

contact tracing; activate and test preparedness plans in countries at risk; and coordinate the response internationally (see Box 1 in the Supplementary Appendix). Supporting national governments, the World Bank has pledged to help fill the funding gap.

At the national level, Liberia and Nigeria have declared national emergencies and are screening people arriving at and departing from airports and seaports. Guinea has closed its borders with Liberia and Sierra Leone. Members of Liberia's National Traditional Council have addressed their communities throughout the country. The engagement of local communities is vital. We have al-

ready seen how, in Téliimélé, site of a cluster of cases in Guinea, transmission was rapidly curtailed with the support of community leaders.

Monitoring of funds raised and disbursed, and of control measures implemented, is now intense. Above all, we are looking for a sustained decrease in incidence, from week to week and district by district, with no sign of further geographic spread. In the coming days and weeks, that will be our primary measure of success in preventing infections and saving lives.

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From the World Health Organization, Geneva.

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Ebola Virus Disease in West Africa — No Early End to the Outbreak

Margaret Chan, M.D.

Many people have asked me why the outbreak of Ebola virus disease in West Africa is so large, so severe, and so difficult to contain. These questions can be answered with a single word: poverty.

The hardest-hit countries, Guinea, Liberia, and Sierra Leone, are among the poorest in the world. They have only recently emerged from years of conflict and civil war that have left their health systems largely destroyed or severely disabled and, in some areas, left a generation of children without education. In these countries, only one or two doctors are available for every 100,000 people, and these doctors are heavily concentrated in urban areas. Isolation wards and even hospital capacity for infection control are virtually

nonexistent. Contacts of infected persons are being traced but not consistently isolated for monitoring.

Large numbers of people in these countries do not have steady, salaried employment. Their quest to find work contributes to fluid population movements across porous borders. The area where the borders of the three countries intersect is now the designated hot zone, where transmission is intense and people in the three countries continue to reinfect each other. Recent decisions to quarantine this area have brought extreme hardship to more than a million people — but are essential for containment.

These are only some of the many challenges to be overcome in the worst Ebola outbreak in the

nearly four-decade history of this disease. The needs are enormous; the prospects for rapid containment are slim. The outbreak, in all its unprecedented dimensions, is an emergency of international concern and a medical and public health crisis, but it is also a social problem.

Now, 6 months into the response to the outbreak, fear remains the most difficult barrier to overcome. Fear causes people who have had contact with infected persons to escape from the surveillance system, relatives to hide symptomatic family members or take them to traditional healers, and patients to flee treatment centers. Fear and the hostility that can result from it have threatened the security of national and international response teams.

The fact that Ebola is frequently fatal and has no cure further fuels fear and perpetuates these dangerous behaviors, underscoring the importance of having medical anthropologists on the response teams. One urgent priority is to change long-standing funeral practices that involve close contact with highly infectious corpses. In Guinea, for example, 60% of cases have been linked to traditional burials. Rumors, whether about witchcraft or miracle cures, abound; at least two Nigerians have died after drinking salt water, which was rumored to be protective. Good communications and community engagement are urgently needed to combat denial, rumors, and behaviors that fan new transmission chains.

Fear and anxiety have spread well beyond West Africa to engulf the world. Nigeria's first case of Ebola, confirmed in July in the

teeming city of Lagos, was a wake-up call. This was the first time the virus had spread by air travel, and it strongly suggests that any city with an international airport is at risk for an imported case. Even in wealthy countries with well-educated populations, fighting fear with facts is hard.

Intense media coverage has allowed the world to see what can happen when a lethal and deeply dreaded virus takes root in a setting of extreme poverty and dysfunctional health systems. The world is seeing the outbreak's multiple human tragedies: abandoned rural villages and orphaned children, economic and social disruption in capital cities, extreme daily hardship in the quarantine zones, riots, uncollected bodies, and above all, the unprecedented number of medical staff who risked their lives and lost them. To date, nearly 160 health care workers have been infected, and more than 80 have died.

The loss of so many medical staff impedes outbreak control in significant ways. It depletes one of the most important assets for controlling any outbreak. It can lead to the closing of hospitals, especially when staff refuse to come to work, fearing for their lives. It increases the level of anxiety: if trained and protected medical staff are getting infect-

ed, what hope is there for the general public? And it has made it difficult for the World Health Organization (WHO) to secure support from sufficient numbers of foreign medical staff.

