered by Russia to the north and China to the south. Although one of the largest countries in Asia in land area (1.56 km^2), it has a small population (2.74 million in 2010). Nearly two-thirds of the population is urban and reside in provincial capitals and cities. Nomadic pastoralists who tend mixed herds of animals across the desert and steppe grasslands primarily make up the remaining third of the population (Central Intelligence Agency 2010).

Beginning in 1990, Mongolia transitioned from a single-party socialist state to a multiparty democracy, which led to withdrawal of Soviet aid and termination of trade relations with Soviet bloc countries. The loss of state subsidies and price controls and implementation of trade liberalization caused the economy to falter during the transition (Stiglitz 2002). Not until 2004 did the gross domestic product (GDP) return to pre-transition levels (Rossabi 2005). Since then, macroeconomic growth has been strong, driven by a rapidly expanding mineral sector.

Although resource extraction had been a major economic activity in Mongolia for some time, the scale of exploration and investment increased markedly in the early 2000s (Central Intelligence Agency 2010). As of 2008, general mining exploration licenses covered a quarter of the country. Copper, gold, and coal dominate mining activities, with much of the product exported to neighboring China (The Economist 2012). The mining industry's proportion of the total GDP tripled from 11 to 33 % during 2003 through 2007, the sector contributing about one-third of government tax revenues (World Bank 2013). Propelled by mining and related construction and transportation sectors, in 2011 Mongolia became the world's fastest growing economy, reporting annual economic growth of 17 % (World Bank 2011).

Mining in Mongolia occurs in a context of a lower middle-income country with a GDP of $8.8 billion, rural underdevelopment, and social and economic inequality (World Bank 2013). Mongolia exhibits significant wealth disparities: more than one-third of the population lives in poverty, a proportion that has persisted despite rapid economic growth. Although income poverty levels in rural areas exceed those in urban areas, both settings have large numbers of vulnerable poor. In rural settings, those lacking sufficient herd animals to sustain livelihoods, especially female-headed households, rank among the poorest of the poor. Urban areas are inundated with rural migrants forced into cities by weather disasters and lack of employment. There they labor in the informal economy, typically living in squatter or "ger" settlements without access to running water, sewerage, or electricity.[1]

---

[1] A ger settlement, or "yurt," is a rural parcel of land in Mongolia comprising several detached and portable dwellings (gers) or shanties. Traditional ger settlements were occupied by pastoralists (nomadic Mongolian people). Gers typically lack modern conveniences such as water, sewage, and electricity. Occupants, although mostly self-sufficient, rely on some communal services such as wells.

Although mining potentially can provide employment, improve infrastructure, and support government services, it also poses substantial social, environmental, and health risks. Adverse environmental impacts noted in Mongolia include dust pollution, diminution and degradation of ground and surface water, and loss of traditional grazing lands by erosion and pollution. Especially concerning is the influx of thousands of mine and construction workers, their families, entrepreneurs, job seekers, and artisanal miners into rural mining areas (World Bank 2006). This influx, which greatly strains infrastructure in some areas, can potentially increase the risk of local epidemics of infectious disease, including HIV. As a result, resource development in Mongolia has become a hotly contested political issue, which has subjected the mining sector to increased public and regulatory scrutiny (Reeves 2011). Mongolians retain a strong identity with their pastoralist history and culture, which has manifested itself in strong pressure to develop resources that benefit the nation while protecting vulnerable herder populations. Recently, and with international donor support, the government of Mongolia began addressing some of these concerns. In May 2012, the efforts culminated in landmark environmental legislation that took into its purview the broad social and health impacts of mining (Mongolian Mining Journal 2012). This legislation demonstrates Mongolian interest in mitigating the negative health impacts of mining, though administering this legislation will be challenging.

Expansion of the Mongolian mining sector raises ethical challenges in three areas. First, the Mongolian government must assess a proposed mining project's impact on Mongolian stakeholders, taking into account the economic, environmental, social, and health impacts. Because projects will affect stakeholders differently, the assessment should adopt an equity lens, with differential impacts noted. A wide-ranging assessment of this kind requires that the government determine how equity will be assessed and how competing negative and positive impacts will be measured and compared. Second, the Mongolian government must use the assessment to help mitigate potential negative social and health impacts. Third, however, the government must consider how regulations could deter mining investments and reduce potential economic benefits of this industry. In a country with a growing population and limited economic development, the loss of these benefits could impact the country's welfare significantly, limiting modernization and expansion of the health care system.

