

Chapter 6

Beginning of the Decline (November–December 2014)



Abstract In November and December 2014, the Ebola outbreak began to follow different paths in different countries. Liberia experienced a significant drop in cases. The apparent declines seen in Liberia in October 2014 were real. Hospitals that were once filled beyond capacity now had only a few cases. By November 13, 2014, conditions had improved so much that Liberia let its state of emergency expire. In Guinea, caseloads remained relatively stable. Sierra Leone became the epicenter of the outbreak. During November 2014, case numbers in Sierra Leone rapidly increased and the disease reached parts of the country that had not yet been affected. Sierra Leone's healthcare system was hard-hit. By December 14, 2014, 12 Sierra Leone doctors had been infected. In other parts of the world, the outbreak also presented a mixed picture. The outbreaks in the United States and Spain were over. In Mali, a second Ebola cluster flared up in mid-November. Ebola reached Scotland on December 29, 2014. Despite the increasing number of cases in Sierra Leone and the intermittent sparks around the world, healthcare officials began to think the worst of the outbreak might be over. Trend lines started to point downward.

6.1 Day-by-Day Outbreak Entries (November–December 2014)

November 1, 2014 (Saturday)

Experts at the WHO think the number of Ebola cases in West Africa may be leveling off. Instead of the exponential growth that has been occurring up until now, they think there may begin to be a steady addition of about 1000 new cases a week (Gallagher 2014a).

María Teresa Romero Ramos has been released from isolation at Carlos III Hospital in Spain (Heckle 2014). She is no longer isolated, but she is still in the hospital.

A UN employee has contracted Ebola in Sierra Leone and been evacuated to France for treatment (Landauro 2014).

November 2, 2014 (Sunday)

The number of Ebola cases in Sierra Leone appears to be increasing. There are now six to nine times more cases each week in Sierra Leone than there were 2 months ago (Al Jazeera 2014a).

Another Sierra Leone doctor, Dr. Godfrey George, has contracted Ebola. Dr. George is the medical superintendent of the Kambia Government Hospital (Associated Press 2014a). He is the fifth Sierra Leone doctor to become infected. The other four have died from the disease.

Health officials stress that it is important for people to remain vigilant and not become overconfident in dealing with Ebola. Missing even a single case can trigger a widespread outbreak. For example, an Ebola victim recently traveled from Monrovia to Nimba County, Liberia. He rode on the back of a motorcycle and arrived at a refugee camp for citizens of the Ivory Coast. Within hours he had physical contact with over 28 people (Sieff 2014a).

The United Kingdom is setting up three new laboratories in Sierra Leone to help with the Ebola outbreak (Press Association 2014a).

Coming Attractions Bridal & Formal will reopen on Tuesday, November 4, 2014. This is the bridal store Amber Vinson visited in Akron, Ohio (Associated Press 2014b).

November 3, 2014 (Monday)

About 30 residents of the village of Kigbal, Sierra Leone, have recently died from Ebola. This is roughly 10% of the population. The village chief says there are bodies everywhere (Harding 2014a).

Infected Sierra Leone doctor, Dr. Godfrey George, has died (ABC News 2014).

Sierra Leone radio talk show host David Tam Baryoh was arrested in Freetown after a guest on his show criticized President Koroma's handling of the Ebola outbreak. It is unclear what Baryoh will be charged with, but his arrest warrant was signed by the President himself (Committee to Protect Journalists 2014).

Many West African Ebola survivors are suffering long-term debilitating effects from the disease. Doctors are calling it post-Ebola syndrome. Symptoms include body aches, chest pain, headache, fatigue, and vision problems. Visual impairment is often the most significant problem. Some victims report cloudy vision; others experience progressive vision loss. At least two people in Kenema, Sierra Leone, have gone blind (Neporent 2014).

MSF says few healthcare workers are willing to work in newly opened Ebola clinics in West Africa (Vogel 2014).

UNICEF will double its staff in Guinea, Sierra Leone, and Liberia to 600 (Roy-Macaulay 2014a)

Forty-two people in Ohio have ended their observation periods after being exposed to Ebola victim Amber Vinson (Associated Press 2014c).

November 4, 2014 (Tuesday)

Ebola has recently infected numerous people in Koinadugu District, Sierra Leone. The district had been free of the disease until mid-October 2014. The Red Cross collected 30 bodies from Koinadugu District today (O'Carroll 2014a).

Throughout Sierra Leone, many people are forced to break quarantine to search for food. Food deliveries to quarantined households have been intermittent and unreliable (Al Jazeera 2014b).

It is estimated that 1126 Ebola treatment beds are currently available in West Africa. However, 4388 are needed (Gale and Kitamura 2014).

Shipping companies are adding Ebola clauses to their contracts. The clauses state where goods should be delivered to if the intended port is closed due to Ebola (Reuters 2014a).

Australia appears ready to send healthcare workers to West Africa. A deal has reportedly been reached where infected Australians will be sent to Britain or Germany for treatment (Australian Associated Press 2014).

The Philippines plans to quarantine 110 Filipino peacekeepers returning from Liberia. The troops will be isolated on an island in Luzon (Romero 2014).

November 5, 2014 (Wednesday)

Total cases: 13,042 (−525 new) Fatalities: 4818 (−133 new)
(World Health Organization 2014a)

The WHO continues to adjust its Ebola figures. This has led to another decrease in the official numbers.

The number of Ebola cases in Sierra Leone continues to increase. 24.6% of all Sierra Leone Ebola cases have occurred within the last 21 days. In contrast, no new Ebola cases were reported in Guéckédou, Guinea, during the past week (World Health Organization 2014a).

María Teresa Romero Ramos has been released from Carlos III Hospital in Spain (Press Association 2014b).

US personnel in Liberia are not allowed to have direct contact with Ebola patients. However, 70 healthcare workers with the US Public Health Service Commissioned Corps will treat patients (Zoroya 2014a). All of the workers have volunteered for the assignment and they will only treat infected local medical workers (Zoroya 2014a). About 1300 US troops are currently in Liberia (Beaubien 2014a). Separately, President Obama has asked Congress for \$6.2 B to fight Ebola (Zoroya 2014a).

The United Kingdom has opened the Kerry Town treatment center in Sierra Leone (Myall 2014). The 80-bed facility is the first of six planned British treatment centers.

German doctors have treated two Ebola patients with the experimental heart medicine FX06. The drug is designed for heart attack patients, but doctors think it could help Ebola patients too. FX06 reduces the loss of plasma through blood vessels. To date, the drug's effectiveness on Ebola patients is unclear. One of the patients treated with the drug has recovered. The other died from massive bleeding (Taylor 2014).

It has now been 21 days since Amber Vinson visited Northeast Ohio. Because no new Ebola cases have been detected in the region, local health officials now con-

sider the area to be Ebola-free (WTAM 2014). With the US Ebola outbreak seemingly contained, Americans do not seem as interested in the overall Ebola outbreak. Today on Twitter, there were about 200 Ebola mentions per minute. This is down from a recent average of 1000 per minute (Haglage 2014a).

Due to transportation and customs difficulties, many US research groups are having a hard time obtaining live samples of Ebola virus. Ebola mutates rapidly, so it is critical for researchers to experiment with up-to-date samples. Universities and research groups are working closely with the CDC and foreign governments to obtain the virus. For example, this week Tulane University received 900 blood samples from Sierra Leone Ebola patients. To get the samples, several Sierra Leone officials, including the country's President, had to sign off on the shipment. The CDC also had to provide a permit to allow the samples to be received in the United States (Steenhuysen 2014).

China will send another 1000 healthcare workers to West Africa to fight Ebola (Daily Times 2014).

November 6, 2014 (Thursday)

There are currently 357 people being monitored for Ebola in New York City. Some had contact with Dr. Spencer, but most are recent arrivals from West Africa (Stuart 2014).

Port officials in Freetown, Sierra Leone, say the port is conducting normal vessel operations. However, the temperature is taken from everyone who boards a ship and hand-washing and PPE are required (presumably not full-body PPE) (Finnan 2014).

The WHO believes the Ebola vaccines undergoing trials will probably cost about \$100 a dose when they become available (Boakye-Yiadom 2014).

Children's Healthcare of Atlanta at Egleston is building a special care unit to treat Ebola-infected children (Schneider 2014).

November 7, 2014 (Friday)

Total cases: 13,268 (226 new) Fatalities: 4960 (142 new)
(World Health Organization 2014b)

MSF confirms that the number of Ebola cases in Liberia is declining. One MSF treatment center in Liberia currently has no patients (BBC 2014a). Effective burial practices are thought to have helped reduce Ebola transmission in Liberia (Miles 2014a). In August 2014, Liberian burials typically occurred 3 days after death. Now they usually take place within 24 h (Miles 2014a). Because the bodies of Ebola victims are highly infectious, rapid burial greatly limits the risk for postmortem exposure from corpses.

Guinea continues to experience high levels of Ebola transmission. Marc Poncin, the Response Coordinator for MSF, thinks most of the Ebola cases in Guinea are being imported from Sierra Leone and Liberia. He says people fleeing disease flare-ups in those countries are returning to their families in Guinea. Some of the returnees are infected and pass Ebola onto their relatives (Beaubien 2014b).

It is unclear how many children have been orphaned by Ebola. Officials in Sierra Leone think there are about 2600 Ebola orphans in the country. NGOs like UNICEF believe the number is closer to 7000 (O’Carroll 2014b).

Texas is on its way to becoming Ebola-free. It has been 21 days since the last Texan was placed under surveillance. None of the 177 people being monitored have developed Ebola (Lupkin 2014a).

The WHO has issued a booklet describing how to conduct safe and dignified burials for West African Ebola victims (World Health Organization 2014c). The guidelines include cultural instructions for burying Christian and Muslim victims (World Health Organization 2014c). The procedures for burying a Muslim Ebola victim are:

The team leader will explain the safe and dignified process of burial.

Ask the family if there are any specific requests in regard to the process of a dignified burial, for example, do they want to perform a dry ablution on the body prior to burial?

Deceased Muslims should not be cremated or placed in the body bag naked.

A dry ablution can be performed by a Muslim member of the burial team on the deceased patient before being placed in the body bag. Otherwise a Muslim person/family member can perform this simple procedure once they have been placed in the body bag (see next page information for dry ablution).

The deceased patient is shrouded by wrapping in a plain white cotton sheet before being placed in the body bag. The shroud should be knotted at both ends. The BMT [body management team] should provide a shroud for the family or they provide one themselves.

If there are female members of the Burial team, they should shroud deceased female patients prior to placing in a body bag (see next page information for shrouding).

Permission can be sought in advance from the Imam that the body bag can be used to represent a shroud. White body bags should be used for Muslim patients.

Dry ablution

(To be only carried out by a Muslim person or Muslim faith representative).

A short Arabic prayer of intention is said over the deceased.

The hand of the Muslim Burial team member carrying out the dry ablution (in PPE), softly strikes their hands on clean sand or stone and then gently passes over the hands and then the face of the deceased. This symbolically represents the ablution that would normally have been done with water.

A short Arabic prayer is said over the deceased.

The body bag is closed if no request for shrouding has been made.

Dry ablution can also be carried out over the deceased in the body bag if a Muslim Burial team member is not available and it was not possible to perform directly on the body.

This process takes about 1–2 minutes only.

Shrouding

A plain unstitched white cotton sheet (scented with musk, camphor or perfumed) is placed on top of the opened body bag.