I have spoken with the presidents of Guinea, Liberia, and Sierra Leone on several occasions. They are frank in their assessment: the outbreak far outstrips their capacity to respond. The attitude of the public is summarized in two sad words: helpless and hopeless. Their most urgent request is for more medical staff. Staff needs are high. Personal protective equipment is essential, but it is hot and cumbersome and therefore severely limits the time that doctors and nurses can spend working on an isolation ward. According to current estimates, a facility treating 70 patients needs at least 250 health care workers.

The situation continues to deteriorate in the hardest-hit countries, but the response has improved over the past 2 weeks. More aid, from individual countries and the World Bank, is coming in. The World Food Program, with its unparalleled logistic capabilities, is addressing daily material needs in the quarantine zones. The WHO is mapping the outbreak to pinpoint areas of transmission and the location of facilities and supplies to ensure that assistance is coordinated and rapidly and rationally distributed. Personal protective equipment is being dispatched on a nearly daily basis. The Centers for Disease Control and Prevention (CDC) is providing robust on-the-ground support, including contact tracing in Lagos. The CDC is also equipping the hardest-hit countries with computer hardware and software that will soon allow real-time reporting of cases. The framework for a scaled-up response, including the deployment of more medical staff, logisticians, and event managers, is rapidly taking shape.

Experience tells us that Ebola outbreaks can be contained, even without a vaccine or cure. Nonetheless, with the formidable combination of poverty, dysfunctional health systems, and fear at work,

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no one is talking about an early end to the outbreak. The international community will need to gear up for many more months of massive, coordinated, and targeted assistance. A humane world

cannot let the people of West Africa suffer on such an extraordinary scale.

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Dr. Chan is the director-general of the World Health Organization, Geneva.

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A Good Death — Ebola and Sacrifice

Josh Mugele, M.D., and Chad Priest, R.N., M.S.N., J.D.

A friend of ours, Dr. Sam Brisbane, died recently. He was a Liberian doctor, and he died from Ebola, a horrible, nightmarish disease.

Information coming out of Liberia has been scarce. Since Dr. Brisbane's death, we've learned that other doctors and nurses with whom we've worked have also contracted Ebola and have died or are being treated in the types of rudimentary facilities we see on the news. As we live in dread of each phone call, questions about how we die and what we're willing to die for have been weighing on us.

The ancients had a concept of a "good death" — dying for one's country, for example, or gloriously on the battlefield. Solon, the sage of Athens, argued that one couldn't judge a person's happiness until one knew the manner of his death. The Greeks recognized that we're all destined to die and that the best we can hope for is a death that benefits our family or humanity.

For emergency-medicine clinicians like us, the concept of a good death can seem too abstract, intangible. Rarely are the deaths we see good or beneficial. We see young people who die in the throes

of trauma; grandparents who die at the end of a long, debilitating illness; people who kill themselves; people who die from their excesses, whether of alcohol, food, or smoking.

Last year, as part of a new disaster-medicine fellowship program, we developed a partnership with John F. Kennedy Memorial Medical Center in Monrovia, the only academic referral hospital in Liberia. We collaborated with the hospital administration to develop disaster-planning and resilience programs and teamed up with the emergency department (ED) staff to enhance medical training and establish epidemiologic studies of trauma. It was there that we met Dr. Brisbane, the ED director. He immediately struck us as a genuine ED doc — at once caring and profane, lighthearted one minute, intense the next. A short, bald man with weathered skin and thick glasses, he spoke openly and easily; his laugh was best described as a giggle, and he swore frequently.

When we conducted an initial vulnerability analysis for the hospital, we discussed our concerns about severe supply and personnel shortages, regular power outages, and occasional electrical

fires. Dr. Brisbane replied that what scared him the most was the potential for an epidemic of some viral hemorrhagic fever. He was right to be scared. We encountered rationing of gloves, a limited supply of hand soap, and an institutional hesitance to practice universal precautions, probably because of the limited resources. The hospital was not prepared for the kind of epidemic it's now facing — nor was the city of about 1.5 million people.

During our time at JFK, we became friends with Dr. Brisbane. We learned that he'd trained in Germany in the 1970s, had returned to Liberia to work, and had chosen to stay through the civil war and during Charles Taylor's despotic rule, continuing to see patients despite the bloodshed around him. He had welcomed the country's new democratic leadership and a new female administrator at the hospital — a first. He ran a successful coffee plantation and gave us bags of coffee every time we visited him. He was the father of eight biologic children and six adopted children, and he had numerous grandchildren around the world.

Within a few days after our return to Monrovia in June 2014,