Before the equity impacts of mining activities can be assessed, stakeholders must first agree to a *standard of equity* to prevent misunderstandings. These include equality, priority to the least advantaged, and sufficiency accounts where the aim is to achieve a threshold level of well-being for all people. Second, officials must determine whether any local populations who are particularly vulnerable to mining's impact merit special consideration. Third, to meet the diverse needs of the Mongolian people, an impact assessment must be locally appropriate and assume various forms. For example, different remediation requirements may apply to different mine developers, depending on circumstances. Fourth, one needs to be clear about when differential impacts of mining become problems of equity. Finally, officials should investigate what requirements for mitigating equity impacts should be included in any policy (Snyder et al. 2012).

6.4.2   Case Description

The rapid urbanization and social upheaval brought on by the mining industry and economic liberalization in Mongolia threaten to destabilize the country and squander its resources. To avert these threats, Mongolia has already developed robust legislation to assess the environmental and health impacts of mining. Some government officials believe that an equity-focused health impact assessment policy represents the logical next step in the country's management of its rapid economic development. Implementation of an equity-focused health impact assessment for new mining projects could ensure that economic benefits are distributed equitably. Doing so could improve health and social cohesion without disproportionately burdening some populations with mining's adverse consequences (Douglas and Scott-Samuel 2001). A policy of this kind, while difficult to develop and implement, is crucial to Mongolia's future.

A panel that includes public health professionals is being organized to make recommendations to the Mongolian government on its equity-focused health impact assessment policy for new mining projects. The agenda for discussion includes the following three areas:

- How to best include stakeholders in the development of the policy?
- How should health equity be conceptualized?
- How can an equity-focused health impact assessment be applied broadly?

6.4.3   Discussion Questions

1. Giving a fair hearing to stakeholders in deliberations about issues that affect them is central to democratic deliberation.

    (a) How important or practical is it in Mongolia to give a meaningful voice to all stakeholders in the deliberations about whether and how a mining project should be allowed to develop?
    (b) What level of consultation constitutes meaningful participation?
    (c) Should stakeholders be given veto power over decisions and an equal voice in a democratic process?
    (d) Is consultation by the government without a vote in the final decision adequate?

2. Equity can be conceptualized differently, leading to various interpretations and attendant misunderstandings.

    (a) Are stakeholders unfamiliar with theories of health equity sufficiently qualified to discuss health equity impacts?
    (b) If not, how can they prepare for discussions of this kind?

(c) Should stakeholders undertaking an equity-focused health impact assessment be asked to reach a consensus on a concept of equity?

(d) Is it preferable to supply a single conception of equity?

(e) How can cultural and linguistic differences in understanding concepts such as equity and fairness be resolved?

3. Some countries are incorporating a health equity assessment component in all policies.

(a) Is there any unique feature of mining development that sets it apart from other developments (e.g. road or housing construction)?

(b) Could equity-focused health impact assessment be used more generally to assess the health equity impacts of projects and policies?

(c) What are the challenges of doing so, especially in a fledgling democracy?

4. Should the panel recommend to the Mongolian government that it apply an equity-focused health impact assessment policy to new mining projects?

References

Central Intelligence Agency. 2010. *The world factbook: Mongolia.* https://www.cia.gov/library/publications/the-world-factbook/geos/mg.html. Accessed 21 May 2013.

Douglas, M., and A. Scott-Samuel. 2001. Addressing health inequalities in health impact assessment. *Journal of Epidemiology and Community Health* 55(7): 450–451.

Mongolian Mining Journal. 2012. The amended law on environmental impact assessment. September 25. http://en.mongolianminingjournal.com/content/34726.shtml. Accessed 23 Jan 2014.

Reeves, J. 2011. Resources, sovereignty, and governance: Can Mongolia avoid the 'resource curse'? *Asian Journal of Political Science* 19(2): 170–185.

Rossabi, M. 2005. *Modern Mongolia: From Khans to Commissars to Capitalists.* Berkeley: University of California Press.

Snyder, J., M. Wagler, O. Lkhagvasuren, L. Laing, C.M. Davison, and C. Janes. 2012. An equity tool for health impact assessments: Reflections from Mongolia. *Environmental Impact Assessment Review* 34: 83–91.