The deceased is lifted by the Burial team and placed on top of the shroud.

The extended side edges of the shroud are pulled over the top of the deceased to cover the head, body, legs and feet.

Three strips cut from the same fabric are used to tie and close up the shroud. One for above the head, one for below the feet and one for around the middle of the body. It is knotted at both ends.

If there are female members of the Burial team, they should shroud the deceased female patients.

The body bag is closed. (World Health Organization 2014c)

US troops are currently being quarantined in Italy after serving in West Africa. In the future, many troops will undergo their quarantine periods at US bases. The bases involved will include Fort Hood (Texas), Fort Bliss (Texas), Fort Bragg (North Carolina), Joint Base Lewis-McChord (Washington state), and Joint Base Langley-Eustis (Virginia). Depending on the location of their next deployment, some troops may still be quarantined in Italy or in Germany (Associated Press 2014d).

The CDC is preparing 50 Ebola PPE kits that can be sent to US hospitals that have newly identified Ebola patients. Each kit contains enough material to take care of one Ebola patient for 5 days. The kits include gowns, coveralls, aprons, boot covers, gloves, face shields, hoods, N95 respirators, powered air-purifying respirators, and disinfectant wipes (Centers for Disease Control and Prevention 2014a).

Former President George W. Bush met with Ebola survivor Amber Vinson today (NBC News 2014a).

November 8, 2014 (Saturday)

There have been no new Ebola cases in Mali since the arrival of Fanta Condé (Monnier 2014). Not even Condé's grand aunt, who brought Condé to Mali and cared for her while she was sick, has developed the disease (Monnier 2014; World Health Organization 2014d).

Photojournalist John Moore of Getty Images recently returned to the United States from Liberia. He is currently undergoing quarantine at his home in Connecticut. He was asked to describe the circumstances surrounding one of his photographs that has become an iconic image from the Ebola outbreak. In the picture, the sister of a deceased Ebola victim is reaching toward her sister's body bag as it is being carried away by members of a burial unit. Moore said the sister was trying to throw soil onto the body bag (Haglaga 2014b). Ebola victims in Liberia are cremated, not buried. Burial is the cultural norm in Liberia, so the soil might have been meant as a symbolic burial.

Morocco has refused to host the 2015 Africa Cup of Nations soccer tournament due to concerns about Ebola (RT 2014).

November 9, 2014 (Sunday)

Rural communities in Sierra Leone often receive little assistance from the central government and have to handle the Ebola outbreak themselves. In the Lokamasama region, 3 h northeast of Freetown, local chief Maro Lamina Angbathor has taken measures into his own hands. He has ordered the construction of a 90-bed isolation ward in the village school and has quarantined the hard-hit village of Kigbal; 31 of village's 200 residents have recently died from Ebola. It is hoped that more help, especially an ambulance, will be sent from nearby Port Loko. If not, the community will do its best to control the outbreak and isolate the sick (Chaon 2014).

When survivors are released from one Ebola center in Liberia, they dip their hands into paint and press their hands against a wall. The center has been open for a long time, but the survivor wall is very small (Eiklor 2014).

Eighteen thousand California nurses are planning to stage a walkout from Kaiser Permanente healthcare facilities on November 11, 2014. A variety of factors are contributing to strike. One concern is that the company has not implemented robust

Ebola preparedness measures. The strike will affect 21 hospitals and 65 clinics (Holloway 2014).

November 10, 2014 (Monday)

The number of Ebola cases in Liberia continues to decline. A 250-bed MSF treatment center in Monrovia has only 50 patients (Gallagher 2014b). The MSF center in Foya has not had any patients since October 30, 2014. Because of the drop in cases, MSF will adopt a new strategy in the country. It will create quick-response teams that will be sent to contain flare-ups of the disease as they arise (Gallagher 2014b). Although cases are falling, the United States has just opened the first of 17 planned 100-bed treatment centers in Liberia (Paye-Layleh 2014a). The treatment center is located in Tubmanburg, about 40 miles north of Monrovia (Paye-Layleh 2014a).

The Liberian village of Jene-Wonde, near the Sierra Leone border, has been heavily impacted by Ebola. About 10% of the population has died since late September 2014, and the disease continues to rage in the community. Village resident Momo Sheriff says about two people are being buried each day. Sheriff's own son has died from the disease (Williams 2014).

In Koinadugu District, Sierra Leone, 50 people have died from Ebola since mid-October 2014 (AFP 2014a).

Mali believes it has contained the Ebola outbreak which started with 2-year-old Fanta Condé. No one under surveillance has developed symptoms, and 108 people will complete their 21-day quarantine by November 14, 2014 (McNeil and Höjjenov 2014; Miles 2014b). At one point, Condé's 5-year-old sister developed a fever. But she had malaria, not Ebola (McNeil and Höjjenov 2014).

An Indian national has been quarantined at the New Delhi airport. The man is an Ebola survivor who contracted the disease in Liberia. The treatment center that released him gave him documents saying he was no longer infected. However, when he arrived in India, active virus particles were found in his semen. He will be isolated until he tests negative (Reuters 2014b).

Dr. Craig Spencer is now Ebola-free (Szabo 2014a). Kaci Hickox has completed her 21-day observation period in Fort Kent, Maine (Mathis-Lilley 2014).

Canada will quarantine high-risk people for 21 days. It is unclear whether health-care workers returning from West Africa will be considered high risk (Branswell 2014).

SES, a satellite service company, has started broadcasting an educational channel about Ebola. The free channel provides people with information about the disease and tips about how to prevent it (Clarke 2014).

November 11, 2014 (Tuesday)

Several Ebola threats have been made in New Zealand. A Jihadist group sent a package to the New Zealand Herald newspaper today containing a small vial of liquid labeled "Ebola" (Chang 2014; New Zealand Herald 2014). It is assumed to be a hoax, but even so, the package was carefully handled and samples have been sent for testing. The paper's newsroom was evacuated and cleaned (Chang 2014). A similar package arrived at the New Zealand Parliament building causing a brief lockdown (New Zealand Herald 2014).

Ebola cases continue to increase in Sierra Leone. On Saturday, November 8, 2014, 45 new cases were reported in the country (Spickernell 2014). On Sunday, 111 new cases were reported. Most of the new cases are in Freetown and Port Loko (Spickernell 2014). The government of Sierra Leone will provide \$5000 to the families of healthcare workers who die fighting Ebola (Reuters 2014c).

A sixth Sierra Leone doctor, Dr. Martin Salia, has contracted Ebola (Roy-Macaulay 2014b). Dr. Salia was infected in Freetown (Roy-Macaulay 2014b).

Thirty members of Fanta Condé's family have been released from quarantine in Mali (Ahmed 2014). None developed Ebola.

Dr. Craig Spencer has been released from Bellevue Hospital in New York City (Lupkin 2014b). He has been cautioned to avoid having sex for at least 3 months (Long and Peltz 2014). With his release, there are no active Ebola cases in the United States.

In California, nurses at Kaiser Permanente have begun a 2-day strike. The strike is partly due to concerns about the company's lack of Ebola preparedness (Smith 2014b).

Ireland will send a limited number of troops to Sierra Leone to fight Ebola (O'Connor 2014).

Morocco will not be allowed to participate in the Africa Cup of Nations soccer tournament. Morocco had refused to host the event out of fear of Ebola (Bisson 2014).

November 12, 2014 (Wednesday)

Total cases: 14,098 (830 new) Fatalities: 5160 (200 new)
(World Health Organization 2014e)

A new Ebola death has occurred in Mali's capital, Bamako (World Health Organization 2014f). The case is not believed to be connected to Fanta Condé. Officials say a 25-year-old nurse named Saliou Diarra has died from Ebola (AFP 2014b). Diarra became infected at the Pasteur Clinic after treating a 70-year-old Muslim Grand Imam (AFP 2014b; World Health Organization 2014f). A doctor at the clinic may also be infected (AFP 2014b). The Pasteur Clinic is now quarantined along with at least 30 people who had contact with the victims (AFP 2014b). Overall, three people are thought to have died in this flare-up: the Grand Imam, nurse Diarra, and a friend of the Grand Imam who recently died (AFP 2014b; World Health Organization 2014f). There is some confusion about the Grand Imam's name. An early report by AFP (2014b) identified him as Goita Sekou, but this report also stated that he was 66 years old. Later reports (i.e., Reuters 2014i) identified him as Oussa Koita, and this is likely his correct name. To avoid confusion, he will simply be referred to as the Grand Imam (e.g., World Health Organization 2014f). The Grand Imam recently came to Mali from Guinea. He was suffering from kidney failure and had Ebola-like symptoms. He died on October 27, 2014, but was not tested for Ebola (World Health Organization 2014f). Because he was a Grand Imam,

he was buried according to traditional Muslim customs. His body was washed and touched by numerous people (World Health Organization 2014f).

Healthcare workers at a MSF Ebola clinic in Bandajuma, Sierra Leone, have gone on strike because they have not received their \$100 a week hazard pay. About 60 patients are currently at the clinic. MSF says they may have to close the center if the strike continues (BBC 2014b).

The Anti-Corruption Commission and the Sierra Leone Police have arrested three men who tried to sell fake chlorine powder. Chlorine is commonly used to clean Ebola-contaminated surfaces. The men were arrested after trying to sell an inspector a large amount of fake powder for \$23,600 (Anti-Corruption Commission 2014).

In Liberia, the rate of new Ebola cases has fallen from about 500 a week to about 50 a week (Daniel 2014). Due to the drop in cases, the United States says it will probably not need to deploy all 4000 troops to the country (Cooper and Tavernise 2014). At present there are about 2100 US troops in Liberia (Cooper and Tavernise 2014).

The US embassy in Wellington, New Zealand, has received a suspicious package similar to the ones sent to the New Zealand Parliament and the New Zealand Herald newspaper yesterday. It is believed the packaged arrived on Tuesday like the others. However, the US embassy was closed in honor of Veterans Day, so the package was not found until today (Finley 2014).

The US nonprofit agency American Refugee Committee is setting up an Ebola treatment center in Fish Town, Liberia, near the border of the Ivory Coast (Associated Press 2014e).

In North Carolina, the Carolinas Poison Control Center has launched a new Ebola hotline number (844) 836–8714. Numerous callers have been contacting the agency about Ebola. To date, 279 calls have been received about the disease (News & Observer 2014).

November 13, 2014 (Thursday)

Liberia has ended its state of emergency. The existing state of emergency was set to expire and needed to be renewed if it was to continue. President Ellen Johnson Sirleaf has decided not to extend it, so this effectively ends Liberia's state of emergency. President Sirleaf says the Ebola outbreak is not over, but there have been recent successes in fighting the disease (Reuters 2014d).

A doctor at the Pasteur Clinic in Mali has tested positive for Ebola. The body of a young girl is also being tested for Ebola. She died at an isolation center in Bamako today (Schnirring 2014a).

Corpses continue to be a source of infection in Sierra Leone. The burials provided by Ebola burial teams do not always fit with local customs. As a result, relatives sometimes go to the graves at night and exhume the corpses. They wash and prepare the bodies according to traditional methods and rebury them (Awoko 2014a). If the deceased person died from Ebola, this can lead to infection.

Clinical trials of three potential Ebola treatments will begin at MSF clinics in Guinea and Liberia next month. Brincidofovir will be tested in Monrovia, Liberia.

Favipiravir will be tested in Guéckédou, Guinea. Transfusions with convalescent blood will be tested in Conakry, Guinea. All of these treatments have shown promise in small-scale trials and with US and Spanish Ebola victims (Karimi 2014).

November 14, 2014 (Friday)

Total cases: 14,413 (315 new) Fatalities: 5177 (17 new)
(World Health Organization 2014g)

Five people have been diagnosed with Ebola in Mali (Rihouay and Bennett 2014). One is a woman who washed the body of the deceased Grand Imam (Gayle 2014). A sixth person, the girl who died on Thursday, is also thought to have had Ebola (Rihouay and Bennett 2014). Officials are working to trace the contacts of all known and suspected cases. At least 200 people have been identified as potential contacts (Rihouay and Bennett 2014).

Infected Sierra Leone doctor, Dr. Martin Salia, will be flown to the United States for treatment. Dr. Salia is a permanent US resident and normally lives with his wife in Maryland. He will be treated in Nebraska (Stobbe and Roy-Macaulay 2014).

Healthcare workers have gained the trust of residents in Liberia. Locals were initially afraid of healthcare workers because they wore frightening-looking PPE and took sick people away to walled treatment centers from which they did not return. Medical personnel have worked hard to demystify their work. For example, in Foya, the walls of the treatment center have been replaced with transparent fences so residents can look into the facility and see what the workers are doing (Sun 2014a).

The California Department of Public Health and the California Division of the Occupational Safety and Health Administration have issued new guidelines for California healthcare workers. The new requirements say that all people working with Ebola patients must have PPE that covers the entire body and prevents the passage of fluids. Additionally, all the pieces of PPE must be compatible with each other (California Department of Industrial Relations 2014). It is unclear what role the recent nurse's strike played in the development of the new requirements. It is likely that the strike added pressure to the agencies to change the current guidelines.

The lack of tourism and suspension of commercial flights has reduced the government Sierra Leone's access to foreign currency (AFP 2014c).

France has advised against nonessential travel to Bamako and Kayes, Mali (Reuters 2014e).

Senegal has reopened its transportation links with Ebola-affected countries. Senegal will now allow planes and ships to arrive from West Africa. However, the country's land border with Guinea remains closed (Reuters 2014f).

November 15, 2014 (Saturday)

Dr. Martin Salia has arrived in Nebraska (Schubert 2014). He is critically ill and was not able to walk off the plane by himself (NBC News 2014b). Dr. Salia's wife, Isatu

Salia, will pay the estimated \$100,000 for his evacuation from West Africa (Martinez and Mohney 2014).

Two more people are believed to have died from Ebola in Mali. Both died in a house that held the body of the Grand Imam (News Ghana 2014).

The British intelligence agency MI5 says the Islamic State may try to send Ebola-infected terrorists to England (Ward 2014). No specific threat appears to have been detected, but the agency considers this hazard as a possibility.

France will begin screening air passengers arriving from Mali for Ebola (France 24 2014).

A team of 160 Chinese healthcare workers arrived in Liberia today. They will staff a new treatment center (Reuters 2014g).

November 16, 2014 (Sunday)

Liberia has set an ambitious goal. It hopes to end Ebola transmission and have no Ebola new cases by Christmas 2014 (VOA News 2014a).

Dr. Martin Salia's medical condition continues to worsen. He is now in extremely critical condition. Dr. Salia's Ebola infection incubated longer than other infected US healthcare workers. He was given an Ebola test when he first developed symptoms. The results were negative, but his condition continued to decline. After about a week, a second test was conducted. It was positive. The first test was wrong – he had had Ebola all along. The treatment center where Dr. Salia worked has been closed and three of his close colleagues are under quarantine (Sieff 2014b).

Dr. Javid Abdelmoneim has been treating Ebola patients in Kailahun, Sierra Leone, for about a month. He says most of the people who die from the disease arrive at the clinic in very bad shape and die very quickly. Those who survive have more energy, even when they first arrive. Over the next few days, they become lethargic and have no appetite. They are so weak they cannot stand or feed themselves. After 4 or 5 days, they start to get better. Their appetite returns and they become ravenously hungry. The average time from admittance to release is 15 days for a survivor (Abdelmoneim 2014).

The United States will begin screening passengers arriving from Mali for Ebola. Screening will start on Monday, November 17, 2014. There are no direct flights to the United States from Mali, but 15–20 people arrive in the United States each day from Mali after making connecting flights in other countries (Centers for Disease Control and Prevention 2014b).

About 170 Kansas National Guard Soldiers from the 891st Engineer Battalion Headquarters will be deployed to West Africa (KSN 2014).

Concerns about Ebola are prompting many countries to begin preparedness measures, even countries that are far away from the ongoing West African outbreak. For example, Jamaica is constructing a four-bed Ebola treatment center at the Cornwall Regional Hospital in St. James (Jamaica Observer 2014).

November 17, 2014 (Monday)

Dr. Martin Salia died at the Nebraska treatment facility at approximately 0400 h this morning (Aizenman 2014a; Fox News 2014). He had been treated with ZMapp and received plasma transfusions from an Ebola survivor, but these could not reverse the

course of the disease. Dr. Salia had lost kidney function, was having difficulty breathing, and was unresponsive (Aizenman 2014a).

There are currently 442 people under surveillance in Mali (AFP 2014d).

EU Ebola coordinator Christos Stylianides and Commissioner of Health Vytenis Andriukaitis have completed a 4-day mission to West Africa. Their trip has prompted the EU to contribute an additional \$36 M to Ebola-fighting efforts (PR Newswire 2014).

The head of UNMEER in Guinea, Marcel Rudasingwa, unexpectedly died of natural causes. He is not thought to have had Ebola (Reuters 2014h).

It is difficult to recruit healthcare workers to work in West Africa. The French Red Cross says 60% of their volunteers back out due to pressure from family and friends (Associated Press 2014f).

November 18, 2014 (Tuesday)

A seventh Sierra Leone doctor has died from Ebola. Dr. Moses Kargbo died at the Hastings Treatment Center today. He was retired but had volunteered to help with the outbreak (News OK 2014).

There are normally 377 native medical doctors in Sierra Leone. Given Sierra Leone's population of 6 M, this means there is only one doctor for every 15,544 people (Awoko 2014b). It also illustrates the impact Ebola is having on Sierra Leone's medical infrastructure. So far, seven Sierra Leone doctors have died from Ebola. This is 1.8% of the country's total doctoral pool.

Sierra Leone still has too few beds for Ebola patients. Forty people called the country's Ebola hotline today requesting transport to a treatment center. Due to the lack of space, 11 of these people could not be accommodated and had to remain at home (Sieff 2014c).

UNICEF has opened two new Ebola isolation centers in Sierra Leone. They are both in Bombali District, in the towns of Pate-Bana and Mapakie (Awoko 2014c).

Due to the declining number of Ebola cases in Liberia, the United States will build fewer treatment centers than originally planned. Instead of 17 100-bed treatment centers, the United States will build 10 centers, most with 50 beds (Zoroya 2014b).

The border between Liberia and the Ivory Coast is ill-defined and porous. Even so, Ebola has not reached the Ivory Coast. Before the outbreak, people easily moved back and forth between the two countries. Now, Ivory Coast villagers mount community-based patrols to prevent Liberians from crossing. The unarmed militia take their jobs very seriously. Members of one militia say a provincial deputy told them that if a single Ivory Coast villager developed Ebola, the entire affected village would be burned to the ground (Warner 2014).

The World Bank estimates that 25% of farmers in Sierra Leone, Liberia, and Guinea have not planted crops because of the Ebola outbreak. The Bank is concerned that this could lead to famine in the region (The News 2014).

The cost for treating the three Ebola patients at the Nebraska Medical Center has totaled at least \$1.16 M (Sun 2014b).

The University of Mississippi Medical Center is renovating a vacant building to serve as a treatment site for any future Mississippi Ebola cases (Associated Press 2014g).

November 19, 2014 (Wednesday)

Total cases: 15,145 (732 new) Fatalities: 5420 (243 new)
(World Health Organization 2014h)

A Cuban doctor, Dr. Felix Baez, has tested positive for Ebola in Sierra Leone (Trotta 2014). He will be sent to Geneva, Switzerland, for treatment. There are currently 256 Cuban medical workers in West Africa (Trotta 2014). So far during the outbreak, a total of 568 healthcare workers have contracted Ebola, and 329 of them have died (World Health Organization 2014h).

A 34-year-old Liberian nurse died at the US clinic in Monrovia, Liberia, today. She is the first person to die at the facility. Dr. Russ Bowman, one of the clinic's physicians, says the nurse was unresponsive when she arrived, so there was little the staff could do for her (Zoroya 2014c).

Thieves in Guinea held up a minibus carrying blood samples being taken for Ebola testing. A cooler full of blood samples was stolen. It is unclear why the thieves wanted the blood. It may have been taken by mistake. Radio announcements are asking the robbers to return the samples (Associated Press 2014h).

Given the current downward trends in West African Ebola case numbers, CDC Director Thomas Frieden says it is unlikely the worst-case scenario projections made during the summer will come true. Some of the early models had predicted that 1.4 M people could be infected by mid-January 2015 (Stobbe 2014).

University Hospital in Frankfurt, Germany, has released Ugandan doctor Dr. Michael Mawanda. He was admitted with Ebola on October 3, 2014 (Frankfurter Allgemeine 2014).

November 20, 2014 (Thursday)

In Bamako, Mali, the doctor who treated the infected Grand Imam has died from Ebola (Reuters 2014i).

A 38-year-old nurse in Bamako, Mali, was attacked by her neighbors after they learned that patients at her clinic had died from Ebola. A crowd gathered at her door chanting "Rita has Ebola." Stones were thrown at her, but she was not injured. The children of some of the clinic's workers have been harassed at school or sent home (MENAFN 2014).

The Macaulay Street Holding Unit in Freetown, Sierra Leone, isolates patients before they are sent to clinics for treatment. About 25% of arriving patients die before they can be sent for care. New facilities are opening in Sierra Leone, but it takes time for them to be fully staffed. For example, the United Kingdom recently opened a 92-bed center in Kerry Town, but many of the beds remain empty while the British train local healthcare workers to run the facility (Sieff 2014c).

A memorial service for Dr. Martin Salia will be held at St. Mary's Church in Landover Hills, Maryland, on November 28, 2014, from 1800 to 2000 h. His funeral will be on November 29 at 1300 h (CBS Baltimore 2014).

Infected Cuban doctor, Dr. Felix Baez, has been transported to Switzerland for treatment (Reuters 2014j).

Because of the Ebola outbreak, the United States will grant temporary protected status to people from Guinea, Liberia, and Sierra Leone who are currently in the US. Residents of the three countries can apply for protection from deportation and for work permits. The documents will be valid for 18 months. It is thought the move will affect about 8000 people (Reuters 2014k).

India will deploy 24 additional thermal scanners at its international airports. The scanners assess arriving passengers for fevers. Eighteen scanners are currently in use (IANS 2014a).

November 21, 2014 (Friday)

Total cases: 15,315 (206 new) Fatalities: 5459 (39 new)
(World Health Organization 2014i)

The Hastings Treatment Center in Sierra Leone has been vigorously rehydrating Ebola patients. The extreme vomiting and diarrhea caused by Ebola rapidly dehydrates victims. Standard rehydration techniques include providing patients with IV drips. However, because of the risk of accidental needlesticks, IVs are not generally used with Ebola patients. Despite the danger, the staff at Hastings started using IVs in mid-September. The results have been very encouraging. The fatality rate for patients in standard treatment centers is about 64%. At the Hastings Treatment Center, the fatality rate is 40%. Equally encouraging is the fact that none of the center's healthcare workers using the IVs have contracted Ebola (Aizenman 2014b).