Stiglitz, J.E. 2002. *Globalization and its discontents.* New York: W. W. Norton.

The Economist. 2012. *Booming Mongolia: Mine, all mine.* January 21. www.economist.com/node/21543113. Accessed 23 Jan 2014.

World Bank. 2006. *Mongolia: A review of environmental and social impacts in the mining sector.* Washington, DC: World Bank. http://siteresources.worldbank.org/INTMONGOLIA/Resources/Mongolia-Mining.pdf. Accessed 23 Jan 2014.

World Bank. 2011. *Mongolia quarterly economic update—August 2011.* www.worldbank.org/en/news/2011/08/24/mongolia-quarterly-economic-update-august-2011. Accessed 15 May 2013.

World Bank. 2013. *Data: Mongolia.* http://data.worldbank.org/country/mongolia. Accessed 15 May 2013.

6.5 Case 2: Exceptions to National MRSA Prevention Policy for a Medical Resident with Untreatable MRSA Colonization

Babette Rump
Department of Infectious Disease Control
Municipal Health Service Utrecht
Zeist, The Netherlands
e-mail: brump@ggdmn.nl

Carla Kessler
Ethics Institute
Utrecht University
Utrecht, The Netherlands

Ewout Fanoy
Department of Infectious Disease Control
Municipal Health Service Utrecht
Zeist, The Netherlands

National Institute for Public Health and the Environment
Centre for Infectious Disease Control
Bilthoven, The Netherlands

Marjan Wassenberg
Department of Medical Microbiology
Utrecht University Medical Centre
Utrecht, The Netherlands

André Krom
Technology Assessment
Rathenau Institute
The Hague, The Netherlands

Marcel Verweij
Department of Social Sciences, Communication, Philosophy and Technology:
Centre for Integrated Development
Wageningen University
Wageningen, The Netherlands

Jim van Steenbergen
National Institute for Public Health and the Environment
Centre of Infectious Disease Control
Bilthoven, The Netherlands

Leiden University Medical Centre
Centre for Infectious Diseases
Leiden, The Netherlands

This case is presented for instructional purposes only. The ideas and opinions expressed are the authors' own. The case is not meant to reflect the official position, views, or policies of the editors, the editors' host institutions, or the authors' host institutions.

6.5.1   Background

Antimicrobial resistance (AMR) is an increasingly serious threat to global public health. First described in 1961, methicillin-resistant *Staphylococcus aureus* (MRSA) is one of the best known antimicrobial resistant (AMR) pathogens. It has become an increasingly serious cause of health care associated infections worldwide (Boyce et al. 2005). People infected with MRSA, which resists standard beta-lactam antibiotics, can present symptoms or be asymptomatic carriers.

In a community setting, most MRSA carriers have few or relatively minor symptoms. In hospitals, however, open wounds, invasive devices, and weakened immune systems pose a greater risk of infection, making MRSA a serious health problem. The presence of Panton-Valentine leukocidin (PVL) cytotoxin in a *Staphylococcus aureus* has the potential to cause more severe infections, such as pneumonia and skin infections, although these are rare events considering the number of asymptomatic carriers (Gorwitz 2008).

Worldwide, prevalence of MRSA among the general public and in hospitals varies widely, as do the strategies used to control hospital-acquired MRSA (Boyce et al. 2005). In the Netherlands and Scandinavia, for example, MRSA causes less than 1 % of all cases of *Staphylococcus aureus* bacteraemia. This percentage contrasts with percentages of up to 50 % in other European countries (Wertheim et al. 2004). To maintain this low incidence, hospitals in the Netherlands and Scandinavia follow a strict AMR related search and destroy policy. This policy consists of active screening of patients and staff for MRSA, strict enforcement of contact precautions, and judicious use of broad-spectrum antibiotics (Boyce et al. 2005).

In the Netherlands, the Working Party on Infection Prevention (WIP) has incorporated this search and destroy policy into national MRSA guidelines. The WIP, funded by the Dutch Ministry of Health, was founded 25 years ago by respective professional societies of physicians, hygienists, and microbiologists. WIP-issued guidelines are professional standards most health professionals and institutes follow (Boyce et al. 2005).

The 2012 WIP guidelines for MRSA prevention in hospital settings involve three principal procedures, which address both symptomatic and asymptomatic patients, since carriers can also transmit the infection. First, patients with MRSA are isolated in single rooms and treated to eradicate MRSA. Isolation procedures require those entering the patient's room to wear a gown and mask. Second, hospital patients at increased risk of being carriers are also placed in isolation until proven MRSA free. Patients considered potential carriers include all patients (a) transferred from hospitals abroad to Dutch hospitals, (b) transferred from Dutch hospitals with an existing MRSA condition, and (c) placed in the same room as a patient subsequently detected unexpectedly with MRSA. Third, hospital staff who care for MRSA patients are

screened for MRSA and treated with antibiotics and mupirocin nasal ointment if found positive (Boyce et al. 2005).[2]

Nationally, this search and destroy policy has proved highly successful and effective at maintaining a low prevalence of MRSA in Dutch hospitals (van der Zee et al. 2013). However, MRSA screening and treatment of health care staff can seriously affect their lives because they cannot return to work unless testing confirms MRSA-negative status. Fortunately, MRSA colonization (antibiotic-resistant strain of bacteria that lives on skin) is usually temporary, but when persistent, eradication requires longer-term efforts. Although untreatable colonization is rare, it can necessitate job change (Boyce et al. 2005).

6.5.2   Case Description

A Dutch medical student has the potentially more virulent Panton-Valentine leukocidin (PVL) form of MRSA colonization yet shows no signs or symptoms of infection. More than a year ago, a routine MRSA screening of health care personnel providing care for MRSA-positive patients detected the colonization. Since then, the student has been treated intensively but unsuccessfully in an attempt to decolonize her. During this decolonization period, the medical student was barred from performing patient-related interventions, temporarily interrupting her medical residency. After initial treatment with mupirocin nasal ointment and antibiotics proved ineffective, a more stringent hygiene regime was added that included hand, nose, hair, and body scrubbing with disinfecting soap. Additional precautions included simultaneous treatment of household members and disinfection of the family home. Despite these efforts, her MRSA status has remained positive. WIP guidelines bar any health care worker diagnosed with MRSA from performing patient-related interventions. Unable to complete the residency requirement of at least 1 year of patient care, the medical student was advised to pursue a career in another profession.

Refusing to accept this verdict, she united with other similarly excluded medical students to launch a protest that gained media attention. In a press interview, she acknowledged that potential iatrogenic spreading of MRSA could risk institutional or community safety. However, she questioned the seriousness of this risk and argued that the protesting students were being unfairly targeted. She pointed out that medical staff are not routinely screened for MRSA unless they have cared for a MRSA-positive patient or have worked in a country with high MRSA prevalence. Because MRSA can be acquired in the community, potentially many undiagnosed MRSA-colonized medical staff or residents currently work in hospitals. She also pointed out that other European countries, despite a higher MRSA prevalence, allow MRSA carriers to work in health care settings. Despite being persistently MRSA positive, these professionals can safely work in medical specialties that do *not* involve direct patient contact.

---

[2] An English version of the WIP guidelines is available at http://www.wip.nl

As a result of this press coverage, the public has pressured the WIP to reconsider its guidelines. Because iatrogenic spreading of disease has public health implications, you, as a public health professional, have been asked to serve on a WIP committee charged with considering whether the guidelines need to be changed to address these and future cases. The chair of the committee wants to discuss the following questions.

6.5.3   Discussion Questions

1. Who are the main stakeholders in this case, and what are their primary interests?
2. What is the ethical rationale for allowing or not allowing medical students who are MRSA carriers to continue their medical education?
3. What would be your ethical justification for either recommending or not recommending universal screening for all medical students and doctors?
4. How would it change your recommendation if

    (a) The MRSA of this student was not PVL positive?
    (b) The overall prevalence of MRSA in the Netherlands was high or rapidly increasing?
    (c) There was little or no evidence that excluding colonized health care workers decreases risks to patients?
    (d) The students agreed to pursue medical specialties that do not involve patient care?

5. Although the European Union (EU) is increasingly standardizing its AMR policy, some EU countries have less stringent regulations than others. Would it be ethical to advise the medical students in question to finish their education in a European country with a less stringent MRSA policy?

References

Boyce, J.M., B. Cookson, K. Christiansen, et al. 2005. Meticillin-resistant *Staphylococcus aureus*. *Lancet Infectious Diseases* 5(10): 653–663.