The Magbente Ebola Treatment Unit near Makeni, Sierra Leone, has started operations (Kamara 2014).

The Liberian finance minister predicts Liberia's economy will shrink by 0.4% in 2014. This is in contrast to the 5.9% increase Liberia experienced in 2013. The reduction is almost entirely due to the Ebola outbreak (Leadership 2014a).

A female Spanish healthcare worker is being flown to Carlos III Hospital in Madrid, Spain, for observation. She was treating a confirmed Ebola patient in Mali when she suffered a needlestick injury (Payne 2014).

The US Food and Drug Administration says it will start stockpiling blood plasma from Ebola survivors for use in future patients (Palmer 2014).

Nepal is asking all Nepalese peacekeepers returning from Liberia to abstain from sex for 3 months to prevent the spread of Ebola (Poudel 2014).

November 22, 2014 (Saturday)

A new Ebola case has been confirmed in Mali. The new patient is a friend of the nurse who died from Ebola (Reuters 2014l).

Infected Cuban doctor, Dr. Felix Baez, has begun treatment with ZMapp. He is currently in stable condition (Associated Press 2014i).

Phoenix Air Group, Incorporated, is playing a pivotal role in US Ebola efforts. The company specializes in providing unique air transport capabilities. It has worked with the CDC for about 9 years. In 2005, the CDC asked Phoenix Air Group if the company could develop a way to transport critically ill, highly infectious patients. This led to the successful development of an air-transportable isolation chamber. It also preadapted the company to be ready to help with the Ebola outbreak. So far, Phoenix Air Group has transported all of the infected Ebola patients to the United States (Haglage 2014c).

A group of 30 UK volunteer healthcare workers from the NHS is on their way to Sierra Leone to fight Ebola (Associated Press 2014j).

November 23, 2014 (Sunday)

BBC reporter Tulip Mazumdar and her news team recently made an overland journey from Freetown, Sierra Leone, to Conakry, Guinea. While traveling to Sierra Leone's border, the group passed through numerous Ebola checkpoints. At each site, the team had their temperatures taken. One checkpoint had prepared a novel hand-washing device. It was composed of suspended chlorine wash bottles connected to a stick. When a user stepped on the stick, the bottles tipped over and disinfectant poured onto their hands. As the team crossed the border and entered Guinea, they found that conditions in Guinea were dramatically different from Sierra Leone. In addition to having lower-quality infrastructure, such as having unpaved rather than paved roads, many Guineans were in denial about Ebola. At the town of Maferiah, several hours from Conakry, villagers said they had heard of Ebola, but many did not believe the disease actually existed (Mazumdar 2014).

UNMEER is opening an office in Mali to help with the country's Ebola outbreak (Clotney 2014).

US troops have finished building a third Ebola treatment center in Liberia. The new unit is in the town of Buchanan in Grand Bassa County (Worzi 2014a).

The Smith Barracks in Germany will be used as an isolation center for US troops returning from West Africa. Efforts have been made to make the barracks comfortable. It has been well stocked with sofas and televisions. A pool table and foosball games are also available. The facility can accommodate up to 180 troops (NBC News 2014c).

A UN worker has recovered from Ebola and has been discharged from the Begin Military Hospital in Paris (Reuters 2014m).

November 24, 2014 (Monday)

Liberia continues to see declines in the number of Ebola cases. Currently, about 20 new cases are being identified in the country each day, compared to 80 a day in September 2014 (Farge 2014a). Given these drops, Brigadier General Frank Tate has confirmed that the United States will not build two of its proposed treatment centers (Farge 2014a). Liberian President Ellen Johnson Sirleaf praised her country's Ebola-fighting efforts (AFP 2014e). She said:

A few months ago Ebola was chasing us, today we are chasing Ebola. Right now our people are out there doing contact tracing. Communities are taking responsibility and they are taking ownership.

They are going in every home to see who is sick so they can take the sick to the treatment centre. They are going to see those who have been abandoned so they can see what they can do for them.

And those who have been freed from the disease... those people are now being integrated into their communities so we are calling on all the communities to walk with them. (AFP 2014e)

Although Liberian Ebola cases are in decline, pockets of the disease continue to flare up in the country. In Rivercess County in the southeastern part of Liberia, 24 Ebola deaths have occurred. Local healthcare worker Lorenzo Dorr says the disease reached the region when a sick woman came from Monrovia on October 21, 2014. She treated her illness using traditional methods but died. Officials told people they should not touch her corpse, but she was given a traditional burial and her body was bathed. A few days later, people who helped with her funeral started becoming sick (Bloch 2014).

An eighth Sierra Leone doctor, Dr. Aiah Solomon Konoyeima, has tested positive for Ebola. Dr. Konoyeima has been working at the Children's Hospital in Freetown (Paye-Layleh and Roy-Macaulay 2014).

Irish burial experts from the Glasnevin Trust, in partnership with Concern Worldwide, are helping manage the burial records of Ebola victims in Freetown, Sierra Leone. The group is supervising ten burial teams at two cemeteries. Graves are marked with small white crosses and families are provided with maps so they can find their loved ones (Cullen 2014).

An Italian doctor [Fabrizio Pulvirenti] working for Emergency in Sierra Leone has contracted Ebola (Reuters 2014n; Sylvers 2014). He will be transported to Rome for treatment (Sylvers 2014).

High demand has companies struggling to produce enough PPE to deal with the Ebola outbreak. Increased demand from US consumers (such as hospitals and the CDC) has reduced the number of PPE suits available for shipment to Africa. For example, DuPont has tripled its production of hazmat suits, but it still is not producing enough to meet the demand. As a result, the company has prioritized buyers. It has placed customers who have direct contact with Ebola victims at the top of the list (Hinshaw 2014).

To date, 99 people in Britain have been tested for Ebola. Only William Pooley has tested positive (Perring 2014).

November 25, 2014 (Tuesday)

Burial workers left 15 bodies at the main hospital in Kenema, Sierra Leone, today. The workers say they have not received their hazard pay for October or November. The bodies have been removed, but the workers are now on strike (BBC 2014c).

Dan Baschiera, an Australian volunteer healthcare worker, has been helping Ebola patients in Sierra Leone. He has seen many patients die. He says rigor mortis sets in very quickly with Ebola victims, frequently within minutes. The faces of the dead often become frozen in painful grimaces. He also says Red Cross burial teams are finding entire villages empty (Baschiera 2014).

The UN says it will not meet its initial Ebola roadmap target by December 1, 2014. The goal was to have 70% of Ebola patients under treatment and 70% of Ebola victims safely buried by this date. The recent increase in Ebola cases in Sierra Leone has contributed to the missed deadline (Al Jazeera 2014c).

In Mali, the WHO says that 99% of the people who had contact with the recent Ebola patients have been identified and traced. The agency is hopeful the outbreak in Mali can be contained. Even so, two new Ebola cases have been identified in the Country. These include the 23-year-old fiancée of deceased nurse Saliou Diarra (Schnirring 2014b).

Police in Thailand are looking for a 31-year-old Sierra Leone man named Samuel Sesay. Sesay arrived in Thailand 2 weeks ago but has stopped reporting for his mandatory 21-day observation checks. Officials do not think Sesay has Ebola, but failing to check in with health officials is a crime (Straits Times 2014).

In the city of Guangzhou, China, travelers coming from Ebola-affected countries are being quarantined. About 150 people arrive in the city each day from countries with Ebola. All foreign visitors from these countries are required to stay at a single hotel, the Hotel Canton. They stay free of charge for their 21-day quarantine period. Visitors under quarantine can travel around the city, but only if they agree to carry a GPS-equipped cell phone and report for twice daily medical checkups. The hotel discards the mattresses of guests after they check out. In an odd twist, travelers are apparently not told they have to stay in the Hotel Canton when they arrive in Guangzhou. Instead, they often have travel from hotel to hotel until they learn they can only stay at the Hotel Canton (Ide 2014).

China has opened a 100-bed, Ebola treatment center in Monrovia, Liberia (Paye-Layleh and Roy-Macaulay 2014).

Illinois has ended its Ebola hotline. Interest in the disease has faded in Illinois and the number of calls to the hotline has fallen (WAND 2014).

November 26, 2014 (Wednesday)

Total cases: 15,935 (584 new) Fatalities: 5689 (230 new)
(World Health Organization 2014j)

Over the last 3 weeks, Sierra Leone's Ebola fatality rate has more than doubled from 52 people per week to 131 per week (Awoko 2014d). Last week, there were 385 new Ebola cases in the country (World Health Organization 2014j). Of these, 118 were in Freetown, 72 in Port Loko, 55 in the Western Area Rural, 54 in Bombali, 31 in Tonkolili, 16 in Kono, 14 in Bo, 10 in Moyamba, 2 in Kailahun, and 1 in Kenema (World Health Organization 2014j). Despite the new cases, Sierra Leone's Information Minister believes the disease may have peaked and could be on the verge of slowing down (Roy-Macaulay and Schemm 2014).

Ledgerwood et al. (2017) describe the initial results of the GlaxoSmithKline Ebola vaccine trials (the preliminary report was published online today; the full article was published March 3, 2017). Assays to assess the safety and efficacy of the vaccine began at Bethesda, Maryland, in September 2014. No significant adverse

effects were detected in 20 vaccinated volunteers, although two people developed transient fevers after being vaccinated. All of the volunteers developed Ebola antibodies within 4 weeks of vaccination. Those given higher vaccine doses (2×10^{11} particle units versus 2×10^{10}) produced more antibodies. Volunteers receiving higher vaccine doses also produced disease-fighting T cells, whereas those receiving lower doses generally did not (Ledgerwood et al. 2017).

Tests indicate that the nurse who died at the US clinic in Liberia on November 19, 2014, did not have Ebola (Zoroya 2014d). She remains the first person to die at the site, but she did not die from Ebola.

South Korea plans to send a team of ten healthcare workers to Goderich, Sierra Leone, to fight Ebola. Britain has agreed to treat any infected Koreans and will evacuate them to a European hospital for treatment (Reuters 2014o).

The six US Ebola survivors, Dr. Kent Brantly, Dr. Rick Sacra, Ashoka Mukpo, Nina Pham, Amber Vinson, and Nancy Writebol, met together today for an interview on the *Today* show. It is the first time all six survivors have come together (Kim 2014).

November 27, 2014 (Thursday)

Another Sierra Leone doctor, Dr. Komba Songu-M'Briwa, has contracted Ebola. Dr. Songu-M'Briwa treated Dr. Martin Salia at the Hastings Treatment Center before Salia was transported to the United States for treatment. It is unclear how Dr. Songu-M'Briwa became infected. He is now being treated at the Hastings Ebola Treatment Center himself. Dr. Songu-M'Briwa is the ninth Sierra Leone doctor to become infected (Sieff 2014d).

In Liberia, an inaccurate death certificate has led to a new cluster of Ebola cases. A man named Solomon King Pour of the Rock Hill community recently died. His relatives thought he might have died from Ebola, but his official death certificate said he had died from other causes. Consequently, community members washed and prepared his body according to local customs. Since his burial, at least eight people associated with the funeral have developed Ebola; one has died. As word of the exposure has spread, community members have voluntarily isolated themselves to prevent further infections (Karmo 2014).

The British Ebola treatment center in Kerry Town, Sierra Leone, remains underutilized. The 92-bed center opened 3 weeks ago, but currently only 11 patients are being treated at the site. Overall, the center has treated 28 patients (Watt 2014).

Germany has developed a dedicated medevac plane for Ebola patients. Lufthansa and the Robert Koch Institute retrofitted an Airbus A340-300 with an isolation unit, two airlocks, an air filtration system, and a cabin for medical workers to decontaminate their PPE. The plane will allow healthcare workers to provide in-flight intensive care to Ebola patients (Paye-Layleh 2014b). Previous medevac aircraft were too small to allow for complex patient care.

A group of 17 Australian healthcare workers has been deployed to Sierra Leone to help with the Ebola outbreak (Medhora 2014).

November 28, 2014 (Friday)

French President Francois Hollande traveled to Guinea today. He is in the country for a 1-day visit designed to show support for Guinea's Ebola-fighting efforts. Hollande is the first western head of state to visit an Ebola-affected country during the outbreak (BBC 2014d).

US nonprofit group EduNation, in conjunction with other agencies, is delivering food to quarantined houses in Sierra Leone. Households with more than ten quarantined individuals receive a food package containing two 50 kg bags of rice, five gallons of palm oil, 25 kg of onions, fish, hot peppers, Maggie seasoning, a bag of salt, a box of soap, sanitary items, and bundles of water (Gbenda 2014).

The WHO is advising male Ebola survivors to abstain from sex for 3 months after they recover from the disease. It also encourages survivors to maintain good personal hygiene after masturbation. Data indicate that Ebola can remain in semen for 82 days after a person develops Ebola symptoms (CBC News 2014).

Researchers have developed a portable, solar-powered Ebola detection lab that can diagnose Ebola in as little as 15 min. Healthcare workers have long wanted a quick and accurate Ebola test. Trials of the experimental lab will begin at a clinic in Conakry, Guinea (VOA News 2014b).

India will require all Ebola survivors to produce a certificate saying no virus is present in any of their body fluids before they can enter the country. Survivors without a certificate will have to wait 90 days after treatment before they can enter India (PTI 2014a).

Infected Cuban doctor, Dr. Felix Baez, is reported to be improving (Reuters 2014p).

November 29, 2014 (Saturday)

Schools in Sierra Leone remain closed, so the country continues to broadcast educational programs over the radio. The programs are considered a simple, relatively effective way to educate children during the crisis. Though helpful, the approach is not perfect. Some students complain that they cannot ask questions. Students are encouraged to call teachers by phone, but not all of them can afford to do so (Kamara and Collins 2014).

There are no active Ebola cases in Mali. There are 285 people under surveillance, but none of them have symptoms of the disease (Reuters 2014q).

A funeral mass was held today for Dr. Martin Salia. Dr. Salia's body was cremated, so his wife carried a small black box containing his ashes into the church (Nuckols 2014).

The condition of the Italian doctor who contracted Ebola in Sierra Leone is deteriorating. He is being treated at the Lazzaro Spallanzani Institute in Rome. The institute issued a statement today saying the doctor has nausea, vomiting, diarrhea, and a fever over 102.2 °F (AFP 2014f).

November 30, 2014 (Sunday)

Criticism continues to mount about the UK's Ebola clinic in Kerry Town, Sierra Leone. Locals and foreign aid workers say the clinic lacks a sense of urgency. Staff at the facility say these concerns are unfounded and are upset by the allegations. On

a positive note, a 21-year-old student named Kadiatu Sesay was recently discharged from the clinic. She is the third survivor to be released from the facility (Harding 2014b).

NPR reporter Kelly McEvers is in Monrovia, Liberia (Weekend Edition 2014). She describes the current conditions on the ground:

KELLY MCEVERS: Well, because I wasn't here during the worst time, and that was August and September, it's hard to say how things have changed. But what I do know are the stories that people have been telling us about what it was like during that time. And it sounds really, really grim. You know, the Ebola treatment units were full. There weren't enough beds. People were being turned away, literally, you know, dying in the streets. You had slums, like West Point, which I'm looking over right now. I'm sort of up on a hill looking down over that West Point slum in Monrovia, the capital, where things were very dire.

Things are different now. There's an election going on. People are kind of letting their guard down. You get a sense that because the numbers are going down, people are relaxing. But what you are hearing from health officials is that people need to remain vigilant. What's happening now is you see Ebola cases popping up in the rural areas again. So that means that the sickness has spread from the city here and people are going back out into their villages and getting sick there. (Weekend Edition 2014)

She also describes reports from teams sent to investigate infected rural communities:

MCEVERS: I mean, but we heard crazy stories. You know, one team went into a really remote village and all they found when they got there were 22 fresh graves. I mean, that's still happening. So I think everyone's saying, look, you know, we're working on it, but we've got more to do. (Weekend Edition 2014)

December 1, 2014 (Monday)

Sierra Leone continues to have very high levels of Ebola transmission (Heilprin 2014). The large number of deaths in and around Freetown has officials scrambling to handle numerous Ebola-infected bodies. The size of the crisis is almost of industrial scale. At one of Freetown's cemeteries (almost certainly King Tom Cemetery), workers dig graves, while bulldozers clear space for additional burials. In one afternoon, about 20 bodies arrived for burial (BBC 2014e).

Sierra Leone's military has opened a new 40-bed treatment center at the 34 Military Hospital in Freetown. Separately, since it opened on September 19, 2014, the Hastings Treatment Center has admitted 585 patients, discharged 363, and had 155 deaths (Awareness Times 2014).

The WHO says Guinea and Liberia have both reached the roadmap goal of isolating 70% of infected victims and safely burying 70% of Ebola fatalities. Sierra Leone has not reached these goals, but the WHO thinks the prognosis for Sierra Leone is very good. This is because new treatment facilities are opening and the number of available beds in the country will soon increase (Miles 2014c).

MSF says the international response to Ebola has been slow and uneven. There continues to be too few trained staff from first world countries in West Africa (Médecins Sans Frontières 2014a).

Two elite UK schools, Cheadle Hulme School and Withington Girls' School, will send their students on an annual 1-week trip to The Gambia despite the ongoing

Ebola outbreak in neighboring countries. Not all parents are happy with this decision. One father (a doctor) says he will not only prevent his daughter from going on the December 13–21, 2014, trip, but he will also keep her home from school for the 21-day incubation period after the other students return (Fitzgerald 2014).

Ebola has not reached Connecticut, but state hospitals have already spent \$5 M in planning and preparing for possible Connecticut Ebola cases (Hladky 2014).

Nigeria is training 250 healthcare volunteers to assist with the West African outbreak (Leadership 2014b).

December 2, 2014 (Tuesday)

Today marks the 1 year anniversary of the start of the Ebola outbreak.

The WHO has congratulated Spain for containing its Ebola outbreak. It has been 42 days since the last, and only, infected Spanish national tested negative for the disease. Because no one else has developed the disease, the Spanish Ebola outbreak is now considered over (World Health Organization 2014k).

Infected Sierra Leone doctor, Dr. Komba Songu-M’ Briwa, continues to undergo treatment at the Hastings Treatment Center. He has been given a private room, but his treatment is the same as the other patients at the facility. He receives antibiotics, an IV drip, and a nutritious diet (Associated Press 2014k).

A story has emerged from the Caldwell community in Liberia about a teacher named Nancy Freeman and her family. It is being used to illustrate the potential dangers of hiding Ebola patients. In November 2014, several people in Freeman’s family died from Ebola. The neighbors were not told. Freeman’s stepmother then became sick and Freeman took care of her privately. Eventually the stepmother became so sick she had to go to the hospital. When Freeman returned from the facility, she told the neighbors her stepmother had jaundice. She then cleaned the house with bleach. A few days later, Freeman became sick. She remained at home. When she vomited, she cleaned the area with bleach. Eventually she was taken to the hospital where she died from Ebola (Smith 2014a).

The World Bank says the economies of Guinea, Sierra Leone, and Liberia have been crippled by the Ebola outbreak. The agency predicts that Guinea’s economy will grow by 0.5% this year, Sierra Leone’s by 4.0%, and Liberia’s by 2.2%. All of these values are less than half of last year’s growth rate. In the case of Guinea, it is only about 10% of last year’s growth (Paye-Layleh and Dilocenzo 2014).

Massachusetts General Hospital in Boston admitted a suspected Ebola patient (Scalese and Tedesco 2014). The person had been in Liberia and arrived at the hospital with Ebola-like symptoms (Scalese 2014). It was later determined that the person had malaria, not Ebola (Scalese 2014).

The United States has identified 35 hospitals that will act as Ebola treatment centers for future US Ebola cases. Together, these facilities have a 53-bed capacity (Sun 2014c).

December 3, 2014 (Wednesday)

Total cases: 17,145 (1210 new) Fatalities: 6070 (381 new)
(World Health Organization 2014l)

The 21-day surveillance period has ended for 114 New York City healthcare workers who helped take care of Dr. Craig Spencer. None of them developed Ebola. There are currently 222 people still under surveillance in New York. Most of these are people who recently arrived from Ebola-affected countries (Ferris 2014).

Anthony Banbury, the head of UNMEER, says there continues to be high levels of Ebola transmission in and around Freetown, Sierra Leone. However, conditions in most of West Africa are significantly better than they were 2 months ago. The current rate of infection is also much lower than what had been predicted. Banbury describes one image that stays with him from the outbreak. He visited a graveyard next to a treatment center. Many of the graves are filled with children and young adults. Even more disturbing, there were numerous unfilled graves waiting to receive victims (Morning Edition 2014a).

An 11th Sierra Leonean doctor, Dr. Dauda Koroma, has tested positive for Ebola. He is being treated at a military hospital in Freetown (Roy-Macaulay 2014c).

There are currently only eight patients at the ELWA-3 Ebola treatment center in Monrovia, Liberia. ELWA-3 is one of the largest Ebola hospitals, with a 250-bed capacity (Beaubien 2014c). The fact that so few patients are being treated at the facility is a dramatic illustration of the drop in Liberian Ebola cases.

Doctors at the Nebraska Biocontainment Unit have prepared a paper describing the way they dealt with the waste generated by Ebola patients (Park 2014). Each patient produced about 1010 lb of solid waste at the rate of about four to eight bags a day (Lowe et al. 2014). Most of the solid waste was composed of towels, linens, bedding, and caregiver PPE. Liquid waste from the patient's toilets was sterilized with hospital-grade disinfectant before it was flushed (Lowe et al. 2014).

Nigeria is providing special insurance for the 250 Nigerian healthcare workers going to West Africa to fight Ebola. The insurance will provide \$96,000 for personal accident and disability and \$190,000 for medical expenses. It will pay \$100,000 to the beneficiary of any worker who dies (Osayande 2014).

US Africa Command's General David Rodriguez says that given the drop in Liberian Ebola cases, many US troops deployed in West Africa may soon be able to return home. The troops are not expected to be needed in Sierra Leone or Guinea (Carroll 2014).

The United Nations Development Programme is working with West African governments and UNMEER to develop a system to coordinate payments to healthcare workers and burial teams in Guinea, Sierra Leone, and Liberia (AllAfrica 2014a).

A US healthcare worker in West Africa may have been exposed to Ebola. They are being transferred to Emory University Hospital for observation (Reuters 2014r).