Gorwitz, R. 2008. Understanding the success of methicillin-resistant *Staphylococcus aureus* strains causing epidemic disease in the community. *Journal of Infectious Diseases* 197(2): 179–182. doi:10.1086/523767.

van der Zee, A., W.D. Hendriks, L. Roorda, et al. 2013. Review of a major epidemic of methicillin resistant *Staphylococcus aureus* : The costs of screening and consequences of outbreak management. *American Journal of Infection Control* 41(3): 204–209.

Wertheim, H.F., M.C. Vos, H.A. Boelens, et al. 2004. Low prevalence of methicillin-resistant *Staphylococcus aureus* (MRSA) at hospital admission in the Netherlands: The value of search and destroy and restrictive antibiotic use. *Journal of Hospital Infection* 56(4): 321–325.

6.6 Case 3: Safe Water Standards and Monitoring of a Well Construction Program

Alison Hayward
Department of Emergency Medicine, Yale School of Medicine
Yale University
New Haven, CT, USA

Uganda Village Project
Iganga, Uganda
e-mail: ahs.hayward@gmail.com

This case is presented for instructional purposes only. The ideas and opinions expressed are the author's own. The case is not meant to reflect the official position, views, or policies of the editors, the editors' host institutions, or the author's host institution.

6.6.1 Background

The lack of access to safe drinking water is a serious public health problem affecting many developing countries. More than 780 million people, mostly located in sub-Saharan Africa, lack safe drinking water. Sub-Saharan Africa only has coverage with safe drinking water sources for 61 % of its population, a stark contrast with regions such as Latin America, northern Africa, and most of Asia, which have all achieved greater than 90 % coverage (World Health Organization/United Nations Children's Fund Joint Monitoring Programme for Water Supply and Sanitation 2012). The Millennium Development Goals (MDGs) have specified that by 2015, the proportion of people who lack access to safe water and sanitation should be halved (United Nations 2013). Significant progress has been made towards achieving this goal; however, vast inequities emerge when comparing populations of rural areas to urban ones, and of more impoverished communities to those with a higher socioeconomic status. As such, progress toward achieving access to safe water and sanitation facilities is not likely to be equitable. As an example, one estimate by the United Nations Development Program suggests that the world overall will attain the safe water and sanitation MDGs by 2016 and 2022 respectively, but sub-Saharan Africa is not projected to attain these goals until 2040 and 2076 (Jimenez and Pérez-Foguet 2010).

In sub-Saharan Africa, 19 % of the rural population resort to using surface water collected from streams, rivers, ponds, or other such sources. Unprotected water sources are particularly dangerous because those who fetch water contaminate the water source by reaching their hands into the water and wading into it as they fill their basins and jerrycans. Open defecation and lack of sanitation also contribute to contamination, as does fecal runoff from livestock wandering through unprotected water sources. Water that is not contaminated at the source runs a high risk of

becoming contaminated on its way to the drinking cup due to inadequate home storage and dispensing methods that allow children or other household members to reach into the water while serving it. As a result of this rampant drinking water contamination, diarrheal disease is common in residents of areas without access to safe water. Diarrheal disease is deadliest for young children, the elderly, and immunocompromised community members, such as people living with HIV/AIDS. In children younger than 5 years of age, diarrheal disease is the second leading cause of death (World Health Organization 2009). With proper access to safe water and sanitation, most of these deaths would be prevented.

Access to safe water can prevent many other potentially lethal infectious diseases. These include schistosomiasis, intestinal worms, and malnutrition from repeated diarrheal and intestinal worm infections. Diarrheal disease, however, represents the bulk of the disease burden contributed by poor sanitation, hygiene, and drinking water quality (Prüss-Üstün et al. 2008).

The World Health Organization (WHO) publishes a simple set of recommendations to help small communities with limited water supplies maintain water safety. One key recommendation calls for the creation of, and adherence to, a Water Safety Plan (WSP), using illustrated pamphlets to convey the need for preventive maintenance of water supplies. Another recommendation calls for innovative monitoring strategies such as the use of mobile phones to send data from the field to public health inspectors (WHO 2010). Water treatment products like chlorine can be added either at the well, when the water is collected, or at the point of use in the home to reduce the risk of water contamination (WHO 2011).