December 4, 2014 (Thursday)

Sierra Leone's Ebola Czar, Palo Conteh, held a press conference today to describe the country's Ebola-fighting efforts (Conteh 2014). He says that although the number of cases continues to rise, additional treatment beds are coming online which should help the situation. Ninety burial teams are now working in Sierra Leone. He also shared the results of a mid-October Ebola survey. On the positive side, 90% of respondents said that they would go to a hospital if they suspected they had Ebola.

Most also said that they would welcome an Ebola survivor back into their community. On the negative side, about one-third of respondents said they would not accept alternatives to traditional burial for a family member, 10% said they would touch the body of a loved one, and 13% said they would not wait for a burial team to bury the corpse of a loved one (Conteh 2014). Separately, it is reported that Conteh plans to jail anyone who is caught washing a body in Sierra Leone (APA 2014a).

Sierra Leone's National Ebola Response Centre has asked the Mayor of Freetown to prepare a new cemetery. The city's King Tom Cemetery is currently the only facility authorized to accept the bodies of Ebola victims. At the rate fatalities are occurring, the cemetery will soon be filled to capacity (APA 2014b).

The Mayor of Kenema, Sierra Leone, says his city is Ebola-free. The central government says this declaration is premature and such statements should be avoided (APA 2014c).

The US healthcare worker who may have been exposed to Ebola in West Africa has arrived in Atlanta. They arrived at 0545 h on a Phoenix Air Group jet (Martin 2014).

The cost needed to control the Ebola outbreak in Dallas, Texas, has been totaled. The Texas Department of State Health Services spent about \$1.28 M on control efforts (NBC DFW 2014). Dallas County spent \$384,000 (NBC DFW 2014). The City of Dallas spent \$155,000 for the general outbreak and \$27,000 to care for Nina Pham's dog "Bentley" (NBC News 2014d).

Mali has received its first mobile Ebola-testing laboratory (Associated Press 2014i).

December 5, 2014 (Friday)

Officials in Sierra Leone say 80–100 new Ebola cases are occurring in the country each day. The largest number of cases are in northern and western parts of Sierra Leone. At present, there are four functioning treatment centers in the country (Lederer 2014).

Two more Sierra Leone doctors, Dr. Dauda Koroma and Dr. Thomas Rogers, have died from Ebola. Dr. Rogers worked at Connaught hospital in Freetown and was being treated at the British clinic in Kerry Town (Roy-Macaulay 2014d).

Infected Cuban doctor, Dr. Felix Baez, has recovered from Ebola and no longer tests positive for the virus. He will be released from Geneva University Hospital in Switzerland (AFP 2014g).

A Nigerian UN peacekeeper has contracted Ebola in Liberia. He will be transported to the University Medical Center Utrecht in the Netherlands for treatment (Paye-Layleh and Corder 2014).

About 100 US marines have completed their deployment in Liberia. They are preparing to go to Germany for their 21-day observation period (Seck 2014).

The CDC says that when Ebola was active in the United States, the US healthcare system was somewhat hypervigilant and tended to over-identify possible Ebola cases. Of 650 people identified as being possibly infected, only four tested positive (0.6%) (Associated Press 2014m).

December 6, 2014 (Saturday)

With the US Ebola outbreak apparently over, US Ebola Czar, Ron Klain, will leave his post and return to his jobs as president of Case Holdings and general counsel for Revolution LLC. He expects to be back at his regular jobs by March 1, 2015 (Newmyer 2014).

Another Sierra Leone doctor, Dr. Aiah Solomon Konoyeima, has died from Ebola. Dr. Konoyeima worked at a children’s hospital in Freetown and was being treated at the Hastings Treatment Center (Roy-Macaulay 2014e).

US troops have built seven Ebola treatment centers in Liberia. Ten more centers are expected to be finished by the end of December 2014 (Beardsley 2014).

Numerous false Ebola alarms continue to occur around the world. Some cases appear to be deliberate hoaxes. For example, a 19-year-old man in Taiwan claimed that he had been vomiting and had diarrhea since he returned from Nigeria where he had eaten bat meat. He tested negative for Ebola. However, Taiwanese records show that the man had never actually left Taiwan (IANS 2014b).

December 7, 2014 (Sunday)

New Zealand is sending 82 healthcare volunteers to Sierra Leone to fight Ebola (IANS 2014c).

December 8, 2014 (Monday)

Liberia is optimistic about its downward trend in Ebola cases. Currently about 10–12 new Ebola cases are occurring in Liberia each day. While still rather high, these numbers are well below the massive numbers that were occurring several months ago. To try to end the outbreak, the government is launching a “no new cases” campaign. Its goal is to eradicate Ebola from Liberia by the end of 2014. Officials worry that as the number of Ebola cases falls, citizens may become complacent and stop practicing rigorous protection measures. Residents are warned to stay vigilant until the caseload drops to zero (Morning Edition 2014b).

To help Liberian Ebola survivors relax and come to terms with their recent experiences, US Christian group Young Life has opened a weekend camp. Recently, more than 100 survivors took part in camp activities (Worzi 2014b).

Throughout West Africa, signs warn of the dangers of Ebola. A banner in Monrovia, Liberia, reads (transcribed from a photograph taken by James Giahvue Reuters 2014s, punctuation and spacing as on the original banner):

Stop

The stigma against

Ebola survivors!!!

Ebola is still real

Protect yourself and

your family.

Members of Sierra Leone’s Junior Doctors Association have gone on strike. They are demanding better treatment for Ebola-infected healthcare workers. In particular, they want to make sure that critical equipment, like dialysis machines, are available to treat infected workers. The doctors note that 10 of 11 infected Sierra Leone doctors have died from Ebola, while only one US-treated healthcare worker has died.

They believe access to high-quality medical support and equipment is the key to surviving Ebola (Roy-Macaulay 2014f).

December 9, 2014 (Tuesday)

Liberian President Ellen Johnson Sirleaf says there have been no Ebola deaths in 9 of Liberia's 15 counties in recent days (AllAfrica 2014b).

Kilmarx et al. (2014) find that healthcare workers in Sierra Leone are 103 times more likely to contract Ebola than ordinary Sierra Leone citizens. Between May 23, 2014, and October 31, 2014, there were 3854 laboratory-confirmed Ebola cases in Sierra Leone. Of these, 199 were in healthcare workers. As of 2009, there were 2402 total healthcare workers in Sierra Leone. Assuming similar numbers of healthcare workers in 2014, this means that over 8%, or 1 in 12, Sierra Leone healthcare workers have contacted Ebola (e.g., Kilmarx et al. 2014).

Much of the money pledged to fight Ebola has not yet been delivered. Of eight leading countries, the United States has delivered the highest percentage of pledged dollars. The United States has delivered \$420 M of a promised \$572 M. In contrast, China has only delivered about \$10 M of a promised \$123 M (Caulderwood 2014).

The United States continues to screen passengers arriving from West African for Ebola. So far, no cases have been identified using these techniques. The CDC says 1933 passengers were screened between October 11, 2014, and November 10, 2014. Seven of these were referred for additional screening, but none of them had Ebola. Given the epidemiology of the disease and its incubation period, many disease experts think airport screening is ineffective (Szabo 2014b).

The US HHS says it will provide drug companies with immunity from legal claims related to the manufacturing, testing, development, distribution, and administration of the three Ebola vaccines currently under development. It is hoped that this will speed up the development of the vaccines. These protections do not apply outside the United States. (Reuters 2014t).

December 10, 2014 (Wednesday)

Total cases: 17,942 (797 new) Fatalities: 6388 (318 new)
(World Health Organization 2014m)

Time magazine has named the “Ebola fighters” its person of the year (McLaughlin 2014; Von Drehle and Baker 2014). The magazine has been printed with five different covers, each featuring a different Ebola healthcare worker (Laurent 2014). The covers include Dr. Kent Brantly, Dr. Jerry Brown (a medical director in Monrovia, Liberia), Salome Karwah (an Ebola survivor and caregiver in a MSF clinic in Monrovia, Liberia), Ella Watson-Stryker (a MSF volunteer health promoter), and Foday Gallah (a 37-year-old ambulance supervisor and Ebola survivor in Monrovia, Liberia) (McLaughlin 2014; Von Drehle and Baker 2014).

Sierra Leone has begun a 2-week lockdown of Kono District in the eastern part of the country. The lockdown started today and will last until December 23, 2014. No one will be allowed in or out of the area, but residents can move around freely within the district. Witnesses say shops are open, but most people are staying

indoors. The WHO says 87 bodies have been buried in Kono District in the last 11 days (AFP 2014h).

Liberian President Ellen Johnson Sirleaf made a video-linked address to US Senators today. She thanked America for helping with the outbreak and encouraged US lawmakers to continue their support. In particular she urged the leaders, as well as her own people, to not let their guard down as the number of Ebola cases in Liberia falls (Neergaard 2014).

December 11, 2014 (Thursday)

The last Ebola victim in Mali has recovered and left the hospital. There are now no known cases in the country (Reuters 2014u).

A WHO response team in Kono, Sierra Leone, has discovered the bodies of 25 Ebola victims in a closed off section of a local hospital. The team says healthcare workers at the site are doing all they can to fight the disease and help patients. They are simply overwhelmed by the scale of the crisis (BBC 2014f).

Officials in Sierra Leone say a new Ebola case has occurred in Kailahun District. It has been 11 days since the last known case in the district. The new patient works for MSF and provides psychological counseling for Ebola patients. He has been transferred to Freetown for treatment (Samba 2014).

Clinical trials of an Ebola vaccine have been ended because some participants reported joint pains. Trials of the Merck and NewLink vaccine started in Switzerland on November 10, 2014. The trials were stopped when 4 of the 59 participants complained of pain in their hands and feet. Researchers are investigating the cause. If the symptoms are harmless and temporary, a new trial with 15 people will begin on January 5, 2015 (Reuters 2014v).

The Global Alliance for Vaccines and Immunization says it will buy up to \$300 M worth of Ebola vaccine as soon as one is recommended by the WHO (AFP 2014i).

UN Secretary-General Ban Ki-moon has appointed Ismail Ould Cheikh Ahmed as the next leader of UNMEER (AFP 2014j). Though it is somewhat unclear, it appears that UNMEER will have rotating leadership with each head serving for about 2 months. Ahmed will succeed Anthony Banbury.

An American nurse was exposed to Ebola in Sierra Leone. They have been placed under observation at the NIH in Bethesda, Maryland (Bethesda Magazine 2014).

December 12, 2014 (Friday)

Photojournalist Michel du Cille of the *Washington Post* has died from a heart attack in Liberia. Du Cille captured many images of the Ebola outbreak. He collapsed while hiking out of a remote village in Bong County (Eversley 2014).

Families are sending about 3000 lb of mail each week to US soldiers deployed in West Africa. Mail provides a significant morale boost to recipients, especially during the holiday season (Byrne 2014).

Preliminary results of the US Agency for International Development's Ebola Grand Challenge were announced today. The contest started in October 2014. Its goal was to aid the development of novel Ebola-fighting equipment. About 1500 contestants participated. Many entrants produced new or better PPE. One submis-

sion was of an antibacterial gel called Zylast that kills bacteria for up to 6 h after it has been applied (McNeil 2014).

December 13, 2014 (Saturday)

Sierra Leone has banned public Christmas and New Year's celebrations and will impose curfews during the holiday season. Most of Sierra Leone's residents are Muslim, but about 25% are Christian (Sabin 2014).

The Guinean government is setting up village watch committees in the mining region of Guinea. Their mission is to provide communities with information about Ebola and identify and contain new outbreaks. Each committee is composed of a young person, a woman, a traditional healer, a religious leader, and a public health representative (Guensburg 2014).

Ebola survivors continue to face significant stigma when they return to their communities. Landlords do not want to rent to them, employers may not hire them, and taxi drivers often avoid them. In Monrovia, Liberia, Vivian Rogers, a 40-year-old Ebola survivor and government filing clerk, has been told to stay at home by her boss. Rogers says she is glad she is still being paid, but feels useless and does not understand why people are afraid of her when she is no longer contagious (Zoroya 2014e).

Réunion Island in the Indian Ocean hospitalized a suspected Ebola case today (RFI 2014).

December 14, 2014 (Sunday)

Ebola cases continue to spike in Sierra Leone. In mid-October, there were approximately 35 burials a day in Freetown. There are now around 80. On the positive side, current burials are taking place quickly. During November 2014, 95% of burials took place within 24 h of a body being recovered (Boseley 2014a).

A 12th Sierra Leone doctor, Dr. Victor Willoughby, has contracted Ebola (Associated Press 2014n).

December 15, 2014 (Monday)

CDC director, Dr. Thomas Frieden, is concerned that Ebola could become endemic in West Africa (Doucleff 2014). If this happens, some level of the disease will remain in the region for the foreseeable future. This would mean that there would be a perpetual risk of Ebola cases being exported from the area to other countries.

In Sierra Leone, Dr. Fasineh Samura, the coordinator for the Koinadugu District Ebola Response Center, has set the ambitious goal of eradicating Ebola from the district within 45 days. Dr. Samura says officials have a list of all the inhabitants of the Neine Chiefdom. They plan to check each household every day for sick individuals. The Paramount Chief of the region, Alimamy Lahai Mansaray V, also requests that residents not host any visitors from outside the region because they might be infected (Sierra Express Media 2014).

As part of a clinical trial, doctors at the ELWA Hospital in Monrovia, Liberia, have begun treating patients with convalescent blood serum (BBC 2014g).

The coming 3-month West African dry season is seen as a double-edged sword in the fight against Ebola. As conditions dry, roads will become more passable. This

will help healthcare workers and supplies get to remote locations more easily. On the other hand, it will increase the mobility of the population which could spread the virus (Tyson 2014).

Ebola has significantly reduced West Africa's air connectivity with the outside world. Compared to a year ago, there are 81% fewer airline seats available for passengers leaving Liberia, 75% less for Sierra Leone, and 39% less for Guinea (Jasper and Bennett 2014).

A large portion of Ebola survivors are experiencing post-Ebola syndrome. Symptoms include joint pain, sleep disorders, skin problems, reproductive problems, and vision problems. In terms of scale, 40% of survivors in Kenema, Sierra Leone, have developed eye problems. Over 33% have developed skin problems (Trenchard 2014a).

December 16, 2014 (Tuesday)

Sierra Leone will conduct house-to-house searches for Ebola victims in the western parts of the country, including Freetown (Roy-Macaulay 2014g). The campaign will be known as Operation *Western Area Surge*. It will start Wednesday, December 17, 2014 (Associated Press 2014o). During the campaign, healthcare workers will visit homes to find hidden Ebola cases (Roy-Macaulay 2014g). The government will also launch a large-scale information campaign at the same time (Boseley 2014b). The campaign will be similar to drunk-driving campaigns used in western countries. It will attempt to intentionally frighten people about Ebola. Officials hope the information campaign will scare people into taking more personal protective measures and make them more willing to report Ebola cases to the authorities (Boseley 2014b).

In Mali, the last 13 people under surveillance have been released from quarantine. None of them developed Ebola. There are no active cases in the country, and no one is under observation (Reuters 2014w).

Conakry, Guinea, has banned all public Christmas and New Year's celebrations due to the Ebola outbreak (AFP and JIJI 2014).

The position of "chlorine sprayer" is a critical part of an Ebola management team. When a team arrives at a site to pick up a patient or recover a body, the chlorine sprayer must first decontaminate the area. The chlorine sprayer approaches the site and methodically sprays the victim and the surrounding area with a 0.5% chlorine solution. Once done, the sprayer signals to the rest of the team that they can begin their work. If a body is being recovered, the outer layer of the body bag is sprayed after the corpse is placed inside (Médecins Sans Frontières 2014b).

Summers et al. (2014) examined the medical and logistical challenges posed by Ebola in four rural Liberian counties. The authors interviewed healthcare workers in Grand Cape Mount, Grand Bassa, Rivercess, and Sinoe counties in western Liberia from August to September 2014. The most significant problems facing workers were inadequate training, lack of supplies, low-quality transportation, and poor communication networks. For example, at the time of the assessment, there were no functioning ambulances in either Rivercess or Sinoe counties. Roads throughout the region were often impassible, especially during the rainy season. It took one team

8 h to walk to a community that had reported cases. Despite some improvements over the last months, it is still difficult to identify and transport Ebola cases in rural Liberia (Summers et al. 2014).

US Ebola survivor, Dr. Richard Sacra, plans to return to the ELWA Hospital in Monrovia, Liberia, in January 2015 (Marcelo 2014).

December 17, 2014 (Wednesday)

Total cases: 18,603 (661 new) Fatalities: 6915 (527 new)
(World Health Organization 2014n)

Operation *Western Area Surge* has begun in Sierra Leone (Associated Press 2014o). During this 15-day campaign, healthcare workers and volunteers will go door to door to find hidden Ebola cases and distribute brochures about Ebola's signs and symptoms (AFP 2014k). Markets will be open from 0600 to 1800 h Monday through Friday and 0600–1200 h Saturdays. Markets will be closed on Sundays (AFP 2014k). By lunchtime today, 52 suspected Ebola cases had been found. Some were discovered by search teams; others were reported to the Ebola hotline number (Farge 2014b). Burial workers at King Tom Cemetery in Freetown buried 51 Ebola victims today (Robinson 2014). The government reminds people that public gatherings are banned during the holiday season. For New Year's celebration, officials say that church services should end by 1700 h December 31, 2014 (Farge 2014b). Violators will be punished (AFP 2014k).

In the past 21 days, there were 1261 new Ebola cases in Sierra Leone (World Health Organization 2014n). Despite the high levels of transmission, CDC director Tom Frieden says US troops are not needed in Sierra Leone because British troops are helping in the country (Associated Press 2014o).

Ebola is affecting the economies of many African countries, even those that have not had any Ebola cases. Tourism revenue in The Gambia is down to 65% compared to last year. This November 10,453 international visitors arrived in The Gambia, compared to 20,905 last November (Novelli 2014).

December 18, 2014 (Thursday)

The Magbente Ebola Treatment Unit near Makeni, Sierra Leone, has discharged 29 Ebola survivors. These are the first patients to be released from the center since it opened on November 21, 2014. So far, the unit has handled 92 Ebola cases and has had six deaths (Kamara 2014).

Sierra Leone doctor, Dr. Victor Willoughby, has died from Ebola. A dose of experimental ZMAb (related to ZMapp) had arrived for him, but he died before it could be administered. Dr. Willoughby was Sierra Leone's most senior doctor (Roy-Macaulay and Diallo 2014).

Even with the high level of Ebola transmission in Sierra Leone, many people still refuse to believe the disease is real. An operator at the country's 117 Ebola hotline number says many callers insist Ebola is a lie and are abusive to her (Bowden 2014).

In Guinea, a serious fire at the Conakry airport has destroyed a warehouse containing Ebola-fighting medicine and supplies (Roy-Macaulay and Diallo 2014). All of the material appears to have been lost.

December 19, 2014 (Friday)

The Red Cross has trained two new burial teams in Kono District, Sierra Leone. One team recently recovered the body of a possible Ebola case in the remote village of Kwador. The victim was a 5-month-old baby. The case provides an excellent example of the social and medical procedures followed by Red Cross burial teams. When the team arrived at the village, one member asked about the victim and explained the burial procedures. The whole village watched as the body was collected and the victim's house was disinfected. The men of the village then came forward and said a prayer. When the villagers were ready, the body was taken to the cemetery and buried (Pattison 2014).

Despite the dangers posed by Ebola, residents of Kono District, Sierra Leone, seem fascinated by what they are calling “the Ebola saga.” When a new body is discovered, people are attracted in great numbers. In one video posted by Reuters (2014x), a large crowd is seen clustering around the body of a man sprawled at the side of the road. Some people are within inches of the body. An eyewitness says the man had been riding a bicycle when he fell off, vomited, and died. Almost everyone in the crowd has their cellphone out recording the scene. When a recovery team arrives, one of the workers says that viewing Ebola bodies has become a hobby for residents (Reuters 2014x).

Ebola survivors are helping at many Sierra Leone Ebola treatment centers. They often take care of infected children. Survivors are immune to the disease, so they do not need to wear PPE. As a result, they do not look threatening to children. They can also stay in the infected area for a long time because they do not need to leave the area to cool down (Trenchard 2014b).

Officials are concerned that the holiday season could help spread Ebola in West Africa. In particular, they worry that city dwellers may carry the virus to their home villages when they return to see their relatives. It is thought that about half the residents of Freetown, Sierra Leone, will travel to remote villages during the holidays (Fox 2014).

UN Secretary-General Ban Ki-moon arrived in Liberia today for a 2-day tour of Ebola-affected countries. Ban wants to visit the countries himself so he can personally see the response to the disease (AFP and Reuters 2014).

The United Nations Development Programme plans to work with Guinea, Liberia, and Sierra Leone to provide cash payments to families affected by Ebola. Payments will go to families who have lost their main breadwinner, survivors who are out of a job, and those caring for Ebola orphans. It is unclear exactly how much each family will receive, but \$50 would support a family of five for about a month (Sifferlin 2014).

The Nigerian peacekeeper who was being treated for Ebola at Utrecht University Teaching Hospital in the Netherlands has recovered (ANP 2014).

The nurse who arrived at the NIH on December 11, 2014, has been released. They have not developed symptoms and will complete the rest of their 21-day quarantine at their home in Virginia (CBS DC [2014](#)).

December 20, 2014 (Saturday)

Liberia is holding senatorial elections today. Voting was originally supposed to take place in October 2014, but it was postponed due to the outbreak (BBC [2014h](#)).

UN Secretary-General Ban Ki-moon has arrived in Guinea as part of his West African tour (Sky News [2014](#)).

US Senator Chris Coons (Democrat, Delaware) is in Liberia to assess the US Ebola response (CBS Philly [2014](#)).

December 21, 2014 (Sunday)

Resources are stretched thin in Kono District, Sierra Leone. There are only two ambulances in the district and two ambulance drivers have died from Ebola. Conditions at Ebola centers in the district are dire. Ten healthcare workers at one center have contracted Ebola, five of them have died. At another site, nurses are so worried about interacting with infected patients that they toss medicine to them rather than risk close-quarter contact (Farge [2014c](#)).

Unsafe burials remain a source of infection in Sierra Leone. The government is threatening to jail people caught holding illicit funerals. Medical personnel are appealing to citizens to accept medical burials. Dr. Desmond Williams of the CDC is leading by example. He made a radio broadcast saying that if he died, he wanted his family to give him a safe medical burial (VOA News [2014c](#)).