The WHO also has detailed guidelines for drinking water quality. These guidelines promote the use of health-based targets, which take into account local variables such as public health status, contribution of drinking water to the transmission of infectious disease, and social and cultural factors. Some international organizations set inflexible water quality standards for pathogen concentrations used in analyzing data from water sources and drinking water. The WHO instead suggests that such targets be modified to realistic and attainable goals. In order to most appropriately allocate limited resources, the WHO additionally suggests "less stringent transitional targets supported by sound risk management systems" to achieve a "tolerable disease burden" for waterborne illness, with incremental improvement in a health-based transitional target eventually progressing towards tight water quality control, as resources allow. Such transitional targets can be developed with the aid of risk management theory. Data collection and advanced statistical modelling may be challenging in countries with limited resources. Estimations of organisms per liter in raw water can be combined with information on risk of diarrheal illness from a given infection, and health outcome targets, to calculate performance targets for reducing pathogens through water source control or treatment interventions. Modifiable targets should consider the relevant risks and benefits in a local area to attain the desired reduction in illness occurrence, and thus, health outcomes, as measured in disability-adjusted life years per person per year. These targets should be outlined in the Water Safety Plan (WHO 2011).

6.6.2 Case Description

You are a managing director for a small nongovernmental organization (NGO) in rural sub-Saharan Africa. Your organization partners with rural villages to construct protected shallow wells in areas where residents otherwise need to walk more than 2 km to reach the nearest safe source. This program was designed to be as cost effective as possible, with village residents volunteering their time and manual labor for well construction.

Organization members debated whether to use borehole drilling or cheaper, hand-dug protected shallow wells. Because boreholes draw water from deep underground, the likelihood of contamination from surface runoff is far less. In contrast, shallow wells risk contamination, particularly if steps are not taken to address the problem, such as constructing a fence around the site to keep grazing livestock away. The nonprofit board concluded that boreholes would be about ten times as expensive to drill, allowing construction of one-tenth the number of wells for the same funding. They therefore decided to focus on shallow well construction to reach the greatest number of communities in need. Still, questions remained about the relative health risks of an approach prone to contamination. Some members of the organization are concerned that the shallow well method was pushed, in part, because it was less expensive and the number of wells constructed would impress donors.

The program was designed in collaboration with the District Water Office for sustainability. Although the District Water Office agreed to assume responsibility for testing the water quality of wells being built, its ability to conduct the tests has been limited by a lack of financial resources. Your organization therefore has undertaken its own water quality testing of roughly 50 wells constructed in the district. Your well construction program manager has reported to you the discouraging results of the water quality tests. Of the wells tested, 20 % have coliform bacteria present in levels unacceptable to international standard drinking water guidelines, which the staff use as a target for water quality as part of the program's monitoring and evaluation plan. The program manager, who has been in discussions with the District Water Office and other nonprofits involved in well construction, has several ideas to improve the well construction process and strengthen protection against coliform contamination in the wells. He also wants to remediate the wells that failed the testing.

Before committing to any of these ideas, you hold an organizational meeting to help you decide whether or how to convey these results to the community members who use the wells, knowing they mistrust both governmental and nongovernmental programs. You particularly worry about the damage to your organization's reputation in trying to convey that the water from wells it has built is dangerous to drink. One staff member suggests holding community meetings to discuss the issue. Meanwhile, all heavily contaminated wells would be marked with signs and red tape to indicate the water is unsafe to drink. Another staffer argues that marking the wells in such a way might frighten community members and discourage them from drinking from the wells even after remediation. He notes that if told not to use these sources, community members might prefer using nearby but similarly (or worse) contaminated open water sources to walking a long distance to find another protected source.

Although the educational workshops the organization offers have always emphasized the need for boiling water or chemically treating it with a chlorination product to ensure its safety, you know that in practice, many community members consider water from a protected source to be "safe," regardless of whether it is boiled or treated. As you leave the meeting, you realize you have four key questions to resolve.

6.6.3   Discussion Questions

1. What ethical implications are raised by considering whether or not to publicize the water quality test results? Which option is more justified, and why?
2. What ethical concerns are raised by the use of shallow well construction, which allows more wells to be constructed at lower cost but at higher risk of water contamination?
3. If the water quality test results are publicized, what participatory approach might best address the problem with water quality?
4. Considering that lower water quality standards could result in more illnesses and deaths in the community, is the WHO's risk-benefit approach the most appropriate way to determine what is environmentally, economically, and socially possible? Would it be better to base one's strategy on an internationally recognized standard for acceptable water quality?

References

Jimenez, A., and A. Pérez-Foguet. 2010. Challenges for water governance in rural water supply: Lessons learned from Tanzania. *International Journal of Water Resources Development* 26(2): 235–248.

Prüss-Üstün, A., R. Bos, F. Gore, and J. Bartram. 2008. *Safer water, better health: Costs, benefits and sustainability of interventions to protect and promote health.* Geneva: World Health Organization. http://whqlibdoc.who.int/publications/2008/9789241596435_eng.pdf. Accessed 15 May 2013.

United Nations. 2013. *Millennium development goals.* http://www.un.org/millenniumgoals/. Accessed 27 May 2013.

World Health Organization (WHO). 2009. *Diarrhoeal disease fact sheet no. 330.* http://www.who.int/mediacentre/factsheets/fs330/en/index.html. Accessed 15 May 2013.

World Health Organization (WHO). 2010. *Small and safe: Investing in small community water supplies will reduce waterborne disease outbreaks and overall costs.* http://www.who.int/water_sanitation_health/WHS_WWD2010_small_systems_2010_4_en.pdf. Accessed 15 May 2013.

World Health Organization (WHO). 2011. *Guidelines for drinking water quality*, 4th ed. http://www.who.int/water_sanitation_health/publications/2011/dwq_guidelines/en/index.html. Accessed 15 May 2013.

World Health Organization/United Nations Children's Fund Joint Monitoring Programme for Water Supply and Sanitation. 2012. *Progress on drinking water and sanitation.* http://www.unicef.org/media/files/JMPreport2012.pdf. Accessed 15 May 2013.

6.7 Case 4: Implementation of Global Public Health Programs and Threats to Personal Safety

Alison Hayward
Department of Emergency Medicine, Yale School of Medicine
Yale University
New Haven, CT, USA

Uganda Village Project
Iganga, Uganda
e-mail: ahs.hayward@gmail.com

This case is presented for instructional purposes only. The ideas and opinions expressed are the author's own. The case is not meant to reflect the official position, views, or policies of the editors, the editors' host institutions, or the author's host institution.

6.7.1 Background

Many global public health agencies and organizations from high-income countries conduct programs in locations where the personal safety of workers and volunteers cannot be guaranteed. Staff and volunteers of nonprofit organizations and government aid agencies face a variety of threats. In 2012, aid workers were harmed in 100 discrete incidents involving 187 aid workers, 43 of whom were international aid workers (Humanitarian Outcomes 2013). These incidents included kidnappings, murder, and traumatic injury. The profile of deaths amongst aid workers and volunteers who serve in conflict zones significantly differs (Sheik et al. 2000). Contrary to popular belief, tropical infectious diseases rarely cause death in aid workers (Hargarten et al. 1991). A systematic review of unintentional injury in international travelers found that only 2 % of traveler deaths were secondary to infectious disease, whereas injury represented a major cause of death. Motor vehicle accidents were the leading cause of fatal injury to travelers (McInnes et al. 2002).

According to the World Health Organization's *Global Status Report on Road Safety*, more than 90 % of the world's road fatalities occur in low and middle-income countries. The report further notes that the majority of road fatalities in these countries occur among vulnerable road users—pedestrians, cyclists, and riders of motorized two-wheeled vehicles (World Health Organization 2009). Little research has been conducted on health and safety policies and procedures for international nongovernmental organizations (O'Sullivan 2010). One exception is the U.S. Peace Corps. A study done of fatalities in the Peace Corps between 1962 and 1983 revealed that unintentional injuries caused 70 % of deaths, with motor vehicle crashes the top cause of fatality, and motorcycle collisions responsible for 33 % of the deaths related to motor vehicles (Hargarten and Baker 1985).

After release of the report, the Peace Corps banned motorcycle use in many countries in which their volunteers serve and mandated a motorcycle safety course

and helmet usage in countries where the use of motorcycles was still permitted. A follow-up study of fatalities through 2003 concluded that injury prevention measures instituted as a result of the prior study had significantly decreased the risks faced by Peace Corps volunteers (PCVs), although, once again, motor vehicle collisions topped the list of causes of death. In the 20 years prior to institution of the helmet rules, 22 of 105,539 PCVs died in motorcycle collisions. In the following 20 years, another 71,198 PCVs participated in the program, but only 2 died in motorcycle collisions (Nurthen and Jung 2008). These studies provide evidence that preventive measures can save the lives of aid workers and volunteers even in low-income countries with poor transportation safety and infrastructure.