A woman named Memuna Janneh has launched an organization called LunchBoxGift. It delivers meals to Ebola victims and healthcare workers in Sierra Leone. Janneh lives in London but has ties to Sierra Leone. Each meal costs about \$1–3 and comes packaged in a bamboo wrapper that can be burned with the trash at an Ebola treatment center. The group started operating in September 2014 (Nathanson [2014](#)).

December 22, 2014 (Monday)

Street Child of Sierra Leone is providing supplies to Ebola orphans in nine Chiefdoms of Port Loko District. The group defines an Ebola orphan as a child under 18 who has lost the family breadwinner to Ebola. Orphans are provided with bags of rice, cooking condiments, cups, plates, spoons, toothbrushes and toothpaste, soap, and used clothing (AllAfrica [2014c](#)).

Tekmira Pharmaceuticals will provide 100 courses of its experimental TKM-Ebola-Guinea treatment for clinical trials in West Africa (Reuters [2014y](#)).

December 23, 2014 (Tuesday)

Working conditions in West African Ebola wards are very challenging. The extreme heat makes working in PPE very difficult. In Port Loko, Sierra Leone, medical workers work in pairs. If one team member becomes overheated, they flash a “T” signal to the other worker. Both team members then immediately leave the hot zone. If the team is in the middle of a procedure, it is left for an incoming team to complete. It is difficult to write notes inside an Ebola ward. The chlorine-rich

environment destroys notepaper, and paper becomes contaminated with infected body fluids. To record data, scribes are posted outside the safety fence and information is shouted to them by medical workers in the ward (Deahl 2014).

Surgeries are no longer performed at the Hastings Treatment Center in Sierra Leone. Many of the surgeons have died from Ebola, and the surviving staff is working too hard to perform operations (Farge 2014d).

The first person has been convicted for violating Sierra Leone's anti-Ebola regulations. Amadou Kargbo, the local chief of Bumpeh, was found guilty of burying an Ebola victim, hiding a sick person (his daughter), and harboring a stranger. He was fined \$235 and will spend 6 months in jail after he completes his 21-day quarantine (APA 2014d).

The 50-bed German-Liberia Ebola Treatment Center has opened in Paynesville, Liberia. It is the first German-sponsored Ebola center in West Africa (Caldwell 2014).

December 24, 2014 (Wednesday)

Total cases: 19,497 (894 new) Fatalities: 7588 (673 new)
(World Health Organization 2014o)

An accident has occurred at a CDC laboratory in Atlanta, Georgia. A technician may have been exposed to Ebola on Monday, December 22, 2014 (Grady and McNeil 2014). Ebola-infected material from the BSL-4 Ebola research lab was accidentally transferred to a BSL-2 lab (Gorman 2014; Graef 2014). The BSL-4 lab had intended to send dead virus particles to the BSL-2 lab, but sent live virus instead (Gorman 2014). The technician in the BSL-2 lab used standard BSL-2 safety equipment (gloves and gown) to work with the samples instead of full PPE (Gorman 2014). The mistake was discovered Tuesday. The technician will be monitored for 21 days to see if they develop symptoms (Grady and McNeil 2014). Other workers who entered the BSL-2 lab are being assessed. The CDC stresses there is no risk to the general public (Sun and Achenbach 2014).

Nurses at the Magbente Hospital in Makeni, Sierra Leone, have gone on strike because they have not received their hazard pay (MENAFN and AFP 2014).

People in Mali remain worried about Ebola and continue to frequently wash their hands (Diarra 2014).

A UN peacekeeper, a Liberian national, has contracted Ebola in Liberia and been isolated (Associated Press 2014p).

Ansumana et al. (2014) note a decline in Ebola mortality in Sierra Leone. Of 581 patients admitted to the Hastings Treatment Center in Freetown since September 20, 2014, 183 have died (31.5%), including 38 who were dead on arrival. This fatality rate is sharply lower than the 74% mortality seen in May and June 2014 in Kenema, Sierra Leone. The patients in Freetown were treated with antibiotics, malaria medicines, ibuprofen, intravenous nutrients, and anti-nausea medicine and given supportive care (Ansumana et al. 2014).

December 25, 2014 (Thursday)

Sierra Leone has placed the country's northern region on lockdown. The lockdown is planned to last for 3 days but could be extended if needed. During the lockdown, markets will be closed and travel will be prohibited unless it is related to the Ebola outbreak (BBC 2014i).

Christmas activities have been subdued in Sierra Leone due to the ban on public gatherings. Some churchgoers have been seen in Freetown in formal attire, but unlike normal years, no boisterous parties are being held. Small-scale private celebrations are taking place, but police are patrolling the streets with instructions to break up any gatherings and arrest the organizers. At the Ebola treatment center in Kenema, patients listened to Christmas carols on a cassette player (Reuters 2014z).

A special Christmas party was held at the Bong County Ebola Treatment Center in Liberia (Baldauf 2014). Four healthcare workers turned their PPE into festive costumes of Santa, two elves, and Frosty the Snow Man. The medics brought candy, sodas, toys, and patterned cloths called lappas to patients in the high-risk area. The patients were overjoyed and sang Christmas carols (Baldauf 2014). In contrast, residents of Monrovia celebrated a quiet Christmas. Some residents said it was the worst Christmas they had ever seen because of the overshadowing epidemic (AFP 2014l).

China says its Academy of Military Medical Sciences has developed an Ebola vaccine that will soon begin clinical trials (PTI 2014b).

December 26, 2014 (Friday)

The CDC technician exposed to Ebola in Atlanta remains under observation, but has not developed symptoms. Eleven other workers who were in the laboratory have been interviewed about their risk of exposure. None are believed to require monitoring. CDC Director Dr. Tom Frieden has ordered a full investigation of the incident (NBC News 2014e).

December 27, 2014 (Saturday)

The Dutch relief ship *Karel Doorman* arrived in Guinea today. It will deliver Ebola supplies to Guinea and then make deliveries to Liberia and Sierra Leone (NU.nl 2014).

The AIDS Healthcare Foundation will sponsor a float in the Rose Bowl Parade to honor Ebola fighters. The float will feature floral portraits of African doctors Dr. Sheik Umar Khan and Dr. John Taban Dada who worked with the foundation and died from Ebola (Sklar 2014).

December 28, 2014 (Sunday)

Former US Ebola Czar Ron Klain defended the CDC following the Ebola accident in Atlanta. He says the agency has been studying Ebola for 20 years and its work has saved thousands of lives (Pengelly 2014).

December 29, 2014 (Monday)

Doctors at Gartnavel Hospital in Glasgow, Scotland, have confirmed Scotland's first Ebola case (BBC 2014j). A female nurse [Pauline Cafferkey] working for Save the Children in Kerry Town, Sierra Leone, contracted the virus while in Sierra Leone. Not knowing she was infected, she returned to Scotland yesterday and developed

symptoms this morning (BBC 2014j; Johnson 2014). During her return trip, the nurse flew on Royal Air Maroc flight AT596 from Sierra Leone to Casablanca, Morocco. She then took Royal Air Maroc flight AT800 from Casablanca to Heathrow Airport, London (Johnson 2014; Thomas 2014). In the United Kingdom, she took British Airways flight BA 1478 from Heathrow to Glasgow. She arrived in Scotland about 2330 h Sunday (Johnson 2014). She began feeling unwell this morning and was isolated at 0750 h (BBC 2014j). British Airways officials are working with the NHS to identify potential contacts (Gill 2014). There were 71 other passengers on her British Airways flight. Officials think the risk of transmission to fellow passengers is low, but an emergency helpline has been established. Authorities are asking passengers to call 08000 858531 so their specific risk can be assessed (BBC 2014j; Gill 2014).

Liberia has purchased 50 acres of land in the Disco Hill community of Monrovia to be used as an Ebola cemetery. Up until now, Liberian victims have been cremated. Cremation is very unpopular in Liberia because it conflicts with local religious beliefs. The government will let families bury their dead in the new cemetery if they do so safely and do not touch the bodies (BBC 2014k).

December 30, 2014 (Tuesday)

The infected Scottish nurse has been identified as 39-year-old Pauline Cafferkey (Evening Edinburgh News 2014). She worked in Kerry Town, Sierra Leone, and may have become infected at a church service on Christmas Day (Evening Edinburgh News 2014). Cafferkey was transferred to the Royal Free Hospital in London this morning. She flew to London on a plane equipped with a quarantine tent (Telegraph 2014). As part of her treatment, Cafferkey will receive convalescent blood plasma (BBC 2014l). She currently is in stable condition (Telegraph 2014).

Two other people are being tested for Ebola in the United Kingdom. One is a female healthcare worker who recently returned from West Africa and has been staying at Torridon Youth Hostel in the Scottish Highlands (BBC 2014m). She will be transferred to the Aberdeen Royal Infirmary for testing (BBC 2014m). The other person is in quarantine at the Royal Cornwall Hospital in Truro (Cowell 2014). A total of 931 people have been screened for Ebola in the United Kingdom since airport checks began (Larner 2014).

Liberia reports a flare-up of Ebola cases near its border with Sierra Leone. Between December 1 and 25, 2014, 49 new cases were reported in western Grand Cape Mount County (Paye-Layleh 2014c).

December 31, 2014 (Wednesday)

Total cases: 20,206 (709 new) Fatalities: 7905 (317 new)
(World Health Organization 2014p)

Infected British nurse Pauline Cafferkey is being treated with convalescent blood plasma and an unnamed, experimental antiviral drug (BBC 2014n; Borland et al. 2014). Cafferkey's family cannot physically touch her, but they can see and interact with her via an intercom system (Borland et al. 2014). In total, 203 people may have

had contact with Cafferkey while she was traveling on December 28, 2014. Officials are getting in touch with these people. Cafferkey had a fever while she was at Heathrow Airport, and her temperature was checked seven times. However, her temperature remained within acceptable limits (below 99.5 °F) and did not trigger further Ebola assessments (Borland et al. 2014). In response to this apparent failure, the United Kingdom's Chief Medical Officer, Sally Davies, has requested that UK Ebola screening procedures be reviewed and improved (Associated Press 2014q).

Liberia will lift its 0000–0600 h curfew tonight to allow people to attend New Year's Eve church services. Participating churches are asked to avoid overcrowded conditions and have attendees practice safe personal protection practices such as hand-washing (Giahnye 2014).

As Ebola survivors leave the Maforki Ebola Treatment Centre in Port Loko, Sierra Leone, they tie a ribbon to a tree near the unit. Many colorful ribbons now adorn the tree (United Nations 2014).

Ebola is affecting many aspects of Sierra Leone's sociology, including the country's sex life. In terms of prostitution, customers fear prostitutes may be infected. They either avoid prostitutes or pay them very little. One sex worker says a customer recently offered \$7 for her services when she would normally charge \$40. Relationship-based sex also appears to be down. One condom provider says the hotels he serves normally require about 2000 condoms a month. Since spring 2014, however, none of the hotels have needed to replenish their stocks (Aizenman and Smith 2014).

UNICEF has donated ten ambulances to Guinea (United Nations 2014).

Some US troops are returning to their home bases after being deployed to West Africa. Returnees include 140 troops from Fort Campbell, Kentucky. They will undergo their 21-day quarantine at different sites before returning to their base. By mid-January, US Africa Command will decide whether the soldiers remaining in Liberia will move to other West African countries or return home (Associated Press 2014q).

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