6.7.2   Case Description

In rural sub-Saharan Africa, you oversee the operations of a nonprofit organization that provides public health programs to remote communities. Needs assessments have shown that these areas have the greatest poverty, as well as lack of access to safe water sources and health care facilities. But the roads leading to the villages, which become little more than footpaths at some points, pose challenges to travelers that include erosion, flooding, and large potholes as well as the physical obstacles of livestock, children, other pedestrians, and bicyclists. The optimal strategy for reaching the villages is to use a motorcycle.

While working on a grant proposal one afternoon at the office, you receive a cell phone call from Moses Izimba, a program manager for your nonprofit. Earlier in the day, several staff and volunteers had taken "boda-bodas" (motorcycle taxis) to a remote village to offer a sanitation outreach program. Despite passenger warnings to drive slowly due to the road conditions, the taxi drivers were speeding when a car that pulled suddenly into their path caused a collision.

One victim is a staff member who had left without his motorcycle helmet as the group rushed to depart. With a quivering voice, Moses reports that this staff member did not survive the collision. Another victim is a volunteer who had purchased a helmet at a local shop, which likely was not safety certified by the Ministry of Transportation. This helmet now lies shattered near the accident scene, while the volunteer, still bleeding from a large scalp laceration, is alive but comatose.

The only four-wheeled vehicle on hand for transportation is the car involved in the accident, which now has a broken windshield, but the driver has offered to transport the victims to a health care facility. You urge Moses to get the injured staff member to the district hospital quickly. As you end the phone call, shocked by the tragic news, several thoughts come immediately to mind. Could this accident have been prevented? How can the organization best deal with a serious trauma to one of its staff members during fieldwork?

You convene a committee to discuss the ramifications of the accident. The committee's pragmatic charge will be to examine staff insurance benefits, including evacuation coverage and repatriation of remains; organizational policy improvements to minimize the likelihood of riding without a helmet; appropriate standards

for safety equipment; an alert system to warn of hazardous road or transportation conditions; and innovative strategies to optimize transportation safety under local conditions. But the committee has also been asked to consider three areas of ethical challenge the situation has presented.

6.7.3 Discussion Questions

1. Under what circumstances should you limit humanitarian aid based on the assessment of risk to workers or volunteers? What is an acceptable level of risk, and what harms—to the organization, its staff, and the communities being served—could potentially result from limiting or ending aid?
2. What are the obligations of nonprofits or humanitarian agencies to protect their workers from safety threats, given that they frequently operate in dangerous environments where infrastructure is lacking? Do the obligations of nonprofits differ from the private sector when it comes to protecting the health and safety of their staff, and if so, how?
3. How can a nonprofit or humanitarian agency best deal with a tragic accident resulting in the death or serious injury of a volunteer or worker? Consider the ethical pros and cons of the potential approaches that could be taken to prepare for risks to aid worker health and safety and address such a situation as it unfolds, including risk communication.

References

Hargarten, S.W., and S.P. Baker. 1985. Fatalities in the Peace Corps. A retrospective study: 1962 through 1983. *Journal of the American Medical Association* 254(10): 1326–1329.

Hargarten, S.W., T.D. Baker, and K. Guptill. 1991. Overseas fatalities of United States citizen travelers: An analysis of deaths related to international travel. *Annals of Emergency Medicine* 20(6): 622–626.

Humanitarian Outcomes. 2013. *Aid worker security database.* https://aidworkersecurity.org/incidents/report/summary. Accessed 4 June 2015.

McInnes, R.J., L.M. Williamson, and A. Morrison. 2002. Unintentional injury during foreign travel: A review. *Journal of Travel Medicine* 9(6): 297–307.

Nurthen, N.M., and P. Jung. 2008. Fatalities in the Peace Corps: A retrospective study, 1984 to 2003. *Journal of Travel Medicine* 15(2): 95–101.

O'Sullivan, S.L. 2010. International human resource management challenges in Canadian development INGOs. *European Management Journal* 28(6): 421–440.

Sheik, M., M.I. Gutierrez, P. Bolton, P. Spiegel, M. Thieren, and G. Burnham. 2000. Deaths among humanitarian workers. *British Medical Journal* 321(7254): 166.

World Health Organization (WHO). 2009. *Global status report on road safety: Time for action.* http://www.who.int/violence_injury_prevention/road_safety_status/2009/en/. Accessed 4 June 2015.